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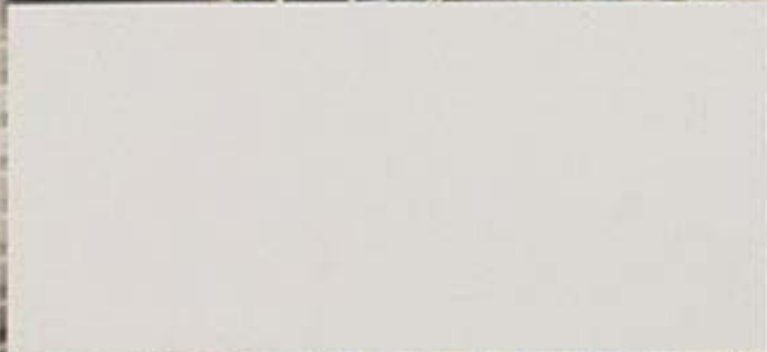
JOURNAL OF THE AIR FORCE ASSOCIATION

MAGAZINE



**Buildup and Battle
in Afghanistan**

**The Bomber Question
"Personnel Recovery"
Making Space Responsive**



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MAGAZINE

December 2010, Vol. 93, No. 12



About the cover: SrA. Samuel Jaks removes the ladder from an F-15 as Capt. Matthew Strohmeier and Capt. Miguel Santibanez prepare for a mission over Afghanistan. See "Buildup and Battle," p. 46.

- 2 Editorial: Containing China**
By Adam J. Hebert
The recent US military agreements with Australia are a necessary but insufficient step.
- 22 The Bomber Question**
By John A. Tirpak
The Air Force hasn't been told when to begin work on a new long-range strike aircraft, or even what it should be able to do.
- 28 Personnel Recovery, in Need of Rescue**
By Marc V. Schanz
USAF's rescue personnel are in desperate need of new helicopters.
- 34 Hog Heaven**
By Walter J. Boyne
Paul Johnson led the rescue of a downed F-14 pilot just as Iraqi forces were moving in.
- 40 Countering the Missile Threat**
By Rebecca Grant
New generations of enemy missiles, and a willingness to use them, could put air bases under siege like never before.
- 46 Buildup and Battle**
Photography by Clive Bennett
Text by June Lee
Afghanistan's Bagram Airfield has grown to accommodate an even greater role in the Air Force mission.
- 54 Air Sovereignty Never Sleeps**
By Marc V. Schanz
Adm. James Winnefeld, the new NORAD and NORTHCOM boss, closely monitors what's needed to defend North America.
- 58 Making Space Responsive**
By Peter Grier
Space systems bring tremendous combat advantages, but they take too long to field. DOD is counting on its ORS office to speed things up.
- 62 Entebbe**
By John T. Correll
The fate of the hostages rode with a C-130 invisibly descending from the night sky.
- 70 The Last of the Dive-bombers**
By Walter J. Boyne
The Army Air Forces turned to dive-bombers for accuracy, but the A-24 Banshee found itself in the wrong places at the wrong times.

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- 4 Letters**
- 8 Washington Watch**
- 12 Air Force World**
- 15 Index to Advertisers**
- 18 Senior Staff Changes**
- 11 Chart Page**
- 39 Verbatim**
- 57 The Keeper File**
- 68 AFA National Leaders**
- 69 Field Contacts**
- 74 AFA National Report**
- 78 Unit Reunions**
- 80 Airpower Classics**

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Containing China?

THE OBAMA Administration's top national security officials spent early November fanning out across the Pacific, visiting a host of nations both expected (Australia, China) and unusual (Tonga, Vietnam).

President Obama, Joint Chiefs of Staff Chairman Adm. Michael G. Mullen, Defense Secretary Robert M. Gates, and Secretary of State Hillary Rodham Clinton all went out. Clinton herself made calls in seven nations.

Two news events emerged from this burst of activity. Obama made a surprising, but largely symbolic, call to add India to the UN Security Council's permanent membership.

More concrete were US and Australian agreements to increase military cooperation. Officials announced three new defense initiatives at annual ministerial meetings held Nov. 8 in Melbourne.

The first calls for more US military visits in Australia. The two nations "resolved to work collaboratively" to develop their force structures in the region. They will see increased manning at joint facilities, US military equipment pre-positioned in Australia, and additional training exercises.

The Pentagon is in the midst of a global force posture review that could have additional repercussions on US basing arrangements throughout the Pacific region. The door is open Down Under. The Australian government welcomes the US "making greater use of our ports and our training facilities, our test-firing ranges," said Foreign Minister Kevin Rudd. Shared facilities are the order of the day: There are no plans for permanent or exclusively American bases on Australian soil.

The second initiative is an explicit call for greater cooperation on cyber operations. Washington and Canberra already work together closely in the shadowy world of cyber operations, but the plan is to pursue even greater synergy defending networks and identifying sources of cyber attacks.

Finally, the two nations announced plans to build a binational space monitoring facility in Australia. The nations share "a deep concern about the increasingly interdependent, congested, and contested nature of outer space,"

read the ministerial meeting's joint communiqué. Space situational awareness over the Southern Hemisphere is inadequate, so the facility will identify, catalog, and track orbiting objects.

This flurry of activity with Australia—and across the Pacific—comes with China as the unmistakable but often unmentioned backdrop. China has claimed international seas as national territory, is widely suspected as the state-sponsored source of cyber at-

The recent US military agreements with Australia are a necessary but insufficient step.

tacks on foreign military systems, and has used an anti-satellite weapon to destroy a spacecraft in orbit.

Top officials, when they mentioned the country at all, took pains to say US engagement across the region is not directed against China and is not an attempt to "contain" China.

"There are some in both countries who believe that China's interests and ours are fundamentally at odds," Clinton said in Honolulu just before leaving US soil for her Pacific tour. "They apply a zero-sum calculation, ... so whenever one of us succeeds, the other must fail. But that is not our view."

Cooperation and integration are clearly US interests. China is now America's No. 2 trading partner, second only to Canada.

Yet many Chinese "still believe that the US is bent on containing" their nation, Clinton continued. "I would simply point out that since the opening of diplomatic relations between our two countries, China has experienced breathtaking growth and development."

This is true, but China has certainly acted as if it needed containment. The communist giant's neighbors can be forgiven for seeking greater ties to the US because there are numerous recent examples of Chinese bullying on an international scale.

China this year protested a proposed sale of defensive weapons for Taiwan in its standard manner. It condemned the sale, reiterated its claim over the democratically governed island, and

called off planned meetings with US military officials.

More recently, a Chinese vice foreign minister said nations had a "choice" regarding Nobel Peace Prize recipient Liu Xiaobo, whom China has ordered jailed for 11 years for advocating democracy. If nations "make a wrong choice" and recognize Liu's award, "they have to bear the consequences," the official said.

Also this fall, China coerced Japan into releasing the captain of a fishing boat that collided with Japanese Coast Guard ships in the East China Sea. Beijing did this by halting key exports to Japan until Tokyo caved.

Most egregiously, China declared the South China Sea—including vast swaths of international waters—to be a "core national interest." This is essentially a territorial claim over the high seas.

These recurring attempts to pressure its neighbors leave aside a long-term Chinese military buildup which is poorly explained, increasingly centered on power projection, and is clearly designed to thwart US military capabilities. (See: "From 'Curious' to 'Concerned,'" November, p. 48.)

In this context, the recent US military agreements with Australia appear to be a necessary but insufficient step. Washington should pursue similar agreements with its other allies and partners in the region—not to keep China in a box, but to secure American interests.

The US already has defense treaties with the Philippines and Thailand. They, and nations such as India, Indonesia, and Singapore, will probably all find a closer relationship with the US mutually beneficial.

Open and peaceful dealings with China are in America's best interest, and China's rise does not mean the US is in decline. Unfortunately, recent actions show Beijing will not always be a responsible international player.

Better relations in the Pacific will help the United States regardless of how China chooses to behave, and the nations in the region don't have to put themselves at China's mercy.

"We're very anxious to make sure that no one thinks we're walking away" from the Pacific, Mullen said last month, "because we're not." ■



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The Cost of Defense

In his editorial "Security Isn't Cheap" Adam J. Hebert cites the work of the Sustainable Defense Task Force as a case in point of critics of Pentagon spending recommending cuts "without credible analysis of strategy or requirements" [November, p. 2]. As a member of the task force, I differ over the credibility of our analysis. But let me speak to where I agree with Mr. Hebert: "Security is not cheap."

In fact, it is extremely expensive. When the country is hit with a financial disaster, we owe it to the country and our military to re-examine our national security strategy and make sure priorities are clear and that our military investments are cost-effective. In the last 12 years of Pentagon budgets, the planning has proceeded as though there is no resource constraint. Unfortunately, that is true of the last QDR as well. Those days are clearly over—Secretary Gates has said as much.

"A well-trained, well-equipped, professional military is not cheap. If the nation wants it to cost less, the nation will probably have to ask it to do less." Exactly. Since the end of the Cold War the US military has steadily advanced its global reach and engagement. Missions have proliferated, including many that should be done by civilians in the State Department and other agencies. Significant numbers of US troops still remain in Europe, even though there is no military threat to Europe that allies can't handle. The most important take-away lesson from the wars in Iraq and Afghanistan is that long, low-intensity land wars are not cost-effective uses of US military power and should be avoided whenever possible. Hopefully we can all agree there should never again be such a "war of choice."

"There are certainly ways to reduce defense spending." Yes, and one that will save around \$45 billion in Air Force modernization accounts is available in a choice about how to modernize the fighter fleet. The Air Force has decided to replace its aging F-16s with just about the most expensive new fighter one can dream up, the F-35. In today's fiscal environment, either the Air Force will

end up with a lot fewer of these planes than planned, or they will choose to get ahead of the budget crunch coming and modernize with new block versions of the still best-of-class F-16s and limit the buy of F-35s this decade to a few squadrons for high-intensity air-superiority missions. If serious air competition emerges a decade from now we can then roll out production of F-35s, presumably much improved with 10 years or more of further fighter development.

Charles Knight
Project on Defense Alternatives
Cambridge, Mass.

Weapons in Laos

John Correll's story on the Medal of Honor posthumously presented was a great piece. However, I would like to clarify and add to the record [*Etchberger, Medal of Honor*, November, p. 42].

In 1966, '67, and '68, I was a major on detail to the CIA in Laos and served as the chief of tactical air ops. During this time, our agency officers and their irregular troops were engaged in countless combat operations, a great number of which were supported by USAF forces.

None was more tragic or frustrating than the fight for Lima Site 85, Phou Pha Thi. I was the CIA staff officer given the overall responsibility for the defense of the site.

I feel compelled to point out that the US ambassador, William Sullivan, NEVER concurred in arming the "sheep dipped" Air Force radar technicians who

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were located deep in enemy territory. All this despite numerous face-to-face requests by the chief of station, Ted Shackley, deceased in 2002, and myself.

In November 1967, I decided to defy this unreasonable denial and drew 40 M16s and ammo from the Air Force 7/13th supply facility on a hand receipt and issued them to the Heavy Green project along with four CIA-owned Browning 9 mm side arms and ammo, plus a large number of frag grenades. The agency had no M16s in stock, but we reasoned that these airmen had at least some familiarity with this weapon during basic training. Therefore, I had to get assistance from 7/13 AF, and the officer in charge, Maj. Gen. [William C. Lindley Jr.], agreed.

The CIA case officers at Site 85 were then instructed to conduct as much training with the radar guys as time permitted. Neither the ambassador nor his staff were ever informed. My agency bosses were witty but maintained secrecy, i.e., plausible deniability.

Additionally, we made a number of requests to permit the embedding of at least a small number of US Army Special Forces combat veterans from MACV SOG in South Vietnam. Such "stiffeners" could have made a great difference in the coming fight. This, too, was always denied, according to Sullivan, because of the 1962 Geneva Accords on Neutrality in Laos—an enormous joke since the enemy blatantly disregarded these strictures.

Col. (Ret.) Gerald Clayton, the Heavy Green unit commander, lives in Florida and can verify this information. The whole sorry story is chronicled in my old book, *Honored & Betrayed* (published 1992), Chapter 6, and is the only accurate record known to me that lays out what our brave USAF troops manning Site 85 had to battle against. A number of other pieces have been written, including official USAF Project Checo reports. But CIA officials who had the actual responsibility for defense of the site were never interviewed—thus the less-than-complete historical accounts. Therefore, I recommend you look up my old book and read the rest of the story. There are a lot of lessons there.

Maj. Gen. Richard V. Secord,
USAF (Ret.)
Fort Walton Beach, Fla.

As I read "Etchberger, Medal of Honor," I could not help but think of my time spent serving in that part of the world. I was stationed in Thailand in 1967-68, when Chief Etchberger was killed escaping from Phou Pha Thi mountain.

We had several occasions when insurgents attempted to shoot down C-141s on landing and explosions within the bomb dump. However, these occa-

sions did not end like that one involving Chief Etchberger and his crew.

It is unfortunate that these airmen were placed in a position to perform a job without sufficient resources to defend themselves. Sharing 10 M16s among 19 airmen was unacceptable. Knowing they were in "neutral territory," it should not have been difficult to believe that this type of occurrence could occur. I do not believe this type of circumstance would occur today. I also hope USAF has taken action(s) to present such an award in a timelier manner.

CMSgt. Peter L. Donahoe Jr.,
USAF (Ret.)
La Vernia, Tex.

Wants Vs. Needs

The October 2010 article on acquisition course correction contained many valid points [*The Acquisition Course Correction*, p. 30]. However, I take exception with Lt. Gen. Mark Shackelford's comment on p. 33. Concerning cooperation between acquisition community people and operators, he states, "What we're going to put on contract is what they actually want." Trying to give operators what they "want" is at the crux of the acquisition system problems we have experienced over the past 25-plus years. What really needs to be done is to get the operators what they NEED, while keeping track of the "wants" for future enhancements if they become affordable. I have to assume that the "want" v. "need" was an honest slip on the general's part.

Lt. Col. Dan A. Phillips,
USAF (Ret.)
Rapid River, Mich.

A Little Tired

I would like to congratulate you on your October issue of your publication. Having been a subscriber to *Air Force Magazine* for 30-plus years, it was a pleasure to read from cover to cover—something I haven't been able to say in recent years, based on your almost constant campaign for a larger budget and the need to replace our "aging, worn-out aircraft." That message, although needed, had become more than a little [tired]. Again, thank you.

MSgt. James L. Clay,
USAF (Ret.)
Shelby, N.C.

What We Dreamed

"We never would have dreamed of this type of stuff in the Cold War" [*The New Look of Base Defense*, October, p. 58]:

It just so happens that we did dream of this type of stuff during the Cold War at the Air Base Defense school at Parks AFB, Pleasanton, Calif., and Camp Beale, Marysville, Calif. (now Beale Air Force Base), during the

early 1950s. Students were air policemen, E-5 and higher, undergoing three months of intensive air base defense training. This consisted of training with recoilless rifles, Browning automatic rifles, mortars, hand grenades, and the personal assignment of M1 Garands. The academic training was at Parks, with the tactical and weapons training taking place at Camp Beale, along with assignment to 10-man tents for the duration of the training. Needless to say, it was a very comprehensive course, with the thought that we somehow had been shanghaied into the Army.

CMSgt. Lawrence H. Cofer Jr.,
USAF (Ret.)
Jacksonville, N.C.

The Defense Budget

Air Force Magazine's October 2010 "Chart Page: Snapshots of a Big Defense Squeeze" [p. 28] depicts what is described as a federal spending "addiction" to entitlement programs, and lumps together Social Security, Medicare, and Medicaid as growing from 20 percent of the 1970 federal budget to 49 percent of the 2010 budget, and ultimately, to 52 percent of the 2040 budget. By beginning the description with, "Defense isn't causing the deficit," the inference is that Social Security is a major contributor to the current and projected deficit. This is misleading. The facts are that receipts from Social Security taxes have exceeded expenditures, and the Social Security trust fund will have sufficient funds through 2037, at which point Social Security tax income will be sufficient to pay about 75 percent of scheduled benefits through 2084.

Further, there are easy fixes to maintaining the Social Security trust fund without raising the tax rate such as raising the ceiling on wages subjected to the Social Security tax. So, Social Security is paid for through 2037 (actually through 2040 if disability insurance is excluded) by Social Security taxes that have nothing to do with the defense budget unless someone proposes to use Social Security taxes to pay for defense programs.

On the other hand, we all know that Medicare and Medicaid are huge potential deficit problems and are being addressed in the political and legal arenas. So I will not engage in a debate on the national security or national morality aspects of adequate health care for our fellow citizens. However, I will argue that it is inappropriate to pit Medicare and Medicaid costs against defense costs in *Air Force Magazine*, especially when the US has chosen to fight two wars off budget. Further, I will argue, it is totally illogical to compare percentages of budget for programs such as Medicare and Medicaid, which



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Letters

are partially a function of population growth, to defense programs, which are a function of threat. The cost of required defense is a finite calculation and not a percentage of the federal budget, gross domestic product, or anything else.

Victor D. Bras
Woodbridge, Va.

Ah, the power of the pie chart! Depending on the point you're trying to make, you can slice it any way you want, and you can color your slices to give a subliminal message ("Let's make defense [blue], and those terrible entitlements an 'evil' red"). Keep in mind that we call Social Security an "entitlement" because the people who are receiving it have already paid for it. "Entitlement" sounds almost un-American to some people, so to put it in perspective, it would be like going to the bank to make a withdrawal and having the teller say, "Oh, so you're asking for an entitlement." Also, note that your very conservative estimates show the defense budget increasing to about \$1 trillion a year. Seems to me, we ought to be able to tighten our belts and get by on that!

David I. Wyllie
Heredia, Costa Rica

Classics

These are some of the things you may not find in the history books about how USAF came to the B-57 [*Airpower Classics: Canberra*, October, p. 88].

TAC had presented its case to Washington for a B-26 replacement. The Douglas B-26 had served during the last years of World War II, and many were worn out during the Korean War. Some B-26s assigned to the Hq Flight Section had cracked secondary wing spars and other old age problems. They were what we had as part of our staff transportation, along with C-47s, B-25s, C-45s, T-33s, and for a while, a B-17. Travel in those days was a lot different from what I see today.

The Glenn L. Martin Co. had a new tactical bomber in development, the B-51. It was powered by three J-47s, two mounted on pylons, forward of the wing on the fuselage, one in the rear of the fuselage under the T tail. This engine could be shut down during cruise if desired and the inlet closed to reduce drag and stop the engine from windmilling. This arrangement was not without its critics but it worked. The airplane's speed was kept secret during early flight tests. However, it was fairly common knowledge among those close to the project that it was outrunning its F-86 chase planes. As I remember, it was a .93 airplane.

The B-51 carried a considerable bomb load in a rotary bomb bay, which eliminated the door problem, plus several cannons in the nose. The Canberra was designed with no guns.

While the B-51s were in flight test, the British were going broke, and Washington decided that rather than give them money, the US would "buy" something from them. The Brits had full-scale PR program to push the deal. They stripped a Canberra down to the bare essentials of flight and set a trans-Atlantic speed record to impress everyone.

It is well to remember that the Canberra was an old design when USAF bought it. It first flew in May of 1949. Designed as a high-altitude-level bomber, it was not the tactical bomber TAC wanted. It was not especially fast, something on the order of a limiting Mach of .87. It had bomb bay doors like a B-17, and whatever way the airplane was headed when you opened them was the way you were going to go. Because the engines were wide set and did not always spool up in sync, during a steep climb using full power, the airplane fishtailed in a distracting manner. USAF pilots did not like the "fishbowl" canopy favored by the British.

Nevertheless, TAC was told this is your new tactical bomber. The deal for the Martin Co. was hard for them to swallow. They were not going to build the B-51 and were faced with building the Canberra or nothing. They agreed to build the Canberra.

Two were flown over and delivered to Martin, along with blueprints and manuals. Of course everything was metric, and Martin set about to draw new plans. There were so many changes necessary that it was just as well. The nose was changed to a tandem cockpit (like the T-33), and the bomb bay was redesigned to incorporate the rotary type as in the B-51. The engines were changed from Rolls Royce to US-made Wrights.

While all this was going on, Martin was flying the RAF airplanes provided in the contract. The tail came off one, and the crash killed the Martin test pilot and one of their design engineers.

As most old-time Air Force folks know, the B-57 went on to do lots of different and difficult jobs. But to say that it was a British design is to ignore what the Martin Co. and the Air Force project folks did for the design.

No B-51s survived. NACA flew one for a while, then it was given to the Langley Air Force Base fire department and was destroyed in a training exercise.

Sad end to a remarkable airplane.
TSgt. Reginald E. Holden,
USAF (Ret.)
Tarboro, N.C.

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Washington Watch

By John A. Tirpak, Executive Editor

Congressional shake-up; UK military austerity; Super Saudi Air Force

THE NEW LINEUP

The November elections swept out the Democratic leadership on the House Armed Services Committee and will lead to new leadership in the lower body's appropriations committee. The top four Democrats on the HASC—in rank order, Chairman Ike Skelton (Mo.), John M. Spratt Jr. (S.C.), Solomon P. Ortiz (Tex.), and Gene Taylor (Miss.)—all lost their seats, although in mid-November Ortiz had requested a recount in his district's close election.

A Republican House majority with the Senate under Democratic control forecasts highly contentious House-Senate budget conferences for the 112th Congress. The new Congress convenes in January.

Top-ranking HASC Republican Howard P. McKeon (Calif.) won his bid for re-election and announced he would seek the chairmanship of the committee in the new Congress. Second-ranked Republican Roscoe G. Bartlett (Md.) also retained his seat.

Despite the leadership losses on the Democratic side, however, the congressional panels that oversee defense spending otherwise won't see radical membership changes.

On the House Appropriations Committee, the chairmanship is likely to be taken up by re-elected Rep. Jerry Lewis (Calif.). The senior Republican, Bill Young (Fla.), also held his seat. Current chair of the defense panel Norman Dicks (D-Wash.) was re-elected but will become the ranking HAC Democrat now that the House is in Republican hands. Young will likely lead the House defense appropriations subcommittee.

Chair of the Senate Armed Services Committee will remain Carl Levin (D-Mich.), who was not up for re-election. John McCain (R-Ariz.) retained his seat and will remain the senior Republican on the SASC. Other returning SASC Republicans include Richard Burr (N.C.), John Thune (S.D.), and David Vitter (La.).

Sen. Daniel Inouye (D-Hawaii) prevailed in his election and will retain the Senate Appropriations-Defense panel chair, joined by re-elected members Patrick J. Leahy (D-Vt.), Barbara A. Mikulski (D-Md.), and Richard C. Shelby (R-Ala.).

THE SUN SETS

Britain's new defense white paper signals big changes in that nation's military posture, calling for deep cuts in the armed forces and pushing the nation further away from an ability to take unilateral military action.

The document, released in October, is the new Conservative government's take on Britain's military role in the world, and is highly critical of the Labor government's handling of defense matters going back to the election of Tony Blair. It bears the signature of David Cameron, new Prime Minister, and Nick Clegg, his deputy, and calls for an across-the-board cut of about nine percent from Britain's defense spending.

Britain's armed forces "have been overstretched, deployed too often without appropriate planning, with the wrong equipment, in the wrong numbers, and without a clear strategy," Cameron wrote, adding there was a "fundamental mismatch between aspiration and resources." The previous government,



Lockheed Martin photo by Andy Wolfe

No more STOVL for Britain.

he charged, failed to "face up to the new security realities of the post-Cold War world."

The cuts are in some ways puzzling, as Britain will finish buying two new aircraft carriers but fail to equip them with aircraft for a decade. Whole classes of aircraft, such as the RAF Harrier, will be eliminated. The Nimrod aircraft is terminated, leaving Britain's nuclear submarines undefended as they leave port for deep water, and the size of the Army will be sharply reduced.

Significantly, Britain has opted not to buy the F-35B short takeoff and vertical landing version of the Joint Strike Fighter, of which it had planned to buy 138. It was to have fielded the second largest F-35B fleet after the US Marine Corps, and its participation was one of the major justifications for developing the STOVL aircraft. Instead, the UK will buy only the F-35C catapult-capable "Navy" version for use on standard aircraft carriers. Cameron said the shift will save about 25 percent in operating costs while giving the UK an aircraft with greater range and payload.

Britain will continue to make a priority of supporting current operations in Afghanistan, and pledged to stay in the fight, "committed to succeeding," and applying "extra resources" there as necessary, Cameron wrote.

Cameron, criticizing the Labor government, said, "The difficult legacy we have inherited has necessitated tough decisions to get our economy back on track," and that military security is bound up with economic security.

However, although the cuts are in many cases draconian, Britain will still have the fourth largest military budget in the world and will meet its NATO target of spending two percent of GDP on its military.

The Pentagon's press secretary, Geoffrey S. Morrell, issued a response to the white paper, saying it undertakes the necessary task of "setting priorities and making choices during tough fiscal times."

Morrell praised the valor of British troops in Afghanistan and said the US is pleased the UK plans to "maintain its historical role as a leading nation that shapes global security," especially

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its continued commitment to the two percent NATO target and maintenance of its independent nuclear deterrent.

The UK will completely withdraw its Army units from Germany, and reduce its heavy armor and artillery, mothballing the gear to “regenerate those capabilities if need be.” To make the Army more “mobile and more flexible,” it will acquire more airlift aircraft, both fixed-wing and rotary. Britain will be able to deploy just one brigade worldwide, but be able to “sustain it indefinitely.” The British Army will pare 7,000 troops by 2015.

There will also be a study of how other countries organize reserves “and see what lessons we might usefully apply.” The US derives high value from reserve forces, which it can maintain at a fraction of the cost of active duty forces.

The Ministry of Defense will lose 25,000 civilian employees under Cameron’s restructuring.

The Royal Air Force will neck down to two types of combat aircraft; at the high end will be a “modernized” Eurofighter Typhoon able to do both air-to-air and ground attack missions, supplemented by Lockheed Martin F-35Cs and “a growing fleet” of unmanned aircraft for both attack and reconnaissance. They will be extended by a tanker version of the Airbus A330, which the white paper described as “the most modern air-to-air refueling aircraft.” Older C-130 tactical transports will be retired 10 years early—they will have fewer troops to move—but a smaller number of new, larger Airbus A400Ms will be bought, supplemented by C-17s already in the UK inventory. The RAF will shrink by 5,000 billets in the next five years.

Although the UK will complete the two carriers now being built, they won’t be equipped with “ski jumps,” which were necessary for the Harriers and F-35Bs. And while in the long term, Cameron wrote that Britain needs the ability to deploy carriers in order to “deploy airpower from anywhere in the world,” he sees no “short-term” circumstances that would require Britain to actually use one; thus the purchase of the F-35C will be delayed. The advantage of a conventional carrier, he said, is that it will be able to operate “in tandem with the US and French Navies, and for American and French aircraft to operate from our carrier and vice versa.” The Royal Navy will lose 5,000 sailors by 2015.

The Royal Marine brigade will be retained with an “effective amphibious capability.”

Britain’s nuclear submarine fleet will be retained, but with fewer nuclear weapons, reducing the missile tubes in each from 12 to eight, and the warheads from 48 to 40, “in line with our commitment [to] vigorously ... pursue multilateral global disarmament.” The Royal Navy’s Type 45 destroyers—which Cameron described as too expensive—will be completed, but a program will be started to design cheaper ships better suited to anti-piracy, anti-drug trafficking, and counterterrorism.

In explaining the changes, Cameron said the UK will still be able to “punch above its weight in the world” and will continue to be “an absolutely front-rank military power.”

YOU GET WHAT YOU PAY FOR

Under an arms deal announced in October, Saudi Arabia will build an air force comparable in many ways to that of the US Air Force.

The deal, valued at more than \$58 billion, would be the largest arms sale ever, if Congress approves. The deal calls for the US to supply the Royal Saudi Air Force with 84 new F-15SA (for Saudi Advanced) fighters, and upgrade 70 of the F-15S aircraft the nation already has to the same configuration.

Accessories sold separately include an impressive array of air-to-air missiles (the AIM-9X and AIM-120 C7, the same as USAF), more than 17,000 bombs—many of which are satellite- and/or infrared-guided—plus top-of-the-line radars, helmet-mounted cueing systems, infrared search-and-track systems, night attack targeting pods and night vision goggles.



DOD photo

Saudi Arabia is beefing up its air force with US aircraft.

Along with other gear, the package will make RSAF’s F-15s as good as those USAF itself hopes to field by the middle of this decade. The difference will be that most of Saudi Arabia’s F-15s will be factory-fresh, while USAF models will all be about 30 years old.

The sale also included AH-64 Apache attack helicopters, UH-60 Black Hawk utility choppers, and a number of light scout and trainer helicopters.

The Saudi air superiority force, by the time the sale is completed, will number 154 of the most advanced F-15s in the world, complementing 72 Eurofighter Typhoons now being delivered, for a total of 226 top-line fighters. These are augmented by five AWACS aircraft. The Typhoon is by some measures second only to the F-22 in all-around capability. The Saudis will also have all the bells and whistles on their Typhoons, to include AIM-132 ASRAAM missiles comparable to the AIM-9X Sidewinder, and Storm Shadow cruise missiles comparable to the American Joint Air-to-Surface Standoff Missile, or JASSM.

The level of Saudi air superiority capability will be significant indeed. The US totals are a useful point of reference: In USAF service there will be 178 refurbished F-15s of comparable capability with the Air National Guard, plus 186 F-22s, for a total of 364 dedicated air superiority machines. The Saudi F-15s can also conduct ground attack missions like USAF’s F-15E.

In addition to its Eagles and Typhoons, the Saudis have some 90 Tornado IDS (interdiction/strike) aircraft, which are receiving upgrades to keep them capable through 2020, and about 50 Hawk trainers that can swing to a ground attack role at need.

Andrew J. Shapiro, assistant secretary of state for political-military affairs, said the sale was meant to “send a strong message to countries in the region” that the US is committed to its Middle East allies. The deal will help Saudi Arabia “defend against threats to its borders and to its oil infrastructure, which is critical to our economic interests.”

Asked if the sale was meant specifically to deter Iran, Shapiro said the Saudis “live in a dangerous neighborhood,” and the US is helping that country defend itself against “legitimate security threats.”

“It’s not solely about Iran,” Shapiro said.

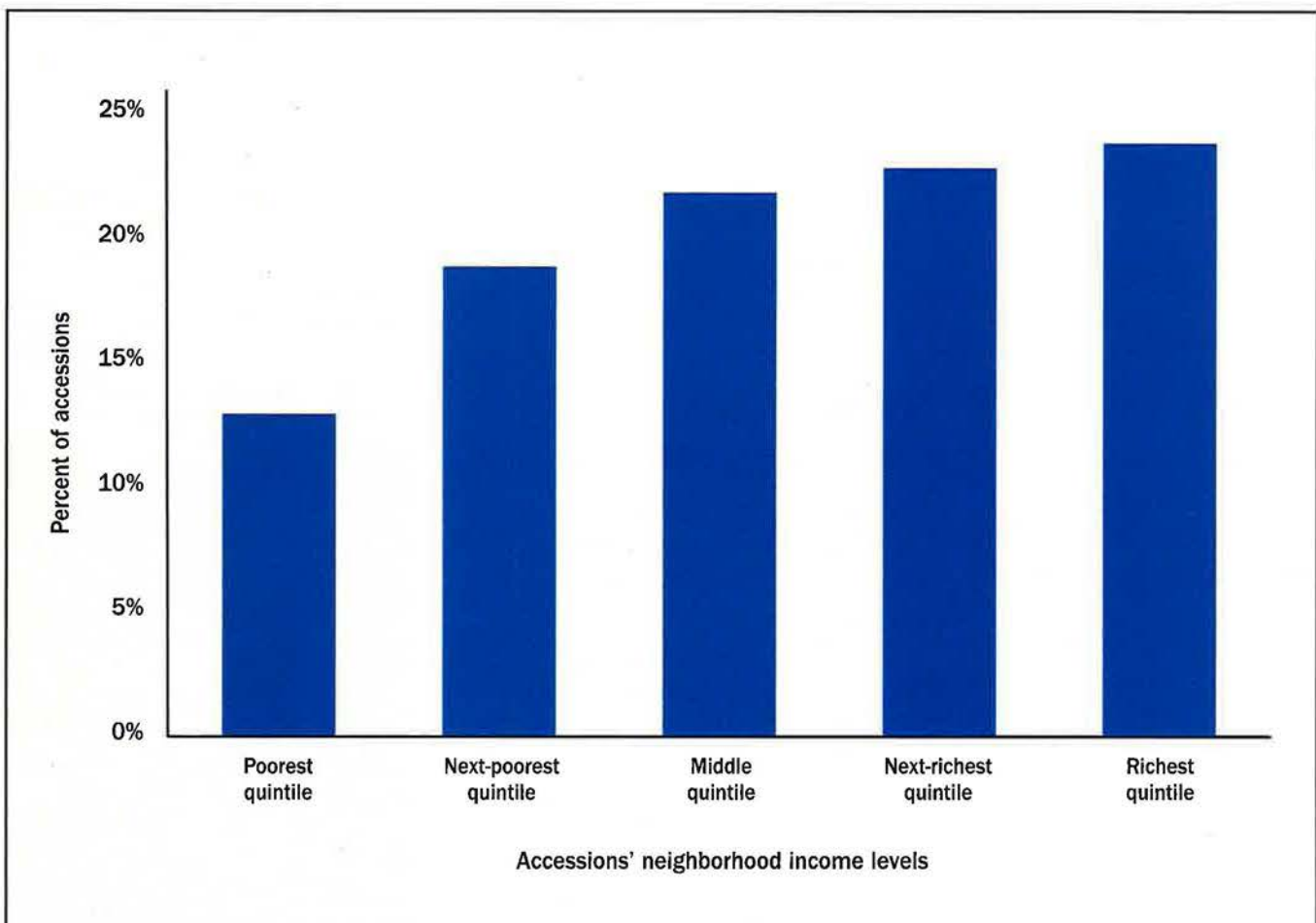
Two members of Congress—Rep. Howard L. Berman (D-Calif.) and Rep. Ileana Ros-Lehtinen (R-Fla.)—have raised questions about the sale, but not outright objection. In a letter to Defense Secretary Robert M. Gates and Secretary of State Hillary Rodham Clinton, the two wrote there could be significant repercussions for other US allies in the region “in the event of political change in Saudi Arabia,” akin to an Iran-like Islamist revolution. They also questioned whether the sale would undermine Israel’s qualitative edge over neighboring countries that haven’t recognized its right to exist. ■

Wealth and Military Recruits

It's long been conventional wisdom that the US armed services recruit disproportionately among the poor. If that claim was ever true, it isn't any longer. Today, says a DOD report, "a majority of new recruits come from middle and upper income neighborhoods." The report divides neighborhoods into five income quintiles, from "richest" to "poorest." Nearly a quarter of the 165,291 men and women recruited

in Fiscal 2010 came from the richest quintile, compared to 13 percent from the poorest. The top three quintiles produced 68 percent of recruits. The Pentagon did not say whether this is a trend. However, it noted that the current 9.6 percent unemployment level is one factor, as is the availability of a generous G.I. bill for college education.

Family Income of Today's Recruits



Source: "Recruiting and the All-Volunteer Force (AVF)," report and briefing by Undersecretary of Defense Clifford L. Stanley, Department of Defense, Washington, D.C., Oct. 12, 2010.

Israel Joins F-35 Club

Israel has officially become an F-35 customer, after long speculation over how many of the fighters it would buy and when.

Israel signed an agreement with the US in October to acquire 20 F-35 strike fighters under a foreign military sale valued at \$2.75 billion. It will receive the aircraft between 2015 and 2017.

Michael B. Oren, Israel's ambassador to the US said the F-35 will "enhance Israel's ability to defend itself, by itself, against any threat or combination of threats, from anywhere within the Middle East."

Israeli Ministry of Defense Director-General Udi Shani signed the letter of offer at an acceptance ceremony in New York City Oct. 7.

Israel will be the first nation to acquire the F-35 outside of the original nine countries partnering to develop the aircraft.

F-16 Sale to Iraq Proposed

The Defense Department notified Congress of the potential sale of 18 F-16IQ fighters, munitions, and aircraft

support to Iraq, under a foreign military sale. The overall value of the deal is estimated at \$4.2 billion.

DOD officials have expressed support for Iraq acquiring an air superiority fighter, preferably a Western aircraft like the F-16, to allow that country to provide for its own air sovereignty. Iraq's more advanced aircraft, such as MiG-29s, were destroyed in numerous wars or sent to Iran, which never returned them.

"The proposed sale will allow the Iraqi Air Force to modernize its air force by acquiring Western-interoperable fighter aircraft, thereby enabling Iraq to support both its own air defense needs and coalition operations," the Defense Security Cooperation Agency said in announcing the potential sale.

The FMS package would include the AIM-7 Sparrow, AIM-9 Sidewinder, 500- and 2,000-pound laser guided bombs, and targeting pods, as well as conformal overwing extended range fuel tanks.

B53 Dismantlement Authorized

An entire type of nuclear weapon will be eliminated from the US inventory under plans announced by the

Glitch Silences Minuteman ICBMs

Fifty Minuteman III ICBMs were temporarily out of contact with launch authorities on Oct. 23, according to Air Force Global Strike Command.

The 319th Missile Squadron, headquartered at F. E. Warren AFB, Wyo., experienced "a disruption of communications" between its five launch control centers and their missiles, said Lt. Col. John Thomas, an AFGSC spokesman.

Evidence pointed to a mechanical failure associated with the missile complex's primary communications system.

Multilayered safety, security, and command and control systems remained available to missile control crews throughout the incident, assuring there was no danger of unauthorized missile launch at any time during the disruption, Thomas said. The missiles' launch capability was unaffected.

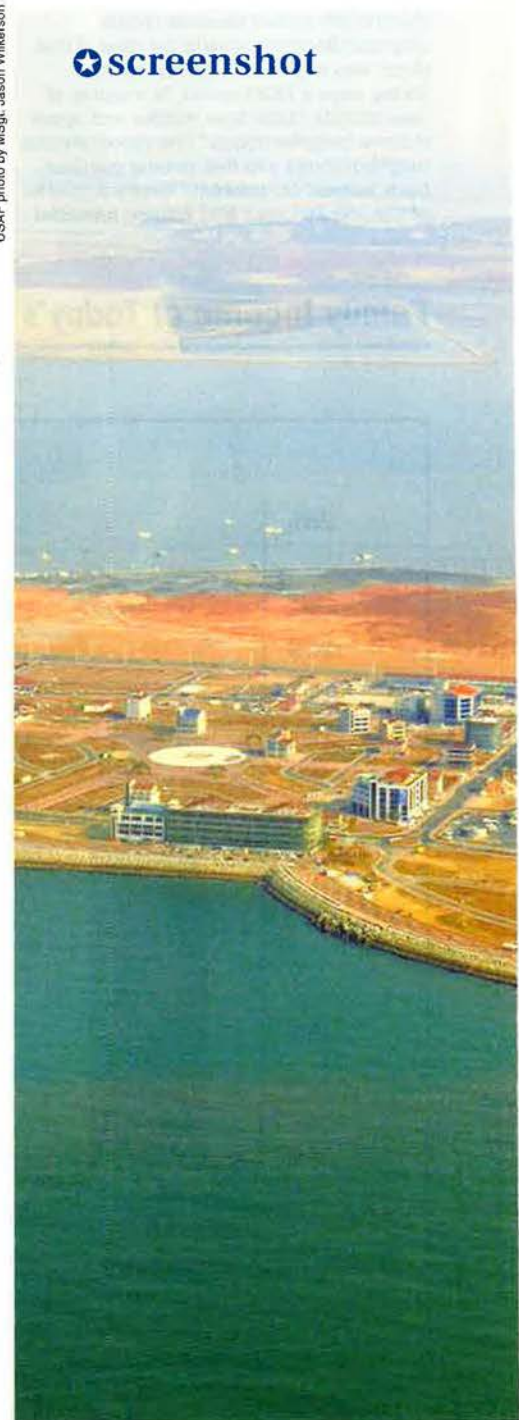
Electronic queries sent from the launch control center to verify the health and security of the missile sites became unsynchronized, transmitting simultaneously over the same frequency, effectively canceling transmission altogether. Missileers diagnosed and isolated the malfunction within 45 minutes, switching control of all 50 missiles to a single launch control center, according to Thomas. The LCCs normally control only 10 missiles each.

All but one LCC was quickly re-integrated into the network, the other remaining offline for additional study of the anomaly. There was no evidence of tampering or malicious activity.

Air Force technical experts noted marked similarities between the incident and others reported at Malmstrom AFB, Mont., and Minot AFB, N.D., in the late 1990s, Thomas said.

✪ screenshot

USAF photo by MSgt. Jason Wilkerson



National Nuclear Security Administration in October.

The NNSA announced that dismantlement of the B53 nuclear bomb inventory will soon begin at the Department of Energy's Pantex Plant in Amarillo, Tex.

The United States introduced this thermonuclear bomb type into its stockpile in 1962. About the size of a minivan, it weighs some 10,000 pounds and was designed to be carried by the Air Force's B-47, B-52, and B-58 bombers.

The weapon, with a reported nine-megaton yield, was a key part of the US nuclear deterrent until its retirement in 1997. The B61-11 tactical nuclear bomb replaced the B53 in the Air Force inventory, but the current number of stockpiled B53s remains classified.

Dismantlement of the weapons will entail physically separating the high-explosive trigger mechanism from the nuclear warhead, then processing the material and components for reuse, demilitarization, recycling, or disposal.

F-15s Depart Tyndall ...

The 95th Fighter Squadron at Tyndall AFB, Fla., has been inactivated, marking the formal end of the F-15 training mission there. The Eagles have been a fixture at Tyndall since 1983.

The 325th Fighter Wing gave up its 48 F-15s as part of the Air Force's divestiture of about 250 legacy fighters for Fiscal 2010.

The aircraft began departing in April, and the final aircraft lifted off for Edwards AFB, Calif. —where it has joined



11.10.2010

A four-ship flight of USAF and Republic of Korea Air Force F-16s performs a flyover at Piung Harbor, South Korea, as part of the year-long commemoration of the 60th anniversary of the Korean War. The war, begun in June 1950, would last three years, and over the next 57 years more than three and a half million American military members would serve a tour of duty in South Korea.

Do We Need a National Space Policy?

Discussion of President Obama's National Space Policy, released in June, has centered on the policy's content. But does the nation really need a national policy governing space? John B. Sheldon, a visiting professor at Air University at Maxwell AFB, Ala., posed that question at a George C. Marshall Institute panel on the new space policy in Washington, D.C., Oct. 6.

"We don't have an air policy," said Sheldon, "we have a set of policies that govern air issues, from military right through to the FAA. The Air Force cooperates with the FAA on a daily basis, and it doesn't need White House guidance to do that."

Ideally, Sheldon argued, space should be removed from the "politicized environment" of White House policy, leaving agencies such as NASA and DOD to cooperate in the same manner as agencies already do in other domains.

"Part of the problem is [that] we in the space community think we're special. From a strategic perspective, we're not. We bring something unique to the strategic equation, but we're not special," he said.

At the implementation stage, the White House policy runs up against yet another obstacle, the lack of what Sheldon referred to as a "grand strategy," which he argues has been absent since the end of the Cold War. "I think, ultimately, [the implementation of] any space policy, regardless of which Administration, will founder on the rocks of a lack of a US grand strategy," he said.

"America must first prioritize what we want to do in the world, and how we're going to do it," before constructing what risks becoming simply another layer of bureaucracy, something requiring nonpartisan consensus.

During the Cold War, Sheldon noted, "the grand strategy was called containment ... and had bipartisan support." The danger posed by al Qaeda today, he added, "is simply not the existential threat the Soviet Union posed," explaining why such a strategy remains elusive today.

NASA's test fleet—following the unit's inactivation ceremony Sept. 21.

With the drawdown at Tyndall, the Oregon Air National Guard's 173rd Fighter Wing at Klamath Falls Airport-Kingsley Field will formally assume responsibility for the Air Force's F-15 training mission. Tyndall will remain the training base for USAF's F-22 Raptor fighters.

... And Elmendorf

The last F-15 assigned to Alaska's Joint Base Elmendorf-Richardson, left on Sept. 24, completing the drawdown of the base's F-15s under the combat air forces restructuring plan.

Elmendorf, which has been home to the F-15 since 1982, completed the transition to a solely F-22 fighter force with the departure of the 19th Fighter Squadron's last of 24 F-15s.

The 3rd Wing at Elmendorf joins the 325th FW at Tyndall AFB, Fla., and the 1st FW at JB Langley, Va., which similarly completed drawdown of F-15 operations within a nine-day period in September.

Secret F-15E Radar Pod Disclosed

The Air Force has acknowledged a previously secret radar pod and revealed that was first fielded on the F-15E in June 2009.

Designated the AN/ASQ-236, the Northrop Grumman pod is meant to bolster US all-weather, precision geo-

location capabilities and overhead surveillance and reconnaissance support to ground troops, the Air Force said.

The pod's synthetic aperture radar "provides detailed maps for surveillance, coordinate generation, and bomb impact

assessment purposes," according to a recently published Air Force fact sheet.

Development of the pod began in the late 1990s, leveraging technology associated with the F-22 program. However, details about the pod's design, development, production and inventory size remain classified.

The Air Force did confirm that the pod is not an interim step pending development of the F-15E's own active electronically scanned array radar, but serves a separate and unique role.

Cyber Force Is Operational

Twenty-fourth Air Force, charged with USAF's cyber operations role, achieved full operational capability Oct. 1.

"Cyberspace is critical to today's joint military operations, and 24th Air Force is proud to be the Air Force's component to US Cyber Command," AFSPC Commander Gen. C. Robert Kehler said in announcing FOC. He added that 24th Air Force is now "a full operational partner on the joint cyber team."

The 24th was formally activated in August 2009, at Lackland AFB, Tex., combining the service's information operations, network warfare, and combat communications functions under one roof.

Following the FOC milestone, the Air Force's LeMay Center for Doctrine Development and Education announced completion of the new cyber operations doctrine outlining command and organizational structures, computer network design and planning, and



Ready, Aim: SrA. Lamar Sjouke draws a bead on his target during Air Force Global Strike Command's first-ever Global Strike Challenge competition, designed to pit the command's top security units, maintainers, and missile and bomber crews in head-to-head competition.

USAF photo by A1C Sean Martin



USAF photo by TSgt. DeNene A. McElie

standard operating and assessment procedures.

AFGSC Fully Operational

Air Force Global Strike Command at Barksdale AFB, La., is now fully operational, less than 14 months after initial activation.

The command now fully assumes the task of overseeing the nation's nuclear-capable bomber and ICBM force, having accomplished more than 700 prerequisite actions, including the establishment and manning of a fully functional headquarters.

"Our successful stand-up was possible because of the commitment, innovative spirit, and sheer hard work of Global Strike Command airmen," stated AFGSC commander Lt. Gen. Frank G. Klotz. AFGSC "put in place all the functions of a major command, while simultaneously executing its functions," Klotz added.

AFGSC is now responsible for planning, programming, and financial management of the Air Force's combined nuclear deterrence-assurance mission.

Klotz To Retire

Shortly after declaring Air Force Global Strike Command fully operational, Lt. Gen. Frank G. Klotz announced he is retiring. Klotz has headed AFGSC at Barksdale AFB, La., since August 2009, nurturing the command from its infancy through to its formal stand-up.

Maj. Gen. James M. Kowalski, Strike Command's vice commander, has been confirmed to receive a third star and succeed Klotz.

Klotz, a missileer, graduated from the Air Force Academy in 1973 and was later a Rhodes Scholar. He went

on to command at the squadron, group, wing, and numbered air force levels, overseeing ICBM and space operations during his 37-year career.

Prior to taking charge of AFGSC, Klotz served as assistant vice chief of staff and also as vice commander of Air Force Space Command, Peterson AFB, Colo.

High Court To Hear A-12 Dispute

The Supreme Court has agreed to hear the 19-year-old case pitting the US government against Boeing and General Dynamics over the Pentagon's termination of the Navy A-12 stealth attack airplane.

The Navy, at the direction of then-Defense Secretary Richard B. Cheney, canceled the Avenger II program in 1991, claiming that General Dynamics and McDonnell Douglas (now part of Boeing) failed to meet contractual obligations. The government is seeking the return of \$1.35 billion paid to the two companies, plus billions in interest accrued as the parties have battled in the courts.

Open Wide: Members of the 105th Maintenance Squadron at Stewart ANGB, N.Y., tour and receive a briefing on the capabilities of the newly refurbished C-5M Super Galaxy. A team led by the Air National Guard maintainers completely refurbished the aircraft's interior in just 26 days, and developed a standardized interior that will be adopted fleetwide.

The companies counter that delays to the program were caused by the Pentagon's refusal to share stealth technology. They further assert that they've been prevented from mounting a proper defense until now due to continued Pentagon refusal to disclose information it deems secret.

General Dynamics sold its aircraft business to Lockheed Martin in 1993, but retained its interest in the A-12 lawsuit.

SBSS "Eyes" Are on Orbit

The Air Force's first Space Based Space Surveillance satellite is now in orbit, and has transmitted its first signals back to Earth.

Index to Advertisers

Alenia.....	3
Cygnus.....	9
Hawker Beechcraft.....	Cover II
Northrop Grumman.....	Cover IV
Pilatus.....	7
USAA.....	21, Cover III
<hr/>	
AFA Career Services.....	77
AFA Conferences.....	79
AFA Hangar Store.....	76
AFA Metlaw.....	76
AFA Spotlight On.....	75
AFA Technology Expositions.....	75
Airpower Industry Guide.....	45

Raptor's Final Steps

The F-22 production line is starting to wind down, as the last of the aircraft planned to be built are now in some stage of manufacture on the production line.

By October, Lockheed Martin had delivered 87 defect-free F-22s in a row "on time or ahead of schedule," company officials said. The last 28 airplanes are making their way down the Marietta, Ga., line and will exit the factory in August 2011. Following paint, engine installation, and checkout operations, the last Raptor—tail No. 195—will be delivered to the Air Force in February 2012.

The remaining 13 midfuselage assemblies currently under way will be completed by April 2011, followed in May by 13 aft fuselages. In June 2011, the final 15 wing sets are set to roll off the line. The last of the Air Force's 187 F-22s entered production at Marietta last month. That Raptor will emerge roughly nine months later, said F-22 general manager George Shultz.

According to Lockheed Martin officials, USAF is retaining the Raptor's production tooling until the service develops a plan to sustain the aircraft, outlining requirements for spare parts and assemblies.

"There are 30,000 tools" involved, and each is promptly placed in a storage container as it is used for the last time. The tools will remain in storage for the next "three to five years" in a government-owned, contractor-operated facility, according to Shultz. Though the long-term storage arrangements for the tooling remain to be determined, Lockheed is meticulously documenting production processes, filming each process as it is completed for the last time. This should enable production to resume, if and when parts or assemblies are needed in the future.

Though the F-22 has been built in a number of configurations over the course of production, the fleet will ultimately consolidate to only two with the installation of increment 3.2 software bringing most F-22s up to "a common standard." Several early mark F-22s will remain in slightly different configuration, however, given the difficulty incurred in standardizing them with later versions. Final changes will be made to the rest of the fleet as F-22s go into depot for modifications.

The payload is designed to detect and track other space objects. According to Col. Richard Boltz, 30th Space Wing commander who oversaw the launch, "SBSS will greatly enhance our existing space situational awareness capability."

Prime contractor Boeing reported in September that the satellite was functioning normally and was ready "to begin orbital maneuvers and operational testing."

Following initial testing, Boeing will hand control of the satellite over to the Air Force. It should become mission-ready this month.

SBSS launched from Vandenberg AFB, Calif., aboard an Orbital Sciences Minotaur IV launch vehicle on Sept. 25.

JSTARS Tests Anti-Shipping Role

An E-8C JSTARS aircraft recently completed a series of flights in which it guided Navy anti-ship weapons against surface combatants from a standoff distance.

Part of a Navy-led joint surface warfare demonstration, the aircraft served as the

Airmen and soldiers make their way back to base after a patrol near the city of Qalat, Afghanistan, in Zabul province. The Provincial Reconstruction Team Zabul also includes US civilians from the Department of State, Department of Defense, and other US agencies.



USAF photo by SSGT Brian Ferguson

Operation Enduring Freedom—Afghanistan

Casualties

By Nov. 16, a total of 1,383 Americans had died in Operation Enduring Freedom. The total includes 1,381 troops and two Department of Defense civilians. Of these deaths, 1,070 were killed in action with the enemy while 313 died in noncombat incidents.

There have been 9,368 troops wounded in action during OEF.

Afghan Election Operations Accentuate Room for Growth

The Afghan Air Force had its first taste of full-scale operations, providing airlift in support of Afghanistan's parliamentary elections, according to USAF Brig. Gen. David W. Allvin, commander of NATO Air Training Command-Afghanistan.

That effort highlighted both the nascent air service's progress and its need for growth, particularly in the area of command and control.

"They did tremendously well" in supporting the Sept. 18 election, but the effort "was just harder than it needed to be," he said. The Afghans logged 225 flight hours, lifting 150,000 pounds of supplies and 530 election workers, supporting 200 polling stations, he said, but "there were several occasions where ... air assets weren't used as efficiently as they could have been."

Explaining NATO's key goals for the air arm, he underscored the importance of "centralized management" and "decentralized executions" in order to maximize the Afghans' limited assets.

Laser JDAM Dropped

An F-16 deployed to Bagram Airfield from Aviano AB, Italy, recently dropped the first GBU-54 bomb used in combat in the Afghan theater of operations.

The GBU-54 is a 500-pound Joint Direct Attack Munition employing an additional laser guidance kit; it's commonly referred to as the Laser JDAM. The combination allows the munition to strike moving targets using laser guidance, in addition to hitting stationary targets using GPS guidance.

According to Capt. Nick Ilchena, an Aviano pilot assigned to Bagram, the Laser JDAM allows ground commanders "more flexibility to attack a variety of targets, in a variety of environments and situations."

The GBU-54 made its combat debut in Iraq in August 2008. It was developed in response to an urgent operational need and fielded within 17 months.

Afghan Wing Takes Over Training Duties

The Afghan Air Force's Kabul Air Wing recently took responsibility for the Afghan crew chief and air assault academy from NATO advisors of the 3rd Combat Aviation Brigade.

Overseen by NATO's Task Force Falcon, courses had been taught at Bagram Airfield for the nine months leading up to the transition. The arrival of more Mi-17 helicopters, combined with the graduation of the AAF's first batch of instructors, mean that the wing is finally ready to assume responsibility for its own operation, according to NATO.

Four helicopters that arrived in October brought the Afghan military's Mi-17 fleet to 31, with a total of 56 eventually earmarked for Afghan service.

command and control node, transmitting inflight targeting updates to Navy weapons during tests off the California coast in September.

The JSTARS modernization branch at Hanscom AFB, Mass., developed the prototype software known as Link 16 Network-Enabled Weapon, used on the test JSTARS. Officials judged the test successful.

B-52-Upgrades Contract Awarded

The Defense Department awarded Boeing an \$11.9 billion contract for B-52 upgrades, the company announced Sept.

29. Boeing said the contract will put all B-52 modernization under a single "umbrella contract."

Though funds have yet to be allocated, the contract allows the Air Force to directly commission studies and work as needed to update and enhance the B-52 fleet as a strategic asset.

The indefinite delivery-indefinite quantity contract spans eight years, during which time Boeing will likely study replacement options for the B-52's current radar, and begin production and integration of the B-52's upgraded CONECT communications suite, according to the company.

Boeing already holds a similar contract for sustainment, having maintained the B-52 fleet for the better part of 55 years, but development and enhancements previously required separate, individual contracts.

Gamecocks Return to Hawaii

The 19th Fighter Squadron has returned to its World War II home island, standing up at JB Pearl Harbor-Hickam, Hawaii, to operate F-22 Raptors as part of the 15th Wing.

The unit was stationed on Oahu from 1923 until 1944. However, since 1994, the squadron had operated the F-15 at JB Elmendorf, Alaska.

Nicknamed the Gamecocks, the unit joins the Hawaii Air National Guard's 199th FS, jointly operating the F-22 as an active duty associate unit. Twenty F-22s are assigned to the combined unit.

The Deep Freeze Is On

Springtime in Antarctica—fall in the Northern Hemisphere—heralds the Sept. 26 resumption of Operation Deep Freeze, the US military's Antarctic mission supporting US scientific research.

C-17s from JB Lewis-McChord, Wash., joined ski-equipped LC-130s from the New York Air National Guard's 109th Airlift Wing ferrying personnel and supplies between Christchurch, New Zealand, and McMurdo Station on Ross Island in the Antarctic.

The Deep Freeze's 2010-11 season extends through late February. Thirteenth Air Force at JB Pearl Harbor-Hickam, Hawaii, leads the joint task force.

C-17 aircrews will use night vision equipment again this season, landing at McMurdo Station in total darkness—a capability that could lead to an earlier start of operations.

In addition to Air Force efforts, the US Navy and Coast Guard are again providing sealift and logistical support.

New Home for 11th Wing

The Air Force inactivated the 316th Wing at JB Andrews, Md., Sept. 30 and transferred its duties to the 11th Wing, now to conduct business from Andrews, instead of JB Bolling, D.C. The duties assumed by the 11th Wing include Presidential support.

The transfer occurred as part of the BRAC 2005-mandated merger of Bolling with Anacostia Naval Station, creating JB Anacostia-Bolling, D.C. This merger put the Navy in charge of the base's operations, including security and law enforcement. Rather than retire the 11th Wing's colors, the Air Force moved the unit to Andrews.

The 11th Wing was formed in 1933 as the 11th Observation Group, based at Hickam Field, Hawaii. The unit fought against the Japanese at Pearl Harbor

Senior Staff Changes

RETIREMENTS: Gen. Kevin P. Chilton, Maj. Gen. William L. Holland.

NOMINATIONS: To be Lieutenant General: Susan J. Helms, Darrell D. Jones. **To be Major General:** Richard T. Devereaux.

CHANGES: Brig. Gen. William J. Bender, from Dir., Warfighter Sys. Integration, Office of Info. Dominance & CIO, OSAF, Pentagon, to Cmdr., USAF Expeditionary Ctr., AMC, JB McGuire, N.J. ... Maj. Gen. (sel.) Richard T. Devereaux, from Cmdr., USAF Expeditionary Ctr., AMC, JB McGuire, N.J., to Dir., Operational Planning, Policy, & Strategy, DCS, Ops., P&R, USAF, Pentagon ... Brig. Gen. Anthony J. Rock, from Commandant, Air Command & Staff College, AU, AETC, Maxwell AFB, Ala., to Cmdr., 321st AEW, ACC, Baghdad, Iraq ... Maj. Gen. Suzanne M. Vautrinot, from Dir., Plans & Policy, CYBERCOM, Fort Meade, Md., to Spec. Asst. to the Vice C/S, USAF, Pentagon.

SENIOR EXECUTIVE SERVICE CHANGES: Jeffrey C. Allen, to Dep. Dir., Log., DCS, Log., Instl., & Mission Spt., USAF, Pentagon ... Wendell D. Banks, to Dir., Sensors, AFRL, AFMC, Wright-Patterson AFB, Ohio ... Mark A. Correll, to Dep. AF Civil Engineer, DCS, Log., Instl., & Mission Spt., USAF, Pentagon ... Ava Sue Dryden, to Dir., 309th Maintenance Wg., Ogden ALC, AFMC, Hill AFB, Utah ... Terry G. Edwards, to Dir., AF Center for Engineering & the Environment, DCS, Log., Instl., & Mission Spt., Lackland AFB, Tex. ... Gail P. Forest, to Dir., P&P, AFRL, AFMC, Wright-Patterson AFB, Ohio ... Kevin T. Geiss, to Dep. Asst. Sec. of Energy, Office of the Asst. Sec. of Instl., Environment, & Log., USAF, Pentagon ... David A. Hardy, to Dir., Directed Energy, AFRL, AFMC, Kirtland AFB, N.M. ... Michael V. Sorrento, to Chief Info. Officer, Asst. SECAF, Financial Mgmt. & Comptroller, JB Andrews, Md.

and continued in the Pacific Theater throughout the war, flying raids over Japan up to the conflict's final days.

Last Ohio ANG F-16 Class Graduates
The Ohio Air National Guard's 178th

Fighter Wing in Springfield has closed the book on its F-16 training mission, graduating the final class from its nine-month initial qualification course.

The course ended when the last four Royal Netherlands Air Force pilots

completed the course Oct. 9, marking the end of 178th FW's F-16 operations.

The 178th is transitioning to three new roles: operating MQ-1 Predator remotely piloted aircraft; analyzing intelligence for the National Air and Space Intelligence Center at nearby Wright-Patterson Air Force Base; and undertaking structural repair of F-16 bulkheads throughout the fleet.

As the 178th shifts roles, responsibility for Dutch F-16 training will fall to the Arizona ANG's 162nd FW in Tucson, which already trains pilots from several allied countries on the aircraft.

Holloman Reaper Crashes

An MQ-9 Reaper assigned to the 29th Attack Squadron crashed on landing at Holloman AFB, N.M. It was returning from an Oct. 27 training mission. The Reaper was the second Holloman-based remotely piloted aircraft to crash within a week; an MQ-1 Predator of the 6th Reconnaissance Squadron went down on Oct. 22, also returning from a training sortie.

The wrecks represent the second and third such mishaps since the base declared initial operational capability with the MQ-1 Predator in September 2009.

The Air Force is convening boards of inquiry into the causes of the two incidents, though no injury or damage to ground property resulted from either crash.

USAF Plans Start Compliance

The Air Force was developing plans on how it would comply should the lame-duck Senate ratify the New START with Russia this year, reported Maj. Gen. William A. Chambers, who oversees nuclear matters on the Air Staff.

Speaking at an Air Force Association-sponsored breakfast in Arlington, Va., in October, Chambers said Air Force officials were readying logistical and budgetary schemes needed to comply with the pact, should it enter into force.

While New START's limits on nuclear force levels will have little effect on either the active nuclear-capable bomber fleet or personnel levels within Air Force Global Strike Command, they will require many stored assets to be "completely defanged," noted Chambers.

Most likely to face the ax would be mothballed B-52s and a number of Peacekeeper ICBM silos presently maintained in renewable condition. A Pentagon compliance review group would define whether, and in what manner, to scrap aircraft and silos, he said.

CYBERCOM Reaches FOC

US Cyber Command, established at Fort Meade, Md., to protect the Penta-

USAF photo by TSgt. Wolfram M. Stumpf



True Jointness: A USAF F-16 (top), a Jordanian F-16 (center), and a Pakistani Mirage (bottom) fly in formation over Wadi Rum, Jordan, during the 2010 Falcon Air Meet at Muwaffaq Salti AB, Jordan. Falcon Air Meet is a two-week exercise during which teams from Jordan, Pakistan, the United Arab Emirates, and the US Air Force and Navy share doctrine and procedures and also compete.

gon's computer networks, is now fully capable of executing its mission, the Defense Department announced Nov. 3.

CYBERCOM, a subunified component of US Strategic Command, began initial operations in May, reaching full operational capability after establishing a joint operations center and incorporating personnel and functions from multiple organizations across the military.

"Cyberspace is essential to our way of life, and US Cyber Command synchronizes our efforts in the defense of DOD networks," said CYBERCOM commander Army Gen. Keith B. Alexander.

World War II Airman Laid To Rest

The remains of Sgt. Michael A. Chiodo, missing since his aircraft was lost on a bombing mission over Germany in 1944, were buried with full military honors Oct. 20 near his hometown of Cleveland.

Chiodo, who was 22 years old at the time of his death, flew as an assistant radio operator on the B-24J Liberator.

The Land of the Rising Sun: Boise Air Terminal in Idaho, to be precise—that's where these A-10s line the ramp during a fiery sunrise in October. The A-10s were at the ANG base to be flown in Hawgsmoke 2010, a biennial worldwide A-10 bombing, missile, and tactical gunnery competition.

It's a Gas, Gas, Blend

The Air Force is looking at several blends of alternative aviation fuel, containing up to 50 percent biomass-derived, or synthetic, fuel mixed with traditional JP-8, according to Jeff Braun, the Air Force's alternative fuels certification director at Wright-Patterson AFB, Ohio.

Several years ago, the Air Force set the goal of certifying its entire fleet to operate on a 50-50 synthetic-biofuel and JP-8 mixture by 2011, bolstering the service's energy independence.

Currently, synthetic paraffinic kerosene (SKP) is derived from natural gas using the Fischer-Tropsch refining process, though there is significant potential for use of coal—abundant in the US—as another option.

Fleetwide certification of a 50-50 blend of JP-8 and SPK is already well under way, with all but four aircraft types in the Air Force inventory now cleared for unconstrained operation on the current SPK-JP-8 blend. As of November, the UH-1 Huey helicopter was nearing certification, with only the MQ-9 Reaper and RQ-4 Global Hawk remotely piloted vehicles and CV-22 tilt-rotor remaining to be cleared for operations throughout the flight envelope using the fuel.

The next step for the Air Force is focusing on approving a variety of mixtures featuring some percentage of hydro-treated renewable jet fuel (HRJ), derived from biomass.

According to officials at Wright-Patterson, any combination of HRJ and SPK adding up to 50 percent of a given fuel blend is possible, assuming it meets Air Force performance and safety specifications. The service is "agnostic" with respect to the HRJ source, be it animal fat (e.g., beef tallow or chicken fat), plant oil (e.g., camelina or algae), or a combination thereof, explained Braun.

As the approval process continues, the Air Force expects to certify the Global Hawk by next spring, with the Reaper following shortly behind in summer 2011. Certification of the CV-22 is currently being pursued as a joint project with the Navy.



USAF photo by MSgt. Terry Atwell

Chiodo died April 29, 1944, near Hanover, when German fighters downed his aircraft as it flew toward targets in Berlin.

The remains of one of Chiodo's crewmates, Sgt. John P. Bonnassiolle, were also recovered in 2007 and were buried in San Francisco in August.

Crew Remains Returned From Pacific

Two airmen, missing in action in the Western Pacific since late 1943 were buried with full military honors Oct. 27. SSgt. Claude A. Ray, 24, of Coffeyville, Kan., was buried in Fallbrook, Calif., and SSgt. Claude G. Tyler, 24, of Landover, Md., was interred in Arlington National Cemetery.

The two airmen were among 12 B-24D crew members lost on a reconnaissance mission from an airfield near Port Moresby, New Guinea, Oct. 27, 1943.

A DOD team excavated the crash site in 2007, returning the airmen's remains to the United States.

SBIRS Gains Allies

The US, Australia, Britain, and Canada will extend their previous collaboration on the Defense Support Program now that the Space Based Infrared System, or SBIRS, is taking its place.

"We have a memorandum of agreement that's been signed by all four nations agreeing to how the three partner nations integrate in with us," said Lt. Col. Jennifer Jenkins, 2nd Space Warn-

F-16s Targeted for Upgrades

As F-16s of the active duty and Air Force reserve fleets surpass their life expectancies, the Air Force is planning a suite of upgrades that will keep them flying as long as necessary, a senior USAF general said.

Lt. Gen. Philip M. Breedlove, head of operations, plans, and requirements on the Air Staff, said USAF has begun discussing how to extend the life of the existing tactical inventory, to ensure we "maintain that operationally viable capability that we need," particularly as advanced air defense weapons are rendering legacy fleets increasingly vulnerable.

Both the Air National Guard and the Air Force Reserve have been fully engaged in a "fruitful discussion" regarding F-16 modernization, assuring that even newer F-16s have the "right amount of capability" to address rising threats, Breedlove added.

The USAF has already decided to pursue "structural changes" on Block 30 and earlier F-16s, mostly aimed at simple operational life extension. Block 40 and 50 aircraft will require "tail by tail" examination to determine how many aircraft, what type of upgrades, and what kind of enhancement they will ultimately need, he said.

The F-16 in particular is worrisome because the type will age out of the inventory faster than its replacement, the F-35, will arrive.

Breedlove—who has been confirmed to become vice chief of staff—emphasized that the fleet must be examined both in terms of lifespan and the capabilities required to survive in future combat. Given that, almost all Block 40 and 50 aircraft will need not only basic structural modification, but avionics, communication, navigation, and radar upgrade in some instances.

Above all, Breedlove noted there will be no blanket approach to service life extension, as some aircraft require more robust capabilities than others. However, the analysis currently under way will inform the Air Force's 2012 budgeting decisions, some of which have already been made.

ing Squadron commander at Buckley AFB, Colo., Oct. 28.

The agreement "has been signed for another three years" which "gets us well into the SBIRS" program, she noted. Six-

teen of the 140 controllers at Buckley's mission control center operating DSP and SBIRS are currently from the three allied countries. The DSP is being phased out after 40 years of operations. ■

News Notes

■ USMC Gen. James F. Amos was confirmed by the US Senate as Commandant of the Marine Corps. He succeeds Gen. James T. Conway. Amos is the first career aviator to lead the Marine Corps.

■ Air Force leadership approved the new, official motto for the US Air Force, "Aim High ... Fly-Fight-Win." The motto will be gradually incorporated into Air Force presentations, correspondence, materials, and training courses.

■ Japan said it is considering acquiring Northrop Grumman's RQ-4 Global Hawk to enhance monitoring of its territorial waters, though the Defense Ministry has yet to formally select the Global Hawk or define specific requirements.

■ The Indian Air Force will acquire between 250 and 300 Sukoi PAK-FA stealth fighters from Russia starting in 2017, according the Indian defense ministry. The aircraft will be jointly manufactured by Sukhoi and Hindustan Aeronautics Limited pending formal agreement.

■ Kadena AB, Japan, is undergoing a major overhaul of its runways,

temporarily shifting all operations to a single set of runways. The project will last approximately 18 months, requiring nine months each for its north-south runways.

■ Lt. Col. Robert Starnes, a navigator with the 15th Special Operations Squadron at Hurlburt Field, Fla., eclipsed 5,000 total flight hours in the MC-130H Combat Talon II, establishing a new record for the type. Starnes retires this month after 23 years of flying service.

■ Flight testing has commenced on the B-2 bomber's extremely high frequency satellite communications upgrade, which will speed up the exchange of battlefield information. Northrop Grumman announced that the aircraft began flying with the equipment at Edwards AFB, Calif., in September.

■ An RQ-4 Global Hawk remotely piloted aircraft that arrived at Andersen AFB, Guam, in September has begun preliminary operations. Two additional Global Hawks are scheduled to arrive at Andersen over the next few months, completing the base's complement.

■ The Idaho Air National Guard's 190th Fighter Squadron won the Air Force's biennial "Hawgsmeoke" A-10 competition for the second time running. Eighteen teams, 200 pilots, and 40 A-10s participated in the competition, held at Boise Air Terminal, in October (see picture on p. 19).

■ Great Falls Arpt., Mont., was selected over Boise Air Terminal, Idaho, as the Air Force's preferred location to host the Air National Guard's seventh operational C-27J unit. The final basing decision is expected in mid-2011.

■ Fifteen airmen completed an 860-mile trek from Lackland AFB, Tex., to Hurlburt Field, Fla., Oct. 9-21, honoring the 14 special tactics airmen killed in Iraq and Afghanistan. Each walker carried a 50-pound rucksack and a baton etched with the name of a fallen airman.

■ Air Force 2nd Lt. Jacob Bradosky, 23, won the 35th annual Marine Corps Marathon in Washington, D.C., Oct. 31, with a time of two hours, 23 minutes, and 30 seconds. Bradosky finished ahead of nearly 21,000 participants, 11 seconds ahead of the nearest competitor. ■



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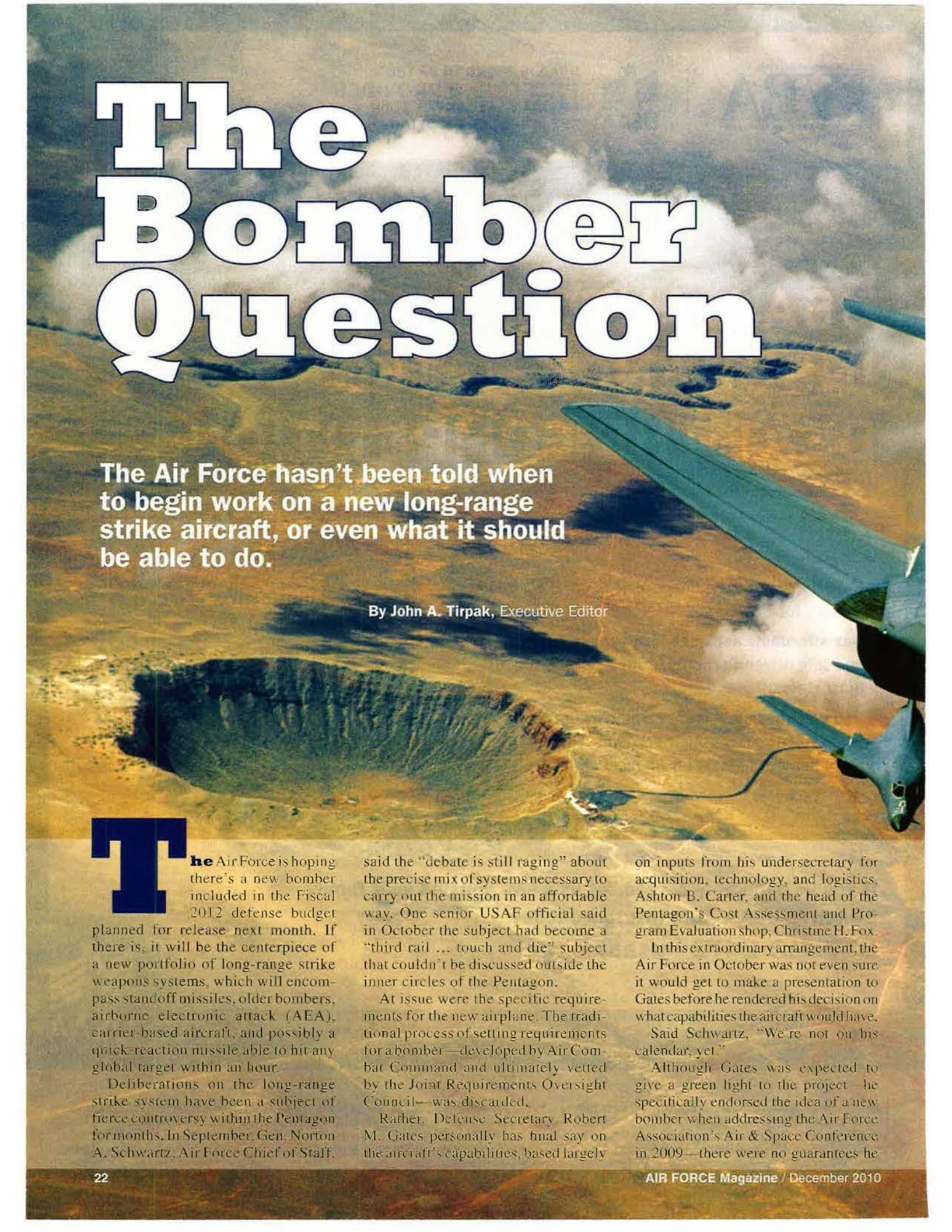
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The background of the page is an aerial photograph of a desert landscape. In the foreground, the right wing and tail section of a B-2 Spirit bomber are visible, flying over the terrain. The landscape below features a large, dark, circular crater or depression in the center, surrounded by rolling hills and sparse vegetation. The sky is filled with soft, white clouds.

The Bomber Question

The Air Force hasn't been told when to begin work on a new long-range strike aircraft, or even what it should be able to do.

By John A. Tirpak, Executive Editor

The Air Force is hoping there's a new bomber included in the Fiscal 2012 defense budget planned for release next month. If there is, it will be the centerpiece of a new portfolio of long-range strike weapons systems, which will encompass standoff missiles, older bombers, airborne electronic attack (AEA), carrier-based aircraft, and possibly a quick-reaction missile able to hit any global target within an hour.

Deliberations on the long-range strike system have been a subject of fierce controversy within the Pentagon for months. In September, Gen. Norton A. Schwartz, Air Force Chief of Staff,

said the "debate is still raging" about the precise mix of systems necessary to carry out the mission in an affordable way. One senior USAF official said in October the subject had become a "third rail ... touch and die" subject that couldn't be discussed outside the inner circles of the Pentagon.

At issue were the specific requirements for the new airplane. The traditional process of setting requirements for a bomber—developed by Air Combat Command and ultimately vetted by the Joint Requirements Oversight Council—was discarded.

Rather, Defense Secretary Robert M. Gates personally has final say on the aircraft's capabilities, based largely

on inputs from his undersecretary for acquisition, technology, and logistics, Ashton B. Carter, and the head of the Pentagon's Cost Assessment and Program Evaluation shop, Christine H. Fox.

In this extraordinary arrangement, the Air Force in October was not even sure it would get to make a presentation to Gates before he rendered his decision on what capabilities the aircraft would have.

Said Schwartz, "We're not on his calendar, yet."

Although Gates was expected to give a green light to the project—he specifically endorsed the idea of a new bomber when addressing the Air Force Association's Air & Space Conference in 2009—there were no guarantees he



B-1B bombers pass Meteor Crater in Arizona. As a "paid for" asset, B-1s might be part of USAF's bomber force for decades more.

Photo by Ted Carlson



wouldn't shelve the aircraft. He had done exactly that in April 2009, with the previous so-called next generation "2018 bomber" in favor of the now vaguely defined "long-range strike system."

A special commission chartered by Congress to review the recommendations in the Quadrennial Defense Review reported out in July that the Pentagon's planned force of 96 bombers is flatly inadequate. The commission, chaired by former Defense Secretary William J. Perry and former National Security Advisor Stephen J. Hadley, said a force of 184 bombers is more appropriate to credibly deter or, if necessary, fight China or other distant potential adversaries. The bombers should be comfortably able to defeat the latest integrated air defenses with a new generation of stealth technology.

Range the Planet

In a recent paper for the Center for Strategic and Budgetary Assessments, Mark A. Gunzinger noted the Air Force withdrew the B-1B and B-52 from penetrating attack missions in the 1990s, due to their inability to survive against modern air defense systems.

"Over time," Gunzinger wrote, "the B-2 should be expected to follow the same path as the B-52 and B-1 and lose its ability to penetrate advanced multilayered air defenses." Air Combat Command "has indicated the B-2 may be losing its stealth advantage." That's because in 2018, the B-2 will be 25 years



A Northrop Grumman concept for a next generation bomber (top) and one from Boeing (above). Contractors don't know where to put scarce R&D dollars without Pentagon guidance.

old, and newer stealth technologies will be needed to evade highly advanced surface-to-air missiles and a variety of search and track radars expected to be ubiquitous by then.

Without the B-2 as a penetrator, DOD would lose its only aircraft that can attack targets in an anti-access environment at distances exceeding those of stealth fighters. "This fact has led the Air Force to conclude that it needs to begin developing a new penetrating bomber," Gunzinger reported.

Air Force leaders have not given many details about what characteristics the new bomber should have. In a September 2010 speech, Air Force Secretary Michael B. Donley said the aircraft's design emphasis would be on conventional missions, "where they are most likely to be used," given that USAF bombers have been called on heavily as conventional attack platforms over the last 20 years. The service's goal, he said, is to avoid the experience of previous bomber projects, which either were too far a technological reach or cost too much to build in necessary numbers.

The Air Force, he said, has no intention of pursuing an aircraft with "narrowly focused capabilities, high-risk technologies, and high costs contributing to affordability problems leading to program cancellations or low inventories." Donley later told reporters the airplane will rely heavily on off-the-shelf technologies to hold down cost and risk.

However, he did say the aircraft must have the ability to "range the planet."

Schwartz separately said the machine will not have the hardening necessary to make it survivable against electromagnetic pulse, i.e., suitable for nuclear war. The bomber would have a wiring architecture making such a retrofit or upgrade possible on a later version, however.

In his speech at the 2010 AFA conference, Schwartz said future adversaries are putting up more sophisticated air

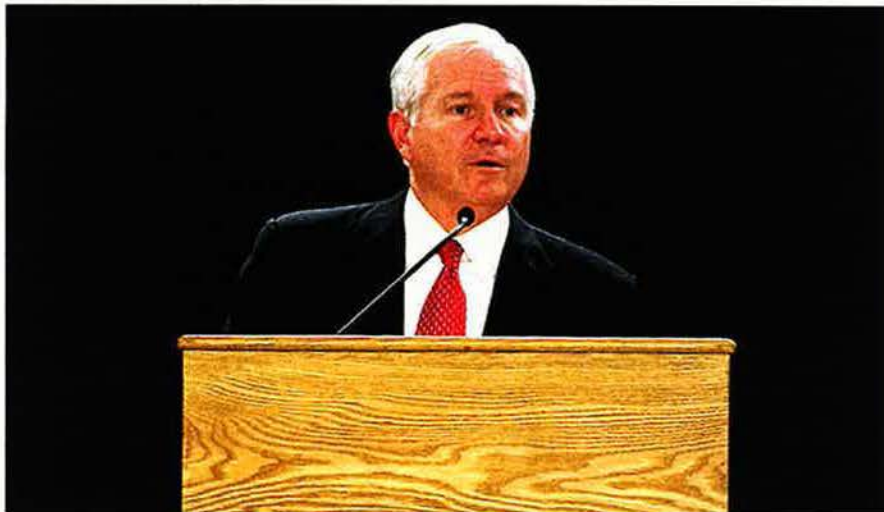
defenses “specifically designed to challenge our ability to project expeditionary power” and “prevent our freedom of action” in the theater of operations. These tougher defenses “can compel friendly forces either to accept higher risks, or be forced to operate, disadvantaged, at greater distances.”

However, Schwartz said, due to tight budget constraints, “we cannot just pursue increasingly expensive advanced technologies.” The answer is to build a “family of systems” able to overcome area denial measures and preserve USAF’s ability to operate anywhere. With the Office of the Secretary of Defense, he said, the Air Force is “carefully developing” this system to ensure “maximum flexibility and longevity” of the portfolio “through a careful balance between simpler and more complex capabilities and platforms, including, we suggest, a penetrating bomber.”

The system chosen will have to be versatile and flexible enough to go against the toughest air defenses without being overkill against undefended targets and be adaptable “over time” to meet new threats as they emerge.

The system chosen will use the block upgrade approach, in which an initial version is gradually improved with new capabilities to expand its power and deal with new threats. USAF will seek to balance weapons carriage, penetrating intelligence-surveillance-reconnaissance, and other capabilities, Schwartz said, allowing the service to “renew and extend our traditional Air Force competence: synchronizing diverse capabilities to deter and defeat complex and determined threats.”

Schwartz said the Air Force and



DOD photo by Cherie Cullen

Defense Secretary Robert Gates scrapped the 2018 bomber, saying the Air Force hadn't adequately defined its mission or requirements. Now he'll decide what the new bomber will be able to do.

the Navy will have to function inter-dependently and rely on each other to accomplish some tasks, including long-range strike.

Four Optional Mixes

In February, along with its Fiscal 2011 budget proposal, the Defense Department submitted to Congress its first-ever “Aircraft Investment Plan,” which was required by statute. The plan did not predict the purchase of any new bombers during the decade 2011 to 2020, but forecast spending between \$2 billion and \$4 billion a year on science and technology on development of a new bomber by the end of the decade, beginning with \$1 billion in Fiscal 2015.

Gunzinger, in the CSBA white paper, offered several options the Defense Department might pursue with the new LRS family of systems. In order to be

effective, he said, such a portfolio must have a mixture of capabilities that include a penetrating bomber, supporting aircraft in the form of airborne electronic attack platforms (manned or remotely piloted), the presence of a robust ISR network, stealthy and longer-ranged attack capabilities for aircraft carriers, maintaining a certain number of legacy bombers for standoff missions, new standoff cruise missiles with which to equip them, and a prompt global strike weapon that could hit a fleeting but critical target within an hour of the order to do so.

He also offered four optional mixes of those capabilities that Pentagon decision-makers should consider. Gunzinger’s preferred option would prioritize funding a new penetrating bomber supplemented by a new carrier-based remotely piloted aircraft with conventional strike capabilities, a new AEA platform for aircraft carriers, a new standoff cruise missile, and a “limited” number of conventional prompt global strike weapons. Under that option, the B-1 and B-52, which are already “paid for,” could continue to serve nicely as standoff platforms or against lightly defended targets into the 2040s.

Before the next generation bomber was canceled, Air Force officials had suggested it would be an aircraft with a combat radius of more than 2,000 miles with a weapons load of about 28,000 pounds. (By comparison, an F-15E strike aircraft has a weapons payload of about 25,000 pounds.) The aircraft also was supposed to be stealthy enough to be capable of surviving—and persisting—in contested airspace against modern air defense systems, be nuclear-capable, and “optionally manned.” To

USAF photo by MSGt. Vol Gemppis



For at least 15 years to come, the B-2 is likely to be USAF's only large-payload, long-range penetration platform. Here, airmen at Andersen AFB, Guam, prepare to load an inert bomb for a B-2 practice mission.



Although the entire B-52 force is 47 years old, with new standoff weapons—possibly hypersonic cruise missiles—the venerable BUFF might have a lease on life into the 2040s.

save money and time, it would rely on proven engine technologies rather than potentially risky new propulsion concepts, and it would be capable of subsonic—rather than supersonic or hypersonic—speeds.

Gunzinger evaluated what might be the “sweet spot” in range, payload, and cost for the new bomber, since Gates announced that affordability would be a principal characteristic of the new aircraft. Boiling it down to the idea that range and payload capability equated to aircraft size and number of engines—and thus unit cost—Gunzinger compared a 40,000-pound payload bomber with a 20,000-pound payload bomber. The larger, four-engine bomber, he deduced, would cost about \$44 billion to develop and build 50 aircraft, while a smaller, two-engine aircraft would cost \$46 billion to develop and build, but yield a 100-aircraft fleet. Schwartz and Donley have both suggested that a 100-aircraft fleet is about what the Air Force has in mind.

The larger fleet of smaller bombers is the better deal, Gunzinger argued, since it would be more tolerant of combat losses and vastly expand the number of aim points the Air Force could hit in the early hours of a conflict.

“As a comparison, 16 B-2s based in Guam could attack approximately 180 targets in a Western Pacific target area per day with GBU-31s [Joint Direct Attack Munitions], compared to 448 GBU-31s delivered per day by a fleet of 80 new active-inventory penetrating bombers with payloads of 20,000 pounds each,” he wrote in the CSBA paper.

The larger bomber would have an advantage, though, in its ability to carry the Massive Ordnance Penetrator, a

30,000-pound bunker-buster able to penetrate deeply buried and hardened targets, which are proliferating.

If the Air Force were able to develop a weapon with the MOP’s effects—but in a 5,000-pound munition comparable in size to the GBU-28 penetrator—the advantage would shift back to the two-engine bomber, Gunzinger said.

Lt. Gen. Philip M. Breedlove, USAF’s deputy chief of staff for operations, plans, and requirements, said in June the expense of hitting hardened and deeply buried targets far from coastlines is one of the central points on which the LRS debate will turn.

“Our enemy learns well,” said Breedlove, who has been tapped to become USAF vice chief of staff.

Roadmap Needed

“The real debate going on,” he said, is “how much of our nation’s wealth are we willing to put against those targets, which our opponent is making very, very expensive to strike.” There is a danger that making certain choices about what the new bomber can and can’t do would “telegraph” to opponents what targets the US might “cede” to a dedicated defender. He said it remains a “core requirement” of the Air Force to be able to hit any target, anywhere. The US can’t allow an enemy “to feel like he has sanctuary because of policy decisions or equipment decisions that our nation has made.”

Darryl W. Davis, president of Boeing’s Phantom Works advanced development organization, said that extensive, “in-depth” work has been conducted on new bomber concepts over the last decade by industry, and if the Pentagon opts for an airplane that is similar to the ones

discussed up to a year ago—“typically, a [15,000- to] 25,000-pound payload, 2,000 to 2,500 miles of radius”—he could “reach up on the shelf and have a lot of stuff [to offer] that’s fairly mature.” If the requirements hover where they have been, he added, companies would be able to “get moving pretty quickly.” However, no one at the Pentagon “has given us any insight as to whether the requirements are going to deviate from what they’ve previously been talking about. ... It’s just absolutely ‘cold mike’ on that. No one will talk,” Davis said.

The Pentagon will need to set its priorities, and requirements will flow from them. “Some cost more, some cost less,” he said. “And the ones that cost less tend to take longer to do the job.”

Part of the cost and complexity of the project will depend on when the Pentagon needs to field the new airplane, Davis said. To hit a hypothetical target of having a squadron of new aircraft operational in 2024, “you probably have to start in 2012,” he said. Starting later would likely incur a “year-for-year slip.”

Concepts for a prompt global strike system have centered on replacing the nuclear warheads of an intercontinental ballistic missile, land- or sea-based, with a conventional warhead. Such a weapon would be able to hit any target on Earth within an hour’s time of the go order. Using ICBMs, though, has drawn concern that such a weapon might be mistaken for a nuclear attack, potentially causing miscalculation by other nuclear powers.

Davis said there are ways to approach the problem that do not involve ICBMs. The X-51 and other hypersonic systems now in test could be perfected and launched from air or sea and take just 20 minutes to traverse 2,000 miles.

“Could you scale those up and make them weapons? ... Sure,” said Davis. However, with such quick time of flight, attack against a mobile or fleeting target would require nearly “perfect” ISR: “the ability to watch it 24/7, 365 [days a year], through all the weather.” If the target moves, there would have to be guaranteed communications and terminal control, because a Mach 7, “20-minute mission ... happens pretty fast.”

Air Force officials said there were good reasons why the 2018 bomber was shelved in favor of the portfolio approach to long-range strike. The nation was on the verge of a new arms agreement with Russia, they said, and it made little sense to commit to a design that might



Photo via E-mans av@pik.com

almost immediately become obsolete. Moreover, whatever system is chosen will have to integrate with airborne electronic attack systems, and USAF had not yet formulated a comprehensive roadmap for AEA.

Timing is not a trivial issue. Beyond the spur of approaching obsolescence is the fact that the defense industrial base has not had a stealth bomber program to work on for a decade. There is the very real possibility that the skills necessary to design such an aircraft could disappear from disuse.

Asked if such skills could vanish—possibly within a year—if a new bomber program isn't formalized in the 2012 budget, Davis said, "Oh, absolutely. There's no question about it."

Davis said industry has spent heavily on design work in anticipation of the bomber program, only to have the rug pulled out from under it several times in the last decade. That makes it tough to go to corporate leadership and ask for more money to invest in the project.

The point at which bomber skills could evaporate is "not all that far away," Davis said.

"Unless we, industry, decide we're going to spend a lot of our own money to keep these [design teams] together," the skills will dissipate, he asserted. Given the Pentagon's demand for industry to get more efficient, "if you can't see that there's ever going to be a return on those kinds of investments, I'm not

sure how far industry is going to go to keep these skills viable for even another year," Davis noted.

A Critical Choice

At the time of the cancellation, Davis said, "engine houses, mission systems houses: ... We were all working on it, thinking [funding] was coming." Now, Davis said, he has only about a dozen engineers involved with bomber concepts.

He wonders, "Why should I go work on this thing in any significant depth when I don't know what the requirements are, I don't know if there will be a program?"

As a consolation to industry when Gates last canceled a next generation bomber, in 2009, he agreed to put money in the 2011 budget for continued exploration of stealth and other technologies. However, by mid-October, Congress had not approved the 2011 budget—with about \$200 million for bomber technology studies—and the money remained unspent.

A new bomber has been controversial since the 1990s, when Congress decided to cap production of the B-2 at just 21 aircraft, versus earlier production targets of as many as 132 stealth bombers. In 1999, the Air Force published a "Bomber Roadmap," which said it was well-fixed for bombers through 2037—an assertion that stunned many members of Congress at the time—assuming the service got a steady diet of funds to continually enhance its B-1Bs, B-2As, and B-52Hs

B-52s line the ramp at Barksdale AFB, La. All B-52s now in service were made in the early 1960s, and advanced weapons will give the venerable bomber more nuclear bite.

with regular upgrades and new weapons. By 2006, however, the Pentagon's QDR called for the 2018 bomber, noting the age of the B-52 (all B-52s now in service were made before 1963). Also, the B-1B had been withdrawn from the nuclear role and was now purely a conventional platform.

In the last few years, the Air Force has been retiring its AGM-129 Advanced Cruise Missile, the stealthy weapon meant to give the B-52 more nuclear bite at standoff ranges. The older AGM-86 Air Launched Cruise Missile was retained, but in smaller numbers. The ALCM is cheaper to maintain.

Adversaries will not wait while the US gets its long-range strike act together, and there are penalties for further delay.

"If the next defense budget continues to defer needed long-range strike investments," Gunzinger wrote, "a gap is likely to emerge in which the nation could lose its conventional long-range strike advantage for a decade or more. Consequently, the United States has a critical choice to make: Either accept this loss on the assumption that long-range strike is less relevant in the future, or implement a plan and provide sufficient resources to maintain its long-range strike advantage." ■



Personnel Recovery, in Need of Rescue

By Marc V. Schanz, Senior Editor

For the small community of Air Force rescue crews and pararescue jumpers, intense life-and-death missions are all too common in Afghanistan. Crews routinely brave harsh conditions and heavy enemy fire to save the lives of

US and NATO troops and Afghan forces and civilians.

But the rescue teams aren't likely to receive a new helicopter to replace the straining fleet of early 1980s-era HH-60 Pave Hawks anytime soon. Even combat replacements for worn-out and





USAF photo by SSgt. Christopher Boxtz

USAF's rescue personnel are in desperate need of new helicopters.

Left: USAF Brig. Gen. Jack Briggs (center) and pararescuemen from the 455th Air Expeditionary Wing train at Bagram Airfield, Afghanistan. Above: An HH-60 passes over a valley near Bagram. Below: A Pave Hawk on a mission over Afghanistan.

destroyed aircraft in the existing fleet are years away.

USAF's previous recapitalization plan called for it to purchase 141 next generation CSAR-X aircraft, with the first arrivals planned for 2012. Now, officials in the requirements process say, the fleet recap plan has been reduced and is at least four years from getting aircraft out on the ramp. The date slipped as the CSAR-X acquisition program came undone and was then scrapped in the Fiscal 2010 budget proposal.

Less Than 100 To Go Around

Sorties such as the one faced by the Pave Hawk crew Pedro 16 last year (see sidebar) illustrate how demanding combat search and rescue can be and why new aircraft are needed.

The Air Force currently fields 99 Sikorsky HH-60G Pave Hawk rescue helicopters, which have performed the CSAR mission since 1982. Nine years of combat have taken a toll on the fleet and revealed performance limitations in areas such as speed, range, capacity, and reliability—particularly now in the high-altitude mountains and plateaus of Afghanistan.

According to officials in Air Combat Command's personnel recovery requirements shop, the availability rate for the HH-60 fleet was under 60 percent as of early October. With less than 100 airframes to go around, air-



USAF photo



Above: Dust swirls as two *Pave Hawks* practice tactical maneuvers near JB Balad, Iraq. **Right:** Maj. Russell Cook taxis a *Pave Hawk* at Kandahar Airfield, Afghanistan.

craft and crews from several squadrons (active duty, Guard, and Reserve) are put together to make up expeditionary rescue units downrange.

The lack of able HH-60s is raising concerns in Southwest Asia and back at JB Langley, Va., home to Air Combat Command.

At the minimum, USAF wants to get its fleet back to a nominal inventory of 112 aircraft soon. Seven *Pave Hawks* have been lost in combat in Iraq and Afghanistan since 2001, and overall, 13 HH-60s have been destroyed since the 1980s. "At some point, we will recapitalize the entire fleet to improve our maintenance availability and ability to deploy the aircraft," said an ACC planner.

Seeing the Cracks

The Air Force's CSAR community faces a two-front battle: keeping the remaining fleet healthy downrange, while shuffling around aircraft at the permanent bases just enough to keep crews adequately trained.

These units are being tasked almost nonstop with medevac missions, evacuating high-risk patients and extracting wounded ground troops from deadly ambush sites.

By early September, HH-60 crews had performed more than 1,200 saves and flown more than 6,300 sorties in Southwest Asia this year, according to ACC officials. As of that month, 20



USAF photo by TSgt. Chad Chisolin

Pave Hawks also had suffered battle damage this year, either from enemy fire or landing in thick dust, known as brownout conditions.

"It's not just the fighter force that [is] stressed," ACC Commander Gen. William M. Fraser III said in September. He specifically mentioned the operations tempo of the Pave Hawk fleet, which is flying more than three times its projected use rate, and noted it was "burning them up."

"Talking to the folks when I was [in theater], I was starting to see cracks, and we haven't seen cracks before, in some of the bulkheads. And so we've got some work to do there," said Fraser. As a result of this tempo, the deployment-to-dwell ratio for rescue airmen is among the highest in the Air Force.

"The utilization rate in theater is at least double what we fly in the States—at least double—sometimes more than that," said Col. Clair Gilk, the division chief for personnel recovery requirements at ACC headquarters. "Not only are you flying them harder, you're flying them in more difficult conditions because of the terrain and the dust and all the other stuff you normally don't find here in the States. That's having an impact."

Maintaining the skills of technicians, pilots, and other crew members also is a concern as the fleet gets put through

the wringer. Lt. Col. Todd Worms, deputy division chief for ACC's flight operations division, said although the CSAR field has high job satisfaction, he watches retention figures closely in both the maintenance and aircrew fields for the HH-60 fleet. "At the optempo we are at, it's one of the things we have to keep an eye on."

For morale and retention, to enhance skills, and for professional development purposes, he also wants to assure the right people are getting their bonuses and applying for weapons school upgrades, despite the narrow window of opportunity for many crews.

"If we have to work the system, we will [get] guys ... where they need to go for [professional military education] and all of that," Gilk said. Units will more often than not have people volunteer to deploy so an airman can attend a noncommissioned officer academy, for example.

Avoiding a Bottleneck

"The bottom line is, that goes on everywhere" across the Pave Hawk community, Gilk said. "Other guys will stand in and suck it up."

The heavy rotation is affecting the components and maintenance of the aircraft as well, said Worms. "Engines go at a higher rate, so there are times we burn through engines faster." There

aren't too many parts issues downrange, as the Army has a large logistics train for its fleet of Black Hawks. These have similar components, so Pave Hawk maintainers can get parts replaced fairly quickly.

The difficulty comes along when the aircraft are due in depot, Worms noted. "Every aircraft we have, every 600 hours, we take it apart and check for cracks, corrosion," he said. The high utilization rate is bringing helicopters back into the depot more often, so maintainers are making sure a bottleneck doesn't occur. "Math tells you the more you fly them, the more often you have to do [phase inspections]."

Maintenance and logistics airmen have gone down to the Pave Hawk depot at Corpus Christi, Tex. (an Army facility), and done work to speed the process up, notably by opening phase lines at other locations to get the aircraft back on the flight line for use in training and to prep for deployment. "Instead of waiting on the line, we get them fixed faster," Worms said.

Due to the high altitudes in Afghanistan, crews are constantly trading weight for performance, tinkering with fuel loads, equipment loads, and other factors when going out on sorties. "When you're talking about high and

A Pave Hawk, armed with two 7.62 mm miniguns, on the ramp at Bagram.



Photo by Chive Bennett

hot conditions, ... it's always a trade-off," noted Gilk, a Pave Hawk operator with more than 20 years' experience.

To get the rescue airmen new and more capable equipment, in November 2006 the Air Force awarded Boeing the CSAR-X contract. The winning design was the HH-47, a Chinook derivative.

Losing competitors immediately protested the decision to the Government Accountability Office. The GAO eventually upheld the protests, and the Air Force reopened the competition.

For a time, service leadership continued to push hard for the program, with then-Chief of Staff Gen. T. Michael Moseley calling the combat search and rescue mission a "moral and ethical imperative."

CSAR is one of the service's core missions and responsibilities, so the Air Force needs the best equipment possible to carry out the mission to retrieve airmen and service members stranded in dangerous combat environments, he argued. "Combat search and rescue is a big deal for people like me," Moseley said in April 2007.

As the competition advanced, officials in the Office of the Secretary of Defense began to criticize the very requirement for a dedicated rescue fleet. John J. Young Jr., then Pentagon acquisition head, questioned the need for a CSAR-X fleet "for the occasional rescue mission" in late 2008. He said there were other assets that could be pressed into service for rescues.

After restructuring, the competition appeared set for a spring or summer 2009 award.

The Dangers of Rescue in Afghanistan

July 29, 2009, began as just another sweltering day in southern Afghanistan to sit and wait for calls for help. Before long, though, an Air Force HH-60 crew—Pedro 16—assigned to Kandahar Airfield's 129th Expeditionary Rescue Squadron received an urgent call-out to accompany another Pave Hawk on a medical evacuation mission to grab three soldiers wounded by an improvised explosive device in a convoy attack.

Accompanying the other helicopter—Pedro 15—the rescuers arrived to find members of the convoy under fire from multiple enemy positions.

Soon, Pedro 16 was directing emergency close air support for two other Army OH-58 Kiowa helicopters, while Pedro 15 landed, inserting pararescue jumpers to evacuate the wounded. Pedro 16 began multiple gun runs against enemy positions with its GAU-2 side-mounted miniguns, while directing other CAS.

On its second landing to evacuate wounded, Pedro 15 took heavy fire and sustained critical damage. The crew was able to get off the ground, but had to land about a mile south of the firefight. Under extreme duress, the crew exited and took fire as Pedro 16 moved in to provide cover while itself evading small-arms fire and rocket propelled grenades. When both of the helicopter's miniguns eventually failed or jammed, crew members MSgt. Dustin Thomas and SSgt. Tim Philpott picked up their M4 rifles and engaged enemies on a nearby ridge.

With one chopper disabled and enemy militants swarming nearby, the crew of Pedro 16 worked an evacuation plan with the assisting Army OH-58s: extracting the crew of the downed helo on the skids of the Kiowas. Still under fire, Pedro 16 landed and took on remaining personnel, before barely escaping because of the intense attack.

"We had five PJs, three wounded, and the flight engineer," recalled Thomas. "It was jam-packed with all the gear and all those people in the back."

Far from a niche capability, today Air Force combat rescue units are under great stress, as they have deployed constantly to support operations in Iraq and Afghanistan.

Pedro 16's experience was not unique. CSAR teams are routinely in harm's way. In June, an HH-60 crashed near Forward Operating Base Jackson in Afghanistan's Helmand province, killing five rescue airmen.

Then came "Black Monday"—April 6, 2009.

Secretary of Defense Robert M. Gates killed off the CSAR-X program as part of the 2010 budget overhaul and criticized the helicopter as another "single

service solution." He ordered a scrub of CSAR requirements to determine whether the mission needed specialized aircraft or if it could be filled with an ad hoc joint capability.

The most recent statements from service leadership indicate USAF will first seek an affordable solution to the Pave Hawk shortfall. It will pursue an off-the-shelf platform that can be upgraded with the specialized gear necessary to perform difficult combat rescues.

Gilk notes there are two programs for USAF's rescue helicopters: the Operational Loss Replacement program and the fleet recap effort.

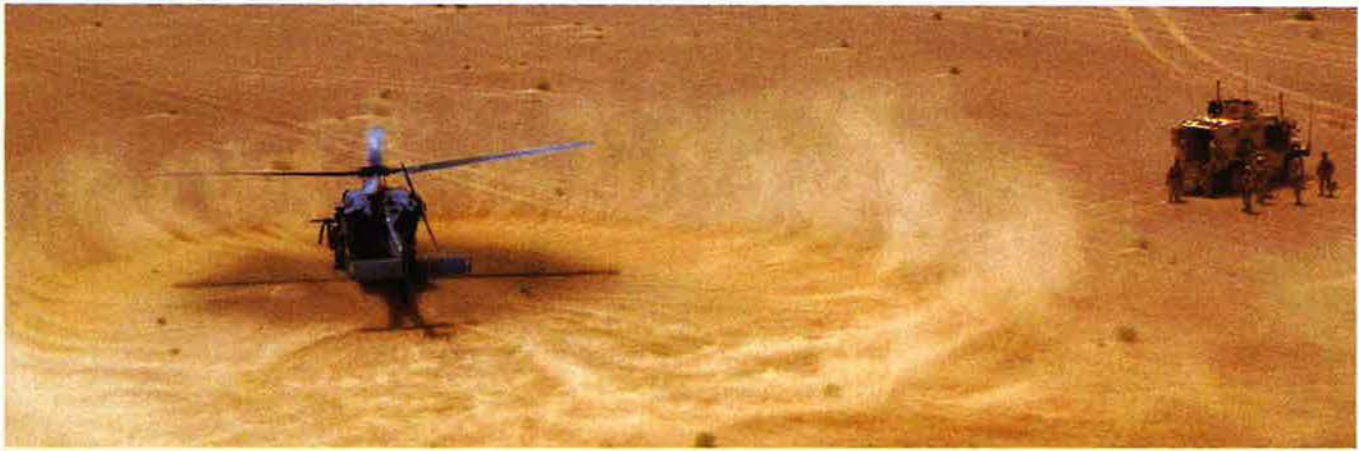
The operational loss effort will buy replacement Sikorskys to get the Pave Hawks back up to 112, said Gilk, with the understanding that these purchases will be the last airframes in the fleet to be replaced in the coming recapitalization program.

"We currently have what's called an increment zero aircraft," said Gilk, referring to USAF's purchase of four new Sikorsky H-60M helicopters, which will be upgraded to Pave Hawks. The

USAF photo



MSgt. Dustin Thomas scans the terrain for imminent threats during a mission over Afghanistan. Thomas was a member of Pedro 16, the 2009 MacKay Trophy winners.



USAF photo

An HH-60G helicopter from the 129th Expeditionary Rescue Squadron lands Aug. 16, 2009, in Afghanistan to pick up a wounded soldier. The dusty and sandy terrain is further stressing the fleet.

remaining aircraft will be purchased over the course of the Future Years Defense Program.

Once delivered, USAF plans to add to the airframe survivability equipment and an improved gun mount for defensive capability. Modifications will include a more integrated cockpit, for better situational awareness, a refueling probe, an auxiliary fuel tank, a hoist, and infrared sensor equipment. The modification process has not yet been agreed upon, but Gilk said he anticipates these modified aircraft arriving in the fleet in two to three years, “hopefully.”

A separate, full-scale recap process is now back under way, but is advancing slowly. On March 23, the Air Force issued an initial notice to industry for input on platforms for a “personnel recovery recapitalization” program. An amended announcement was issued Oct. 20. USAF seeks four trainer assets and four combat ready helicopters in the field no later than Sept. 30, 2015. A contract award is scheduled tentatively for Fiscal 2012.

Previous CSAR-X requirements called for 140 to as many as 170 larger and more capable helicopters. “We don’t currently possess the budget or the funding to get to where we need to go,” Gilk said bluntly of the decision to remain at 112 rescue aircraft for the time being.

Chief of Staff Gen. Norton A. Schwartz said USAF would prefer not having to extend the service life of the fleet of HH-60 Pave Hawks, but couldn’t promise a new aircraft would be in the budget soon. He said the Air Force would prioritize replacing the operational losses first. “We

are committed to [recapitalizing] these machines and we’ll do that as rapidly as our topline ... will allow,” he said.

Schwartz’s direction to replace the combat losses allows new airframes—which will be more reliable and less maintenance intensive—to get to the crews sooner, Gilk added.

The Air Force plans to inform Congress of its long-term recap plans in the Fiscal 2012 budget, being sent to Congress early next year.

An Institutional Hit

Currently, ACC is looking at five-year increments for the long-term recapitalization effort. The Air Force hopes to purchase 36 rescue helicopters in the current Future Years Defense Program, which runs through 2015. “The numbers will be dependent on the amount of funding beyond the FYDP,” Gilk added. “We are confident we are going to get those 36 aircraft, but funding changes year to year.”

As for the difference between operational loss helicopters and what USAF seeks in the longer-term recapitalization effort, Gilk said the new fleet would be more capable with a better ability to hover and better integration of systems and data links with other aircraft.

He added there are a few issues to be worked out with the Office of the Secretary of Defense on acquisition strategy before USAF can announce a strategy and end point for the fleet. For obvious reasons, the Air Force, DOD leadership, and Congress are eager to avoid another CSAR-X episode, which wasted money, delayed the equipment, and led to large amounts of bad publicity.

Since CSAR-X was scrapped, the mission has clearly also taken an institutional hit. Dollars for equipment have dried up, and the Air Force has elevated other priorities in its requirements queue. In September, Maj. Gen. Robin Rand,

then head of USAF’s Congressional liaison office, listed the KC-X tanker, the F-35, intelligence, surveillance and reconnaissance assets, and satellite communications and space missile warning as the service’s top acquisition priorities. Notably absent was a new combat search and rescue helicopter—previously in the second spot on the list of top Air Force acquisition priorities.

Air Force officials involved in the CSAR requirements process say the mission and requirement remain a high priority. Rescue forces provide a “much sought after capability in theater,” said Gilk.

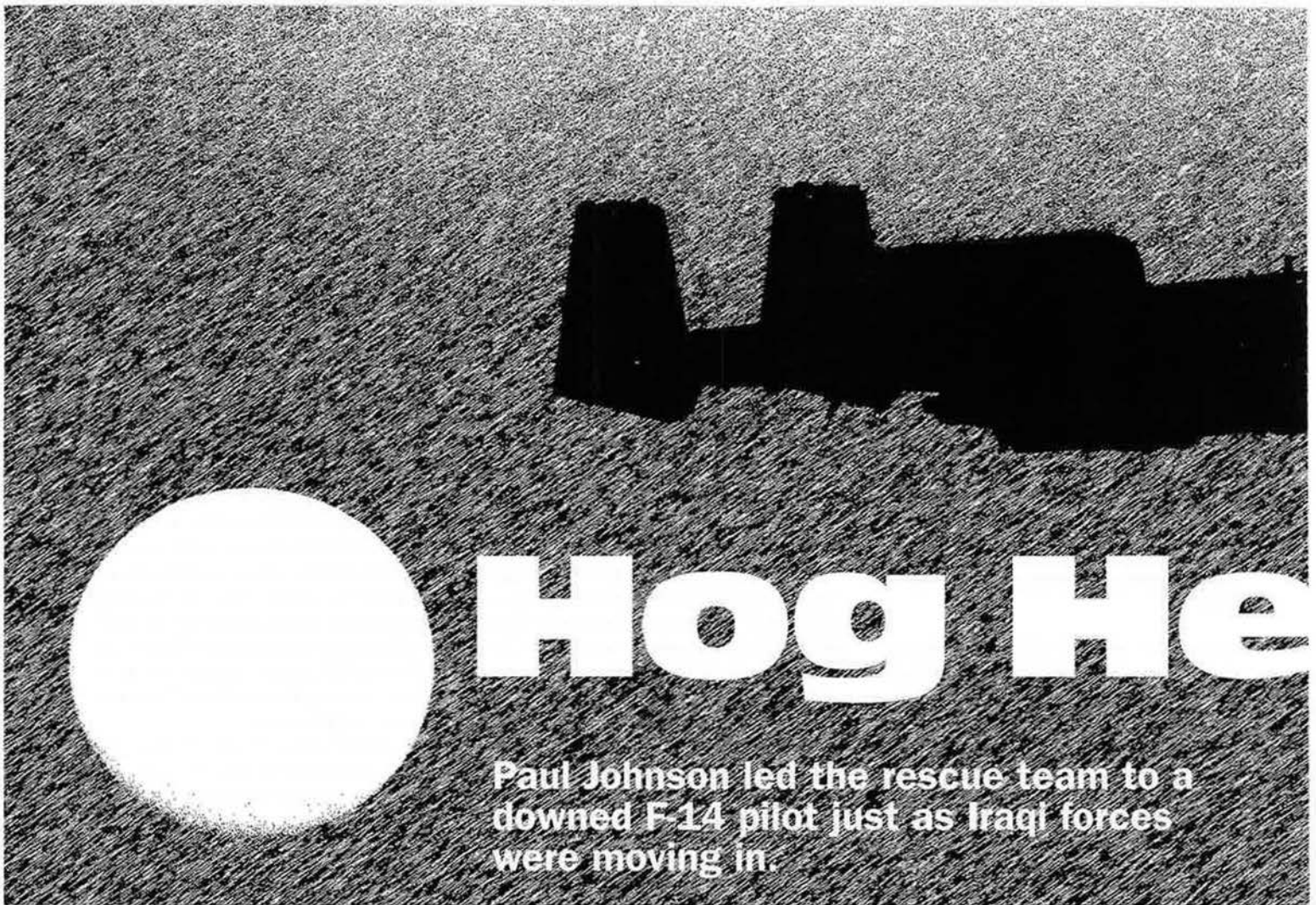
“We are not in any way changing the fact that we are pursuing that mission.”

The terminology also has changed. Gone from the Air Force’s core mission list is CSAR, replaced with the term “personnel recovery.”

Personnel recovery remains a core Air Force function, according to ACC, and USAF is the only service that specifically dedicates organized, trained, and equipped forces to carry it out. In recent years the capability has been in greater, not less, demand.

For the immediate future, USAF’s rescue community must get as much out of its current fleet as possible, which means keeping a close eye on certain health indicators. “When we do depot level maintenance, we are looking at where we are having cracks and what needs to be replaced,” Gilk said. “We are listening to our guys in the field, and they see it firsthand. ... We are trying to determine what our next point of failure or cracks that we need to deal with are.”

At both the forward operating bases and permanent stations, we should “take a look at what these guys are doing,” Gilk concluded. “You cannot survive in this mission if you’re not working as a team.” ■



Hog He

Paul Johnson led the rescue team to a downed F-14 pilot just as Iraqi forces were moving in.

The memoirs of many pilots begin with the moving moment when they first saw an airplane and determined they would become a pilot. Not so for Paul T. Johnson, who grew up in the rural South with his sights set not on enemy aircraft—but on becoming a successful farmer.

In 1980, Johnson earned an agriculture degree from Murray State University in Kentucky, launching a farming career focused primarily on row crops and cattle.

The farming vocation proved to be relatively short-lived, but Johnson wouldn't join the Air Force for five years after graduating from college.

Six years after that, Captain Johnson was in Saudi Arabia, flying from King Fahd Royal Airport to King Khalid Military City Airport to sit on alert and wait for a search and rescue mission. Johnson would soon earn an Air Force Cross for his role in a Desert Storm rescue operation. It was an A-10 mission of unprecedented length and

depth into Iraqi territory, and it ended with the successful rescue of an F-14 Tomcat pilot who had been shot down deep behind enemy lines.

That day, Jan. 21, 1991, started out in typical fashion. After being kept on a weather hold, Johnson launched on the flight from Fahd to Khalid as Sandy 57, with Capt. Randy Goff as his wingman in Sandy 58.

Deep Into Iraq

An hour into the flight, and just 10 minutes before they were to land at KKMC, they were given a combat search and rescue task. An F-14, call sign Slate 46, was down.

Johnson received a very tentative set of coordinates, call signs for a KC-10 tanker and the MH-53 Pave Low rescue helicopter, and headed west. He took on fuel from the tanker, and checked in with the E-3 AWACS, which promptly vectored him to investigate a suspected Scud missile site.

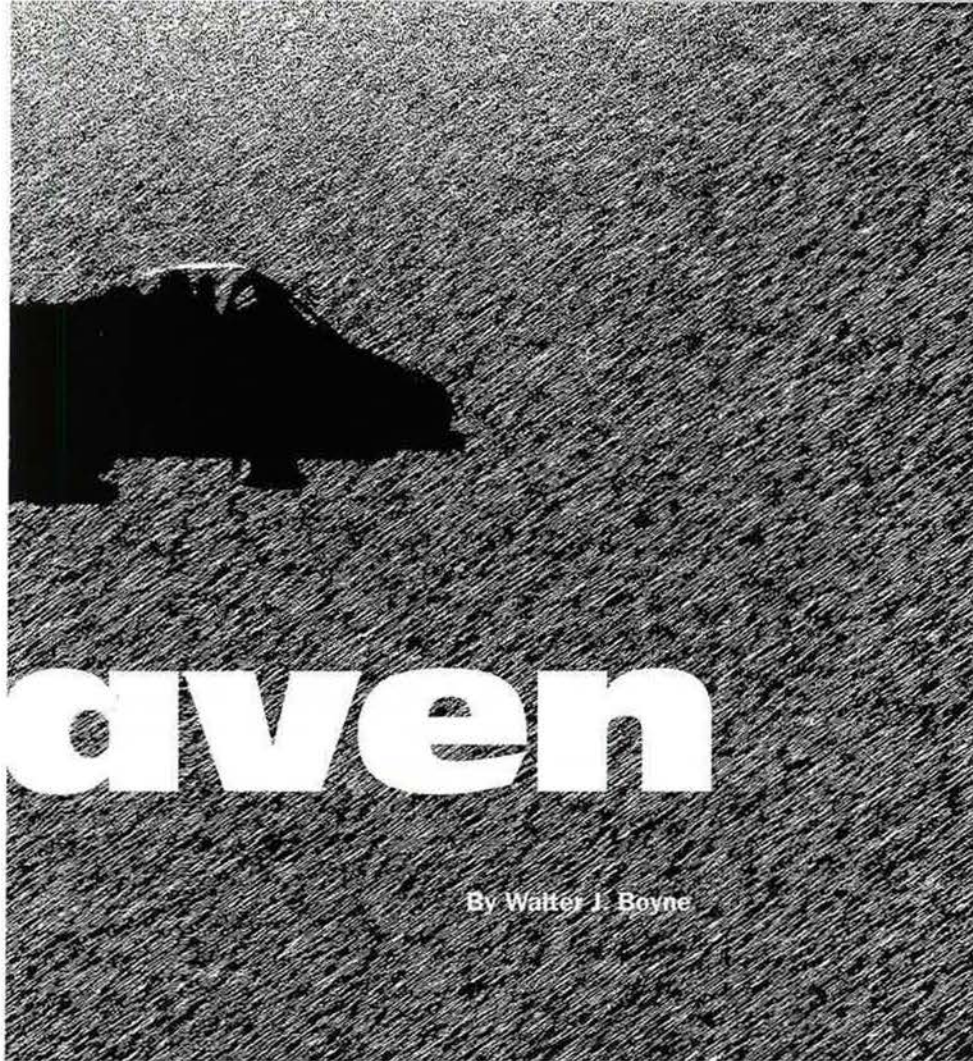
At this time of the war, the threat of Scuds was extreme. There was widespread concern that Saddam Hussein

would goad Israel into attacking Iraq through Scud attacks. Such an Israeli attack could have splintered the coalition, which included numerous Arab nations, attempting to free Kuwait.

Johnson found the suspected site and confirmed it did not harbor Scuds. He refueled again, contacted the AWACS, and was redispached to the original set of coordinates.

Much of the equipment in use during Desert Storm would have been familiar to the earlier generation of pilots who had flown in Vietnam.

Johnson had to track down the downed pilot using coordinates given to him (and later determined to be incorrect) by the Automatic Direction Finder. The ADF was, to say the least, imprecise. Johnson flew east and picked up a radio signal from the pilot, but the ADF needle refused to turn. He flew back west, and then swung to the north, where the voice signal grew louder. Johnson was soon farther into Iraq than any A-10 had ever been, west of al Asad Air Base—some 60 miles north of the coordinates he had first been given.



caven

By Walter J. Boyne

Eventually the ADF needle swung around. The downed Navy pilot, Lt. Devon Jones, and his radar intercept officer, Lt. Lawrence R. Slade, had ejected after their F-14 was hit by a surface-to-air missile. Jones had been transmitting to rescue coordinators, but there was no contact with Slade.

Flying below the clouds at about 300 feet, Johnson flew directly over Jones, but couldn't see him, as he was well-camouflaged in a hole he dug with his survival knife in the barren terrain. Johnson memorized the terrain scene and dropped a mark point into his inertial guidance system—which itself had drifted considerably in the five hours of flight.

By this time, there were two Pave Low helicopters, an AWACS, a KC-10, and a flight of F-15 Eagles all on the CSAR channel. Suddenly the mission had become a vintage Vietnam-style CSAR effort, with everyone talking nearly nonstop. The voice traffic soon reached a point where Johnson had

A surface-to-air missile took down the F-14 Tomcat (like the one shown below during Operation Desert Storm) with Navy pilot Lt. Devon Jones and Lt. Lawrence Slade, a radar intercept officer, on board. They ejected into hostile territory, deep inside Iraq.



USAF photo



In this photo taken from the door of an MH-53 Pave Low, Navy Lt. Devon Jones runs toward pararescueman Sgt. Ben Pennington during the rescue effort.

to assert himself, demanding that all voice communication cease except for the survivor, the A-10s, and the Pave Lows.

The Pave Lows were using their ADF gear as well, but were too low to pick up the signal. This left Johnson with a knotty problem: He could provide the coordinates he was reading out from his inertial system—but because of the characteristic drift of the system, he knew that they were not the correct coordinates. The Pave Lows would then attempt to home in on a bogus location.

Johnson was also beyond “bingo fuel”—lacking the amount needed to safely return home—and had to personally violate the first rule of CSAR by

leaving the survivor behind. Johnson told Slate 46 to stay put, turned south toward the KC-10 tanker (which had itself flown 25 miles into hostile Iraqi territory at 15,000 feet), and topped up his fuel.

Johnson immediately returned to the search area, rendezvousing with Capt. Thomas J. Trask and copilot Maj. Michael Homan in Moccasin 05, a Pave Low. He led him back to the area where Jones was still hiding out and again got the ADF needle to swing, pointing out where the aviator was.

The Americans were not the only people using ADF to pick up Jones’ signal. Across the desert, kicking up a cloud of dust, came an Iraqi truck.

Johnson asked Jones if he saw the vehicle.

“The truck is headed straight for me,” Jones replied.

Slopping Hogs to Flying Hogs

How did Johnson go from farmer to A-10 pilot? Much of the credit goes to his neighbor, Elliot Lambert, who was an Air National Guard lieutenant colonel.

Lambert, who had once flown Boeing KC-97s and Douglas C-124s, believed the Air Force would be a good career choice for young Paul Johnson, and steered him toward it.

Johnson liked agriculture, but was nonetheless attracted to two possible new careers. One option was acting on Lambert’s advice and joining the Air Force. The other was following in his father’s footsteps and becoming a youth minister.

In 1985, Johnson entered the Air Force.

He first went to Hondo, Tex., to participate in the flight screening program, where he flew the T-41 Mescalero (a military variant of the Cessna C-172). This was enough to convince Johnson he wanted to become a pilot.

Next he was sent to Officer Training School at Lackland AFB, Tex. Johnson was four weeks into the program when his father died. Attending to the funeral

Johnson and Goff used their 30 mm cannons to destroy the Iraqi military truck that was moving in on Jones. A-10s, such as this one, had never been so far into Iraq.



and to family affairs interrupted his program, and he was washed back a class.

While he disclaims being a natural pilot, Johnson proved to be a very good one.

Now a brigadier general and commander of the 451st Air Expeditionary Wing at Kandahar, Afghanistan, Johnson entered pilot training at the age of 27. He was within four months of being too old to be eligible for flight training.

After earning his pilot's wings, Johnson was sent to Davis-Monthan AFB, Ariz., to fly the A-10 Warthog. In his own words, he had made a transition from "slopping hogs to flying hogs."

The assignment came at a time when the Air Force was considering retiring the A-10, but Johnson made the most of it. On being transferred to his first operational unit, the 353rd Tactical Fighter Squadron at Myrtle Beach AFB, S.C., he assumed a number of duties that would help prepare him for combat. He became an instructor pilot and eventually served as both squadron safety officer and squadron weapons officer.

Then, in August 1990, Iraq invaded Kuwait.

The 353rd was tasked to go to Saudi Arabia, and all of the aircraft were prepared and standing by. The deployment was delayed, however, because planners were unable to establish an adequate "tanker bridge" for the trip to the sandbox.

When at last the whistle blew, squadron commander Lt. Col. Richard D. Schatzel gave the news that the 353rd was going to beddown at the King Fahd airport in Saudi Arabia.

After the briefing, Schatzel asked Johnson to follow him down the hallway to his office. There, Schatzel closed the door, and told Johnson he would not be accompanying the squadron to Saudi Arabia. Instead, Johnson was being assigned as a student at USAF's Fighter Weapons School at Nellis AFB, Nev.

The assignment had been on the books for some time, but Johnson desperately wanted to go into combat first. Schatzel told him not to worry—there would undoubtedly be delays overseas before combat started, and in this he proved to be correct.

Johnson now recalls fuming during the four-day drive from South Carolina to Nevada, frustrated at seemingly being denied the chance to go to war for the United States.

He walked into an extremely difficult environment at the weapons school. The sentiment for retiring the A-10



Airmen examine Johnson's A-10, mangled on a later mission over Iraq. He managed to refuel in flight and wrestle his Hog back to base in Saudi Arabia.

had gained strength, and the school's instructors were frozen in their jobs, with no replacements assigned. They were anticipating the disbanding of the program.

Reflecting back, Johnson cannot call his time at the weapons school fun, but it was extremely challenging. Each day ended with a profoundly candid assessment of the students' skills in a manner jokingly described as having three primary attributes: fear, sarcasm, and ridicule. Johnson says these critiques of his and the other A-10 pilots' skills were necessarily blunt, and actually reflected the seriousness and professionalism of the instructors.

Johnson saw his experience at Nellis as a matter of attitude. Graduates had to be both skilled and approachable, on the ground and in the air, so that younger pilots would later come to their weapons officers with confidence when problems needed solving.

Far North, But Not Too Far

On the night he received his weapons school diploma, Johnson also received an envelope from Col. Henry Hayden, 354th Tactical Fighter Wing director of operations. Inside was a letter saying, "Congratulations, we know you've done well, now get over here posthaste."

Two weeks later, Johnson was with the 353rd TFS in Saudi Arabia. There he found little turnover, and as Schatzel had predicted, the unit had not yet seen combat.

Johnson felt a little diffident when he was immediately assigned the job

of squadron weapons officer, replacing Capt. Stephen R. Phillis.

Phillis later became the 353rd's only casualty, shot down Feb. 15, while flying a search and rescue combat air patrol attempting to retrieve another downed pilot.

The early days in Saudi Arabia were filled with tedium, not excitement. The 353rd's A-10s were tasked to prepare for combat search and rescue missions in two locations. One was at King Fahd, while the other was KKMC.

Most in the 353rd, including Johnson, would have preferred being assigned to combat sorties. This was especially the case during the first four days of Desert Storm, when all the American aircraft that were shot down were in areas far too dangerous for a rescue attempt or where the downed airmen were immediately captured.

On the day of his rescue, the Tomcat pilot Jones might have also been considered too far north, but now the A-10s were there, watching as the Iraqi military truck bore down on him.

Johnson still had not spotted the well-camouflaged survivor, but got him to describe the truck's relative position so that the Warthogs could take it out. Johnson and Goff then attacked the truck, turning low above the ground. The A-10s missed on the first pass, but turned sharply and came back.

"I rolled in and finished it on my second pass," Johnson told William L. Smallwood for the book *Warthog*, shortly after the war. "That truck was down there burning, orange flames



USAF Brig. Gen. Paul Johnson greets Afghanistan Air Force Brig. Gen. Mohammed Yousef at Kandahar Airfield, Afghanistan, in September 2010. Johnson is now commander of the 451st Air Expeditionary Wing at Kandahar.

and black smoke pouring out of it, and the [rescue helicopter] comes in and lands. Then, just 100 yards away from the burning truck, this guy jumps up out of his hole and runs to the helo."

The job not yet done, Johnson refueled for the fourth time that day and flew escort on the Pave Low until he was released to return to King Fahd. On the day of the pilot's rescue, Johnson logged eight hours and 45 minutes of combat flight time. Trask and his MH-53 crew later received the Mackay Trophy for their role in the rescue.

Jones, who had been flying with VF-103, the "Jolly Rogers," went quickly back to his ship, USS *Saratoga*.

His radar officer, Slade, on the other hand, was captured about four hours after he had ejected and appeared on Iraqi television with two other coalition prisoners on Jan. 25. Slade was finally

released as part of a group with five other POWs on March 3.

Johnson earned the Air Force Cross for his role coordinating Jones' rescue, but his excitement in Iraq was not over. Only a few days later, on another combat sortie, Johnson was hit by enemy fire while trying to attack a SAM site in poor weather. His A-10 was hit on egress, after he had concluded—five minutes too late by his estimation—that he would not be able to take out his target.

"I looked out the cockpit to the right and got a cold chill," he told Smallwood after the war. "I could see hydraulic lines sticking up out of the

The A-10 flown by Johnson on the rescue mission is on static display at the National Museum of the US Air Force, Wright-Patterson AFB, Ohio.

right wing, a little bit of flame over the top of the wing, and a big gaping hole in the leading edge with some of the top wing skin gone. ... It was an ugly sight." The right landing gear's housing was shot away, and the right engine had ingested some of the debris, spit it back out, and kept running.

The explosion had destroyed one of his two hydraulic systems, and Johnson was still loaded up with live ordnance. He managed to bring the damaged Hog 12 miles back to Saudi Arabian airspace, and then refueled the battered A-10 in flight. With a fresh load of fuel, he pressed on to KKMC, still 50 miles distant.

Johnson's next worry was whether or not the wing would stay attached when he lowered the landing gear. He had no way of knowing how extensive the damage was, and was concerned that the additional drag of the extended gear would overstress the wing.

Fortunately, the gear went down without incident. Johnson flew a no-flap approach and made a smooth landing, even though a tire, almost certainly damaged by the flak, shredded upon touchdown.

After these two highly eventful sorties, the rest of the Gulf War for Johnson was not quite as dramatic. His Hog was repaired in theater, and he flew it home under its own power after the war. ■

Walter J. Boyne, former director of the National Air and Space Museum in Washington, is a retired Air Force colonel and author. He has written more than 600 articles about aviation topics and 40 books, the most recent of which is Hypersonic Thunder. His most recent article for Air Force Magazine, "The Remote Control Bombers," appeared in the November issue.

From Berlin to Bagram

"Born in an era of incredible innovation and change following World War II, the United States Air Force has lived up to its promise, changing how our armed forces have both protected the peace and secured victory. From the Berlin Airlift during some of the toughest days of the Cold War to Operation Everest outside Bagram, Afghanistan, this year, from embracing new technologies to supporting counterinsurgency efforts in two wars, the men and women of the United States Air Force represent one of the fastest and most flexible ways we execute our national will."—**Adm. Michael G. Mullen, Chairman of the Joint Chiefs of Staff, Sept. 18.**

Hands Across the Ocean

"During my recent travels to North Korea and China, I received clear, strong signals that Pyongyang wants to restart negotiations on a comprehensive peace treaty with the United States and South Korea and on the denuclearization of the Korean Peninsula."—**Former US President Jimmy Carter, New York Times, Sept. 16.**

Second Opinion

"As long as US nuclear aircraft carriers sail around the seas of our country, our nuclear deterrent can never be abandoned, but should be strengthened further. The United States is not a defender, but a disruptor, of peace."—**Pak Kil Yon, North Korean vice foreign minister, Los Angeles Times, Sept. 30.**

Not

"I'm not doing 10 years. I'm not doing long-term nation-building. I am not spending a trillion dollars."—**President Obama on strategy for Afghanistan, Bob Woodward, Obama's Wars, released Sept. 27.**

Airpower Independence

"Airpower, an independent air force, is essential in today's world just as it was in 1940. Every element of warfare needs expertise. Air warfare is no different. I suggest others in other environments would nowhere near be as capable because they do not have the experience, nor have they got the talents, to do it."—**Royal Air Force**

Air Chief Marshal Stephen Dalton on 70th anniversary of the Battle of Britain, London Telegraph, Sept. 15.

Studying the Bomber Studies

"Eighteen years later, we're still studying it. The study has gone on so long that we're studying our study. It's time to quit studying and put pencil to paper. We need to start executing instead of thinking about executing."—**Rep. Jim Marshall (D-Ga.), on next generation bomber under study since 1992, Warner Robins Patriot, Sept. 27.**

Dissuasion and Deterrence

"Dissuasion and deterrence are the dual abilities to discourage potential adversaries from acting contrary to our national objectives or interests. Dissuasion provides the credibility that adversary activities can always be countered by our national power. Deterrence is the credible threat and/or use of force in response to adversary actions."—**USAF 2010 Combat Air Force Strategic Plan, Sept. 15.**

Joint Basing Failure

"The bottom line is there are some significant issues with joint bases, and over time, you will see no more, that's for sure. The question is whether we will see less."—**Gen. Norton A. Schwartz, Air Force Chief of Staff, on consolidation of military bases, Air Force Times, Sept. 20.**

Ancient History

"Nine years after the terrorist attacks of Sept. 11, 2001, one percent of Americans mention terrorism as the most important problem facing the country, down from 46 percent just after the attack."—**Gallup poll report, Sept. 10.**

Source of the Force

"Propensity to serve is most pronounced in the South and the Mountain West, and in rural areas and small towns nationwide. ... This trend also affects the recruiting and educating of new officers. The state of Alabama, with a population of less than five million, has 10 Army ROTC host programs. The Los Angeles metro area, population over 12 million, has four host ROTC programs. And the

Chicago metro area, population nine million, has three. It makes sense to focus on places where space is ample and inexpensive, where candidates are most inclined to sign up and pursue a career in uniform. But there is a risk over time of developing a cadre of military leaders that politically, culturally, and geographically have less and less in common with the people they have sworn to defend."—**Secretary of Defense Robert M. Gates, Duke University, Sept. 29.**

Assassin's Mace

"China's military buildup centers on a set of capabilities, called 'Assassin's Mace' by the Chinese, which is designed to exploit surprise. ... East Asian waters are gradually becoming a 'no-man's land' for American warships and forward based aircraft, while US satellites are becoming sitting ducks and the Pentagon's digital backbone is increasingly endangered."—**Andrew F. Krepinevich, president of Center for Strategic and Budgetary Assessments, Wall Street Journal, Sept. 11.**

Cyber Defense in Depth

"The first critical component required to develop the capability to operate through an attack is to evolve from a perimeter-defense strategy to a defense-in-depth strategy. Our approach to cybersecurity in the past had been to build walls around the network higher and thicker. This puts all of our protection at our borders and protects everything inside to the same standard. ... We are pursuing a defense-in-depth strategy that segregates internal assets based on their prioritization. ... Attackers must therefore overcome increasingly greater protections to gain unauthorized access to higher-value resources."—**Maj. Gen. Richard E. Webber, commander, 24th Air Force, House Armed Services subcommittee on terrorism and unconventional threats, Sept. 23.**

Al Qaeda Resurgence

"We have to recognize that we are dealing with the third generation of al Qaeda that is more advanced, so we have to deal with this. There are definite signs of regeneration."—**Iraqi Defense Minister Qader Obeidi, Los Angeles Times, Sept. 13.**

New generations of enemy missiles, and a willingness to use them, could put air bases under siege like never before.



Countering the Missile Threat

By Rebecca Grant

USAF photo by SrA Amanda Grabiec

Operating from air bases under threat of missile attack may become one of the most important keys to projecting US airpower in the years ahead. For all its expeditionary experience, it has been decades since the Air Force has so intently focused on this problem.

Now, top leadership is again taking it seriously.

“The attack against the naval base at Pearl Harbor was recorded in history as a day which will live in infamy,” said Air Force Chief of Staff Gen. Norton A. Schwartz in a September address to AFA’s 2010 Air & Space Conference. “What is lesser known is that enemy aircraft first targeted our fighters on the ground, preventing them from gaining

Photo by Jim Haselbine



Top: F-22s outside hardened shelters at Kadena AB, Japan. **Above:** SrA Casey Bennett guards a Patriot missile battery at Osan AB, South Korea.



Photo via sinoelint.com



AP photo by Feroz Mohseni

China's Dong Feng missile, shown here on a transporter-erector-launcher vehicle, plays a part in China's base-attack military strategy.

An Iranian short-range Zelzal missile is launched during a drill in 2009 near the city of Qom, south of Tehran.

control of the air and challenging the offensive.”

Both joint and Air Force doctrine instruct commanders to take care of base defense. However, ensuring the tempo of air base operations across a region, with missile attacks in progress, has not been treated as a major variable in air campaigns for some time. Schwartz's warning suggests this is about to change as nations such as China and Iran sharpen their ability to disrupt operations.

Of course, USAF has been here before. Air bases and aircraft on the ground were major targets during the Cold War.

Doctrinal debate on base survivability was common in the 1980s. When the Soviet Union exited the stage, these types of all-out threats to air bases collapsed. Politics sometimes complicated base access. Operating from overseas bases has become routine. USAF commanders rarely deal with the serious threat of disruptions to operations at even a single base.

Soon, the dynamic could change. Two trends are sharpening the emphasis on keeping air bases in the game. First is the rise of China's power projection capabilities, which cast Pacific theater operations into a harsh light.

“The main Air Force and Navy bases on US territory in the Western Pacific are located on the island of Guam, the major logistics node for all US military operations in the Western Pacific,” wrote Jan Van Tol, a retired



A KC-135 undergoes maintenance as an F-22 Raptor takes off from Andersen AFB, Guam. Andersen is key to US power projection in the Pacific.

naval officer, in his study of AirSea Battle for the Center for Strategic and Budgetary Assessments. “This creates enormous logistical vulnerabilities that could offer [China] the opportunity (and perhaps even the incentive) to cripple US power-projection capability by attacking and incapacitating a handful of soft facilities,” he added.

Second is Iran’s quest for advanced missile technology. Iran already has ballistic missile forces in quantities sufficient to complicate matters. Maintaining air and sea operations around the Persian Gulf could get much harder if bases fall under threat of missile attack.

The strategic question for 2010 and beyond is when and how the threat may jump up from the occasionally deadly attacks in Afghanistan or Iraq to full debilitation of air base capacity.

The Air Force has closely watched missile threat implications. At Wright-Patterson AFB, Ohio, the National Air and Space Intelligence Center monitors test and development activities around the world. NASIC analyses track the rising asymmetric threats.

“Ballistic missiles have been used in several conflicts over the last 25 years, including the Iran-Iraq war, the Afghan civil war, the war in Yemen, the 1991 and 2003 Persian Gulf conflicts, and the Russian military action in Chechnya and Georgia,” a 2009 NASIC report found.

Most of these conflicts featured short-range ballistic missiles with ranges of some 600 miles. Dozens of nations possess them. Tallies of missile inventories are widely available. Less common are discussions of how the multilayered threat could alter the pace of an air campaign during joint operations. Since Operation Desert Storm, USAF has counted on mounting a steady campaign where obstacles such as weather in the Balkans or sandstorms in Iraq slow the pace only briefly.

Narrow Margins

Opponents with roving missile launchers threaten this assumption.

The Air Force has quietly studied the implications of regional missile attack for more than a decade. Enemy arsenals once seemed no match for hundreds of USAF fighters deployed to a theater.

A seminal 1999 RAND report titled “Air Base Vulnerability to Conventional Cruise Missile and Ballistic

Missile Attacks” explored whether missile attacks could degrade future airpower. While the authors recognized a growing threat, their meticulous operational analysis concluded enemy missile arsenals did not yet have reach or numbers to shut down an air campaign.

“By devoting the lion’s share of its resources to a single contingency, the USAF can easily repeat an air campaign of the size and intensity of Desert Storm from bases outside the range of the missile threat we have proposed,” the report noted.

Accuracy remains the key, though. An adversary attacking an air base with inaccurate missiles would have to shower the runway, ramp, and dispersed hardstands to catch and destroy aircraft on the ground. But with accurate targeting, one missile per aircraft hardstand could be enough to take out the aircraft.

A more effective attack strategy may now be within the capabilities of China or Iran, for example. Against this, USAF has fewer fighters: Inventory requirements dropped as precision weapons enabled attack of multiple targets. However, war plans through the past two decades assumed open access to regional bases. Little thought was given to potentially significant at-

trition from ground sabotage or missile attack. Nor did plans go into how many fighters it might take to sustain major air campaign operations from distant bases beyond missile threats.

The narrower margins of combat airpower mean air base vulnerability has now emerged as a major operational variable in joint air campaign effectiveness.

What would prompt an enemy to attack air bases? For China, it's a matter of sound military strategy. In a 2007 report, RAND analyst Roger Cliff quoted this passage from Chinese military doctrine: "If an attack is aimed at disrupting the enemy air strike plans, one should target the enemy's command and control systems and fuel and ammunition supply systems; if it is aimed at degrading an enemy aviation corps group to reduce the pressures from its air strikes, one should target the aircraft parked on the tarmacs of airports housing the enemy's main bomber and fighter-bomber aviation corps."

How would the attack unfold? Observers of Chinese military doctrine focus on pre-emption. Another highly disruptive option would be to dribble out attacks much as Saddam Hussein did with Scud missile firings against Israel and Saudi Arabia in 1991. Either option would require renewed focus on how to keep the string of air bases up and running.

There are strategic implications, too. The goal of an adversary would be to blunt and disrupt an air campaign before it kicks up. A critical ingredient in conventional deterrence will be to keep aircraft operating from regional bases at an efficient tempo. Fighters take the lead, but tankers, intelligence-surveillance-reconnaissance aircraft, intratheater lift, and strategic airlifters must all sustain operations, as well.

Aerial refueling aircraft have been specifically identified by Chinese military strategists as targets for attack, according to the 2007 report by Cliff.

Ensuring an air campaign runs as planned under these conditions will be a prime task for future operations. It will take a combination of missile defenses, hardened facilities, and quick recovery capacity to offset a determined attack.

As an earlier generation of airmen found, the problem can't be treated as just a case study in base defense. It's a legacy concept from the intensive 1980s debates on base resilience.

Airpower was a primary NATO advantage pitted against superior num-

A Wide Range of Threat Missiles

Exported Russian Scuds are still the dominant missile threat on the world market, but the Scud is far from a monopoly. A look at other systems that could threaten US air bases begins with China's CSS-6 series, with ranges from 370 to 550 miles. "China has the most active and diverse ballistic missile development program in the world," concluded a study by the Air Force's National Air and Space Intelligence Center (NASIC).

Short-range missiles fired from Iran's coastline in the Persian Gulf region have more than enough range to threaten bases in several neighboring states. All major types of short-range missiles are road-mobile, and some, such as India's Dhanush missile, are even configured for ships.

With missiles, the operational threat is defined partly by range and warhead, but also by number of launchers. Launchers can be reused for multiple missiles.

Medium- and intermediate-range missiles cover distances from 600 to 3,400 miles. Iran's mobile Shahab 3 missile with a range of about 800 miles is a typical example.

"The current generation of Chinese missiles already can strike many of our fixed bases and those of our allies and friends in these regions," such as those on Taiwan, Okinawa, and Guam, noted missile proliferation expert Henry Sokolski in the August 2010 *Armed Forces Journal*.

China and Russia possess intercontinental missiles. North Korea could join the club if and when it deploys the Taepo Dong 2 missile.

Attack drones are another looming possibility, as international air shows are full of vendors hawking an array of unmanned vehicles, and there are also cruise missiles to consider. Their unpredictable, low-altitude flight paths make them especially tough targets to track and intercept.

"Land-attack cruise missiles (LACM) are highly effective weapon systems that can present a major threat to military operations," found NASIC. "At least nine foreign countries will be involved in LACM production during the next decade, and many missiles will be available for export."

NASIC estimates up to 20 countries could possess cruise missiles by 2020.

bers of Soviet forces. As with Chinese military writings today, Soviet doctrine emphasized swift crippling of front-line air bases. Before the Berlin Wall fell in 1989, the Air Force had a thriving cottage industry of doctrinal discussions of air base defense and operations under attack.

Although the location and the weapons are different from prior conflicts, the basic requirements of operating under attack still apply as USAF gears up to deter regional threats.

Base Resiliency

"The ability of an air base to survive an enemy attack and quickly reconstruct minimum essential operating areas so it can resume offensive air operations has long been a concern," wrote Lt. Col. Joe Boyles and Capt. Greg K. Mittelman in *Airpower Journal* in 1989. "Because the problem is difficult to solve, [the Air Force] solution was to have faith in the joint air defense network and assume that forward air bases were invulnerable."

Getting past this assumption was a shock. One of the biggest transitions during the late 1980s was the move from thinking about absorbing Soviet attacks to discussing the factors essential to continuing operations. Air base oper-

ability (ABO) became the key phrase, because it best captured the need to generate sorties under attack.

The next step is calculating what it takes to keep a group of bases in business during missile attack. As in the past, postattack recovery comes first. This includes assessing and clearing any impediments to movement around the base, such as unexploded ordnance, terrorists still on or around the base, or chemical attack residues. Next steps center on repairing damage and regenerating operations.

The resilience of air bases then forms a variable in how much of the day's tasking can be flown as planned. Back at the air operations center, the question becomes whether enough bases are operational to support the next tasking cycle—the resilience of the center itself becoming a factor, too.

When bases are at risk, operability can depend on lessening the impact of initial attack on the force as a whole. USAF is no stranger to hardening bases, for example. Hardened aircraft shelters were essential in the Cold War and expeditionary operations. Shelters were built by the US in Oman during the Iran-Iraq war in the 1980s for the use of Oman's Air Force, for example.

Ultimately, shelters may lessen the impact of a sudden strike, but they do little to protect transient aircraft or prevent strikes while the airplanes are preparing to launch.

Dispersal is another concept back in vogue. The benefit is to increase the number of targets and diminish the value of knocking out any particular forward operating location. Dispersal strategies must take into account fighters, larger aircraft, command and control, and critical maintenance and support functions to maintain operations.

Timing is important as well. RAND analysts long ago torpedoed the notion of starting up close then falling back. "Adopting a go-in-close-and-fall-back-if-necessary strategy could result in the loss of a sizable fraction of USAF combat aircraft and personnel. Additionally, it may be difficult or impossible to move units out of close-in bases, because the continuing threat of attack would pose a grave threat to airlift operations, and most operating surfaces would be strewn with wreckage, posing a serious [foreign object damage] hazard to surviving combat aircraft," the 1999 RAND study noted.

Air base operability involves a constant trade-off between pulling aircraft and support assets beyond the threat rings versus keeping them ideally positioned for maximum impact. Distance directly affects sortie rates.

Shortly before the beginning of Operation Desert Storm, commanders moved F-15E units closer to Kuwait, for example, with the express intent of generating more sorties. Retreat to "safe" bases could diminish the number of sorties over the target at any given time.

One of the tasks to suffer most as distances increase would be combat air patrol and 24/7 operations, such as finding and attacking mobile missile launchers. Attack operations—hunting and killing launchers—are essential to effective, layered missile defense. But attack operations soak up constant coverage from fighters ready to attack launchers in a fleeting window. Combat air patrols in turn depend on functioning bases near enough to provide critical mass necessary for effective suppression.

A layered anti-missile strategy would encompass Patriot batteries and fighters with air-launched hit-to-kill weapons that could also shoot down missiles in the ascent phase.

Growing missile threats have spawned huge advances in theaterwide missile monitoring and intercept capabilities.

Similarly, air base operability looks poised to become a theater-level priority.

Opponents that would use missiles to disrupt air base operations still have daunting challenges to contend with. The Air Force's expeditionary character gives it many options for ensuring operability from a number of bases.

First, USAF has long experience with quickly setting up bases. The Air Force rapidly expanded base capability in the midst of an escalating air campaign during Operation Allied Force in the spring of 1999. Aircraft launched at bases from Missouri to Turkey, as Gen. John P. Jumper, who was commander of US Air Forces in Europe, said at the time. Operations expanded from nine bases in five countries to 22 bases in 11 countries in the theater.

The Reflex Reaction

Air base operations under attack have been a constant preoccupation on the Korean Peninsula. Short distances and the North Korean missile arsenal have made base attack a given in planning scenarios.

"Estimates suggest that Pyongyang already has at least 500 [Scuds] in its inventory and that some or all of them can carry chemical warheads," noted Bruce E. Bechtol in a 2005 *Air and Space Power Journal* article. The North could use these missiles concurrently with the long-range artillery already deployed along the DMZ, "with little or no warning," Bechtol added.

Air base operability under missile, air, or ground attack threat will be just as important at new bases and in other regions. Going forward, expeditionary forces can't risk neglecting defenses and basing strategy as new bases open up.

Eastern Europe and the Baltic republics are a good example. Russia conducted missile and air attacks on bases and military targets during the 2008 conflict with Georgia. A similar dispute with the Baltic republics—where NATO maintains rotational detachments of fighters for air sovereignty—might again find bases lucrative and visible targets of attack.

"Given the small size of the Baltic states and the vulnerability of their bases to Russian attack, it might be advisable to use those sites as forward operating

locations, with main operating bases in more secure areas farther to the rear," wrote retired Lt. Col. Thomas McCabe in *Air and Space Power Journal* last year.

Bases in the US aren't immune to evolving threats, either. According to NASIC, a credible conventional missile threat to CONUS will materialize within this decade. "With sufficient foreign assistance, Iran could develop and test an ICBM capable of reaching the United States by 2015," noted the report.

Solving the equation for air base operability poses a major strategic challenge for the Air Force. It drives at the whole purpose of forward deployed airpower to set the US advantage in regional conflicts. Failure to articulate a regional strategy for air base operability will lead to lower confidence in airpower as a member of the joint team.

Already, doubts are growing about the ability to project airpower in regions where bases are threatened by missile attack. The reflex reaction is to shift emphasis to aircraft carriers, submarine-launched missiles, long-range bombers, and perhaps, conventional intercontinental ballistic missiles.

Each of these alternate arsenals has drawbacks compared to the lethality and flexibility of advanced fighters. The primary one is limited ability to sustain operations, due to relatively small arsenals, few platforms, and the realities of extended distances. A larger, survivable bomber force could weigh in heavily—but such a force is years, maybe decades, away.

Conventional deterrence cannot just subtract land-based airpower from the equation. This means renewed attention to the keys of air base operability.

The late Cold War dialogue contained a final warning about the organizational obstacles to stepping up to air base operability.

"ABO faces many challenges," summed up Boyles and Mittelman. "It is not enough to leave the challenges of ABO in the hands of overseas base-level commanders; each obstacle must be addressed by corporate Air Force leadership bent on strengthening the logistics base to permit projection of airpower." ■

Rebecca Grant is president of IRIS Independent Research. She has written extensively on airpower and serves as director, Mitchell Institute, for AFA. Her most recent articles for Air Force Magazine are "Airpower Over Waier" and "One-Man Air Force" in the November issue.



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Buildup and Battle

Afghanistan's Bagram Airfield has grown to accommodate a greater Air Force mission.

Photography by Clive Bennett
Text by June Lee





A C-17 Globemaster III rolls to a stop on a Bagram runway after a resupply mission. Bagram Airfield, Afghanistan, has been a hotspot for NATO and US operations in Southwest Asia and there are no signs of the pace letting up.

In Afghanistan, Bagram Airfield hosts several thousand airmen and other troops, deployed from all over the world. The 455th Air Expeditionary Wing at Bagram provides air support to coalition and NATO International Security Assistance Forces on the ground. **1** The air traffic control tower is one of the busiest places on Bagram Airfield, with more than 100 movements taking place in a day. Civilian air traffic controllers keep an eye on the runway and the skies above Afghanistan. **2** An F-15E from the 48th Fighter Wing at RAF Lakenheath, UK, taxis past revetments for the start of another mission. All F-15s over Afghanistan fly two-ship sorties. **3** A CH-47 Chinook from the Georgia Army National Guard undergoes line maintenance by Army Spc. Cody Staley and Spc. Joe Dominguez (in the helicopter).





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11| A1C Aaron Simonson gives F-16 pilot Capt. Nathan Harrold the approval to head off on a mission. Both air and ground crews share a mutual respect that acknowledges their joint duty of getting the job done. 12| Sikorsky personnel service a UH-60 Black Hawk helicopter at Bagram. Army Black Hawks and USAF Pave Hawks regularly evacuate the wounded out of dangerous areas.

13| M-ATVs in a C-17 at Bagram wait to be unloaded. These mine-resistant ambush-protected all-terrain vehicles support Afghanistan operations by protecting ground troops from improvised explosive devices and rocket-propelled grenades. 14| Concrete revetment walls are decorated by the various squadrons that deploy to Afghanistan. Displayed here are the combat records of two F-16 squadrons: the 34th

EFS, Hill AFB, Utah, and the 79th EFS, Shaw AFB, S.C. 15| Ground crew members from the 455th AEW refuel a C-17. The time it takes to refuel can be as little as 40 minutes from "brakes on to brakes release."

11| Six GBU-38 Joint Direct Attack Munitions (foreground) sit on a trolley ready to be loaded onto aircraft. These specific JDAMS will be loaded onto F-16s for future operations.

12| Three Navy Prowlers are being prepared for a morning sortie. The EA-6Bs belong to the Marine Corps VMAQ-1 electronic warfare squadron.

13| These signs, found all around the base, are a sobering reminder of the danger coalition forces face each day. 14| Capt. Neil Gregory, with the 4th Expeditionary Reconnaissance Squadron, steps off an MC-12 after completing an intelligence-surveillance-reconnaissance mission tracking Taliban movements. The Liberty Project Aircraft have been a valuable asset, providing real-time ISR, since they first arrived at Bagram.





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1|1 An F-15E Strike Eagle roars off the runway for the start of a mission over Afghanistan. This aircraft was deployed from Lakenheath, with the 492nd Fighter Squadron. *1|2* C-130s are a mainstay at Bagram. The number of airlift missions will not dwindle any time soon. *1|3* Capt. Matthew Strohmeier and Capt. Miguel Santibanez, pilot and weapons system officer, respectively, complete last-minute checks of their aircraft before loading up on munitions. They are both deployed from Lakenheath. *1|4* The fire truck Engine 17 races past fighter aircraft while checking emergency response times on the base.

11 Air traffic controller Tizrah Berlin uses a signal light gun, a handheld device that shoots red, green, and white light beams to communicate with aircraft. The light beams can travel up to four miles. **12** SSgt. Daniel Templeton of the 455th Aircraft Maintenance Squadron wipes down the windscreen of an F-15E. Thorough cleaning is important to remove sand and bugs that build up over time. **13** Air transportation is crucial to a country like Afghanistan where its rugged terrain makes it difficult to deliver aid quickly by ground. **14** Capt. Thomas Stevens and 1st Lt. Kevin Kubik prepare to land a C-17 at Bagram. They are delivering a Humvee and a radar unit from Ramstein AB, Germany. **15** Fire crew members climb into a fire truck for a practice run.





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1|1 An F-16 taxis to the main runway prior to a mission. This aircraft is armed with two wing-mounted AIM-120 AMRAAMs, two GBU-12 Paveway bombs, a GBU-38 JDAM, and a GBU-54 LJDAM. For F-16s at Bagram, this is a common weapons load. 1|2 An aerial view of Bagram. 1|3 An F-16C from the 31st Fighter Wing at Aviano AB, Italy, displays two GBU-38 JDAMs under its left wing. 1|4 A broader view of the concrete revetments turned canvas board for the squadrons at Bagram. From left to right, the 492nd "Mad Hatters," 336th "Rocketeers," 391st "Bold Tigers," 74th "Flying Tigers," 81st "Panthers," and the 190th "Skull-bangers" brighten up the landscape. ■

Adm. James Winnefeld, the new NORAD and NORTHCOM boss, closely monitors what's needed to defend North America.

USAF photo by James Haselline



Air Sovereignty Never Sleeps

By Marc V. Schanz, Senior Editor

The nation's air sovereignty alert fighter force is predominantly composed of older F-15s and F-16s in the Air National Guard, many of which are approaching the end of their service lives. Particularly troublesome are the ANG's F-16 Block 30 aircraft; most will leave the inventory by Fiscal 2018—before the Guard units are scheduled to receive F-35s.

"I rely on the [Air Force] to make sure that the capabilities that I require, that I ask for, that I need, are filled," said Adm. James A. Winnefeld Jr., commander of NORAD and US Northern Command. "So far... they've given me the assurance that we will have an adequate fighter fleet to conduct this mission."

The ASA mission, as performed today, has a skilled core of personnel carrying out sorties daily, and NORAD wants to keep that capability in place. "They are very experienced pilots, by and large—real veterans," Winnefeld said. "Many of them are airline pilots and they understand very well the airspace system inside our country."

NORAD is responsible for 18 airborne alert sites that can launch interceptors at a moment's notice. "I'm confident if we had had that in place on 9/11, that we would have at least stopped three" of the hijacked airliners, said Winnefeld, who spoke to reporters in Washington, D.C., in September.

The ASA mission is unique in terms of tactics, techniques, and procedures

used to intercept aircraft that might be lost or have "evil intent," Winnefeld said. "It's a very good fit to have the Air Guard flying this mission for us."

NORAD watches the air sovereignty fleet health closely, but Winnefeld has a high level of confidence the Air Guard will receive the appropriate aircraft to carry out the mission.

"There is a lot of analysis going on on those airframes by the Air Force... to see if we can eke a little bit more time out of those," he said of the F-16 Block 30 fleet. "Some are optimistic

Two Air National Guard F-16s power over the Grand Canyon during an Operation Noble Eagle sortie. The Air Force is trying to eke out more life from the F-16 fleet.

that they're going to get ... more life out of those airplanes."

Before he came into the job as NORTHCOM and NORAD boss, Winnefeld said he talked with Air Force Chief of Staff Gen. Norton A. Schwartz, who assured him the ASA mission is being taken "very seriously" and promised the Air Force is "going to make sure there are adequate airplanes to fly it."

Winnefeld believes, though, some gaps exist in the ASA mission, such as in the ability to defend against low, slow-moving aircraft.

An F-16 can get somewhere in a hurry and engage a target, Winnefeld said, but Vipers don't go low and slow easily. As a result, NORTHCOM and NORAD are examining options for obtaining something smaller and slower, such as a light fighter-type aircraft, Winnefeld said.

"I think if there's going to be a requirement, I would want to try to get at it in the next year," he said, adding he needed to address feasibility with the Air Force and other agencies.

"If I have a little defended area or something like that, you can visualize, say, a large outdoor athletic event or a political convention—things like that, the kinds of things that I routinely try to provide defense for—I potentially could have the ability to provide better defense for that if I have the smaller

aircraft," Winnefeld said. He noted the incident in February, where an Austin, Tex., man crashed his small aircraft into an Internal Revenue Service building, killing himself and an IRS employee.

"I think it's due diligence on my part to look to the future at what potential threats are out there, in addition to the threats that we've already seen in the past," Winnefeld said.

In the near term, however, Winnefeld expressed caution about any attempt to perform air defense with unmanned assets.

A Mission for Fighters

While "there are a lot of missions that we're finding that can be transitioned to unmanned aircraft," he said, "there's a lot of very careful human analytical thought that has to be applied when you intercept an aircraft." A pilot must be able to discern what the pilot of a civilian aircraft is up to and his intent and then perform maneuvers to get his attention, and potentially divert him off a course. "It's something I don't think we're ready to do with an unmanned aircraft," he added.

NORTHCOM's area of responsibilities stretch across Mexico and parts of the Caribbean and up north to the Arctic, where receding sea ice is opening lanes of transit. Old territorial disputes have

been reanimated as natural resources become more accessible. Nations such as Russia and Canada have moved to increase resources for their respective Arctic operations.

"Some people have the impression that suddenly all the ice is melting and there's an enormous amount of traffic flowing back and forth across the Arctic, and that's just not the case right now," Winnefeld said. "But it will be opening more and more ... so it's wise for us to look ahead to that rather than react to it."

Winnefeld noted that military-to-military cooperation amongst Arctic allies is "very good," noting US participation in Operation Nanook in August. Nanook saw Canadian, Danish, and US Navy and Coast Guard personnel conducting disaster response training and patrols in Canada's territorial waters, and it was the first time foreign militaries participated in the event. "There's no alliance or anything like that, but it's a collegial relationship," he said.

NORTHCOM benefits from the close relationship with Canada. Winnefeld's predecessors in Colorado Springs, Colo., have largely integrated the staff at NORTHCOM and NORAD so that

An F-15 Eagle takes off from Barnes Arpt., Mass. The Air National Guard mans 16 of the CONUS alert sites.



USAF photo by MSgt. Mark Fortin



An F-22 intercepts a Russian Tu-95MS Bear bomber near Alaska in 2007.

strategy and policy have US and Canadian personnel working right alongside each other.

“We gain the benefit of having Canadian expertise as we start to work our way through what our push to security could be in the Arctic,” he noted. This arrangement also reassures the Canadians the US is not doing things running counter to their interest.”

Winnefeld agreed with his predecessor, Air Force Gen. Victor E. Renuart Jr., who said prior to his retirement that national Arctic policy needs to be updated and reflect lessons learned from DOD’s Antarctic operations.

Winnefeld’s command also has responsibility for cooperation with Mexico—something taking up an increasing amount of attention as that country’s government is locked in battle with powerful narcotics cartels.

The US is assisting the Mexican government inside Mexico, while being cognizant of the long-running sovereignty issues between the two countries.

“I work closely with my counterparts down there, the commander of their Army and Air Force and also the commander of their Navy, in trying to help provide capability, to do shared experiences, subject matter expert exchanges, some training here and there,” Winnefeld said. Under the Merida Initiative agreement, the US

also is supplying technical capabilities, such as helicopters, night-vision tools, and ion scanners to help with drug and weapon detection at the country’s ports.

NORTHCOM also is directing efforts at unpacking one of the trickier issues confronting the Department of Defense: the roles and responsibilities for conducting cyber defense and offense.

Cyber Attack

“It’s new territory for a lot of people in our business,” he said. “I have a very ambitious staff, and they would like nothing more than to own all of the cyber response inside North America, ... but I’ve told them this is why we created [US Cyber Command], to be the real technical experts in how to operate and defend our networks.” CYBERCOM was created as a four-star subunified command under US Strategic Command. It is collocated with the National Security Agency at Fort Meade, Md.

A question remains, however: What happens when a major cyber attack occurs against the US? How would NORTHCOM be tasked, and what responsibilities would it have? Discussions between CYBERCOM, STRATCOM, and NORTHCOM have occurred on this subject, Winnefeld said, and the issue is being worked out.

If a cyber attack on the nation’s electrical system occurred, he posited,

NORTHCOM would be tasked to assist the Department of Homeland Security and help civil authorities in a “supporting role,” in recovering from the attack. Its mission would be to ensure public infrastructure was functioning properly, and, if not, to make sure it recovers.

Winnefeld also is focused on cruise missile proliferation. “However small and limited, it would be quite a shock, I think, if a cruise missile came whistling into Washington, D.C., from off the coast of Maryland, or something like that,” he noted. NORTHCOM is contemplating a “comprehensive look at our ability to do aerospace warning,” Winnefeld said. This would include not just threats from airliners and small, low-flying aircraft, but also cruise missiles.

Tracking fast-moving targets, such as cruise missiles, at low altitude is a difficult task, technically speaking, he pointed out.

However, “if it were to come down to no-kidding intelligence that we thought this might happen, we do have capability that we can put into play that would help us detect such a threat and engage it,” he concluded. “But it’s a tough problem.” ■

George Shultz Vs. “Hamlet”

George P. Shultz was President Reagan's Secretary of State on Oct. 23, 1983, the day 241 US troops died in a truck bombing of their Beirut barracks. The disaster turned him into the hardest of hard-liner anti-terrorists. One year later, Shultz gave a memorable speech calling for military action—even pre-emptive strikes—to defeat terrorists. He famously warned the US was becoming “the Hamlet of nations,” frozen by uncertainty. At the time he spoke, Shultz was losing the bureaucratic debate on use of force. Today, though, the Shultz view prevails, as the US has progressively lowered the threshold for military action against terrorists abroad.

The magnitude of the threat posed by terrorism is so great that we cannot afford to confront it with half-hearted and poorly organized measures. Terrorism is a contagious disease that will inevitably spread if it goes untreated. ...

We have to be stronger, steadier, determined, and united in the face of the terrorist threat. We must not reward terrorists by changing our policies or questioning our own principles or wallowing in self-flagellation or self-doubt. Instead, we should understand that terrorism is aggression and, like all aggression, must be forcefully resisted.

We must reach a consensus in this country that our responses should go beyond passive defense to consider means of active prevention, pre-emption, and retaliation. ...

A successful strategy for combating terrorism will require us to face up to some hard questions and to come up with some clear-cut answers. The questions involve our intelligence capability, the doctrine under which we would employ force, and, most important of all, our public's attitude toward this challenge. ...

The heart of the challenge lies in those cases where international rules and traditional practices do not apply. Terrorists will strike from areas where no governmental authority exists, or they will base themselves behind what they expect will be the sanctuary of an international border. And they will design their attacks to take place in precisely those “gray areas” where the full facts cannot be known, where the challenge will not bring with it an obvious or clear-cut choice of response.

In such cases, we must use our intelligence resources carefully and completely. We will have to examine the full range of measures available to us to take. The outcome may be that we will face a choice between doing nothing or employing military force. ...

We can expect more terrorism directed at our strategic interests around the world in the years ahead. To combat it, we must be willing to use military force.

What will be required, however, is public understanding before the fact of the risks involved in combating terrorism with overt power. The public must understand before the fact that there is potential for loss of life of some of our fighting men and the loss of life of some innocent people. The public must understand before the fact that some will seek to cast any pre-emptive or retaliatory action by us in the worst light and will attempt to make our military and our policy-makers—rather than the terrorists—appear to be the culprits. The public must understand before the fact that occasions will come when their

“Terrorism and the Modern World”

George P. Shultz
Park Avenue Synagogue, New York
Oct. 25, 1984

Find the full text on the
Air Force Magazine's website
www.airforce-magazine.com
“Keeper File”

government must act before each and every fact is known—and the decisions cannot be tied to the opinion polls.

Public support for US military actions to stop terrorists before they commit some hideous act or in retaliation for an attack on our people is crucial if we are to deal with this challenge.

Our military has the capability and the techniques to use power to fight the war against terrorism. This capability will be used judiciously. To be successful over the long term, it will require solid support from the American people. ...

We will need the flexibility to respond to terrorist attacks in a variety of ways, at times and places of our own choosing. ... If we are going to respond or pre-empt effectively, our policies will have to have an element of unpredictability and surprise. And the prerequisite for such a policy must be a broad public consensus on the moral and strategic necessity of action.

We will need the capability to act on a moment's notice. There will not be time for a renewed national debate after every terrorist attack.

We may never have the kind of evidence that can stand up in an American court of law, but we cannot allow ourselves to become the Hamlet of nations, worrying endlessly over whether and how to respond. A great nation with global responsibilities cannot afford to be hamstrung by confusion and indecisiveness. Fighting terrorism will not be a clean or pleasant contest, but we have no choice but to play it. ■



Making Space Responsive

By Peter Grier

Space systems bring tremendous combat advantages, but they take too long to field. DOD is counting on its ORS office to speed things up.

Space systems have changed the way the US fights its wars. The intelligence they provide helps US forces outmaneuver their adversaries, and the communications they carry enable those forces to attack with precision.

Space-based capabilities have helped revolutionize logistics, reducing the size of forward deployed units and cutting the number of weapons needed. But the manner in which those systems reach space has changed little since the era of Apollo moon shots. The development of many national security satellites remains a lengthy and expensive process. For the

most part, those satellites are designed with strategic, not tactical, uses in mind.

The Operationally Responsive Space office's mission is to fix this disconnect. This three-year-old office is a Department of Defense joint organization, housed at Kirtland AFB, N.M. It aims to boost and coordinate US efforts to make some space assets cheaper, faster, and more attuned to the needs of commanders on the ground.

The ORS office does not intend to replace the traditional model of space development, but to add additional capabilities and program resiliency, says director Peter M. Wegner. "We want this

office to really be the focal point for exploring new ways of doing business in space ... and to be the focal point for having the ability to respond rapidly in a crisis," said Wegner.

As a model for its role, the ORS office looks to the development of the computer industry, according to Wegner. The rise of personal computers did not eliminate the market for big mainframe data crunchers, and in the same way, a quick-response space capability would supplement existing super space systems.

Right now, though, ORS is barely out of its infancy.

help to US forces. The Army established a Tactical Exploitation of National Capabilities (TENCAP) program in 1973, for example. But DOD finally moved to create a focused departmentwide ORS office in part due to increased concerns about the vulnerability of the nation's space network. In short, it may not be as safe up there as it used to be.

Greater Risk

In this context, China's 2007 test of a direct-ascent anti-satellite weapon against one of its own satellites was a turning point. The successful test took the US and the rest of the world by surprise, created a giant cloud of space debris, and served notice that regional powers might be able to create havoc in the heavens, if they so choose.

At the same time, defense budgets appear to face a period of constraint. Huge national deficits loom in coming decades, and no aspect of government, even defense, is safe from reductions.

Increasing redundancy in US space capabilities by throwing money at expensive development programs is not an option. Space, like other military activities, will be asked to do more with less.

Fortunately, advances in small satellite technology are making the vision of faster-paced and less-expensive system development more realistic. The goal of ORS is to harness this change to produce satellites that are, in the office's own phrase, "good enough" to satisfy the needs of troops across the spectrum of conflict, from peace to war.

This may require a degree of bureaucratic reinvention, and an acceptance of greater risk in the enterprise. "New approaches to methods, development, and acquisition are necessary to attain ORS capabilities and ... broader space operations efficiency," reads the office's founding document, a 2007 "Plan for Operationally Responsive Space" report to congressional defense committees produced by the deputy secretary of



A Minotaur IV is launched into the night from a space launch complex at Vandenberg AFB, Calif.

Officially organized in 2007, it did not have significant numbers of personnel until 2008. In 2011, it will move from what its chief calls the "crawl phase," in which the office figures out how it fits in the larger US space community, and begin to walk by making its own technological investments. By 2015 or so, ORS should be in the full-speed "run phase," defined as providing multiple responsive space capabilities to combat forces.

The need for a more flexible and faster US approach to space assets is not driven just by current operational needs. Pentagon planners for years have dreamed of small satellites able to provide real-time



A Minotaur I lofts the TacSat-3 into orbit from Wallops Flight Facility, Va. The TacSat-3 satellite was transferred to Air Force Space Command last summer.



defense, then Gordon England; the DOD executive agent for space, at that time Air Force Undersecretary Ronald M. Sega; and Marine Corps Gen. James E. Cartwright, then head of US Strategic Command. This report defines operationally responsive space as “assured space power focused on the timely satisfaction of joint force commanders’ needs.” The US Strategic Command concept of operations for ORS sets a goal of producing space assets that can be employed in minutes to days by those who need them; deployed in days to weeks if more assets are needed; and developed in months to begin with.

By congressional direction, the ORS office is supposed to come up with satellite payloads and buses of modular open-system design which cost \$40 million for each satellite-bus combination. The target for space launches is a low \$20 million per shot.

The task is admittedly daunting. The analogy ORS officials use is they are building a U-2 reconnaissance aircraft wing for space—while the aircraft are already being flown and missions are constantly changing. “We don’t know what the threats will be, or where they’ll come from, so these need to be adaptive systems,” said Wegner.

The ORS chief acknowledges some in the US space community see his office itself as a threat to their resources. With money in short supply, the faster-cheaper

approach inevitably will siphon cash away from larger space investments, others in the space community contend. Given the unpleasant truth that the services themselves compete for funding, as do programs within services, this attitude toward ORS is likely to persist. But in many cases people look to ORS as “complementary” to legacy systems, said Wegner. “We’ve developed some good collaborations,” he said.

The Tiers

The ORS approach to its mission is organized in three tiers of ascending difficulty. These roughly match up with Wegner’s description of ORS first crawling, then learning to walk, then running at full speed. Tier One is the rapid exploitation of current on-orbit assets. As outlined in the 2007 “Plan for Operationally Responsive Space,” the timeline for Tier One response is hours to days. In other words, once commanders want something, they get it—fast. By necessity, Tier One likely would not involve construction of any new equipment.

Given it does not involve much money, Tier One is something on which ORS has already made progress. “Today I’ve got a team in my office that focuses on Tier One,” said Wegner. “They’re developing a database of space capabilities on orbit and systematically working through that to figure out how to get access to those in a crisis and then get data down.”

The SBIRS GEO-1 satellite undergoes work at the Lockheed Martin facility in Sunnyvale, Calif. SBIRS typifies the large-effort, large-reward model of traditional space programs.

Tier Two is intended to involve the stockpiling of ORS assets in a kind of space ready reserve. If troop needs can’t be met with Tier One, then ORS runs out to its stockroom and sees what kind of modular capabilities it has lying around that can be combined into a low-cost satellite and launched within days or weeks. “That means you’ve really got to anticipate ahead of time what might be needed,” said Wegner.

Tier Three would involve unanticipated requirements. If ORS can’t fulfill a request with off-the-shelf parts, it should be able to develop and deploy an entirely new capability within months to a year, according to the 2007 DOD plan. “Achieving such a timeline will be very challenging and cannot be accomplished unless the amount of new development involved is very limited,” notes an ORS fact sheet.

To lay the groundwork for eventually responding to Tier Three emergencies, ORS officials are trying to cultivate contacts with the scientific and technical communities, so they can figure out how to get such an innovative development process in place.

“How do you plan to solve an unanticipated need? You have to develop a very adaptive architecture,” said ORS chief

Wegner. This architecture will have to be a modular, open system. ORS is looking at ways of building a modular and adaptable satellite bus, he added.

"What if I get a need, and I need to add two times as much propellant to the system?" said Wegner. "We're working that on the bus side right now."

If this is the case, why doesn't the ORS office use its money to build a stockpile of different kinds of satellites it could warehouse to guard against any eventual-ity? Simply put, it would be too expensive and it probably would not work. After five years of sitting around, this costly equipment might be obsolete.

One of the roles of the ORS office is to act as the coordinator of Pentagon-wide responsive space efforts, and one of the main programs ORS coordinates may be the Tactical Satellite series of experimental spacecraft. Back in 2007, the DOD responsive space plan described TacSat as "the principal test bed for proving out the technologies required to develop and field future ORS space capabilities."

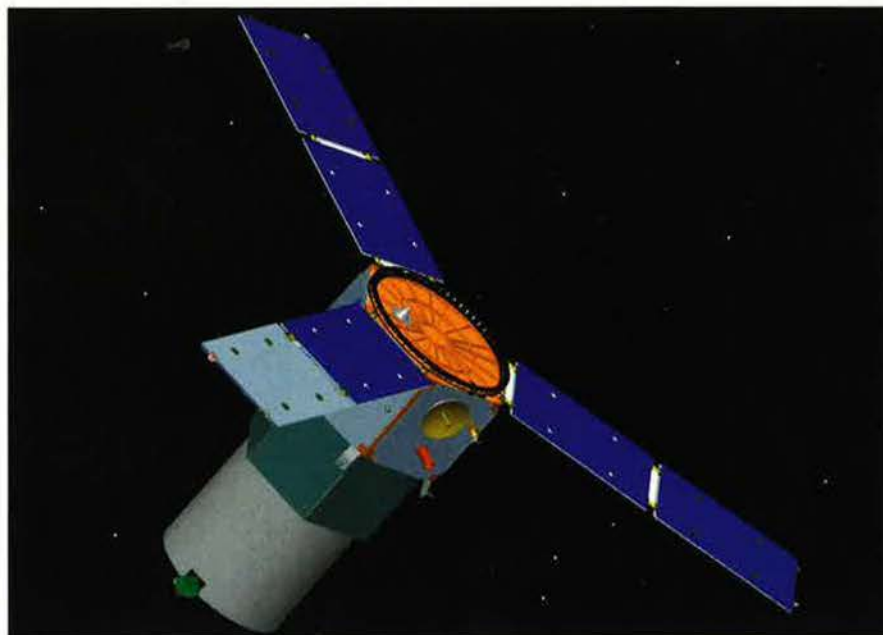
An Air Force Minotaur I rocket put TacSat-3 into low Earth orbit in May 2009. The satellite's primary payload is ARTEMIS, the Advanced Responsive Tactically Effective Military Imaging Spectrometer. This land-focused sensor captures light from a wide swatch of the electromagnetic spectrum, enabling it to detect specific substances, from damp dirt to the types of metal used in weapons. In minutes, it can theoretically deliver situational awareness to troops on the ground.

TacSat-3's experimental phase went so well, this past summer the \$95 million satellite was turned over to Air Force Space Command. AFSPC will run the program under US Strategic Command oversight, with the Army the primary beneficiary of TacSat-3's intelligence. "Overall, the TacSat-3 mission is a stepping stone for delivering operationally relevant space capabilities to the joint force commander," said Wegner in June, when the turnover was first announced.

For the ORS office, TacSat-3 has indeed been a stepping stone. In many ways, the TacSat program has been a precursor to ORS-1, the Operationally Responsive Space office's first operational satellite.

The ORS-1 program is the result of a request from US Central Command for additional intelligence-surveillance-reconnaissance capability in Southwest Asia. The program timeline is ambitious, with a planned 24 months from its October 2008 initiation to launch.

The Space Development and Test Wing is executing the program for the



USAF graphic

An artist's conception of Air Force Research Laboratory's TacSat-3 on orbit. TacSat-3 sensors can detect a wide range of substances, from damp dirt to metals used for weapons.

ORS office, which in turn is coordinating with CENTCOM, STRATCOM, and other organizations involved in the effort. Goodrich Corp. is partnering with Alliant Techsystems to produce the operational satellite system.

Budget Unpredictability

"In some senses, we've been able to—almost from a clean sheet of paper—look at the way we build space capabilities," said Wegner. "That's the great lesson learned out of ORS-1."

Schedule is important to ORS office officials.

Historically, the US launches space assets when planners are comfortable everything is ready. ORS, in contrast, is willing to accept a bit more risk in the name of capability acceleration. This could mean looking at integration and test schedules, for instance, to see where a little time can be shaved off. Or it could mean using lighter single-strength parts instead of parts bulked up to provide redundant strength. "Spacecraft are very nonlinear," said Wegner. "You add a pound to the solar array, and it ripples through the whole system. If you can take out a little bit, that effect gets magnified through the rest of the system. ... It's interesting to watch that effect."

The ORS-1 team successfully completed a system requirement review in December 2008; a preliminary design

review in March 2009; and critical design review in June 2009. The satellite system now is ready for launch, which was originally scheduled for late 2010. But ORS-1 has run into a launch vehicle manifest problem. Essentially, there are five payloads now vying to ride Minotaur I rockets into space.

"There's uncertainty about what date we can actually launch," said Wegner.

The problem is not due to a lack of Minotaur boosters, which are solid-fuel rockets constructed from converted ICBMs. The problem is process constraints that are preventing satellites from being launched as soon as they could be, said the ORS head. "There are lots of boosters, but in essence only one team that can pull those out of storage, integrate them together, and go launch them," said Wegner.

The other main challenge the ORS office faces is one virtually all Pentagon programs can relate to: competing demands for scarce military resources and budget unpredictability. It is an uncertain time in the Defense Department. This can make setting priorities year after year difficult.

"For example, when we think what mission we should go off next and do, it's been somewhat difficult to get that nailed down," said Wegner. "From year to year, what's important to senior leaders sort of changes. ... It's a challenging part of the job." ■

Peter Grier, a Washington, D.C., editor for the Christian Science Monitor, is a longtime defense correspondent and a contributor to Air Force Magazine. His most recent article, "USAF's Indispensable 'Failures,'" appeared in the August issue.

The fate of the hostages rode with a C-130 descending out of the night sky with its lights off.

ENTEBBE

By John T. Correll



Air France flight 139 originated in Tel Aviv on Sunday morning, June 27, 1976, bound for Paris with an intermediate stop in Athens. Airport security in Athens was notoriously lax. No one was on duty at the metal detector, and the official checking carry-on luggage at the X-ray machine was not watching the screen.

Four passengers from a connecting flight from Bahrain—a German man and

woman and two Palestinian men—had no difficulty boarding with concealed handguns and hand grenades. The aircraft, an Airbus 300, left Athens at 12:20 p.m.

Seven minutes out of Athens, the German man forced his way onto the flight deck while his companions took over the passenger cabins. They declared the hijacking to be on behalf of the Popular Front for the Liberation of Palestine and forced the pilot, Capt. Michel Bacos, to turn southward.

Loss of radio contact and the change in course alerted Israel that the flight, with a large number of Israeli and Jewish passengers, had been hijacked. The aircraft diverted to Benghazi, Libya, where it refueled and took off again at 9:50 p.m. One of the passengers, a woman, faked a medical emergency and managed to talk her way off the airplane in Benghazi and escape the hijackers.

The Airbus landed at Entebbe airport in Uganda at 3:15 a.m. on Monday. On



board, in addition to the four hijackers, were 243 passengers and the Air France crew of 12. At least six more terrorists joined the operation, coming from the Popular Front's forward location in Mogadishu, Somalia, bringing more lethal weapons, including AK-47 assault rifles.

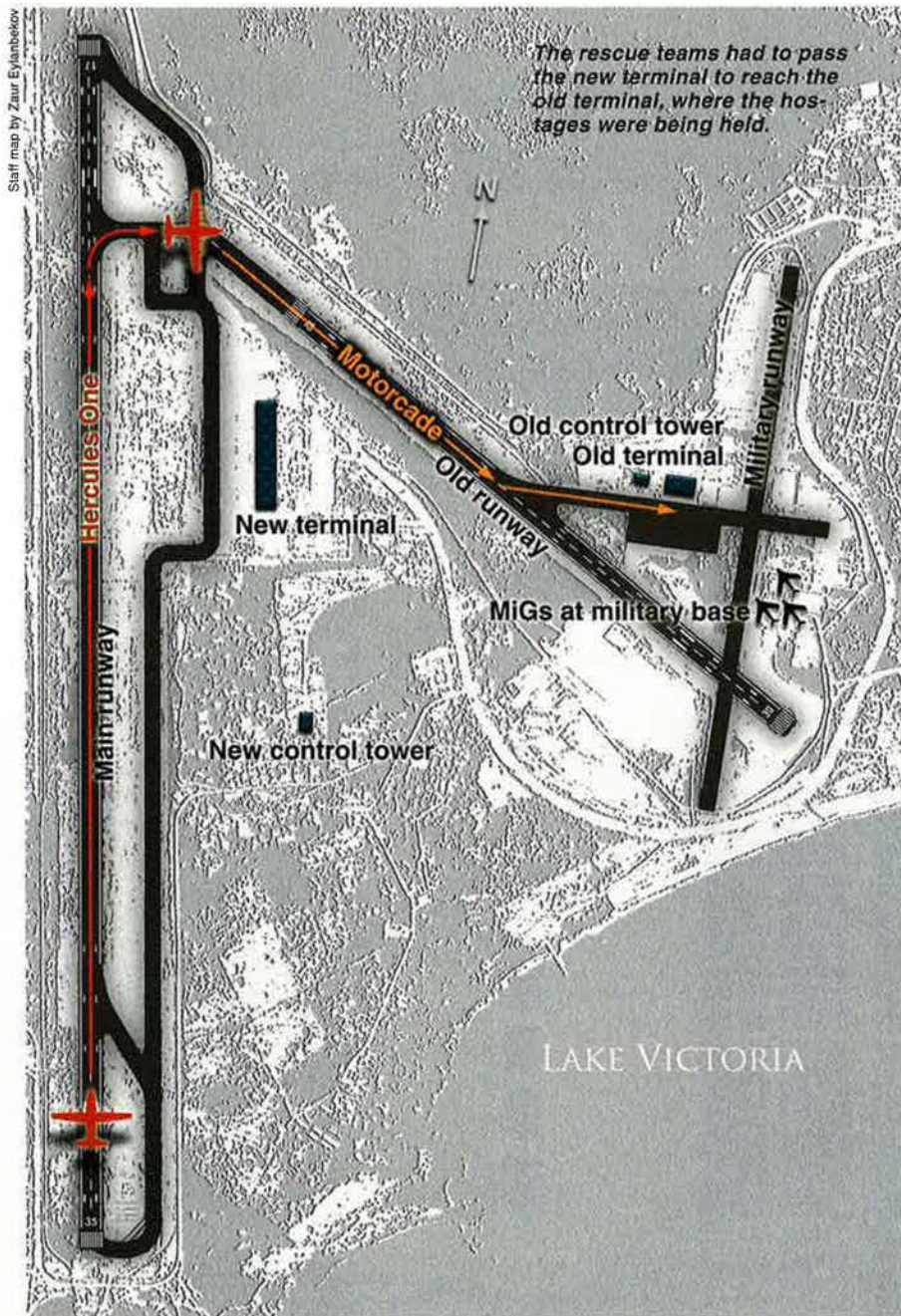
At midday on Monday, the hostages were moved from the airplane to the dilapidated old airport terminal, which had been used as a warehouse since a

new terminal and runway were built in the early 1970s. Ugandan soldiers pointed their guns at the passengers. It was soon obvious that Ugandan President Idi Amin was not only supporting the Popular Front operation but also was an active participant in it. A terrorist relief team took over guarding the hostages while the original hijackers rested.

It was not until 3:30 p.m. Tuesday that the Popular Front announced its

demands, broadcast over Ugandan radio. Unless 53 terrorists—40 of them held by Israel and the others by West Germany, Kenya, France, and Switzerland—were freed by 2 p.m. (Israeli time) on Thursday, the hostages would be executed.

Israel had faced the seizure of hostages before, and its policy was to do everything possible to free them through direct action, rather than give in to demand for release of terrorists.



The rescue teams had to pass the new terminal to reach the old terminal, where the hostages were being held.

Several times in the past, however, terrorists had gotten what they wanted. In the hijacking of an El Al airliner in 1968, the Israelis traded 15 terrorists for the hostages. In another instance, they gave up 50 terrorists for two Israelis taken off a TWA airliner at Damascus.

Results from military action in hostage situations had varied. In 1972, terrorists captured a Sabena airliner, landed in Tel Aviv, and demanded the release of 317 Fedayeen "freedom fighters."

Israeli soldiers disguised as mechanics killed two hijackers and wounded a third in a 90-second assault. All 101 hostages were freed except for a

woman who jumped up in panic and was shot and killed.

By contrast, the attempt by Israeli special forces in 1974 to free 88 hostages, mostly children, held by Palestinian terrorists at a school in the Israeli town of Ma'alot was a disaster. All of the terrorists were killed, but so were 22 children, with another 56 wounded.

When the terrorists announced their demands in Entebbe, the Israeli Cabinet came under intense pressure from the families of the hostages, who wanted Israel to agree right away with the exchange.

Meanwhile in Entebbe, the hostages were crowded into a confined space

in the old terminal, where primitive conditions worsened as the plumbing clogged and backed up. Idi Amin arrived by helicopter on Monday afternoon for the first of several visits. He told the hostages the crisis was Israel's fault for not agreeing to demands of the hijackers. He insisted on being addressed as "His Excellency Field Marshal Doctor Idi Amin Dada."

Amin, who took power in a 1971 coup, gave the impression of being a strutting buffoon who decorated his uniform with medals and honors he awarded to himself, but he was deadly dangerous. Already, tens of thousands were dead in his purges and sweeps of repression. The Israelis, who conducted training for the Ugandan armed forces from 1963 to 1972, knew him well. He had fallen out with the Israelis and ejected them when they refused to help him attack Tanzania and Kenya.

The terrorists collected passports and other documents and separated the Jewish passengers from the non-Jews. On Wednesday afternoon, they released 47 hostages, mostly French. Captain Bacos declined release so long as any of his passengers were detained, and at his urging, the Air France crew did likewise.

That night, Israeli agents visited the freed hostages in France and gathered information about the situation in Entebbe.

Another 101 hostages were released on Thursday morning, leaving only the 95 Israeli and Jewish passengers and the Air France crew in captivity.

Getting There

The Israeli Defense Forces could attempt a rescue, but unless they could land and take the old terminal by surprise, the hijackers would kill the hostages. The rescue force could very well be lost as well.

Prime Minister Yitzhak Rabin, who had been IDF chief of staff during the Six Day War in 1967, was reluctant to mount a military operation, as was his chief of staff, Lt. Gen. Mordechai Gur. The main advocate of a military response was the defense minister, Shimon Peres, who was not a military man, having risen instead through civilian government ranks. Maj. Gen. Benny Peled, commander of the Israeli Air Force, agreed with Peres on military action.

As deliberations continued, the armed forces explored several ideas, including a parachute drop into Lake

Victoria, adjacent to Entebbe, with troops coming ashore in rubber boats. Whatever was decided, the Israeli air force could get them there. The C-130 Hercules, called Karnaf, or "Rhinceros," in Israeli service, could reach Entebbe without difficulty. When Israel had maintained a large presence in Uganda, the IAF used C-130s for regular supply runs.

The problem, in addition to achieving surprise, was refueling. After landing, the C-130s would have only enough fuel remaining to fly another one-and-a-half hours. There was a chance that Kenya might allow them to refuel in Nairobi on the way out, but more likely, the C-130s would have to rob fuel from the storage tanks at Entebbe.

From their time in Uganda, the Israelis had some knowledge of the fuel system at the airport. Furthermore, the old terminal had been built by an Israeli construction firm, which still had the blueprints and gave them to the government. Additional information came from the intelligence agency Mossad, which rented a light airplane in Nairobi, and faking an in-flight emergency, circled the Entebbe airport taking pictures.

Brig. Gen. Dan Shomron, head of infantry and paratroop command, said the big question was whether the IAF could insert his force without alarming the terrorists. "From the moment that we will be on the ground in Entebbe, we can carry it out easily," he said.

With no firm plan yet in hand by Thursday afternoon, 90 minutes before expiration of the ultimatum, Israel

Yoni Netanyahu was 30 years old when he led the raid on Entebbe. He was the only member of the rescue team killed in the successful rescue of more than 100 hostages.



announced it would negotiate for the release of the hostages. The terrorists set a new deadline for 2 p.m. on Sunday.

Later that evening, the IDF came up with its plan, devised with substantial inputs from Peled and Shomron, to land a combined force at Entebbe for a surprise attack at night. The insertion force was pared down to four C-130s. The plan was called Operation Thunderbolt. Maj. Gen. Yekutiel Adam, chief of operations and number two man in the IDF, would be the overall commander. Shomron was appointed ground commander.

Yoni and the Unit

The central role in the assault fell to the special forces unit of the Israeli Army, Sayeret Matkal, known as "the Unit." Its commander was Lt. Col. Jonathan Netanyahu, 30, called "Yoni," who had been in the position for a little more than a year. Initially,

Shomron named Col. Ehud Barak, the highly experienced former commander of the Unit, to lead the assault on the old terminal with Yoni serving under him, but on Friday evening Adam sent Barak to Kenya to seek permission for post-mission landing and refueling, so Netanyahu was in clear command.

Yoni and his assault force of 29 would be on the first C-130. They would be wearing Ugandan Army uniforms, but they had to reach the old terminal quickly, before the operation was discovered. The C-130 could not get too close without being seen or heard, so they had a considerable distance to go after deplaning.

The C-130 could carry three vehicles, which suggested a motorcade that looked like something it wasn't. Idi Amin was known to travel in a black Mercedes limousine, accompanied by several escort vehicles. He had visited the hostages several times, and another visit was not implausible.

The Unit decided to use a Mercedes and two Land Rovers to get from the C-130 to the terminal. The Mercedes they obtained, however, was white, believed to be the wrong color, and was hastily repainted black.

Unknown to the Israelis, Idi Amin was now using a white Mercedes instead of a black one. The Unit made fake license plates from cardboard and little flags to fly on the front of the car, as seen in pictures of Amin's Mercedes.

The IDF staged a dry run rehearsal of the landing Friday night at Ophir, on the southern tip of the Sinai Peninsula.

The IAF would use seven aircraft for the operation, two Boeing 707s and five C-130s. The 707s, with El Al airline markings and civilian registration numbers, would fly the standard



A jubilant crowd lifts an unidentified member of the rescue team into the air during the celebrations at the Ben Gurion Airport in Tel Aviv.

Corbis photo by David Rubinger



L-r: Ben Zion Netanyahu, Yoni's father, Defense Minister Shimon Peres, and Prime Minister Yitzhak Rabin, at Yoni Netanyahu's funeral ceremony in Jerusalem in 1976.

commercial route toward South Africa. The first 707 was the command and control aircraft, with Adam and Peled aboard. The second was configured as a field hospital. In their civilian guise, both could refuel at Nairobi.

The C-130s staged out of Ophir, the southernmost airfield in Israel, and topped off their tanks there for the 2,500-mile flight. Tight security slipped when the pilot of an airplane belonging to Arkia, Israel's domestic airline, noticed the activity at Ophir and commented on an open frequency, "Looks like there's a party going on down there." Fortunately, it led to no harm.

The first Karnaf was in the air at 3:30 p.m. Saturday, followed at regular intervals by the others. The Cabinet was still debating the issue and had not reached a decision to approve the mission when the C-130s launched. There was some expectation among the assault force that the aircraft would be recalled.

Hercules One carried Yoni and his 29 troopers, their Mercedes and two Land Rovers, ground commander Shomron, and 52 paratroopers. The next two aircraft each carried two armed jeeps, and more soldiers and paratroopers, and one also carried Shomron's command jeep. Hercules Four was the hostage transport. It also brought the medical team, a portable fuel pump mounted on a pickup truck, and a 10-man IAF refueling team. In all, Shomron's assault force numbered about 170.

The C-130s flew the length of the Red Sea at 200 feet to evade Saudi and Egyptian radars, then crossed Ethiopia—

which had no radar that could track the C-130s at night—at 20,000 feet, which used less fuel. Operation Thunderbolt did not receive final authorization from the full Israeli Cabinet until the C-130s were over Ethiopia. The C-130s crossed western Kenya and reached Lake Victoria about 10:30 p.m. They were now out of radio range of the Arab countries, so Hercules One made first radio contact with the Boeing 707 command aircraft.

Out of the Night

Hercules One approached Entebbe from the south and lined up on the main runway, which ran along the western side of the airport. Flying without lights, the C-130 could not be seen from the ground. The crew could see the new terminal and control tower off to their right and beyond that, the lights of the old terminal, where the hostages were held. It was on a ramp off the old runway, which ran the width of the airport on a southeast-northwest diagonal. A mile-and-a-half to the east, a military airstrip lay along the far side of the airport, with five MiG-21s and three MiG-17s parked nearby.

Hercules One touched down unseen at 11:01 p.m., Israeli time—just after midnight in Uganda. The pilot cut inboard engines to reduce noise and taxied onto an access strip connecting to the diagonal runway. Paratroopers hopped out to place emergency landing beacons for use by the other C-130s if the runway lights were turned off.

The Mercedes and the Land Rovers, carrying Yoni's party, headed down the runway toward the old terminal, about a mile away. They drove with

lights on and at about 40 mph, hoping to look like a presidential motorcade. Just before they reached the old control tower, a Ugandan Army sentry pointed his rifle at them and tried to stop them. The sentry knew, perhaps, that the black Mercedes was not Idi Amin's car. They had to shoot their way through and immediately came under fire from the old control tower. They charged the last 30 feet on foot.

The hostages were on the ground floor, guarded by seven terrorists and dozens of Ugandan soldiers. The terrorists were momentarily confused, uncertain why the Ugandans were shooting. In the rapid exchange of gunfire that ensued, four terrorists on the ground floor were killed, but one of them hit Netanyahu in the chest with a burst from his AK-47. His wound was mortal, and he died as the Unit doctor tried to revive him.

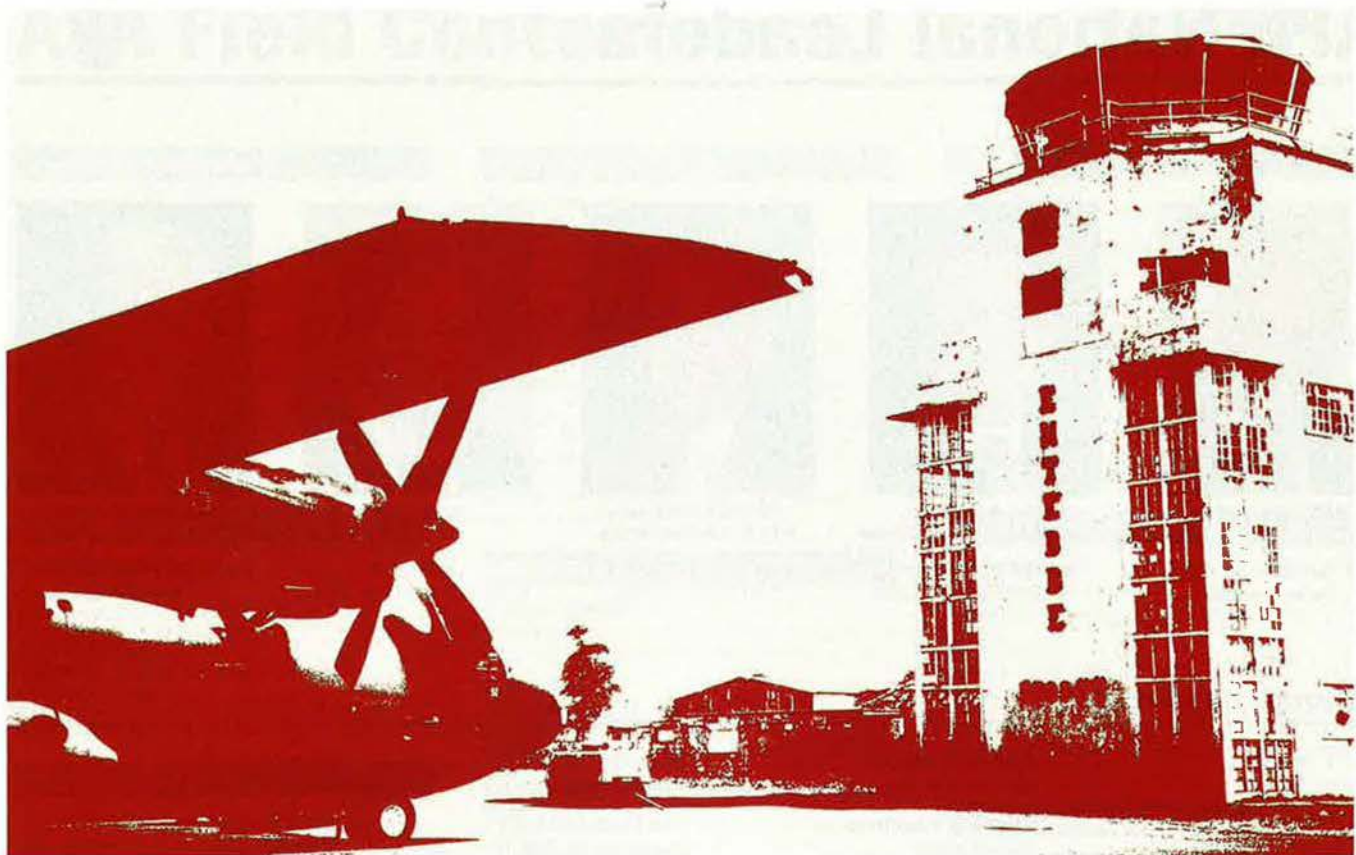
The assault team spread out through the building, where they found and killed three more terrorists. Two hostages were also killed, one in the crossfire and the other when he leapt up unexpectedly at the sight of Israeli forces.

Hercules Two was on the ground at 11:06 p.m. Hercules Three was close behind, landing with the emergency beacons when the runway lights went out suddenly while the C-130 was on final approach. As paratroopers secured the new terminal and control tower, where resistance was light, the four armed jeeps, commanded by Maj. Shaul Mofaz, raced down the diagonal runway. They took up a blocking position in front of the military base and strafed the MiGs with their swivel-mounted machine guns. Several of the MiGs exploded and all eight were destroyed. The jeeps also suppressed fire from the top of the control tower, raking it with bullets each time the Ugandans put their heads up.

No additional Ugandan troops joined the fight. Idi Amin and his senior officers did not know what was going on. Possibly, it was a coup. Idi Amin took shelter and the others holed up until the situation was clear.

"No officers wanted to risk becoming involved with the wrong side," said Henry Kyemba, a minister in Amin's government.

Hercules Four taxied into position near the old terminal to take the hostages aboard. One was missing. On Friday, 75-year-old Dora Bloch, choking on a piece of meat, had been taken to a hospital in Kampala, 21 miles away, and she



was still there. The other 104 scrambled aboard the C-130, which would also carry the bodies of Netanyahu and the two dead hostages.

The IAF technicians were preparing to pump fuel from the airport tanks when Peled sent word from the command and control aircraft that the C-130s could refuel in Nairobi. Hercules Four was the first out.

The last aircraft, Hercules Two, lifted off at 12:40 a.m., Israeli time, on Sunday July 4—an hour and 39 minutes after the first C-130 had landed.

When they got to Nairobi, all concerned tried to make the situation as unexceptional as possible. The IDF's "Entebbe Diary" said, "Without any fuss, fuel tankers moved into position by the planes and began refueling, while the drivers presented the paperwork to their pilots for signature, just as they would to any commercial flight. No questions were asked, and no information volunteered."

One of the hostages, seriously wounded in Entebbe, was taken to a Nairobi hospital, but did not recover from surgery. The immediate fatalities from the raid were three hostages, 20 Ugandan soldiers, seven hijackers, and Yoni Netanyahu.

Idi Amin added to that by having four flight controllers executed summarily

for their failure to see the approaching C-130s.

His thugs also dragged Dora Bloch out of her hospital bed and killed her.

The C-130s were met en route by Israeli fighters and escorted to Tel Nof Air Base south of Tel Aviv. After debriefing, they went on to Ben Gurion Airport in Tel Aviv, where a huge reception awaited.

The raid went down in military lore and legend, and Operation Thunderbolt was renamed Operation Jonathan in honor of the fallen commander. Three movies were subsequently made about the mission, and there have been numerous articles and books, notable among them *Entebbe: The Jonathan Netanyahu Story* in 2003 by Yoni's brother, Iddo.

Uganda asked the United Nations Security Council to condemn Israel's action. The UN declined to pass a resolution condemning either Israel or Uganda, but Secretary-General Kurt Waldheim of Austria felt compelled to say that the raid was "a serious violation of the national sovereignty of a United Nations member state," meaning Uganda.

For staying with the passengers and urging other crew members to do likewise instead of accepting release, Bacos was reprimanded and suspended from duty by Air France.

History was not quite finished with some of the principals in the Entebbe

operation. Rabin returned for another term as prime minister in 1992. He was assassinated in 1995, and was succeeded by Peres (who had earlier been prime minister 1984-86). Peres was followed by Benjamin Netanyahu—Yoni's younger brother—who was prime minister from 1996 to 1999.

Adam, commander of the overall operation, was killed in action in Lebanon in 1982. The ground commander, Shomron, subsequently became IDF chief of staff. Barak, the former commander of Sayeret Matkal and emissary to Kenya to arrange for landing and refueling, was prime minister of Israel from 1999 to 2001. Mofaz, who commanded the contingent of armed jeeps at Entebbe, went on to be IDF chief of staff and defense minister.

Benjamin Netanyahu is currently prime minister of Israel, Peres is president, and Barak is defense minister.

Idi Amin continued as dictator of Uganda until he was ousted in 1979. He fled to Libya and then to Saudi Arabia, where he died in 2003. ■

John T. Correll was editor in chief of Air Force Magazine for 18 years and is now a frequent contributor editor. His most recent article, "Etchberger, Medal of Honor," appeared in the November issue.

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The Army Air Forces turned to dive-bombers for accuracy, but the A-24 Banshee found itself in the wrong places at the wrong times.

The Last of the Dive-bombers

By Walter J. Boyne

In warfare, as in business, timing and location are everything.

The classic Douglas dive-bomber of World War II served the Navy brilliantly as the SBD Dauntless, while the virtually identical A-24 Banshee had only a mediocre career with the US Army Air Forces. There were many reasons for this, but the main one was the combination of the Navy's long-standing training in dive-bombing and the nature of its targets, which allowed the SBD to perform.

In contrast, dive-bombing was thrust upon the heavy-bomber-centric AAF following the spectacular successes of the German Junkers Ju 87 Stuka in





the initial phases of World War II. The undeniably menacing look of the Ju 87 certainly made the pitch easier as well.

When at last the AAF sought to obtain a dive-bombing capability, it took delivery of Douglas A-24s (erstwhile Navy SBD-3s) in mid-1941. Unfortunately, the Banshee had too little performance and was too late in the game. The AAF service of the A-24 might be characterized as brave but undistinguished. Yet during the same time period, the naval SBD Dauntless versions of the aircraft were writing history in a series of decisive battles from the Coral Sea through Midway and well into 1944.

The Dauntless was ultimately replaced by the larger, faster, but less forgiving, Curtiss SB2C Helldiver, but it remained a favorite among Navy and Marine fliers.

The Navy and Marine Corps saw in dive-bombing a solution to two problems. The first was accuracy, essential for Marine close air support, but the second was creating a weapon that could fly from the crowded decks of an aircraft carrier to deliver an armor-piercing bomb on an enemy ship.

Even relatively large carriers such as *Lexington* and *Saratoga* could not carry medium or heavy bombers. The task had to be left to smaller airplanes such as the Curtiss F6C Hawk or multipurpose biplanes such as the Curtiss F8C Falcon.

Lt. Cmdr. Frank Wagner, commanding officer of strike squadron VF-2, began demonstrating dive-bombing in March

1926, and instructed his squadron in the technique.

He made Navy history on Oct. 22, 1926, with a surprise dive-bombing mock attack on ships of the Pacific Fleet, using the Curtiss F6C-2 single-seater. By 1928, the Navy was confident enough in the technique to order the Martin XT5M-1, which offered both a torpedo and a dive-bombing capability. One of the demanding requirements called for the new Martin to be able to pull out of a terminal velocity dive with a 1,000-pound bomb still attached.

Sopwiths and Zeppelins

The Curtiss Co. exploited the now-intense Navy and Marine Corps interest with the further development of the basic F8C into the famous Helldiver series of dive-bombers. Nascent US dive-bombing capability is vividly portrayed in the 1931 film "Hell Divers." The nominal stars are Clark Gable and Wallace Beery, but the real stars are the airplanes, including the Curtiss F8C-4, Great Lakes TG-1, Martin T4M-1, and others as well as *Saratoga* and the dirigible USS *Los Angeles*.

The Army Air Forces, meanwhile, may have waited until just before the US entry into World War II before finally turning to dive-bombers, but the discipline itself extended back before World War I.

Left top: An A-24 on the ramp on Makin, in the Gilbert Island chain. Left bottom: German Stukas in 1943. Above: An RA-24B assigned to Air Transport Command.

During the 1910-20 Mexican Civil War, an American named Leonard Bonney flew his Moisant monoplane in the service of the Mexican government. A report of his combat activities said Bonney allegedly dived on enemy positions, releasing his small, spherical dynamite bombs prior to pulling up.

His reason for doing so, no doubt, was accuracy, and it was accuracy that prompted many early attempts at dive-bombing during the First World War of 1914-18.

Among the first of these was to preempt what was regarded as the major German aerial threat of the time, the Zeppelin. The war was scarcely two weeks old when on Aug. 14, 1914, the French sent clumsy Voison bombers, flown by inexperienced pilots, to bomb the airship hangars at Metz, France. One pilot who dropped his bombs by diving on the target obtained the best results. Two months later, the British Royal Flying Corps sent Sopwith Tabloids against the Zeppelin sheds at Duesseldorf in Germany, and once again the best results were obtained by diving to a low altitude before dropping the bombs.

There were many other examples of aircraft diving to ensure accuracy



A Douglas A-24 on static display at the National Museum of the US Air Force, Wright-Patterson AFB, Ohio.

in bomb delivery, including accounts by Arthur Gould Lee in his book *No Parachute*. However it appears the first truly preplanned and practiced dive-bombing attack took place on March 14, 1918, when 2nd Lt. William Henry Brown dived his Royal Aircraft Factory S.E. 5a on a German supply barge in a French canal, sinking it with a 20-pound Cooper bomb.

Brown's technique was adopted by other British flying units, but the grievous losses suffered in ground attack overshadowed these successes, and dictated the course of Great Britain's dive-bomber development for the next two decades.

The Royal Air Force eschewed close air support and concentrated instead on light bombers, which reached their peak with the handsome but useless Fairey Aviation Co.'s Battle in 1937. The Royal Navy's Fleet Air Arm was a bit more advanced, however, and that year contracted for a true (if generally ineffective) dive-bomber, the Blackburn Skua.

The United States began its dive-bombing experience with an unlikely aircraft, the de Havilland DH-4. This large, slow but sturdy aircraft was used by the Marine Corps in Haiti against the mercenary Cacos in 1919, and against the "Sandinistas" in Nicaragua in 1927 and 1928.

The Army Air Service's Third Attack Group demonstrated dive-bombing at Aberdeen Proving Ground in Maryland

on Sept. 1, 1919. The Third conducted active dive-bombing attacks along the Mexican border for the next two years.

The newfound American fascination with dive-bombing was mirrored in Germany, which was engaged in a systematic program to develop dive-bombers. The rebuilding German air arm was encouraged to develop dive-bombing by the enthusiasm of Ernst Udet. An ace from World War I with 62 victories to his credit, Udet had observed American dive-bombing, and persuaded Hermann Goering to purchase two export versions of the Curtiss F11C-2 Goshawk, which had a very short and not too successful career in the US Navy.

Horn of Jericho

The Junkers firm took advantage of this developing interest and entered the dive-bombing field by clandestinely developing the K 47 as a civil aircraft, testing it in Sweden in 1932.

This led in time to the history-making Ju 87, a Sturzkampfflugzeug, the generic term for dive-bomber, which led to the infamous nickname Stuka. This became a proprietary term for the malevolent-looking Ju 87 with its inverted gull wings, spatted undercarriage, and drooping pointed nose.

The Ju 87 had a troubled development life, including numerous crashes and the firm opposition of then-Col. Wolfram F. von Richthofen, a cousin of the famed Red Baron of World War

I, Manfred von Richthofen. Udet prevailed, however, and the Ju 87 entered combat in the Spanish Civil War in 1938. The Ju 87 dropped the very first bombs of World War II when three Stukas bombed the approaches to the Dirschau Bridge over the Vistula River in Poland on Sept. 1, 1939.

The sinister Stuka went on to great success in the Polish, Danish, Norwegian, Dutch, Belgian, and French campaigns, serving as flying artillery and working hand-in-glove with fast-moving Panzer divisions.

The Stukas were rugged aircraft, able to operate out of forward fields, generating many sorties in the course of a day. Their accuracy was phenomenal, and in the early days, their sound had a profound psychological effect upon the relatively green troops they were facing. The Germans had added to the natural noise of a diving aircraft the wind-driven "Horn of Jericho" to terrify the enemy.

Journalists reported on the success of the Ju 87 and the term "Stuka" became identified with quick victories.

There was tremendous popular and political pressure on the Army Air Corps to obtain a dive-bombing capability, which it filled by obtaining 168 SBD-3s and designating them as A-24s. These were essentially Navy aircraft with the

deck hook removed and a pneumatic tail wheel tire replacing the solid Navy version. Over time a further 170A-24A and 615 A-24Bs were obtained, versions respectively of the Navy SBD-4 and SBD-5.

The very first A-24s were immediately dispatched to the Philippines in November 1941, intended for the 27th Bombardment Group (Light).

However with the Japanese attack on the Philippines, the aircraft were diverted to Australia, arriving in Brisbane in December 1941. These A-24s, some already used aircraft when the AAF obtained them, had seen hard service in large-scale Louisiana maneuvers in September 1941, and were dirty and in bad mechanical condition.

Meanwhile, the personnel of the 27th were subject to the true rigors of warfare, landing in the Philippines and being given a wide variety of duties. Col. John H. Davies, the 27th's commander, and 12 pilots attempted to fly out to Australia in a Douglas C-39 and two Douglas B-18s, but got only as far as Java.

Other officers and men were transported from the Philippines in five separate submarines, running the gauntlet of the Japanese fleet.

Sadly, around 400 members of the 27th were left behind in the Philippines, where they fought with the ground forces until surrender as part of the 1st Provisional Air Corps Regiment. Many were killed, and the survivors had to endure the infamous Bataan Death March.

On Feb. 5, 1942, the pilots and ground crew of the 27th assembled in Australia were ordered to move to Malang, Java. Fifteen aircraft of the 91st Bombardment Squadron arrived on Feb. 17, but only seven A-24s were available for the dawn attack on Japanese vessels landing troops on Bali.

The bombing results were poor, and the A-24 was no match for the Japanese fighters it encountered. Lacking armor and self-sealing fuel tanks, the Banshee was slow, short-ranged, and vulnerable to combat damage.

On Feb. 27, the A-24s participated in the disastrous battle of the Java Sea. A fortunate decision was made to withdraw the unit from Java, and it returned to Australia where it would later be equipped with the more suitable Douglas A-20.

By March 1942, a total of 42 officers, 62 enlisted men, and 24 of the A-24 Banshees were assigned to the



A Dauntless, the Navy's legendary dive-bomber, drops its weapons load. The nearly identical AAF Banshee never achieved similar success.

8th Bombardment Squadron, 3rd Bomb Group, and stationed at Charters Towers in Queensland, Australia.

The few remaining A-24s in Australia were tasked to defend New Guinea. On July 26, 1942, seven Banshees attacked a Japanese convoy, but were in turn attacked by fighters. Six of the A-24s were shot down, and the aircraft was subsequently withdrawn from combat.

This was not the end of the road for the Banshee, however. As the US gained air superiority in the Pacific, a later version of the aircraft, the A-24B, was introduced.

Passing the Torch

This version of the Navy's SBD-5, employed a 1,200 horsepower engine and was faster than its predecessors. It served with the 407th Bomb Group, flying against the Japanese-held island of Kiska, Alaska, in mid-1943. Other Banshees went to the 531st Fighter-Bomber Squadron and the 86th Combat Mapping Squadron.

The 531st flew from Makin Island against Japanese forces in the Marshall

Islands and did well, in what were by then fairly permissive skies. On most missions, they had fighter cover, either AAF Bell P-39s and Curtiss P-40s, or Navy Grumman F6Fs.

In other parts of the world, dive-bombers soldiered on. The veteran Ju 87 served until the last day of the war for the Luftwaffe. However by 1944, all the air forces of the world realized the latest single-seat fighters could also function in the close air support role, and could do any dive-bombing required. Thus the dive-bombing torch was passed to aircraft such as the Hawker Typhoon, Republic P-47, and Focke Wulf Fw 190.

Although withdrawn from combat, A-24s continued to serve as trainers or target aircraft. Some remained in service until 1950 and, as the "A" designation was canceled, received the redesignation of F-24.

In the A-24-SBD comparison, the Dauntless undoubtedly outshined the Banshee. Although the airplanes were essentially the same, the environment, the training, and the targets were vastly different. ■

Walter J. Boyne, former director of the National Air and Space Museum in Washington, D.C., is a retired Air Force colonel and author. He has written more than 600 articles about aviation topics and 40 books, the most recent of which is Hypersonic Thunder. His most recent article for Air Force Magazine, "The Remote Control Bombers," appeared in the November issue.

AFA National Report

natrep@afa.org

By Frances McKenney, Assistant Managing Editor

Looking for Jimmy Stewart

The Air Force Association's field leaders gathered in Arlington, Va., in late October for two days of information sessions on AFA's latest strategy, operations, and procedures.

The association's top leaders who took part in the meetings, workshops, and presentations were as new to the job as many of the attendees. AFA vice chairman of the board for field operations, Justin M. Faiferlick, opened the session by welcoming an audience that included six new region presidents and just over a dozen new state presidents.

In his remarks, AFA Chairman of the Board S. Sanford Schlitt said many changes were already under way, though he and Faiferlick had only been elected a few weeks before at September's National Convention. Schlitt said establishing at least one new entity, an Air Force council centered on families, is under consideration.

A new group formed for Project Loudspeaker has been charged with, as Schlitt put it, "looking for the next Jimmy Stewart"—someone who can advocate for AFA in the same way the Academy Award-winning actor did as a founding father of the association.



Staff photo by Eric Chang Lee

AFA Chairman of the Board Sandy Schlitt (second from right) discusses the agenda before the Region and State Presidents meeting in October in Arlington, Va. Clockwise from left: Bill Grider, Joe Hardy, Paul Lyons, Schlitt, and Kelly Jones.

More photos at <http://www.airforce-magazine.com>, in "AFA National Report"

Following Schlitt's overview of AFA initiatives, the region and state presidents listened to briefings from the association's department directors.

In a first for these orientation meetings, field leaders took in professional-development presentations: Rebecca Grant, of AFA's Mitchell Institute, spoke on "Losing Air Dominance and the Vanishing Arsenal of Airpower" in an afternoon session. Retired Lt. Gen. David A. Deptula, former deputy chief of staff for intelligence, surveillance, and reconnaissance, served as dinner speaker. The next day, motivational speaker Mike Abrashoff, a former Navy commander and book author, gave a presentation on grassroots leadership.

Science Fair on the National Mall

Since they were already in Washington, D.C., Schlitt suggested the field leaders visit the AFA booth at the USA Science and Engineering Festival, held on the National Mall, in front of the US Capitol, on Oct. 23 and 24. Lockheed Martin hosted the festival, which took place in conjunction with the first White House Science Fair.

William Yucuis, the **Central Florida Chapter** president, represented AFA at the booth on opening day. The next day, others from AFA—a festival partner—and Sarah Giese of *USA TODAY*



In Alabama, the Tennessee Valley Chapter's guests fill the room for a celebration of the Air Force's anniversary in September.

newspaper, pitched in. They provided information on the *CyberPatriot* program and on AFA-USA TODAY's Visions of Exploration program. Visions provides newspapers to classrooms to encourage the study of science, technology, engineering, and math.

Yucuis came up with the idea of drawing visitors to the booth by assembling paper "rockets" and "launching" them with soda straws. When he began shooting the four-inch-long paper rockets into the air, youngsters began crowding his booth. From then on, "there were kids at my table 100 percent of the time," he said.

An aerospace engineering teacher, Yucuis uses the same paper rockets, as well as the Visions program, in his classroom at Lyman High School in Longwood, Fla. Fifteen visitors to the AFA booth asked for a copy of his lesson plan on paper rockets.

The festival included some 1,000 booths and displays, with activities spilling over into nearby areas, including the off-site auditorium where the AFA booth was set up. It could have been an overlooked location, except that it shared space with a star attraction: Lockheed Martin's F-35 flight simulator. This drew a crowd that stretched out the door and down the block.

Some half-million people visited this first USA Science and Engineering

Festival, according to the White House Office of Science and Technology.

How To Win a Grant

In October, the **Wright Memorial Chapter** in Ohio sponsored two grant-writing workshops, guiding teachers in applying for AFA Educator Grants.

The grants promote aerospace education in K-12 classrooms by providing up to \$250 per academic year for activities that otherwise go unfunded.

"The grant process is competitive," explained Chapter Executive VP Shiela Wallace, and teachers are "terrified" of having to apply for one. Wallace, a retired elementary schoolteacher, said,

"I've seen people cry, I've seen people get sick, I've seen people get hives" when their school principal asks them to apply for a grant.

The Wright Chapter tackles this problem through its Educators Action Team: Wallace and chapter members Julie Livingston, a junior high school librarian, and Sharon M. Murner, a retired teacher. The team conducts grant workshops several times a year.

The attendees show up, armed with catalogues, state standards of learning, and other information. They open an AFA grant application online, and the Wright team takes them through it step by step. Visualize what the judges are looking for, they tell the teachers.

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They also proofread the applications. At the workshop's end, the teachers can hit the "submit" button and send in the form.

Fifty educators from public, private, charter, and parochial schools in eight counties attended the October workshops, one conducted on a Friday night and the second one held the next day. Ohio State President Kent D. Owsley and Chapter President Jeff A. Liffick were on hand to welcome the teachers.

The Educators Action Team's two other workshops this year took place in February—in conjunction with Dayton's family oriented technology festival—and in April. The October classes took place at Wright-Patterson Air Force Base.

Do they have an impact? The list for 2010 shows that AFA awarded Educator Grants to 17 Ohio teachers. Only Florida, with 30 recipients, secured more of the total 115 grants that AFA offered.

Wallace said the Ohio workshops have two secrets to success. First, they instill confidence in the teachers' ability to write grants. The second key lies in the application's last question. It asks for any information that might help the judges make up their minds. Here's where the teachers should pull out all the stops, Wallace tells them. "Yank on the judges' heart strings."

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Leadership Training for Cadets

The Mountaineer Cadet Officer Leadership School, founded by a **Chuck Yeager Chapter** member in West Virginia, noted its 10th anniversary this summer.

Conducted for six days in June at Concord University in Athens, W.Va., MCOLS 2010 trained more than 180 students from five states in leadership skills.

When David F. Slaughter organized the first MCOLS in 2001, some 50 cadets enrolled. Slaughter now belongs to the **Gen. Bruce K. Holloway Chapter** in Tennessee.

Retired Lt. Col. Elizabeth L. Lassiter, the senior aerospace science instructor at Monticello High School, Charlottesville, Va., and a **William A. Jones III Chapter** member, served as MCOLS commandant this year.

The Yeager Chapter provided all plaques and trophies, and Chapter President Ira S. Latimer Jr. and Herman N. Nicely II, secretary and treasurer, attended the culmination pass in review and graduation to hand out the awards.

Cadets received honors in nine categories, encompassing everything from academic achievement to best room inspection. The students from E. C. Glass High School in Lynchburg, Va., took home the most hardware: Samuel Crawford for best in personal inspection; Chelsey Cash, best in female physical fitness; and Jordan Moshkowski, outstanding cadre cadet.

Stepping Up for Honor Flight

With coordination by **Red Tail Memorial Chapter** members, the program called Honor Flight flew 102 veterans from Ocala, Fla., to Washington, D.C., in October.

Honor Flight is a nonprofit group based in Springfield, Ohio. It has been bringing veterans to the Nation's Capital to visit the World War II Memorial since 2005.

Red Tail Chapter President Michael H. Emig led the Ocala Honor Flight effort, raising \$65,000. Chapter member Morrey M. Deen chaired the local committee. Other chapter members helping out were Jennifer Deen and Leah R. Fletcher. US Rep. Clifford Stearns (R-Fla.) lent his support.

Emig had lined up some 30 volunteers and medical staff for the trip, but his group included 40 people in wheelchairs. So he asked Kevin R. Lewis, external affairs VP for the **Donald W. Steele Sr. Memorial Chapter (Va.)**, to find more volunteers in Washington to move the guests from place to place. Destinations included the Air Force Memorial and Arlington National Cemetery.

"The Steele Chapter got the easy task," Lewis said. Within days, he had 14 volunteers, including fellow chapter member John Kiecana.

Emig asked other area AFA chapters for volunteers, too: the **York-Lancaster Chapter** in Pennsylvania, the **Nation's Capital Chapter** in D.C., and from Maryland, the **Thomas W. Anthony Chapter** and the **Baltimore Chapter**.

It wasn't the first time the Steele Chapter came through for the vets. Last year, Emig organized a similar Honor Flight. At the last minute, however, the escorts bowed out. Emig issued a desperate call to action to contacts in the area, including the Steele Chapter. Then, as now, Lewis led the chapter's response, and in the end, the Florida veterans were greeted by some 40 volunteers, including Stearns, who welcomed the group again this year at the World War II Memorial.

Air Force Birthday

The **Tennessee Valley Chapter** in Alabama hosted a birthday celebration in September, to mark 63 years since the establishment of the Department of the Air Force.

Retired Maj. Gen. Robert Chedister, commander of Air Armament Center at Eglin AFB, Fla., from 2003 until 2006, was guest speaker. He covered some USAF history and, in particular, aviation in Alabama. It turns out, Wilbur Wright personally chose the warmer climate of Montgomery, Ala., as the site for the nation's first civilian flight school. The school operated from March to May 1910, before returning to the Wright brothers' hometown area, Dayton, Ohio.



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The chapter birthday celebration included awards presentations. The inaugural Outstanding Airman of North Alabama award went to SSgt. Bruce M. Evans, 280th Combat Communications Squadron (ANG). An infrastructure technician, Evans is deployed, so Chapter President Frederick Driesbach presented the award to Evans' wife, Amanda, and son, Caleb. The SNCO Outstanding Airman Award went to MSgt. Matthew D. Strube, flight chief in the Sensor Analysis Division at the Missile and Space Intelligence Center, Redstone Arsenal, Ala.

Chapter Education VP John R. Phillip presented the Teacher of the Year award to Sonya Hester, a kindergarten

teacher from Boaz (Ala.) Elementary School. AFJROTC scholarship winners and the Huntsville High School AFJROTC *CyberPatriot II* team also received honors. The team had reached the semifinals in AFA's national cyber defense competition in 2009.

More Chapter News

■ Col. Blaine D. Holt spoke at the October luncheon of the **Iron Gate Chapter** in New York City about his assignment as commander of the 376th Air Expeditionary Wing at Transit Center Manas, Kyrgyzstan. Just before he arrived in June 2009, the country's parliament voted to close Manas to the American military (later agreeing to keep it open).

In April, President Kurmanbek Bakiyev was ousted, accused of corruption and election rigging. In June, ethnic rioting erupted in the south. According to Chapter President Frank T. Hayes, Holt led US airmen in providing medical care and humanitarian aid to local residents, working to strengthen partnerships in Manas despite the turbulent year. His account of his assignment in Kyrgyzstan had "everyone on the edge of their seats," commented Hayes. Holt is now a Council on Foreign Relations military fellow.

■ The **Golden Triangle Chapter** in Mississippi hosted an AFA table at Columbus Air Force Base's Retiree Appreciation Day on Sept. 25. The event provided military retirees with information on everything from base agencies and the local community to the Tricare health care system. Chapter President Rick T. Johnson, Treasurer Michael A. Coughlin, and member Jim Prouty manned the table. More than 100 retirees—some from hundreds of miles away, according to a news release—toured the base and had lunch at the Columbus Club.

■ The **Fort Worth Chapter** sent M. N. Dan Heth, AFA Texas VP for the North Area, to the 26th annual POW/MIA Remembrance Ceremony, hosted by cadets of Texas Christian University's AFROTC Det. 845 in Fort Worth, Tex. The cadets performed what Heth called "a stirring flag ceremony" at the base of the university's flagpole, with the entire unit in formation. They presented a US flag to retired Lt. Col. Jerry A. Singleton, who was keynote speaker for the ceremony. Singleton had been a CH-3C pilot, assigned to the 38th Aerospace Rescue and Recovery Squadron, Udorn AB, Thailand, in 1965, when he was shot down. He was a POW in North Vietnam until 1973. He is a member of the Fort Worth Chapter. ■



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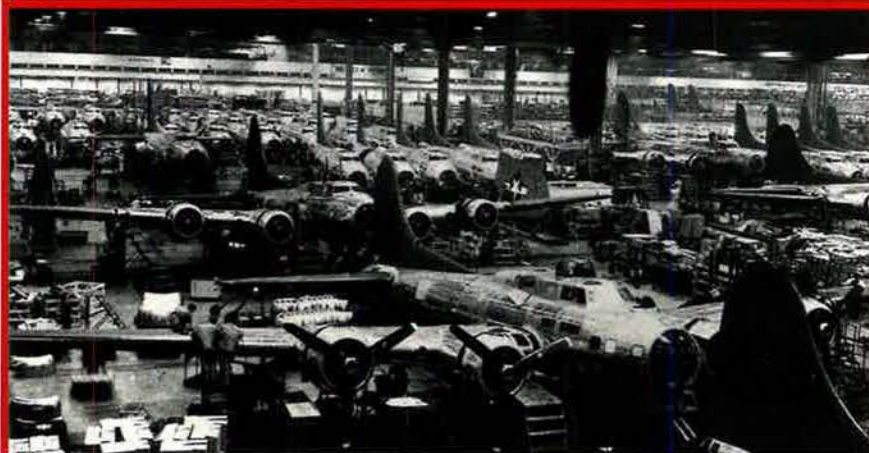
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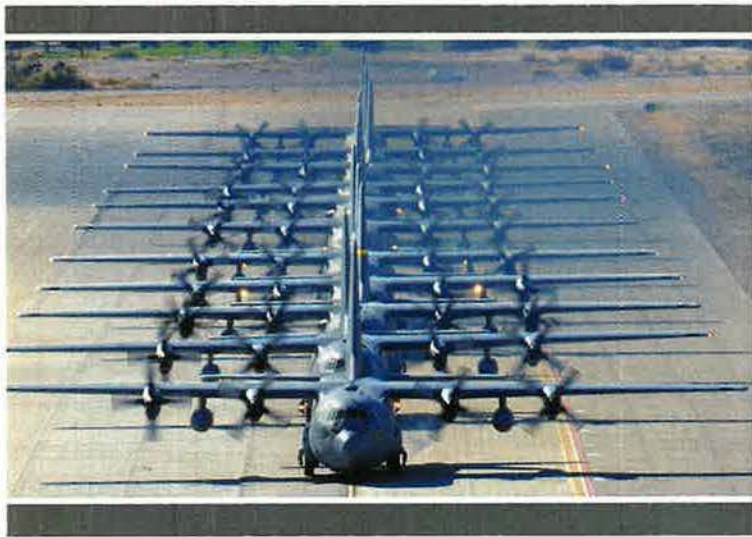
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MiG-17 Fresco



The MiG-17 Fresco was a rarity—an “interim” aircraft that nonetheless went on to have a long and distinguished career in its own right. This Soviet fighter, a bridge between the MiG-15 and MiG-19, was slower than the US fighters that it faced in Vietnam. Still, it proved to be a formidable foe when used within a comprehensive air defense scheme. It was a general-purpose day fighter, but it also saw much action in the role of fighter-bomber.

The MiG-17’s wings were thinner and longer than those of the MiG-15. They featured a sharper compound sweep of 45 degrees at center and 42 degrees outboard. A larger empennage enabled the MiG-17 to maneuver better at higher altitudes. It was also the first Soviet fighter to use an afterburner. Though the MiG-17 used the basic

Klimov VK-1 engine found on the MiG-15, the sleeker design made it faster by 25 mph. While smaller than the USAF F-86 Sabre, the MiG-17 was a comparable performer. Indeed, the MiG-17 went supersonic in February 1950.

The Soviet Union produced more than 6,000 MiG-17s before it stopped building them in 1958. Poland and China, combined, built another 2,000. The Chengdu (Shenyang) J-5 variant set China on the course to producing its own modern jet fighters. Rarely has a fighter been so popular overseas; the developed Fresco served in more than 40 air forces for some three decades.

—Walter J. Boyne

This aircraft: Soviet Air Force MiG-17F—Bort 547 black—as it appeared in 1954 when it was assigned to the 234th Proskuravskiy Fighter Aviation Regiment of Guards at Kubinka AB, Russia.



In Brief

Designed by Mikoyan-Gurevich ★ built in USSR, China, Poland
★ first flight Jan. 13, 1950 ★ crew of one ★ number built, about 8,000
★ **Specific to MiG-17F:** one Klimov VK-1F turbojet engine ★ armament, one 37 mm cannon, two 23 mm cannon ★ load four 190 mm TRS-190 or two 212 mm ARS 212 rockets, two 250-kg bombs
★ max speed 711 mph ★ cruise speed 535 mph ★ max range 900 mi
★ weight (loaded) 11,733 lb ★ span 31 ft 7 in ★ length 36 ft 5 in
★ height 12 ft 5 in.

Famous Fliers

Notables: S. N. Anokhin, A. N. Chernoburov, Vasily Ivanov, Ivan Ivashchenko, Pet' Kazmin, Wu Keming, K. K. Kokkinaki, G. A. Sedov, A. P. Suprun. **Aces:** Nguyen Van Bay, Le Hai, Luu Huy Chao (all North Vietnamese).

Interesting Facts

Became USSR's first missile-armed interceptor ★ shot down USAF RB-50 on July 29, 1953, near Vladivostok ★ in Vietnam, considered by some US pilots as more dangerous than later-model MiG-21 ★ used extensively by Arab air forces in 1956, 1967, 1973 Mideast wars ★ caused death of famous test pilot Ivan Ivashchenko in March 1950 crash ★ suffered “aileron reversal” in early prototypes ★ used engine (VK-1) that was a copy of Rolls Royce Nene ★ carried two external tanks due to fuel inefficiency ★ revealed to public in June 20, 1953, mass fly-by at Tushino ★ used as target drones after onset of obsolescence.



Have Ferry was the second of two MiG-17s that were tested by USAF in 1969. Both fighters were provided to the US by Israel.



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