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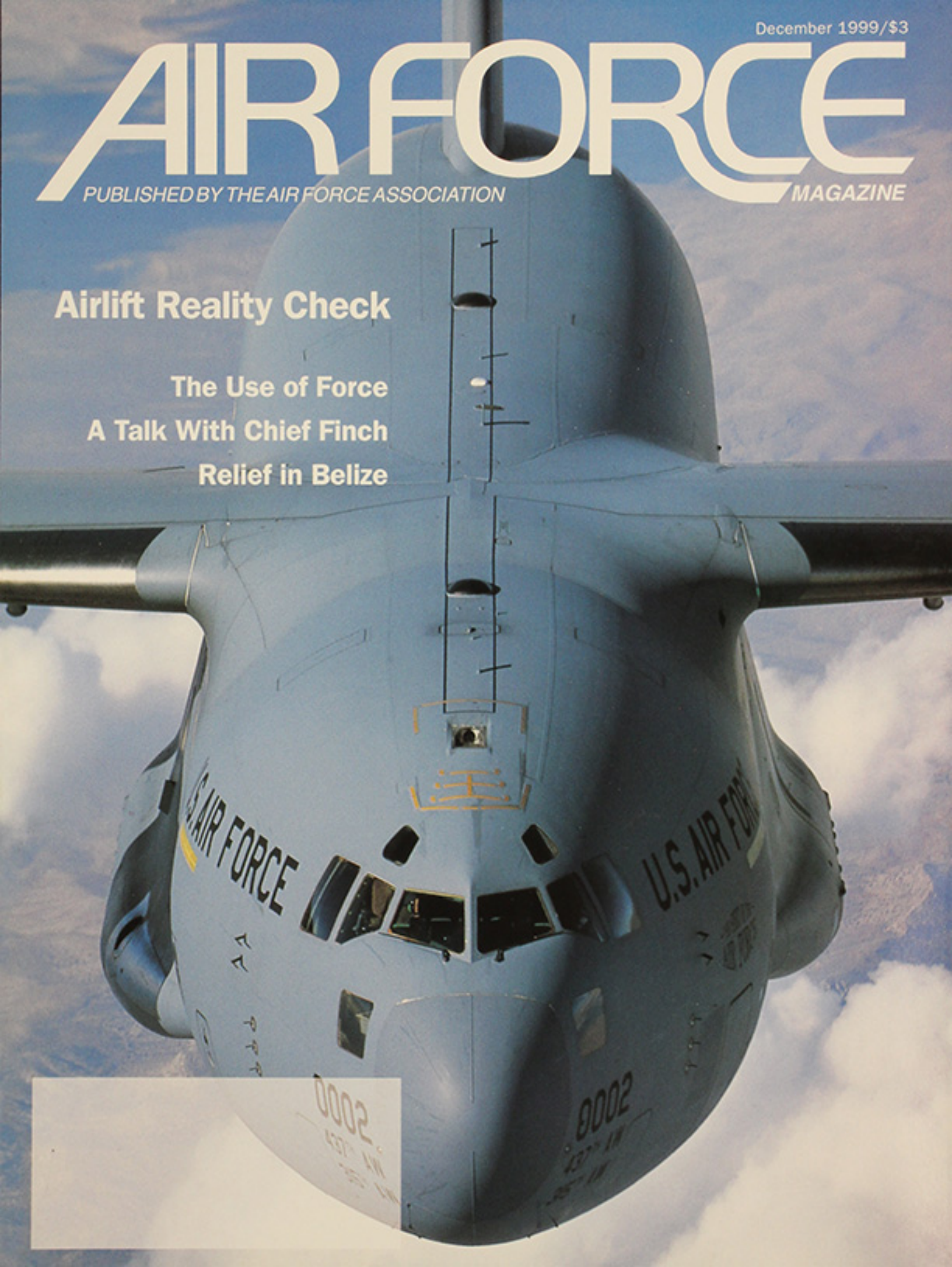
AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

Airlift Reality Check

The Use of Force
A Talk With Chief Finch
Relief in Belize



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About the cover: C-17s, like this one from Charleston AFB, S.C., were part of the USAF airlift and tanker fleet that racked up 7,600 sorties in Allied Force. See "Airlift Reality Check," p. 30. Photo by Ted Carlson.

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By John T. Correll, Editor in Chief

Lessons Drawn and Quartered

You may have thought that airpower—being the only military force engaged—was the decisive element in the Kosovo campaign last spring. If so, you are probably astounded by the theories now in vogue saying that airpower was a failure, or nearly so, and that the outcome was attributable to something else.

It has been almost six months since the conflict ended, and the "Lessons Learned" commentaries have begun to flood the market. Some of the conclusions drawn defy credibility. The attempt to discredit airpower is particularly strange. At a superficial level, it rests on two suppositions, both wrong: that the Serb field army in Kosovo escaped with virtually no damage and that the Serb field army was the primary target.

Western reporters were quick to accept the claim of Gen. Nebojsa Pavkovic, Yugoslav 3rd army commander, that NATO got only 13 of his tanks. (He also says he shot down 47 NATO aircraft.) In actuality, about a third of Pavkovic's tanks, half of his armored personnel carriers, and half of his mortar and artillery pieces were destroyed.

The measure of success for the air campaign was not demolishing tanks, one by one, in Kosovo. The main objective, the only one we had any realistic chance of achieving, was to defeat Serb leader Slobodan Milosevic by attacking strategic targets in Yugoslavia.

It was never feasible for airpower to stop the house-to-house violence by direct attack on the military and police forces intermingled with the civil population. Gen. Michael E. Ryan, Air Force Chief of Staff, acknowledged a "moral imperative to take on the forces in Kosovo," but made a distinction between that and the "strategic imperative."

When the Serbs gave up on June 3, the air campaign was deemed a success. That judgment was soon disputed.

"The reason Slobodan Milosevic finally caved in—a primary reason—was the presence of US Army ground

forces in Albania," said Lt. Gen. John W. Hendrix. His reference was to Task Force Hawk, a brigade-size unit he had commanded. It consisted largely of 24 older-model Apache helicopters.

Pointing to that task force and to the activity of Kosovo Liberation Army irregulars, retired Lt. Gen. Theodore G. Stroup Jr. of the Association of the US Army said, "That is what

So, are we now to believe it was ground power that carried the day in Kosovo?

brought about the negotiated settlement, not the bombing of water supplies, power grids, and Yugo factories."

Task Force Hawk was deployed but not engaged. There is scant evidence that a much-heralded KLA "counteroffensive" had any real effect. Nevertheless, these arguments are finding some acceptance. In September, for example, a five-column headline in the *Washington Post* said, "Land Threat May Have Won War."

By most estimates, a ground invasion required 100,000 to 200,000 troops and several months to prepare and execute. Milosevic knew that as well as we did but supposedly became convinced in late May that NATO was on the verge of cranking up just such an operation.

To buy the Land Threat theory, we must believe that Milosevic was more worried about a ground invasion force that wasn't there—and against which his own dug-in forces could have put up a fight—than he was about NATO airpower, against which he was powerless to retaliate and which was taking apart more of his regime with each passing day. To whose advantage was it for NATO to trade a situation in which it held the asymmetric advantage for one in which it did not?

Airpower is faulted for not stopping the persecution of the Kosovars. It is said that ground troops could have done better. By the time NATO decided to take military action, the Serbs were well along with their atrocities in Kosovo, and almost 250,000 refugees were already on the move.

Suppose, though, that a ground force had deployed and our massed armor had subsequently moved against the Serb armor, artillery, and infantry entrenched in and around the towns and villages. Would the Kosovars, caught in the middle of a vast tank battle, have been better off? Would more of them have returned to their homes afterward? Would the casualties have been worth it?

There was plenty wrong with Operation Allied Force. We lurched into war with no plan that looked beyond the first few days. The politicians micromanaged the target list. Time and again, we revealed our intentions to the enemy. That fumbling approach was no model for future strategies. Even so, the initial judgment was right. The air campaign succeeded.

Airpower has become the force of choice for crisis response. We have moved from an era in which airpower was always the supporting element to one in which, more often than not, we lead with airpower. The Army, stung by criticism for lack of agility, has begun a "comprehensive transformation" to retain its relevance. The strained disparagement of airpower is not unrelated to these developments.

We do not know exactly why Milosevic quit. It was probably for a combination of reasons. A number of forces and factors, including the mounting pressure of world opinion, probably had a bearing on it.

However, Army Gen. Wesley K. Clark, the NATO supreme commander, nailed the central point in his testimony to the Senate in October.

"I think the end result occurred from a variety of factors," he said. "I believe the indispensable condition for all the other factors was the success of the air campaign itself." ■

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Another Look

I was extremely disappointed by Edward N. Luttwak's flippant comment in "Another Look at the Air War That Was" [*October*, p. 39]. According to Luttwak, the Air Force—and the military in general—is misdirecting huge amounts of defense resources and thus wasting his tax dollars because of its focus on air defense suppression and force protection. He felt cheated as a taxpayer when the Army didn't sacrifice its Apache helicopters in the Kosovo conflict. He didn't mention that the way they were to be used was completely outside the Army's employment doctrine and would most likely have resulted in senseless losses. To Luttwak, military members should "kill themselves in the country's interest." Treating highly dedicated men and women like this is a recipe for low morale and battlefield disaster.

Col. Larry A. Smith,
USAF (Ret.)
Colorado Springs, Colo.

On Whit Peters

I have been consistently impressed with the ability of Secretary of the Air Force F. Whitten Peters to grasp not only the broad, complex issues facing our force but also the more subtle and less glamorous subjects our men and women deal with every day. However, after reading his recent comments [*"Whit Peters on the Issues," October*, p. 46] to the Senate Armed Services Committee, I feel that even he is failing to grasp one of the fundamental reasons behind our current retention dilemma.

I think we need to consider an issue that we cannot make adjustments to, legislate more of, or strategize for. America in the late 1990s does not know who its military is, what we are about, or why we are necessary.

Many people no longer put stock in the core values that form the glue of our armed forces. The concepts of honor, duty, country, service before self, etc., are alien to many people, now. We no longer attempt to recruit people by touching their sense of patriotism; today it is all about "what is in

it for me." In an era when the economy is strong and educational opportunities abound, I hear many voices speaking with disdain about the idea of joining the military. I read stories of school boards and parent-teacher organizations that want to keep [military] recruiters out of public schools. On more than one occasion, I have had friends and acquaintances who were stunned when they learned I am a member of the Air Force Reserve.

Without the specter of some great and powerful enemy lurking out there, I think we have lost sight of what we need to protect our country and our way of life from. Service in the military is, in my estimation, one of the highest forms of citizenship in a democracy. Unfortunately, there is no dollar value we can place upon citizenship, no budget to allocate funds for patriotism, and no grand strategy to make our people appreciate what they have.

Perhaps a real and general understanding of all of this will only occur when people have lost their freedom because there are too few of us left to protect it.

SSgt. Christopher L. Winningham,
AFRES
Denver

As an enlisted member in the Air Force—a 17-year master sergeant—I truly appreciate what Secretary Peters has done for our Air Force.

We are winning one battle as pilot retention is getting better. What about the backbone of the Air Force, the NCO corps? What about the training, education, and leadership we give to

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the Air Force? How about enticing us to stay another four years—even past the 20-year mark—with a hefty \$5,000 or \$10,000 or \$20,000 bonus? Are we not worth it?

I realize that this request is too much to even consider, due to the sheer numbers of NCOs. We endure the same optempo as pilots (in some cases more so), the same deployments, the same family sacrifices, and have been involved in the same crises. There are few, if any, bonuses because we are enlisted. I received a whopping \$900 re-enlistment bonus in 1987. Goodness!

It is good to see that the Air Force is taking care of today's airmen with larger bonuses. All of these young people have volunteered to serve our country and [make] the ultimate sacrifice if required. They are sent around the world as peacekeepers to pass out food and restore democracy in less than desirable places, but at the same time they are receiving public assistance and many qualify for food stamps and have incomes below the national poverty level. That is just not acceptable! We are not asking for multithousand dollar bonuses; just please give us equitable pay with the civilian sector so that our overall quality of life improves.

MSgt. Randall James
Langley AFB, Va.

Back to MiG Alley

I thoroughly enjoyed the photo story of the 51st Fighter Wing in the October issue. [*See "Back to MiG Alley," p. 30.*] It is very important for those of us Stateside to remember that we have dedicated men and women living and working on the edge for us, even though we don't see them in the news each day. I especially enjoyed the reference to the history of the wing. My father flew P-40s and P-51s as a member of the 25th Fighter Squadron, 51st Fighter Group, out of Assam [India] and later Kunming, China. That checkerboard tail on the A-10 looks awfully familiar.

Michael D. Tooley
Fayetteville, Ark.

More Lessons

In the October issue, 1st Lt. Robert

B. Riegel takes issue with your article on Operation Allied Force. [See *Letters: "Lessons, What Lessons?"* p. 4.] That he finds that his operational specialty was perceived as being ignored is not as important (or new) as the assertions and attitudes he conveys concerning space power. I would like to ask the lieutenant what service he thinks he belongs to. Space provides us with a better (and more efficient) method to do those things that the Air Force (and Navy and Army) has always needed and done—communication, intelligence, surveillance, and reconnaissance. No one I know doubts the capabilities that US space assets provide. However, if it weren't for space, we'd just have a bunch more airplanes doing those missions, like we used to. Space is an enabling capability, part of airpower. You [lieutenant] are part of the Air Force, or don't you notice that when you put your uniform on?

Maj. Scott W. Poynter,
184th Bomb Wing (ANG)
McConnell AFB, Kan.

[Retired] Lt. Col. [Louis J.] Kapos-ta's letter reflects a Hollywood screen-play view of airpower: Air Force aircraft screaming into the jaws of danger, spraying bullets and dropping ordnance with pinpoint accuracy; computerized missiles and smart bombs controlled via remotely piloted vehicles by personnel hundreds of kilometers away; and the Army, Navy, and Marines relegated to mopping up operations.

When an Air Force F-16 was shot down over Bosnia, it was a Marine helicopter force, flying off nearby Navy ships, which successfully extracted the pilot. It was a team effort!

Our military forces are already dangerously small. The Kosovo operations saw us calling up the reserves and instituting Stop-Loss measures to maintain the operations tempo. Cutting the Army and Navy does not guarantee a larger Air Force. To suggest cutting our military further is suicidal.

Capt. Gregory D. Bova,
USAF (Ret.)
Tucson, Ariz.

Real World 2

I read the two letters on health care in the October issue. [See *"Step Into the Real World,"* p. 6.] I totally agree with what they said. As the wife of a retired Air Force officer living in Austin [Texas] (where we have no military medical facility), finding a health care provider who will take Tricare (I have Tricare Standard) has become increasingly challenging.

Their names drop off the list of Tricare providers daily. I understand Dallas County is void of providers for Tricare. So, why do we have Tricare if no one will accept it?

Marie Martin
Austin, Texas

After reading about how the people responsible for Tricare believe it's working and others stating its problems, I believe a simple solution can be reached. Why don't we apply a 10 percent penalty for any Tricare claims not paid within 30 days by the contractor responsible for the region, to be paid to the government? This, I believe, will speed up processing of claims by the contractors. The fine is to be paid by the contractor and not recouped from the government.

Also the contractor should maintain a certain level of providers for each city/state, based on retiree population. I don't think I should be made to drive 50 to 100 miles just to see a doctor in the network. If they do not meet and maintain this level, they should also be penalized.

Most health care contractors want large profits. So if we strike at their pocketbooks, they will most likely correct issues and problems very quickly.

John Triantafyllou,
USAF (Ret.)
Ogden, Utah

Reconnaissance on the Wing

The RB-47H shot down over the Barents Sea on July 1, 1960, piloted by Capt. Willard Palm, was downed by a MiG-17—not a MiG-19. [See *"Reconnaissance on the Wing,"* October, p. 72.] In numerous flights over the Barents and around Banana Island in the early 1960s, the MiG-17 was the only interceptor type that came out to play with us.

As for the reference to an RB-47D on p. 77, that one leaves me cold. Lockbourne [AFB, Ohio] and Forbes [AFB, Kan.] reconnaissance wings had E, H, and K models and some specifically configured ERBs and TTs. The only D model I am aware of is an XB-47D used for testing.

The sentence on p. 77 stating that the Royal Air Force supplemented the SAC [Strategic Air Command] reconnaissance effort using B-45s is only partially correct. [There were] 107 bomber versions built, assigned to TAC and based at RAF Sculthorpe [UK]. Thirty-three RB-45Cs were built for SAC based on the B-45 bomber, not another RB-45 version, as shown in the table [p. 75].

The first C model was delivered to SAC in August 1950. The Cs were initially assigned to Barksdale [AFB,

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La.), then to Lockbourne. Their function was photo/radar reconnaissance, not Elint. The C model was significantly different from the bomber version. It carried no gunnery, had a solid, rather than glassed-in nose, and most importantly, it had aerial refueling capability.

RAF aircrews checked out in the RB-45C at Barksdale. A three-aircraft detachment of SAC RB-45Cs operated out of Sculthorpe. RAF pilots and navigators maintained their currency in the Sculthorpe SAC rotational aircraft and, on two occasions, took them deep over Soviet territory, sporting RAF markings rather than USAF stars.

Col. Wolfgang W.E. Samuel,
USAF (Ret.)
Fairfax Station, Va.

■ *The RB-47D on p. 77 should have read RB-57D—a typo we didn't catch. You may be right that it was a MiG-17 not a MiG-19 that shot down the RB-45H, but both MiG versions were in use at the time.—THE EDITORS*

On p. 75 the chart of recon aircraft and missions is incomplete in one previously very important category—weather. In the World War II years, the B-17 was used extensively for weather recon, especially across the North Atlantic. At least four WB-26C Invaders were used extensively and daily during the Korean War for both synoptic and tactical weather recce in addition to 20 or more RB-26Cs for photo and [electronic intelligence].

The WB-57, WB-66, [and] RC-135 were at various times in the 1960s and 1970s extensively used for weather recon and tropical storm data gathering.

Incidentally, the Luftwaffe flew, unchallenged, four-engine Dorniers around England and over the Atlantic until nearly the last day of the war in the European theater of operations—this I have on good authority. H. Boley, a meteorologist employed as a civilian forecaster at Fürstenfeldbruck, Germany, in the late 1940s, flew several times a week and never saw an Allied aircraft.

CMSgt. Richard H. Langill,
USAF (Ret.)
Ex-Hurricane Hunter and
TAC Weather Weenie
Plainfield, N.H.

The chart listing piloted long-range reconnaissance aircraft was especially informative, going so far as to list the single EC-97G and the seven RB-69 versions of the Navy's Nep-

tune patrol bomber. I was, however, bemused by the omission of the RF-100A.

North American manufactured six RF-100A aircraft, tail #53-1545 through #53-1548 and #53-1551 through #53-1554. These aircraft, referred to as "Slick Chicks," were an important resource for intelligence agencies and flew covert missions in Europe and the Far East. Tail #53-1548 was lost in a fatal accident at Yokota [AB, Japan] on Jan. 6, 1955, and #53-1551 crashed at Bitburg [AB, Germany] on Jan. 10, 1956. The four remaining RF-100A aircraft continued to serve until Jan. 5, 1961, when they were removed from service. They subsequently served as a source of parts for the Nationalist Chinese F-100As.

Brig. Gen. Arthur Cornelius,
ANG (Ret.)
Valencia, Calif.

During the "meat" of the Vietnam War—when U-2s were taking pics at 80,000 feet, when SR-71s were at 70,000 and Mach 3, when RB-57s were flying [at] 50,000 feet [in the] south, and a few RF-101s may have still been around, again down south—the RF-4 was flying mission after mission over both North and South [Vietnam], but mostly over North [Vietnam]. When mission planners anywhere needed high-resolution quick-pics of northern targets, the RF-4s flew the missions.

Early in the Vietnam War, they were flown, like the article said of other airplanes in other wars, alone and often at night. You might guess that many RF-4s were lost and no one knew where, how, or why. So rescue was a moot issue.

Furthermore, instead of flying at 80,000 feet or Mach 3, they were flying subsonic at speeds and altitudes that would give the best results for photos, infrared, or side looking airborne radar—which is low and slow. These speeds and altitudes were also the best for anything from small arms to SAMs. During the daytime, target lineups would put an RF-4 on a long, straight-line, level run over the target area at subsonic, at low altitude, all meant to maximize photo/sensor take. During the nighttime, target lineups would again be straight line, but at still lower altitudes, popping photo cartridges at regular intervals so any ground defense unit could know where to fire next. The only defense was turning on all jammers and hitting afterburner at the start of the run!

Back at base, the take was run



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through collocated processor systems, interpreted, and sent out to users within hours (sometimes minutes), or a follow-up sortie could be levied immediately.

Hundreds of sorties were flown over Hanoi and the North, as well as Laos, Cambodia, and other areas farther south. I don't have a total as to how many RF-4 guys were killed or MIA, but I'll bet it's more than those lost in SR-71s, U-2s, and RB-57s combined in Vietnam.

I was in the 55th Strategic Reconnaissance Wing in the late 1950s and know intimately what was being done by the RB, ERB, and other special B-47s, and I know they went in harm's way. But it was nothing like an RF-4 night mission, alone, over Hanoi, subsonic, on a long, straight-line run, wings level, low altitude, popping extremely bright photo cartridges at frequent and regular intervals, knowing small arms, AAA, and SAM units knew exactly where you were and where you were going.

R.J. Pejsar,
USAF (Ret.)
Indian Harbor Beach, Fla.

The full unexpurgated story on Cold War air reconnaissance missions is yet to be told. A tantalizing glimpse at this fascinating story was pictured in Boyne's [article]. What is particularly intriguing is his reference to the RAF flying B-45s on these clandestine missions. Could he have meant the Canberra?

I was flying F-86s in Europe in 1952 and came across lots of B-45s and knew they were based at Sculthorpe in England, but I never saw any with the RAF roundel. What I did see on separate occasions were lone aircraft, painted black and without any markings—one a Lancaster and the other a B-29—flying low and westwardly, crossing the Czechoslovakian border.

My squadron wouldn't normally have been anywhere near where these aircraft were sighted except that a few weeks before, a couple of F-84s were shot down by MiG-15s just east of their base at Fürstentfeldbruck near Munich, Germany. Being the nearest ones with the F-86 we were sent from our base in Grost-enquin, France, to Munich to balance out the performance equation with the MiGs.

Sections of four Sabres would patrol up and down the border from dawn to sunset while an equal number of contrails would parallel us to the east. It was all very dull until one very early detail when we sighted a black Lancaster hugging the ground



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Letters

and crossing the border. We informed radar control of our contact and they snapped back: "Negative, there is no radar contact!" We persisted in our call out and radar came back with even more emphasis: "Repeat again, there is no radar contact on any such target!" On another dawn patrol we caught sight of the B-29 with the same refusal to recognize the target and even stronger denial to permit us to take a closer look. We never did get an explanation from our people on the ground, so we pilots just assumed they were traditional spy flights and let the matter drop.

George Fulford
Mill Valley, Calif.

■ *At that time, the RAF did operate some RB-45s.*—THE EDITORS.

Making ABL Possible

Thank you for publishing the informative article on Airborne Lasers. [See "Military Lasers High and Low," September, p. 50.] There is no doubt that this revolutionary system, although started years after every other theater missile defense program, has the chance to be deployed for not only a lower cost but several years

before any other ground-based system.

However, I would like to draw your attention to several points that you inadvertently overlooked that have made the ABL possible. The first is that active duty Air Force officers at Air Force laboratories invented several key ABL technologies:

■ The COIL (Chemical Oxygen-Iodine Laser) device was invented by a team of military officers and civilian researchers led by Maj. Bill McDermott in the 1970s.

■ Adaptive optics technology, which compensates for atmospheric turbulence, was invented by military and civilian researchers led by Bob Fugate in the 1980s.

■ A majority of the seminal acquisition, pointing, and tracking elements were developed and demonstrated in the field for the first time by a team of military and civilian researchers led by Col. John Otten in support of the Airborne Laser program in the 1970s.

The ABL is a superb example of industry taking advances made in USAF laboratories and engineering them into a weapon system. The message is that technology transition from defense laboratories works and that military officers are key to its success.

The second and most important point is that active duty USAF officers are crucial to every phase of the ABL, as well as many other highly technical programs throughout the Air Force. With today's shrinking S&T (Science and Technology) budget in industry and academia, military labs have a greater role in producing the next generation of S&T for tomorrow's weapons. But this cannot be done without technically smart military officers. They serve a key role that is impossible for civilians: It is the presence of the uniform and the proximity to operations that make them extensions of the warfighter.

Yesterday's research that produced stealth, precision weapons, and [the global positioning system] was championed by a cadre of S&T officers that eventually advanced to flag rank. The technically rich environment that produced S&T officers and their promotion path that led to flag rank no longer exists.

Just as the Air Force has aggressively addressed the pilot shortage, the time is now for addressing the careers and future of USAF S&T officers—for they are the key for ensuring USAF's technological dominance.

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Aerospace World

By Peter Grier



MSgt. Joe Butler, LC-130 crew chief, New York Air National Guard's 109th Airlift Wing, checks the cargo aircraft's skis for the unit's Antarctic rescue flight Oct. 16. The wing has flown people and supplies to Arctic and Antarctic outposts since 1975, but this was one of its earliest flights. It had to be warm enough—58 degrees below zero—to risk the trip. (See article below.)

New York ANG Unit Stages Polar Rescue

An aircraft and crew of the New York Air National Guard on Oct. 16 dashed through brutal cold and into the depths of Antarctica to rescue a doctor who had been diagnosed with breast cancer and was stranded there for months.

In a 6.5-hour, 1,680-mile round-trip, the ANG's specially equipped LC-130 aircraft flew from McMurdo Station on the Antarctic coast to the South Pole and back again. The crew and aircraft were from the New York-based 109th Airlift Wing.

"The risk factor was eight or nine out of 10," Maj. Robbie McAllister, the pilot, told the Associated Press. "It was at the limits of the operational ability of the airplane."

The Air Guardsmen retrieved Jerri Nielsen, a physician assigned to a 41-member National Science Foundation research team that spent the winter at the domed Amundsen-Scott South Pole Station. The crew brought in a replacement doctor.

Nielsen had discovered a lump in

her breast some months ago but had to wait for a break in the Antarctic weather before she could leave. Before the crew could attempt the rescue, the temperature had to "warm up" to at least 58 degrees below zero. Otherwise, the airplane's fuel would not flow and hydraulic systems would not function properly while the airplane waited on the ground.

Nielsen returned to the United States for treatment.

"People were just really pleased we were able to get in and get her out," said Col. Graham Pritchard Jr., wing commander.

Crew members were McAllister, the pilot; Maj. David Koltermann, copilot; Lt. Col. Bryan Fennessy, navigator; CMSgt. Michael Cristiano, flight engineer; and SMSgt. Kurt Garrison and TSgt. David Vesper, loadmasters. The medical team included Maj. Kimberly Terpening, flight nurse, and CMSgt. Michael Casatelli and MSgt. Kelly McDowell, medical technicians.

Anthrax Shots Go On

Some National Guard and Reserve

members may quit over the issue, but the military still needs to press ahead with its effort to inoculate the Total Force against anthrax, Pentagon officials told Congress at a Sept. 30 hearing.

The anthrax shots are a defensive necessity, like a flak jacket or helmet, said military leaders.

On the battlefields of the future "if you don't get inoculated you're going to die," Deputy Defense Secretary John J. Hamre told the military personnel subcommittee of the House Armed Services Committee.

The vaccine used by DoD is the same one authorized in 1970 by the US Food and Drug Administration and used ever since by US livestock workers, said Hamre. It is intended to protect against many different anthrax strains.

Internet misinformation and rumor-mongering have alarmed some service members, Hamre said.

"I would admit we have not done a good enough job explaining to all of the people at home," he said.

As of Sept. 30, the program has given shots to more than 340,000 personnel, including 27,000 Guardsmen and Reservists, said officials.

"When they're injected, there are often local side effects that include tenderness, soreness, redness, a lump at the site, fever, muscle aches, and pains," said Lt. Gen. Ronald R. Blanck, surgeon general of the Army.

Some 72 cases of serious side effects have been reported. Of these, government doctors attributed 55 cases to the anthrax vaccine. All 55 of these service members have been returned to full duty.

... But Skepticism Continues

Not all members of Congress are convinced of the anthrax program's claimed benefits.

Rep. Christopher Shays (R-Conn.) estimated that 30 percent of pilots and technicians in some Air National Guard units have quit over the issue, but officials are "unable, or unwilling, to discern a trend," said Shays.

In Memphis, for instance, 22 of the Memphis Air Guard's 50 pilots were

refusing to take the anthrax vaccination as of early October. Thirty-eight other personnel were taking a similar position.

The 60 servicemen "have requested to be released from the unit due to concerns over the anthrax vaccination program," said a Tennessee ANG press release.

Air Force Ends T-3 Flying Program

The Air Force is permanently grounding its T-3A Firefly training airplanes, officials announced Oct. 9. The service's introductory flight training will now be handled by commercial flight schools—a move that will save \$16 million a year in operating costs, according to Air Force estimates.

The move increases the training time for incoming pilots from 40 to 50 hours, while requiring that they earn a private pilot's license before entering the Air Force's undergraduate pilot programs.

The Firefly—a powerful and agile British-made propeller airplane—had been used to screen pilot candidates for the rigors of jet training. But the airplane has been dogged by problems with engine stalling.

The Air Force Academy had suspended use of the Firefly in 1997 after three cadets and three instructors died in crashes over a three-year period.

Congress Expands Arlington Cemetery

The government will expand Arlington National Cemetery by acquiring 45 acres of surrounding land under the terms of a provision contained in this year's defense authorization bill, signed into law by President Clinton in early October.

The national cemetery will acquire the entire 37-acre Navy Annex, as well as eight acres from Ft. Myer, according to the legislation's terms. The land could provide enough space for up to 30,000 more grave sites. Currently about 60,000 sites remain available.

"Now we can preserve for future generations the greatest honor for our greatest heroes, burial at Arlington National Cemetery," said Rep. Bob Stump (R-Ariz.), chairman of the House Veterans' Affairs Committee.

The Navy Annex is to be torn down within 15 years, under the new law. Ten acres of the land may be reserved for a possible National Military Museum.

For the Ft. Myer land to connect to the cemetery, Arlington must also

Fine Print on the F-22 Deal



Under terms of a House-Senate-White House deal on the F-22 fighter, USAF gets to keep its most critical program going for at least another year, but it will also face some new roadblocks.

The compromise defense appropriations bill signed by President Clinton on Oct. 25 contains \$2.5 billion for F-22 work, enough to sustain the fighter through Fiscal 2000.

At the same time, the deal pins the F-22's fate to a series of high-stakes tests. Lawmakers decided (and Clinton agreed) that the F-22 would stay in development and not enter production. This was done to permit more-robust testing of avionics, stealthiness, and weapon delivery systems.

Officials said a decision to begin production of the fighter will hinge on the following:

- Successful flight of an F-22 incorporating sophisticated Block 3.0 avionics software.
- Pentagon certification that the F-22 program met relevant Defense Acquisition Board program exit requirements.
- Submission to Congress by DoD's director of operational test and evaluation of a report on the adequacy of testing.

F-22 critics are particularly insistent on the first point. Rep. Jerry Lewis (R-Calif.), chairman of the House Appropriations Committee's defense subcommittee and leader of the charge against the F-22, said success in this area is "essential" for production.

F-22 backers have some concerns. Software integration can be tricky and difficult. The F-22's integrated avionics, moreover, are revolutionary in complexity and scope.

The fighter's avionics system will have 1.7 million lines of software code, integrated in three blocks. Block 1 focuses on radar capability. Block 2 begins the process of sensor fusion, with some electronic warfare functions. Block 3 brings full sensor fusion and electronic counter-countermeasures.

The Air Force plans to integrate the Block 3 software into a test F-22 in spring 2000.

"Block 3.0 testing is especially significant," Lewis warned in an Oct. 6 statement. "This stage involves very complicated and technical evaluation of the avionics that are basic to the F-22 attaining performance at levels beyond any aircraft in the world."

Testing isn't the only challenge. The compromise deal also cost the Air Force program a big chunk of money.

Congress took \$560 million out of the original \$3 billion budget request. The Air Force now must cut spending elsewhere to make up the difference over the next two years.

Maj. Gen. Claude M. Bolton Jr., the Air Force's top officer for fighter and bomber programs, told *Air Force Magazine* that USAF is at pains to find \$412 million in 2001 and \$148 million in 2002.

"Other programs—and I don't know which, right now—will be impacted," he said.

The cut and other aspects of the compromise mean that the first six F-22s—which will be called "test" aircraft rather than "production" aircraft, though they are essentially identical—will be paid for through incremental funding over three years.

"There should be no program impact," said Robert S. Rearden Jr., Lockheed Martin's top F-22 manager, "as long as the government authorizes and appropriates the required funding."

The fighter program had been in turmoil since midsummer, when a small band of House appropriators, led by Lewis, launched a surprise attack on its production budget. The Senate, led by Sen. Ted Stevens (R-Alaska), eventually forced a compromise generally favorable to the Air Force program.

obtain nearly 10 acres of intervening National Park Service land that surrounds Arlington House, the former home of Confederate Gen. Robert E. Lee.

A Park Service report has recommended the transfer of this parcel. However, environmental groups and local governing bodies have expressed concern about the move, saying they fear a grove of old-growth forest may be cut down to make way for grave sites.

Recruiting Challenge Outlined

Air Force recruiters brought in 32,068 new airmen in Fiscal 1999—the highest annual number since 1992. However, the goal was 33,800, and the Air Force was left just short of its quota.

"There are a lot of opportunities in the civilian sector, and there are a lot of opportunities to go to college," said Lt. Gen. Donald L. Peterson, USAF deputy chief of staff for personnel, during an Oct. 8 visit to Ramstein AB, Germany. "This makes for tough competition."

One of the biggest problems underlying the recruiting challenge is a lack of knowledge about the Air Force and what it has to offer, said USAF's top uniformed personnel officer.

Compared to earlier times, the public has little understanding of the military in general, as only 6 percent of Americans under the age of 65 have worn their country's uniform. Meanwhile, the Air Force has closed 25 percent of its Stateside bases and 65 percent of its overseas bases in recent years.

"There is less of a footprint where people are exposed to the military, which makes for a challenging recruiting environment," said Peterson.

The Air Force plans to spend \$37 million more on advertising this year. Last year's total of four enlistment bonuses has been greatly expanded. Currently the service offers enlistment bonuses for more than 100 different specialty codes.

Greater retention of personnel would also ease some of the pressure on recruiters. The 4.8 percent pay raise approved by Congress will likely make continued service more attractive to many, as could higher promotion rates.

The Air Force recently received authorization to increase its middle and senior noncommissioned officer ranks, noted Peterson.

"The top five enlisted ranks will grow from 48.5 percent of the enlisted force today to 56 percent of the

force by 2003. This will permit the Air Force to maintain needed experience while maintaining reasonable promotion opportunity," said Peterson.

Airlift Crews Get Eye Protection

Air Force Research Laboratory contractors have been testing Laser Eye Protection spectacles on aircrews flying the C-17 Globemaster III out of Charleston AFB, S.C.

The tests are a response to the growing threat of offensive and defensive laser weapons worldwide.

"Our goal is to protect the aircrew from unseen hazards—primarily infrared lasers," said Alex M. Archibald Jr., operational requirements specialist for Litton-The Analytic Sciences Corp.

Possible protection comes in a normal-looking pair of glasses. There have been tests of two types—reflective and dye-based. Reflective spectacles reflect lasers away, as sunglasses protect against the sun's rays. Dye spectacles absorb the light, like a sponge.

Both types have been tested on pilots during ground and taxi operations and while wearing night vision goggles. The point was to iron out any problems before airborne testing.

Testing during flight has already

Senate Delivers Crushing Blow to Clinton's CTB Pact

On Oct. 13, the Senate voted 51–48 to reject a treaty that would ban all underground nuclear tests. It will likely enter the history books as one of the Clinton Administration's most notable policy defeats.

To supporters of the Comprehensive Test Ban Treaty, the Senate's action was a diplomatic faux pas. France, Germany, Britain, Japan, and other allies had urged the Senate to ratify the CTBT as a signal to nations with emerging nuclear programs that more testing—and hence the accumulation of more modern warheads—is unacceptable.

President Clinton, for his part, said the vote illuminated a Senate Republican return to isolationism.

Treaty opponents replied that a permanent test ban would have frozen the US nuclear arsenal at its current level of development while rivals continued to work on new warheads via clandestine tests. Rogues such as North Korea aren't even CTBT signatories, opponents pointed out.

"[The CTBT] won't make any difference to countries who are determined to be part of the nuclear club," said Sen. Richard G. Lugar (R) of Indiana, a staunch internationalist who nevertheless voted against the treaty.

The future safety of the US stockpile was also a big issue in the vote.

CTBT backers said that new computer models ensure that subcritical explosions are all that is needed to determine if warheads are dangerously deteriorating.

Opponents said that tests will always be necessary to properly judge the stability of the nation's nuclear weapons.

The vote does not mean that a test program is set to resume. The US has observed a test moratorium since 1992,

and that will continue for the foreseeable future, said Administration officials.

From 1945 until 1992 the US conducted 1,030 nuclear explosions, according to a nuclear weapons expert. Most were aimed at perfecting new warhead designs.

In recent decades, the US has withdrawn 11 warheads a year from active status for purposes of reliability review. Ten of these were simply examined visually. One was torn apart and its nuclear pit examined for problems.

An environment rich in radiation, plus the natural aging process, can affect everything from the chemical explosives to the glues and plastics used in nuclear weapons, say experts.

Problems have cropped up in the past. Former Secretary of Defense James R. Schlesinger, arguing against the treaty in a Senate hearing, noted that the Polaris warheads of the 1960s suffered from corrosion and had to be refitted.

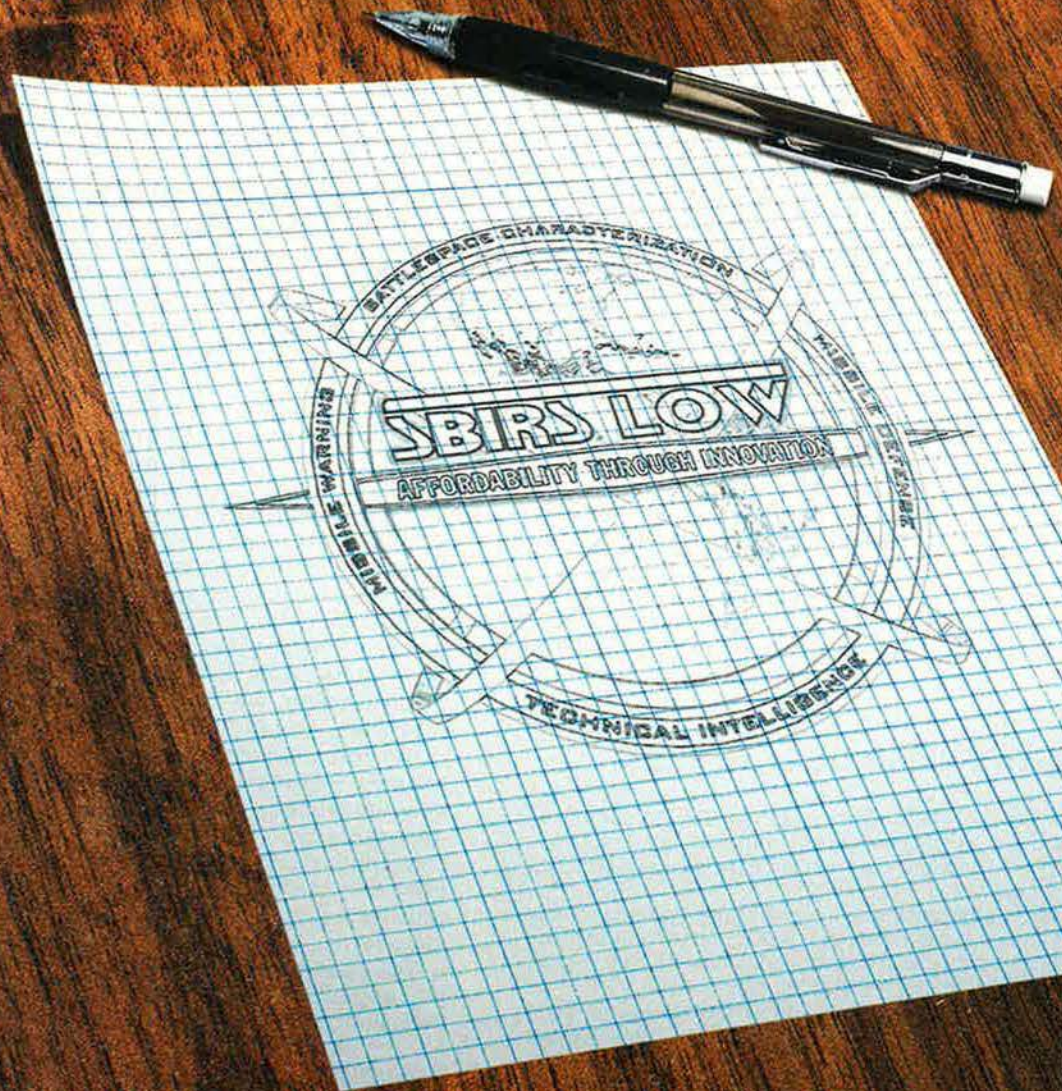
Minuteman ICBM warheads had high-explosives problems.

Schlesinger said that until a few years ago, the US nuclear laboratories opposed a flat test ban and wanted any test pact to allow explosions of a few kilotons for reliability check purposes.

US intelligence can't accurately verify whether China or Russia carries out such low-yield explosions, added treaty opponents. Administration officials rejoined that that's not true—and that anyway, it doesn't matter.

"Would that be militarily significant in terms of undercutting our strategic capability? Our judgment is no," said Secretary of Defense William S. Cohen.

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occurred for C-21, C-130, F-15E, and F-117 aircrews.

"If all the results are favorable, the [Air Force Materiel Command] Life Support [System Program Office] will determine how the lenses can be adapted into visors and glasses to be worn in all USAF aircraft," said Bill R. Ercoline, a retired USAF pilot and lead human factors scientist for the Litton-TASC LEP group.

ABL Team Completes Laser Testing

The Air Force-industry team developing the Airborne Laser missile defense system has successfully completed testing of a laser module that will serve as the technical foundation for flight laser modules.

The TRW-built Flight-weighted Laser Module-3 (FLM-3) exceeded the power and beam quality requirements of the operational ABL system during a four-month test program at TRW's Capistrano Test Site in southern California.

"The FLM-3 test results provide the latest evidence from our extensive ABL test program that the sys-

tem design is solid and that we're on course to put this revolutionary weapon system in the air in 2003," said Col. Michael W. Booen, director of the ABL program.

The success stemmed from changes TRW made in the components that regulate the flow of chemical reactants in the laser module, said officials. That allowed FLM-3 to operate under a full range of operating conditions, from a first shot with a fresh chemical magazine to a last shot from a spent magazine.

Team ABL will now finalize the design for the flight laser modules and begin manufacturing the first of six such components needed for the first 747-based ABL system. Testing is set to begin late next year.

Boeing to Build Eyes in Sky

On Sept. 3, the National Reconnaissance Office announced that Boeing won government approval to proceed with a multiyear, multibillion dollar spy satellite contract.

The move broke Lockheed's 40-year grip on building the nation's "eye-in-the-sky" satellites. "It's a major coup

for us," Boeing President Harry C. Stonecipher said.

Lockheed Martin had challenged the award, but the Pentagon rejected the company's claim, clearing the way for Boeing to proceed with the work, which could be worth as much as \$15 billion, according to industry analysts.

Satellite development begins in the middle of the next decade, said NRO officials.

Reserve to Benefit from Raise in Flying Training Age

The Air Force Reserve undergraduate flying training program will benefit from the recent raising of the age limit for pilot and navigator applicants from 27.5 years to 30 years, say Air Force Reserve Command officials.

"In the past, we've had a number of enlisted aircrew members who worked extremely hard to get their degree and get private flying time while involved in a very high operations tempo for the Reserve," said MSgt. Cynthia Crocker, chief of undergraduate pilot and navigator training at AFRC headquarters. "When they finally met all the requirements for undergraduate flying training, we had to tell them they were too old."

Air Force Chief of Staff Gen. Michael E. Ryan raised the age limit on July 1 to broaden the pool of qualified applicants for both Reserve and active flying training programs. For the Reserve, the change was effective with the recent Fiscal 2000 flying training board.

The age limit applies to when training actually begins, not when the selection board meets, noted Crocker.

U-2 a "Mainstay" of Allied Force

It may be old, but the U-2 was the backbone of US reconnaissance efforts during Operation Allied Force, according to a high-ranking Air Force official.

"We never dropped a bomb on a target without having a U-2 take a look at it," said Maj. Gen. William T. Hobbins, director of operations for US Air Forces in Europe, in a letter to the aircraft's builder, Lockheed Martin.

The U-2 was USAFE's only around-the-clock, all-weather, multi-intelligence capability, according to Hobbins. It flew 189 combat missions and provided 1,300 hours of collection time. Its mission capable rate was 90 percent, said Hobbins.

U-2s collected more than 80 percent of the imagery for Kosovo airstrikes, said the letter.

Ryan's Concerns About USAF Posture

Gen. Michael E. Ryan, Air Force Chief of Staff, testified Oct. 21 before the House Armed Services Committee, relaying concerns about declining readiness, operations tempo, and the Air Force capability to meet the national strategy's two-war requirement. Excerpts:

Erosion of Force Readiness: "Underfunding and loss of skilled personnel and high operations tempo over the past years have contributed to a slow but steady decline in Air Force readiness. ... Readiness is down an additional 5 percent since my last appearance before this committee [in the spring]. ...

"I'm truly concerned about this continued downturn in readiness yet hopeful that we'll see a readiness stabilization as the Fiscal Year 1999 and 2000 budget initiatives and the supplementals ... take effect."

Falling Short of Two-War Needs: "The Air Force, again, is not a two-MTW force, either. Our lift force, many of our special assets, bombers, are not—and tankers and health assets are not—two-Major Theater War capable. They must swing from one to the other.

"But 99 percent of the force is required to go to one or the other in the first 30 days. And that's why our readiness issue has been on the front burner for us for so long. ... I would be very uncomfortable in backing up that strategy."

Few Assets, in High Demand: "In [Allied Force], we used about 40 percent of our ISR [Intelligence, Surveillance, and Reconnaissance] assets. That's about what we planned on using for a Major Theater War. We had the other half, or 60 percent, of them available for worldwide tasking. Every one of our assets, however, because of the worldwide requirement and a Major Theater War, were tasked at surge rate."

Stresses of Allied Force: "Before Allied Force, we were operating from five fixed and four expeditionary bases in Europe. At the end of the buildup, we had moved into 21 more bases, erecting tent cities for thousands, and deploying over 500 aircraft throughout Europe. We flew 11,000 sorties on the airlift side, moving millions of [pounds] of cargo.

"In 78 days of high-intensity combat, we flew over 50 percent of the 38,000 [combat] sorties and dropped almost 90 percent of the 23,000 munitions expended with not a single combat loss. ...

"Allied Force, together with our global commitments, meant that, by percentage of force, we in the Air Force were more heavily tasked [overseas] than at any other time in the last four decades, including Desert Storm."

DoD Chalks Up First Successful NMD Test

The Pentagon is getting better at hitting bullets with bullets. In an Oct. 2 test, the Raytheon-built Exoatmospheric Kill Vehicle anti-missile weapon—a prototype National Missile Defense interceptor—hit a simulated re-entry vehicle launched on a Minuteman II ICBM.

The successful test followed a string of hits by the theater high altitude area defense and Patriot-3 anti-missile systems. It marked the first demonstration of hit-to-kill technology at the speed and range of an ICBM.

The Minuteman was fired from Vandenberg AFB, Calif. The EKV was fired from the Kwajalein missile range in the Pacific, some 4,300 miles away, about 20 minutes later.

The EKV intercepted the target after flying about 230 miles, at an altitude of 140 miles. Its onboard sensors successfully picked out the simulated warhead from a decoy balloon and the Minuteman's third stage.

Then the EKV slammed into its target at a closing speed of 16,000 miles per hour, hitting within 10 percent of the best spot to obliterate the warhead, according to program officials.

Russia reacted negatively to the test, which it said violated the terms of the Anti-Ballistic Missile treaty of 1972.

"Such actions ... effectively lead to the undermining of key provisions in the treaty with all the negative consequences which that entails," said Russian Foreign Ministry spokesman Vladimir Rakhmanin at a news briefing.

US officials have been attempting to begin a discussion with Russia about how the ABM pact might be amended to allow limited defenses capable of handling an attack by North Korea and other rogue states.

But the Kremlin has been adamant about spurning the overtures, saying that the ABM Treaty remains a cornerstone of the world's arms control framework. It has even rejected a US offer to help complete a Russian missile-tracking radar near Irkutsk, Siberia.

"We aren't negotiating any kind of amendments to the ABM," Rakhmanin said.

Air Force Changes Rules for Prospective Pros

Air Force officers with dreams of making it big in professional sports ranks will have to meet new criteria before they can embark on that career.

Previously, prospective pros in the service were allowed to join the Individual Ready Reserve. Officers in the IRR are not required to actively participate with a unit unless recalled by the President.

Effective Oct. 5, officers requesting a separation from active duty to pursue a sports career will be required to serve three years in the active reserves for every one year remaining on an existing active duty commitment.

Before even being considered, they must serve two years of active duty commissioned service and have a binding contract on the regular-season active team roster. The Secretary of the Air Force must approve these waivers.

Only five Air Force officers have been allowed to try for the pro ranks in the past 10 years. The policy came under review because the majority of these individuals did not make a regular-season professional roster.

The best-known Air Force professional sports success story is Chad Hennings, a former A-10 pilot in Desert Storm. Hennings, who was a star on the Air Force Academy football team, is a starting defensive tackle for the NFL's Dallas Cowboys. He

was not one of the five officers who requested a waiver.

Boeing Hires Air Force for C-17 Work

Here's something different: Boeing

has hired the Air Force to work on its own airplanes.

On Sept. 27, Boeing and the service signed a contract that for the first time will allow a private firm to subcontract work on military aircraft to a government depot.

The public-private partnership is part of the Air Force's Flexible Sustainment strategy for maintaining the C-17 Globemaster while it is still in production.

Boeing has overall responsibility for supporting the aircraft, but the company can take advantage of government-owned resources where it sees fit.

Under terms of the new contract, Boeing will steer some upkeep work to Warner Robins Air Logistics Center, Robins AFB, Ga. Beginning next April, Warner Robins ALC will perform C-17 Analytical Condition Inspections, which look for hidden aircraft wear and tear.

"What we're doing is a business test case," said Col. Larry Eriksen, leader of the Support Systems Integrated Product Team at the C-17 System Program Office. "We want to see how we can most wisely use the resources and best practices of the commercial world, combined with those of DoD. In order to do that, we need to join forces somewhat and take advantage of what works best from both environments."

The ACIs will take about 45 days

UCP Changes, Space Command to Guard the Networks

On Oct. 7, Secretary of Defense William S. Cohen announced changes to the Unified Command Plan, bringing the demise of US Atlantic Command, a new emphasis on defending the US homeland against 21st century threats, and the enlargement of US European Command's zone of authority.

US Joint Forces Command has now arisen in the place of Atlantic Command. In making the name change, Pentagon authorities are attempting to hurry along the long-touted transition to a seamless warfighting structure for the US military, with the Army, Navy, and Air Force working jointly as never before.

The new USJFCOM will have a mandate to "accelerate" joint training opportunities, implement joint warfighting lessons learned, and recommend changes to joint doctrine, according to Pentagon officials.

In another change, US Space Command will become the lead military agency for computer network defense. It will assume responsibility for the Arlington, Va.-based Joint Task Force-Computer Network Defense. Operational since 1998, the JTF-CND is the main line of defense for all military information networks. It monitors and attempts to stop cyber intrusions and works closely with other federal agencies.

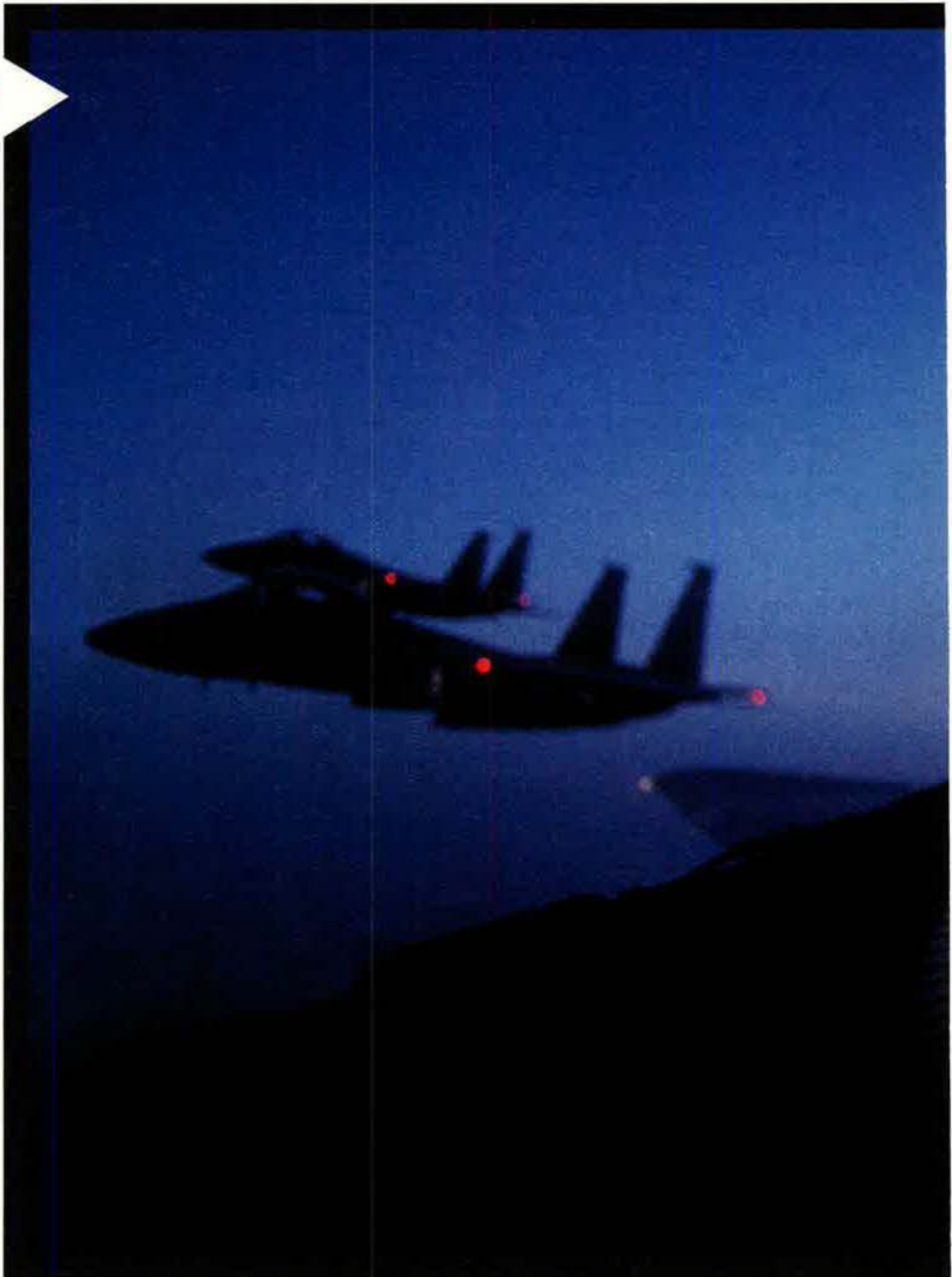
"Space Command has some built-in potential in that regard, in terms of the types of experts they have, both in computers/communications and space assets. And so it was almost a logical fit for them to take on that additional responsibility," said Chairman of the Joint Chiefs of Staff Army Gen. Henry H. Shelton.

Space Command also will eventually be in charge of highly classified offensive computer network attack capabilities.

Finally, the Unified Command Plan changes transfer responsibility for the waters off the east coast of Africa from Pacific Command to European Command. Likewise, charge for the coastal waters off western Europe and Africa's west coast will move from the former Atlantic Command to European Command.

Air Combat Mission Systems

Paveway Laser Guided Bombs
Joint Standoff Weapon
EGBU-15
AIM 9X, AIM 9M Sidewinder
AMRAAM
HARM, HARM Targeting System
Maverick
ALE-50 Decoy
ALQ-184 Jammer Series
F-15: APG-63/70/63(v)1 Radars
F-16: MMC, EEFC Computer
F/A-18: ALR-67(v)3 Radar
Warning Receiver
F-117: IRADS Targeting System
F-22: APG-77 Radar (JV) and
Common Integrated Processor (CIP)
Joint Strike Fighter
B-2: APQ-181 Radar
AC-130 Gunship: FLIR and
Fire Control Radar
CV-22: Radar and Infrared Systems
Advanced Targeting FLIR (ATFLIR)
U-2: Advanced Synthetic
Aperture Radar
U-2: Senior Year Electro-Optical
Reconnaissance System
Global Hawk
Advanced Surveillance Sensors
Situation Awareness Data Link
(SADL)
Miniaturized Airborne GPS
Receiver (MAGR 2000)





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The Defense Budget Bills at Year's End

President Clinton on Oct. 25 signed Fiscal 2000 defense appropriations legislation into law. The spending bill allocates \$267.7 billion in funds for Defense Department pay, purchases, and operations in Fiscal 2000. That amount exceeds President Clinton's original request for these particular accounts by \$4.5 billion and the Fiscal 1999 bill by \$17.3 billion. Members of Congress termed it the first significant increase in defense appropriations in 14 years.

A companion military construction appropriation bill, passed earlier, provides billions more to the armed services.

The Fiscal 2000 legislation fully funds a 4.8 percent pay raise for military personnel, up from the 4.4 percent requested by the Administration. It adds \$399.2 million over the budget request for recruiting and retention efforts—including a \$110 million pot for aviation continuation pay to alleviate Air Force and Navy pilot shortages.

The bill provides \$53 billion for weapons procurement. Some \$3 billion of this would go for 15 C-17 airlifters and \$2.5 billion for further development of the F-22 fighter. (See box on p. 11.) Congress granted \$36 million for advanced procurement of more E-8 Joint STARS radar airplanes and \$113 million for 29 Joint Primary Aircraft Training System aircraft. It adds \$275 million so that the Air Force can buy five new F-15 Eagles next year.

Research and development funding, at \$37.6 billion, comes in \$3.2 billion above the White House request. There is \$309 million for the Airborne Laser program and \$109 million for upgrades to the bomber fleet, including \$95.9 million for B-2 data link and weapons upgrades, \$5 million for the B-1 for conventional bomb modules, and \$8 million for B-52 upgrades.

At \$92.2 billion, operations and maintenance spending came in \$1 billion over the Clinton budget outline. Of this, an extra \$289 million was added to spare parts and war reserve

material accounts and \$222 million for depot maintenance.

In their conference report, appropriators also included language calling for the Pentagon to produce a detailed report on how it will expand and maintain its fleet of low-density, high-demand aircraft, such as the U-2, E-3 Airborne Warning and Control System, and Joint STARS.

The companion defense authorization bill for next year received President Clinton's signature Oct. 5. This bill, which essentially sets policy and spending guidelines, also gave assent to the 4.8 percent raise next year—the largest such increase in military compensation in nearly two decades, officials said.

"We have to recruit and retain the best people and provide them with a sound quality of life if we're going to remain a dominant force for good for the future," said Secretary of Defense William S. Cohen at the bill's Pentagon signing ceremony.

The legislation also makes significant changes in the military retirement program. Under the authorization bill, those who joined the military

after September 1986 have a choice:

- Accept a one-time bonus of \$30,000 after 15 years of service and remain in the current retirement system, which will pay 40 percent of base pay (and approximately one-fourth of total pay and allowances) upon separation at 20 years.

- Transfer into the more generous pre-1986 system, which will provide them 50 percent of base pay (and approximately one-third of total pay and allowances) after 20 years of service.

Under the authorization legislation, Air Force end strength will shrink again from 1999's 370,882 to 360,877.

The military's Tricare health system will see some change, with lawmakers directing the Pentagon to implement General Accounting Office-recommended improvements to Tricare's claims processing system.



Staff photo by Guy Aceto



Air Force Academy quarterback Mike Thiessen dashes for yardage on the way to a 19-14 win over Navy in October at Redskins Stadium in Landover, Md. The USAFA team then clinched the Commander in Chief's Trophy for the third year in a row by beating Army 28-0 on Nov. 6.

apiece. Boeing currently performs such inspection work at its commercial depot site in San Antonio.

Next year may see a second such contract, this time between Boeing and the Ogden ALC, Hill AFB, Utah. That agreement would cover landing gear, brakes, and wheels.

It would "involve much more support equipment and training than the inspections and [would] actually involve some repair work," said Eriksen.

F119 Engine Certified as F-22 Power Plant

Pratt & Whitney's F119-PW-100 engine has been certified to power the F-22 Raptor through its full flight envelope. Meeting Full Flight Release criteria means that the F119 is well on its way to completion of Engineering and Manufacturing Development.

Meeting FFR affirms that the power plant has demonstrated a durability



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When all the scores are tallied, the best get the highest grades. TRW's outstanding performance earned the ESD/SR Program Office Award for Excellence on the Command Center Processing and Display System— Replacement (CCPDS-R). It's this kind of performance that gave the Air Force the confidence to entrust TRW with Total System Performance Responsibility for the nation's ICBM forces - a confidence and trust TRW earns each and every day.

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TRW's team for ISC2 is A+.

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Where Performance Counts

of at least half its expected hot section life of 1,000 engine flight hours and 2,150 total accumulated cycles. As of Sept. 30, P&W F119s had logged more than 384 flight test hours and a total engine run time in excess of 10,000 hours.

"As the second of four EMD milestones, achieving FFR is an essential step toward our ultimate goal of having the engine released for production," said Tom Farmer, P&W's F119/F-22 program manager.

Final Countdown for Old Launch Towers

Final countdown for two huge launch towers at Space Launch Complex 41, Cape Canaveral AS, Fla., came on Oct. 14. After a crowd of hundreds joined in yelling the words "Blasting into the future," explosives leveled the 5-million-pound Mobile Service Tower and the 2-million-pound Umbilical Tower.

The job was done in about 20 seconds.

Lockheed Martin Astronautics razed the towers—site of 27 Titan III and IV launches—to make way for construction of a new Atlas V launch complex.

Lockheed Martin Astronautics is developing the Atlas V family of more efficient, lower cost rockets in cooperation with the US Air Force Evolved Expendable Launch Vehicle program.

In October 1998, the Air Force awarded the company contracts valued at \$1.15 billion to complete development of the Atlas V and provide launch services for nine missions.

Army Probes Alleged Korean War Massacre

The Army has begun an investigation into allegations that US soldiers gunned down hundreds of civilian refugees under a South Korean bridge nearly 50 years ago.

The probe was spurred primarily by recent press reports on the alleged incident at No Gun Ri (or Nokuen-Ri) in South Korea. Subsequently, there have been reports of similar events in other locations.

The Pentagon's primary responsibility right now will be the No Gun Ri investigation, stated Defense Department spokesman Kenneth Bacon on Nov. 2. "Then we will look at the evidence of others and weigh that."

Persistent questions about possible liability and compensation have been answered with: "It's premature to talk about all these other issues."

Bacon did say, however, that compensation would be one of the steps to be considered once the facts are determined.

The opening phase of the Korean War was chaotic, Pentagon officials noted. Ill-trained and ill-equipped US troops faced a determined push south by North Korean soldiers.

At the time, US commanders feared North Korean infiltrators who dressed as civilians and hid in groups of refugees, only to turn and fire on defenders once they had passed.

US officials reiterated that a document search showed no trace of the action. The new inquiry into the incident will likely take at least a year, said Army Secretary Louis Caldera.

A Department of Defense steering group, led by Undersecretary for Personnel and Readiness Rudy de Leon, will oversee the Army's effort. On Nov. 2, Defense Secretary William S. Cohen also announced appointment of "seven distinguished Americans, with relevant expertise

outside the Department of Defense, to provide their professional advice on the conduct of the [No Gun Ri] review and on the Army's report."

South Korea is participating in the probe, as well.

News Notes

- Gen. John P. Jumper, head of US Air Forces in Europe, was confirmed by the Senate on Nov. 8 as commander of Air Combat Command, replacing Gen. Ralph E. Eberhart.

- On Oct. 29, the Senate confirmed Eberhart, head of Air Combat Command, to be commander in chief of US Space Command.

- Gen. Richard B. Myers, head of US Space Command, was confirmed Oct. 29 for the post of vice chairman, Joint Chiefs of Staff. Myers replaces Air Force Gen. Joseph W. Ralston.

- Meanwhile, Ralston was confirmed by the Senate on Oct. 29 to succeed Army Gen. Wesley K. Clark as Supreme Allied Commander Eu-

Perry Calls for "Urgent Focus" on North Korean Weapon Program

A high-level review team led by former Secretary of Defense William J. Perry has concluded that the US needs an "urgent focus" on ending North Korea's nuclear and long-range missile programs.

A 1994 pact, the Agreed Framework, has already succeeded in stopping plutonium production at North Korea's Yongbyon facility. But the review team still has serious concerns about the possibility of continued weapons work, according to its report.

Japan has been jolted by a North Korean long-range missile test. China—one of North Korea's few friends—has gained a greater understanding of US concerns about the stability of the Korean peninsula. South Korea has a new government and a new approach to relations with its prickly northern cousin.

"All these factors combine to create a profoundly different landscape than existed in 1994," concludes the North Korea policy review study.

Three facts constrain any US approach to the hermit kingdom of Asia, according to Perry's group.

The first is that the North Korean government shows no sign of either collapsing or opening further to the outside world, despite long-standing Western predictions that its policy of radical self-reliance is ultimately doomed.

The second is that the US must treat North Korea with caution. The risk of a destructive war involving untold casualties remains too great for anything but prudent and patient moves.

The third is that the US must attempt to supplement the 1994 Agreed Framework, not replace it. "Unfreezing Yongbyon remains the North's quickest and surest path to nuclear weapons," points out the newly released study.

A two-track strategy may thus now be the best approach to dealing with North Korea, according to Perry's group.

Under the preferable scenario, the US, its allies, and the North Koreans would work out complete and verifiable assurances that Pyongyang has no nuclear weapons program at any facility and that it will cease development, testing, or sales of threatening missiles. In return, North Korea would receive step-by-step relaxation of sanctions and an eventual normalization of relations.

If North Korea rejects this first track, the US and its allies may need to adopt a second approach and try to contain Pyongyang, according to the Perry report, while keeping the Agreed Framework intact.

Negotiators would "have to take firm but measured steps to persuade [North Korea] that it should return to the first path and avoid destabilizing the security situation in the region," concludes the Perry report.

rope. On Nov. 3, NATO officially appointed Ralston to the post, effective May 2000. Currently vice chairman of the Joint Chiefs, Ralston has also served as head of Air Combat Command.

■ Anti-nerve agent pills given to troops during the Gulf War cannot be ruled out as a possible cause for some of the illnesses veterans of the war have reported, according to a new study by RAND. Pyridostigmine bromide was administered to an estimated 250,000 troops because it's the only medication known to be effective against the nerve gas soman.

■ Air Force Recruiting Service finished Fiscal 1999 some 5 percent short of its active duty recruiting goal. It marks only the ninth time in 44 years of record keeping that the Air Force has not met its recruiting needs.

■ US Air Force airlifters began ferrying an elite Thai peacekeeping force into troubled East Timor on Oct. 4. The troops were flown out of Don Muang RTAB, Thailand, on a variety of aircraft, including a C-141 from McGuire AFB, N.J., and a C-5 from Travis AFB, Calif.

Curtain Down on "Valor"

In February 1983, *Air Force Magazine* began a series of one-page stories about Air Force heroes. We called the new series "Valor." It ran monthly and was enormously popular from the start.

By the time the fourth "Valor" story was published in May 1983, we had recruited Col. John L. Frisbee, USAF (Ret.), a former editor of *Air Force Magazine*, to take over as the regular author. He has written all of the episodes that have appeared since then. At the request of the editors, he also rewrote the first three stories to produce a complete "Valor" set under his authorship.

The last original "Valor" story was published in September 1998. We have been running reprints since then. The series makes its 197th and final appearance in *Air Force Magazine* this month, coinciding with John Frisbee's 83rd birthday.

All of the "Valor" stories—the 176 Frisbee originals, the three non-Frisbee episodes, and the reprints, some of which contain slight modifications or corrections—are a permanent part of the *Air Force Magazine* section of the Air Force Association Web site (www.afa.org).

This is the most extensive body of work anywhere in the world on heroism in the US Air Force and its predecessor organizations. Nothing else comes close, and it's doubtful that anything else ever will.

■ A catastrophic failure in the high-pressure turbine assembly caused the crash of an F-16 from the 523rd Fighter Squadron, Cannon AFB, N.M., on July 12, according to a just-released accident board report. The assembly failed when two blades separated due to material fatigue.

■ On Oct. 6, contractors imploded

the first of 150 Minuteman III silos in eastern North Dakota to be destroyed under the terms of the Strategic Arms Reduction Treaty I. Some 100 spectators watched 750 pounds of an ammonium nitrate-fuel oil mixture turn a Cold War-era icon into a pile of rubble.

■ The Air Force took delivery of its first WC-130J on Oct. 12. The aircraft, a special weather reconnaissance version of the Lockheed Martin C-130J, is assigned to AFRC's 53rd Weather Reconnaissance Squadron at Keesler AFB, Miss. Six more are scheduled to be delivered this year, with an additional three coming in 2000.

■ The life stories of veterans now living at the Armed Forces Retirement Home are profiled at a new "Home for Heroes" Web site maintained by the American Forces Information Service. The home is actually two facilities—the US Soldiers' and Airmen's Home in Washington and the US Naval Home in Gulfport, Miss. The site address is <http://www.defenselink.mil/specials/heroes/>.

■ On Oct. 4, the Kelly Field Heritage Foundation unveiled a statue at Kelly AFB, Texas, honoring the many women whose dedicated efforts made the facility a bastion of the war effort during World War II. Some 10,000 of these "Kelly Katies" filled the jobs of aircraft repairmen who went to war, said base officials.

■ Forty-three Air Force bases and more than 400 people competed in the Air Force Supply and Fuels Readiness Competition at Davis-Monthan AFB, Ariz., Oct. 6–8. Altus AFB, Okla., was the Supply and Fuels Competition Champion Team at the "Roadeo."

■ Raytheon has delivered the first operational Global Positioning Sys-

Senior Staff Changes

RETIREMENT: Lt. Gen. Charles H. Roadman II.

NOMINATIONS: To be **General:** Gregory S. Martin. To be **Major General:** Thomas J. Fiscus. To be **Lieutenant General:** Bruce A. Carlson, Stephen B. Plummer, Norton A. Schwartz.

PROMOTIONS: To ANG **Major General:** Harold A. Cross, Daniel James III, Paul J. Sullivan. To ANG **Brigadier General:** Dwayne A. Alons, Richard W. Ash, Myron G. Ashcraft, George J. Canelos, James E. Cunningham, Myron N. Dobashi, Juan A. Garcia, John J. Hartnett, Steven R. McCamy, Roger C. Nafziger, George B. Patrick III, Martha T. Rainville, Samuel M. Shiver, Robert W. Sullivan, Gary H. Wilfong. To AFRES **Brigadier General:** Bernard J. Pieczynski.

CHANGES: Lt. Gen. (sel.) Bruce A. Carlson, from Dir., Operational Rqmts., DCS, Air & Space Ops., USAF, Pentagon, to Dir., Force Structure, Resources, and Assessment, Jt. Staff, Pentagon ... Gen. Ralph E. Eberhart, from Cmdr., ACC, Langley AFB, Va., to CINC, NORAD and USSPACECOM, and Cmdr., AFSPC, Peterson AFB, Colo. ... Gen. John P. Jumper, from Cmdr., USAF, Ramstein AB, Germany, to Cmdr., ACC, Langley AFB, Va. ... Gen. (sel.) Gregory S. Martin, from Principal Dep. Asst. SECAF, Acq., Pentagon, to Cmdr., USAF, Ramstein AB, Germany ... Gen. Richard B. Myers, from CINC, NORAD and USSPACECOM, and Cmdr., AFSPC, Peterson AFB, Colo., to Vice Chairman, JCS, Pentagon ... Lt. Gen. (sel.) Stephen B. Plummer, from Dir., Prgms., DCS, P&P, USAF, Pentagon, to Principal Dep. Asst. SECAF, Acq., Pentagon ... Gen. Joseph W. Ralston, from Vice Chairman, JCS, Pentagon, to SACEUR, NATO, SHAPE, Belgium ... Lt. Gen. (sel.) Norton A. Schwartz, from Dir., Strategic Planning, DCS, P&P, USAF, Pentagon, to Dep. CINC, USSOC, MacDill AFB, Fla.

SENIOR EXECUTIVE SERVICE RETIREMENTS: John H. Darrah, Frank F. Pilotte.

SES CHANGES: Steven F. Butler, to Dir., Engineering, Air Armament Center, Eglin AFB, Fla. ... Mario J. Caluda Jr., to Exec. Dir., AAC, Eglin AFB, Fla. ... Herbert C. Carlson Jr., to Chief Scientist, AF Office of Scientific Research, Arlington, Va. ... Lester McFawn, to Dir., P&P, AAC, Eglin AFB, Fla. ... Charles Mangio, to Chief Scientist, Natl. Air Intel. Ctr., AIA, Wright-Patterson AFB, Ohio ... Barbara A. Westgate, to Associate Dir., Prgms., USAF, Pentagon.



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Army Makes Effort to Lighten Up

The US Army will attempt to reshape itself into a lighter, more mobile force that is still capable of outgunning any potential adversary, according to a long-awaited vision statement outlined by new Army Chief of Staff Gen. Eric K. Shinseki on Oct. 12 at the annual convention of the Association of the United States Army.

The Army's plan for the next few decades seemed more oriented toward maintaining its heavy-force status quo. But the experience of Operation Allied Force—in which an Army Apache attack helicopter unit proved so ponderous as to not be useful during actual hostilities—has apparently helped push the service toward greater reforms in its traditional structure.

The next-generation Army will give up its behemoth tanks and drive light but lethal wheeled vehicles, said Shinseki. Highly computerized communications and surveillance gear will increase the units' lethality.

"In the changing world in which we live today, we've got to be able to get to the fight faster," added Secretary of the Army Louis Caldera.

In the most immediate evidence of change, the Army will create two new mobile brigades able to move to the fight anywhere in the world within 96 hours. The new units will be medium forces in the Army's scheme of things—lighter than today's 70-ton M-1 tank-equipped units but laden with more armored vehicles than airborne troops.

The technology to fully equip these brigades may not be available for a decade or more. Wheel and armor technology will have to make major advances to provide the combination of movement and protection that Army leaders want.

"The 70-ton tank is going to be something else," said Lt. Gen. Paul J. Kern, director of the Army Acquisition Corps. What it is going to be, though, "is a bit murky right now."

Plans call for a combat vehicle of about 20 tons that can be carried on a C-130. It should carry an infantry squad while serving as their main gun and be capable of being adapted for use in air defense, field artillery, communications, and other functions.

Use of such a common platform could greatly reduce support requirements. The new vehicle is also supposed to be much more fuel efficient, requiring 95 gallons per day, as opposed to the M-1's 494.

"We're not just looking at the tonnage. We're looking at the entire capability of that system," said Kern.

Gen. Bruce Holloway, Flying Tiger

Gen. Bruce K. Holloway, USAF (Ret.), a veteran of the Flying Tigers of World War II and one of the Air Force's premier postwar leaders, died on Sept. 30 at his Florida home. He was 87.

Holloway graduated from West Point in 1937 and flew for two years with the Army Air Corps. However, his first combat experience came with the American Volunteer Group in China—Claire L. Chennault's Flying Tigers. After the group was activated as the AAF's 23rd Fighter Group, Holloway became one of its mainstays, rising from major to colonel and eventually to group commander.

During his tour in China, he shot down 13 Japanese airplanes, earning status as a fighter ace.

After the war, Holloway became commander of the new Air Force's first jet fighter group. Continuing a steady rise through the ranks, he was named head of US Air Forces in Europe in 1965 and USAF vice chief of staff in 1966. In 1968, he became commander in chief of Strategic Air Command, the post from which he retired in 1972.

tem-guided EGBU-15 glide bomb to the Air Force. The F-15E-carried weapon can be steered to its target via GPS satellite signals or by the aircraft's aircrew.

■ The Air Force introduced an improved recruiting Web site Oct. 18 that is intended to allow viewers to

get a glimpse of the service's past, present, and future. It includes everything from a "boneyard" with view of Air Force aircraft past to links to "microsites" that describe specific career and educational opportunities. The site address is <http://www.airforce.com/>.

■ Planners say they expect a record crowd of over 3,000 for the year 2000 Bataan Memorial Death March at White Sands Missile Range, N.M., on April 16. The 26.2-mile march is a grueling desert exercise which is meant to recognize the sacrifices made by thousands of US and Filipino service members overwhelmed by the Japanese in the Philippine Islands during World War II. "It is a unique tribute to a group of soldiers who made the ultimate sacrifice," said Army Capt. Paul Zeps, Bataan Memorial Death March project officer. ■

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Correction

In November, the obituary on p. 23 for Maj. Gen. Oris B. Johnson noted that Ent AFB, Colo., had changed its name to become Peterson AFB. Ent AFB was a separate facility in Colorado Springs. Thanks to reader Tex Houston for noting the error.

By John A. Tirpak, Senior Editor

The NATO Way of War

The air campaign followed a strategy of gradualism because there was no consensus within the alliance for anything more.



FOR Pentagon officials, Operation Allied Force did not amount to a Major Theater War. Moreover, the US would have pulled out had it been called on to execute the two-

MTW national strategy. Still, the US military ran low on a number of key capabilities needed to conduct the action and could not have conducted the bombing campaign without the direct support of NATO allies, according to the first Department of Defense review of lessons learned in the Balkan conflict.

The quick-look report on Allied Force, presented to Congress in October as a down payment on the full after-action review due at the end of January, offered few new insights into NATO's largest military action ever. Many of the main issues—shortages of electronic jamming and defense-suppression aircraft, the ponderous effort to move the US Army's Task Force Hawk into Albania, and the growing gap in technical capabilities between the US and its NATO allies—had already made headlines in previous months.

What was new in the report was a more elaborate explanation of the factors driving NATO choices about how to conduct the war. NATO has been bitterly criticized for its gradualist approach in trying to coerce Yugoslav President Slobodan Milosevic into abandoning the ethnic cleansing of Kosovo. Moreover, while the review raised important questions about the sufficiency of assets—particularly what have become known as low-density, high-demand systems—the report avoided calling for any large new corrective actions.

William S. Cohen, the Defense

Secretary, and Army Gen. Henry H. Shelton, the Chairman of the Joint Chiefs of Staff, in a joint statement before the Senate Armed Services Committee, said that Allied Force did not constitute an MTW and that the US, "in concert with its allies [must] be able to deter and defeat large-scale, cross-border aggression in two distant theaters in overlapping time frames." However, such a scenario would be attended by "higher levels of risk."

A two-MTW crisis "would be extraordinarily demanding—well beyond that required for Operations Desert Shield/Desert Storm in 1990 and 1991," stated the defense leaders.

Not Enough for Three

"It would involve our complete commitment as a nation and would entail all elements of our Total Force," they noted, including pulling out of Kosovo and swinging the forces employed there to the other conflicts. Cohen asserted, in response to a question, that the US doesn't have "a three-MTW capability. ... This [Kosovo] was nearly a third MTW as far as the air campaign was concerned."

Going into Allied Force, the Pentagon decided to maintain a substantial contingent in the Middle East and beef up its assets in Korea "to discourage leaders in Baghdad and Pyongyang from believing that our focus on Kosovo would present an opportunity to threaten our allies and friends in those important regions," Cohen and Shelton said in their joint statement. Neither country made any significant threatening moves during the conflict, although airstrikes continued to be carried out in Iraq in response to threats against allied aircraft enforcing no-fly zones there.

Cohen told the Senate committee that after-action reports tend to focus on the problems and that "we really shouldn't lose sight of the most important lesson of all: that NATO did, in fact, accomplish its mission and achieve all of its goals in what I would say is a very decisive victory."

Shelton added, "The bottom line: [Allied Force] is the largest combat operation in NATO history; we achieved our military objectives; we were fortunate to come out with no combat casualties; Milosevic's forces are out and we're in, and so the Kosovar Albanians are back at home."

So many pressures were brought to bear—political, military, economic, and so forth—that "we can never be certain about what caused Milosevic to accept NATO's conditions" for an end to the air campaign, stated Cohen and Shelton.

The "mounting damage" to the Serbians, coupled with "Serbia's utter inability to cause any notable damage or casualties to NATO forces, had a major impact on Milosevic's decision."

The two Pentagon leaders also attributed great value to NATO's solidarity, engaging Russia in diplomacy with Serbia, the threat of the Kosovo Liberation Army, economic sanctions, and the buildup of NATO ground combat power in the region, e.g., Task Force Hawk. "These factors all played important roles in the settlement of the crisis," they said.

Army Gen. Wesley K. Clark, Supreme Allied Commander Europe and the commander in chief of the operation, said in separate Senate testimony that the victory over Yugoslavia was the result of "a variety of factors" but that "the indispensable condition for all the other factors was the success of the air campaign itself. ... Everything else hinged on that."

Two Axes of Attack

Clark reported that two axes of attack—strikes against strategic targets principally in Belgrade and strikes against tactical targets in and near Kosovo—were both necessary to the campaign. The bombing of Belgrade—area targets "brought home the pain to Milosevic and his people," while the effort against Serb troops and vehicles in Kosovo pinned them down and constrained their ability to continue with ethnic cleansing.

Cohen also said that the Pentagon had not set a standard for zero casu-

alties in future wars. Casualties were considered "not possible but probable and likely" going into Allied Force, he added.

The fact that NATO needed to obtain and hold a consensus on its strategy required that a more gradualist approach be taken to the operation. Some NATO allies were reluctant to attack anything other than the troops and vehicles actually carrying out the ethnic cleansing of Kosovo, while others insisted that the fastest way to obtain Milosevic's compliance was with a strategic bombing effort on Serb centers of gravity.

USAF Lt. Gen. Michael C. Short, the joint forces air component commander of the operation, said in separate testimony to the Senate Armed Services Committee that, if he'd been free to prosecute the air war as he judged best, "I'd have gone for the head of the snake on the first night. I'd have turned the lights out [in Belgrade] the first night." This would have gotten Milosevic's attention, Short said, and put him on notice that his most valuable national infrastructure and personal sources of power and comfort would be rapidly destroyed.

Short also criticized France for playing "the red card" to remove particular groups of targets from the list to be attacked—some in Belgrade, some in the Yugoslav province of Montenegro, and others. (The red card reference is to soccer, in which a player who receives a red card is thrown out of the game.) Serb military assets in these places enjoyed a refuge and posed a persistent threat to NATO fliers, Short said.


Cohen, however, insisted that the campaign would never have been launched at all—and Milosevic would have gotten away with ethnic cleansing—if demands had been made by some NATO members to pursue anything other than a gradually increasing air campaign.

Cohen and Shelton, in their joint statement, outlined a five-phase NATO approach to the war that had been worked out in the summer of 1998, beginning with air raids and cruise missile strikes, but allowing for a more all-out effort if these failed to produce the desired effects. Early success was anticipated, and some NATO countries doubted more coercion would be needed.

"Although there were expectations on the part of some that this would be a short campaign, we made clear to our allied counterparts that Operation Allied Force could well take weeks or months to succeed and that

the operation should only be initiated if all were willing to persevere until success was achieved," they emphasized. "Alliance leaders agreed in advance that if the initial strikes did not attain NATO's goals, NATO would have to persist and indeed expand its air campaign."

At the NATO summit in Washington in April, the member nations in fact decided to broaden the target



"Although there were expectations on the part of some that this would be a short campaign, we made clear to our allied counterparts that Operation Allied Force could well take weeks or months to succeed."

list by adding military-industrial infrastructure, media, and other strategic targets to the mix.

Cohen Praises Allies

Some in Congress suggested that the US, to bypass the constraints imposed by working within NATO, would have been better off acting alone. Cohen, however, insisted that "without strong, continued cohesion within the alliance, this operation couldn't have gone forward. ... The notion somehow that the United States could have carried out this mission unilaterally is simply not true. We could not have done it."

"Some say that working within the NATO alliance unduly constrained US military forces from getting the job done quickly and effectively," Cohen and Shelton observed in their statement. They acknowledged that it was challenging.

"Gaining consensus among 19 democratic nations is not easy," they added. "It is true that there were differences of opinion within the alliance."

Cohen and Shelton noted, however, that the US was heavily de-

pendent on allied airfields and overflight rights, as well as logistical support and the availability of ground troops for the later Kosovo peacekeeping operations. Commercial air traffic through the region continued throughout the 78-day conflict, despite more than 30,000 combat sorties in a confined airspace. Moreover, the allies contributed about an equal percentage of their air forces to the campaign as the US did, Cohen reported.

Most important was the political and diplomatic support of the allies. Cohen and Shelton claimed that the efforts of the alliance isolated Yugoslavia politically and economically.

The joint statement provided a long laundry list of challenges that made the operation one of the most difficult in memory. These included everything from domestic concerns in the member nations to terrain, weather, and the lack of secure communications gear among all NATO forces. In spite of the sore spots, nearly 50 years of exercises and an integrated command structure paid off, according to Cohen.

He noted that "soon after the conflict began, entire classes of targets were delegated for approval by NATO's military commanders. Only certain sets of targets, such as those in downtown Belgrade, in Montenegro, and those with a high likelihood of civilian casualties, were reviewed by the allied capitals and by higher political authorities."

The operation was also vitally necessary to support important US national interests, Cohen asserted in testimony.

"If NATO as an institution had not responded to this crisis [Serbian ethnic cleansing in Kosovo], it would have meant that the world's most powerful alliance was unwilling to act when confronted with serious threats to common interests on its own doorstep," stated Cohen and Shelton. Having made threats to use substantial force to end Serb atrocities, NATO stood to lose its credibility if it did not make good on them, they argued.

Perhaps as importantly, the Pentagon leaders said that Milosevic was intentionally trying to destabilize the region and that it was necessary to head off a broader conflict that might have drawn in Greece, Turkey, and possibly even Russia.

NATO "stood up to the challenge facing it and succeeded," they said.

Parallel Complications

Despite the successes, the campaign highlighted areas that needed

work, Cohen and Shelton said. "Parallel US and NATO command-and-control structures and systems complicated operational planning and maintenance of unity of command," they noted. More work is needed to polish the order of battle and chain of command, especially for out-of-area, non-Article 5 operations, meaning combat outside NATO's treaty area boundaries and not involving an attack on a member.

Also a key lesson was the widening gap between the technological prowess of the US and its NATO partners. Other members of the alliance lacked standoff jamming gear, night and precision weapons, and secure voice communications. Gen. John P. Jumper, commander of US Air Forces in Europe, said in a written statement for the House Armed Services Committee that this last problem meant many secure communications "were made in the clear." "As a result, sensitive information sometimes fell into enemy hands," he added.

Cohen told the Senate committee, "The gaps in capability ... had the effect of impeding our ability to operate at optimal effectiveness." For example, the Allies had "insufficient air mobility assets [which] slowed deployment of KFOR ground forces [into Kosovo once Milosevic capitulated]."

The NATO nations have met to discuss the technical gaps and have agreed to fix them. The Defense Capabilities Initiative—adopted by NATO at the April 1999 summit—"will enhance allied capabilities in five key areas: deployability and mobility, sustainability and logistics, effective engagement, survivability of forces and infrastructure, and C² and information systems," stated Cohen and Shelton.

The two defense leaders praised the C-17 as the "workhorse of the airlift force," especially its proof of the concept of direct-delivery from Stateside bases to the front of the battle area.

Jumper stated that the C-17 was "the star of the Task Force Hawk deployment." Along with C-130s, C-17s "flew 737 sorties to move more than 7,700 passengers and nearly 23,000 short tons of cargo for the Apache contingent."

Another shortcoming was the fact that while the Pentagon maintains plans for rapidly moving out for a Major Theater War, "it did not have such plans for Operation Allied Force," Cohen and Shelton noted. "The rapidly evolving requirements of Allied Force strained our ability to quickly develop plans for deploying our forces that uti-

lized our lift assets efficiently. We relied heavily on strategic airlift ... while using strategic sealift sparingly."

Ineffective but Worrisome

The Serb air defense system was redundant, mobile, and adaptable, Cohen and Shelton said, and while Serb fighters were quickly put out of commission, the surface-to-air missile threat persisted to the end of the campaign. Constant pressure from Air Force F-16CJ and other defense-suppression assets made the Serb air defense effort ineffective but forced round-the-clock jamming and suppression missions to be flown, taxing the available assets in these areas.

Cohen and Shelton stated that the EA-6B Prowler and RC-135 Rivet Joint aircraft were "employed in numbers roughly equivalent to those anticipated for a Major Theater War and even then were heavily tasked." They called for "innovative and affordable ways" to expand capabilities in standoff jamming but offered no immediate plan.

Adm. Jay L. Johnson, chief of naval operations, said in Senate testimony that there is "an analysis of alternatives" under way to examine "what's after EA-6B" and promised some sort of plan for a new tactical jammer before spring. In the meantime, the Navy is adding funds to its EA-6B budget line to bring on an-

other expeditionary squadron of Prowlers by stepping up a modification program converting airplanes previously in desert storage.

The US Sixth Fleet commander, Vice Adm. Daniel J. Murphy Jr., said, "In the future, our dependence on limited numbers of EA-6B aircraft may be reduced through the increased use of GPS-guided and standoff weapons."

"We looked at the shortages on the ISR [Intelligence, Surveillance, and Reconnaissance] capability," Cohen said. "We need more platforms. More JSTARS [E-8 Joint Surveillance Target Attack Radar Systems], more Rivet Joints. We need greater [numbers of] ... precision guided munitions."

Cohen and Shelton stated that far better air defense systems are now on the market, and "we must acknowledge some concerns for the future." It's likely that the US will face better-armed adversaries in the future, and "we need to prepare for that possibility now."

New munitions played a major role in the success of the air campaign. Jumper noted that "out of more than 9,400 designated target aim points, over 70 percent were struck by precision munitions." Only 20 weapons out of 23,000 bombs and missiles used went astray, he added.

Cohen and Shelton said that the Joint Direct Attack Munition in particular was a huge success—and the only bomb that could be dropped during complete cloud cover.

"We operated under conditions in which there was at least 50 percent cloud cover more than 70 percent of the time," they reported.

Shelton, in direct testimony, noted that the Pentagon "increased the rate of production and, in fact, ended up the operation with more than we started with." A review is under way to assess the weapons used in the campaign—some of which, like JDAM and the Joint Standoff Weapon, were used for the first time in combat—and whether the mix available matches the expected future usage.

Cohen and Shelton stated that the US used nearly all of its tanker capability in the conflict, and the Pentagon is now reviewing options in tanker forces and crew ratios "to determine whether they are sufficient to meet future needs in either Major Theater Wars or other contingencies." (See "Airlift Reality Check," p. 30.)

Efforts are also under way to improve the ability of forces to find con-

"We need more platforms. More JSTARS

[E-8 Joint Surveillance Target Attack

Radar Systems], more Rivet Joints.

We need greater [numbers of] ... precision

guided munitions."



cealed targets and distinguish real targets from decoys, they said.

Task Force Hawk

A sore spot in the Balkans operation was Task Force Hawk, an Army unit of 24 Apache helicopters, force-protection troops, and support personnel mainly airlifted from bases in Germany to Tirana, Albania. Once there, two Apaches were lost in training accidents and two crew members killed.

Cohen and Shelton said the Apache helicopters were meant to aid the air campaign—hampered by poor weather—by attacking mobile targets in Kosovo. They noted that, while Task Force Hawk had recently completed a training cycle, they had been trained for flat desert conditions—not the mountainous terrain of Kosovo.

Shelton explained that, early in the conflict, when cloud cover was hampering the effort to destroy moving ground targets in Kosovo, the Apaches were called for as a means to get low and attack the targets below the clouds. There was heavy risk involved—the Apaches were particularly vulnerable to air defense artillery and shoulder-fired surface-to-air missiles—but it was considered worth the risk to keep up the momentum of air attacks.

"The contributions that the Apaches might make to prosecuting mobile targets in Kosovo were considered potentially worth the risks associated with their use," Cohen and Shelton reported. "As the campaign progressed and the weather improved, the effectiveness of higher-flying, fixed-wing aircraft improved, and the benefits of Apache operations at low altitude were no longer judged to outweigh the risk of their vulnerability to shorter-range air defenses."

More experimentation is needed with similar units, so that in the future such resources can be employed quickly and without taking along "their usual supporting and supported command elements," they noted.

Losses and Successes

NATO lost 15 Unmanned Aerial Vehicles in Allied Force—all to enemy fire—but Cohen and Shelton judged UAVs to have performed very well. "The Army Hunter, Navy Pioneer, and Air Force Predator reflect the state of the art in ground control and mission planning capabilities, airworthiness, and mission payloads," they said. The Air Force Predator was fitted with a laser target designator and actually had des-

igned a target for one strike when the air war ended. The capability will be adapted to other platforms and will be employed more.

UAVs are "designed deliberately to be expendable" and provided invaluable information while sparing the risk of sending aircrews into especially dangerous spots, they said.

High levels of readiness and training were maintained throughout the conflict, Cohen and Shelton asserted in their statement. Losses due to accidents were even "below levels typi-



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cally anticipated in peacetime." However, the reconstitution effort after the war will carry a high price tag, they said. The costs have not yet been fully determined, but the whole operation has forced a review of planning for both peacetime and wartime readiness.

A key lesson learned—and one already well understood even before the conflict—was the need to gain greater access to higher-bandwidth data transfer mechanisms. Innovations such as digital target folders worked well in cutting down both planning and execution times on attacks, but the flow of data has to be better accommodated.

There is also a shortage of personnel to perform language translation and intelligence functions, Cohen and Shelton noted.

Cohen told the SASC in direct testimony to be careful not to draw too many lessons from Allied Force.

"What was successful in this conflict may not be in another," he said. "And so we analyze the Kosovo operation with an eye toward capturing concepts that have broad applicabil-

ity, ones that can apply in many different situations."

Senate panel members asked Clark, NATO Allied Forces Southern Europe Commander Adm. James O. Ellis Jr., and Short to comment on the principal lessons that should be learned and *not* learned from Allied Force.

Clark responded that "when we enter into a campaign—any campaign—we've got to apply decisive force, decisive power as rapidly as possible to secure our objectives. The longer a campaign takes, not only the greater the risk to the people prosecuting [it] but the greater the risks of its expansion, inadvertent consequences, and possibly the loss [of] the campaign." He also advised that greater coordination should be made between the military and the diplomatic fronts and that other kinds of coercion—economic, for example—should be counted among the tools available.

NATO also should not have taken a ground option off the table right at the beginning but instead threatened the use of all its capabilities against Belgrade, according to Clark.

Ellis said his biggest surprise in the conflict was that "there were no surprises." Milosevic used "no asymmetric effort ... either cross-border into the former Yugoslav Republic of Macedonia, any use of missiles or terrorism, or other threats that certainly were within the purview or the capabilities [of Belgrade]."

"They chose not to employ that," he said, but "we may not be able to ensure that [this won't happen] in future efforts." Force-protection initiatives should not be sidelined, he said, simply because the threat did not materialize this time.

Short said he is "very concerned that our allies will learn the wrong lesson" from the air campaign. In Operation Deliberate Force 1994, "we bombed in Bosnia for six weeks and brought the Serbs to the table with no loss of American lives and no loss of American airplanes.

"Now we've done it again. We bombed for 78 days, we lost two airplanes, and no one died [in combat]. I'm terribly concerned that the political leadership of some of our allied countries will believe that airpower is a freebie, that you can do it and no one dies on our side.

"Just to paraphrase what my bosses have said, when this nation chooses to send its young sons and daughters into harm's way we need to do it as best we can and hard as we can and come with everything we've got in the bag." ■

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Airlift Reality Check

Air Mobility Command took the Kosovo operation in stride, but there weren't enough tankers and airlifters to support a second crisis, had it come to that.

By John A. Tirpak, Senior Editor

IN Operation Allied Force, Air Mobility Command did a masterful job, delivering everything US and NATO officials asked, and more. USAF's airlift and aerial tanker fleets logged 7,600 sorties during the deployment and redeployment of NATO's forces, transporting 32,000 passengers and 52,645 tons of equipment. The mobility forces also carried out a major humanitarian relief operation, frequently in the most primitive conditions.

Yet the Balkan air action, for all its successes, also underlined an unpleasant truth: The Air Force simply doesn't have enough airlift to support US forces should they be called on to fight and win two Major Theater Wars in close succession—the benchmark of national strategy. Experts preparing a new Pentagon airlift analysis planned to state this fact plainly, for the record, and to establish a firm requirement for more airlifters.

Some new aircraft already are on the way. The Air Force earlier this decade programmed a C-17 fleet of 120 aircraft. That plan, however, has been overtaken by events. The forthcoming USAF budget plan for 2000–05 contains full funding for 14 additional C-17s plus an unfunded requirement for a 15th.

Allied Force and its aftermath laid bare some critical mobility problems for AMC. One is the vulnerability of transports to shoulder-fired missiles.

Another is the inadequate crew ratio in tankers. Yet another is the difficulty of maintaining the C-5 Galaxy fleet. In USAF's post-conflict reconstitution effort, the C-5 is demonstrating record-low mission capability. Some are demanding improvements or even replacement of the C-5s.

Insufficient Force Structure?

Gen. Charles T. Robertson Jr., the AMC commander who also serves as commander in chief of US Transportation Command, discussed some of these problems in a recent interview with *Air Force Magazine*.

Robertson noted that, at the height of the Balkan War, officials conducted an investigation of whether USAF's airlifters could handle the task of swinging critical elements of the fighting force engaged in one MTW to a distant second MTW, as well as move US-based forces to the second hot spot within required timelines. It couldn't. Robertson said, "We figured it would take us ... eight days longer to swing the force to a second MTW ... than we had previously planned." This finding, the general noted, caused "a bit of a gulp."

Current US national security strategy calls for American forces to be able to fight and win two near-simultaneous MTWs in widely separated parts of the world. Robertson declined to quantify the interval between the two MTWs—the exact figure is classified—but agreed that it's

"something like" the figure of 45 days that has been widely published here and elsewhere. The emergence of the eight-day lag means that only 85 percent of the US force redeployment would be completed by Day 45.

Analysts determined that the airlift deficiency was caused by the operational posture of the airlift force in Europe during Allied Force. Specifically, the fleet of C-17 airlifters was heavily committed to intratheater work, transporting to Albania the US Army's Task Force Hawk—helicopter gunships, tanks, artillery, air-defense missile batteries—rather than providing long-range, intertheater airlift, as principally intended.

The heavy use of the C-17 as an intratheater airlifter in Europe "robbed all the other [Commanders in Chief] of their day-to-day exercise and sustainment capabilities while Kosovo was going on," Robertson noted. The operation "raised their interest level" in the amount of airlifters available, he added, noting that the requirements of the CINCs are a primary driver of the new mobility requirements review.

In recent Congressional hearings, Robertson was asked to spell out how well AMC could carry out the two-MTW requirement. He said the risk is "medium for the first, high for the second. That's unchanged. ... To swing to a second is high risk."

Robertson added that he hasn't been able to determine in hard numbers just where the medium risk becomes high risk or what is the width of that high band of risk. He and the other CINCs have all said "high is unacceptable," added Robertson, and he hopes some relief will come from the new Pentagon study.

Long before Allied Force, Pentagon officials commissioned the new Mobility Requirements Study, called MRS-05, to identify airlift forces needed in the Year 2005. The study was carried out by the Joint Staff and the DoD Program Analysis and Evaluation Office. Plans called for its release this month, but the analysts some time ago had telegraphed its principal conclusion: The US doesn't have enough airlift, and it will have to buy more.

Up a Million

Until now, the US officially had a

Photo by Ted Carlsson



New studies, coupled with recent real-world experience, point up the need for more strategic airlift. The C-17's reliability and austere-field performance suggest a fleet expansion beyond the planned 135 airplanes.



Much of the C-5 fleet is only about 10 years old, meaning an upgrade to fix its many reliability problems might be economically feasible. The C-5 has plenty of airframe life left and is unmatched in its outsize-cargo carrying capacity.

requirement to supply 49.7 million ton-miles per day of airlift capability, and to be able to supply it day after day. The new study was expected to call for increasing the requirement by at least 1 million ton-miles per day. MRS-05 indirectly takes the Balkan conflict into account in calculating the airlift capability needed.

Robertson was aware that more airlift seemed called for. "Does an increase of a million short tons require an increase in [strategic] lift?" he asked. "They think it does. I think it does."

Several real-world factors not considered in previous mobility studies were considered in MRS-05. For example, it takes account of the fact that airlifters generally are not at home bases waiting for an operation to be ordered, as previously assumed. Rather, they are at any given time positioned all over the world and would have to reposition themselves to handle a different operation.

The study also considered what would happen to airlift operations if a mobility base took a direct hit from a weapon of mass destruction, putting a significant fraction of the fleet out of action temporarily or permanently.

The presence of chemical or biological weapons, Robertson noted, also "significantly reduces our ability to use commercial airlift and sealift" to support an operation. The concept of commercial air carrying

some outsize cargo is being assessed. Finally, more realistic assumptions about the actual reliability and availability of airlift are incorporated into the analysis.

The initial runs of the computer models being used to assess the ability of the force to perform to the strategy indicated a requirement for strategic airlift beyond 135 C-17s already in the Air Force plan. Analysts are now looking at the war to see how much the addition of 15 C-17s would affect the shortage. When we get to 135 C-17s, said Robertson, the Air Force probably still won't

have enough to conduct day-to-day peacetime operations.

The Air Force, though it has come up with the money for those 14 new airlifters, is still unable to get full funding for their spares, simulators, and support gear. Costs total \$1 billion for the first 14 airplanes, \$180 million for the 15th.

Boeing has made an unsolicited proposal to produce 60 more C-17s, a move that would defer the end of production from 2003 to 2007. Efficiencies gained from spreading overhead cost over more airframes and from a sharp learning curve would reduce the unit price by 15 percent, Boeing claims. The out-the-door cost of a new C-17 would drop from today's \$198 million to \$149 million by the time the last C-17 came off the line. The last batch would have increased range due to inclusion of new fuel tanks.

The Air Force has not formally responded to the proposal, but there is still interest, Robertson reported. "That offer ... is very attractive." He added that an additional C-17 buy is in the mix of options as to how to fix shortfalls with the C-5, which is losing ground in the fight to uphold mission capability and on-time departure.

Possible alternatives to buying more C-17s include using more commercial airlift and sealift.

"No Squirming"

When the Kosovo operation erupted,



The Civil Reserve Air Fleet is nearly fully subscribed, but a surging market for air cargo is putting pressure on this key backup to the airlift fleet. CRAF was not activated for Kosovo but would have been ready if called on.



Air Mobility Command's tanker assets were nearly "maxed out" for Allied Force. An increase in crew ratio, coupled with allied approval of the avionics changes in the Pacer CRAG update, will alleviate some of the stress on the tanker fleet.

Robertson noted, there was "no squirming" in the Civil Reserve Air Fleet—the group of commercial carriers that agrees to lease aircraft and crews to the government in wartime in exchange for peacetime cargo contracts. They were ready to join the effort, but CRAF was not activated for the conflict. CRAF will be fully subscribed with participants in 2000 and will not have any gaps in aeromedical evacuation, which has long been a problem to fill out.

Robertson warned, though, that policy-makers shouldn't count too heavily on the commercial sector to pick up slack in airlift capability. "There's no excess capacity in commercial lift," he pointed out, noting that the demand for air cargo and delivery services is growing sharply. "We have to be very careful what we promise our customer on a day-to-day basis, as far as commercial augmentation goes, because ... we need to get in line with everyone else who wants it." The situation is "another reason why an organic airlifter is very important in the peacetime equation," he added.

Air Mobility Command managed the Balkan operation without resorting to a massive call-up of the Air National Guard and Air Force Reserve—or even adding substantially more flights per day—but by shifting the way it does its business, according to Col. Larry Strube, director of global readiness at AMC's

Tanker Airlift Control Center at Scott AFB, Ill.

During a normal day, Strube said, AMC runs about 300 missions to support exercises and sustainment operations worldwide. When the magnitude of Allied Force became evident in February, however, AMC decided to cut into the fenced-off missions reserved for training each day—those dedicated to air refueling and normal continuation and upgrade training, Strube said. The "fence" came down on Feb. 18; that freed up, for operational purposes,

about 100 flights per day that would have been used for training.

To avoid building up a maintenance backlog on its aircraft, AMC typically reserves some percentage of each type for necessary maintenance.

With respect to the C-17, Strube said, "We try to schedule 85 percent of the ... aircraft on a daily basis. That's the maximum we'll schedule." Though "there were days when we actually went to 100 percent" of the C-17 fleet, he added. "We have at least managed our aircraft so that we weren't hurting the long-term health of the fleet." As a result, there was no huge maintenance or depot backlog after Allied Force as there was after Desert Storm, when a substantial portion of the airlift fleet was grounded, pending long-deferred maintenance. After Allied Force, "we did not have any major impacts on our depot schedules," Strube reported.

Spares at the Ready

Because of departure reliability problems with some types, AMC sent along maintenance crews and spare parts to Stateside bases to meet aircraft when they arrived to pick up equipment for shipment to Europe. Sometimes, if aircraft were available, a spare aircraft would also be sent. The practices prevented many mission aborts.

Just to move Task Force Hawk, an Army contingent of tanks, ar-



The C-17 can get into all kinds of places that would previously have been off-limits to a big cargo airplane. Without the C-17, Task Force Hawk would never have gotten to Tirana, Albania, before the 78-day Yugoslav conflict ended.

mored vehicles, troops, and Apache attack helicopters from Ramstein AB, Germany, to Tirana, Albania, took 542 C-17 missions involving 24,000 short tons of cargo. The airlift took 30 days, at about 20 missions a day.

Strube said that part of the speed with which the airlift was accomplished was due to the Air Force having converted Tirana from a daylight-only airfield into a 24-hour-a-day air base by deploying a portable microwave landing system there.

Also, the C-17's head-up display and other high-tech gear made the Tirana airlift go more swiftly, Strube said. "The fact that the Air Force spent the money for some high-tech, cosmic systems [on the C-17]," said Strube, "gave us a nighttime precision capability" in very tight spaces in high terrain.

Many criticized the long delay in deploying the Army unit, but many of the missions were limited by the extreme weight of Army gear. The M-1 tank, for example, is so heavy that a C-17 can only airlift one at a time. Allied Force marked the first time the M-1 has been moved by air during hostilities.

In mid-October, the Army announced it would restructure itself to be lighter and more deployable. The move was driven by the fact that the Army "sat out" Allied Force, having been too heavy to get to the action in a timely fashion. In particular, the Army wants to develop a new tank with the capability of the M-1 but at half its weight or less.

"The Army's trying to get lean and lethal," Strube said. "Obviously, if you're ... light, you get more there in a hurry. In this case, the C-17 was the perfect airplane to do this and performed extremely well."

Robertson said, "It did everything ... we asked ... with a 97 percent reliability rate." In moving Task Force Hawk from Germany to Albania, the C-17 was able to land, unload, and take off again in an average of 40 minutes and do it on an austere airfield with lots of small debris posing a great foreign object damage threat.

The capability of the C-17 was "the reason we got Task Force Hawk into Tirana as fast as we did," he said. The 30-day transit period did not seem fast to some critics, but without the C-17, the airlift would



USAF photo by SSgt. Chris Steffen

The austere facilities, short runway, and limited ramp space at Tirana are typical of the conditions the airlift fleet now faces around the world. In Allied Force, the C-17 was pressed into intratheater lift work, causing a strategic airlift shortfall.

have been impossible, Robertson said.

"You cannot get into the Third World nowadays, with these kinds of taxiways and runways, without this kind of capability [found in the C-17]," said Robertson. "The C-5 couldn't do it. The C-141s are going away. The C-130s aren't big enough. So that's a success story for the C-17," he asserted.

During the operation, AMC lost about 2,500 sorties that would have been used for training, Strube said. While some of those training sorties—notably in air refueling—were more than made up by real-world experience, many more, such as upgrade and aircraft commander qualifications, had to be made up later.

After Kosovo, all of AMC reduced its scheduling by roughly 10 percent to get maintenance backlogs caught up as well as to get personnel through missed training sessions. The AMC norm of 300 missions per day was changed; it dropped to about 240 per day, Strube said. Plans called for AMC to be caught up and back to pre-Kosovo scheduling by late November.

Galaxy Woes

The C-5 mission capable rate during the reconstitution period was "down to 56 percent," Robertson reported. It is a figure, he said, that "waters my eyes." Not counting the post-Kosovo downtime, he said,

"We've been using 61 percent as a recent average," which is still markedly below the goal of 75 percent.

Re-engining the entire C-5 fleet to raise mission capable rates and departure reliability to manageable levels would be an expensive proposition. The Pentagon has undertaken an analysis of alternatives to see what mix of repairs, updates, and new airplanes offers the most capability at the lowest cost.

Robertson suggested applying a pass-fail test to a C-5 upgrade "just like we did on the C-17" earlier this decade, when that aircraft had to pass a reliability, availability, and maintainability assessment to win approval for a multiyear contract. In this concept, he said a squadron's worth of 10-year-old C-5Bs would get new engines and other improvements to determine if the upgrade would deliver a worthwhile payback in performance. If it did, a larger-scale refit could be considered.

A huge percentage of AMC's tanker assets—95 percent of regular aircraft and crews and 65 percent of Guard and Reserve tanking capability—was tagged to Operation Allied Force.

With 294 crews and 160 tanker aircraft involved, Allied Force was "the most tanker-intensive operation we've had since Desert Shield and Desert Storm—maybe even bigger than that," Robertson said. Had the order come down to implement an



Nowhere is Total Force practiced as well as in the mobility field. More than 65 percent of the Guard and Reserve tanker capability was used in Allied Force. Had a bigger war been launched, it would have claimed nearly 100 percent of US tanking assets.

even larger deployment of forces to the theater—something Robertson said was imminent when Slobodan Milosevic accepted NATO's terms—virtually all of AMC's tanker assets would have been used, with nearly all Guard and Reserve capability called up.

AMC deliberately tried not to touch tankers at Pacific bases to have them available if a second MTW erupted in Korea, Robertson noted, but even tanker units at Kadena AB, Japan, and Eielson AFB, Alaska, wound up contributing either crews or airplanes.

In fact, AMC had a tighter supply of aircrews than aircraft. The AMC aircrew-to-tanker ratio is normally 1.35 active and 1.27 Guard and Reserve, but NATO commander US Army Gen. Wesley K. Clark insisted on an in-theater ratio of 1.8, "and so we flat ran out of aircrews," Robertson said.

A ratio of 1.56 had been proposed as the new tanker manning level even before Allied Force broke out. Now, "we think our tanker [crew] requirement is valid ... as a result of Kosovo," he added.

C-17s for the Theater

Part and parcel of the MRS-05 study will be another analysis of intratheater lift, Robertson noted, and the C-17 may be more formally designated in this kind of mission.

There were some lessons learned

in Kosovo that did not suggest buying more equipment, Robertson observed. The operation underscored that planning staffs in overseas headquarters have become "pretty lean ... on tanker expertise," due to the pilot drawdown and staff manpower cuts.

The Allied Force Combined Air Operations Center in Vicenza, Italy, initially demanded more tankers than were needed at the time. AMC drafted planners and a "tanker colonel" to go to the CAOC to help the commander "work mobility issues and ... requirements," said Robertson. It was a good lesson, he added.

Another one was putting 12 C-17s under the direct command and control of the CAOC, for missions like airlifting Task Force Hawk. The temporary change in ownership was a "tremendous success story," said Robertson, because it improved the speed at which orders could be transmitted and airplanes moved where they needed to be.

"It's something we're going to have to go back and write into the doctrine, as to how that's done," Robertson said.

However, one lesson does require a substantial infusion of funding which simply isn't available for the foreseeable future. That lesson was the lack of self-defense mechanisms on airlifters operating in or near the combat zone.

"Every day ... there was a lot of talk about airdropping relief sup-

plies to the [ethnic Albanian] refugees who were still in-country" but who had fled their homes in Kosovo, Robertson explained. "We were facing a real dilemma because the threat environment would not allow us to do that. There is no protection for our strat airlifters against [infrared surface-to-air missiles]," particularly those of the shoulder-fired variety, he said.

The problem is being worked, Robertson said, but the solutions are "not cheap." To outfit the entire airlift fleet, including C-130s, with such self-defense mechanisms would cost over \$6 billion, he said. AMC is looking at what's the right number of airplanes to equip.

"We're trying to figure a way ... to find a number that's in the hundreds of millions, rather than billions, and stretch it out," he noted. "There aren't a lot of solutions to the problem." The requirement for self-defense has just been stated, and the Air Force labs and Electronic Systems Center are working on possible answers.

The big lesson is that such systems "will certainly help us operate in areas where we're going to be increasingly restricted from operating," said Robertson.

In the Kosovo operation, newly modified Pacer CRAG KC-135s, which are fitted with new avionics, were not allowed to operate in the European theater without restrictions imposed by the host countries. The airplanes operate traffic collision avoidance systems, weather radar, station-keeping equipment, and other new avionics that NATO nations were worried would interfere with civilian radio-frequency functions.

"We finally got a waiver for single-ship operations" but not the standard formation flights, Robertson noted. He had hoped that the single-ship operations would demonstrate that Pacer CRAG wouldn't have an impact on civilian functions. Worldwide, however, nations are "jealously guarding ... the frequency spectrum," said the general. "They want iron-clad assurances we won't interfere" with anything else in the frequency spectra involved.

Europeans were expected to approve Pacer CRAG for unrestricted operations, but Robertson said, "Our acquisition processes are moving faster than our ability to get host nation approval." ■

Gradual
escalation—
supposedly
dead after
Vietnam—
is staging a
comeback.

The Use of Force

By John T. Correll, Editor in Chief



Caspar Weinberger

BOTH Caspar Weinberger, who was Secretary of Defense in the Reagan Administration, and Gen. Joseph W. Ralston, who is currently vice chairman of the Joint Chiefs of Staff, bring some personal history to the question of when and how US armed forces ought to be used in combat.

Ralston, an F-105 pilot in the Vietnam War, flew 147 combat missions over Laos and North Vietnam. Like other airmen of his generation, he understood firsthand that gradual escalation, a theory devised by Harvard economist Thomas C. Schelling and embraced by the Lyndon Johnson Administration in the 1960s, “was seen as the worst possible way to employ airpower” in the skies of Southeast Asia.

The experience of Vietnam—where more than 47,000 Americans died in a war the nation was not committed to winning—still hung heavily over the armed forces when Weinberger became Secretary of

Defense in 1981. A year later, at the insistence of the State Department, US Marines were deployed to Beirut as an "interpositional force" to form a "presence" between factions in the Lebanese civil war. In October 1983, a terrorist truck bomb exploded at a Marine barracks there, killing 241 Americans who, by the rules of the deployment, were limited in the measures they could take to defend themselves.

In November 1984, Weinberger made headlines around the world with the proclamation of six tests the nation should meet before employing US forces abroad. It was immediately dubbed the Weinberger Doctrine (see box).

He said the troops should not be committed to combat unless a vital national interest was at stake and that if we did go to war, it should be with sufficient force to win. There should be clear military objectives for the forces thus committed, and there should be reasonable expectation of public and Congressional support for the endeavor. The nation should not employ lethal military force until all other choices had been exhausted. The armed forces should not be expended as pawns in a diplomatic chess game.

Secretary of State George P. Shultz and others took exception to Weinberger's declaration, but the troops loved it. Unlike Vietnam, the Gulf War of 1991 followed the Weinberger Doctrine to the letter and was by coincidence the first war the United States had won in many years.

Kosovo and Vietnam

At the Air Force Association Convention this September, Ralston and Weinberger were speakers at a policy forum on the use of force. It included a reassessment of the Weinberger Doctrine in light of developments since 1984, especially Operation Allied Force in the Balkans, which had concluded three months previously.

Weinberger still stands by his doctrine. "I've always thought and always felt that there was a great deal more to the decision to commit troops to action than whether it serves some temporary diplomatic cause or whether it was something that seemed to be necessary because of the political situation at the time."

In his opinion, the operation in Kosovo met the first of his six tests—

a vital national interest was at stake—but none of the others.

"What we did was do pretty much what we had done in Vietnam. We did not go in to win," Weinberger said. "We did not go in to take out the leadership of the country, Serbia, that had caused all of this." In the first few weeks, hobbled by political constraints and limitations, the air operation was "basically ineffective." It did not begin to have much effect until "very much later in the campaign when we decided to go after particular kinds of targets that were much more militarily significant."

Even then, Weinberger said, it "was not the kind of victory that we should have had." Serbian President Slobodan Milosevic was able to "cut a deal" in which "(a) he stayed in power, (b) he could take all of his troops out with all of their equipment, [and] (c) Kosovo was not to be independent."

In the Balkans, "you had a number of failures which in effect tarnished to a very considerable extent and reduced the value of the enormous contribution made by the Air Force and all of the people connected with it," Weinberger said.

Ralston saw similarities with Vietnam, too, but his judgment of the Kosovo operation was different. The Serbs lost a gamble that "their heads would last longer than our fist," and "airpower created the conditions necessary for a diplomatic solution." However, "the air war for Kosovo introduced a new and unique twist to the concept of gradualism," he said.

"By degrees, the air campaign against Serbia resembled more Vietnam than it did the Persian Gulf," Ralston said. "NATO's political leaders wanted to threaten Belgrade, just

The Weinberger Doctrine

In a classic speech on Nov. 28, 1984, Secretary of Defense Caspar Weinberger declared six major tests to be applied when considering the use of US combat forces abroad. He stated his six points—which have become known as the Weinberger Doctrine—as follows:

"First, the United States should not commit forces to combat overseas unless the particular engagement or occasion is deemed vital to our national interest or that of our allies. That emphatically does not mean that we should declare beforehand, as we did with Korea in 1950, that a particular area is outside our strategic perimeter.

"Second, if we decide it is necessary to put combat troops into a given situation, we should do so wholeheartedly, and with the clear intention of winning. If we are unwilling to commit the forces or resources necessary to achieve our objectives, we should not commit them at all. ...

"Third, if we do decide to commit forces to combat overseas, we should have clearly defined political and military objectives. And we should know precisely how our forces can accomplish those clearly defined objectives. And we should have and send the forces needed to do just that. ...

"Fourth, the relationship between our objectives and the forces we have committed—their size, composition, and disposition—must be continually reassessed and adjusted if necessary. Conditions and objectives invariably change during the course of a conflict. When they do change, then so must our combat requirements. ...

"Fifth, before the US commits combat forces abroad, there must be some reasonable assurance we will have the support of the American people and their elected representatives in Congress. ... We cannot fight a battle with the Congress at home while asking our troops to win a war overseas, or, as in the case of Vietnam, in effect asking our troops not to win, but just to be there.

"Finally, the commitment of US forces to combat should be a last resort."

as our political leaders in Washington had hoped to do with Hanoi. Bombing in a series of steps, it was believed, would be the most effective because it would gradually increase the pressure on Milosevic. And just like we did in Vietnam, we actually signaled to him what type targets we would hit.

"The sanctuary of time actually strengthened Milosevic's cat-and-mouse strategy, just as it had Ho Chi Minh's. In both cases, it enabled our opponent to shift resources and consolidate power. In some respects, we further helped Milosevic consolidate power by not targeting, early on, the TV, radio broadcasting, and telecom-

munications capabilities that would have denied him the ability to command his forces and to communicate with his people.”

Making Gradualism Work?

At least four factors were different this time. “North Vietnam was largely an agrarian state that lacked a tangible industrial framework,” whereas Serbia “is a relatively developed industrial society. It possessed industrial capacities that could be disrupted or destroyed,” Ralston said.

Ho Chi Minh had no internal political opposition to worry about. Milosevic did.

North Vietnam drew moral support from many nations critical of the US war effort. By contrast, the weight of world opinion was against Milosevic, who was confronted by “international condemnation he simply could not avoid.”

The Vietnam War was costly to both sides, but in the Kosovo operation the Serbs were unable to inflict reciprocal punishment on NATO.

“The now-famous visual images from Desert Storm, reinforced by even more dramatic successes in Kosovo, PGMs [Precision Guided Munitions], along with space assets, stealth, cruise missiles, electronic countermeasures, and advanced reconnaissance and surveillance platforms, may have added sufficiently strong teeth to make a strategy of gradualism work,” Ralston said.

“In spite of what might indicate the success of a gradualism strategy, US airmen will no doubt continue to maintain that a rapid and massive application of airpower will be more efficient and effective than gradual escalation. I share this belief.

“Yet, when the political and tactical constraints imposed on air leaders are extensive and pervasive—and that trend seems more, rather than less, likely—then gradualism may be perceived as the only option, and whether or not we like it, a measured and steadily increasing use of airpower against an opponent may be one of the options for future war.”

Obligations

If so, Ralston said, it is the obligation of the armed forces to develop and acquire the capabilities to achieve success in such an approach.

From a policy perspective, the

Gulf War was the high-water mark for the Weinberger Doctrine. The Clinton Administration came to office in 1993 with a strong inclination toward looser rules for the use of the armed forces. Within a year, 18 US Rangers died in Somalia in what began as a peacekeeping operation that got out of hand. They had been trying to capture a warlord who was riding around on US aircraft a mere two months later.

In 1995, the Administration announced a new national security strategy of “Engagement” abroad and “Enlargement” of democracy around the world and said that US armed forces would be used to protect not only vital interests but also when “important, but not vital, US interests are threatened.”

Recent years have seen an emphasis on military operations other than war and the frequent use of the armed forces in limited engagements, typically lasting a few hours or a few days and intended more to send political signals than to achieve major military effects.

Weinberger made indirect reference to these operations in his remarks at the AFA Convention, describing them as “things where our national interest was really not involved and yet the troops were used, I’m afraid, more for political effect than for anything else.”

Asked about the nation’s “irreconcilable penchants” for military involvement all around the globe and the concurrent mind-set to avoid casualties, Weinberger said, “I don’t think the American people have this great penchant or passion for deploying troops all over the



Gen. Joseph W. Ralston

world. I think our current leaders do.”

He remains firmly opposed to gradual escalation.

“If you are going to fight a war, you have to fight a war, and I don’t think that you can do [that] with the idea that this week, we will try bombing a few roads, then next week, if that doesn’t work, we’ll try a bridge or two,” he said. “I think if you are going to go [into] a war, you have to intend to win it, and you have to have the forces to win it, and you have to do it from Day 1. I would not want to be [the] one who sent up pilots and told them they must avoid barracks but they can hit ammunition dumps.” ■

A photograph of a tropical landscape. In the foreground, there is a body of water with ripples. The middle ground is dominated by a dense line of palm trees, some leaning over the water. The background shows more palm trees and a clear sky. The overall scene is peaceful and scenic.

Tropical Relief

The small country of Belize, still recovering from a 1998 hurricane that was one of the strongest Atlantic storms on record and that devastated much of Central America, got some much needed medical assistance this summer from the Maryland Air National Guard's 175th Wing, Baltimore. More than 16,000 people died in the storm, which left some 1.5 million homeless in the region.

A year after Hurricane Mitch, a Central American country still needed humanitarian assistance. The Maryland ANG answered the call.

Photography by Paul Kennedy



Bounded by Mexico to the north and Guatemala to the south and west, Belize sits on the Caribbean Sea. The country is just under 9,000 square miles, about the size of Massachusetts. Formerly called British Honduras, it was a British colony until it became independent in 1981.

At left, members of a 175th Wing C-130 aircrew plan a mission for the nearly seven-hour flight from Baltimore (Martin State Airport), to Belize City, the country's largest city. The wing sent 30 members of the 175th Medical Squadron and several from the 175th Security Forces and the wing's Services Flight on a 15-day deployment to Belize. The 175th MS undertakes at least one humanitarian mission every three to four years.

At right, with laptops, books, and MREs (Meals, Ready to Eat), these ANG personnel are well-prepared for their flight. Among the Guardsmen on this humanitarian mission were some who have more than two decades of ANG service and have taken their medical expertise to similar locations over the years. One of these "old-timers," SMSgt. Barbara A. Courtney, a full-time physician's assistant at Johns Hopkins Hospital, put it simply: "We like being used."



From Belize City, the 175th MS traveled by bus to small and isolated villages, such as Dangriga, Gales Point, Hopkins, and Pomona. There they set up shop, usually in the village schoolhouse, to offer routine and emergency medical care. The Baltimore ANG medics would operate a clinic for one to two days at each location—operating solely from supplies and equipment they brought with them into the country.

At left, some children hold coloring books and dental care kits they've received from the Guardsmen. The 175th also donated medical supplies and equipment to the Belize health care network.



Above is a section of Gales Point, a Creole village that was the last stop on the ANG's humanitarian mission. At right, a Guard member administers vitamins to a baby in the reception area of the temporary medical clinic set up in the village.



As many as 300 men, women, and children waited in line for medical treatment at each village. Some who could not be treated in their own villages walked or took a bus to catch up with the ANG medical personnel at their next stop.



Originally inhabited by Mayans, Belize today is a mix of Central American and Caribbean cultures. It is the only country in Central America where the primary language is English, but Spanish, Creole, Mayan, and Garifuna (Caribbean) are spoken as well.

Continued on p. 46

KOSOVO

MILITARY DEPLOYMENT/HUMANITARIAN RELIEF

1,232 MISSIONS

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REASONS. THERE'S ONLY ONE **C-17.**  **BOEING**



Although prepared to face everything from malaria to HIV, the 175th MS practiced lots of basic medicine on this mission. The medical personnel found that—among the children, at least—intestinal worms made up 60 percent of the medical problems. SrA. Alesha Knaub, a five-year Guardsman, persuaded the youngsters to take their worm pills by offering juice with the medicine.

In Belize, the ratio of physician to patient is one per about 1,500, as compared to one per 365 in the US. The need is there. As Lt. Col. Phillip Brown, deployment commander, noted, "While we understand our overall commitment as Guardsmen lies in the protection and defense of the United States, the Maryland Air National Guard is a service of people reaching out and caring for the needs and the well-being of other people."

Medical technicians had a chance to apply their training in prepping and dressing wounds. "All this training is applicable and necessary, not only in peacetime but also in wartime," stated Lt. Col. Vickie Pollard, a nurse with 24 years in the Guard. "But above all the training, watching [175th members] bond together as a team and look out for one another has been heartwarming for me."

Another team member said the experience was eye-opening. "These people, for the most part, have nothing, yet they don't complain. ... They are a proud people and don't expect any handouts, yet they are grateful for the help we've given to them," said SSgt. Greg Phillips. "Maybe they've learned some things from us, but I've learned a whole lot more from them."



It was muggy, with temperatures in the mid-80s, and the mosquitoes never quit. Some team members even became sick themselves, but they still continued to work. "I have found in all my years of volunteering to be a part of these humanitarian efforts, that the need doesn't rest," said Capt. Harold Archer, a nurse and 21-year Guardsman. "The need gets greater."

At left, in a rare free moment, though, some of the ANG personnel took time for a different type of interaction—basketball.



The makeshift clinics, like the one above, were the setting for everything from general medicine to tooth extractions. At right, a young patient receives some roxycaine before dental work begins.



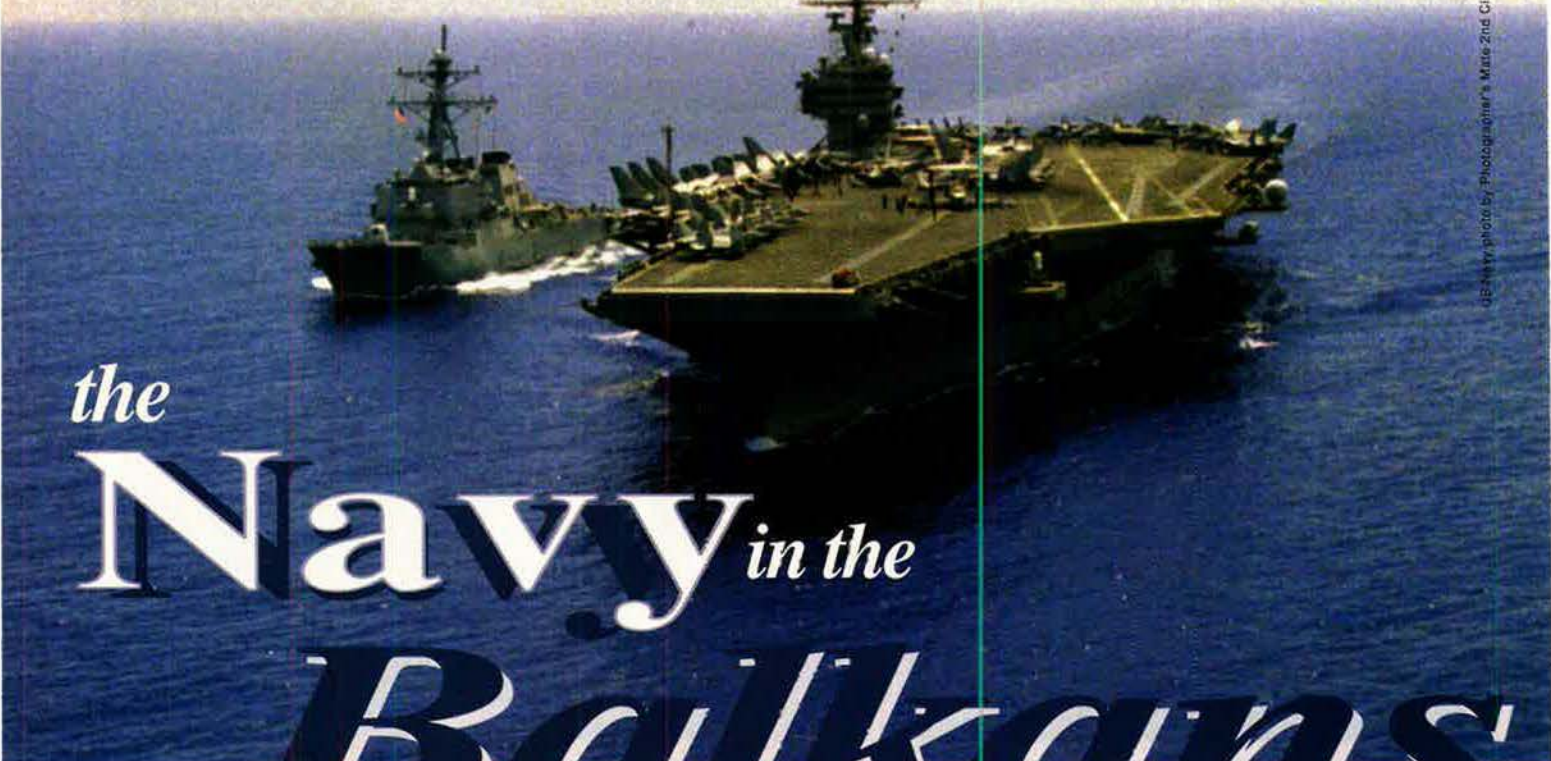
SrA. Kristina Paxton (above), who served four years on active duty before joining the Guard, commented on the challenges of the Belize mission: "While I learned a great deal on active duty, I was never exposed to this side of the military."



At left, a woman's smile is evidence that the efforts of the 175th were welcome. "It makes me feel good knowing that I'm bringing some relief to their situations," said Knaub. ■

The Sixth Fleet commander says carrier air did more of the job than has been recognized.

© 1999, photo by Photographer's Mate 2nd Class Steven Harbour



the **Navy** *in the* **Balkans**

Vice Adm. Daniel J. Murphy Jr. commands the US Navy's Sixth Fleet and NATO Striking and Support Forces, Southern Europe. He was principal naval commander in Operation Allied Force. He appeared before the Senate Armed Services Sea Power Subcommittee on Oct. 13 and the Defense Writers Group on Oct. 14. Here are excerpts of statements during those sessions.

The Navy Contribution

"The Navy contribution to ... the air campaign in Kosovo, although low profile, was nonetheless very significant. The Tomahawk shooters, in and of themselves, destroyed nearly 50 percent [of the] fixed target list in key categories such as the Serb army and police headquarters. ... We were able to keep nine Tomahawk shooters in-theater. Those nine sustained the air campaign in the first couple of weeks when the laser-guided bomb droppers could not find targets because of bad weather. And if it hadn't been for those nine, we would have stalled."

"The [carrier] *Theodore Roosevelt* ... arrived 14 days after the start [of hostilities]. Nonetheless, with only 8 percent of the total dedicated aircraft [deployed by NATO], [it was] credited with 30 percent of the validated kills against fielded forces in Kosovo."

What Might Have Been

"I don't know what [would have been the] specific impact [of] having had that air wing off the coast [of

Yugoslavia] the first 14 days, when General Clark [Army Gen. Wesley K. Clark, NATO Supreme Allied Commander Europe] was looking so hard for a means of stopping and slowing the slaughter in Kosovo, but I frankly believe that it would have been significant. ... A carrier and a carrier air wing, from the outset, would have made a significant difference, I believe."

"Tension" Over Competing Needs

"There was a tension between two competing requirements, especially in the first month of the war. That was to meet the demands of the strategic air campaign to go after targets that count in Serbia proper and then, at the same time, [commit] sufficient air assets to apply pressure to the Serb forces and to the [Serb police] forces that were then, with full impunity, continuing to burn and pillage villages."

"Had it been possible to get *Theodore Roosevelt* on scene on Day 1, my expectation is that air wing would have been applied directly into Kosovo,

would have met the [commander in chief's] Day 1 requirement from the very outset, [and applied] considerable pressure to deny movement ... to those forces that were conducting the ethnic cleansing. So, yes, sir, I think it would have made a difference."

Putting the Serbs at Risk?

"It took two weeks to get [*Theodore Roosevelt*] there. ... [It] began dropping bombs on the very first day [it was] there. In those two weeks, as you all well remember, we were unable in any way to slow the ... atrocities and the ethnic cleansing in Kosovo. General Clark wanted badly to get airpower in there to stop, to at least put at risk, these forces. There was no guarantee it would have stopped it, but what was going on was being done with relative impunity. If that carrier had been there in those first two weeks, it would have made a difference."

Air Tasking Order Limitations

"The ATO process, with large numbers of aircraft, is a procedural, sequential, rigid process. It is not able to react inside 24 hours, and it's simply an asset management tool. We had almost 900 aircraft, including tankers and support aircraft, ... and you have to make sure all of these airplanes don't run into each other. ... That all leads to a fairly unresponsive capability.

"Air Force doctrine is very clear in how it goes after an air campaign, and the ATO is really intended to service a preplanned campaign. It does that very well. When the adversary doesn't behave the way the air campaign had anticipated, though, a wheel can come off.

"We never neutralized the IADS [Integrated Air Defense System]. We weren't any safer on Day 78 than we were on Day 1. The [Air Force] doctrine calls for neutralizing the IADS *before* taking on the targets that count. Well, if we had followed that doctrine to the letter, we would have pounded nothing but IADS for 78 days. So Mike Short [Lt. Gen. Michael C. Short, USAF, Joint Forces Air Component Commander] did, of course, the sensible thing, as you would expect him to do, and he deviated from strict doctrine."

Same-Day Service

"The [*Theodore Roosevelt*] air

wing had 74 aircraft. When something had to be struck the same day—the target was directed in the morning and it had to be struck some time that day—two systems could do it: the carrier air wing and the Tomahawk. Nothing else could, and that's just a fact, and General Clark would validate that."

The Podgorica Airfield

"The Podgorica airfield is a good example. Podgorica was threatening the introduction of [the US Army's] Task Force Hawk into Albania because it was only about 30 miles across the border. It was a Serb air base, and the Serbs had moved a significant number of air-to-ground aircraft ... into that airfield.

"When we detected that move, General Clark that morning said, 'I have to have that airfield taken out now. We cannot afford a strike, even an ineffective strike, against Task Force Hawk just across the border.' He turned to General Short and said, 'Can you do it?' and General Short said, 'The Navy can do it.' This was on a video teleconference. He [Clark] turned to me and said, 'Dan, can you do it?' and I said, 'Yeah, we can do it.' ...

"We put 48 airplanes in the air that afternoon and took out the entire airfield, including the underground tunnel complex that had 26 airplanes in it, and we emulsified every one of them, and [our crews] were home for dinner aboard that carrier."

Quicker to React

"This is what the Navy does. ... [Navy] air wings are trained to, within a matter of hours, plan a significant strike. ... This is not, in any way, finding fault with the Air Force. The Air Force was working three days down the road, figuring how they are going to take out all of the bridges, and that's what they do. Air campaigns are the Air Force's business. If you want to take something out quickly, that's what the Navy is particularly good at, in terms of airpower."

Hitting Moving Targets

"We had nine Tomahawk platforms rotating through the Adriatic. And we had preplanned just about everything that didn't move, and then we started preplanning things that did move. For example, the SA-3 sites. ... They knew we didn't fly during

the day for the first several weeks. So they had daytime sanctuary, and, at night, they moved them around so we couldn't get a good fix on 'em.

"So we tracked where they had been. There are only so many places that you can put an SA-3. We targeted all of that ground, basically. Then, we'd get an Elint [electronic intelligence] hit, get an overhead image, we'd drive a U-2 over the top of it, snap it to see, yeah, it's there. ... The Tomahawk would leave the tube of a submarine or the vertical launcher on one of our surface combatants. Forty-five minutes later, we took that out. We had 85 percent kill rate on relocatable targets, with Tomahawks."

Left Free to Roam

"Throughout Kosovo, we were watching basically three different prongs of [Serbian] attack against villages. ... We knew where they were going; just follow the burning villages. ... Had we had the airpower there to do it—we didn't at the time, because we were concentrating principally on IADS—we could have gone after the roads. [That's] what we ended up doing, basically, two weeks later. We took them off the roads. After the first couple of days, they could no longer use the roads. Then they would go into hiding during the day and try to move at night. By denying them mobility, all by itself, we would have slowed down the ethnic cleansing."

Cross Purposes

"General Clark wanted to do both [hitting tactical and strategic targets], and General Short said, 'I don't have enough to do both. Be patient, here. Let me get *this* out of the way (*this* being principally the IADS), ... and then I'll go after these fielded forces that you want me to hit, General.'

"When that carrier [*Theodore Roosevelt*] was one day out of Norfolk, I called the battle group commander and told him, 'Be prepared to go after fielded forces, and be prepared to fly during the day.' ... [The commander] didn't like either one of those comments, but they rolled in. Of all the sorties they flew, not even 5 percent were outside of Kosovo. From the day they got there, they were going after fielded forces in Kosovo. ... Hitting the fielded forces would have helped." ■

By John L. Frisbee, Contributing Editor

First Over Tokyo

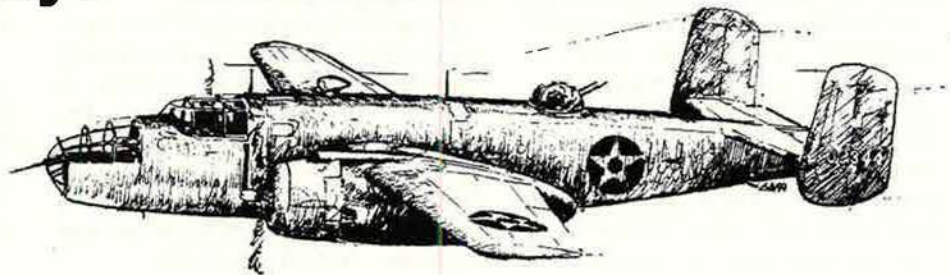
Hap Arnold picked Jimmy Doolittle, "a leader who not only could be counted upon to do a task himself ... but could impart that spirit to others," for a seemingly impossible mission.

JIMMY Doolittle, first national president of AFA, instrument-flying pioneer, winner of many major aviation awards, World War II commander of Eighth and Twelfth Air Forces, is perhaps best remembered as architect and leader of the Tokyo Raid of April 18, 1942. Adm. William F. Halsey, commander of the task force that launched Doolittle's 16 B-25 bombers from the aircraft carrier *Hornet*, called that historic mission "one of the most courageous deeds in military history."

For his brilliant planning and inspiring leadership of the raid, General Doolittle, then a Reserve lieutenant colonel (he had resigned his Regular commission in 1930), was awarded the nation's highest decoration for valor, the Medal of Honor.

Why this extraordinary mission that challenged military orthodoxy and the logic of aircraft design? After a series of military disasters in the Pacific following Pearl Harbor, President Franklin D. Roosevelt believed a badly shaken America needed some symbol of ultimate victory, one that also would explode the Japanese myth of their islands' invulnerability. He directed his military leaders to bomb Japan at the earliest time. But there were no bases in China available for a heavy bomber attack, and Navy carrier aircraft lacked both range and bomb load. Then Navy Capt. Francis S. Low came up with the fantastic idea of flying Army Air Forces bombers from a carrier.

Lt. Gen. Henry H. "Hap" Arnold greeted the idea enthusiastically. He called on Doolittle, who had voluntarily left an executive position with Shell Oil, to organize and train a force for the task. Arnold had no



thought of allowing his indispensable 45-year-old troubleshooter to actually lead the mission. Doolittle thought otherwise and, as usual, won.

Doolittle had 10 weeks to work out the myriad details of an operation that had never before been considered and would not be repeated. Crews were volunteers from the 17th Bombardment Group and the 89th Reconnaissance Squadron—two early B-25 outfits. Many experts thought that flying medium bombers at above gross takeoff weight from 500 feet of carrier deck was sheer madness. But if anyone could do it, it was Doolittle, supreme pilot and doctor of aeronautical engineering, whose biographer, C.V. Glines, called him "master of the calculated risk."

The plan was to launch from the carrier 400 miles off Japan's coast at dusk on April 19. Crews would bomb independently at night and recover early the next morning at Chuchow, China. Doolittle calculated they could make it to China if launched on plan, possibly from 500 miles off Japan, but definitely not from 650 miles.

Early on the morning of April 18, patrol airplanes from the accompanying carrier *Enterprise* sighted Japanese picket ships ahead. Halsey ordered the B-25s to launch immediately, 30 hours ahead of schedule and 620 miles from the coast. First off the rolling, pitching deck into a 30-knot wind, rain, and low clouds was Doolittle, proving to his crews that it could be done. All knew that Japanese defenses, including an estimated 500 fighters, had been alerted. They also knew that they probably would have

to ditch at night, short of the China coast, with no hope of rescue.

Despite warning from a picket ship, the Japanese were taken by surprise, expecting a strike by carrier airplanes the following day. There was little opposition from fighters and flak. With Doolittle first over Tokyo, all but one B-25 bombed their targets, then all headed for China, except Capt. Edward J. York's crew, which, low on fuel, landed near Vladivostok, Russia, and was interned by the Soviets.

The 15 China-bound bombers picked up an unexpected tailwind that helped them reach the coast in darkness, rain, and low clouds. They were unable to contact Chuchow, which had not been informed of their early launch. Lost and running out of fuel, all 15 bailed out, ditched near the shore, or crash-landed. Eleven crewmen were injured, three lost their lives, and eight, who landed in Japanese-occupied territory, were captured, three of them subsequently executed.

As reports of the crews' fates filtered in, the usually ebullient Doolittle was overwhelmed by the thought that, although they had hit their targets, he had failed the men who trusted his leadership. He didn't know that when word of the raid reached home, it was greeted wildly as the first American victory in the Pacific. The raid had achieved President Roosevelt's objective, a fact that Doolittle had still not fully accepted when, on May 20, the President presented newly promoted Brigadier General Doolittle with the Medal of Honor, the first awarded to an airman in World War II. ■

First appeared in April 1989 issue.

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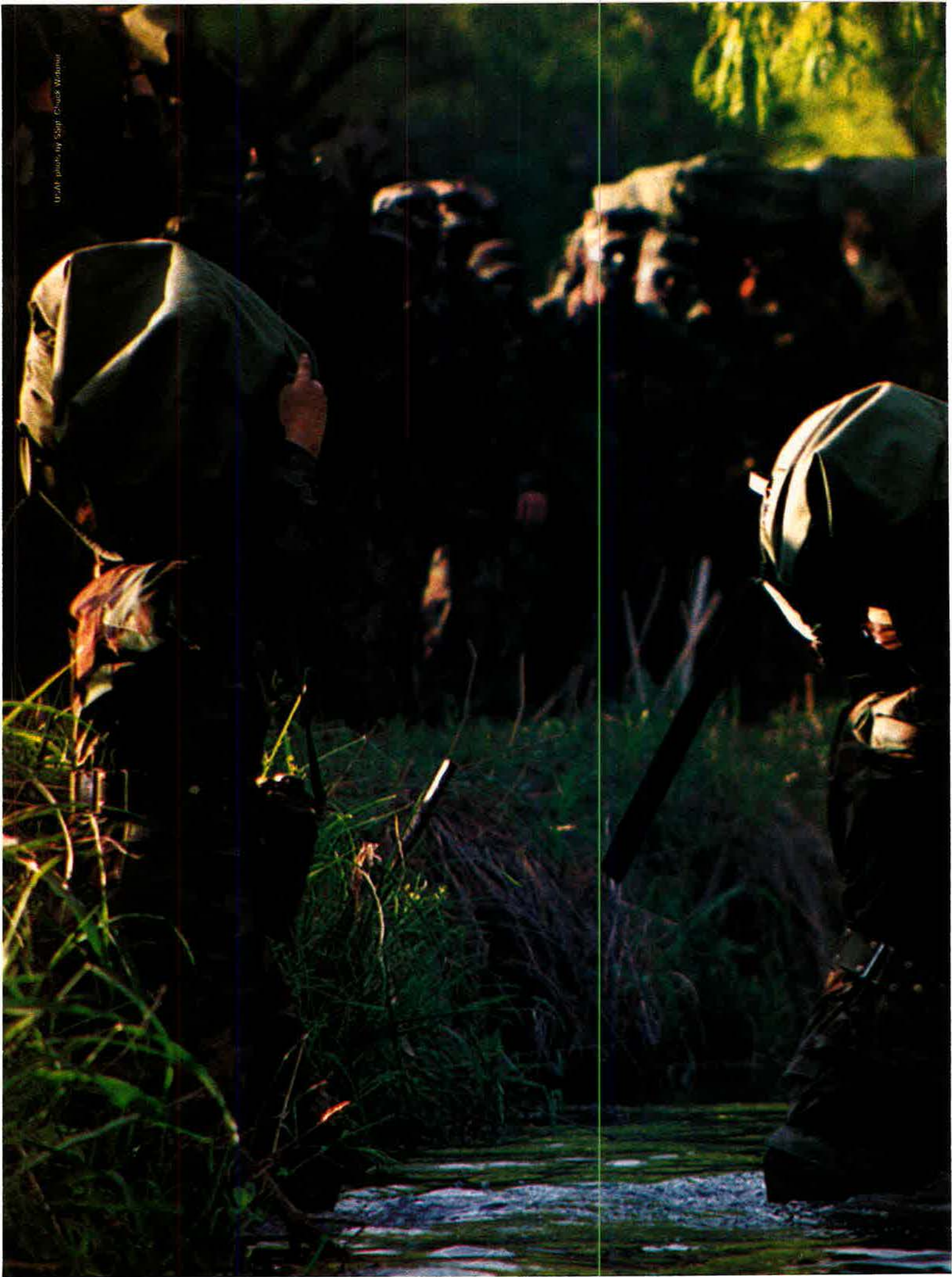
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A person in a military uniform is seen from behind, carrying a large, heavy pack on their back. They are wading through a shallow stream in a forest. The water is splashing around their legs. The background is filled with dense green foliage and trees, with sunlight filtering through the leaves, creating a dappled light effect. The overall scene conveys a sense of ruggedness and military training in a natural environment.

Military skills in the field become part of basic training at Lackland.

Warrior Week

By Bruce D. Callander

PICTURE this scene: A large group of airmen, living in a tent city near an improvised airstrip, eating field rations and staying alert day and night, placed under stress and kept constantly on guard for any number of unpleasant surprises, which could be anything from air bombardment or missile attack to infiltration by an enemy force.

Air Force veterans of World War II, Korea, Vietnam, the Persian Gulf, the Balkans, and numerous smaller operations would find nothing unusual about the situation.

However, these airmen probably did not ever step into this kind of environment until they entered an actual combat zone. For today's new recruits, it is becoming a routine



Basic military trainees at Lackland AFB, Texas, keep their gear dry as they cross a creek during the new seven-day Warrior Week program, which became a key feature of USAF recruit training on Oct. 1.

part of Basic Military Training at Lackland AFB, Texas.

It is all part of what Air Education and Training Command calls "Warrior Week." The full seven-day program opened officially Oct. 1 and incorporates an earlier Field Training Experience, called an FTX, which lasted 36 hours. Trainees in their first five weeks of service life learn to pitch tents, handle an M-16 rifle, and carry out their duties in a stressful environment.

The environment, for some, can be dangerous. In a tragic turn of events, an 18-year-old trainee at Lackland died on Sept. 12, two days after collapsing near the end of an FTX. Micah Schindler of Cincinnati was the first Air Force recruit to die at Lackland in five years. Lackland has been conducting FTX training for two years. Col. Stefan Eisen Jr., commander of the 737th Training Group, said Schindler had given no indication that he was in trouble before collapsing as he stood in line to wade through a waist-deep stream near the end of the FTX's 5.8-mile march. The Air Force has initiated a review to determine what happened.

Warrior Week is an unusual type of training for members of the Air Force. Traditionally, USAF has made only limited efforts to teach enlisted members some basic soldiering skills. Since most were expected to maintain advanced weapons or support air operations, USAF saw little need to prepare the troops for combat condi-

tions. It offered physical conditioning and instructor in close-order drill but concentrated on preparing airmen for technical training and later duty in the high-tech world of modern aerospace.

That was then—before the end of the Cold War.

Now, the services have rewritten their job descriptions to include humanitarian deployments, contingency operations, and peacekeeping. Moreover, the Air Force over the last decade has closed many of its overseas bases and redesigned itself as an Expeditionary Aerospace Force, comprising packages of units that can be assembled for a given purpose and moved quickly to world trouble spots. The Air Force estimates that 85 percent of all airmen entering the force today will deploy to a world hot spot at least once during their career. And as recent events have shown, it's no longer just aircrews that can find themselves in harm's way.

"Change the Culture"

Gen. Lloyd W. "Fig" Newton, head of AETC, recently declared his command will play a major role in the Air Force's transition into the EAF, beginning with Warrior Week.

"We need to get new airmen into the deployment mind-set right from the beginning of their military careers," said Newton. "We need to change the culture, so when these airmen get to their first duty stations

after technical school they will already know the deployment basics."

The command now assigns high priority to giving recruits a fuller acquaintance with the basics of living in the field, said Maj. Terry Schuller, Warrior Week flight commander in the 737th Training Support Squadron at Lackland.

"We have gotten away from the forward deployed bases and we have moved more toward a contingency type of tasking," said Schuller. "You have seen that in Somalia and Desert Storm and several similar operations.

"Many of our troops were going out there with no idea what a tent even looked like. So we're trying to familiarize them with the operational living environment, living in tents, sleeping on cots. We need to qualify them in areas that will make them deployable immediately following basic training.

"They need training in self-aid and the buddy system, in anti-terrorism, basic defense tactics, and nuclear-biological-chemical warfare. It's readiness training. And they need at least familiarization with the M-16 and combat tactics."

This sort of training cannot easily be adapted to a formal school setting. For that reason, Lackland has created the kind of tent city that airmen are likely to encounter when they are sent out on real deployments. For a week, they experience the life of a warrior up close.

"The biggest thing is taking the trainees away from the carpet and the cable television of the dormitory and explaining to them what they have just signed up for," said SMSgt. Christopher Dobbins, Warrior Week operations superintendent. "Too many of the kids coming in today think that this is some kind of IBM computer training."

Dobbins went on, "While education and benefits are great tools for recruiting, we have to be sure that the trainees leave here understanding that they're part of a new expeditionary force. We want to give commanders an airman who is capable of being deployed, not somebody they still have to train."

The Air Force was not alone in deciding that new recruits needed something more than drill and academic studies. In recent years, a number of review groups, including at least one Congressional commit-

tee, concluded that all services need more rigor in their early training programs.

The First FTX

The Air Force took its first step in that direction by adding the Field Training Experience to its BMT program about two years ago. The first FTX began as a 12-hour, overnight operation. FTX then grew into a 24-hour session of war gaming and recently was expanded to 36 hours.

"That gave the trainees a very small glimpse of what the expeditionary Air Force looks like," said Dobbins. "We have built on that in constructing Warrior Week."

Dobbins said AETC also "looked at what the other services were doing and took the best of the best." He explained, "We went out to see the Crucible at the Marine Corps, the Army's Victory Forge, and the Navy's Battle Stations. We took some of the best ideas from our sister services and tailored them to what the Air Force does."

What evolved is a seven-day exposure to some of the conditions members can expect in any deployment, culminating in a more rigorous taste of mock combat conditions. The environment of the main Warrior Week camp is only slightly more austere than that of Lackland's, but the trainee's life becomes more basic as the week wears on.

When they arrive on a Sunday afternoon, the tents already are erected.



USAF photo by Yolanda Hunter

A majority of airmen will deploy to a world trouble spot at least once in their USAF careers. Along with practicing buddy care (above), recruits now experience field training in which they pitch tents and defend their camp.

Both living and academic tents are air-conditioned. They have hardened latrine facilities with showers and shaving facilities. Much of the teaching of the academics is done with audiovisual equipment.

There are four distinct units—the Airey, Harlow, Kisling, and Barnes Groups, named for the first four Chief Master Sergeants of the Air Force. The recruits will train for several days at the main encampment and, toward the end of the week, they ride the bus to another site for M-16 familiarization. From there, they march to the FTX area, which is a more

austere environment simulating a forward deployed location.

At that camp, there are no air-conditioned tents, no running water, and no showers. There is also sleep deprivation. Trainees learn how to erect tents. The whole exercise will be built around an actual mission, defending the base from invasion by the enemy, a role played by the instructors. At the end of the FTX deployment, they perform a 5.8-mile march out.

Among the Elite

The trainees still will have a week to go in BMT, but Warrior Week is a major milestone in the training. A ceremony will mark the end of the ordeal. The trainees will receive their first US collar insignia and some token of their achievement. Back at the dorm area, they will eat a special "warrior meal" apart from other trainees, but the main mark of recognition will be a change of title.

"The ceremony welcomes them into the enlisted corps," said Schuller. "Before that, they are known as trainees. From that day on, they will wear the blue uniform and be called Airmen. It's a right they will have earned, not something that has been given to them. And we'll make it a point for underclass trainees to see these upper-class members have moved into the enlisted corps. It will give them something to reach for."

The newly designated Airmen will have special privileges for the final



USAF photo by Robbin Cresswell

Nuclear, biological, and chemical training during Warrior Week helps produce airmen who are better prepared for deployment when they report to their first assignments.

week of their training. After graduation ceremonies, to which parents are invited, they go on to technical schools for added training and then to operational units. If the new approach works as the Air Force hopes, they will remember Warrior Week as the turning point in their training, the event that marked their transition from recruits to full-fledged members of the force.

In earlier periods of Air Force history, members trained with a specific unit and usually went into combat with the same unit. In today's expeditionary forces, that often will not be the case. "In the operational world right now," said Schuller, "they

pretty much mirrors what's out there in the real world today."

To keep Warrior Week from extending BMT beyond the traditional six weeks, officials moved appropriate pieces of the curriculum from the Lackland campus to the simulated camp. Now, trainees will learn some of the Air Force's history in the sort of environment where much of it was made. They will learn the importance of teamwork by applying it to everything from pitching a tent to halting an attack. And they will hear about life in deployed units from those who have experienced it and now act as instructors or visiting lecturers.

Dobbins said, "We've developed what we call an Air Force Heritage program. It's similar to what we used to call Enlisted Heritage, where people such as former Chief Master Sergeants of the Air Force came in during the fourth week of training and talked with the trainees. Now, we'll have the Air Force Heritage briefing at the actual encampment area. We'll have people who were deployed to Bosnia and Kosovo, actual real-life, no-kidding heroes who flew those missions and who supported the ground troops. We'll also have people such as [former] CMSAF [Eric W.] Benken who have been out there and seen the operations."

Schuller added, "We're also focusing on such people when we hire staff from the MTI [Military Training Instructor] corps to do this type of training. Some of the most experienced people from deployments are the staff sergeants, the senior airmen, and the tech sergeants out there, and those are skills we are looking for. We ask applicants about their deployment experience."

The Real Thing

"Another thing that adds realism to the training is that experts have developed everything about the camp, from the infrastructure to the visual effects," said Dobbins. RED HORSE and Prime BEEF construction and engineering teams came in and practiced their deployment skills by put-



may take 10 or 12 personnel from one unit, 10 or 12 from another unit, and 10 or 12 from a third and put them together. They come up with a package and send them out to accomplish a mission."

He continued, "Our training attempts to mirror that. When trainees in-process at the Warrior Week camp, they come over to us as flights, people they have been with since Day 1 of basic training. When they get to us, we divide them up and move them out to different packages as we would in expeditionary forces. We want them to understand that they will not always be together as a 48-person flight everywhere they go. What we stress more than anything else is that we're all part of the same team. It doesn't matter what uniform you wear or what squadron you're assigned to. That



USAF photos by Yolanda Hunter

Though it's within sight of civilization—Wilford Hall Medical Center (top left)—Warrior Week's tent city is no 1+1 dormitory. At the beginning of the week, trainees live in air-conditioned tents already erected. But at the end, they march to a camp with no running water and pitch tents themselves.

ting up the encampment infrastructure and facilities. Nothing in the camp is fake.

As the officials are quick to point out, however, the program is not designed to produce the USAF equivalent of a foot soldier. Rather, it aims to lay the groundwork for future training.

Said Dobbins, "We try to do as much as possible to make the training real. We give a real-world intelligence briefing, touching on actual events, either very recent or ongoing at the time. There's a constant update that we'll get from our intelligence folks over at Kelly [AFB, Texas]. Those things are built into the curriculum to give them an understanding of the possibilities that they may encounter later on.

"But a key point we try to make is that this still is basic training. We try to give all these troops an understanding of what they may come across regardless of what AFSC [Air Force Specialty Code] they may go into. We're not teaching just security troops or medics or civil engineers. We're trying to give all these airmen that will graduate basic training a very basic understanding of what they could come across.

"We try to give them the basics, but what career field they go into and what kind of missions they go on will determine what sort of follow-on training they might get. The mission in Desert Storm was far different from that in Bosnia or what's currently going on in Kosovo."

Schuller added, "We're trying to train a broad spectrum of different career fields, different troops. It's to get them familiar with how to put a gas mask on, what a defensive fighting position is, and what a camp would actually look like. We present some of the conditions that they're going to live in, sleeping in tents and eating MREs [Meals, Ready to Eat]. It's just familiarization, so that when they arrive, it's not going to be a surprise to them."

Providing this taste of reality is a staff of roughly 50 permanent-party instructors and supervisors. Most are officers and NCOs specifically dedi-



USAF photo

Warrior Week exposes trainees to conditions they will face in today's Expeditionary Aerospace Force. After completing this milestone in their Basic Military Training, they are formally welcomed into the enlisted corps as Airmen.

cated to Warrior Week, but a few of the faces will be familiar to the trainees. "Some of the Military Training Instructors from Lackland's main training area will be involved during Warrior Week," said the major. "We supplement with these 'street' instructors for a couple of reasons. For safety purposes, it gives us more personnel to watch for symptoms of heat stress and problems such as that."

Leadership by Example

"It also shows a leadership-by-example mentality, just as it does for our instructors to get out during physical conditioning," said Schuller. "It's good for the trainees to see their instructors doing some of the rigorous activities with them. And, certainly, the street instructor is going to be involved in the culminating ceremony on Saturday morning. It's a chance for their own MTIs to talk to them a little bit and spend a little time with them in a more relaxed environment. It's more meaningful coming from the street instructor than it would be from an instructor that they just met in the fifth week of training."

Much of the thrust of Warrior Week is directed toward teamwork. In today's service, that means working

with reserve as well as active duty members. "Every new Air Guard or Air Force Reserve recruit must go through basic training," said Schuller. "They go through the same training, and unless you look at their records, you won't know who is a reservist and who is active duty."

The same thing holds true for the instructor cadre. USAF is trying to give trainees a cross section of what the Total Force is. Dobbins said that the Air Force plans to have Guard and Reserve instructors augment the Warrior Week staff so that the airmen see that there is no distinction, that they all wear the same uniform.

Dobbins speaks from personal experience when he talks about the Total Force concept. His wife is with the medical staff of a local Reserve wing. As Dobbins was preparing for the official opening of Warrior Week, she was getting ready to leave for a two-week active duty tour in Japan.

It's too early to judge how well the new routine is preparing airmen for duty in the real Air Force, but Lackland does have feedback on its shorter field training. Most of it has been positive, said Schuller. "Almost every training critique that we get wants more of the field training experience," he said. "Airmen say that's why they came to basic training. That's what they wanted to learn. Commanders and government commissions have indicated the same thing, that we're going in the right direction." ■

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

Verbatim

By Robert S. Dudley, Executive Editor

Mike Short School of Diplomacy

"I'd have gone for the head of the snake on the first night. I'd have turned the lights out the first night. I'd have dropped the bridges across the Danube. I'd [have] hit five or six political and military headquarters in downtown Belgrade. [Yugoslav President Slobodan] Milosevic and his cronies would have waked up the first morning asking what the hell was going on."—**USAF Lt. Gen. Michael C. Short, Operation Allied Force's air boss, in Oct. 21 remarks to Senate Armed Services Committee.**

Purple Haze

"The reason Slobodan Milosevic finally caved in—a primary reason—was the presence of US Army ground forces in Albania."—**Lt. Gen. John W. Hendrix, commander, US Army V Corps in Europe, quoted in the Sept. 11 European Stars and Stripes.**

Shelton Speaketh ...

"Although we've done much in the past year to improve our readiness, there's still much more that needs to be done in order to sustain the momentum. ... Readiness is a very fragile thing, and, if lost, it takes considerable time and resources to regain. [Across-the-board reductions in all federal programs proposed by some members of Congress would be] devastating. ... This would strip away the gains that we have made ... to start readiness moving back in the right direction."—**Army Gen. Henry H. Shelton, JCS Chairman, in Oct. 26 remarks to the SASC, criticizing a Republican-sponsored proposal to trim all federal programs by about 1 percent.**

... Republicans Respondeth

"The fact of the matter is that the national security budgets submitted year after year by this Administration—and which you have testified in support of before our committee the past two years—would have been 'devastating' to our nation's military. In fact, the 'gains' you referred to in your testimony yesterday 'to start readiness moving back in the right

direction' were initiatives of our committee, not the Administration. ...

"You know that in Fiscal Year 1999, we provided \$17.8 billion in emergency appropriations ... to address shortfalls caused by our record number of peacetime deployments, including major operations in Iraq and the Balkan region. You also know that we and our colleagues in Congress were severely criticized by the President and this Administration for doing so.

"In Fiscal Year 2000, we added another \$4.5 billion to the President's request for our national security. Again, we were criticized by the President for the priority we placed on our nation's defense. In fact, up until the hour he signed the defense appropriations bill into law on Monday, the President's spokesman and advisors were expressing concerns about the bill and the possibility the President might veto it.

"Yet yesterday, you say that it is Congress that threatens the 'gains' we have made in strengthening our national security."—**Sen. Ted Stevens (R-Alaska) and Rep. C.W. "Bill" Young (R-Fla.), chairmen of Senate and House appropriations committees, in an Oct. 27 joint letter of response to Shelton.**

Tell It to the French

"Once the threshold is crossed and you're going to use force, that force has to be as decisive as possible in attaining your military objectives. ... [In Operation Allied Force], every single [NATO] nation had a domestic political constituency, and every single nation had a different set of political problems."—**Army Gen. Wesley K. Clark, Supreme Allied Commander Europe, in an Oct. 21 SASC hearing on the conduct of Operation Allied Force.**

Actually, Tell This to the French

"Since last week, when the Senate voted overwhelmingly to reject the Comprehensive Test Ban Treaty, condemnation bordering on hysteria has rung out from the capitals of the

world. ... "French President Jacques Chirac (who, with his German and British counterparts, penned a *New York Times* op-ed before the vote, lecturing the Senate on its responsibility to ratify the test ban) declared that, by rejecting his advice, the Senate had launched 'an attack on the process of nonproliferation and disarmament, which is one of the priorities of the European Union.'

"With all due respect to Mr. Chirac, the last time I checked, no nation was counting on the safety and reliability of the French nuclear arsenal to guarantee its security. Many do, however, depend on the US for nuclear guarantees."—**Sen. Jesse Helms (R-N.C.), chairman of the Senate Foreign Relations Committee, in the Oct. 18 Wall Street Journal.**

Lost Generation

"As President, I will begin an immediate, comprehensive review of our military—the structure of its forces, the state of its strategy, the priorities of its procurement—conducted by a leadership team under the Secretary of Defense. I will give the Secretary a broad mandate—to challenge the status quo and envision a new architecture of American defense for decades to come. We will modernize some existing weapons and equipment, necessary for current tasks, but our relative peace allows us to do this selectively. The real goal is to move beyond marginal improvements—to replace existing programs with new technologies and strategies, to use this window of opportunity to skip a generation of technology."—**Texas Gov. George W. Bush, Republican Presidential front-runner, in a Sept. 23 speech at The Citadel.**

The Hazards of Duke

"Troops are supposed to be willing to die so that civilians do not have to."—**Peter D. Feaver, Duke University associate professor, in a Nov. 7 Washington Post article co-authored with Christopher Gelpi, also of Duke.**

The Hart–Rudman Commission says that the US homeland is likely to be attacked with weapons of mass destruction sometime in the next 25 years.

New World **COMING**

By Peter Grier

A

MERICA is the strongest military power the world has ever seen—by far. Yet its strength is a ponderous shield, and, over the next 25 years, the US will become increasingly vulnerable to hostile attack on its homeland.

Rogue states, terrorists, and other adversaries will acquire weapons of mass destruction, and some will use them. The advanced technologies which make the US military and economy the envy of the world will themselves create new vulnerabilities.

So asserts a sweeping new Pentagon-ordered study of the nation's national security situation. "Americans will likely die on American soil, possibly in large numbers," concludes "New World Coming," the first report of the US Commission on National Security/21st Century. The panel also is known as the Hart–Rudman Commission, for its two co-chairmen, former United States Sens. Gary Hart (D–Colo.) and Warren B. Rudman (R–N.H.).

Meanwhile, the pressures of the fast-paced global economy and rising world expectations for freedom and development could crack apart unstable countries. In some cases, disintegrating nations may drag whole regions down with them. That means Kosovo-style fights could crowd the US foreign policy agenda in the decades ahead.

The US, along with its allies and international organizations, needs to start planning now to survive and prosper in this future of asymmetrical military threats and regional instabilities.

"Developing effective ways to cope with these crises ... will require a far more systematic effort than has been made so far," Hart said at a House Armed Services Committee hearing on Oct. 5.

The New World, Briefly Noted

The Hart–Rudman Commission reached 14 basic conclusions about the world of the next 25 years. Here they are:

1. America will become increasingly vulnerable to hostile attack on our homeland, and our military superiority will not entirely protect us.
2. Rapid advances in information and biotechnologies will create new vulnerabilities for US security.
3. New technologies will divide the world as well as draw it together.
4. The national security of all advanced states will be increasingly affected by the vulnerabilities of the evolving global economic infrastructure.
5. Energy will continue to have major strategic significance.
6. All borders will be more porous; some will bend and some will break.
7. The sovereignty of states will come under pressure but will endure.
8. Fragmentation or failure of states will occur, with destabilizing effects on neighboring states.
9. Foreign crises will be replete with atrocities and the deliberate terrorizing of civilian populations.
10. Space will become a critical and competitive military environment.
11. The essence of war will not change.
12. US intelligence will face more challenging adversaries, and even excellent intelligence will not prevent all surprises.
13. The United States will be called upon frequently to intervene militarily in a time of uncertain alliances and with the prospect of fewer forward-deployed forces.
14. The emerging security environment in the next quarter century will require different military and other national capabilities.

Many Americans believe that the end of the Cold War left this nation more secure and the world, in general, a safer place. To paraphrase Rep. Floyd Spence (R–S.C.), chairman of the committee, reality does not support this view. If the US military is to shape itself to deal with the problems of the next millennium, he said, it must have some idea about what those problems will be.

That is the idea behind the Hart–Rudman Commission, a federal advisory panel formed in 1998 and mandated by Congress to issue a series of studies over the next year and a half.

Forward to the Past

The situation today is similar to that of the late 1940s, say commission members. By this, they mean the current national security infrastructure was designed for one kind of world but now confronts the dawning of another, which will be quite different.

Back then, a series of studies and surveys led to the National Security Act of 1947, which among other things established the Air Force as an independent service. The current commission hopes to have a comparable impact.

Established by Congress, the panel will serve, in essence, as Red Team critics from outside the Department of Defense. Its 14 members include former Secretary of Defense James Schlesinger; former Secretary of the Air Force Donald Rice; retired Army Gen. John Galvin, former Supreme Allied Commander Europe; Norman Augustine, the former chairman and chief executive officer of Lockheed Martin; Newt Gingrich (R–Ga.), former Speaker of the House; Andrew Young, former US ambassador to the United Nations; and Leslie Gelb, former State Department official and now the president of the Council on Foreign Relations. Serving in the panel's top staff position as executive director is Gen. Charles G. Boyd, USAF (Ret.), former deputy commander in chief of US European Command.

The organization of the US national security structure changed little over the last 50 years, commissioners note. But threats will be different in 2025—so defense needs to change, too.

The commission's Phase I report,



USAF photo by SrA. Jeffrey Allen

released Sept. 15, describes the emerging world of the next 25 years. Phase 2, due next April, will lay out a national security strategy appropriate to that world. Phase 3, in 2001, will propose changes to the nation's security infrastructure in an attempt to implement that strategy.

"It will be the task of this commission to probably recommend some things that will be highly controversial, knowing how each constituency of our defense establishment feels about itself," Rudman told reporters at a Sept. 15 press conference.

First, the good news: The world of 2025 could see much less conflict than today, according to Hart-Rudman's Phase 1 report. Tens of millions of the poor may rise to middle-class lives free from the depredations of want and disease. An explosion in scientific discovery "bears the potential of near miraculous benefit for humanity."

Regions Aflame

However, progress is a fragile process. Nothing is guaranteed. Dire scenarios of regions aflame, in the grip of despots, are also possible. And active American engagement in the world may be a necessary condition to fully realize the promise of the next century.

"It is a rare moment and a special opportunity in history when the acknowledged dominant global power seeks neither territory nor political empire," says the commission. "Every effort must be made to ensure that this responsibility is discharged wisely."

That is perhaps the most basic assumption underlying the Hart-Rudman study: That the US will remain a primary political, military, and cultural force through 2025. In fact, "the United States will remain the principal military power in the world," says the study.

That does not mean that the United States will be the world's only guarantor of stability. Washington will still work with and within a variety of international organizations, the commissioners believe. Nongovernmental organizations such as refugee aid groups, ethnic lobbies, environmentalists, and others will continue to proliferate and are likely to be more important in the years ahead.

As the US confronts an array of increasingly complex threats, it will

be dependent on allies, although in the next century "it will find reliable alliances more difficult to establish and sustain," according to the Hart-Rudman group.

The panel also concludes that the much-heralded globalization revolution will continue, with the international aspects of finance, information services, transportation, and other economic sectors increasing.

While fossil fuels will remain the dominant energy source, science and technology will produce amazing advances that will be distributed ever more widely around the world. The benefits of the rising economic tide will remain unevenly distributed, however. "Disparities in income will increase and widespread poverty will persist," says the commission.

Nirvana is not coming. Weapons of mass destruction will proliferate to both states and nonstate actors, such as terrorists. So will weapons of mass disruption, such as computer viruses.

"Maintenance of a robust nuclear deterrent therefore remains essential as well as investment in new forms of defense against these threats," says the Hart-Rudman group.

Deterrence does not always suffice. In many nations, the importance of human life is viewed differently than it is viewed in the United States. "We should expect conflicts in which adversaries, because of cultural affinities different from our own, will resort to forms and levels of violence shocking to our sensibilities," says the group.

Given its analysis of the strategic background of 2025, the US Commission on National Security/21st Century foresees some daunting vulnerabilities for the nation.

Battleground: America

Most sobering is that the US could become what the Middle East, the Balkans, Central Asia, and East Africa are today: a battleground.

"America will become increasingly vulnerable to hostile attack on our homeland, and our military superiority will not entirely protect us," reads the first of the report's main conclusions.

Though the US will be stronger than any other single nation, emerging powers—either alone or with allies—will more and more be able to blunt US regional aims, conclude

commissioners. Unable to totally enforce its will abroad, the US will find its traditional defenses too inflexible for some 21st century threats. American influence and culture will be both pervasive and pervasively resented.

Not only will the disgruntled of the world obtain nuclear, biological, or chemical weapons. "Some will use them," says the report, with dire consequences for the US.

And the US will be uniquely vulnerable. The nation's increasingly complicated technological infrastructure will be a tempting target. Imagine, said the commissioners, the effect of a cyber attack on the US air traffic control system on a foggy morning when 200 jetliners are preparing to land at airports misted by rain.

The long-established sanctity of the US homeland might render the psychological effects of true terrorism that much more devastating.

"The most serious threat to our security may consist of unannounced attacks on American cities by subnational groups using genetically engineered pathogens," says the Hart-Rudman group.

Technological vulnerabilities will not be limited to the US, of course. All advanced states will be increasingly affected by the inherent weaknesses of the new global economic infrastructure. Thus, many nations may face the paradox that they are becoming simultaneously more wealthy and more insecure.

"For most advanced states, major threats to national security will broaden beyond the purely military," says the commissioners.

Not all these threats are obvious. Some may not even be intended. The explosion of the Internet and other world-shrinking means of communications, for instance, could be a boon to those seeking to break the hold of despots on their nations. Big ideas will travel quickly around the globe. At the same time, the death of distance means that citizens will be more easily able to form allegiances with people or movements anywhere in the world.

The bonds between citizen and state might be loosened in the US, as well as in traditionally closed societies, such as Iraq.

"The stage will be set for mass action to have social impact beyond

the borders and control of existing political structures," says the report.

Nation States in Crisis

Thus the very idea of the nation-state will likely come under attack in the next millennium, according to Hart-Rudman. International financial organizations, international law enforcement agencies, and international peacekeeping organizations will increasingly usurp national sovereignty.

Impersonal global market forces could crack apart some important states via currency depreciations or debt crises.

"The result will be an increase in the rise of suppressed nationalisms, ethnic or religious violence, humanitarian disasters, major catalytic regional crises, and the spread of dangerous weapons," says the first New World Coming report.

Still, most violence will erupt due to internal conflicts in existing states. The desire for self-determination expressed in Kosovo, Chechnya, and elsewhere will not abate. As more and more people learn about the state of life in the rest of the world they will be less tolerant of their own oppressive or incompetent leaders.

"The number of new states, international protectorates, and zones of autonomy will increase, and many will be born in violence," says the report.

In some ways, next-century conflict will fulfill the predictions of science fiction fantasists. Space will become a critical and competitive military environment, believe Hart-Rudman panel members. Other nations will launch spy and communication satellites. "Weapons will likely be put in space," says the Phase 1 report.

Yet the essence of war will not change. It will cause casualties, carnage, and death. Some adversaries will attempt to maximize casualties in developed societies that have a built-in aversion to losing military personnel.

"It will not be like a video game," says the Hart-Rudman study.

The shadow struggle of intelligence agencies will become more challenging for the US. Electronic miniaturization and new types of sensors will expand collection capabilities for all nations and groups that are technically adept. The US

will continue to confront strategic shocks in which human judgment fails to predict all the dangers in the fast-changing world.

Dealing with regional security crises may become more challenging for the US. Tight budgets and the vulnerability of forward-deployed forces will mean that fewer and fewer US units are positioned overseas, says the commission. Political reluctance and the growing gap between the military capabilities of the US and its allies may make it harder and harder to find partners for combined military operations.

Needed: A Changed Military?

Which leads to the panel's final conclusion: The US military needs to be ready, and it needs to change. Fighting and winning in the first quarter of the 21st century will require forces that are stealthy, fast, accurate, lethal, mobile, and smart.

"It is essential to maintain US technological superiority, despite the unavoidable tension between acquisition of advanced capabilities and the maintenance of current capabilities," concludes the report.

The mix and effectiveness of overall US capability will need to be rethought and adjusted, says the panel. "Discriminating and hard choices will be required," it concludes.

Further Hart-Rudman reports will outline specific recommendations, but panel members have hinted at the ideas to come. When he was in the Senate, Gary Hart often promoted the idea that the US needed to buy cheaper weapons in larger quantities to counter the massive Soviet numerical force advantage. Today, he sounds somewhat different.

"It may be necessary," said the former senator at a Sept. 15 press conference, "to draw down force levels temporarily" to free up money to pay for modernized equipment, which will include systems characterized by "speed, range, unprecedented accuracy, lethality."

Coping with the vulnerability of the US homeland may require some nonmilitary moves, added ex-Speaker Gingrich.

"One of the things this probably implies is a capacity for homeland defense and for civil defense on a scale we have never dreamed of and which will require a significant redistribution of authority," he said.

Commissioners want their work to serve as a spur to the national security establishment in particular and the nation in general. Their basic message is that Americans are going to be less secure than they now believe themselves to be.

The comfortable life of Americans could be destroyed by disruption of computer systems, blacking out of power supplies, poisoning of water reservoirs, and jamming of transportation networks.

"Anybody who lives in Washington, D.C., knows what a single truck can do on the Beltway [a major eight-lane highway that circles the nation's capital] to disrupt the fragility of our communities," said former Rep. Lee Hamilton (D-Ind.), a panel member.

The geopolitical lineup of the world may alter suddenly, as it did the day the Berlin Wall came down. There is no guarantee that today's wealthy and influential nations will remain so.

The question of whether economies in democratic countries, such as Japan, can keep up with, and compete with, emerging giants such as China and India over time is very central, said commissioner Lionel Olmer, a former undersecretary of commerce for international trade.

Most of all, commissioners say, the US needs to realize that thinking does not make it so. Action will be required to shape the coming world. "So there, in a nutshell, is the challenge for American security policy and diplomacy," said commissioner Rice.

As Hart-Rudman sums up: "The future is one of rising stakes. While humanity has an unprecedented opportunity to succor its poor, heal its sick, compose its disagreements, and find new purpose in common global goals, failure at these tasks could produce calamity on a worldwide scale." ■

Peter Grier, the Washington editor of the Christian Science Monitor, is a longtime defense correspondent and regular contributor to Air Force Magazine. His most recent article, "New Roles for the Guard and Reserve," appeared in the November 1999 issue.

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The new Chief Master Sergeant of the Air Force sees cultural changes coming up.



A Talk With Chief Finch

THE Air Force's transition from a Cold War garrison force to the Expeditionary Aerospace Force of the future will entail much more than the structural realignment now under way, the new Chief Master Sergeant of the Air Force believes. "We have to change the mind-set and the culture of what we are and what we're trying to achieve as an Air Force," said CMSAF Frederick J. "Jim" Finch.

Helping the enlisted men and women of the Air Force make those changes is one of the top goals Finch set for himself as he moved into his job as the service's top enlisted representative.

Finch also wants to continue the effort to improve pay, benefits, and quality of life for Air Force personnel and hopes to clear away the misinformation that he believes is behind some of the concerns about deteriorating benefits.

Moreover, as the Air Force struggles to attract the high-quality young men and women it needs, Finch hopes to persuade his comrades that "we all have to be recruiters."

While the service will be "throwing dollars" at the problem by increasing advertising and recruiters, "the bigger message in all of this is that recruiting is everybody's responsibility, not just those in the recruiting force," he said.

Finch, 43, joined the Air Force in 1974. In his career, he has had numerous assignments in missile maintenance and several positions in professional military education, including one as the commandant of the Pacific Air Forces Noncommissioned Officers Academy. He also has two assignments as a command chief master sergeant.

After 25 years in the Air Force, the East Hampton, N.Y., native moved into USAF's top enlisted post on Aug. 2. Finch said the transition was made easier by his previous four years as command chief master sergeant for Air Combat Command, Langley AFB, Va.

Most of the issues affecting Air

Force enlisted personnel "don't vary much from command to command," he said during an interview in his Pentagon office. The biggest concerns he has heard during his initial trips around the force, Finch said, involve "optempo, pay and compensation issues, and career and training concerns."

The Great Transition

One of the big challenges that he faces, Finch said, is the one confronting the entire service. "The whole Air Force is in transition to an Expeditionary Aerospace Force concept," he said.

Although the service has been working through that shift in the 10 years since the Cold War thawed, "we finally have figured out how we can get our arms around this, to get organized, and to structure our Air Force to be able to handle what our nation has asked us to do."

That restructuring primarily involves formation of 10 Aerospace Expeditionary Forces. Together, these 10 units, another five mobility forces, and two on-call Aerospace Expeditionary Wings will form the basis of the Expeditionary Aerospace Force. The AEFs are composite units that will take turns being "in the box" to handle the kinds of known, rotational deployments, such as Operations Northern and Southern Watch in Southwest Asia, that have driven the operational and personnel tempos almost to the breaking point. The two on-call AEFs will share the responsibility for pop-up contingencies. The first two AEFs of the EAF concept went operational Oct. 1.

While others in the Air Force leadership deal with the organizational transition, Finch is focusing on the mental and cultural changes he believes the new concept requires.

A key part of that, he said, is determining "how we get an NCO in 2010, what that person is expected to do." The leadership's responsibility "is not just to take care of today's NCOs and missions but to make sure we grow NCOs for the future. ... If we want to grow E-9s [chief master sergeants] for 2010,

we have to start talking to staff sergeants today. We're doing that."

The cultural change on the horizon, said Finch, means "we're going to spend a lot of time away from our families," and that means "we'll have to put a lot more attention on how we take care of the families while they [the troops] are deployed. That wasn't a major concern in the past."

Finch went on, "We also have to make people understand that this is the norm that we're going to have for the future. It's not an anomaly ... that's going to go away in two years."

To make sure that Air Force people understand that reality, the message will be conveyed "from Day 1," starting at Basic Military Training at Lackland AFB, Texas, Finch said.

Finch in early October went to Lackland to speak to the first recruits graduating from "Warrior Week," the intense period of field training recently added to BMT.

"We created Warrior Week ... to let people know and have a mind-set when they first come into the Air Force that this is what the Air Force is all about: We deploy," he said.

See the World

Finch recalled that when he enlisted in 1974, "I expected to deploy a lot. I found that we did a lot of training to do that ... but never really went anywhere." Now, the new training should send a strong message that "people who come into the Air Force will get a chance to deploy, to see a lot of the world," he said.

In his meetings with the troops in his current job, as at ACC, the issues that seem to come up the most concern optempo, Finch said. "We've downsized our force to the point that there are not enough people around to do the things we have to do to meet our daily requirements," he said. That means people "have to find creative ways to do things. ... I think that's what people refer to when they talk about optempo."

As far as deployments and being away from home, "we approach that by creating the AEF, by packaging the force," Finch said.

Pay and benefits have been an-

other top concern, he said. "What it really comes down to, we're asking people to do things and do they feel that they're being appreciated," reported Finch. Convincing the airmen that they are appreciated has been "a difficult sell" recently, he conceded.

Finch said he was "much more optimistic today" after enactment of the Fiscal 2000 defense authorization bill that provides the biggest pay and benefits improvements since the early 1980s.

One of the big improvements in that bill was the repeal of the 1986 Redux plan. That plan cut traditional retirement of 50 percent of base pay at 20 years to only 40 percent of base pay at 20 years. Finch thought the objection of those affected by Redux "wasn't so much the money" as it was the feeling "that you're not taking care of me as you're taking care of somebody else. ... We created haves and have-nots" based on whether someone came into the service before or after 1986.

A third major issue has been medical care, particularly the Tricare program, Finch said.

He attributed concerns about Tricare mainly to "the confusion that's been associated with the regions standing up. ... There were some hiccups along the way."

These concerns "have slowed down as issues were worked out," said Finch. "While there are fewer ones now, there still are some issues to tackle." So Tricare will be a concern for a little bit longer, he said.

Housing also is a concern, both for married and single personnel, Finch said. Although the goal is "to provide a fair and equitable compensation for housing," either through on-base quarters or the variable housing allowance, he said, "we're not there yet."

Despite the Pentagon's efforts, the cost of housing has risen faster than compensation, he said.

The number and quality of on-base housing also are concerns, "because we don't have enough military construction dollars to fix all the housing shortages that we have, both for families and for single airmen."

There has been a lot of focus in recent years on taking care of the single airmen, attempting to provide the new 1+1 arrangements in the dormitories, Finch said.

"We're still working to get everyone into single rooms."

The military leadership has taken great strides, he said, in educating the Administration and Congress on the importance of pay and benefits. "It's a major factor in keeping people in."

Mostly Misinformed

But Finch said he has found that some of the perception among Air Force personnel about declining benefits is "mostly a case where people have been misinformed about what action we've actually taken."

"There have been a number of pay and benefit increases during the last eight to 10 years," he said. "I'm taking an active role to make sure the force knows that."

The chief said he has found that some of the feeling that benefits have dropped is because people see "a loss of services within the Air Force" resulting from a shortage of support personnel.

When squadrons deploy, they take not only aircrews, mechanics, and technicians but also support personnel, such as administration and finance clerks, engineers, and security people, he said.

That can result in a reduction in services at the home base, he noted.

The shortage of support personnel also becomes part of the optempo/perstempo problems, Finch said.

Deploying the support personnel "leaves the home base with the same amount of work but fewer people." That has stressed the support personnel left behind, he said.

The Air Force leadership is trying to address that problem by increasing the numbers of people in some of those overstressed support fields, he said.

Because the Air Force is not likely to get added end strength, those extra support troops will have to come from people whose jobs are contracted out, Finch said.

Headquarters is hoping to eliminate between 5,000 and 7,000 jobs through the competitive outsourcing program and to reallocate those authorized personnel numbers into fields such as engineers and security.

The service also is working to eliminate the shortages in spare parts that led to almost unconscionable levels of cannibalization in some of the flying units, Finch said.

When a decision was made some years ago to reduce spending on spare parts to apply the money toward other problems, "we were expecting to take a little hit on readiness," he said.

"But what we really found was that spare parts, while you think about it from a readiness standpoint, ... is really a quality-of-life issue."

That is true because, despite the lack of parts, "our people still wanted to get the job done." That forced them to "steal the parts from one aircraft to fix another," doubling their workload.

"You can do that for a short while. You can't do it long," Finch said. "So we're working on that. The funding levels are up," he said.

Finch said he no longer finds concerns in the enlisted force that the leadership either does not know or does not care about their problems.

"There was a time when that would come out," when people were saying they were working very hard but that information was not getting to Congress, he said. Finch attributed that problem to "the way we were getting information up to the senior leadership."

"There was a time, ultimately, that people questioned whether Congress and the senior leaders were getting the right message," he said. "I don't see that any more."

Finch said he has a "great relationship" with Gen. Michael E. Ryan, the Air Force Chief of Staff. "I can go see him anytime I need to see him and have easy access even when I'm not in town," he said.

Finch said he has found that when he brings concerns to Ryan and Air Force Secretary F. Whitten Peters, they "are very much up on most issues. It's hard to surprise them."

But Finch said he considers his main job "is to be able to provide both General Ryan and Secretary Peters with basically unfiltered information from the troops."

"While individuals may be a little reluctant to talk to a general, they have no problem talking to a chief," he said. ■

Otto Kreisher is a Washington, D.C.-based military affairs reporter and regular contributor to Air Force Magazine. His most recent article, "Hawley's Warning," appeared in the July 1999 issue.

Flashback

Luck



1st Lt. Joe R. Hollaway Jr. strikes a casual pose, but his "armrest" was created when a German shell pierced his aircraft's propeller blade as he flew a sortie over France during World War II. Hairless Joe 2nd—the name of his airplane—should have been called Lucky Joe. The shell hit the widest part of the blade; had it struck closer to the edge, it probably would have shattered the propeller.

During the 1990s,
the Air Force's
overall Mission
Capable rate has
10 percentage
points.

Eight Straight

U

SAP readiness, as measured by Mission Capable rates in the total Air Force, has declined for its eighth straight year.

Near-final figures for Fiscal 1999 show an average MC rate for all operational flying forces of 73.7 percent, the lowest in the decade. It means that, during the year, an average of less than three-quarters of the Air Force fleet was prepared to perform most of their missions. (Figures were available for the first 10 months of Fiscal 1999.)

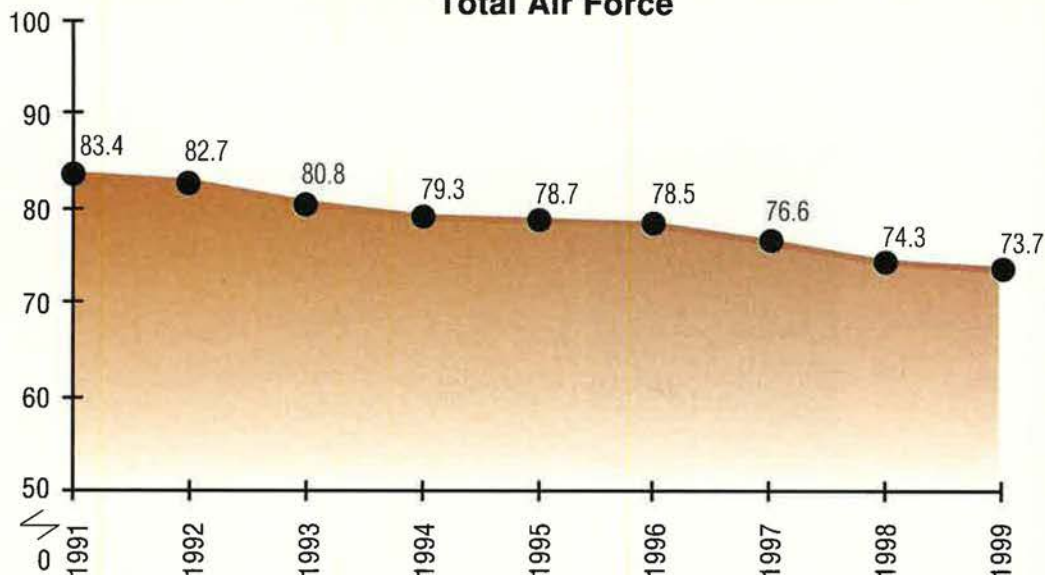
The problems seen in 1999 continue a broad, decade-long trend. The MC rate for USAF's combat forces has dropped nearly 10 percentage points from a high of 83.4 percent in 1991, despite the Clinton Administration's avowed determination to arrest and reverse the slide.

The trend has been generally downward in all four major categories—fighters, bombers, strategic airlifters, and “other” forces such as surveillance and reconnaissance aircraft.

During the early and mid-1990s, MC rates in the bomber force registered a substantial increase. However, bomber MC rates have declined in the three most recent years. The MC rates for strategic airlifters, after a decline, have stayed more or less flat since the mid-1990s, a fact attributed mostly to the introduction of new C-17 airlifters.

In the first 10 months of Fiscal 1999, which ended Sept. 30, readiness went through numerous twists and turns. (See p. 70.) Overall MC rates fell through much of the year, picked back up during Allied Force, the air operation in the Balkans, and then started back down again when it was over.

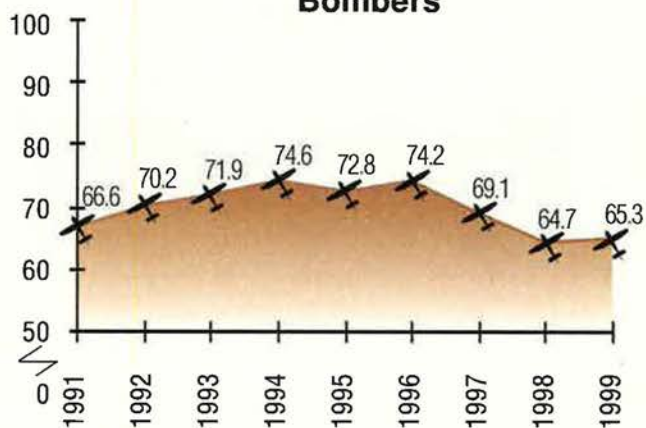
Total Air Force



Fighters



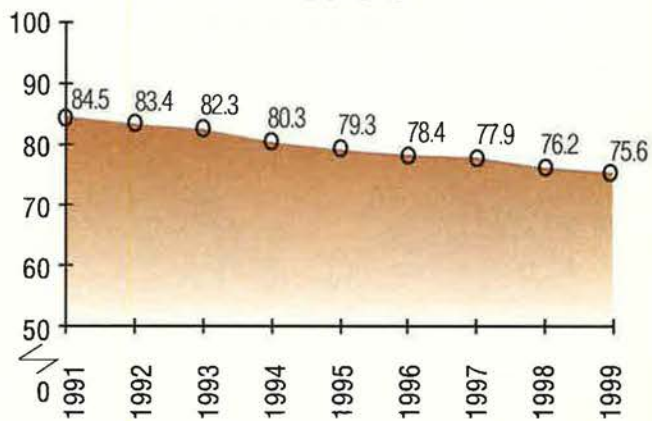
Bombers



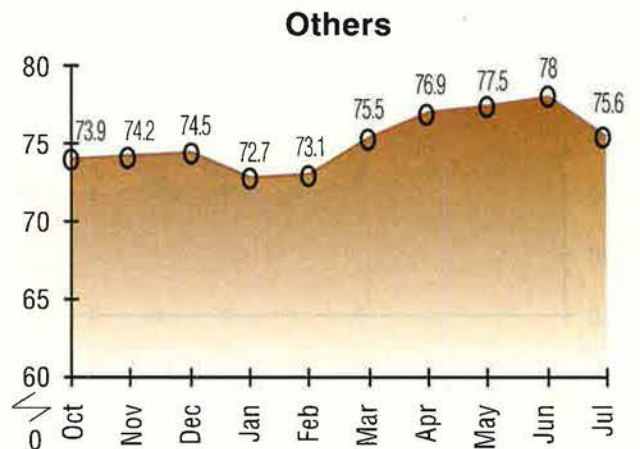
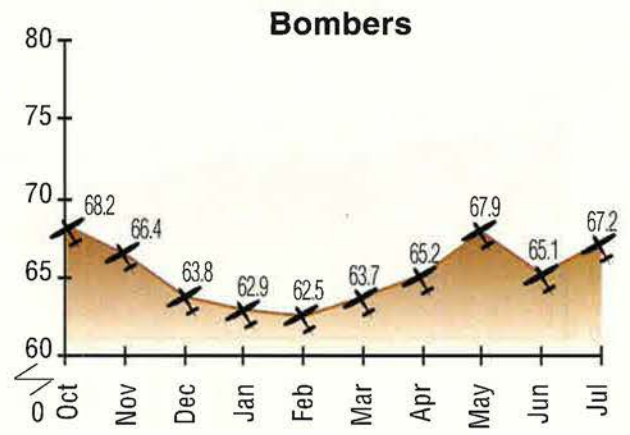
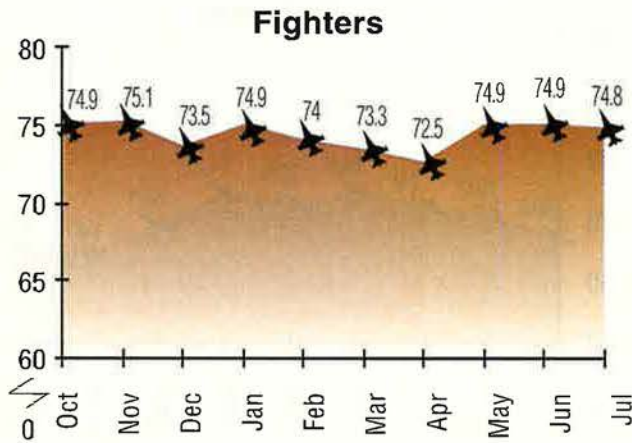
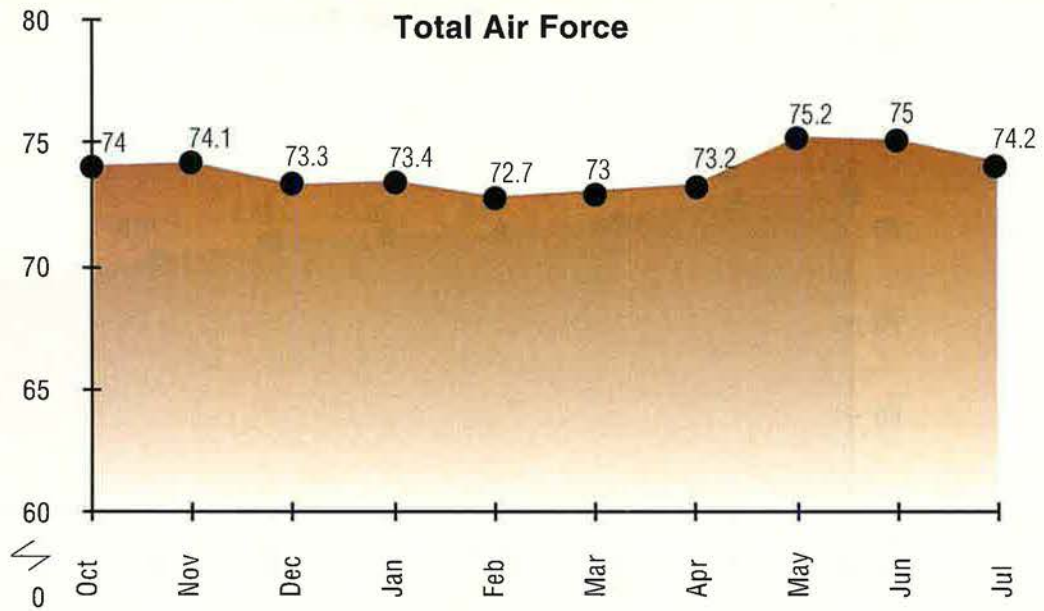
Strategic Airlift



Others



Continued on p. 70



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In its heyday, it included a Ground Observer Corps, radar picket lines in the far north, SAGE centers, and almost 1,500 interceptors.

The




In the mid-1980s, F-4s out of the 57th Fighter-Interceptor Squadron escort a new Soviet Bear-H bomber on reconnaissance patrol off North America. This typical Cold War scene was replayed recently as Air National Guard F-15As intercepted a Russian Tu-95 Bear near Iceland, a NATO member.



Rise of Air Defense

By Walter J. Boyne



LAST June 25, a pair of Tu-95 Bear bombers raced out of Russia and seemed to be about to enter the airspace of Iceland, a NATO nation. Two F-15A fighters from the Louisiana Air National Guard's 159th Fighter Wing, which had been deployed to Reykjavik, scrambled and rose to meet the Bears, warning them off. The Bears turned onto another course and departed the area. The intercept marked only another round in the continuing, eight-decades-long history of American air defense operations.

In 1916, no less a visionary than Alexander Graham Bell warned about the possibility of airship raids on the US. For the next 25 years, experts studied the problem of air defense and lay the foundation for the future. During World War II, there was a sizeable effort to defend the country from aerial attack, and in the years immediately following World War II, the Soviet Union presented a threat in the form of Tu-4 bombers.

The US reacted slowly to the Soviet air threat, not from slothfulness but because of the drastic adverse effects of rapid demobilization of US Army

Air Forces and greatly shrunken postwar budgets. In time, however, the newly independent Air Force would meet the Soviet bomber challenge head-on with a massive response. From a small beginning, more than a dozen ever more sophisticated interceptor aircraft were introduced, ranging from World War II P-61 Black Widows to today's F-15s. Total numbers rose from a single P-61 to a peak strength of almost 1,500 interceptors of various kinds.

In addition to the airplanes, there were sophisticated Surface-to-Air Missiles; immense radar systems built through the trackless Arctic; a huge, enthusiastic Ground Observer Corps; picket ships; Texas Towers; and airborne command-and-control aircraft. All were integrated into a series of computer-based control systems.

Threats Near and Far

There were many hotly contested political issues. At the most basic level in the Air Force, there was concern that funds to create an "impenetrable air defense" would be obtained by siphoning money away from Strategic Air Command's mission of nuclear deterrence. Apart from the intramural disputes, USAF's battles with the Army over control of SAMs and other issues were particularly bitter.

The initial requirement was to stop a handful of conventionally armed



The Ground Observer Corps was reconstituted in 1950 to become part of the first line of defense against air attacks in the post-World War II years. Volunteers like these carried on operations until the corps was deactivated in 1959.

piston engine-powered bombers on a one-way mission, flying a predictable course. The threat swiftly grew to the prospect of an attack by hundreds of turboprop and jet bombers armed with thermonuclear weapons and attacking from different directions. Meeting such a threat required the creation of a huge system. It consumed billions of dollars. It required leadership, foresight, and brilliant science.

Even more important, its day-by-day success hinged on the dedication of pilots, mechanics, radar operators, and all of the other anonymous per-

sonnel who fought off the extreme cold weather and endless hours of boredom to stand guard against an enemy they hoped would never come.

Air Defense Command duty was almost always difficult. Many bases were located in the north and weather conditions were often miserable. In the early days, bases had few amenities, and alert crews had to stand by their aircraft in drafty hangars. In the far north, snow was sometimes so deep that an aircraft taking off could not be seen until it lifted above the snow walls lining the runway. After an intercept, landings were made at the snowbound runway with minimum visibility and ceiling. ADC pilots were almost always superb at their work.

Activation of Air Defense Command took place in March 1946 at Mitchel Field, N.Y. It was part of a general reorganization of the US Army Air Forces. It was commanded by Lt. Gen. George E. Stratemeyer, former head of USAAF in China. Stratemeyer drove himself, attempting to accomplish tasks for which resources would not be forthcoming.

At the time, the leading air defense specialist was Maj. Gen. Gordon P. Saville, who had formulated his ideas as an instructor at the Air Corps Tactical School. He had been heavily involved in the air defense issue early in World War II. He even wrote AAF's handbook "Air Defense Doctrine" in 1941.



Shown here on air defense alert, the radar-equipped F-86D filled in the gap in the early 1950s while a more ideal long-range, supersonic, high-altitude fighter-interceptor was developed. Some pilots called this aircraft the "Sabre Dog."

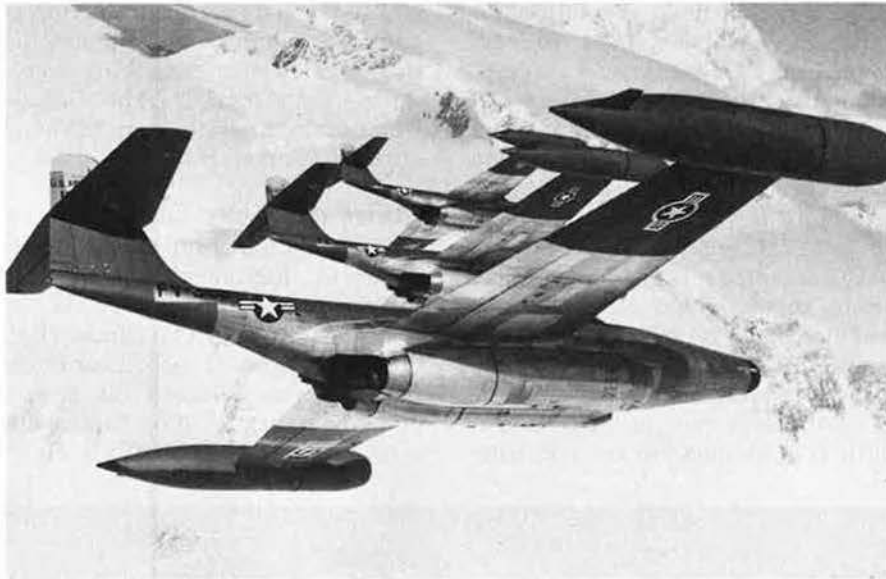
Saville had given much serious thought to the Claire Chennault-style warning system, which made heavy use of ground observers connected to central filter stations. He advocated and promoted growth of radar stations, Ground Observer Corps, and control centers that would be useful for the future.

The Georgia-born Saville was a tough customer who, if he had to, would run roughshod over an opponent to accomplish his mission. By 1944, however, most people viewed the probability of an Axis air attack as negligible and Saville was given other duties. It was not until 1948 that he returned to the air defense problem under ADC and Stratemeyer.

Saville was assigned as a special projects officer in June 1948, with the mission of reviving ADC from the shambles of demobilization. His



F-102 Delta Daguers escort a Soviet Tu-95 Bear. The Dagger, which won the "1954 Interceptor" competition, entered service in 1956. At peak deployment there were more than 25 F-102 squadrons.



These three F-89D Scorpions, assigned to the 64th Fighter-Interceptor Squadron, Elmendorf AFB, Alaska, performed air defense duty in the Arctic, from Alaska to Greenland and Iceland. This model carried 104 2.75-inch folding-wing air-to-air rockets in its wingtip pods.

flamboyant personality and regulation-defying ways were regarded as the price the Air Force had to pay for his brilliant intellect.

Hands-On Experience

He and his commander had a foundation for the effort. In World War II, USAAF had acquired great experience with air defense systems. It confronted the Luftwaffe in three vicious years of fighting over Europe. Japan's defenses, while less formidable than those of Nazi Germany, presented many problems. The

service also had acquired much valuable knowledge through the development of its own radar stations and interceptor units in the US.

What both Stratemeyer and Saville lacked, however, were the airplanes, personnel, and funds for ADC's mission. Assets were almost nonexistent. There were two night fighter squadrons. One was a purely paper organization, while the other, initially, had one officer and two enlisted men.

Postwar budgets for the military were cut beyond the bone, and the

services were constantly shifting and scrambling to cover shortfalls. On Dec. 1, 1948, USAF established the new Continental Air Command, with Stratemeyer in charge, as a coordinating agency for ADC and Tactical Air Command and the training of the Air National Guard and Air Force Reserve. Simultaneously, Saville became head of an ADC which was now a subordinate organization.

He continued to plug away at the problem, however. As the Soviet threat became generally recognized, so did a requirement for adequate early warning. In the earliest effort to provide it, USAF came up with a system in 1947 known as "Radar Fence Plan," which called for 411 radar stations and 18 control centers and was projected to cost \$600 million. The cost of the plan clearly exceeded the Air Force ability to pay, and Saville was asked to develop a less expensive version.

Saville's answer was something that became known as the "Permanent System." It was to consist of 85 radar stations and 11 control centers, in the United States and Alaska. The cost was estimated to be about \$116 million, spread over the period 1949-50. It became fully operational in April 1953.

However, the Air Force was loath to ignore the immediate threat, and it built a temporary system, sarcastically but aptly called "Lashup." It comprised 43 sites by 1950. The system used World War II AN/CPS-5



By the early 1960s, detecting incoming Soviet ICBMs had become more important than intercepting an attack by Soviet bombers. NORAD expanded in the 1960s primarily in response to this new threat.

search radar systems that were deficient in range and in low-altitude detection capability. In addition, 36 ANG fighter units were called to active duty for the mission.

Back to Radar

Lashup had the great value of introducing the US again to the concept of a radar air defense system. It was soon augmented by three more-effective systems whose inputs would be fed to one of the bigger gambles of the period—the Semiautomatic Ground Environment system, designed to control fighters and fight the air defense battle. SAGE had begun as a concept in the Air Defense Systems Engineering Committee, headed by eminent Massachusetts Institute of Technology scientist George E. Valley. Valley foresaw that computers would develop to the point that they could be used to control an air defense system. He was right, and he was backed by ADC commanders throughout the years.

In the early 1950s, the Soviet military threat began to expand rapidly. The United States responded primarily by building up the striking power of the Air Force's Strategic Air Command, which grew steadily in offensive power with the acquisition of jet bombers and tankers and, later, Intercontinental Ballistic Missiles. Deterrence occupied the top rung of the strategic ladder.

Yet the requirement for air defense was by then widely recognized.

ADC was reinstated as a full major command in January 1951, with Lt. Gen. Ennis C. Whitehead as commander and ADC headquarters established at Ent AFB, Colo. More importantly, the air defense mission now began to receive major appropriations. It was used mainly to buy an adequate interceptor force, and ADC operated a succession of ever more sophisticated radar systems supplemented by advanced SAMs.

The Royal Canadian Air Force proved to be a boon partner with the United States, both in the responsibilities it assumed in the construc-

tion of the warning systems and in the provision of effective air defense squadrons. In some respects, the air defense mission was to RCAF what the nuclear deterrent mission was to USAF—its No. 1 reason for being.

In the early 1950s, the two North American air forces launched construction of the Pinetree Line and completed it in June 1954. Consisting of 33 stations, it extended on both sides of the international border and provided warning and ground-control-intercept activities. The United States paid for 22 of the stations and provided personnel for 18.

Canada then constructed the Mid-Canada Line, building it entirely with its own resources. Built along the 55th parallel, the early warning system was also called the McGill Line, after the scientists at McGill University who planned and designed it. Not so much a radar warning line as an unmanned microwave fence, the line signaled when something—anything—flew over it. The Mid-Canada Line became operational in 1957 and cost approximately \$220 million.

Above the Arctic Circle

It was then that military officials began to entertain the prospect of building a warning line in the far north, inside the Arctic Circle. High cost projections disturbed Air Force leaders, who believed the money could be better spent on bomb shelters and base dispersal efforts. How-



An F-106 launches an ATR-2A (the training version of the AIR-2A Genie rocket). Operating with the SAGE system, the Delta Dart could be flown automatically from wheels up to flareout before touchdown.

ever, USAF conducted experiments in conjunction with the Lincoln Laboratory of MIT and became convinced that a Distant Early Warning Line was feasible.

Once again working in cooperation with Canada's air force, USAF in December 1954 placed a contract for the construction of the DEW Line.

The DEW Line, built along an irregular path extending from Cape Lisburne, Alaska, to the west coast of Greenland, with auxiliary stations situated even further east, was a mammoth undertaking. It was the largest construction project ever attempted in the Arctic, and it required the movement of hundreds of shiploads of material and thousands of sorties by American transport airplanes. The workforce toiled day and night, seven days a week, to make



On the ground in the late 1950s, air defense in the far north included radars on the DEW Line, amid windswept peaks on the frozen landscape. Construction of the DEW Line was the largest building project in the Arctic.



A more radical idea for early warning: Texas Towers, named for their resemblance to oil-drilling platforms. The radar stations rose from the sea, off the northeast coast of the US. This is TT-3, located south of Nantucket, Mass. The last of the towers was decommissioned in 1963.

the July 31, 1957, date when responsibility was to be transferred to USAF. Twenty-five lives were lost in the process.

The "White Alice" communications system was built to link airborne warning and control aircraft with the DEW Line radar. Ultimately, 49 sites were built, extending along the Aleutian archipelago out to Shemya, Alaska. There were few places where boredom was more pervasive.

The success of the DEW Line smoothed the way for the creation of the Ballistic Missile Early Warning

System, which was completed in 1963 after five years of intensive effort. The BMEWS sites included Thule AB in Greenland, Clear AS in Alaska, and RAF Fylingdales Moor in England. In addition, the number of radar stations had increased dramatically during the decade of the 1950s, with 300 small automatic radar sites adding coverage.

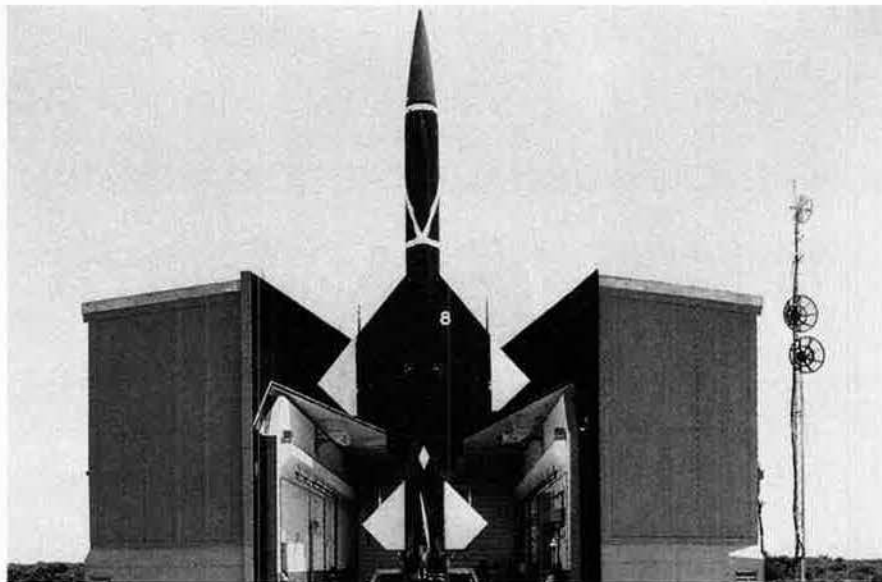
The Pinetree, Mid-Canada, and DEW Lines all were integrated into the SAGE system. The SAGE project had gotten a major boost from the ADC commander, the brilliant Gen.

Benjamin W. Chidlaw. Chidlaw had done remarkable work during World War II, supervising some of the most advanced projects at Wright Field in Ohio before becoming a combat commander in Europe. When he took command of ADC in August 1951, he concluded that it had the capability to destroy only about 10 percent of an incoming bomber force, and he was determined to improve the situation with technology. Chidlaw's answer was SAGE, which he promoted relentlessly.

After years of development effort, the SAGE system became operational on June 26, 1958, when the New York sector came on line. Air Force enthusiasm for SAGE led to the planning of an intricate network of eight air defense regions within the continental United States and 32 SAGE direction centers. It was linked to 54 fighter-interceptor squadrons backed up by 66 Nike-Ajax SAM battalions.

Shifting Emphasis

In the early 1960s, however, SAGE was overtaken by events, as USAF shifted its emphasis away from intercepting bombers and toward the detection of ICBMs. It also had initial operating difficulties, with operators tending to prefer well-known manual techniques of controlling interceptors rather than relying on automated information. SAGE was never tested in battle, but it gave the US Air Force a crash course in com-



The BOMARC—shown here at Cape Canaveral AFB, Fla.—was USAF's ground-fired weapon for area defense and was operational from 1959 to the 1970s. Deployed at 10 sites, BOMARCs were integrated into the SAGE system.

puter technology that would stand it in good stead in the future.

The need to extend the radar warning lines and to fill gaps in coverage, particularly for low-flying aircraft, led to the use of other means of detection.

In 1953, USAF began using the EC-121 Warning Star as an early warning aircraft. The military EC-121s flew out of Otis AFB, Mass., on the East Coast and McClellan AFB, Calif., in the west. Eventually, USAF operated 11 squadrons. The early EC-121s had relatively primitive electronic systems and were not very reliable. Over time, however, the equipment improved and the EC-121s could be linked directly to the SAGE network. The success of the EC-121s could be attributed to the aircrews who flew the long missions and to the patience of the ground crews who kept the maintenance-prone airplanes airborne. The success of the EC-121s led to the later generation of the E-3 Airborne Warning and Control System aircraft.

The Air Force took some unconventional steps, too. It even harked back to the early 1940s by reconstituting a Ground Observer Corps. During World War II, more than 1.5 million US civilians had trained in the GOC. They were almost too enthusiastic, though, and tended to deluge Ground Control Intercept sites with well-meaning but unhelpful phone calls. The program was discontinued in 1944. In February 1950,

Whitehead called for a Ground Observer Corps of 160,000 members to help plug the gaps in low-altitude coverage. The GOC was not deactivated until 1959.

The radical extent to which USAF would go for radar warning time was best evidenced by the sea-based platforms called Texas Towers. These resembled oil-drilling rigs and were placed on shoals about 100 miles off the northeast coast of the United States. The Air Force proposed five towers, but only three were built. The first, Texas Tower Two (TT-2), began operation 110 miles east of Cape Cod in December 1955.

A staff of 54 was installed on each tower, which would roll and groan from being pitched in the sea swells and from vibration of equipment. It was difficult duty, and it turned tragic on Jan. 15, 1961, when all 28 members of a caretaker crew died when a winter gale caused the collapse of TT-4. The last of the towers, TT-3, was decommissioned in 1963.

The question of who was to control US air defense became a source of considerable tension between the Air Force and the Army. The Army wished to retain control of its anti-aircraft artillery and felt that their

The Lineage of the Air Defense Fighter

When the Cold War began, bomber technology was ascendant and would continue to be so for more than a decade. That P-61 did not have the capabilities to engage the Soviet Tu-4 bomber. Its successor, the F-82 Twin Mustang, was even more disappointing. It took a long time to get into production and did not perform well in inclement weather.

The early jet fighters, such as the P-80 and P-84, lacked all-weather capability and were deemed useless for air defense purposes. Much hope was placed on two jet-powered interceptors, the XP-87 Blackhawk and the XP-89 Scorpion. (Designations changed to XF-87 and XF-89.) They, in their turn, proved to be inadequate. The XF-87 was cancelled and the Scorpion had to undergo extensive redesign.

While the Scorpions were maturing, the F-94 Starfire was pressed into service as an "interim" interceptor. North American in 1949 pushed an interceptor version of the Sabre, the F-86D. Despite the demands its complexity made upon a single pilot, the F-86D was backed by senior Air Force officials. Some 2,504 would be built and it would in time be the most numerous interceptor in the Air Defense Command fleet, with more than 1,000 in service by the end of 1955.

The F-86D was not ideal, however, for its afterburner consumed a great deal of fuel in getting it to altitude, and the pilot was overburdened by cockpit tasks.

At the same time that a decision was made to use the F-86D, a design competition for a "1954 Interceptor" was held by the Air Force. Criteria for the 1954 Interceptor included long range, supersonic speed, and high-altitude capability. It was to be integrated with the ground-based radar system and be guided automatically to the target. The interceptor's own radar and fire-control system would make the interception, fire the weapons, and then guide the aircraft automatically back to the home field.

The winner of the competition—the F-102 Delta Dagger—did not enter service until 1956, and then only to serve as a stopgap until the arrival of the F-106 Delta Dart. "The Six" became operational in 1959, and, when the bugs were worked out, met all of the expectations of the 1954 Interceptor competition. However, the 200 black boxes of the MA-1 system were a maintenance challenge.

To augment the interceptor force, ADC brought the F-104 Starfighter into service in 1956 and the F-101B Voodoo in 1959. The F-104 was too small to house all the necessary equipment for a first line interceptor. It was retired to the Air National Guard by 1960. The F-101s proved to be excellent interceptors, almost equal to the F-106s, and remained in service until the 1980s.

claim was enhanced by development of the Hawk and Nike series of Surface-to-Air Missiles. The Air Force developed its own SAM, the BOMARC (for Boeing-Michigan Aeronautical Research Center), and wished to control all aspects of air defense, including ground-fired weapons.

It was a difficult issue, going to the very heart of roles and missions. Defense authorities ultimately decided that the Army would deploy the Nike for point defense and the Air Force would deploy BOMARC for area defense.

BOMARC was an ambitious project. Seven years of testing passed before the missile became operational in 1959. Some 500 nuclear-tipped BOMARCs were deployed at 10 sites (two in Canada), and the missile was integrated into the



Photo by Theo Van Gelfen

Air National Guard units played a key role in the US air defense mission during the Cold War and continue to do so today. Above, a KC-135 refuels F-4s from the Minnesota and California ANG.



An F-15 from the 21st Tactical Fighter Wing intercepts this Soviet Bear-H off Alaska's northern coast in July 1985. Back then, Soviet aircraft routinely tested North America's air defenses.

SAGE system. Performance was remarkable for the time, with a speed of about Mach 2.5, a ceiling of 80,000 feet, and a range of 200 miles. BOMARC's onboard radar guided it to its target. The proximity-fused nuclear warhead was intended for use against Soviet formations. The missile stayed in service until the early 1970s.

Birth of NORAD

The Army didn't like the Air Force's organizational ideas, either. In 1954, Chidlaw produced a plan for a US Air Defense Command, a joint command featuring close coordination and cooperation of Army, Navy, and USAF units concerned with air defense. He also suggested that Canada be invited to partici-

pate. The Army was outraged and expressed its deep disapproval.

The Army's reaction notwithstanding, the Joint Chiefs of Staff embraced Chidlaw's idea, using it as the basis for the formation, in 1954, of Continental Air Defense Command. Chidlaw himself became the first commander of the Colorado Springs, Colo.-based CONAD, which was the progenitor of North American Air (now Aerospace) Defense Command, established in 1957.

NORAD expanded greatly in the 1960s but principally because of the emerging Soviet ICBM threat. Robert S. McNamara, Secretary of Defense in the Kennedy and Johnson Administrations, concluded that the ICBM problem was so overwhelming that it rendered relatively inconsequential the threat of Soviet bomber attack. The American air defense system had risen from postwar wreckage to become the most sophisticated ever, but, with the rise of the ICBM, emphasis on air defense against bombers went into a sharp decline.

ADC's mission was reduced over time. In 1980, ADC was once again inactivated, and its assets were divided between the Air Force's Tactical Air Command and Strategic Air Command. Today, ADC's proud heritage is maintained by NORAD, Air Combat Command, the Air National Guard, and the Air Force Reserve, as was made clear on a recent day in the skies around Iceland. ■

Walter J. Boyne, former director of the National Air and Space Museum in Washington, is a retired Air Force colonel and author. He has written more than 400 articles about aviation topics and 29 books, the most recent of which is Beyond the Horizons: The Lockheed Story. His most recent article for Air Force Magazine, "Route Pack 6," appeared in the November 1999 issue.

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Bernád, Dénes. *Rumanian Air Force: The Prime Decade, 1938-1947.* Squadron/Signal Publications, Inc., 1115 Crowley Dr., Carrollton, TX 75011-5010 (972-242-8663). 1999. 80 pages. \$11.95.




Bradley, F.J. *No Strategic Targets Left.* Turner Publishing Company, PO Box 3101, Paducah, KY 42002-3101 (800-788-3350). 1999. 112 pages. \$24.95.



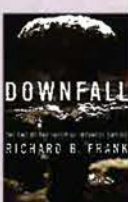
Dann, Richard S. *Walk Around: UH-60 Black Hawk.* Squadron/Signal Publications, Inc., 1115 Crowley Dr., Carrollton, TX 75011-5010 (972-242-8663). 1999. 79 pages. \$14.95.




Filley, Brian. *FW 190A, F, and G in Action.* Squadron/Signal Publications, Inc., 1115 Crowley Dr., Carrollton, TX 75011-5010 (972-242-8663). 1999. 57 pages. \$8.95.




Frank, Richard B. *Downfall: The End of the Imperial Japanese Empire.* Random House, Inc., 201 E. 50th St., New York, NY 10022 (800-726-0600). 1999. 484 pages. \$35.00.




Hutton, Stephen. *Squadron of Deception: The 36th Bomb Squadron in World War II.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1999. 215 pages. \$39.95.




Jablonsky, David, ed. *Roots of Strategy: Book 4.* Stackpole Books, 5067 Ritter Rd., Mechanicsburg, PA 17055 (800-732-3669). 1999. 533 pages. \$19.95.




Jenkins, Dennis R. *Convair B-36 "Peacemaker": WarbirdTech Series Vol. 24.* Specialty Press Publishers and Wholesalers, 11605 Kost Dam Rd., North Branch, MN 55056 (800-895-4585). 1999. 100 pages. \$16.95.




Kinzey, Bert. *P-40 Warhawk in Detail.* Squadron/Signal Publications, Inc., 1115 Crowley Dr., Carrollton, TX 75011-5010 (972-242-8663). 1999. 79 pages. \$12.95.



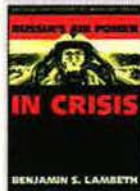
Kisamore, Norman D. *Leo, My Big Brother: The Biography of an Achiever.* Pentland Press, Inc., 5122 Bur Oak Cir., Raleigh, NC 27612 (800-775-1100). 1999. 244 pages. \$22.95.




Lambert, John W. *Atlantic Air War: Sub Hunters vs. U-Boats.* Specialty Press Publishers and Wholesalers, 11605 Kost Dam Rd., North Branch, MN 55056 (800-895-4585). 1999. 111 pages. \$18.95.




Lambeth, Benjamin S. *Russia's Air Power In Crisis: A RAND Research Study.* Smithsonian Institution Press, PO Box 960, Herndon, VA 20172-0960 (800-782-4612). 1999. 233 pages. \$29.95.




Launius, Roger D., ed. *Innovation and the Development of Flight.* Texas A&M University Press, John H. Lindsey Building, Lewis St., College Station, TX 77843-4354 (800-826-8911). 1999. 335 pages. \$44.95.




Levine, Alan J. *The War Against Rommel's Supply Lines, 1942-1943.* Praeger Publishers, 88 Post Rd. W., PO Box 5007, Westport, CT 06881-5007 (203-226-3571). 1999. 219 pages. \$59.95.




McCain, John, with Mark Salter. *Faith of My Fathers: A Family Memoir.* Random House, Inc., 201 E. 50th St., New York, NY 10022 (800-726-0600). 1999. 349 pages. \$25.00.




Patterson, Dan, and Paul Perkins. *Thunderbolt: Republic P-47.* Howell Press, 1713-2D Allied Ln., Charlottesville, VA 22903 (800-868-4512). 65 pages. \$15.95.



Stanaway, John, and Bob Rucker. *The Eight Ballers: Eyes of the Fifth Air Force: The 8th Photo Reconnaissance Squadron in World War II.* Schiffer Publishing Ltd., 4880 Lower Valley Rd., Atglen, PA 19310 (610-593-1777). 1999. 184 pages. \$39.95.



Westrum, Ron. *Sidewinder: Creative Missile Development at China Lake.* Naval Institute Press, 2062 Generals Hwy., Annapolis, MD 21401 (800-233-8764). 1999. 331 pages. \$32.95.



AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

AFA Helps the 509th Secure Award

The Air Force Association recently helped secure an Air Force Outstanding Unit Award—with valor device—for the 509th Composite Group, whose aircraft *Enola Gay* and *Bockscar* dropped the atomic bombs on Hiroshima and Nagasaki, bringing World War II to an end and saving countless American lives.

Lt. Gen. Thomas J. Keck, Air Combat Command vice commander, made the formal presentation of the award at a ceremony at Andrews AFB, Md., on Oct. 16, during a 509th reunion.

The official citation recognizes the 509th as the first Army Air Forces group to be trained, organized, and equipped, under adverse conditions, for atomic warfare.

Efforts over the years—sometimes involving senior members of Congress—to secure an award for the unit were unsuccessful. That changed this past spring, when AFA became involved at the urging of Frederick C. Bock, a 509th aircraft commander. AFA's Government Relations staff studied the regulations governing awards, combed through the unit history to match events with specific award criteria, and was instrumental in preparing the package of documents that led to approval for the award. AFA also helped with details of the actual ceremony, arranging for loan of the unit flag from the 509th Bomb Wing at Whiteman AFB, Mo., getting a streamer for the flag, and buying the AFOUA ribbons presented to the unit members.

Buon Giorno, AAA

Nearly 70 members and guests of the Association Arma Aeronautica—AFA's Italian counterpart—attended a reception hosted by AFA at its Arlington, Va., headquarters in October.

The AAA members had traveled to the US to participate in special events ranging from marching in New York City's Columbus Day Parade to touring the Pentagon, an activity arranged through AFA.

Speaking to the reception audience through an interpreter, AFA National President Thomas J. McKee



In an Andrews AFB, Md., ceremony, the 509th Composite Group received an Air Force Outstanding Unit Award. At left is Lt. Gen. Thomas Keck, ACC vice commander, congratulating Paul Tibbets, who was the 509th commander and is a member of the Capt. Eddie Rickenbacker Memorial (Ohio) Chapter.

noted that the two organizations have worked together for almost a decade, dating back to a trip to Italy made by Jack C. Price, now Aerospace Education Foundation president but who was then serving as AFA national president (1988–90). Price and retired Gen. Catullo Nardi, then AAA president, signed a memorandum to work together to preserve an aerospace heritage for future airmen. The two associations have nurtured their ties since then.

In his AFA outreach effort in Europe last year, then-AFA National President Doyle E. Larson met Nardi, as well as retired Gen. Vincenzo Manca, current president of the 36,000-member AAA, and retired Gen. Riccardo Marchese.

Both Manca and Marchese were present for the latest reciprocal visit. Welcoming them to the AFA reception were Lt. Gen. William J. Begett, USAF assistant vice chief of staff, as well as Larson, Price, John E. Craig II, region president (Central East Region), Mary Arne Thompson, national director, and Charles Link,

president of the Air Force Memorial Foundation.

In his remarks, Manca noted that the air forces of the two countries continue to have a solid relationship, sharing bases and training. "All aviators," he said, "have the same heart."

AFA Leaders on Joint STARS

AFA National President McKee and Board Chairman Larson received a five-hour orientation flight on a Joint Surveillance Target Attack Radar System aircraft from the 93rd Air Control Wing, Robins AFB, Ga., in late September.

A modified Boeing 7C7 equipped with long-range, air-to-ground radar to locate and track vehicles on the ground more than 200 kilometers away, the E-8 Joint STARS is vital to ground surveillance, battle management, and command and control.

AFA's 2000 Statement of Policy notes that the 1998 Quadrennial Defense Review directed that the planned buy of 19 Joint STARS aircraft be reduced to 13, on the assumption that NATC countries would buy the

Photo by Paul Kennedy



system. They have not, and AFA has stated that full funding should be restored to Joint STARS to procure a minimum 19 aircraft.

"Joint STARS is a tremendous national asset and gives our ground commanders great situational awareness," McKee commented in a Georgia newspaper interview. "Without the full number, we continue to overextend our people and resources."

A fifth Joint STARS aircraft was delivered to Robins in October.

Search for a Guardian Angel

On Nov. 1, 1944, 1st Lt. Everett R. Jones Jr. was a B-24 pilot with the 466th Bomb Group, Attlebridge, UK. Returning from bombing fuel refineries at Gelsenkirchen, Germany, his bomber developed engine trouble. Jones shut down an engine, dropped to a lower altitude, and the aircraft became an easy target for enemy fighters. The crew was anxiously watching for enemy aircraft when an American P-51 appeared and adopted the role of escort. Suddenly, a German fighter appeared and shot down the Mustang. The German aircraft, Jones recalled, came and went in a flash. "We had never seen a man-made object travel so fast," he said.

Last April, Jones, now a **Dallas (Texas) Chapter** member, saw a model airplane magazine that led him to conclude the German fighter must have been a rocket-powered Me-163 Komet. Identifying the airplane led him to wonder again about the P-51 pilot. The memory of the pilot's sacrifice had always "plagued" him, he said.

In May, Jones placed an item in *Air Force Magazine's* "Bulletin Board" section, seeking information on that P-51 pilot. Within weeks, the responses arrived. One came from Steven M. Blake, an **Orange County/Gen. Curtis E. LeMay Chapter** member. A postal mail carrier and amateur historian, he had earlier researched the November 1944 incident for a book. Blake sent Jones copies of reports and photos he collected.

And so, 54 years later, Jones finally had a name for his bomber's guardian angel: 2nd Lt. Denis Alison, from Bir-



Renewing ties between AFA and the Associazione Arma Aeronautica are AFA National President Thomas McKee, holding a gift from the visitors, and AAA President Vincenzo Manca (center). Guido Adelfio (left) served as translator.

mingham, Mich., assigned to the 20th Fighter Group, Kings Cliffe, UK.

The story of Jones's search for the pilot who saved his life—and *Air Force Magazine's* role in the process—became a huge feature story in *The Dallas Morning News* in August. It covered more than two pages, including photos and a diagram of the action.

For the Memorial

TRW recently donated \$100,000 to the Air Force Memorial Foundation, in a presentation attended by Secretary of the Air Force F. Whitten Peters and Air Force Chief of Staff Gen. Michael E. Ryan.

The donation is part of a multiyear \$500,000 pledge that TRW has made to the foundation.

PBS to Air "Legends"

The Public Broadcasting System will air the 13-part series "Legends of Airpower" next year, with radio broadcaster Gene Pell as host and narrator.

Legends is also scheduled to air in February on the cable network Speedvision.

The original series was partially underwritten by the Aerospace Education Foundation and produced by Three Roads Communications of Arlington, Va., with the Air Force Association to help commemorate USAF's 50th anniversary.

In its 30-minute programs, *Legends* covers the lives of military aviators Henry H. "Hap" Arnold, Randy "Duke" Cunningham, Benjamin O. Davis Jr., Jimmy Doolittle, AFA National Director Emeritus Russell E. Dougherty, Francis S. "Gabby" Gabreski, John Glenn, Charles A. Hornier, Curtis E. LeMay, Billy Mitchell, Bernard A. Schriever, Jimmy Stewart, and Chuck Yeager.

The series will be presented on PBS by South Carolina Educational TV.

Pell hosts a Radio America program on military issues. He has been director of the Voice of America and an NBC Pentagon correspondent.

A Fighter Pilot's Life

"Gabby" Gabreski, the legendary fighter pilot who racked up 28 victories in World War II and 6.5 in the

Staff photo by Guy Accelo



AFA National President McKee and Board Chairman Doyle Larson took a Joint STARS orientation flight at Robins AFB, Ga. Pictured here (l-r) are Col. James Neumeister, 93rd Operations Group commander, Larson, McKee, Jack Steed, national director, and Col. Lynn Wills Jr., 93rd Air Control Wing vice commander. McKee said the flight better prepared him to speak about Joint STARS' capabilities and potential.

Korean War, joined **Nassau Mitchel (N.Y.) Chapter** officers at a "Flight of Aces" celebration for the American Museum for the Preservation of Historic Aircraft at Republic Airport, N.Y., in September.

Seated in the shadow of a B-25 belonging to the museum, Gabreski signed copies of *Gabby: A Fighter Pilot's Life*. The book was most recently republished in 1998.

The Flight of Aces event included a B-17 Flying Fortress and B-24 Liberator flown in by the Collings Foundation of Stow, Mass.

Chapter members who attended included Fred DiFabio, chapter president; William D. Sherman, chapter vice president; Gerald R. Hunter, chapter vice president for veterans affairs; and Ney Carr, former vice president for membership.

In late summer, the chapter had set up an AFA display at a county awards ceremony and concert held on Long Island, N.Y., called "A Centennial Salute to Veterans." The AFA exhibit featured story boards with photos, artwork, videos, and other memorabilia. Walter N. Zywan, a former New York state treasurer, helped DiFabio man the display. DiFabio also received a Centennial Veterans Medal at the event.

Dream Come True

During the Air Force Birthday Ball co-sponsored by the **Alamo (Texas)**

Chapter at Lackland AFB in September, AFA National President McKee reminisced about growing up on USAF bases.

He told the audience of more than 300 guests that he used to watch takeoffs and landings from a hill overlooking a runway and daydream about becoming a pilot. This became more than a dream, of course; McKee went on to become a T-38 instructor pilot and also flew the A-7D during his seven years on active duty.

The formal birthday ball at which he made these remarks was co-sponsored by Gen. Lloyd W. "Fig" Newton, commander of Air Education and Training Command, and featured 38 basic military trainee graduates who were recognized in a ceremony as the future of the Air Force.

Another highlight of the evening was the performance by NightHawk, a jazz ensemble from the Air Force Band of the West. Dressed in World War II-vintage uniforms, one of their specialties is creating the look and sound of the 1940's Glenn Miller AAC Jazz Band. Their musical tribute at the birthday ball culminated with the audience singing the Air Force Song.

The ball benefitted the chapter's scholarship and community outreach programs. Among distinguished guests were Robert C. Dixon, of the **Iron Gate (N.Y.) Chapter**, and William V. McBride, a national director emeritus and an Alamo Chapter member.

Convention: Georgia

The Georgia State Convention at Robins AFB in August highlighted some hot topics for convention-goers.

Lt. Col. Peter Faber, from the National Security Briefing Team, presented a convention special feature entitled "Future of Aerospace Warfare: America's Global Force." The program covered the global security environment and outlined USAF's future technical and organizational plans. It is one of 10 briefings the Air Force Strategic Planning Directorate now makes available for presentation to groups interested in promoting the aerospace power perspective.

Col. John Lee, from Robins AFB's 78th Medical Group, gave the second special feature, a presentation on Tricare. It generated questions about Tricare and other health care programs being tested by the Department of Defense.

That afternoon, the awards luncheon featured retired Gen. Alfred G. Hansen, a former commander of Air Force Logistics Command (1987-89), former Lockheed Martin executive, and now an international consultant. He talked about current trends in logistics and their impact on readiness.

The **Savannah Chapter** received the Chapter of the Year award. In addition to national-level awards (listed in the November issue), state-level Exceptional Service Awards were presented to Col. Martin Jubelt of **Carl Vinson Memorial Chapter** and the Savannah Chapter's Charles K. Clark. Leeroy Claxton of the Carl Vinson Chapter received a state-level Medal of Merit.

Georgia's new AFA state president is Robert E. Largent, also from the Carl Vinson Chapter.

Convention: Indiana

Marcus Oliphant of the **Southern Indiana Chapter** was named Indiana AFA Member of the Year at the State Convention, held in Indianapolis in August.

In addition to national-level award winners listed in the November issue, state-level award recipients at the convention included J. David George of the **Central Indiana Chapter**, who earned a Spirit of Indiana Award. It recognized his coordination of the successful effort to have a B-2 named after the state. Erick Haberkorn was honored as the state's Teacher of the Year. Georjean A. Bush from the **Fort Wayne Chapter**, was recognized as first runner up in competition for AEF's Christa Mc-

Auliffe Memorial Award for Teachers.

TSgt. Dallas E. May, from the 330th Recruiting Squadron in Indianapolis, received the Outstanding Recruiter of the Year Award. The state's Civil Air Patrol Cadet of the Year was Jonathan B. Rodarmel.

State officers elected were, from the Fort Wayne Chapter, William Howard Jr., president; Marjorie A. Feedback, secretary; Allen P. Feedback, treasurer; and from the Central Indiana Chapter, Harold F. Henneke, vice president.

Safety Superman

The **Del Rio (Texas) Chapter's** recent quarterly meeting presented awards to spotlight safety in USAF operations and recognized several outstanding personnel from Laughlin AFB, Texas.

Selected as the chapter's Safety Superman Award recipient was Joe Benavidez from the base's Civil Service Aircraft Maintenance organization. He helped prevent a flight line fuel spill and the loss of aircraft parked on Laughlin's ramp when he helped stop fuel venting from an aircraft, reported Col. (sel.) Jason Barlow, then chapter president.

A Safety Award of Merit went to Capt. Patrick McNutt, a T-37 flight commander and instructor pilot with the 85th Flying Training Squadron, and 2nd Lt. Curtis Grayson. They helped prevent a T-37 gear-up landing, according to Barlow.

Honored for outstanding airmanship was 2nd Lt. Randel Gordon. He was an 87th FTS student pilot when he recovered his T-38 after a bat strike on a night student solo sortie, Barlow said.

SSgt. Phil Westfall and A1C Jon Rousseaux, both of the 47th Operations Support Squadron, received Enlisted Awards of Merit for their outstanding contributions to their unit.

On the Road Again

The **Chautauqua (N.Y.) Chapter** hit the road again, for their fifth annual bus trip, this time to the Tidewater, Va., area.

Under the leadership of John A. Dunderdale, chapter president, and Barbara C. Dunderdale, New York state secretary, the group of more than 30 chapter members and guests traveled by a chartered bus belonging to one of their Community Partners.

The group toured Langley AFB, one of the oldest, continuously active air bases in the US, and home to Air Combat Command. They also toured nearby NAS Oceana, a Navy fighter

and attack complex with more than seven miles of runway. They received operational briefings at each facility.

Awards and Ceremonies

The **Cape Canaveral (Fla.) Chapter** secured a \$750 grant from AEF, and matched it with another \$750, to send Teresa Guthrie-Sarver, a physics teacher at Melbourne High School in Melbourne, Fla., to one of the United States Space Foundation's week-long Space Discovery Graduate Courses at the US Air Force Academy in Colorado Springs, Colo. In July, Guthrie-Sarver, now a Canaveral Chapter member, attended the Living in Space and Basic Rocketry course and learned techniques to integrate aerospace topics into her classroom.

The **John W. DeMilly Jr. (Fla.) Chapter** celebrated its 30th anniversary at the All Ranks Club at Homestead ARB, Fla., in August. Newly elected Chapter President William R. Kountz joined past presidents Michael E. Richardson, John H. Breslin, J. Rudolph Gossman Jr., and Jose E. Clay in cutting a birthday cake. AFRES Col. Charles E. Stenner Jr., 482nd Fighter Wing commander at Homestead, was guest speaker at the event. A DeMilly Chapter member, he encouraged more interaction between the base and community and outlined his vision for the base's future.

David R. Cummock, region president (Florida Region); William L. Sparks, national director; and Marguerite H. Cummock, president of the **Brig. Gen. James R. McCarthy (Fla.) Chapter**, attended the presentation of the Right of Line award to AFROTC Det. 157 of Embry-Riddle Aeronautical University in Daytona Beach, Fla. Col. Wolfgang E.K. Gesch, national AFROTC commander and also a **Montgomery (Ala.) Chapter** member, traveled from Maxwell AFB, Ala., to present the award to Col. John J. Mitchell, a McCarthy Chapter member, and cadet Jose A. Corella.

More AFA/AEF News

■ The **Badger State (Wis.) Chapter** held a farewell dinner for AFRES Brig. Gen. Paul R. Cooper, then commander of the 440th Airlift Wing at General Mitchell IAP/ARS. He is now commander of the 445th Airlift Wing (AFRC), Wright-Patterson AFB, Ohio. Chapter President Russ Klug said Cooper was instrumental in helping the Badger State Chapter become more active. He not only attended meetings but arranged for the chapter to use the wing's facilities. Cooper received an AFA Certificate of Appreciation at his farewell.

■ The **Jackson (Miss.) Chapter**

recently presented David R. Teske with \$500, recognizing his selection as Teacher of the Year for the South Central Region. Teske is a 6th and 8th grade advanced science teacher at Chastain Middle School in Jackson. Representing AFA at the presentation were Marleen E. Eddlemon, then a region vice president (South Central Region); Billy M. Boyd, then Mississippi state president; Gerald E. Smith, current state president; Ronald J. Vaughan, state vice president; and Charles Wilkinson, chapter president.

■ Allan M. Van Wickler, **William A. Jones III (Va.) Chapter** president, presented the 1999 Virginia State AFA Award to James Temple, a chapter member and cadet wing commander at the University of Virginia in Charlottesville. The award honors the state's leading AFROTC unit. The presentation took place at the unit's Leadership Laboratory, where a change of command ceremony took place for the detachment commander, Col. Kermit V. Boschert, a chapter member. The new commander is Col. James D. Allshouse, also a chapter member.

■ Robert J. Cantu, an AFA national director and **Alamo Chapter** member, received the Air Force Decoration for Exceptional Civilian Service in a ceremony at Randolph AFB, Texas. He is chief, plans and programs, for Air Force Recruiting Service in San Antonio. The award recognizes his service as key advisor to nine AFRS commanders, from 1984 to 1999.

■ The **Thomas W. Anthony (Md.) Chapter** received an award as top chapter in Maryland at an AFA state conference. On hand to accept the award were Brig. Gen. James A. Hawkins, Charles X. Suraci, chapter president, Natalie L. Desmond, and Norman A. Marous.

Have AFA/AEF News?

Contributions to "AFA/AEF National Report" should be sent to *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Phone: (703) 247-5828. Fax: (703) 247-5855. E-mail: afa-aef@afa.org. ■

Correction

In August, the location and briefer in the photo, p. 108, were incorrectly identified. The photo was taken at Yokota AB, Japan, where then-1st Lt. Paul E. Swenson, 374th Support Group, presented a quality-of-life briefing.

1st FG Assn. May 24–28, 2000, at the Mission Inn in Riverside, CA. **Contact:** Robin Hansen, 1926 Timber Point West, Prescott, AZ 86303 (520-778-7040) (rhansen@cableone.net) (www.cableone.org/rhansen/1stfighter/index.html).

17th and 18th SOS, Shadow and Stinger gunships. Oct. 14–15, 2000, in Fort Walton Beach, FL. **Contact:** Fred Graves, 1105 Maple Dr., Mountain Home, ID 83647 (208-587-9255) (farkle@micron.net) (www.ac-119gunships.com).

96th ARS, Altus AFB, OK (1953–65). April 27–30, 2000, at the Hampton Inn in Pensacola Beach, FL. **Contact:** Richard F. Lyon, 1054 Woodlore Cir., Gulf Breeze, FL 32561 (850-932-0124) (lyondick@member.afa.org).

469th TFS, F-105 combat aircrews (November 1965–March 1968). Sept. 21–24, 2000, at Wright-Patterson AFB, Ohio. **Contact:** Roy Dickey, 311 Dickey Ln., Prattville, AL 36067-8077 (phone: 334-361-0108 or fax: 334-358-2529) (rysdcy@aol.com).

1095th SRS/ADG alumni (1951–70). May 18–21, 2000, at the Holiday Inn Bossier City in Bossier City, LA. **Contacts:** K.D. Phillips, 244 Lincoln Dr., Bossier City, LA 71111 (318-746-3375) or Sam Powell, 2841 Arrow Creek Dr., Atlanta, GA 30341 (770-457-7209).

Arc Light/Young Tiger crew members. May 12–14, 2000, at the Renaissance Nashville Hotel in Nashville, TN. **Contact:** Earl L. Flora, 704 Sherman Dr., Bellevue, NE 68005-2627 (402-291-1099) (elfsill@aol.com).

Fourth Ferrying Group Assn, Air Transport Cmd (WWII). May 10–13, 2000, at the Ramada Inn in Charleston, SC. **Contact:** Rick and Gail Ravitts, 2410 Devonshire Dr., Rockford, IL 61107 (815-229-1122).

Pilot Training Class 56-U. Sept. 28–Oct. 1, 2000, in San Antonio. **Contact:** Richard Martin, 13827 San Pedro Ave., San Antonio, TX 78232-4333 (phone: 210-490-0086 or fax: 210-490-0847) (carprosa@flash.net).

UPT Class 60-F, all bases and instructors. March 29–April 1, 2000, at the Holiday Inn Downtown/Market Square in San Antonio. **Contact:** Bob Suhrheinrich, 1107 Carter Dr., Pensacola, FL 32504-6500 (850-478-1316) (bobsir@juno.com).

Warner Robins High School graduates, 1959–63. May 20, 2000, in Warner Robins, GA. **Contact:** Jean Gunther Bennett, 103 Fairway Dr., Kathleen, GA 31047 (912-987-0061).

Seeking members of **Aviation Cadet Pilot Train-**

ing Class 56-G for a reunion in September or October 2000 in Colorado Springs, CO. **Contact:** B. Titzer, 6533 Sharon Rd., Newburgh, IN 47630 (812-853-8178) (rftmct6533@aol.com).

Seeking former members of the **46th ARS** for a reunion in the Upper Peninsula, Mich., area in June 2001. **Contact:** 46th Air Refueling Sq Assn, 520 Cherry Creek Rd., Marquette, MI 49855 (906-249-3529) (ARS46@aol.com).

Seeking former members of the **47th Air Police Sq,** 47th BW, Langley AFB, VA, 1950–52, and RAF Sculthorpe, UK, 1952–55, for a reunion in Virginia in fall 2000. **Contact:** Richard Gibson, 4054 Rigel Ave., Lompoc, CA 93436 (rmgibson@member.org).

Mail unit reunion notices well in advance of the event to "Unit Reunions," *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

Bulletin Board

bulletin@afa.org

Seeking anyone involved in bringing four **45th TRS RF-101Cs** from Misawa AB, Japan, to Taiwan in 1962 and any information on those aircraft. **Contact:** Wei-Bin Chang, 58-1 Chung Shan Rd., Cholan, Miaoli, Taiwan 36941 (phone: 886-2-2382-4692 or fax: 886-2-2382-4580) (weibin@yahoo.com).

Seeking information on and photos of **A-7D #DM242** from Davis–Monthan AFB, AZ, and any former crew members from the **355th TFW,** 1972–75, who remember it. **Contact:** Mike Lagueux, 1928 N. Clemens Way, Tooele, UT 84074 (435-843-5325).

Seeking anyone who served or had a family member serve in the armed forces, Coast Guard, or merchant marines during the **Korean War** between June 25, 1950, and July 27, 1953, in preparation for commemorative ceremony. **Contact:** US–Korea 2000 Foundation, Inc., 4600 Duke St., Ste. 416, Alexandria, VA 22304-2517 (phone: 703-212-8128 or fax: 703-684-0193) (info@uskorea2000.org).

Seeking information on **Lt. Harold Claude Greene,** of Cave City, KY, who trained at Ft. Leonard Wood, MO, and was a WWII B-17 radioman/gunner with the 369th BS, 306th BG. After commissioning, he was with the 385th FS, 364th FG. **Contact:** Mike Greene, 7615 Crawford Ct., Alexandria, VA 22315 (M1Greene@aol.com).

Seeking information on the B-24 **The Dragon and his Tail** from the 43rd BG, Ie Shima, Okinawa, in WWII, particularly photos of the aircraft's left side. **Contact:** Thomas G. Izbrand, 7239 W. Sunnyslope Ln., Peoria, AZ 85345-7290 (Leadsled58@aol.com).

For unit markings research project, seeking former air- or ground crew members of the **83rd FIS,** ADC (1951–52), and **64th, 65th, and 433rd FISs,** ACC (1953–55). **Contact:** Don Wood, 6561 N. Paseo Tamayo Rd., Tucson, AZ 85750-1228 (520-529-3460).

Seeking information on **Lt. John J. Barcynski,** B-29 co-pilot killed over Yokohama, Japan. May 1945, whose crew included **Col. James T. Connally, Capt. James W. Cornwell, Lt. Bernard E. Gerstner, MSgt. Donald W. Brollar, SSgts. James V. Bagley and Thomas J. Daigneau,** and **Sgt. Ernest J. Fox.** **Contact:** Kaz Barcynski, 134 Southern Hills Dr., New Bern, NC 28562 (phone or fax: 252-637-0587) (kazbar@coastalnet.com).

Seeking **Donald Raymond Curtis,** of St. Louis, who was stationed at Clark AB, Philippines, 1965–69, and was a jungle survival instructor. **Contact:** Jay Hope, 2/3 Roadshow Dr., Wodonga, Victoria, Australia 3690 (phone: 02-60-23-7202 or fax: 02-60-21-3477) (jhope@au.drakeintl.com).

Seeking **John Carnes, Mel Gheridini, and Dino Posselli,** of Flight 253, 3711th BMTS, March–April 1981. **Contact:** Rick Ellington, 3 Castlegate Trailer Park, Townville, SC 29689.

Seeking contact with **Lt. Glenn B. Gremillion,** 162nd TRS, 10th Photo Recon Gp, Ninth AF, who flew a recce mission in the Linz/Danube area May 4, 1945, and took photos of a downed Luftwaffe Ju-88 northeast of Linz. **Contact:** Karl Affenzeller, Buchtastrasse 5, Freistadt, Austria A-4240.

Seeking **32nd BS or 301st BG, Fifteenth AF,** veterans, who flew out of Foggia, Italy, air bases in 1944, or enlisted personnel who were POWs at Stalag Luft IV or VI. **Contact:** Maj. Shawn Rife, 808 Filson Ct., Newport News, VA 23608 (757-890-9423).

For history, seeking the families of **James Elias Davies,** killed June 27, 1940; **Cyril Dampier Palmer,** killed Oct. 27, 1942; and **Ian Bedford Nesbitt Russell,** killed June, 1, 1940, all while flying with the RAF in France. Also seeking information on **Edward DePeyster Brown,** who flew with the RAF, then USAAF. **Contact:** Floyd Williston, 227 Stuart Ave., Winnipeg, Manitoba, Canada R2G 0Y4 (footless@escape.ca).

Seeking color USAF patches to be traded with ITAF or NATO air forces badges. **Contact:** Gabriele Stefani, Via C. Battisti 7/A, San Quirino Pn, Italy 33080.

Seeking **TSgt. Amy Shake,** who attended the MAC NCO Academy West, Norton AFB, CA, and graduated in December 1981. Last known base was Hickam AFB, HI. **Contact:** Jim Whitehill, PO Box 1717, Stafford, VA 22555.

Seeking copies of old **operation orders, after action reports, and action intelligence reports** dated April 30, 1944, to Aug. 15, 1944. **Contact:** Bill Millar, 7908 Donegal Ln., Fort Worth, TX 76180 (817-281-2119) (marbill@flash.net).

Seeking audio/video footage of **Richard Jason** of Armed Forces TV or Radio Berlin in 1971. **Contact:** Susan Denison (781-386-7463).

Seeking **aviation cadet candidates** from western New York who left Buffalo, NY, Feb. 1, 1943, for basic training. **Contact:** Robert F. Myers, PO Box 27124, Panama City, FL 32411 (rmyers324@aol.com).

For membership in Air Force Women Officers Association, seeking active and retired **USAF female officers.** **Contacts:** Karen Rankin (877-22-AFWOA) (bkds_rankin@msn.com) or Maj. Anne Farrer (703-569-8640) (farrer-anne@msn.com).

Seeking **F-86 pilots** who were rescued from behind enemy lines or from the Yellow Sea/Chodo area during the Korean War. **Contact:** Forrest L. Marion, Air Force Historical Research Agency, 600 Chennault Cir., Maxwell AFB, AL 36112-6424 (334-953-2962) (forrest.marion@maxwell.af.mil).

Seeking former members of **AC&W or SAGE** units stationed at King Salmon, AK, October 1957–58; Geiger Field, WA, October 1958–59; and McChord AFB, WA, November 1959–61.

Contact: Edward R. Franklin, 4801 Kesling Ct., San Diego, CA 92117-3128 (858-279-3368) (edmarinc@access1.net).

Seeking information on **Eugene E. Metz**, whose dog tags were found on an English farm in 1999, and **Lt. William Farrow** of Darlington, SC, whose dog tags and driver's license were found and who was a B-25 pilot on Jimmy Doolittle's raid on Tokyo in 1942. **Contact:** Charles R. McCreight, 202 W. Calhoun St., Sumter, SC 29150 (phone: 803-773-3211 or fax: 803-775-2665).

Seeking **Kenneth N. Jordan**, of the 86th Fighter-Interceptor Wg, who served at Landstuhl, Germany, in 1955, married Ms. Holland, and ran the Carolina Detective Bureau in Greenville, SC. **Contact:** Lenny Isaacson (718-449-9504) (lenlines@aol.com).

Seeking witnesses of the execution of **Cpl. Clark and Pts. Guerre and Grimes** in 1944 or 1945, in Slepton Mallet, UK. **Contact:** Emmett N. Bailey Jr., 609 Spring Valley Rd., Henderson, NC 27536 (nabcountry609@webtv.net).

Seeking a **patch** from the 6200th Air Base Wing, Clark AB, Philippines. **Contact:** Pete Sarmiento, 404 Rosier Rd., Fort Washington, MD 20744-5549 (pdsarm@aol.com).

Seeking **Capt. Robert A. "Obo" Oboski**, a B-52 radar navigator instructor at Castle AFB, CA, 1980-84, whose last known address was in the Dallas-Fort Worth area. **Contact:** Harry B. Fitzpatrick, 316 River Rd., Benton, ME 04901 (207-453-7738) (fitzpat@mint.net).

Seeking **Maj. Thomas W. Wildes**, a doctor at the Sembach AB, Germany, hospital in August 1991. **Contact:** Mike Vitti, 1487 E. Pin Hook Rd., Sparta, TN 38583-6963 (931-761-8484) (ililgen@multipro.com).

Seeking information on **Maj. Esequiel "Zek" Encinas**, a pilot in Vietnam, killed June 17, 1972, in Laos. **Contact:** William C. Koch Jr., 8812 Windjammer Dr., Raleigh, NC 27615-2713 (billkoch@aol.com).

Seeking information on the unit and pilot of a **P-47** that, while providing close air support to 10th Mountain Div. troops, crashed Feb. 19, 1945, near Valpiane, Italy. **Contact:** William J. Lee, 9226 C General Brown Loop, Ft. Drum, NY 13603-3007 (315-773-8301).

Seeking graduation list for **Flight 2961**. **Contact:** Stan Lutz, 666 W. Germantown Pike, Apt. 518 South, Plymouth Meeting, PA 19462.

For display, seeking memorabilia from former personnel of **Larson AFB, WA**, formerly known as Moses Lake AAB. Also seeking information on the aircraft and mission of base, 1942-52. **Contact:** Doug Sly, Big Bend Community College Foundation, 7662 Chanute St., Moses Lake, WA 98837 (509-762-6308) (dougs@bcc.ctc.edu).

For **air mobility heritage** display, seeking donated or loaned airlift, tanker, or rescue patches, photos, and other memorabilia from all US conflicts. **Contacts:** Don Russell, AMWC/WCB, 5656 Texas Ave., Ft. Dix, NJ 08640 (609-562-4101 ext. 513) (donald.russell@mcguire.af.mil) or Mark Binkowski (609-562-4101 ext. 521) (mark.binkowski@mcguire.af.mil).

Seeking information on **Capt. David Louis Hrdlicka** of Littleton, CO, who was a member of the 563rd TFS, Takhli, Thailand, and pilot of an F-105 that was downed near Sam Neua, Laos, May 18, 1965. He was captured by the Pathet Lao. **Contact:** Richard S. Wirtz, (tat2@ptialaska.net).

For a book, seeking photos and contact with anyone who served in the UK between 1946 and 1953 with B-29s and B-50s. **Contact:** R.M.

Robinson, 37 Home Farm Rd., Houghton, Huntingdon, Cambridgeshire, UK PE17 2BN.

Seeking contact with anyone who knew **Maj. Eugene J. Kranske**, who was stationed at Forbes AFB, KS (1955-57); Weisbaden AS, Germany (1957-60); Wright-Patterson AFB, OH (1961-62); Colorado State University, Fort Collins, CO; and Los Angeles AFB, CA (1964-69). **Contact:** Mari Kranske, PMB 162, 322 Culver Blvd., Playa del Rey, CA 90293 (310-822-6947) (mkranske@email.com).

Seeking contact with members of **Basic Training Flight #3377**, Sampson AFB, NY, who had A2C Charles Sivits as an instructor. **Contact:** Richard L. McCormick, 307 S. Meridian St., Greenwood, IN 46143 (317-881-6585).

Seeking information on **Maj./Lt. Col. Donald D. Davies**, USAAF flight surgeon from Salt Lake City, who served in the Pacific Theatre during WWII. **Contact:** Matthew Rimmer, West Lodge, Penmaenpool, Dolgellau, Gwynedd, UK LL40 1YF.

Seeking **Col. Robert T. Fowler and Marge**, whose last known residence was Arlington, TX. **Contact:** Tom and Joan Barthauer (937-653-5606).

Seeking information on USAF participants in and aircraft serial numbers for all **Silver Star actions and Cuban Missile Crisis U-2/RF-101s, Paul Doumer and Thanh Hoa Bridges, Kham Duc, Bolo, Bat-21, and Homecoming** (SEA C-9/-130/-141) missions. **Contact:** Ron Thurlow, Box 171, Alpha, OH 45301 (tlow52@hotmail.com).

Seeking pre-1990 **patches** of the 28th BS. **Contact:** Bob Kasprzak, 4213 Pleasanton Rd., Englewood, OH 45322-2657 (937-836-1609) (tokasprzak@aol.com).

Seeking **Captain Johnson**, possibly of the 311th Air Commando Sq, who served as a C-123 pilot and was stationed in Da Nang, South Vietnam, in 1968. **Contact:** Andrew Fox (andrew.fox@igint.com).

Seeking contact with anyone who remembers **Rolleston Hall** in Rolleston, UK, which was used by the American Red Cross as a convalescent home. **Contact:** Sally Vincent, 44 Third Ave., Frinton on Sea, Essex, UK CO13 9EE (fax: 01255-675109).

Seeking contact with anyone who knew **Maj. Charles J. Loring Jr.** in Korea in June 1952. He was an 8th Fighter-Bomber Wg supervisor for training replacement pilots and also served as an F-80 pilot and squadron operations officer with the 36th Fighter-Bomber Squadron and 80th Fighter-Bomber Squadron, 8th Fighter-Bomber Gp, from July to November 1952. **Contact:** Martin Donovan, 9-A Bayberry Ln., Scarborough, ME 04074 (phone or fax: 207-885-0068).

Seeking contact with anyone stationed at or having information about **Coolidge AAF, Antigua, West Indies**, during WWII. **Contact:** Maj. Scott Van Ness, PO Box 4915, Antigua AS, Patrick AFB, FL 32925-0915 (268-462-3895) (scott.vanness@pafb.af.mil).

Seeking contact with anyone who served at **Ft. Pepperrell** in St. John's, Newfoundland, Canada, 1941-61. **Contact:** E. Scammell, 12 Kent Place, St. John's, Newfoundland, Canada A1B 1V5 (709-722-4546) (ereynold@pagemaker.ca).

Seeking information on the squadron or wing identified by a black and white checkerboard marking on the vertical stabilizer of a P-51. **Contact:** Frank B. Seaman (cats@pinehurst.net).

Seeking information on or contact with fellow crew members of **TSgt. Kenneth T. Smith**, mechanic/gunner on a B-17 assigned to 327th BS, 92nd BG, 8th AF, in 1944-45. **Contact:** Marvin

Bixby, 4649 Mayes Dr., Fayetteville, AR 72704 (501-442-4930).

Seeking information and photos of AF runway arresting systems such as **MA-1 and BAK-9** and issues of AF publications "**Flying Safety**," "**Interceptor**," and "**TAC Attack**" from the 1950s to 1970s. **Contact:** Paul Mardian, 519 E. Pasadena Ave., Phoenix, AZ 85012 (602-230-2343).

Seeking an original B-58 Hustler desk **model** (plastic or metal). **Contact:** Dale R. Messimer, 1236 Christobal Privada, Mountain View, CA 94040 (650-969-1236) (flynmess@aol.com).

Seeking **John Harold Grey**, of Elizabeth, NJ, who served in northwest UK in 1953 as a pilot/engineer and may have been a master sergeant or staff sergeant. He had a brother, Charles Hermen Grey, and a sister, Goldie. **Contact:** Adelle Brown, 23 Aspen Grove, Toxteth, Liverpool, Merseyside, England 8 OSR (0151 281 8876 or 07930 977795).

Seeking information on the **712th Aircraft Control and Warning Sq**, based on St. Lawrence Island, AS, in the 1950s. **Contact:** Floyd Cooper Sr., 1183 King Arthur Ct., Henderson, NV 89015.

For the reactivation of the 13th Bomb Sq, seeking contact with former unit members of the **13th Aero Sq, 13th Attack Sq, or 13th Bomb Sq**. **Contact:** Bill Cowan, PO Box 79568, Saginaw, TX 76179 (817-232-0313) (rottenbill13@juno.com).

For a display, seeking information, photos, patches, news clippings, and memorabilia on the **Korean War**. **Contact:** Charles R. Timms, 620 Lowry Ln., Seneca, SC 29678 (864-888-4133).

Seeking a copy of **Long Arm of America**, a book about the C-130. **Contact:** Henry M. Pokrzywka, 2077 Maple Ave., Charlton, NY 12019-2806 (518-399-1897).

Seeking anyone assigned to the **342nd BS**, 97th BW, Biggs AFB, TX, in 1956. **Contact:** William H. Ball, 110 Alanwood Dr., Ormond Beach, FL 32174-4606 (wbball49265@aol.com).

Seeking contact with instructors from the technical school at **Chanute AFB, IL**. Especially seeking pre-radar technical school instructors, June 1944 to June 1945. **Contact:** Wayne Barney, 209 E. Frye Ave., Peoria, IL 61603-2445 (309-685-3301) (wbarney@ocslink.com).

Seeking **Maj. Ed Harkins (pilot) and Capt. Bobby Goldman (navigator)**, of the 509th BW, Pease AFB, NH, who were crew members on FB-111s in the early 1970s. **Contact:** Curt Lenz (curt.lenz@f-111.net).

For a memorial dedication, seeking Paul Davis, son of Flight Lt. **Carl R. Davis**, who was killed over Kent, UK, Sept. 6, 1940, and buried in Storrington, UK. **Contact:** Steve Holbrook, 8 Plantation Way, Storrington, West Sussex, UK RH20 4JF (01903-742451).

If you need information on an individual, unit, or aircraft, or want to collect, donate, or trade USAF-related items, write to "Bulletin Board," *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. Items submitted by AFA members have first priority; others will run on a space-available basis. If an item has not run within six months, the sender should resubmit an updated version. Letters must be signed. Items or services for sale, or otherwise intended to bring in money, and photographs will not be used or returned.

Pieces of History

Photography by Paul Kennedy

High Fliers



By the 1920s, it already had become clear that pilots were heading for higher altitudes and would need special protection to compensate for the lack of oxygen. With the advent in the 1950s of the U-2, which would eventually be capable of flying more than 70,000 feet above Earth, low air pressure posed an additional problem. USAF researchers and contractors came up with the partial

pressure suit. The suit at top is an early form-fitting MC-2 partial pressure suit. It left the feet, encased in boots, without a pressurized covering. The partial pressure suit evolved into a "protective assembly"—including pressurized gloves and boots—with development of the rear-entry, 25-pound S1010B (at bottom) worn by U-2R pilots.

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