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AIR FORCE

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MAGAZINE

The Next Class
Pilot training at Laughlin



Famous and Formerly Enlisted

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Airpower vs. Armor**

Snapshots of the 2000 Budget

**Congressional Defense
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About the cover: Blazing across the Texas sky, these T-38s out of Laughlin AFB, Texas, are flown by students from Laughlin's newest batch of USAF pilot trainees. See "The Next Class," p. 34. Staff photo by Guy Aceto.

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By John T. Correll, Editor in Chief

Opportunity Slips Away

As recently as December 1997, the Central Intelligence Agency assured Congress that it would be another 15 years before rogue nations like North Korea had ballistic missiles that could reach Alaska or Hawaii. Eight months later, that assumption went down in flames when the North Koreans fired their three-stage Taepo Dong 1 missile across Japan. The Department of Defense has since reversed its position and announced plans to develop a national missile defense system.

Once again, a threat has turned out to be closer and more serious than we had thought. It is also a reminder that our technological leadership is not guaranteed to be permanent. It can fade away if neglected.

After the Soviet Union fell and the Cold War ended, we entered a "strategic pause," during which no real challenge to the military superiority of the United States was foreseen. It was supposed to be a time when we could cut forces, ease the operational pressures on those forces, and then make orderly investments and prepare for the future.

The force cuts happened—but none of the rest of it did. As a result, the defense program today is pulled in three different and competing directions.

■ One pull is by current operations, especially the "engagement and enlargement" operations so favored by the Clinton Administration. When the sweeping cuts were made, no one anticipated that the employment rate for the armed forces was about to pick up by 400 percent. Expectations about the scope and duration of these operations have often been optimistic. US troops were supposed to be out of Bosnia by December 1996, at the latest.

Within the defense program, greater importance is now accorded to smaller-scale contingencies and military operations other than war. The armed forces have adjusted accordingly. For example, the Air Force has concluded that peacetime deployments will be a continuing way of

life and is reorganizing itself into 10 aerospace expeditionary forces.

■ A second pull on defense resources is maintaining a force that can respond to two overlapping major theater wars. This requirement is sometimes disparaged by people who do not know any better, but a lesser standard for sizing the force is not feasible.

The two conflict standard was adopted in 1993 when the Bottom-

The "strategic pause" was a chance to rebuild the defense program in light of future requirements.

Up Review went searching for a rationale to justify a budget reduction that had already been decided upon. This approach was selected after a lower-cost concept called "Win-Hold-Win" failed to establish credibility on any front, including Congress.

The need to cover one theater conflict is indisputable. In addition, however, there must be enough forces to form a reasonable reserve, to serve as a hedge and deterrent against simultaneous trouble elsewhere, and to perform other military missions. The minimum standard for sizing the force is more than one regional conflict, and if it isn't two conflicts, it's very close.

■ The third pull is what the National Defense Panel report called "transformation" of the force. There are varying interpretations of what that entails, but it includes taking advantage of the technological revolution in military affairs, exploiting the possibilities of space, and preparing to meet new threats that range from the proliferation of weapons of mass destruction to the vulnerability of our national infrastructures.

One of the changes brought by the revolution in military affairs was that information and long-range pre-

cision strike technology offered an alternative to traditional models of warfare built around massed forces, high casualties, and battle lines drawn on the ground.

Of the competing demands on defense resources, the priority has been tipped in favor of current operations, many of which are loosely defined and open-ended. These operations have tended to draw the services into costly, manpower-intensive activities and toward capabilities that may differ from those needed to fight and win regional wars.

The additional money proposed in this year's defense budget is not even enough to solve the shortfall in readiness and current operations. It does not begin to address the needs of the future. In fact, air and space systems—the linchpins of the revolution in military affairs—are frequently under attack as unaffordable and unnecessary.

The armed forces have obviously made gains, some of them spectacular. For example, although the Air Force bomber fleet of 2004 will be about half the size of the 1992 fleet, it will be able to hold 10 times as many targets at risk.

But in a broader sense, we have failed to exploit the strategic pause. The emphasis has been on short term considerations, and expanded peacetime operations have consumed a big share of defense resources. In their present circumstances, the armed forces are prepared to meet the two-conflict standard only with a stipulation of "moderate to high" risk.

The rest of the world is not standing still. The North Korean ballistic missiles are just one example of the spread of advanced military technology. Our own force modernization programs are underfunded and strung out. We have not made much progress at all toward transformation.

The strategic-pause window as initially projected expires around 2010—or perhaps 2015 if we're lucky. We have essentially missed our chance in the first part of the window, and we are well along toward letting the opportunity that remains slip away. ■



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Administration Bashing

I am writing to register my disappointment in your February editorial "Lessons in Limited Force" [p. 2]. I believe that your attack on the Clinton Administration in this instance was disingenuous, misleading, and inaccurate.

My primary concern with your editorial lies in the fact that it focuses on and criticizes often reported incidents without offering alternative strategies. To my mind that type of behavior indicates a lack of intellectual integrity. Two examples of a demonstrated lack of offering alternatives may be seen in your treatment[s] of the Osama bin Laden affair and the use of airpower in connection with Desert Fox. The criticism of the approach taken with Desert Fox is particularly grating since the initial attacks have been followed up with a continued effort to erode Iraq's air defense capabilities. Future actions may be uncertain; however, I read a positive intention on the Administration's part to deal terrorism a blow. If you have an effective "plan" of action to propose, let's hear it. If it makes sense, we'll support it, but to merely stand back and take pot shots is unconscionable. Worse, it reads like the *New York Times!*

Col. Jay W. Spechler,
USAFR
Boca Raton, Fla.

The true lesson of the limited force strategy is really a continuation of the age-old discussions on the application of force as a political instrument. Our country has spent tremendous resources building the finest military ever. The security we've enjoyed and the Cold War victory are proof. While the Weinberger criteria for the employment of force served well in the final years of the Cold War, it is probably not an enduring standard for the ages. Protecting our vital interests, with clear objectives and a well-defined end state, should remain the primary reason for use of force. And I do believe we could have done better in this regard in our most recent uses of the military instrument. War is indeed a serious undertaking.

However, the editorial suggests that there is no use for force short of total war. It's always interesting to see the "armchair quarterback" talk about shortcomings and failures. It would be interesting to see an editorial addressing the use of force where we have interests, although they may not be vital interests. Does [John T.] Correll believe we can use the military instrument, specifically airpower, to effectively deal with problems such as Iraq, Kosovo, Bosnia, Haiti, or combating illegal drugs? Or does he think we should keep our forces in garrison—well-armed, trained, and waiting for the big one?

Lt. Col. John Campbell
Navarre, Fla.

Sorry State

The February issue was to me the most depressing ever. It detailed the sorry state of US foreign policy, if it can even be called that.

First, the editorial highlighted the futile Administration attempts to influence world events by the use of lethal military power in "small increments for limited purposes, even if no vital US interest was at stake." The wishy-washy application of this faulty policy—threaten, back off, threaten again, etc.—has resulted in our credibility plunging to levels not encountered since the start of World War II.

Desert Fox, the strikes against targets in Afghanistan and the Sudan, the fruitless patrolling of the no-fly zones, [and] the expensive, endless commitment in the Balkans, including the latest crisis in Kosovo, have failed

to alter the attitude of the hostile government leaders, enhanced their standing in the international community, and sapped the strength of our armed forces.

Aging assets, lack of spare parts, retention problems, reduction in the fleet, application of limited military force, etc., could be fixed if sufficient resources and national resolve were applied. Only then would there be a better possibility to carry out the stated national policy of being able to fight two regional conflicts at the same time.

"Desert Stronghold" [p. 44] was the icing on the cake. I have nothing but high praise for the courage, dedication, and selfless commitment on the part of the personnel taking part in this senseless enterprise. The boredom, loneliness, and family separations endured by me and my peers during assignments at Goose Bay, the DEW Line, Thule, and North Africa were nothing compared with the hardships endured daily by our troops stationed at Prince Sultan AB. At least we had a purpose and a mission and could count on the "serve 20 years and retire with 50 percent of pay" so eloquently depicted by Tamar A. Mehuron in "The Chart Page" [p. 7].

I don't have any answers to these problems. It is probably going to take a new Administration with the guts to formulate and carry out a bold new foreign policy in the Middle East, the Balkans, and other parts of the world.

Maj. C.A. Belella,
USAF (Ret.)
Hagerstown, Md.

More Answers

The February article "Strategic Control" [p. 20] raises several valid points but leaves a number of critical questions unanswered. It is true that we are facing a significant change in the strategic and operational environment. The Cold War challenge of a second superpower poised to charge across the European plain is gone; the Soviet Union's demise leaves a fractured world with numerous new challenges that may not respond to traditional military strategies. The proposed Stra-

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tegic Control strategy falls short of the mark, also.

Strategic Control seems to be the successor to [Giulio] Douhet's thoughts on the use of airpower. It calls for better bombs and better targeting. The premise is that by striking the key targets, the enemy's will to fight will be wrested away and he will throw his hands up in desperation and surrender to the stealth bomber passing overhead. This didn't work in World War II, Vietnam, or the Arabian Gulf. Despite complete air supremacy in the Gulf War, Iraq did not capitulate without the introduction of joint forces on a massive scale. Strategic Control sounds like a great concept in the developed West, but it does not take into consideration that our "regional conflict" may well be our adversary's "war of national survival." How much airpower punishment is required to defeat a regime that—like Britain under the blitz—sees itself facing "its finest hour?"

Air Expeditionary Forces provide outstanding striking power, but they require overflight and forward basing rights to remain in theater. As missile technology spreads throughout the world, potential adversaries can directly threaten our potential allies with weapons of mass destruction. This drastically increases the cost of cooperation with the United States. Without reasonable proximity to the target, land-based air forces lose the ability to rapidly reattack and sustain the punishment of our foe. A joint solution to this "area access" problem would involve close coordination between Navy carrier air wings and AEFs to reduce the dependency on land bases.

Excessive reliance on technology is not risk free. Missiles malfunction and miss. The recent failure of an AGM-130 near Basra points this out. Modern warfare relies heavily on real-time intelligence. It is arguably important to hit the right target to deny the enemy the use of his systems; numbers count, however, particularly if the enemy can successfully preclude our use of land bases in nearby "friendly" countries. In that case, Strategic Control from CONUS will lack the mass necessary to gain and retain control at the theater level.

Strategic Control sounds wonderful—even "inexpensive" in the way it is presented. But it harkens back to the earlier debates following World War II. A similar strategy failed to prevent the Korean War, and not that much has changed. Forward presence and mass still matter. Someone still has to open the door for the bombers to come in. That "someone"

includes joint forces—particularly naval forces operating forward from the sea.

Cmdr. Kevin P. Newmeyer,
Strategy and Policy Division,
Chief of Naval Operations
Pentagon

[Retired] Gens. [Michael J.] Dugan and [Charles D.] Link and Senior Editor [John A.] Tirpak sound like breathless cheerleaders for some new laundry detergent, promising still "brighter whites." Let's hope we don't start to believe our own hype. The picture caption (p. 22) makes reference to "find, track, target, and destroy anything of significance on the surface of the Earth." Well, we didn't do that with Scud missiles in Desert Storm, and Saddam Hussein has proved elusive more recently. Airpower is essential, potentially decisive in some circumstances, but it has real limits against the threats facing America today. The vision of an Air Force reaching out and touching targets without really being involved is chilling and will ultimately ensure that Air Force leaders are not taken seriously in the development of national security policy for a messy, complex, and dangerous world.

Col. Michael R. Gallagher,
USAF (Ret.)
Sacramento, Calif.

Making Friends

World War II Luftwaffe fighter pilot Hans G. Berger and I had similar reactions to your article "High Plains Luftwaffe" [*February, p. 34*], especially [regarding] the closing comments about the Germans' reception in the local area being "overwhelming" [and] the final remark, "We are also strengthening our bonds as allies and learning to fly and fight as a team."

It was Berger, in his FW 190 White 8, who was believed to have shot down my B-17 *Toonerville Trolley* on April 24, 1944.

Our second meeting took place 52 years later, at the site where the bomber had crash-landed. We held hands in front of our two flags while the national anthems were played. During the three days we spent together we established a close friendship. Now we exchange e-mail and magazines (*Air Force Magazine* for *Jäger Blatt*).

Who could have imagined the relationship that now exists, not only between the two of us but between the two air forces—also that we both have survived to see it happen?

Edward D. McKenzie
Conway, N.H.

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Life in the Sandbox

My hat is off to [William H.] McMichael for his piece on Prince Sultan AB [Saudi Arabia]. [See "Desert Stronghold," February, p. 44.] He clearly got out there on the ground and talked to people of all ranks and specialties for a well-rounded look at duty at P-SAB, right down to the heat and the smells. Especially welcome were the candid comments of the folks stationed there.

McMichael has done a service to the Air Force by bringing up unpleasant realities the troops in the field have been complaining about for years. (Yes, we've been over in Southwest Asia for nine years now!) Many blue-suiters could see these present crises in spares, personnel, and readiness coming, even as far back as 1994, and we spoke up. But, as Capt. [Mike] Fontaine said in the article, "No one wants to be the guy who can't get the job done with less money"—that usually means sacrificing one's career for a higher cause.

We venerate Brig. Gen. Billy Mitchell, but few people are willing to follow his example. Seeing our past heresy exonerated now in *Air Force Magazine*, long known for reporting a rosy Air Force picture, is encouraging. *Air Force Magazine* has done the Air Force, and the general public, a service by publishing an article that tells it like it is. Now we just have to see if our senior leadership is reading it.

MSgt. Jack C. Sartoris
Holloman AFB, N.M.

The article "Desert Stronghold" was great. Kudos to all who have been, are, or will have to tour P-SAB. Don't think for a moment that what you are doing is going unnoticed or unappreciated. I was glad to see that someone finally recognized the conditions under which you have been tasked to perform. You are doing an outstanding job with little resources. Our thoughts and prayers are with you all. Thank you!

SrA. Kristen Goode,
Howard AFB, Panama

I am dismayed by the photo on the cover of the February issue because it depicts a less-than-professional example of a military checkpoint.

My first impression was that the photo depicted a mock security position set up for the camera. However, after reading the article and determining that it is a real [position], I became concerned enough to write. Whoever designed this checkpoint forgot to include many of the basic requirements for a good defensive position.

For example, since dead spaces (low areas in front of a firing position

where opposing forces can hide) should not be an issue in a desert environment, the machine gun is too high off the ground. The weapon should be positioned lower to the ground—which would provide grazing fire, offer the firing crew a lower silhouette/profile (thus better self-protection), and set up a field of fire that eliminates dead spaces.

Second, the machine gun is set up for a training environment, not a tactical environment. The machine gun tripod has its own mechanism to establish left and right lateral limits. The existing artificial steel red and white limitations reduce the capability of both airmen to shift fire should their lateral interlocking fires become inoperable. Additionally, there is no ammunition belt attached to the M-60 machine gun (which was probably removed for the safety of the photographer), and hopefully the other airman has ammunition in her M-16.

Third, there aren't nearly enough sandbags around the position. If the gun remains where it is, the sandbags need to go up much higher, at least above the edge of the window. There should also be more layers of sandbags making the protective wall deeper. Sandbags and deflective material should also be stacked on the roof of the firing position. Without these added layers of protection, any mortar or hand grenade landing on top of the position would harm the airmen inside.

Fourth, camouflage netting should be used to break the silhouette of the checkpoint, not used merely to decorate the "shack" (using the author's words). And what's the purpose of that hinged thing attached to the window? Evidently something added by a carpenter, certainly not by a security professional.

I'm encouraged that thermal imaging and motion sensors are liberally covering the perimeter of the base. These high-tech tools, combined with night vision scopes and goggles, should keep the "bad guys" away from bases like Prince Sultan. But I am concerned that the bunker depicted in the photo looks more like a shack than a fortified defensive position. These are just a few suggestions to protect our security forces. The threat is real, and we as Air Force leaders need to make sure our people have the best possible defense during these dangerous times.

Lt. Col. Stephen P. Howard,
USAF

Forces Division, JCS
Pentagon

I just finished reading "Desert Stronghold"—whayDa great story. It brought back a few memories of my 1995 90-day TDY to Al Jaber, Kuwait. Folks rotating to the Sandbox are truly the unsung heroes in the Air Force.

MSgt. James E. Riner Jr.,
Superintendent, Force Readiness
Aviano AB, Italy

Troop Carriers

C.V. Glines' "Troop Carriers of World War II" [February, p. 62] provides long overdue recognition to a vital aspect of USAAF operations but omits entirely any mention of what was, arguably, the most important troop carrier operation of the war.

In March 1944, the 60th Troop Carrier Group, equipped with C-47s, moved to Brindisi, Italy. Its mission was to supply the guerilla forces—in Yugoslavia, Albania, and Greece. I was a navigator and over the next six months flew 71 combat missions, all but one under the cover of darkness. The weather and the terrain were by far the worst I encountered in my 14 years on flying status. Most of our targets were in narrow mountain valleys between successive mountain ranges with peaks to 14,000 feet. In addition to the wretched weather and terrain, we faced German anti-aircraft fire and night fighters.

The guerillas and the British and American ground liaison personnel established almost 100 drop zones and, incredibly, 36 landing strips, all in German-occupied territory. Our cargo consisted of everything from Enfield rifles and [Office of Strategic Services] agents to jeeps, 75 mm artillery pieces, and the mules to pull them.

Between March and October 1944, the 60th TCG flew 4,587 combat sorties, of which 3,307 were successful. Of the unsuccessful missions, 661 were due to bad weather and 481 were caused by lack of reception on the ground or incorrect signals. If we eliminate these two categories, over which we had no control, the group's success rate was an almost unbelievable 98 percent. The 60th's "combat airline" made an incredible 714 landings in German-held territory, all in darkness and on short (1,500–1,800 feet) crudely improvised strips. We brought in over 5,000 tons of supplies. We infiltrated by parachute and conventional landing 2,576 personnel and evacuated 9,322 wounded. In spite of the weather, the hazardous terrain, and active opposition from the Germans, we lost only 53 aircrew members and 10 aircraft (one aircraft per 459 sorties).

In September 1944, Clarence J. Galligan, our group commander and, at age 24, the youngest in USAAF, was promoted to colonel and awarded the Legion of Merit. In November, we received the Presidential Unit Citation and an even more glowing one from Gen. Ira C. Eaker, air commander in chief of Mediterranean Allied Air Forces, saying, in part, "I know of no organization in this theater which has done better."

At one of the most critical times in World War II, the 60th TCG provided the guerrillas with the means to tie down, demoralize, and inflict heavy casualties upon 16 German and other enemy divisions in Yugoslavia and another eight to 10 in Albania and Greece. Suppose the 60th had not done the job. Suppose that even 10 divisions could have been transferred to France prior to D-Day. The Allied landing might well have failed, and even if it had succeeded, the history of World War II would have been vastly different, much bloodier, and longer in duration.

Lt. Col. Richard H. Kraemer,
USAF (Ret.)
Austin, Texas

Symington

Walter J. Boyne wrote a rather flowery article about Sen. Stuart Symington ["Stuart Symington," *February*, p. 68]. A brief reference was made to the B-36 but missing was any reference about his role concerning the Northrop flying wing.

During a televised deathbed interview given by Jack Northrop he told the story about Symington's pressure for him to merge his company. When Northrop refused this order [Symington] caused all Northrop flying wing aircraft to be destroyed. This action set back flying wing advanced technology many years until the B-2 finally made its appearance. The interview provided a completely different view of Symington.

Richard D. Russell
Daytona Beach, Fla.

Desert One

Otto Kreisher's "Desert One" article in the January issue [p. 60] leaves me wondering: Why now and for what purpose? There certainly are no new startling revelations for readers. Since Kreisher did not contact me when writing his article, he should know that I provided Ed Seiffert, and other key Marine helicopter personnel involved in the rescue attempt, a copy of *The Guts to Try* manuscript at least one year before the 1990 publication date. To this day I have not received one word from Seiffert to argue his case.

Nine years later, Seiffert chooses to speak out but conveniently refuses to second-guess his helo pilot abort decisions. Those abort decisions were among the major reasons for the failure, which I attempted to analyze in my book and set the record straight about what went wrong. But I want [Air Force Magazine] readers to know the brunt of my criticism was not directed at the individual helo pilots (wingmen), but at the Marine mission commander and flight leader who failed to lead!

We learned some hugely important lessons from this mission, and benefiting from the truth of those lessons is far more important than worrying about the bruised egos of a few still in denial.

James H. Kyle
Author, *The Guts to Try*
Honolulu, Hawaii

I noted in the March edition seven letters expressing views on "Desert One," indicating there is still a tremendous interest in the subject.

Crippled Eagle tells the story of the rescue attempt from its antecedents dating back to July 1976 when REDCOM was given the mission to prepare a DoD counterterrorist strike force in the wake of the Israeli raid at Entebbe.

[This book] tells the story of the 1976-79 period of scarce resources, moves into the Iran story from before November 1979, details the five months of preparation and false starts, carries through the rescue attempt and beyond, [and] document[s] much of the follow-on efforts that were the foundation for many of the Special Operations force capabilities the nation has today.

Crippled Eagle tells the story without the bitterness of either Charlie Beckwith or Jim Kyle.

Rod Lenahan
Charleston, S.C.

■ *Lenahan is the author of Crippled Eagle.* —THE EDITORS

I was very disappointed after reading "Desert One." The almost total omission of the USAF Combat Control Team members and their leader, John Carney, is unforgivable.

As the publication that touts itself as the "Force Behind the Force," you guys really did USAF a disservice by running this article the way it appeared.

For anyone [who] would like to find out more about the CCT's role in Desert One, please go out and buy *From a Dark Sky: The Story of US Air Force Special Operations*, by Orr



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To explain these needs to the American people.

Kelly. This book is an excellent source of little-known facts about a lot more than just combat controllers. It'll make you look at Air Force Spec Ops with the respect it has earned and deserves.

Mark J. Hughes
Frederick, Md.

Verbatim—Rebuts

It is obvious to me that [remarks by] retired Army Gen. Frederick J. Kroesen [were] meant to build Army morale by putting down the Air Force. [See "Verbatim," "Not All There," February, p. 17.] I respect the general's time served in the Army but do not appreciate his opinionated description of mine. I took great offense in his comments about airmen being part-time soldiers. My father-in-law (now deceased) maintained and flew in the B-17. His accounts of time served were a far cry from part-time duties. My own personal experiences in the Air Force, from 1967 to 1988 in aircraft maintenance, did not relate to part-time duty either. I would be willing to wager that the general has never observed a fighter wing [operational readiness inspection] in chemical warfare gear or an exercise in the middle of the desert.

Additionally, the technology that was used in Desert Storm came from the air first. [Army] Gen. [H. Norman] Schwarzkopf seemed to be [really] pleased with airpower in all of the Pentagon reports I viewed. It seems that Kroesen needs to update himself on where airpower is used today in our military. I'm sure that all of our branches' (including the Army's) pilots, maintainers, and weapons loaders would not take too kindly to his description of them as part-time participants.

SMSGt. Pat McGrath,
USAF (Ret.)
Mason, Ohio

Kroesen correctly acknowledges weather's influence on airpower. It hampers air, just as typhoons slow naval operations and mud impacts Army ground operations. However, after we consider what this 20th century weapon has done on a "part-time," basis, the results when they conquer weather are awesome to contemplate!

I also cheered Eighth and Ninth Air Force airplanes that overflew my foxhole on Omaha Beach. But the significant element was something not there, the German air force.

Few, if any, of the infantry's appalling casualties were caused by the GAF. I waded ashore on D+2. During

the first week, I saw less than a dozen GAF airplanes. Yet, what tempting targets the beaches were, far larger and more crowded than Dunkirk, [France, and] Gela or Salerno [Italy]!

Where was the GAF? Survivors of Eighth and Fifteenth Air Forces damn sure know. During the months before D-Day, they and the RAF made deep penetration raids into Germany. They took terrible losses but decimated the GAF.

Crucial to Allied success in Normandy was the enemy's inability to bring up reinforcements. Instead of hours, panzers took days to reach the front, if they reached there at all. Not only did Ninth Air Force's B-26s take out bridges and rail centers, their fighter-bombers went after anything that moved. Even the Wehrmacht's 30th Mobile Brigade, using bicycles, was delayed by airpower!

In August, XIX Tactical Air Command was given the specific mission of protecting Third Army's southern flank. Its "part-time" work must have been effective. Its commanding general, Brig. Gen. O.P. Weyland, was invited to join in accepting the surrender of German [Foot] March Group South on Sept. 16.

Often, we do not fully appreciate things, or people, until they are not there. Airpower's sheer dominance of the battlefield was dramatically, and tragically, proven on Dec. 15. It was suddenly turned off. The resulting Battle of the Bulge was one of the costliest battles in the proud history of American arms. After 10 days of "Hitler's weather" [airpower] returned with a vengeance. Transport airplanes dropped supplies to Bastogne [Belgium], fighters stopped road movement, and bombers pounded rear areas.

If, as Kroesen believes, airpower is just a "fair weather" friend, it sure has been a good one!

Jerry S. Stover
Dallas

Apparently, Kroesen is "not all there." I suppose that, in December 1944, if [then-] Lieutenant Kroesen's infantry had had dedicated tactical Army fighter-bombers during the Battle of the Bulge his intrepid infantry pilots would have been flying close support during the snow storms.

Maj. Mitchell S. Cwiek,
USAF (Ret.)
Escondido, Calif.

I extend my sympathies to the family of retired ground pounder Kroesen for I fear he has entered a stage of

senility that is irreversible. It was my understanding that Brig. Gen. Billy Mitchell resolved that attitude long ago.

Marcus R. Oliphant
Bloomfield, Ind.

Whence the Bear

When I was a young lieutenant learning how to fly the single-seat F-105D at McConnell AFB, Kan., in 1969, I was told the following story about the derivation of the term "bear" to describe the backseater in the F-105G Wild Weasel. [See "Pieces of History: The Bear's Cave," February, p. 80.]

A significant number of B-58 Electronic Warfare Officers transitioned to the F-105 Wild Weasel when the B-58 was retired. The B-58 employed an innovative egress system which used a clamshell arrangement which snapped shut to enclose the ejection seat (and the crew member) before the seat was rocketed away from the aircraft. The idea was to protect the "ejectee" from supersonic windblast. To test this arrangement, so the story went, a live bear was strapped into one of those seats and actually ejected in flight from the EWO's cockpit. (The bear survived the experience, but I understand that he was really, really angry.)

The B-58 EWOs were called "bears" in honor of this first ejection seat passenger, and when they came to the F-105 Wild Weasel, the name came with them. This story sounded plausible in 1969. In 1972 when I became a Wild Weasel front seater (the "bears" called us "frogs," but that's another story) at Korat AB, Thailand, the story had become a legend and part of our culture.

If it didn't happen that way, it should have.

Lt. Col. James G. Terry,
USAF (Ret.)
Albuquerque, N.M.

Corrections

In the February issue, on p. 15, please note that Luke AFB is still in Arizona, and the DoD history on Vietnam POWs is titled *Honor Bound: The History of American Prisoners of War in Southeast Asia, 1961-1973*; on p. 16, Senior Enlisted Advisors should have been listed under their new title Command Chief Master Sergeants.

In the January issue, the call sign for the helicopter force in Desert One was "Bluebeard," not "Bluebird," as appeared on p. 65 of the article "Desert One."

The Chart Page

By Tamar A. Mehuron, Associate Editor

The Defense Budget at a Glance

In February, President Clinton presented his proposed defense budget for Fiscal 2000. The document requests \$267.2 billion in budget authority and \$260.8 billion in outlays for the direct program (DoD activities only). The budget request for the total national defense program (DoD activities and defense activities in the Department of Energy and other federal agencies) is \$280.8 billion in budget authority and \$274.1 billion in outlays.

Funding levels can be expressed in several ways. Totals are most frequently stated in **budget authority**, which is the value of new obligations that the government is authorized to incur. These include some obligations to be met in later years. Figures can also be expressed in **outlays** (actual expenditures, some of which are covered by amounts that were authorized in previous years).

Another difference concerns the value of money. When funding is in **current** or **then-year** dollars, no adjustment for inflation has taken place. This is the actual amount of dollars that has been or is to be spent, budgeted, or forecast. When funding is expressed in **constant dollars**, or **real dollars**, the effect of inflation has been factored out to make direct comparisons between budget years possible. A specific year, often the present one, is chosen as a baseline for constant dollars.

The following charts address only the Defense Department program. In some instances, numbers on the charts in this section may not sum to totals shown because of rounding. Years indicated are Fiscal Years. Civilian manpower figures are now measured in terms of Full Time Equivalents.

	1999	2000	2001	2002	2003	2004	2005
Budget authority							
(current \$)	262.6	267.2	286.4	288.3	298.7	307.6	318.9
(constant FY 2000 \$)	268.6	267.2	279.3	274.3	277.1	277.8	280.4
Outlays							
(current \$)	263.6	260.8	268.6	278.3	290.2	300.0	317.6
(constant FY 2000 \$)	269.5	260.8	261.9	264.9	269.8	271.4	280.0

Defense Outlays as a Share of Gross Domestic Product



Current \$ billions	1999	2000	2001	2002	2003	2004	2005
Air Force	76.9	79.1	84.8	86.7	89.2	92.3	95.1
Army	65.3	67.2	71.3	73.6	76.4	78.9	82.3
Navy	81.9	83.3	91.4	89.2	93.1	96.2	100.3
Defense agencies	38.5	37.6	38.9	38.8	40.0	40.3	41.2
Total	262.6	267.2	286.4	288.3	298.7	307.6	318.9
Percentages							
Air Force	29.3	29.6	29.6	30.1	29.9	30.0	29.8
Army	24.9	25.1	24.9	25.6	25.6	25.7	25.8
Navy	31.2	31.2	31.9	30.9	31.2	31.3	31.5
Defense agencies	14.7	14.1	13.6	13.5	13.4	13.1	12.9

Fiscal 1999–2005 figures are from the Clinton Administration's Fiscal 2000 budget request.

Force Structure Changes

	Cold War Base 1990	Base Force	BUR Plan	QDR Goal	2000
Air Force					
Active fighter wings	24	15.3	13	12+	13
AFRC/ANG fighter wings	12	11.3	7	8	7.6
Army					
Active divisions	18	12	10	10	10
Army National Guard/Army Reserve	10	34 ^a	5+	8	8
Navy					
Aircraft carriers					
Active	15	13	11	11	11
Reserve	1	—	1	1	1
Carrier air wings					
Active	13	11	10	10	10
Reserve	2	2	1	1	1
Marine Corps					
Active MEFs	3	3	3	3	3
Reserve MEF	1	1	1	1	1

^aBrigades

Total Funding of Major Programs

(Current \$ millions, RDT&E and procurement funding)

	2000
Air Force	
C-17 transport	3,561.9
F-16 fighter	440.8
F-22 fighter	3,074.3
B-2 bomber	374.6
E-8 Joint STARS aircraft	483.0
Milstar satellite	361.3
JPATS	121.7
Joint Strike Fighter (RDT&E only)	235.4
Army	
AH-64D helicopter	773.5
RAH-66 helicopter (RDT&E only)	427.1
Navy	
DDG-51 destroyer	2,928.0
New attack submarine	1,105.7
F/A-18E/F fighter	3,066.3
Trident II ballistic missile	537.0
E-2C early warning aircraft	411.6
JPATS	45.1
Joint Strike Fighter (RDT&E only)	241.5

Procurement of Major Air Force Systems

(Current \$ millions)

	1999	2000
Aircraft Procurement		
B-2 bomber	294	167
C-17 transport	3,003	3,385
C-130J transport	189	31
E-8 Joint STARS	563	353
F-22 fighter	795	1,852
JPATS	106	88
Missile Procurement		
AIM-9X	—	31
AMRAAM	92	97
Other Procurement		
AWACS	113	124
Titan IV (Titan II refurbishment)	584	431
GPS satellites	94	171
DSP satellites	89	112
Medium Launch Vehicle	175	65
RDT&E		
Airborne Laser	257	309
Milstar satellite	547	361
Titan launch vehicles	77	45
EELV	259	325
SBIRS satellites	732	558
F-22 fighter	1,571	1,222
Joint Strike Fighter	455	235
B-1 bomber	195	204
B-2 bomber	131	202
JASSM	129	166
UAV	380	218

Acronyms

AFRC	Air Force Reserve Command
AMRAAM	Advanced Medium Range Air-to-Air Missile
ANG	Air National Guard
AWACS	Airborne Warning and Control System
BUR	Bottom-Up Review
DSP	Defense Support Program
EELV	Evolved Expendable Launch Vehicle
FTE	Full Time Equivalent
GPS	Global Positioning System
JASSM	Joint Air to Surface Standoff Missile
JPATS	Joint Primary Aircraft Training System
MEF	Marine Expeditionary Force
QDR	Quadrennial Defense Review
RDT&E	Research, Development, Test, and Evaluation
SBIRS	Space Based Infrared System
UAV	Unmanned Aerial Vehicle

Operational Training Rates

	1990	1996	1997	1998	1999	2000
Air Force						
Flying hours per crew per month, fighter/attack aircraft	19.5	20.0	19.3	17.0	17.7	17.2
Army						
Flying hours per tactical crew per month	14.2	13.9	14.5	11.4	11.5	14.5
Annual tank miles	800	618	654	630	703	800
Navy						
Flying hours per tactical crew per month	23.9	22.8	21.1	20.2	22.1	22.3
Ship steaming days per quarter						
Deployed fleet	54.2	50.5	50.5	50.5	50.5	50.5
Nondeployed fleet	28.1	29.6	28.0	26.8	28.0	28.0

Cutting the Pie: Who Gets What

(Budget authority in current \$ billions)

	1999	Change 1999-2000	2000	2001	2002	2003	2004	2005
Military personnel	70.9	+2.8	73.7	76.3	78.4	80.9	83.7	86.7
Operations & maintenance	98.1	+5.4	103.5	103.8	105.0	107.8	111.2	114.4
Procurement	49.0	+4.0	53.0	61.8	62.3	66.6	69.2	75.1
RDT&E	36.6	-2.2	34.4	34.3	34.7	34.5	35.0	34.2
Military construction	5.1	-2.8	2.3*	7.1*	4.2	4.3	4.5	4.8
Family housing	3.6	-0.5	3.1	3.8	3.6	3.7	3.9	3.9
Other	-0.7	-2.1	-2.8	-0.7	0	0.9	0.1	-0.3
Total	262.6	+4.6	267.2	286.4	288.3	298.7	307.6	318.9

*These large funding changes in Fiscal 2000 and 2001 reflect a one-time action to allow advance funding in military construction accounts.

Manpower

(End strength in thousands)

	Change 1990-97	1998	1999	2000	Change 98-00	2005	QDR Goal
Total active duty	-630	1,419	1,390	1,385	-34	1,370	1,360
Air Force	-162	372	366	361	-11	351	339
Army	-259	488	480	480	-8	480	480
Navy	-187	387	372	372	-15	368	369
Marine Corps	-23	173	172	172	-1	171	172
Selected reserves	-226	886	877	865	-21	837	835
Civilians (FTE)	-211	770	724	700	-70	637	640

Aerospace World

By Peter Grier

Oklahoma Depot Hits Jackpot

Oklahoma City Air Logistics Center, Tinker AFB, Okla., has won a \$10.1 billion contract to conduct engine work now carried out at San Antonio Air Logistics Center, Kelly AFB, Texas. It is the biggest such repair and overhaul contract competitively awarded by the Air Force, according to officials.

The award will save the service about \$1.8 billion over 15 years, said Darleen A. Druyun, principal deputy assistant secretary of the Air Force for acquisition and management, at a Feb. 12 announcement. She said the savings would provide badly needed cash for modernization efforts.

The last round of base closings put the work up for grabs. The 1995 Defense Base Closure and Realignment Commission reported that San Antonio ALC and Kelly AFB, Texas, should be realigned. The commission further urged that ALC workloads be consolidated at other military depots or with similar private sector commercial activities.

Following up on the commission's recommendations, USAF conducted a competition for the propulsion business work of San Antonio. It received bids from Oklahoma City ALC and from Pratt & Whitney, which proposed to leave the work in San Antonio.

Though much of the propulsion work will now move to the north, some will stay in Texas. Lockheed Martin's Kelly Aircraft Co., a major Oklahoma City ALC subcontractor, plans to do its share of the work at the Greater Kelly Development Corp. facilities in San Antonio.

The propulsion business area workload consists of repair and overhaul of TF39, T56, and F100 non-core engines, modules, and associated fuel accessories, together with two-level maintenance of the TF39 and TF56 engines.

Senate Boosts Pay, Retirement

US military personnel are well on their way to getting their biggest raise in pay since the early Reagan-era increases.

On Feb. 24 the full Senate passed

a sweeping pay and pension bill that would increase military salaries by 4.8 percent, starting next January. It would allot selected bonuses of up to 10.3 percent and increase pensions of retirees to 50 percent of basic pay, up from 40 percent. In addition, the bill would permit a career service member, if he or she so desired, to stay with the 40 percent retired pay formula and, at 15 years of service, take a \$30,000 lump sum payment, which he or she could invest.

Passage of the bill marked a bit of one-upmanship on the part of the GOP-led Senate. The Clinton Administration propose a somewhat less generous package consisting of a 4.4 percent raise and bonuses up to 9.9 percent.

The Administration had not proposed a full pension inflation adjustment—as the Senate approved.

"There is one thing that takes higher priority than budgets, and that's the defense of our country," said Senate Majority Leader Trent Lott of Mississippi after the legislation passed.

The White House is not happy about

the Senate raising its bet, but officials indicated that it would be difficult for the President to veto the stand-alone pay and pension bill over its relatively narrow differences with Clinton's own proposal.

AEFs Seen to be on Track

Air Force officials said that the first two Air Expeditionary Forces will be ready for action in October—90 days before the comprehensive Expeditionary Aerospace Force concept becomes fully operational in January 2000.

Home bases for the lead AEFs will likely be Seymour Johnson AFB, N.C., and Mountain Home AFB, Idaho, Maj. Gen. Donald G. Cook, director of AEF implementation, said Feb. 16.

AEFs will consist of people and equipment from multiple wings and bases. The home base will provide a common ground for training and a command structure.

The Air Force is four to five years away from 10 complete AEFs, mainly because it does not have the equipment to ensure they are all equal in



Brig. Gen. David A. Deptula, Combined Task Force Operation Northern Watch commander, checks an AIM-7 Sparrow during a preflight at Incirlik AB, Turkey. Northern Watch coalition aircraft continue to face heavy aggression from Iraqi forces as they conduct routine enforcement of the northern Iraq no-fly zone.

USAF photo by SrA, Adam Slump

The Battle of Arlington Ridge

ARLINGTON, VA., March 4—The announced subject of the National Park Service hearing Feb. 17 was comment on the Environmental Assessment for the Air Force Memorial to be located on Arlington Ridge, overlooking the Potomac River. However, a parade of almost 60 speakers representing groups opposed to the project soon turned the hearing into an attack on the Air Force Memorial, contending that it would encroach on the Marine Corps Iwo Jima Memorial, which occupies eight of the 25 acres on the ridge.

The leadoff speaker was Maj. Gen. David F. Bice, who appeared in uniform and declared the official opposition of the US Marine Corps to the placement of the Air Force Memorial, even though it would be 500 feet away from the Iwo Jima monument, down a slope, and screened by a stand of mature trees. Others in the lineup took a more emotional—and sometimes strident—tack, arguing that the presence of the Air Force Memorial on “hallowed ground” would be a “travesty” and even that it would “pollute” Arlington Ridge.

A small contingent from the Air Force Memorial Foundation, the Air Force Association, and the Air Force Sergeants Association had a few minutes on the program, but the presentations were dominated by the opponents, who were cheered on by more than 200 supporters in the audience.

The next day, AFA President Thomas J. McKee, who had been present at the Park Service meeting, issued a national Call to Action to members of the Air Force Association, asking them to communicate their views on the matter to the Park Service and other oversight groups.

Since time ran out on Feb. 17 before all of those who signed up to speak were heard, a follow-on session was held on March 3—and this time, supporters of the Air Force Memorial were there in strength.

Responding to those who said the Air Force Memorial would “pollute” Arlington Ridge, AFA Chairman of the Board Doyle E. Larson said that “we have not—nor would we ever—show such utter disrespect, either for the Marine Corps War Memorial or for the Marine Corps war dead. We revere the memory of the Marines who fell at Iwo Jima, indeed, the memory of all 19,733 Marines who died in battle in World War II.

“However, if there should be present those who do not already know it, let them listen now and listen well. The combat dead of the Army Air Forces in World War II—52,173 of them—deserve a similar respect, and we of the Air Force Association will insist on this respect on their behalf.”

Also entered into the record of the hearing was the text of a letter, sent March 1 by Congressmen Cliff Stearns, Sam Johnson, and Van Hilleary to all members of the US House of Represent-

tatives, pointing out that the Air Force Memorial Foundation had followed exactly the complex laws and procedures prescribed by Congress and saying that the men and women of the Air Force “deserve a memorial of *their* design, erected in a solemn place of *their* choosing, approved as a result of a rigorous process we legislators enacted over 10 years ago.”

Spokesmen for the Air Force Memorial noted some of the erroneous statements made at the Feb. 17 meeting, the most serious of which was the repeated claim that a superb alternative site was available at the location of the Navy Annex. In fact, that site is presently occupied (by the Navy Annex) and the Department of Defense says it will continue to be required for the next 21 years.

Those who had made another fraudulent claim, that the Marine Corps was blindsided by the plans for the Air Force Memorial, were reminded that the former commandant of the Marine Corps testified to the US Senate that he and the Marine Corps leadership had been apprised of the plan in 1994 and “did not impose any objection.”

Arlington Ridge—the official name for which is the “Nevius Tract”—consists of 25 acres. The Marine Corps Memorial and parade ground cover eight acres, the Netherlands Carillon takes up three acres, and two of the remaining acres have been approved for the Air Force Memorial. Marine Corps supporters like to refer to Arlington Ridge as “Iwo Jima Park” and hold that nothing else should ever be built on any of the rest of the tract.

They prefer to ignore a letter from the Department of the Interior on Jan. 5, 1954, “outlining the provisions under which the Marine Corps War Memorial Foundation, Inc., is authorized to erect the memorial as a part of the development of the Nevius Tract.”

Those provisions, countersigned as acceptable and understood by Maj. Gen. Merrit A. Edson, USMC (Ret.), president of the foundation, included the stipulation that “this authorization is granted with the understanding that the Marine Corps Memorial is an element of an ultimate development of the Nevius Tract and that the future development of this tract may require revisions in the development of the grounds and planting in the immediate vicinity of the Marine Memorial in order to bring this memorial into conformity with the ultimate developments of the entire area.”

It was not until much later that Marine Corps supporters and others began to assert that Arlington Ridge belonged to the Iwo Jima Memorial alone.

capability. The service leadership is not interested in some AEFs being more capable than others, said Cook.

At any given time, two AEFs will likely be deployed on 90-day rotations, and two other AEFs will be on call. Not all the aircraft and personnel of a particular AEF will be necessarily involved in a deployment. Different percentages of assets will be called upon, depending on need.

DoD to Tricare: Heal Thyself

Military medicine provides an excellent level of care, but the Tricare system still has much room for improvement.

Rudy de Leon, defense undersecretary for personnel and readiness, gave that assessment to attendees at

the annual Tricare conference held in Washington in early February.

The system needs to do better about how and when patients receive care, how they learn about their health care options, and how and when bills are paid.

“As I talk with our beneficiaries at home and on deployment, a common theme emerges,” said de Leon. “Active duty members and their families are pleased with the quality of health care they receive. The problems exist in the level of service.”

To learn more about specific problems, de Leon has been holding town hall Tricare meetings across the country. He said most complaints fall into two categories: how long it takes to get through on the telephone to make

an appointment and the number of times patients have to deal with their whole bill because the doctor hasn't been paid.

“We must resolve that the system will not allow young military families to be hounded by bill collectors or surprised by out-of-pocket costs,” said de Leon. “And we must do all we can to pay our health care providers on time so that the best civilian doctors and other health care professionals will want to participate in the Tricare system.”

Defense health officials hope to re-engineer the way the 27 million Tricare claims are processed each year.

By the end of 1999, Tricare will move to Medicare-like standards for its claims processing. This means

Survivor Benefit Plan Open Enrollment

March 1 marked the opening of a year-long Survivor Benefit Plan Open Enrollment period mandated by last year's defense authorization bill.

Those eligible to take part are service members or former members who, on Feb. 28, 1999, were not participating to the fullest extent possible in both the Survivor Benefit Plan and the Supplemental Survivor Benefit Plan. They must also have been eligible to elect a greater SBP and/or SSBP coverage than now in effect, but did not.

The deadline for enrollment is Feb. 29, 2000. Those interested must submit a DD Form 2656-3, Survivor Benefit Plan (SBP) Open Enrollment Election.

Open period enrollees will have to pay two kinds of premiums. The first are the normal monthly premiums paid for the coverage, beginning with the effective date. The second is a one-time open enrollment (buy-in) premium.

The amount of this buy in is determined by the length of time the retiree had an eligible beneficiary but did not opt for SBP protection. If enrollees desire, the buy in can be deducted from retired pay in monthly installments, although there are limits as to how much can be taken out.

Details may be obtained from an SBP counselor at a military installation or by calling toll free (800) 531-7502.

USAF photo by TSgt. Lance Cheung



In a training exercise to ensure they know the Geneva Convention rules, USAF security forces personnel from the 51st Security Forces Squadron in South Korea guard Army Pvt. Anthony Casper, playing the role of an enemy POW.

that 95 percent of error-free claims filed by health care providers will be processed within 14 days, and 95 percent of "clean" claims submitted on paper will be processed within 30 days.

The current Tricare standard—that 75 percent of all claims be processed within 21 days—has been criticized as insufficient by providers, beneficiaries, and such officials as Army Chief of Staff Gen. Dennis J. Reimer.

Army Aims To Move Faster

The Army is creating light strike forces in an effort to improve its ability to deploy swiftly to world trouble spots, Army Secretary Louis Caldera

announced at a Feb. 16 session of the Defense Writers Group in Washington.

The first experimental strike force, consisting of 3,000 to 5,000 soldiers, will be formed within the year at Ft. Polk, La., where it will be tested in wargames.

The force will eventually include lighter, but technically sophisticated, tanks and artillery, said Army officials. Current Army divisions are designed for conventional warfare, have heavy weapons, and up to 18,000 soldiers.

The goal is to provide units that combine deployability with a heavy unit punch. "We want to get to the fight quickly," said Caldera.

Air Force Nominee Emerges

A former acting head of the Department of Energy emerged in early March as President Clinton's likely nominee for the long-vacant post of Secretary of the Air Force.

Charles B. Curtis, 58, would be the second name put forward by the Administration to fill the job left empty when Sheila E. Widnall stepped down in October 1997. The first, Florida state Sen. Daryl L. Jones, was rejected by the Senate Armed Services Committee when lawmakers decided he had misled them about some aspects of his Air Force Reserve career.

Curtis is a Washington lawyer and former Army Reservist. Government service included a stint as head of DoE's defense and national security programs. He was chairman of the Federal Energy Regulatory Commission during the Carter Administration.

He and Defense Secretary William S. Cohen are former law school classmates. Both graduated from Boston University School of Law in 1965.

DoD Pushes Base Closure Again

Defense officials are again pushing Congress to allow more base closings. They think their chances of winning are better this year than last year, when lawmakers voted against a new Base Realignment and Closure round.

If they get a green light, no installation will be immune to possible closure.

"We in the Air Force need a BRAC very badly," Air Force Chief of Staff Gen. Michael E. Ryan said in Janu-

ID Card Rumors Rampant

There is no truth to the rumor that the Pentagon has set a mandatory date to obtain the new automated ID card, say Air Force personnel officials.

Such rumors have been circulating widely in recent months, note members of the Air Force Personnel Center, Randolph AFB, Texas.

If a mandatory date is established, it will be well-publicized in advance. Meanwhile, retirees with a family member who requires renewal of an ID card may request issuance of a new automated card for themselves at the same time.

Updated information can be found on the Internet at www.afpc.randolph.af.mil/deers.



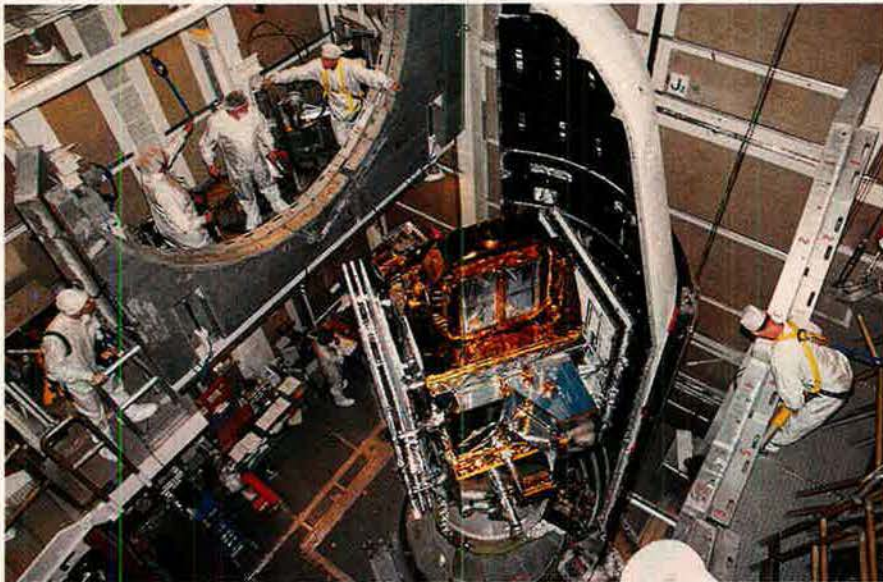
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A Boeing Delta II boosted the Advanced Research and Global Observation Satellite into orbit from Vandenberg AFB, Calif., Feb. 23. ARGOS carries several USAF experiments and will collect data on Earth's environment and perform demonstrations, ranging from electric propulsion to orbital debris detection.

ary. "We have too many forces spread out over too many installations."

Pentagon chiefs have been making their arguments for base closings in some unusual settings. Secretary of Defense William S. Cohen made a pitch for the move during a Jan. 28 speech before the Illinois House of Representatives.

"It should offend every one of us that serious needs for our troops remain unmet while we squander money on facilities we no longer need," he said.

One reason officials believe they may prevail in 1999: a possible change of heart by a key base closure opponent of recent years. Sen. John Warner (R-Va.), who cast a deciding committee vote against BRAC last summer, has been discussing a closure bill with the Pentagon. As the new chairman of the Senate Armed Services Committee, Warner will have considerable influence over the fate of such legislation.

"There isn't a person up here who doesn't recognize that there are ... [more] bases than we need," said Warner at a Jan. 27 Capitol Hill briefing.

Last year, Congressional opponents said there was little evidence that previous closures had actually saved money and that the effect on surrounding communities was unpredictable. Since then, a General Accounting Office report backed up Pentagon claims that recent closing rounds have saved money—\$2 billion to \$3 billion a year—and that most lost jobs were replaced in two years.

Lawmakers remain suspicious that the Clinton Administration may play politics with base closings by favoring one state over another. However, proponents say Clinton is now likely to be out of office before another

BRAC round is completed. This, they say, could help alleviate political concerns.

Air Force Buys Ad Time

For the first time in its history, the Air Force will pay for national television advertising to support its recruitment efforts.

Plans called for an initial \$17 million purchase of ads to air during NCAA basketball games that led up to the Final Four Tournament in March. Plans call for another \$37 million network ad campaign to take place in the fall.

Air Force leaders are taking this step in response to harsh recruiting difficulties. In the first quarter of Fiscal 1999, the service fell short of its goal by 6 percent—or a total of 696 airmen. Officials do not want to fall short for the entire year, a problem that has not been experienced since 1979.

"It's too early for us to say with certainty that the Air Force will not meet its recruiting mission, but our indicators are not encouraging," said Brig. Gen. Peter U. Sutton, commander of Air Force Recruiting Service. "We need the awareness that television can generate right now, so

Tenet Sees Dangerous World for US

George J. Tenet, the director of central intelligence, is more worried about Moscow's direction than he was a year ago, and he says that Russia is backsliding on its promise to curb its transfer of advanced missile technology to Iran.

The Clinton Administration has not succeeded with its strategy of slapping sanctions on Russian firms and institutions involved in the spread of advanced weapons, according to Tenet's Feb. 2 testimony on the threats facing the nation.

"There were some positive signs in Russia's performance early last year, but unfortunately there has not been a sustained improvement," he said. "Especially during the last six months, expertise and materiel from Russia has continued to assist the Iranian missile effort in areas ranging from training to testing to components."

Furthermore, Russia's growing lawlessness, combined with public sentiment for a strong hand at the helm, may illuminate a "dangerous path for a country with Russia's authoritarian history," according to the nation's top intelligence official.

Other threats abound, according to his rare public testimony. North Korea is close to developing ballistic missiles that could be capable of hitting parts of the continental United States, he said. Its recent test of a three-stage rocket, although unsuccessful, "demonstrated technology that, with the resolution of some important technical issues, would give North Korea the ability to deliver a very small payload to intercontinental ranges ... although not very accurately."

An advanced two-stage North Korean rocket now in development might threaten Alaska and Hawaii and portions of the US mainland, with more accuracy, he said.

Meanwhile, resourceful terrorists such as Saudi exile Osama bin Laden are planning attacks similar to the 1998 African embassy bombings. The potential profitability of smuggling items related to Weapons of Mass Destruction may lead to international organized criminal interest that would facilitate transport of WMD materials to rogue states and terrorists. Drug production has declined in Peru and Bolivia but increased in Colombia, so that drug shipments to the US are increasing overland through Central America and Mexico.

"What is noteworthy is the manner in which so many issues are now intertwined and so many dangers mutually reinforcing," said the US DCI.

it can begin to have an impact this year."

In past years, the Air Force has relied on non-paid TV public service announcements to augment national and local print advertising. But such spots are shown irregularly and have an uncertain recruiting effect, said officials.

USAF General To Head Spy Agency

President Clinton has nominated Air Force Maj. Gen. Michael V. Hayden to be the director of the National Security Agency.

Hayden has had years of experience in intelligence gathering and information warfare, making him a natural to lead the nation's secret code-breaking and eavesdropping organization. Currently deputy chief

of staff for the United Nations Command in Korea, he has also commanded Air Intelligence Agency and run the Joint Command and Control Warfare Center at Kelly AFB, Texas.

If confirmed by the Senate, he would take the helm of an agency that is still adjusting to its new duties in the post-Cold War world.

The NSA's job has been made more difficult in recent years by the rise in fiber-optic cables, digital cellular telephones, and proliferating encryption technology, say experts. All these developments make it harder than ever to clandestinely glean communications data useful to US national interests.

Titans Cleared for Launch

After a six-month stand-down, the

Air Force's Titan rocket fleet is ready to start counting down toward its next launch.

Air Force officials suspended Titan flights after the loss of a Titan IVA last Aug. 12. Range safety officers at Cape Canaveral AS, Fla., were forced to destroy the launch vehicle about 40 seconds after liftoff, due to indications it was breaking up.

An accident investigation board has determined that electrical shorts in the vehicle power supply wiring harness were the most likely reason for the catastrophic failure. The board found evidence that a wire with damaged insulation—undetected during prelaunch inspections and tests—intermittently shorted as vibration increased after liftoff.

Shorting caused intermittent loss of power to the missile guidance com-



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Joint STARS in Space?

The Defense Department in February awarded contracts for preliminary work on a new fleet of satellites that could perform from space the same kind of synthetic aperture radar-moving target indicator mission now performed by E-8 Joint STARS aircraft.

The new program, called Discoverer II, is a joint effort by the Air Force, Defense Advanced Research Projects Agency, and the National Reconnaissance Office.

Its goal is to put into orbit two research and development satellites by 2003 for a year-long demonstration. If successful, further operational launches could begin by 2007.

The project could relieve pressure on the Joint STARS aircraft, which are in constant demand by regional commanders in chief. The system provides near-real-time indication of whether and where any vehicles are moving in a theater of operations.

Acting Air Force Secretary F. Whitten Peters said at AFA's Air Warfare Symposium in Orlando, Fla., that even a full complement of 19 Joint STARS would be insufficient to meet CINC requirements. Only 14 are funded.

The Discoverer II satellites are to "be capable of detecting and tracking moving targets on the Earth's surface, producing high-resolution imagery, and collecting high-resolution, digital terrain mapping data," the Air Force said.

Forces in the field are to be able to query the satellites themselves and get back the requested data in near real time, "directly from the satellite itself," worldwide and in all weather, the service added.

The system would eliminate "blind spots" in coverage and provide even more precise fixing of targets.

A major component of the program is to demonstrate the feasibility of building the satellites at a cost that would permit a large constellation to be deployed. The target costs are \$100 million each, with a 20-year, 24-satellite fleet operating cost under \$10 billion.

Competitive contracts were awarded to Lockheed Martin Astronautics, Denver, Colo.; Spectrum, Astro, Inc., Gilbert, Ariz.; and TRW Defense Systems Division, Redondo Beach, Calif. One or two of the competitors deemed offering the best concepts will proceed to satellite fabrication in late 2001.

"If successful, the Discoverer II program will usher in a revolution in the coverage and timeliness of reconnaissance and surveillance support under the direct control of theater commanders in chief or joint task force commanders," USAF asserted.

—John A. Tirpak, Senior Editor

puter, resulting in eventual loss of control.

Armed with this information the Air Force has developed a list of necessary corrective actions. It includes reinspection of all wire harnesses on current Titans, redesign or modification of systems related to power and guidance, and inspection improvements.

A Titan IVB carrying a Defense Support Program satellite is scheduled for launch from Cape Canaveral by early April. A Titan II launch from Vandenberg AFB, Calif., is set for late April.

DarkStar Dead?

The Pentagon moved to kill the DarkStar Unmanned Aerial Vehicle program in mid-January and divert remaining funds in its budget to a rival long-range UAV program, Global Hawk.

DarkStar was intended as a stealthy eye in the sky that could sneak past enemy defenses and provide commanders with real-time intelligence.

Acquisition officials decided, however, that stealthiness was not a major virtue for a small, unmanned aircraft intended to fly at high altitudes. They opted instead for range, payload, and

cost advantages provided by the larger, less-expensive Global Hawk.

Global Hawk, built by Teledyne Ryan Aeronautical, has completed at least 12 test sorties at Edwards AFB, Calif., as it looks toward a spring military utility assessment that will determine how it might be used in joint battlespace operations.

Two January test flights were cut short due to a faulty reading on the engine's oil sensor and a crack in the vehicle's hydraulic pump casing. However, during a Jan. 22 test, the UAV took in images from synthetic aperture radar, electro-optical, and infrared sensors, and sent them to ground controllers in real time.

"For the first time, all four of Global Hawk's command and control and imagery transmission data links were operational," said Lt. Col. Pat Bolibrzuch, program manager of the Joint High Altitude Endurance UAV Office.

DarkStar could yet be revived, as a number of members of the House and Senate have asked DoD to reconsider the move.

Anthrax Vaccine Safe, Says DoD Doctor

There is no truth to recent reports that contaminated anthrax vaccine has recently been shipped to military units, said the Pentagon's top doctor on Feb. 3.

Neither the Department of Defense nor the Food and Drug Administration has found any evidence of microbial contamination in vaccine vials, insisted Dr. Sue Bailey, assistant secretary of defense for health affairs. The manufacturing process for the vaccine has met all FDA requirements, she said.

Senior Staff Changes

RETIREMENT: Maj. Gen. Bobby O. Flood.

NOMINATIONS: To be Lieutenant General: Michael V. Hayden.

PROMOTIONS: To ANG Major General: Walter R. Ernst II.

CHANGES: Lt. Gen. (sel.) Michael V. Hayden, from DCS, UN Cmd. Korea, to Dir., NSA, Ft. Meade, Md. ... Maj. Gen. Stephen B. Plummer, from Cmdr., JTF Southwest Asia, USCENTCOM, Riyadh, Saudi Arabia, to Spec. Asst., DCS, P&P, USAF, Pentagon ... Maj. Gen. Steven R. Polk, from Dir., Air & Space Ops., PACAF, Hickam AFB, Hawaii, to Cmdr., 19th AF, AETC, Randolph AFB, Texas ... Maj. Gen. (sel.) Randall M. Schmidt, from Cmdr., 366th Wg., ACC, Mountain Home AFB, Idaho, to Cmdr., JTF Southwest Asia, USCENTCOM, Riyadh, Saudi Arabia ... Brig. Gen. (sel.) Robin E. Scott, from Chief, Strike Warfare Assessment Div., Jt. Staff, Pentagon, to Cmdr., 366th Wg., ACC, Mountain Home AFB, Idaho ... Brig. Gen. Glen D. Shaffer, from Dir., Intel., USEUCOM, Stuttgart-Vaihingen, Germany, to Dir., ISR, DCS, Air & Space Ops., USAF, Pentagon ... Maj. Gen. Michael E. Zettler, from Dir., Maintenance, DCS, Instl. & Log., USAF, Pentagon, to Cmdr., Oklahoma City ALC, AFMC, Tinker AFB, Okla. ■

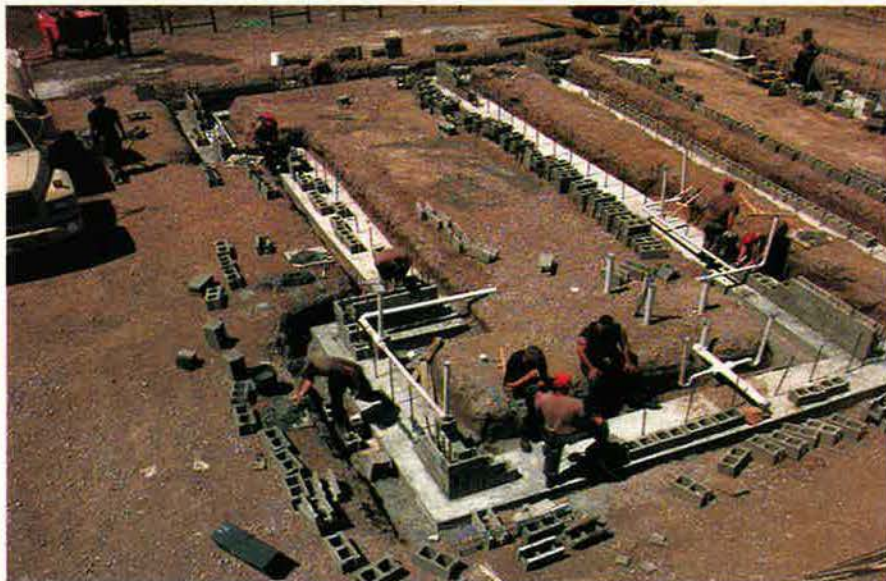
"There have been no vials shipped or any immunizations given any of our service members with lots or vials that were contaminated in any way," she said.

Last February, the manufacturer found some vials with bits of stopper or other foreign matter floating in them. They were pulled from shipment.

"That is part of the usual quality assurance practices," said Bailey.

Some 166,000 US service personnel have already received the first of the series of six shots needed to protect against anthrax, according to Pentagon officials. About 76 people have refused the shots, saying they doubted the immunization's effectiveness, safety, or necessity.

At Travis AFB, Calif., A1C Jeffrey Bettendorf refused several orders to take the shots last year. After a spe-



USAF photo by SSgt. Chris Steffen



USAF photo by SSgt. Steve Faulisi

Members of the 823d RED HORSE Squadron, Hurlburt Field, Fla., participated in a US Southern Command exercise on St. Kitts-Nevis. At top, the engineers place restraining walls for a building at Camp Springfield, St. Kitts, while (above) A1C Christine Hensley levels out a block during construction of an operations center for the St. Kitts Defense Force.

cial court-martial on the matter was scheduled for March 16, Bettendorf requested discharge in lieu of facing court-martial. The airman was discharged "under other than honorable conditions."

He was a member of the 815th Air Mobility Squadron, a unit that deploys quickly into high-threat areas and thus needs protection against biological warfare, according to commanders.

C-5 To Get Much-Needed Upgrades

The Pentagon is pushing forward with much-needed upgrades to improve reliability and maintainability of its C-5 airlifters.

On Jan. 22, DoD officials awarded a Lockheed Martin-Honeywell team a contract to add digital avionics to the C-5 transport. This C-5 Avionics Modernization Program will lead to replacement of the aircraft's automatic flight control system (autopilot) with a modern digital version. In addition, the effort will install a new communication/navigation system to meet global air traffic management standards and six new liquid crystal displays for flight and engine instruments.

Flight testing of the new avionics is scheduled to begin in October 2001.

Phase 2 of the overall modernization plan calls for re-engining the C-5 fleet. The current TF39 power

plant has been rendered obsolete by today's big commercial turbofan engines.

Replacement of TF39s with new GE CF6-80C2 engines would boost the C-5 mission capable rate back into the mid-80s percent range, about equal with other Air Mobility Command aircraft, according to Lockheed Martin officials. The engines would also increase the mission capable hours by nearly one-half and takeoff thrust by nearly 22 percent.

An additional 40 subsystem and structure improvements, such as new pylons and thrust reversers, will yield like-new departure reliability, according to Lockheed Martin. Flying hour cost will be cut 34 percent. All these benefits come at a cost of less than 20 percent that required for comparable new airplanes.

F-22 1999 Milestones

Lockheed Martin delivered the mid-fuselage for the fourth flying F-22 to its Marietta, Ga., assembly plant late last year—and right on schedule.

Raptor 04 will be the first F-22 with a full complement of avionics. Its mid-fuselage, the most complex part of the plane, has about 40 percent more wires, by length, and the first fiber optics of any F-22 yet.

"In terms of internal changes, this represents our final evolutionary step towards a production configuration," said Mary Ann Horter, F-22 airframe manager at Lockheed Martin Tactical Aircraft Systems in Fort Worth, Texas.

Block 1 avionics flight testing in a 757 flying test bed was scheduled to begin in February or March and be completed by summer.

In other planned program mile-



The 270th Air Traffic Control Squadron (ANG), Kingsley Field, Ore., used this mobile ATC facility to provide air traffic control for civilian and government aircraft after a freighter ran aground off the Oregon coast in February. The 270th helped out at what are normally low volume, uncontrolled airports, like this one in Newport, Ore.

stnes, a non-fly ng static test F-22 was to begin formal testing in the spring to verify the structural capability of the F-22 design. Raptor 03, the third flyable F-22, is expected to be flown for the first time in the fall.

The year's end should see the first flight readiness review for Raptor 04, as well as the contract award for Lot 1 aircraft and engines, and a long-lead funding contract for a Lot 2 of 10 aircraft and 25 engines.

Joint Experimentation Program To Begin

The Pentagon plans to begin a new program designed to fund exercises and experiments aimed at building forces as foreseen in Joint Vision 2010.

The Congressionally mandated Joint Experimentation Program is penciled in for \$300 million in 1999 and \$350 million over the next six years, according to budget documents.

Last year, US Atlantic Command was named executive agent for the effort. In December, USACOM issued a Joint Experimentation Campaign Plan that called for a "totally new" force development method.

News Notes

■ The crash of a 27th Fighter Wing F-16D at Cannon AFB, N.M., last December was caused by engine failure due to a problem with a blade in the first stage compressor section, according to an Air Combat Com-

mand accident report released Feb. 16. Both the pilot and a passenger ejected safely from the aircraft.

■ Two US fighter aircraft in Japan—an Air Force F-16 and a Marine F/A-18—crashed within days of each other in late January. Neither pilot was badly hurt, but the incidents caused a Japanese Foreign Ministry official to call the US Embassy, express concern about the spate of accidents, and ask that they be thoroughly investigated.

■ An F-15E crew from Elmendorf AFB, Alaska, safely flew their aircraft several hundred miles back to base after an explosion tore off four feet of the left wing's leading edge, plus the left wing pylon and external fuel tank. No word yet on the cause of the fireball.

■ The Raytheon-built AGM-154A Joint Standoff Weapon was used in combat for the first time Jan. 24. A Navy F/A-18 on patrol over the skies of Iraq launched the weapon at an

Iraqi air defense site, effectively taking it out of operation.

■ On Feb. 9, US and Slovakian military officials signed a Memorandum of Understanding that will give US fighters access to the Republic of Slovakia's Kuchyna Bombing Range and nearby Malacky AB, located about 25 kilometers east of the Austrian border. The successful completion of the MOU, after two years of work, means that US F-15s and F-16s will soon be loosing live munitions in what was once part of communist Czechoslovakia.

■ The Air Force ended 1998 with 34 active duty deaths attributed to suicide—the lowest such number on record.

■ The daughter of a Holloman AFB, N.M., NCO won the Miss USA pageant. Kimberly A. Pressler, daughter of 9th Fighter Squadron MSgt. Stan Pressler, was crowned Feb. 5 in Branson, Mo., and will represent the US in the Miss Universe pageant.

■ The Air Force Personnel Center changed its phone numbers March 14. AFPC's commercial telephone prefix will change to 565 and the new DSN prefix will be 665.

■ Jan Ferguson, cultural resources program manager in Aeronautical Systems Center's 88th Air Base Wing Office of Environmental Management, has won the servicewide 1998 Thomas D. White Award for individual excellence in cultural resources management. Ferguson played the lead role in the successful integration of the 84-acre Huffman Prairie Flying Field, a national historic landmark, into the Dayton Aviation Heritage National Historical Park, one of the newest parks in the US national park system.

■ On Feb. 10 the National Aeronautic Association announced that the U-2S/ER-2 spy plane has won the NAA's Collier Trophy for 1998. The trophy recognizes the top aeronautical achievement in the US for the year. The U-2S, first delivered to

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the Air Force in 1994, can carry four times the payload of its predecessor and has claimed a number of altitude and payload records.

■ Brig. Gen. Richard S. "Steve" Ritchie (AFRES), the Air Force's only pilot ace in the last 45 years, has flown his last fighter. Ritchie became an ace by downing five MiG-21s during the Vietnam War. He retired Jan. 29 after more than 34 years in the Air Force, Air Force Reserve, and Colorado Air National Guard.

■ A C-17 crew from Charleston AFB, S.C., recently saved the life of a citizen of Christmas Island, a remote South Pacific atoll. While deployed in Hawaii the crew flew an emergency mission to the tiny island and evacuated an individual seriously ill with complications from diabetes.

■ Hurlburt Field, Fla., 20th Special Operations Squadron and 4th SOS aircrews got a little more realistic action than they had planned during routine training Jan. 28. An AC-130U Spooky gunship located and two MH-53J Pave Low helicopters retrieved two F-15 pilots who ejected after their fighters collided over the ocean, 75 miles from the Florida coast. The pilots had only minor injuries.

■ An Air Force Reservist with the 756th Airlift Squadron at Andrews AFB, Md., has won the 1998 Koren Kolligian Jr. Trophy, the Air Force's top aircrew safety award. Capt. Mark S. Barker garnered the honor for successfully landing his crippled C-141 Starlifter under adverse weather conditions.

■ Air Force officials have chosen Sept. 18 as the date for the third annual US Air Force Marathon at Wright-Patterson AFB, Ohio.

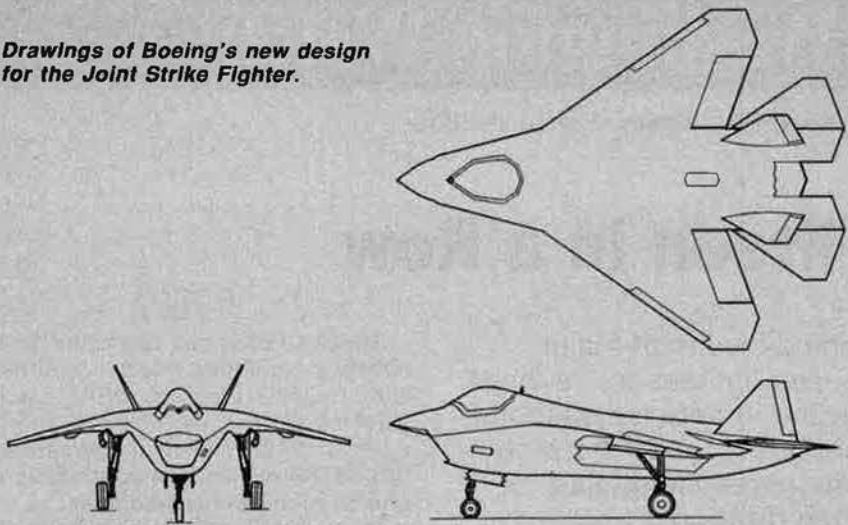
■ An MH-53 Pave Low helicopter from the 352d Special Operations Group's 21st Special Operations Squadron performed an emergency medical evacuation from USS *Monongahela* in the Mediterranean on Feb. 4. The aircraft plucked a seaman suffering with appendicitis from the ship and transferred him to a hospital in Italy.

■ Two F-16 fighter squadrons at Aviano AB, Italy, have temporarily merged. With most of the 510th FS deployed for training in the US, remaining aircraft and people teamed up with the 555th FS on Jan. 25 to ensure that USAF can meet mission requirements for patrols over the former Yugoslavia.

Obituary

Fred D. Orazio Sr., an Air Force aerospace design pioneer who helped break the sound barrier, died Jan. 17

Drawings of Boeing's new design for the Joint Strike Fighter.



Boeing Revises JSF Design

Boeing revised its design for the Joint Strike Fighter to save weight, improve maneuverability, and reduce carrier-landing speed, company officials said in February.

The clipped-delta planform of the concept Boeing originally offered in the competition has been supplanted by its Model 373, which features a more conventional wing/empennage layout, as well as a more swept chin inlet.

Company program manager Frank Statkus told reporters the change was made to reflect the "constantly maturing" requirements laid out by the JSF Program Office.

"Design evolution is inherent in the process," Statkus said. "Every time the requirements changed, the configuration changed." He acknowledged that "we needed to save some weight" on Boeing's Model 372, because it didn't meet requirements. The redesign, however, has not only improved expected handling but also paid some benefits in radar cross section reduction, Statkus added.

Under the JSF contracts, Boeing and competitor Lockheed Martin each are to fabricate and fly two demonstrator aircraft. The Boeing versions—X-32A and X-32B—are well into construction and will still reflect the previous configuration.

Statkus, however, said the two demonstrators will still meet program requirements: to demonstrate commonality among variants; Short Takeoff and Vertical Landing hover and transition; and low-speed flying qualities for carrier operations. The two planes are not intended as prototypes of the ultimate product, he pointed out.

"It was never part of the program to fly the exact version you'd build" in production, he asserted.

He insisted that the flight control laws written for the plane will not be affected by the change in weight or center of gravity and that the redesign is not a substantial departure from what the company has been proposing so far. He allowed, however, that "we still have work to do" to improve the pattern of dispersal of hot gases around the STOVL version of the plane, to improve the environment for ground crews.

The configuration is not likely to change again, at least externally, Statkus also said. Should requirements change again, Boeing will seek to meet them with internal changes, to avoid altering the airflow patterns around the inlet and wing. Further efforts to cut weight will also focus on internal structure and components.

Statkus said Boeing is "within a few percent" of where it needs to be to complete the program at the planned cost. So far, the company has expended 58 percent of the amount budgeted for the project; it is also about 54 percent of the way through the program.

—John A. Tirpak, Senior Editor

in Centerville, Ohio, at the age of 86. A Pennsylvania native, Orazio arrived at Wright Field, Ohio, in 1939 to work in the design branch of the Army Air Corps Aircraft Laboratory. Teamed with George Bailey, he did preliminary design work for what, shortly after the war, became the first air-

plane to surpass Mach 1, the X-1. During the remainder of his long Wright Field career, Orazio contributed to technical efforts such as the X-20 Dyna-Soar and the Air Force's man-in-space effort. In 1971, he received the Air Force Association's Theodore von Karman Award. ■

Washington Watch

By Robert S. Dudney, Executive Editor

Fifteen In a Row

Behind claims of major budget "increases," a long decline in defense spending continues. So do the problems in readiness and modernization.



Last fall, Undersecretary of Defense Jacques S. Gansler warned that US forces were caught in a modernization "death spiral," whipsawed by escalating costs and shrinking budgets. Force readiness was in a similar fix. All signs are that President Clinton's new defense plan will do little to arrest that downward spin, at least in the Air Force.

As the White House tells it, the Pentagon will get a boost in the Fiscal 2000 budget, the first step in what's touted as a "sustained, long-term increase in defense."

In reality, the Administration merely "boosts" defense from a very low planning level. The budget, unveiled on Feb. 1, does nothing to raise today's low spending level. In fact, it actually proposes yet another year-to-year cut.

Military spending—\$268.6 billion in 1999—would fall to \$267.2 billion in 2000, constituting a drop of \$1.4 billion. This would mark the 15th straight "down" year for the Pentagon, whose most recent budget increase came in 1985.

Within that overall budget, the Air Force would get \$79.1 billion, slightly more than this year's amount, when effects of inflation are eliminated, and roughly the same relative share. This poses several problems.

Gen. Michael E. Ryan, Air Force Chief of Staff, noted in September that USAF faced unfunded requirements totaling \$5 billion in readiness and modernization accounts alone. The new budget was supposed to remedy that problem. When the budget drill ended, however, USAF had managed to cover only half of that amount.

The Air Force still confronts \$2.6 billion in unfunded needs, reported Gen. Ralph E. Eberhart, USAF's vice chief of staff. This includes shortages of \$926 million in infrastructure, \$788 million in modernization, and \$900 million in readiness.

Over the Future Years Defense Program, covering the period 2000–05, the gap grows to nearly \$10 billion, Eberhart said.

A prominent critic of the Administration plan is Rep. Floyd D. Spence, the South Carolina Republican who serves as chairman of the House Armed Services Committee. In his view, the Administration is using smoke and mirrors to create the illusion that it is strong on defense, but in fact is playing "high stakes poker" with US military forces and with the nation's ability to protect its national interests.

Spence argues that the White House's budgeting sleight of hand is transparent, a point on which Spence lectured the members of the Joint Chiefs of Staff at a Feb. 24 hearing of the committee he chairs.

"This budget may be viewed as clever politics in the minds of some people downtown [at the White House]," Spence told the chiefs, "but it sends a terrible message to the troops who are defending this country. And it certainly does not represent a serious commitment to addressing ... critical unfunded requirements."

Little for Tomorrow

Ryan, in recent testimony to the Senate Armed Services Committee, calculated the effect of inadequate funds. "It [USAF's new budget] will fix immediate readiness problems," the Chief said. "It will not fix tomorrow's readiness problems at all. We need the full \$5 billion."

Even the immediate problems may not be all that easy to fix, given their scope and magnitude.

Materiel readiness is in trouble. Ryan said that the mission capable rate for major Air Force systems stands at 74 percent, a 10 percent drop since 1991. One-third of that decline occurred in the past year.

The Air Force aircraft cannibalization rate shot up by 78 percent in the past three years.

On the personnel front, USAF is deeply concerned about low pilot and navigator retention. The "take rate" for the pilot bonus at the eight-year mark has fallen from 81 percent in 1994 to 27 percent in 1998, the last full year for which figures are available. This is well below the Air Force goal of 50 percent and the lowest of any year in recent memory. Only four years ago, the Air Force was losing 7 percent of pilots with more than 14 years of service. Last year, it lost 25 percent. USAF is now short about 800 pilots.

Even though the Air Force has launched a number of get-well programs, Ryan said it is not certain that pilot retention has yet turned around.

Enlisted ranks are a source of concern as well. The year 1998 saw enlisted retention of those completing their second term drop for the fifth year in a row; the new figure was 69 percent, well below the Air Force goal of 75 percent. The year 1998 was the first since 1981 in which USAF failed to meet re-enlistment goals in all three re-enlistment categories—first-termers, second-termers, and career.

In the first quarter of Fiscal 1999, USAF missed recruiting goals in two of three months. "That," said Ryan, "has not happened to the Air Force in a very long time."

If nothing else, the new budget attempts to address the worsening military personnel problem. It proposes a 4.4 percent raise in military pay to help close a 14 percent gap between military and private sector compensation. Congress seems certain to boost the pay hike even higher.

In addition, the budget would also restore the traditional military retirement program, providing a military member with 50 percent of base pay after 20 years of active duty. Today's so-called Redux system offers the retiree only 40 percent of the average of his or her high three years.

In time, these measures may produce a turnaround, but the effect of the Air Force's materiel and personnel woes already has been severe. Overall readiness of major combat units has fallen 18 percent in three years, and that's not the worst of it. The combat unit readiness rate of stateside outfits in Air Combat Command has dropped a startling 56 percent.

The Air Force has diverted funds and supplies from ACC so its front-line units could be funded at something close to war-ready levels.

When Ryan talks about "tomorrow's readiness problems," he refers to weapon modernization. The new budget does not address a number of major and urgent Air Force requirements.

The most critical of these concerns military use of space. The Air Force has multibillion-dollar requirements for space-based capabilities, but little additional funding was devoted to them. Ryan told the House Armed Services Committee that USAF faces "a continual demand for more capability in space."

USAF now is grappling with mounting deficiencies in the aircraft fleets, because a decade of slack procurement has caused the average aircraft age to rise to uncomfortably high levels, with no assurance of relief any time soon.

"With a progressively aging fleet of aircraft and underfunding in readiness accounts, our people are working harder and harder to cope with their vital missions," Ryan told the House Armed Services Committee.

As if echoing Gansler's warning of some months ago, the USAF Chief added, "We must end that downward spiral of readiness."

In More Detail

The following focuses on the budget year 2000, with longer-range projections provided as needed. Figures refer to new budget authority. To facilitate year-to-year comparisons, all amounts are given in constant Fiscal 2000 dollars. The term "this year" refers to Fiscal 1999 and "next year" to Fiscal 2000.

Next year's budget breaks down into five categories:

- Procurement, \$19.2 billion.
- Research and development, \$13.1 billion.
- Operations and maintenance, \$25.6 billion.
- Military personnel, \$20.3 billion.
- Construction and housing, \$1.5 billion.

Offsetting receipts total \$410 million.

Today's active duty component is by far the smallest in the history of the Air Force. When the Air Force was formed in 1947, it had 386,000 active duty people. In the late stages of the Cold War, end strength topped 600,000. Force size at the start of this year was down to 367,500—nearly 5 percent less than in 1947. The force continues to shrink.

Pentagon plans call for the service to cut another 1,600 members this year and another 5,000 next year, dropping the total to 360,900. In the outyears, 2001–05, the Air Force will lose another 10,000 active duty members, according to budget papers.

Within the Air National Guard and Air Force Reserve Command, one finds essentially no change in end strengths. USAF's next-year budget provides for a combined military force of 180,300—106,600 Guardsmen and 73,700 Reservists.

In more than a decade of reductions, the US military has suffered a net reduction of 767,200 active duty troops. The armed forces, which numbered 2,174,000 troops at the end of 1987, had shrunk to 1,406,800 on Sept. 30, 1998. By the end of this September, the force will be down to 1,390,400 troops, or only 64 percent of its Cold War size.

In the next year's budget, force structure remains stable. The Total Air Force will maintain about 20 Fighter Wing Equivalents, 13 of which will be in the active duty force. The number of Guard and Reserve wings will expand slightly, from 7.2 FWEs this year to 7.6 FWEs next year.

The Air Force plans to maintain a fleet of 190 heavy bombers—76 B-52s, 93 B-1Bs, and 21 B-2s. Of that number, 44 B-52s, 54 B-1s, and 21 B-2s will be fully funded in terms of parts, maintenance, and load crews and are ready for immediate deployment in major theater war. Twelve more B-52 bombers are held in reserve for nuclear missions.

The USAF airlift fleet of 2000 will consist of 46 C-17s, 104 C-141s, 104 C-5s, and 405 C-130s (all assigned for performance of wartime missions). The long-range tanker force consists of 472 KC-135 and 54 KC-10 Air Force primary mission aircraft.

ANG will operate 1,028 aircraft and pull 357,800 flying hours in interceptor, tactical airlift, air refueling, general-purpose fighter, and electronic warfare missions. AFRC will have 60 flying units containing 389 aircraft.

O&M funding will support the day-to-day activity of 86 major bases,

4,987 primary authorized aircraft, and 550 ICBMs. It funds 1.8 million flying hours.

Flying time in the next year for active Air Force fighter and attack aircrews has been set at 17.2 hours per month, down slightly from 17.7 this year but up a bit from 17.0 in 1998. Bomber crews, which flew about 19.3 hours per month in 1998 and 17.9 hours this year, will get only 15.8 hours per month next year, but this is not viewed as a worrisome problem because the Air Force will be doing more training on advanced simulators.

Combat Aircraft

The new spending plan pushes the Air Force's fighter of the future, the F-22 Raptor, into low-rate initial production.

The Pentagon budgeted \$3.1 billion for the F-22 program next year, enough to continue development efforts and pay for six more production aircraft. Officials envision a steady increase in the procurement funding for the F-22 over the next several years, rising to annual production of 36 aircraft.

The Air Force also supports the Joint Strike Fighter program, which is expected to produce new fighters for the Air Force, Navy, Marine Corps, and Britain's Royal Navy. USAF plans next year to commit \$235.4 million of a Pentagon-wide total of \$476.9 million to continue development of the JSF. The Navy provides the rest.

William J. Lynn III, the Pentagon comptroller, said the F-22's program "is paid for" over the life of the Future Years Defense Plan, meaning the Air Force does not have to find bill payers in other accounts down the line.

In a surprise move, the Air Force included money in the latest budget to buy 10 new F-16 multirole fighters, due to shortages in attrition reserve aircraft. Service officials said they would spend \$440.8 million for F-16 procurement and research. All would be of the latest, Block 50 type.

Two more F-16 buys are planned in the outyears—10 fighters in 2002 and 10 more in 2003.

USAF budgeted \$308.6 million next year for yet another type of theater combat aircraft—the YAL-1 Attack Laser, also known as the Airborne Laser. A jumbo jet fitted with a high-energy laser, the YAL-1 would attack threatening ballistic missiles in their boost phase and perhaps be capable of shooting down aircraft.

(In other tactical aircraft developments, the Navy put up another \$3.1 billion to develop and procure 36 F/A-18 Super Hornet fighters, and the Defense Department committed \$1.2 billion to procure 10 MV-22 Osprey aircraft for the Marine Corps and provided small amounts aimed at future Osprey buys for the Air Force.)

USAF's procurement budget was virtually devoid of long-range airpower aircraft and systems.

The Air Force provides \$374.6 million to continue work associated with the B-2 stealth bomber and its systems, but USAF is prohibited from spending any of that money on new bombers. The Administration has turned thumbs-down on acquisition of stealth bombers beyond the 21 previously ordered.

The new budget contains some \$130.4 million to continue to modify the fleet of B-1 bombers for conventional theater war.

Money also flowed to precision guided munitions. Another \$505.7 million is earmarked for next year's development and procurement of five types of precision weapons—the Joint Air to Surface Standoff Missile, Joint Standoff Weapon, Joint Direct Attack Munition, Sensor Fuzed Weapon, and Wind-Corrected Munitions Dispenser.

The money will buy 8,332 of these ground-attack systems.

For aerial combat, the Air Force and Navy will spend a combined \$207.3 million to buy 310 copies of the AIM-120 Advanced Medium Range Air-to-Air Missile and \$142.3 million for 155 AIM-9X Sidewinder air-to-air missiles.

Airlift and Tankers

Airlift modernization again consumes a large chunk of USAF's procurement funds.

The new budget allots \$3.6 billion to procure 15 new C-17 airlifters and to fund their spare parts, R&D, and basing support construction. DoD has an official requirement for 135 C-17s. All but one of those is funded through the FYDP.

The Air Force has programmed extensive C-5 engine and avionics upgrades but allotted only \$42.9 million to work on the new C-130J tactical airlifter, without buying any new ones.

Aerial refuelers get attention. The budget provides \$347.1 million to modify aging KC-135 aircraft in the active force, Air National Guard, and Air Force Reserve. Next year's investment in the Pacer CRAG program provides glass cockpit sys-

tems for 175 KC-135 aerial refuelers.

Eyes in Sky and Space

The Air Force continues to allot significant amounts of money to fund programs offering timely information about battles in the air and on land.

For example, the service will spend \$483.0 million next year for one more E-8C Joint Surveillance Tar-

US Defense Spending	
Fiscal Year	Constant Billions
1985	\$424.5
1986	\$406.9
1987	\$392.9
1988	\$384.8
1989	\$379.4
1990	\$371.3
1991	\$334.9
1992	\$322.3
1993	\$309.2
1994	\$284.2
1995	\$283.5
1996	\$276.3
1997	\$274.6
1998	\$269.7
1999	\$268.6
2000	\$267.2

Fiscal 1991-92 budget authority figures exclude the cost of the Gulf War.

get Attack Radar System aircraft, the 14th of a required fleet of 19 aircraft. The fleet also contains one test aircraft. Defense Secretary William S. Cohen in 1997 cut the Joint STARS buy from 19 to 13, but he had second thoughts and shifted course. Air Force officials said they do not know whether the service will be permitted to buy any more. "We still have a requirement for 19," said Eberhart, "but the 15th through the 19th [aircraft] is not in the President's program at this time for fiscal reasons."

In another major investment, the Air Force committed \$557.7 million for continued development of the Space Based Infrared System, successor to the Defense Support Program warning satellite. However, in order to save money to divert to other programs, USAF slipped both phases

of the program by two years. The so-called SBIRS High goes from 2002 to 2004, and the SBIRS Low from 2004 to 2006, a development that outraged some key members of Congress.

"This is a high priority with the Space Command—probably the No. 1 priority," complained Sen. Bob Smith (R-N.H.) of the Senate Armed Services Committee. "It was on schedule, no technical problems, and the Air Force takes \$325 million."

F. Whitten Peters, the acting Secretary of the Air Force, explained the officials concluded they could delay the program in light of the fact that existing DSP satellites have sufficient life to perform the early warning mission and that USAF has five additional DSP spacecraft in reserve.

Elsewhere, the budget contains \$361.3 million for the Milstar satellite follow-on system and \$269.8 million for Global Positioning System satellite work.

The Outyears

Administration spokesmen, in their public explanations of the new defense program, have tended to put heavy emphasis on the "outyears," the last five years of the six-year defense program, rather than on the initial year, Fiscal 2000.

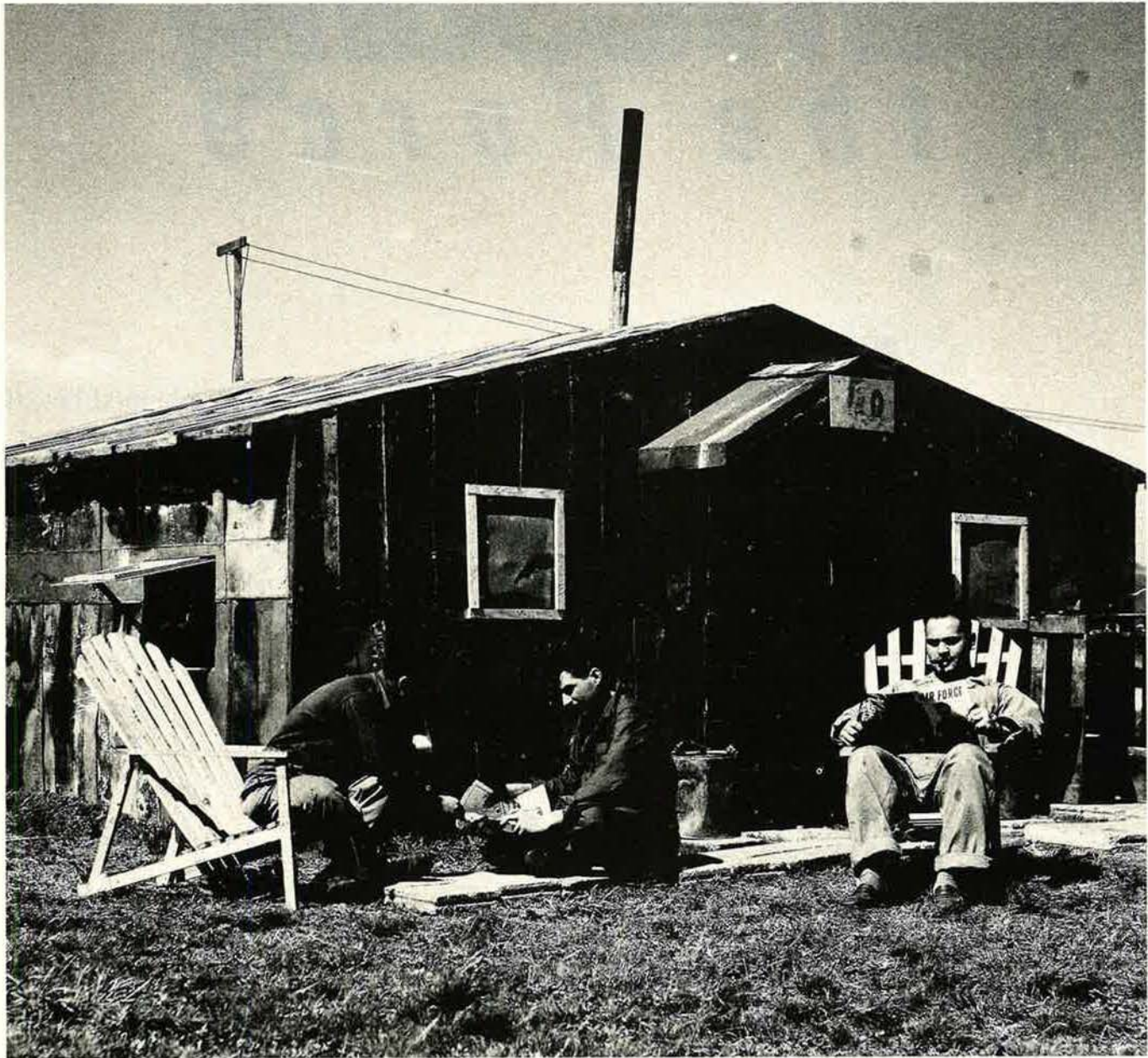
They note that the plan calls for the Defense Department budget to go up significantly from 2000 to 2001 and then stay up, with the services, over the full multiyear plan, getting a combined boost of \$112 billion over the original very low planning levels.

The Air Force, for its part, is scheduled to receive budgets, in the five "outyears," of \$84.8 billion, \$86.7 billion, \$89.2 billion, \$92.3 billion, and \$95.1 billion, in current dollars. That appears to mark a considerable increase over today's funding.

However, critics note that, once the effects of inflation are removed and Pentagon budgeting "gimmicks" are eliminated, an increase that looked like \$112 billion actually turns out to be a \$44.5 billion. The same holds true of the Air Force budget. For example, the big USAF budget in the last "outyear" actually loses nearly \$12 billion of its value when the inflation is squeezed out.

The same critics point out that most of the spending would not take place until after the Clinton Administration leaves office and so would have to be proposed and defended by a new President. ■

Relaxing Reading



With wood and tin from bomb crates—and a bit of ingenuity—members of a Fifteenth Air Force B-24 unit, based in Italy in World War II, built a modest chateau of their own. Enjoying precious leisure time are (l-r) SSgt. Frank Marciano, Cpl. Pierre Berard, and Cpl. Joseph Brasile, who is reading an early edition of Air Force Magazine. At

the time, it was still "The Official Service Journal of the US Army Air Forces."

At an AFA symposium, Air Force leaders take account of a slight increase in the new budget.

Reinvesting in the Force

How does the Air Force plan to use its larger-than-planned Fiscal 2000 budget?

That was the key topic at the Air Force Association's 1999 Air Warfare Symposium in Orlando, Fla. Titled "Global Engagement With Air Force Aerospace Power," the event also shed light on the new Expeditionary Aerospace Force concept and ways USAF intends to structure and posture itself for the next decade and more.

Gen. Michael E. Ryan

After more than a decade of decline, Air Force funding may be in for a small increase—just enough to preserve critical modernization, deal with the erosion of readiness, and, maybe, stem the exodus of quality people, USAF Chief of Staff Gen. Michael E. Ryan told the symposium.

Since the Cold War ended a decade ago, he said, “We have downsized this Air Force of ours by 40 percent” in budget, personnel, and force structure. “That was the peace dividend, and we have paid it. And now it is time to reinvest in our Air Force.”

Ryan in recent months had told Congress and President Clinton that the Air Force needed a boost of \$5 billion per year to meet its minimum program needs. For Fiscal 2000, USAF got half that amount.

However, that will at least slow the decline in readiness, Ryan said. He noted that, since 1996, “our readiness rates overall ... [have] dropped 18 percent.” Since overseas units get priority, however, stateside units have been hit much harder. “If you look at Air Combat Command units in the top two categories of readiness, we have dropped over 50 percent” in the same period, he observed.

Because many airplanes have “much life [left] in them,” said Ryan, there will be an aggressive program of revitalization of some existing airframes, rather than replacement. This will improve the capability of the force, but its average age will still be high. Currently, it’s 20 years.

Ryan noted particularly a re-engining program for the C-5, the C-130X upgrade to standardize the Hercules fleet, and 14 more C-17s as previously unaffordable add-ons. The F-22 and Joint Strike Fighter will stay on track, and there will be 30 new Block 50 F-16s to improve defense-suppression capability.

With new weapons, avionics, and structural improvements, other types of aircraft such as bombers and tankers are “substantially good out to the year about 2040,” Ryan asserted.

The Expeditionary Aerospace Force concept is moving ahead, Ryan said. This new concept will spread the workload around more evenly and give the troops “some stability and predictability in their lives,” with more notice of deployments.

Ryan summed up the strategic

goals of the remodeled Air Force as providing “freedom *from* attack, ... freedom *to* maneuver, ... and freedom *to* attack.” USAF must be able to protect the nation, the other services, and itself; it must be able to move forces and information rapidly “anywhere around the globe”; and it will bring force down on any enemy, Ryan explained.

The concept of Strategic Control is a “fairly good construct” for rationalizing the organization and funding of the armed forces, Ryan asserted. It notes how the US must not only win the three freedoms of warfare for itself but also “take them away from an adversary.”

Ryan believes “the days are gone” when the United States will “put great armies on great armies, [creating] a mashing machine that produces carnage.” Aerospace power can “prevent the need to have great clashes of armies that produce such casualties,” Ryan emphasized.

“You may not have to use every arm of the [military] ... if you have the threat to use it,” he explained.

Improved readiness funding, a more manageable optempo situation, and top-level attention to personnel issues such as pay and retirement give Ryan cautious optimism that the premature departure of experienced people can now be stemmed. New figures show pilot “take rates” on re-enlistment bonuses at “about 45 percent, up from about 27 percent” the previous quarter.

Ryan said he is “not predicting anything” about retention. However, Ryan said he thinks “there is a realization out there in our Air Force that the leadership is trying very hard ... to take care of the deficiencies we have with respect to readiness today.”

Ryan said he senses “a feeling of optimism out there ... that there is a great ray of hope that we can put this Air Force on a vector into the future that makes it fully ready and fully capable.”

F. Whitten Peters

F. Whitten Peters, acting Secretary of the Air Force, echoed Ryan’s view. He asserted that the Air Force’s “glass is more than half full, not half empty.”

The budget now before Congress, he said, represents “real gains for our people, for readiness, and for



By John A. Tirpak, Senior Editor

modernization. We did not get all we wanted, and we did not get all we needed, but we got a fair share of what was available within the balanced budget caps."

Indeed, if there is to be any more money for defense, "there will have to be an adjustment of the balanced budget agreement presently in place," Peters noted.

Peters said that, in order of priority, the money will go to "people first, then readiness, then modernization." Should any more money be available, it would go to infrastructure, he said.

"We had to take risks somewhere and we took that risk in infrastructure support," Peters acknowledged. Base operating support got short-changed and will soon "become a very critical problem," he said. "We will replace real property at the rate of once every 300 years, against an industry standard of ... once every 50 years."

Peters said that the refashioning of the Air Force in the EAF mold is necessary because, in his view, "the demands of peace are, in many ways, more stressing" than the requirements of fighting two Major Theater Wars.

The EAF is "an extraordinarily good plan," he asserted, though he added it won't solve all Air Force optempo problems because "it does not cover our critical low density, high demand assets like the AWACS and U-2 nor our strategic lift assets." These systems, along with Joint STARS and "bandwidth for global communications" are top priorities of theater commanders in chief, he reported.

USAF is investigating moving the Joint STARS moving target indicator mission to space to obtain "full-time, real-time global surveillance," Peters noted. Even if the Air Force got its full requirement for 19 Joint STARS—only 14 are now funded—it still could not keep up with demands from theater CINCs. The optempo imposed on Joint STARS crews and their families "would be merciless and unsustainable," he added.

Peters, in a thumbnail sketch of the Fiscal 2000 budget, contended USAF will strive to avoid what Pentagon acquisition chief Jacques S. Gansler called "a death spiral in modernization," as the cost of operating older systems siphons away

funds needed to modernize systems to avoid those very same rising costs.

More than \$2.5 billion has been earmarked for spares and repairs, new engines, and engine modules, as well as 100 percent funding of spares per flying hour. Peters said the Air Force fears, because spares are not as "interesting as whole airplanes or whole rockets, that we may lose this funding on Capitol Hill," but it is crucial.

"We estimate that age-related factors alone have increased spare parts costs by \$750 million in 1998 and 1999 combined," he said. Other long-neglected items getting healthier this year will be combat ranges and "mundane" things like tech orders, Peters said.

Because of Congressional cuts in the last budget, the Airborne Laser was restructured in the Fiscal 2000 budget. This is "truly a heartbreaker," Peters said, because the ABL was "on schedule, on budget, and meeting or exceeding all performance requirements." The restructuring delays initial operational capability by a year.

The Space-Based Laser Readiness Demonstrator, targeted for 2006–08, was deemed to be not much of an advance over current technology and not providing a "path to a future system." It has been supplanted by a 2010–12 "flight experiment" which will be closer to the final product, Peters said.

He said the 30 new F-16s will have the HARM targeting system to serve with the EAF, which otherwise would not have had enough capability in defense suppression to go around.

Peters said, "Fielding of these aircraft will also allow us to modernize the Air Guard F-16 fleet, while keeping 15 primary aircraft in each Guard F-16 squadron." At the same time, it fills in gaps in the F-16 attrition reserve, making the plan a "win-win-win buy," he added.

The upgrade of the C-5 will lift the departure reliability of the airplane from 60 percent to more than 75 percent, which will provide an enormous boost to strategic lift, Peters noted.

"We now have in our inventory more than 75 percent of all aircraft that we will use for the next 25 to 40 years," he added. "This includes all of our strategic lifters, all of our tankers, and all of our bombers. There-

fore, aging aircraft will continue to be a significant planning, technical, and budget challenge. The same can be said for our strategic missile forces, which we are upgrading to last well into the next century."

Signs of a turnaround in pilot retention are welcome, but they are coming too late for the Air Force to avoid serious problems. By 2000, said Peters, there won't be "enough pilots to simultaneously man our staffs at minimal required levels and fill our cockpits at required levels," or in pilot training squadrons to "produce 1,100 experienced pilots a year," which is the requirement.

A worldwide USAF conference will be held this spring "to try to sort out" how to fix the problem, he added, but "even in the best case, it is now clear we will be operating with fewer pilots and less experience for much of the next decade."

Gen. Michael J. Dugan, USAF (Ret.)

The "golden age" of air- and space power has not arrived yet, but to bring it about, the Air Force must reorient its culture toward conceptual thinking and away from hardware alone, according to retired Gen. Michael J. Dugan, a former USAF Chief of Staff.

Dugan said aerospace is, in many ways, still in its infancy and was nurtured by early leaders who were willing to challenge the status quo and think as far as "50 years into the future." The danger for the established Air Force, he said, is that its culture is too focused on individual systems.

He warned against USAF members thinking of themselves first as "heavy equipment operators, ... very good at what they do, very good at the here and now," but with little sense of connection to the larger Air Force, with a mission to bring about the future.

"One of the significant changes during the 1990s has been the apparent decline in Air Force institutional structure for thinking about the future of air- and space power, for thinking about vital aerospace contributions to the nation as a whole," Dugan asserted.

"The heavy equipment operator syndrome can and must be converted into a spirit of service," Dugan urged, citing the inclination of individuals

in other services to focus on service to country rather than a specialty.

"Equipment loyalty is short term and easier to lose focus on when the demands of service life become difficult," Dugan asserted. "I do believe that there is a better and longer, more vibrant and more persistent loyalty to the organization, to the institution, to the nation, when one builds on a different set of values—values of service."

The Air Force should build on "the notion of 'all warriors are created equal,'" which is a "wonderful war-fighting concept. It makes everybody play on the team," he added.

Dugan also urged a reversal of the habit of treating industry with suspicion, a habit that became fashionable when, in the last 20 years, each Administration has sought to be "holier than the previous one" on ethical behavior of government employees.

The Air Force "desperately need[s] the knowledge, the experience, the expertise, the historical perspective that can only come from industry. ... A willingness to engage industry representatives in serious conversation and collaborative thinking about the future has, I believe, diminished rather than grown, and the United States is in danger of losing its grip on one of its principal lifelines," he asserted. "Industry, in many cases, is where the long-range thinkers have roosted," and USAF must "exploit the available intellectual resources wherever they find them."

"Industry," Dugan noted, "is the source of many of the innovations that heavy equipment operators love to exploit."

Dugan said the Air Force has not done an adequate job of "continuously telling our story in public," so that Americans recognize the value of the Air Force and give it the support it needs. He advocated conducting "the debates about priorities among important national needs"—particularly "the contributions of airpower in comparison with other elements of national security"—in public.

"They are certainly not best argued in the Pentagon," where USAF will always be outvoted, he said.

That support will be vital to being ready for whatever conflict next emerges, Dugan warned.

When it does, Dugan warned, "The American people are going to expect

Rep. Cliff Stearns and the Air Force Caucus

To highlight the special needs of the Air Force, as well as help overcome dwindling military experience in a Congress with fewer and fewer veterans in its ranks, a bipartisan Congressional Air Force Caucus is being formed, according to Rep. Cliff Stearns, a Florida Republican.

"Our mission is ... to ensure that the Air Force remains strong and vibrant and to get the message out" about the need for adequate pay and benefits and spares and modernization funding, said Stearns, a former USAF officer. He said the caucus already has 17 members and will work on "expanding air mobility, upgrading our [force of] conventional bombers, ... continuing with fighter modernization, and developing new aerospace capabilities," including a missile defense system.

Stearns said the caucus will focus on making pay and benefits more competitive with those in the private sector and will move to include military service members in the Federal Employees Health Benefits Program.

He noted that the caucus will also seek to "educate our ... peers in Congress" about USAF's "integral role" in defending the nation. Under 30 percent of House members and less than 47 percent of Senate members have any military experience, he noted, down from 40 percent and 61 percent, respectively, five years ago.

The group will also urge the executive branch not to make any more open-ended military commitments to hot spots around the world, because the caucus believes such commitments sap the fiscal strength of the services.

"We need to ... establish the objective, go in, [achieve] the objective, and leave, but not continue to leave our troops there for long periods of time," he asserted.

Stearns also announced the creation of the Military Retirement Health Care Task Force, which will investigate "all the promises and representation made to members of the armed services" by recruiters about lifetime health care for 20-year veterans and their families.

"We're going to submit a report to Congress with remedies to fulfill these promises made by these recruiters, so, in the end, all the promises made will be promises kept," he emphasized.

the United States Air Force to be every bit as good and successful as it was in the [Gulf War], and they will be seriously disappointed if we can't deliver that."

Gen. Richard E. Hawley

The commander of Air Combat Command, Gen. Richard E. Hawley, was among the first to loudly sound the alarm about declining readiness and shortchanged modernization over

the last few years. However, he now feels that the "benign neglect that was causing me such concern ... has been transformed into what I think is an emerging bipartisan support for better custody" of the military services.

He is also enthusiastic about the many new capabilities hitting the ramp which are already or soon will vastly increase the fighting power of USAF.

The F-22's flight test program is proceeding well, Hawley asserted. The flight test aircraft have accumulated more than 200 flight hours, maneuvered to 6g's and 26 degrees angle of attack, achieved an altitude of 50,000 feet, and hit speeds up to Mach 1.4.

"It is living up to its promise, both in performance and in the key areas of maintainability and reliability," Hawley said. That will come in handy when it becomes operational, when the F-22 will be able to deploy "with half the airlift of a comparable F-15 squadron today, [and] one that we will sustain with one-third fewer people." He added, "When you can save airlift, that means more combat power for the CINCs." Given the proliferation of new surface-to-air missiles "with a 100-mile reach," the F-22 has become more, not less, important, he said, given the absolute necessity of controlling "the third dimension."

With new upgrades to radar, avionics, and weapons, the B-1B and B-52 fleets will have "10 times the lethality of the bomber force that migrated from SAC to ACC in 1992," Hawley asserted.

Within the last year, the B-2 has shown that it can deploy and operate from a forward base and still score "shacks" on all its bomb runs. All of the B-2s now deployed at Whiteman AFB, Mo., are of the full-up Block 30 version, and the full complement of 21 airplanes should be on the flight line by 2000.

More than 1,000 Sensor Fuzed Weapons have been delivered to inventory, and 1,000 Joint Direct Attack Munitions will be on hand by the end of this year.

"This is no longer pie-in-the-sky stuff," Hawley noted. "This is no longer programs and plans [or] ... line items in the budget," he said. "This is real capability: all-weather day/night, near-precision attack capability anyplace in the world, anytime, against anybody who deserves to get 'schwacked.'"

Hawley went on to tick off other new capabilities, like new Block 30/35 AWACS, with the Link-16 system and integrated GPS that improves "by a factor of 200" the accuracy of targets it feeds to the common operational picture.

He noted that the sixth Predator system has been delivered, now with

an improved voice link to civilian air traffic control "so it can begin to operate in that FAA environment, which has been such a challenge for us." Predator is now operating in Southwest Asia in support of Central Command, as well as in Bosnia, and in the next few years, the inventory will build up to where "we can sustain three systems forward deployed at all times."

Global Hawk has racked up 11 flights, up to 61,000 feet and 350 knots, with a 9.5-hour sortie under its belt, all adding up to "great promise," Hawley said.

He is proud of the EAF concept and pointed out that a regional CINC will get a force that has been "tailored for his mission and specifically trained and prepared to do his work," rather than one simply rounded up and sent "without any focused, tailored preparation."

Overall, Hawley said he's changed his outlook of "gloom and doom" and is now "really optimistic" that things are falling into place "that can make our problems go away." Mission capable rates haven't gone back up, "but they did level off" since 1998. It is "a start," Hawley said.

Retention has continued to fall, Hawley acknowledged, but "the just-released Presidential budget is a huge step in the right direction." He believes the attention paid to fixing retirement, boosting pay, and putting adequate spares in the bins "sends exactly the right message" to the troops—that "the nation considers that what they do is important."

Much of the turnaround depends on inflation staying low, he noted.

"We need to examine the assumptions very carefully, and should they prove false, we must be prepared to provide more direct sources of funding for these critical needs," he said.

Gen. Richard B. Myers

To spin off a new, separate Space Force or to hand over space operations to another service or some new joint organization would require forgetting many of the lessons of the last decade, as well as ignoring the Air Force's good stewardship of space assets, Gen. Richard B. Myers, head of both US and Air Force Space Commands, asserted.

"We learned our lesson of tactical vs. strategic airpower, and of fight-

ers vs. bombers," as irrelevant comparisons, Myers said. "It is not about the medium or the platform but ... the capability that we bring to the fight, the effects that we create on the battlefield," he explained.

Myers said he believes the growing appreciation of the importance of space to "our standard of living and for our national survival" has created a "sense of urgency, a certain natural impatience with the pace of progress." The Air Force, however, is moving at a pace he considers "about right" in space, given the resources available.

"We are the greatest 'spacefaring' nation in the world. So it is not like we have not done our job very well. We have done our job damn well," he insisted. "It is the resource, technology, and policy issue. Well before we can put weapons in space, somebody has to say at the political level that is OK. And so far, they have not said that."

Severing the Air Force from space operations would simply create more layers of bureaucracy, more "stove-piping," and less efficient use of the resources available for the missions space assets help conduct, he argued.

"I submit that it's time that we put the stewardship issue behind us and focus on the real enemies—funding, technology, and, I would add today, policies—that hold space power back," Myers asserted. "It is simply time to get on with it."

Efforts continue to integrate space capabilities into all aspects of warfighting, he said. Last year's EFX '98 experiment showed that USAF can "deploy more teeth to the fight by leaving more tail at home," using satellite communication to "reach back" for needed data and expertise.

When military and commercial space operators are able to discuss both "warfare and market share" with regard to the same systems, "those in uniform need to take a hard look" at the system and see if it still "fits into a military core competency," he said, arguing that divestitures can help bring in savings needed for space investment.

Myers thinks, for example, that launch operations are a candidate for substantial divestiture, considering that commercial launches are now outpacing military launches and that the Evolved Expendable Launch Ve-

hicle system will be a contract for launch services, not systems.

He also said there must be more money for space "at a national level. It is more than we can do in the Air Force" alone. He noted, for example, that GPS is, in effect, "a global utility that the Air Force is funding."

Myers noted that the threat to US space systems is hard to define but that "Indonesia, Turkey and Iran" have been known to jam satellites and that "countries are working on directed energy threats to satellites." So far, he has not been able to generate much enthusiasm among commercial operators to harden their satellites against jamming or blinding.

He added that he is "pushing" for more intelligence community emphasis on assessing the space threat.

Gen. John P. Jumper

NATO is in an identity struggle, striving to define its post-Cold War mission, even as it integrates new members with different levels of technology, US Air Forces in Europe Commander Gen. John P. Jumper told the symposium.

"The Alliance ... stands in the crossroads of a new era," he said. Originally based on Article 5 guarantees—that an attack on one is an attack on all—the Alliance "is now being challenged with new dynamics—dynamics that talk as much about interests as borders."

The struggle has brought about conflicts of doctrine, which have seen the NATO forces restructured into "joint subregional commands." Jumper noted that this structure tends to "break up airpower into small penny packets and distribute it around to individual command and control." That's a problem because under the new structure, "within the major headquarters of NATO ... there will be no senior airmen." Jumper, at what he called the "third level of command," is the top airman in NATO's chain of command.

"In the politics of NATO, we will have to continue to struggle with compromises and answers that are most difficult for airmen," said Jumper. "That's what I see my job to be over the coming year."

Another area of difficulty is "within the Joint Task Force structure," of US forces, Jumper said. There are so many JTFs with "convoluted numbers and makeups" that it's hard to

find enough people to staff them all, particularly given the headquarters drawdowns.

"I think if there's something we can concentrate on as a joint team partnering with other services, it is to deal with that problem," he added.

Things are still being learned from mounting expeditionary forces, he noted. Initial runs of supplies and support need to be smaller, "get you started" types. There needs to be more work done on "understanding the difference between deployment lift and sustainment lift."

More detailed information also needs to be collected and maintained about available airfields and the communications, electrical power, and other facilities that will be available at a deployment site.

He's pleased that the new philosophy of "all warriors are created equal" has begun to erase the focus on the platform and brought into focus the mission. Space operators, intelligence officers, and airmen coming together for a recent Kosovo operations planning session all wore Air Force Weapons School patches, he noted.

"When you put them out there, they don't care where the platform resides—in the air or above the air. ... They talk about effects, ... and they don't talk about the relative importance of one platform over another, and we can all take a lesson from that."

Jumper cautioned that in the EAF structure—which configures the Air Force for the peacetime deployments and contingencies—focus must not be lost on "the major war plans."

Should a major war erupt, "EAF, AEF, it's all off. We flow [the wartime force] as it's written," Jumper insisted. "We cannot give up our commitment to the major war plans ... [or] to the CINCs who depend on that airpower to be there, and be there quickly."

Maj. Gen. Donald G. Cook

The Air Force is being reshaped to fulfill its Global Engagement Operations strategy and to better respond to the realities of modern contingencies through its Expeditionary Aerospace Forces, EAF Implementation Director Maj. Gen. Donald G. Cook explained.

"We have moved from a Cold War Air Force, focused on containing the

threat with a large forward presence, to a smaller, capabilities-based Air Force, focused on shaping and responding around the world," Cook explained.

There is plenty of reason to reorganize, he noted. In 1998, there were "over 60 deployments and 23,000 sorties" flown in Operation Southern Watch, over Iraq. At the same time, "there were 30 deployments and over 2,200 sorties in Bosnia." The operating tempo was stressing the force too much, Cook said.

The new strategy will make USAF more responsive to the contingencies—both ongoing and unexpected—that appear to be inevitable.

The Air Force will be organized into 10 EAFs, Cook explained. Of these, two will be on call, ready to go to a specific theater on short notice. Their composition, training, and equipment will be tailored to the unique needs of the CINC they are to support, and during the period when they are on call, they will be at maximum readiness for their expected mission.

They will not own certain kinds of systems—like Joint STARS and AWACS—because these are in high demand but short supply. Such capabilities will swing to where they are needed, and alternatives for them will be used whenever possible.

The on-call EAFs will be in that status for 90 days, after which they will revert to a downtime status. After that, they will re-enter a 10-month workup period, in which they "will train, equip, and rest for future operations activities necessary to keep the force ready and strong."

Cook cautioned that this workup period should not be "misconstrued as tiered readiness. It is not."

Rather, "all our combat forces remain committed to the theater operational plans within 30 days," Cook noted. The two on-call EAFs can be considered as tagged to whatever Smaller-Scale Contingency may come up, Cook said, while the rest of the force is available to handle the two Major Theater War requirement.

While the EAF concept is being implemented, the two interim EAF units will be the 366th Wing at Mountain Home AFB, Idaho, and the 4th Fighter Wing at Seymour Johnson AFB, N.C. They will serve as our on-call wings for the near future, Cook explained. ■

The skies over Laughlin AFB, Texas, are quickly filling up with the next crop of USAF pilots.

The Next Class



Students in front, instructors in back, three sleek T-38s of the 87th Flying Training Squadron at Laughlin AFB, Texas, slice through the skies over the Rio Grande River on a mission to learn precision formation flying. The need for new USAF pilots is soaring, and the pace of activity at this south Texas training base is climbing rapidly.



Photography by Guy Aceto, Art Director, and Susan Kennedy



Air Education and Training Command is stepping up pilot training to compensate for a USAF pilot shortage expected to persist for a decade. Training cuts in the early 1990s resulted in a shortage of nearly 700 pilots in 1998, and the figure could grow to 2,000 within three years. Through Laughlin's 47th Flying Training Wing, around 30 officers earn their wings about every three weeks.

Nearly 400 blue-and-white aircraft dot the Laughlin flight line. All students must master the T-37 in primary flight training, but after that, it's the T-38 for fighter-bound students and the T-1A for those headed to bombers, tankers, or transports. Specialized Undergraduate Pilot Training was instituted both to manage shrinking inventories of trainers and to provide more relevant training to students.

The T-37 became USAF's primary jet trainer in 1957, so long ago that all of today's four-star generals with pilot wings trained in it. Tens of thousands of pilots around the world have begun their military flying careers in this venerable twin jet, known for its solid handling and high-pitched whine, which earned it the nickname "Tweet." Overdue for retirement, the T-37 will be relieved, beginning in 2002, by the Raytheon T-6A Texan II, winner of the Joint Primary Aircraft Training System competition. The T-6 is a departure because it is not only a single-engine turboprop but a tandem-seat airplane, as well. Its performance bests the T-37 in most respects, and it offers glass-cockpit displays and avionics. The training syllabus will still focus on primary flight instruction.



Many roads lead to Laughlin. New lieutenants come from ROTC, Officer Training School, and the Air Force Academy, and a few captains cross-train from other career fields, as well. Flying experience varies; some may already have a civilian pilot's license, others may have been through a flight screening program, and for some, it's entirely new. The goal is the same for all, though: the silver wings of an Air Force pilot.

The T-37's cockpit will be familiar to students long before they actually sit in one. Weeks of academics and hours of "switchology" time in part-task trainers, like this one, mean no surprises when it's time to really fly. There are classes in life support, egress training, aircraft systems, and aerodynamics so that students like 2d Lt. Chad Erikson (left) utilize every minute of flying time to maximum benefit.



Last year, the 47th FTW added a second T-37 unit to help keep up with the heavier flow of students. The flying pace overall for the wing is fast—320 sorties a day—and many instructors make “triple turns”—flying with three students in a single day, with the necessary pre- and postflight briefs for each. Above and at right, 2d Lt. Allen Selkey (left) observes as his student, 2d Lt. Charles Hamby, checks the maintenance log of the Tweet they’re about to take out. After signing off, the two will do a preflight walkaround.



Every class is known by its graduation year and class number and builds esprit de corps by designing and wearing its own patch. Class 99-13 lets it be known it harbors no superstitions, with its motto “Luck Don’t Fly.”



At left, the T-37’s distinctive paint scheme makes it a standout in the Texas skies.



Nothing is left to chance when students mix with jet airplanes, and safety gets sharp focus in the classroom as well as the cockpit. In a preflight brief, 2d Lt. Ryan Sparkman goes over the drill. A First Assignment Instructor Pilot, Sparkman's flight training is still a fresh memory, and he knows how students think. Below, instructors and students hurry up and wait for the crew bus.



After learning the basics in the T-37, students are selected to split off onto two tracks. Those bound for fighter units go on to train in the T-38. Faster, larger, and more nimble than the T-37, the T-38 is much more challenging. Reaching the T-38 is a major milestone in a process many students began with their high school applications to the Air Force Academy or perhaps even their first air show. At right, the student up front watches for ground crew signals as a sortie begins. The instructor, in the second seat, literally backs up the student.



When the T-38 Talon was introduced in 1961, it was the world's first supersonic trainer and led to the F-5E Tiger II fighter still serving with many air forces around the world. In the SUPT program, the T-38 also hones skills in formation flying, night and instrument flying, and cross-country navigation. The 38-year-old Talon has been getting a much-needed update in the form of the Pacer Classic modification. The cockpit is being completely redone, with multifunction and head-up displays and integrated Global Positioning System-Inertial Navigation System, and there are structural enhancements. AETC expects this new T-38C, slated to start entering service this year, to keep taking students supersonic through 2020.



Students flirt with the Mexican border, which abuts the base's airspace, as they shift positions during formation practice. Formations get tighter, echelon turns (right) get smoother, and confidence rises as training progresses. The three types of trainers at Laughlin each have their own designated airspace, to avoid confusion in the skies. As the pilot production rate has ticked up, Laughlin's leadership expects that its students and instructors could log over 100,000 hours of air time this year.



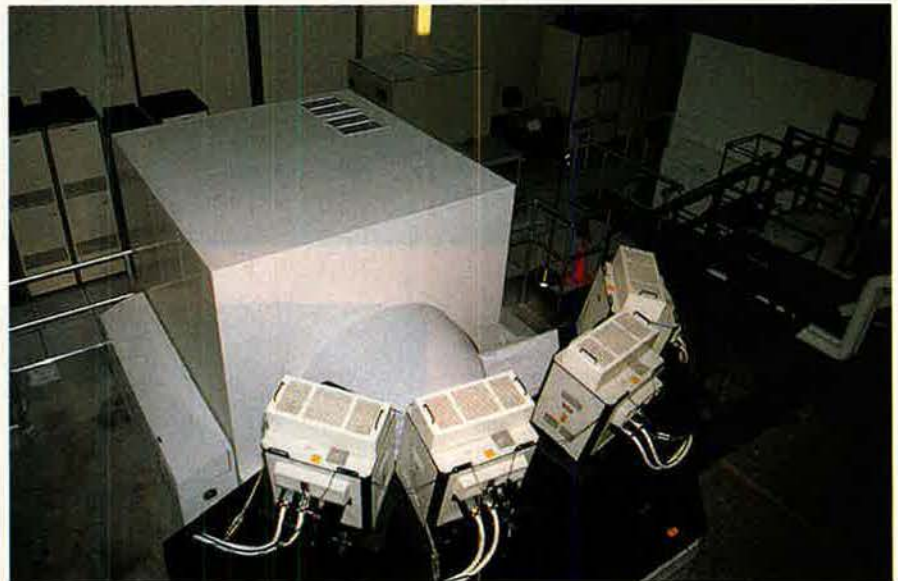
There is a certain joy to be found in this kind of flying. Though heavily scripted, the missions leave room for unplanned, but educational, aerobatics. Instructors find great satisfaction in seeing the progress their students make with each sortie.



Pilot training is a serious business, requiring intelligence, concentration, and stamina both on and off the ground, but a pilot's first solo is worthy of some lighthearted celebration. At left, 2d Lt. Jefferey Cashion is about to splash down in the "Pogo Pool," so named because the call sign for a student on first solo is "Pogo." Classmates and instructors from E (Elvis) Flight are only too happy to help commemorate this landmark moment in a fellow pilot's career.

As simulators have become more realistic, their low cost and training value have taken on more importance. While students will receive 200 hours of flying time during SUPT, they will get 500 hours in "the box," as a simulator is known. There are usually long lines waiting for time in devices like this T-1 sim. All three aircraft types at the base have simulated counterparts in the windowless blockhouse down the street from the flight line.

Laughlin boasts an instructor crew that includes FAIFs, pilots with front-line time, and older civilians with years of experience under their belts, providing for an exceedingly well-rounded flying education. It competes with other SUPT bases to provide USAF with the very best pilots.



Still the new kid on the flight line is the T-1A Jayhawk, introduced in 1992 to teach future "heavy" pilots their craft. The 86th FTS operates the T-1, which, when delivered, was the first new trainer procured in over 30 years. The Jayhawk has proved quite popular with crews, and it gets regular updates, such as the addition of GPS. At left, a crew works the checklist prior to a sortie.

The Air Force switched bomber-bound students to the Jayhawk track last year initially to lighten the load on the heavily used T-38. Students still fly 18 sorties in the older jet to familiarize them with higher-speed aircraft, like the B-1. With the T-1 and the T-38, the service believes bomber-bound pilots now have the best of both worlds.



Staff photo by Guy Aceto

The T-1 syllabus has a natural emphasis on longer missions and crew coordination, but the training is just as intense as in other squadrons. Students fly more frequently and are eager to advance to the next level of training. Above, a Jayhawk spools up for a sortie. At right, Capt. David M. Quigley looks on as his student, 2d Lt. John Kruczynski, performs the preflight check.



Photos by Susan Kennedy

Staff photo by Guy Aceto



Another T-1 mission launches down the long Laughlin runway. The torrential rains and floods of 1998 stopped flying operations last summer, but sorties are back up to record levels.



Students and instructors are well aware that pilot retention is down. Enthusiasm remains high, however, especially since greater numbers of graduates coming out of Laughlin mean more pilots to shoulder the burdens of the 21st century Air Force. ■

Edgy Western nations signed the Treaty of Washington in April 1949, never dreaming it would be 45 years before NATO even fired a shot.

A Half Century of NATO

By Stewart M. Powell

FIFTY years ago, when Western leaders signed the Treaty of Washington creating the North Atlantic Treaty Organization, they could not have imagined that the fledgling Cold War partnership would succeed in holding off Soviet aggression in Europe without shots being fired. Nor could they have foreseen that the combat-ready Alliance would wait 45 years before firing *any* shots, and then only to carry out a small air-to-air attack in the Balkans, a region outside of NATO's treaty area.

These are only two of the major ironies of an Alliance marking its 50th anniversary on April 4, 1999. The United States long planned to host a celebratory summit in late April to welcome Poland, Hungary, and the Czech Republic into NATO, making them the first new members since the end of the Cold War.

Plans called for NATO leaders to use the occasion to shift the focus of the Alliance to the challenges of the 21st century—combating the spread of weapons of mass destruction, ethnic violence, and regional conflict. The White House hoped that the unveiling of a compelling new vision for NATO will garner public support for continuation of an alliance that critics regard as a costly bureaucratic anachronism.

Once the cornerstone of Western security, NATO today struggles to attract and hold popular allegiance and sufficient resources. Western



With the Cold War's end, NATO shifted its focus to ethnic violence and regional conflict. F-15Es (above) from RAF Lakenheath, UK, patrolled Bosnia in support of the NATO no-fly zone in 1995.

USAF photo by SrA. Conrad M. Evans

Europeans are plunging into a variety of international alliances and organizations with Eastern Europe, all designed to deal with the economic, political, and security challenges faced by greater Europe.

Meanwhile, NATO's leaders are struggling to bolster the unique trans-Atlantic security tie between Europe and the US amid competition from the 10-nation Western European Union, deepening economic integration within the 15-nation European Union, and the growing political and security role of the 55-nation Organization for Security and Cooperation in Europe.

In the run-up to the anniversary summit, Secretary of State Madeleine K. Albright vowed that the event would lay out a vision for a "new and better" NATO.

Said Albright, "We want an Alliance strengthened by new members; capable of collective defense; committed to meeting a wide range of threats to our shared interests and values; and acting in partnership with others to ensure stability, freedom, and peace in and for the entire trans-Atlantic area."

In the Beginning

Alliance leaders celebrate the anniversary in an international atmosphere far different from that of the dark, early days of the Cold War, when Allied leaders were searching for ways to deter threatened aggression by the Soviet Union.

With the end of World War II, Americans soon pressed for demobilization. Winston Churchill, Britain's former wartime prime minister, tried to rouse Americans to the emerging danger of Soviet aggression, declaring in Fulton, Mo., on March 5, 1946, "An iron curtain has descended across the continent" of Europe, raising the specter of confrontation between the East-West Allies that defeated Nazism and Fascism.

Soviet-sponsored Communist governments were taking power in Poland, Bulgaria, Romania, Hungary, and Czechoslovakia. Communist forces scored gains in the civil war in Greece. Yugoslavia joined the Communist bloc, and in adjacent Albania, anti-Nazi forces had created a Communist government in 1944. Soviet forces began harassing Allied rail and road traffic into occupied Berlin.



USAF photo by SSGT John Lasky

As part of NATO's Implementation Force, USAF Capt. Ryan Greer (foreground) and John Wood, 50th Airlift Squadron, transported materiel out of their temporary base at Ramstein AB, Germany, for Operation Joint Endeavor.

The tide of Soviet expansion rang alarm bells across the war-weary Low Countries of Belgium, Luxembourg, and the Netherlands, as well as Britain and France—nations that had battled invaders from the East in two world wars. These five anxious nations concluded the Brussels Treaty on March 17, 1948, seeking collective defense arrangements.

On July 6, 1948, barely two weeks after Soviet forces blockaded road and rail traffic into Berlin, the US and Canada opened negotiations with the Brussels Treaty Powers to formulate security arrangements. By October 1948, the seven nations had reached "complete agreement on the principle of a defense pact for the North Atlantic," setting the stage for negotiations on a "North Atlantic Treaty" in Washington, D.C., in late 1948.

With the Berlin Airlift in full swing, supported by supply ships sailing from the United States, US officials sought ways to protect the North Atlantic sea lanes that had been so vulnerable to German U-boats in World War II. With an eye on geostrategic choke points that could be used to bottle up Soviet naval forces, leaders of the seven-nation North Atlantic Alliance on March 15, 1949, invited five militarily limited nations to join the effort.

Denmark's geographic position offered potential control of the straits between the Baltic Sea and the open ocean. Iceland and Nor-

way offered possible control over the North Atlantic "gaps" through which Soviet maritime forces in Arctic waters would have to pass in order to reach vital western sea lanes. Italy provided a geographic sentinel in the heart of the Mediterranean. Portugal offered bases to enable Allies to overfly and patrol the Strait of Gibraltar at the mouth of the Mediterranean.

Article 5

Leaders of the 12 Alliance nations, when they signed the Treaty of Washington in that first week of April 1949, committed their countries to Article 5, which affirmed that each ally would treat an attack on one as an attack on all, though without ever mentioning an "enemy" or the Soviet Union.

Already, hundreds of millions of dollars were flowing to Western Europe under the Marshall Plan. Soon, President Harry S. Truman augmented the existing aid with another \$900 million of US military assistance to the newly allied nations. The US-dominated Alliance handed over key military command to American generals, naming Gen. Dwight D. Eisenhower the first Supreme Allied Commander Europe on Dec. 19, 1950. The top civilian post of NATO secretary general went to Britain's Lord Ismay, the first of nine Europeans to hold the post.

NATO's evolution hinged on the ebb and flow of the Cold War. The



The Partnership for Peace program gives former Warsaw Pact countries opportunities to work with prospective and established NATO members in multinational exercises like Baltic Challenge '98 (above) in Lithuania.

Soviet Union tested its first atomic bomb in August 1949, and then Soviet-backed North Korean forces launched an invasion of South Korea in June 1950. Alarmed by these events, NATO launched a military buildup and forged an integrated military command structure. NATO based its Cold War strategy upon a classified NATO document known as MC 14/3. The plan emphasized deterrence of Soviet attack with forward deployed conventional forces backed by the threat of a potential US nuclear response to any aggression against Western Europe.

Soon, the Allies reached out for control of yet another maritime choke point, inviting Greece and Turkey to join the 12-nation Alliance in October 1951. The new members offered the Allies ports and airfields to control the eastern Mediterranean and the Dardanelles, giving NATO the leverage to bottle up the Soviet Union's Black Sea fleet in the event of conflict. NATO put the entry of Greece and Turkey on a hurry-up timetable, and the two entered the Alliance within five months of the decision.

The Allies moved to bolster the central front, as well. On May 6, 1955, NATO invited the new Federal Republic of Germany to become the 15th nation in NATO. The Kremlin, ever sensitive to deepening integration of West Germany into the West's defensive perimeter, or anything resembling German rearmament,

retaliated by creating the Warsaw Pact of East Germany, Poland, Hungary, Czechoslovakia, Romania, Albania, and Bulgaria.

NATO soon confronted limitations. The Alliance was forced to stand by in 1956 when Soviet-backed Polish communist forces crushed anti-regime riots in Poznan, Poland, in June and Soviet forces broke the Hungarian rebellion in November.

The Soviet Union caught the West by surprise, as well, by testing an intercontinental-range ballistic missile in June 1957 and then launching the first orbiting satellite—Sputnik—on Oct. 4, 1957. Sputnik awakened Americans to a new threat from above. The Soviet Union's successful orbiting of Maj. Yuri Gagarin on April 12, 1961, heightened the alarm.

High Tensions

Tensions mounted when Soviet forces downed an American U-2 spy plane over Soviet territory May 1, 1960, capturing Francis Gary Powers. Nikita Khrushchev kept up the pressure, first at his summit with President John F. Kennedy in Vienna in June 1961 and then with East Germany erecting the Berlin Wall on Aug. 13, 1961, to divide a city that had been administered by the four occupying powers since the end of World War II.

NATO stepped forward to establish a mobile task force to reinforce American, French, and British forces in West Berlin if needed. The United

States pointedly moved ground forces into West Berlin by road across East German territory.

The Soviet-bloc ventures prompted greater military preparations by NATO. In 1962, NATO planners won greater clout for dealing with any Soviet invasion across the heavily armed central front with the decision by President Kennedy and British Prime Minister Harold Macmillan to commit part of their nations' strategic nuclear forces to NATO.

NATO, on Dec. 14, 1966, established the Nuclear Defense Affairs Committee and the Nuclear Planning Group to coordinate Allied strategic planning for the combat use of nuclear weapons. To buttress the link between the United States and Western Europe, NATO formally adopted the new strategic concept of "flexible response" in December 1967, signaling US readiness to use tactical and theater nuclear weapons based in Europe as weapons of last resort against any Soviet invasion of Western Europe.

France, under President Charles de Gaulle, disputed the policy and what he viewed as France's subservient role in it. He and others viewed it as an attempt to make it safe for the US to fight a limited nuclear war in Europe. France pulled out of NATO's integrated military command structure, though it remained a member of the Alliance.

In the late 1960s, the Allies matched preparations for war with publicly declared readiness to ease East-West tensions. The United States and the Soviet Union opened direct air links in 1966 and joined 60 other nations in 1967 to sign the first international treaty providing for peaceful exploration and use of outer space. In 1967, NATO responded to the slight thaw in the Cold War by adopting the landmark Harmel Report, an act that put promotion of detente on an equal footing with defense and deterrence of Soviet attack.

NATO in 1971 began exploring conventional force reductions with the Soviet Union. The effort contributed to the 1984 Stockholm Conference's accord on Confidence- and Security-Building Measures and Disarmament in Europe, a building block for the Conventional Forces in Europe accord to reduce conventional forces from the Atlantic to the Ural Mountains.

"First Use"

Improving East–West relations moved nuclear arms control to center stage. The Warsaw Pact renounced first use of nuclear weapons in 1976 in an effort to build public support within NATO countries to force abandonment of Alliance doctrine, which left open the option of making first use of nuclear weapons to halt an attack, even an attack with only conventional forces.

NATO rejected the Soviet proposal, citing the Allies' need for nuclear weapons as a defense of last resort in the face of an enormous, numerically superior Warsaw Pact conventional force.

In 1977, NATO's Nuclear Planning Group launched a study of theater nuclear force modernization. The study led to adoption in December 1979 of the so-called dual-track decision. In that decision, NATO pledged to pursue arms control initiatives with the Soviet Union at the same time it was upgrading NATO's arsenal of theater nuclear weapons. The idea, in short, was that Moscow could limit or even forestall the deployment of NATO Euromissiles but only if it drastically curtailed deployments of its own mobile SS-20 missiles.

The Reagan Administration's build-and-negotiate strategy, however, soon encountered European concerns that US actions would ignite Soviet retaliation against Europe. Large-scale protests erupted. In the end, the Alliance held firm; beginning in late 1983,

the Euromissiles were deployed in West Germany, Italy, Belgium, and the Netherlands. Soon, though, Moscow was back at the arms control table and this time with a new leader—Mikhail Gorbachev. This time, the negotiations produced an accord—the Intermediate-Range Nuclear Forces Treaty—calling for the elimination of an entire class of nuclear weapons.

However, the Soviet Union had put the Alliance through a nerve-racking crisis in 1983–84, canceling all arms talks with the US and stepping up its own deployment of SS-20s. The result was new divisions between the US and its Allies. Seven European nations reactivated the Western European Union in mid-1984, giving impetus to a loose knit alliance of European members of NATO. By 1987, France and Germany were discussing the formation of a largely symbolic but still important Franco–German brigade. The two nations, combatants in both world wars, formed a joint security council in 1988. Spain and Portugal joined the WEU in 1988.

The Alliance had frequently demonstrated a willingness to accommodate European demands for a bigger voice in the Alliance. NATO had moved its headquarters and rejiggered defense planning, following the decision by French President de Gaulle to withdraw French forces from military integration with NATO. NATO adapted to a decision by Greece to withdraw its forces

from the Alliance's integrated military structure in mid-1974 and later welcomed reintegration of Greek forces in 1980. When Spain joined the NATO Alliance May 30, 1982, as the 16th member, NATO accepted Spanish refusal to allow nuclear weapons on its soil.

Soon, the accommodation was happening again. The Alliance began taking steps to reach out to the East: The first concrete step, albeit modest, was the June 18, 1990, award for the first time of 55 one-year fellowships not only to citizens of NATO's 16 nations but also, for study of democratic institutions, to citizens of former Soviet–bloc nations.

The Big Drawdown

At the same time, the United States and NATO initiated dramatic force reductions in Europe. US forces in Europe dropped from 300,000 to 100,000. Two-thirds of the land forces stationed in Germany were withdrawn. Large scale trans-Atlantic reinforcement exercises such as REFORGER were ended. The number of forward based combat aircraft dropped 70 percent, and their readiness eased, too, with barely half NATO's air assets kept at 30 days' readiness or better, compared to nearly 70 percent kept at 12 hours' readiness in 1990.

NATO's embrace of Eastern Europe intensified in July 1990 when NATO leaders concluded the London Declaration—proposing unprecedented East–West day-to-day cooperation with former Warsaw Pact nations. (The Warsaw Pact was formally dissolved in 1991.)

In its 1991 update of its strategic concept, NATO declared, "Risks to Allied security are less likely to result from calculated aggression against the territory of the Allies, but rather from the adverse consequences of instabilities that may arise from the serious economic, social, and political difficulties, including ethnic rivalries and territorial disputes, which are faced by many countries in Central and Eastern Europe."

In a step unimaginable just a few short years before, the Soviet Union itself vanished. Gorbachev announced his resignation as Soviet leader and signed a decree relinquishing his role as supreme commander in chief of Soviet forces on Dec. 25, 1991. The

USAF photo by MSgt. Keith Reed



At the end of 1998, NATO was providing troops as an extraction force for monitors in Kosovo. Airmen from the 49th Fighter Wing, Holloman AFB, N.M., arrived at Aviano AB, Italy (above), in support of possible NATO operations in Kosovo.



F-16s from Aviano, like this one, flew a 1994 NATO Operation Deny Flight mission, during which they downed four Bosnian Serb G-4 Super Galebs—NATO's first combat in 45 years.

successor to Gorbachev was Boris Yeltsin. Replacing the Soviet Union was the Russian Federation and 14 new nations that had been part of the Soviet structure.

NATO viewed Russia as a potential ally and underscored its view in early 1992 by committing NATO transport aircraft to airlift humanitarian assistance into Moscow and St. Petersburg. Alliance courtship of Russia symbolically deepened all the more when NATO Secretary General Manfred Wörner took part in a high-profile Washington, D.C., conference to map aid to Russia.

Yeltsin visited NATO headquarters Dec. 9, 1993, just three days before Russia carried out the first multiparty parliamentary elections since 1917.

Fast-moving developments in early 1994 cemented the post-Cold War architecture that gave NATO a key role in reshaping security across Eastern and Western Europe. President Clinton led NATO Allies at a Brussels summit Jan. 10–11, 1994, to launch the so-called Partnership for Peace program that invited former Warsaw Pact nations and Conference on Security and Cooperation in Europe nations to forge day-to-day working ties with NATO en route to potential membership. The first NATO-PFP peacekeeping exercise was held in September 1994.

By late 1998, 27 nations, including Russia, had signed up. Twelve of the partners, including the three na-

tions that won entry in 1999, expressed interest in joining NATO.

Special Relationship

NATO pressed ahead with its bid to create a special relationship with Russia, forging a treaty between the Alliance and Russia in May 1997 that laid the foundation for the NATO–Russia Permanent Joint Council. NATO also concluded a charter on a “distinctive partnership” with Ukraine. To assuage East bloc concerns, NATO stipulated that the Alliance has “no intention, no plan, and no reason” to deploy or store nuclear weapons on the territory of former Warsaw Pact nations such as Poland, Hungary, and the Czech Republic that are joining NATO. Nor did the Alliance promise to forgo nuclear weapons deployment if necessary in the future.

The end of the Cold War forced the Alliance to shift its focus to the once-taboo “out-of-area” threats. Several NATO Allies contributed forces to the coalition that ousted Iraqi occupation forces from Kuwait in the 43-day Persian Gulf War in early 1991. NATO aircraft from the Allied Command Europe Mobile Force were deployed to southeastern Turkey Jan. 2, 1991. The operation was the first combat use of the small multinational force since its creation in 1960.

NATO signaled concern over ethnic strife in the East as early as Aug. 9, 1989, when Wörner expressed Allied concern over Bulgaria's treat-

ment of ethnic Turks within Bulgaria.

When cease-fire agreements were repeatedly made and broken in Bosnia after civil war erupted in 1991, NATO repeatedly appealed for combatants to respect cease-fire arrangements. But paralyzed by the necessity for consensus and unanimity, NATO was forced to adopt a step-by-step approach in concert with the United Nations that required a cumbersome and time-consuming “dual key” decision-making process for any military action.

Initial steps were modest. In July 1992, NATO created a maritime operation in the Adriatic Sea to monitor Balkan embargo compliance by Serbia and Montenegro. Within four months, “monitoring” shifted to “enforcement,” provided by both NATO and WEU forces. The combined operation became known as Sharp Guard in June 1993. By the time NATO and the WEU had ceased enforcement in 1996, Allied warships had challenged 74,000 ships, inspected nearly 6,000 vessels at sea, and diverted 1,400 vessels to port for inspection.

Moreover, on Oct. 14, 1992, NATO provided AWACS aircraft to “monitor” a UN-declared “no-fly zone” across Bosnia. Three months later, NATO approved Allied “enforcement” of the no-fly zone. By April 1993, NATO warplanes were flying sorties to enforce Operation Deny Flight from both US aircraft carriers and from bases in Italy.

First Actual Combat

The stepped-up Alliance efforts over Bosnia led to the first NATO combat operation in its history. On Feb. 28, 1994, NATO aircraft shot down four Serbian warplanes violating the no-fly zone over Bosnia. Over the course of the next 20 months before the US-brokered Dayton Peace Agreement, the United Nations called on NATO forces to carry out combat action at least a dozen times to provide close air support for UN peacekeeping troops, to shoot down aircraft defying the no-fly zone, or to stage airstrikes against UN-selected targets, ranging from single tanks to heavy weapon bunkers to anti-aircraft sites.

Then, in August 1995, a three-week campaign—called Deliberate Force—was launched. It included

some artillery fire, but it was dominated by airpower, the weight of which hammered the Bosnian Serb heavy weapons, ammunition depots, command-and-control bunkers, and other targets. At the same time, NATO air forces undertook a parallel operation called Dead Eye, which took down the Serbian Soviet-style air defense network.

Within three weeks of the first bomb on target, recalcitrant Serb leaders agreed to enter serious negotiations with their foes in the three-year-old war. Within two months, the Dayton Peace Agreement had been signed, effectively bringing the war to a halt.

The US-brokered Dayton peace accords changed NATO's role for-



Staff photo by Guy Acello



Photo by Gert Kromhout

A Connecticut ANG A-10 (top) at Aviano and an F-16 (above) from the Netherlands over Bosnia. NATO begins a new era as it revamps its military structure and turns to combined joint task forces to carry out specific missions.

ever. A 60,000-strong US-led NATO Implementation Force entered Bosnia in December 1995 on Operation Joint Endeavor to implement the Dayton peace accord. The operation was the first ground force operation in NATO history, the first out-of-area deployment by NATO forces, and the first joint operation between NATO forces and non-NATO forces.

A year later, on Dec. 20, 1996, the NATO-led IFOR was replaced by a

smaller, more mobile and lightly armed 31,000-strong NATO-organized Stabilization Force. Known as Operation Joint Guard, the second force was assigned to deter resumption of hostilities and to provide selective support for civilian reconstruction efforts. NATO troops staged periodic raids to capture suspected war criminals who were dispatched to the Hague for trial by an international war crimes tribunal.

By the end of 1998, NATO had added a new role in the Balkans, providing 1,800 troops in Macedonia to serve as an extraction force for the 2,000 unarmed monitors sent into Kosovo to deter clashes between Yugoslav Serbian military forces and Albanian rebels seeking independence for the predominantly Albanian province within Serbia.

As the 50th anniversary approached, NATO began a more wide-ranging transformation to combat the threats of the post-Cold War era. NATO revamped its military structure, cutting the number of headquarters from 65 to 20. The two strategic commanders—for Europe and for the Atlantic—remained American generals.

Allies mapped plans to turn over NATO forces to the command of combined joint task forces to carry out specific tasks outside the normal role of the NATO Alliance. The task force concept, road tested in the Balkans, offered a diplomatically acceptable route for NATO and Russia to cooperate in the field. NATO agreed to have the deputy SACEUR, always a European, lead any WEU-led combined joint task force operations involving NATO forces.

NATO officials looked for the summit to bolster a trans-Atlantic bond. "To complete Europe's post-Cold War consolidation, we need engagement," Javier Solana, NATO's secretary general, wrote in a year-end article for *Time* Magazine. However, Solana said, the Alliance will only be successful "if it stands together." ■

Stewart M. Powell, White House correspondent for Hearst Newspapers, has covered national and international affairs since 1970 while based in the United States and Britain. His last article for Air Force Magazine was "Bell at the White House," in the February issue.



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By David A. Ochmanek, Edward R. Harshberger, David E. Thaler, and Glenn A. Kent



CURRENT US defense strategy recognizes that success or failure in future theater conflicts will hinge largely on the outcome of the opening phase of the campaign—what has come to be called the “halt” phase. The Report of the Quadrennial Defense Review notes that maintaining the capability “to rapidly defeat initial enemy advances short of their objectives ... is absolutely critical to the United States’ ability to seize the initiative ... and to minimize the amount of territory we and our allies must regain.”

In theater conflicts, if the US and allies can halt the attacking force short of its primary objectives, the remainder of the conflict is likely to unfold along favorable lines. Having halted the attack, the allied coalition will have gone far toward seizing the initiative from the enemy. Coalition forces should also find it easier to secure important rear-area assets needed to facilitate arrival of follow-on reinforcements and supplies. By halting the attack short of its primary objectives, the United States and its allies will have denied the enemy its most important bargaining asset. Failing to do so would mean war of incalculably greater risk.

We investigated the potential of new concepts for destroying and halting moving armored forces. These new joint concepts incorporate advanced munitions with systems for theaterwide surveillance and control. Such an approach would allow rapidly deployable, longer-range firepower systems—such as aircraft and air- and surface-launched missiles—to locate, identify, engage, and destroy enemy forces far more quickly and effectively than ever before. The centerpiece of our analysis is a novel and fairly transparent quantitative approach that estimates the ability of US forces to damage and halt an

invading mechanized ground force. We designed a generic scenario involving forces that a reasonably competent and fairly well-equipped regional adversary, such as Iran or Iraq, might bring to bear roughly 10 years from now. In this scenario, enemy forces attempt to seize key territory. Enemy forces include several army corps, 500 attack and interceptor aircraft, chemical and biological weapons, ballistic and cruise missiles, and reasonably modern surface-to-air defenses.

Our conclusion: Modern, longer-range firepower systems—coupled with new surveillance and control capabilities and equipped with advanced anti-armor munitions—can engage and heavily damage large numbers of moving mechanized forces. In theaters that do not feature heavily foliated or urbanized terrain, joint US forces will be able to rapidly halt armored invasions short of their objectives even in highly stressing scenarios—provided sufficient investments are made in the emerging information and firepower systems.

The Base-Case Scenario

For the base case, we assume a US posture somewhat more robust than that deployed today in the Gulf. Forces consist of five squadrons of land-based aircraft, pre-positioned equipment for two heavy Army brigades, a battalion of 24 AH-64 Apache helicopters, a carrier battle group with aircraft and Tomahawk missiles, and 250 Army Tactical Missile System (ATACMS) missiles, mounted either on multiple launch rocket system launchers or, as has been proposed, Navy surface combatants afloat in the region. Modest numbers of surveillance and control assets—notably E-3 AWACS, E-8 Joint STARS, RC-135 Rivet Joint,



“Enabling forces” would go in first and gain control over enemy capabilities. Notable among them would be F-22s (shown here) and F-15Cs, USAF’s top two air-to-air fighters.

E-2 Hawkeye, and P-3 Orion aircraft—provide the eyes and ears of these forward deployed forces. We also assume in this base case that all air-to-ground munitions are pre-positioned at multiple locations and can be distributed to main operating bases by intratheater airlift and surface transportation.

We assume that the enemy’s chief objective is to seize critical assets some distance from the prewar border. Mechanized ground forces spearheading the enemy advance are instructed to move as rapidly as possible. We assume that the leading edge of those forces moves at an average rate of approximately 70 kilometers per day. We assume as well that each unit moving forward will sustain this average velocity until that unit suffers the loss of some 70 percent of its armored vehicles. This assumption is based on a deliberately conservative judgment of the level of attrition required to render an attacking force incapable of coherent offensive operations. We also assume that the enemy uses its air defenses to try to protect this advancing force. That is, mobile Surface-to-Air Missiles advance along with the leading edge of the attacking ground force, and interceptors operate from time to time within this same airspace.

Our base case assumes that the enemy possesses but does not use lethal chemical, biological, or nuclear weapons in the halt phase—not because such use can be ruled out but

rather because we believe that most adversaries would prefer to achieve their objectives without running the risks associated with first use of such weapons. In this case, we assume that the enemy reserves Weapons of Mass Destruction as a means for helping to ensure the survival of his regime should the war turn bad. Our assessment of the effects of WMD use is summarized below.

First Enable, Then Destroy

To deploy forces of sufficient size into the theater with acceptable risk and employ that force effectively,

US and allied forces must gain a measure of control over other enemy military capabilities. Therefore to defeat an enemy attack, we first focus on gaining a foothold in the theater and creating favorable conditions under which friendly forces can operate. This is the “enabling” portion of the halt phase. We then focus on destroying enemy armored columns as rapidly as possible. Key objectives:

- Protect rear-area airfields, ports, and the like.
- Suppress and destroy enemy air defenses.
- Disrupt enemy C³ and transportation networks.
- Destroy Weapons of Mass Destruction when found.

Assets to accomplish these objectives would be those in theater prior to the outbreak of hostilities, as well as those that could arrive within the first few days after C-day (the day that large-scale US reinforcement begins). Notable among these are: F-15Cs, F-22s, and multirole aircraft for air defense and sweeps against enemy aircraft; the Airborne Laser system, Aegis upper tier, and Patriot or other land-based ballistic missile defense systems; B-2 bombers to destroy the most capable enemy SAM systems; and F-18 and F-16 fighters carrying High-speed Anti-Radiation Missiles to suppress other SAM radars. Also needed are systems for precision attacks on fixed, hardened targets. Examples are stealthy F-117



In the campaign to destroy enemy radars, USAF F-16s (above) and Navy F/A-18s would wield the “fang” of choice—the AGM-88 HARM missile. B-2 bombers would attack the toughest SAM sites.

Staff photo by Guy Acrio

attack aircraft, Tomahawk land attack missiles, joint air to surface standoff missiles, and conventional air launched cruise missiles.

Not until the enabling phase has been under way for some time—in our assessment, four to five days—would the bulk of the assets be turned to attacks on the enemy's armored columns. Given a relatively modern and reasonably well-employed enemy air defense system, it would take about this long before non-stealthy aircraft, such as the B-1B and the F-15E, could operate at medium altitudes with relative safety. Once the enemy's interceptor and

Fig. 1 Assumed Deployment: Base Case, Halt Phase

Day 0 (in place)	Forces (fighter aircraft in squadrons)
	2 units F-15C, F-16(L), A-10, F-16HTS; 3 units FA-18; 1 unit AH-64; 250 ATACMS
1	F-22, F-117, 8 B-2
2	F-22, 3 units Airborne Laser
3	F-16HTS, F-15C
4	F-15E
5	F-15E, 50 B-1B
6	F-16(L)
7	F-16(L), F-15C; 3 units F/A-18 (USN); 2 units F/A-18 (USMC)
8	F-15E
9	F-16(L)
10	2 units F-16
11	O/A-10
12	O/A-10

F-16(L) refers to F-16s equipped with LANTIRN; F-16HTS refers to F-16s equipped with HARM Targeting System, used for SEAD.

USAF photo by 1st Lt. Dave Westover



After enemy air defenses are peeled away, non-stealthy aircraft such as heavyweight F-15Es would commence devastating precision attacks on enemy armor.

SAM forces had been suppressed, however, these and other platforms can bring massive firepower to bear.

Fig. 1 shows the flow of US firepower assets to the theater over the first 12 days of the war. This arrival rate assumes that Civil Reserve Air Fleet Stage II has been activated and that, by Day 4, 900 tons of intertheater airlift capacity are available to support USAF deployments each day. The table shows the Air Force could expect to deploy approximately 1.5 squadrons of combat aircraft a day to a distant theater under such conditions. We also show 50 B-1Bs arriving on Day 5 and a second carrier, along with two squadrons of Marine Corps F-18s, arriving on Day 7. Also deploying are additional support aircraft, including those for reconnais-

sance (U-2s, RC-135s, E-2s, and P-3s), surveillance and control (E-3s and E-8s), aerial refueling (KC-135s and KC-10s), search and rescue, and intratheater airlift.

Fig. 2 provides two snapshots characterizing allocation of available firepower assets on Day 4 and Day 8 of the halt phase. On Day 4, the bulk of the effort is devoted to such enabling tasks as Suppression of Enemy Air Defenses, air defense and sweep missions (air-to-air), and attacks on high-value and time-sensitive fixed targets. By Day 8, more assets are available to the commander, and most of them are devoted to attacking the enemy's advancing armored columns.

Operational Objectives

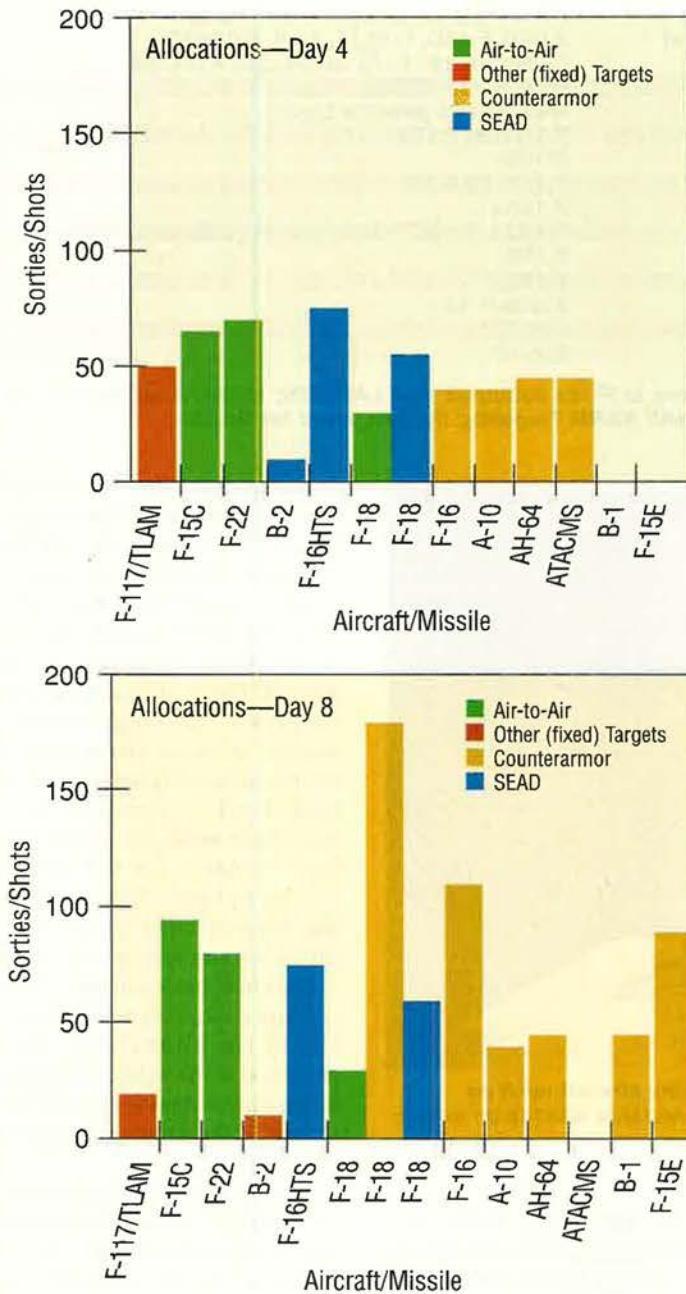
In this scenario, the mechanized,

enemy ground force is confined to a discrete number of main axes of advance. We assume in our base case that lead elements of enemy forces rapidly move along each axis unless they encounter significant resistance in the form of either an opposing ground force or heavy and effective firepower. As longer-range air and surface systems attack each element of the advancing force to a specified high level of damage, we assume that those units are pulled out of the line of march for the remainder of the halt phase. The net advance of the leading edge of the unattacked units on any given day is then the difference between the "base rate" (in this case, 70 km) and the column length (in kilometers) that can be attacked with sufficient lethality to achieve the damage level necessary to render the attacking units ineffective.

The number of kilometers' worth of armored columns attacked each day is determined by factors contributing to the amount and effectiveness of longer-range anti-armor firepower: the number of assets available, their sortie rate, their payload and weapon characteristics, the portion of attack assets that actually find valid targets (determined by the surveillance, assessment, and battle management assets available), and the level of damage that is deemed necessary to compel an enemy unit to halt.

Values are assumed for every variable for each day of the halt phase. We assumed, for example, in our base case run that the 50 B-1B aircraft in theater had a sortie rate of 0.75. Hence, the aircraft were assumed to fly a total of 37 sorties per day, all of

Fig. 2



which were allocated to attacking moving armored columns. Of these sorties, 25 are assumed to have attacked their intended targets. Those sorties delivered a total of 750 Wind-Corrected Munitions Dispenser-upgraded Sensor Fuzed Weapons, each filled with 40 Skeet—smart target-sensing weapons. In a similar way, the other firepower assets—fixed-wing fighter-bombers, attack helicopters, and ATACMS missiles—are allocated to destroy moving armor.

We assume that by the middle part of the next decade—the time frame of this study—assets such as JSTARS, UAVs, and other sensor platforms

will provide sufficient data to assessment centers to allow them to locate columns of moving vehicles, a high portion of them armored, even when columns are interspersed among a host of unarmored vehicles. Specifically, we assume that during the halt phase, when large numbers of armored vehicles are moving, about one-third of the sorties allocated to the attack of moving armor fail to find and engage columns rich in armored vehicles. We believe this assumption is conservative.

We also assume that all US attacks on moving armor entail use of a quality anti-armor munition: Most USAF

aircraft deliver the WCMD/SFW, Navy and Marine aircraft deliver Joint Standoff Weapons with SFW, attack helicopters deliver Hellfire missiles, and ATACMS missiles deliver Brilliant Anti-Tank submunitions.

Weapons and Sortie Effectiveness

For area weapons, munitions effectiveness devolves to estimating the number of weapons that must be delivered against a column of vehicles to achieve a desired level of damage. Once the average spacing between armored vehicles is specified, damage expectancy can be translated into the average number of armored vehicles damaged or destroyed per weapon expended and per sortie.

Our focus is on the CBU-97 SFW, which incorporates the Skeet, now in production for USAF. When the dispenser released from an aircraft reaches appropriate altitude, it opens and releases 10 BLU-108 submunitions. These are slowed by parachutes, and as they approach ground level, a small rocket motor fires at the base of each munition, raising it up and spinning it. Each of the BLU-108s then tosses four Skeets along predetermined patterns. Collectively, these 40 Skeets cover an area roughly 400 meters by 200 meters. Each Skeet seeks out infrared signatures characteristic of vehicles with warm engines and, if it finds one, fires an explosively forged projectile that is able to penetrate several inches of armor plate.

In more than 100 tests of CBU-97s, each weapon, or dispenser, delivered against a representative column of armored vehicles and trucks, has damaged, on average, three to four armored vehicles. Average spacing between the armored vehicles in these columns has been around 50 meters. Thus, for the eight armored vehicles that fall within a single weapon's 400-meter "footprint," we can expect that nearly half of them will be damaged to at least an "availability kill" (or "A-kill") level. This means that some component of the vehicle has been damaged to the extent that the vehicle must be withdrawn from the line of march and repaired before continuing on.

We next estimate the effect when multiple weapons are delivered against a column. We know we must expect diminishing returns to scale as bomblets are delivered with increas-



A single F-16 can carry four CBU-97 Sensor Fuzed Weapons and could be expected to engage around 30 armored vehicles and damage approximately half of them.

ing density. Again, a range of outcomes is possible. At one end of the spectrum, the weapons could be delivered with optimal spacing, such that each pattern just overlapped its neighbors, providing “double” coverage over the entire segment of road attacked. We refer to this approach as “ordered fire.” For a situation in which each pattern measured 270 meters in length (the useful length of the pattern, assuming some delivery errors), it would take seven weapons to cover 1 km of road in this fashion. This density of Skeets would damage more than 70 percent of the armored vehicles within the weapon’s footprint. We judge that this level of damage would be sufficient to render a unit at least temporarily incapable of continued effective operations—that is, the unit can be considered to have halted for the time being.

At the other end of the spectrum, the weapons could be delivered randomly within the segment of the column attacked. We refer to this as “unordered fire.” Here, some sections of the column are triple covered or more, while others are totally uncovered. In this case, 10 weapons would be required per kilometer to achieve the same damage expectancy (greater than 70 percent) as the seven optimally laid down weapons. Guided dispensers, such as WCMD and JSOW, should allow a result closer to optimal. To be confident that we are not overstating the effectiveness of future anti-armor

capabilities, we assume less-efficient random deliveries. Hence, in most of the cases that follow, we allot 10 WCMDs or 10 JSOWs for each kilometer segment of an armored column attacked.

What is the net effect of these assumptions on sortie effectiveness? A single F-16 can carry four CBU-97 weapons. If those weapons were each as effective as the single weapons delivered in tests, we would expect that each F-16 sortie would be able to engage around 30 armored vehicles and that it would damage approximately half of these. Note that this estimate is extrapolated from tests in which the armored vehicles

were separated by an average of 50 meters. Intervehicular spacing of as much as 50 meters would be characteristic of a highly disciplined force, particularly once heavy attacks began. Nevertheless, we degrade that level of effectiveness first by assuming that the enemy can maintain, on average, 100 meters between each armored vehicle on the march. This assumption allows us to account for the possibility that some coalition anti-armor sorties will encounter armored formations with spacing considerably greater than 100 meters. We next assume the delivery errors mentioned above. We also account for the diminishing returns to scale and operational degradations stated earlier.

The net effect of these assumptions is to reduce our estimate of expected armored vehicle kills for a typical sortie by almost 90 percent from levels demonstrated in tests. This seems prudent, if not pessimistic.

Results of the Base Case

Fig. 3 shows the number of fixed- and rotary-wing sorties available in the first 12 days of the baseline scenario. (ATACMS shots are included and counted as one sortie each.) One can clearly see the shift in emphasis from “enabling” over the first five days to direct attacks against armor. The key is degrading the enemy’s airborne and surface-based air defenses to the point that nonstealthy aircraft, such as the B-1B and F-15E and other fighter-bombers, can op-

Fig. 3

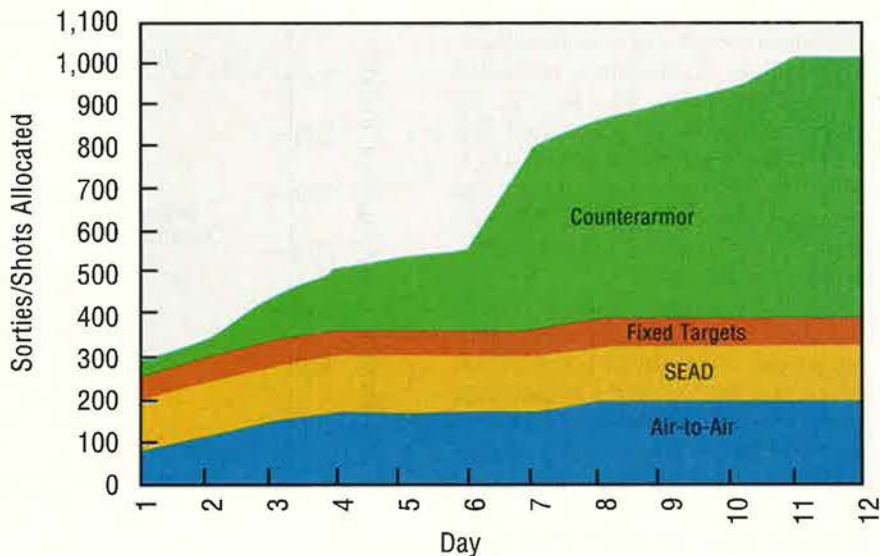
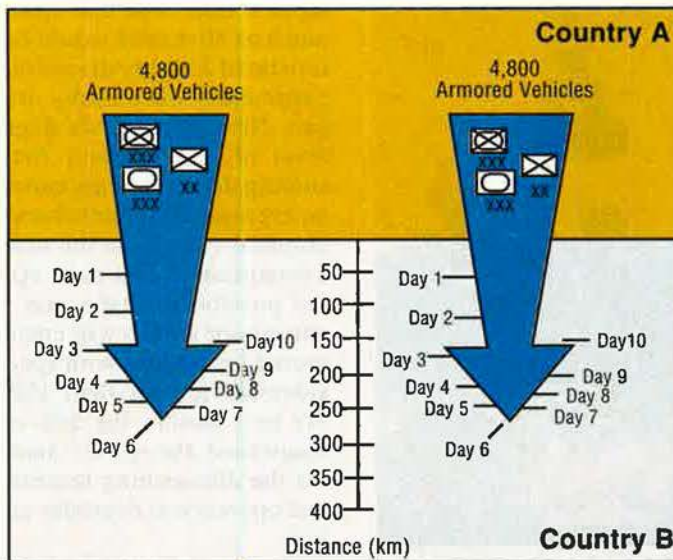


Fig. 4



erate with relatively low risk at medium altitudes.

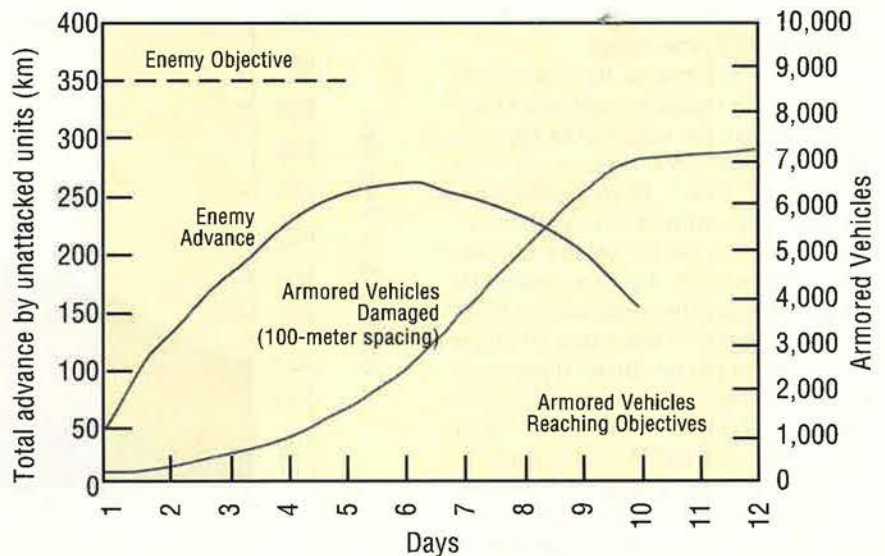
Fig. 4 tracks the enemy's ability to press the attack in the face of the counterarmor capacity of US longer-range firepower assets, assuming that all of the counterarmor assets deliver a quality munition. At first, while US forces are few in number and preoccupied with enabling efforts, enemy forces make good progress. By Day 6, however, US firepower has been able to reach and, by Day 7, to exceed the capacity to attack 140 km of armored columns daily—that is, 70 km along each of two main axes of advance. This has the effect of halting and then pushing back the point of advance of the enemy's unattacked ground forces. The furthest point reached by columns of vehicles before they have been attacked—the enemy ground force's "high-water mark"—is, in this case, approximately 260 km beyond the prewar boundary. After that, enemy columns are halted short of this point. By Day 10, US firepower assets have attacked and heavily damaged every armored column that enemy ground forces can generate, even if the enemy chooses to put every armored unit in the offensive on the move.

Fig. 5 summarizes these results and shows, for each day of the halt campaign, the furthest point of advance for the enemy's unattacked units, plotted in kilometers against the scale on the left. The figure also shows the cumulative number of enemy armored vehicles damaged or destroyed, plotted against the right-

hand axis. We estimate that US firepower assets could damage more than 7,000 armored vehicles out of a total of 9,600 committed to the attack, assuming they are all put on the move.

Once every armored unit has been attacked to the damage expectancy goal of at least 70 percent, the enemy's attack has been, for all intents and purposes, halted. Note that this occurs on Day 10, at which point the rate of kill drops dramatically. US forces may find it difficult to locate undamaged armored vehicles once they halt because the enemy can begin to find or create cover and concealment for his vehicles and because surveillance assets and crews of attacking aircraft are apt to have some difficulty in distinguishing

Fig. 5

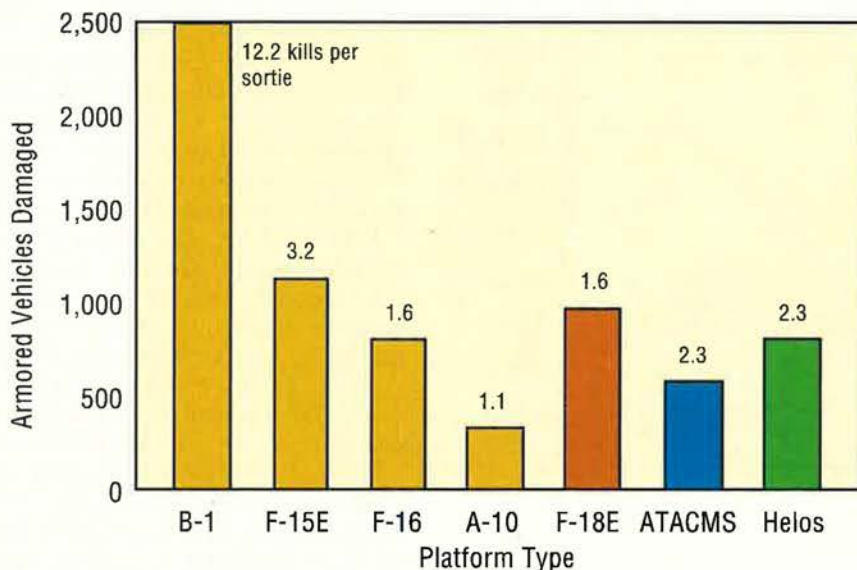


unattacked vehicles from those that have been damaged. At this point, US fixed-wing assets cease expending area munitions and shift to attacks with one-on-one weapons, such as the AGM-86 Maverick missile and laser-guided bombs, which are targeted against individual vehicles.

Fig. 5 shows our estimate of the number of enemy armored vehicles that reach their objective, defined as being a line 350 km from the prewar border. Obviously, in this case, the estimate is that no vehicles reach this point.

It is worth examining which systems contributed to the successful halt. Fig. 6 shows numbers of armored vehicles damaged by platform type and, at the top of each bar, the average number damaged or destroyed per sortie. Perhaps the most striking conclusion that emerges is the potential of large payload aircraft, such as the B-1B, to damage moving armor. With approximately 2,400 kills, the 50 B-1B aircraft deployed in our scenario accounted for more than one-third of the entire joint force's armor kills during the halt phase. This level of effectiveness results from the B-1B's large payload and the availability of a highly capable anti-armor weapon that can be delivered from medium altitude. Within the time frame of this analysis, the B-1B is programmed to carry and deliver 30 WCMD/SFWs in a single sortie. This carriage capacity together with the aircraft's long range, which allows it to be based beyond the strike capabilities

Fig. 6



of most regional adversaries, makes the modified B-1 a highly attractive asset in the halt phase. By the same token, the F-15E fighter, which can carry at least twice as much ordnance as most other fighter-bombers, also plays a disproportionately large role in halting the attack.

The ATACMS missile can play an important role as well. If the missiles and their launchers are deployed forward in advance of the conflict and if the advanced BAT munition proves to be effective, this system can be employed in the opening days of the halt campaign even before the enemy's air defenses have been suppressed. The ATACMS missile thus denies the enemy ground force a free ride even during the portion of the campaign that is most stressful for the defender.

The halt force, in this analysis, expended nearly 9,000 WCMD/SFWs and 2,000 JSOW/SFWs, both filled with Skeet projectiles. It was assumed that most USAF aircraft employed WCMD/SFW while most Navy and Marine aircraft employed JSOW/SFW. However, the currently programmed inventories for these weapons are only around 5,000 WCMD/SFW-Skeets and 3,000 JSOW/SFW-Skeets for the Air Force and fewer than 1,500 JSOW/SFW-Skeets for the Navy and Marines. This programmed stockpile of advanced weapons is probably adequate in scenarios with lengthy periods of buildup because sufficient attack assets would be deployed to permit a brute force

approach of destroying armor with large numbers of these and other less-capable munitions. But a robust power projection capability in the face of a determined adversary and a stressing, short-warning scenario would demand munitions that get the most lethality possible out of every sortie.

Variations on the Base Case

Having presented this base case, we now briefly examine a series of possible alternative cases. Perhaps the most obvious of these is one in which enemy ground forces are able to advance along more than two main axes. We summarize the outcome of such a case in Fig. 7. Here, we assume that enemy ground forces move along seven distinct avenues of advance. However, because some avenues are assumed to have less capacity than the two main axes in our base case, the average movement rate for columns decreases from 70 km per day to 40. We keep constant all of the other variables from the base case.

Under these conditions, enemy forces are worse off than in the base case: They lose approximately the same number of armored vehicles (around 7,200), but they reach their high-water mark at only 240 km beyond the prewar boundary (vs. 260 in the base case). By moving on more axes, enemy forces can quickly generate more columns that must be neutralized to halt the attack. But this effect is more than offset by the reduced speed of movement, particularly in the early days of the

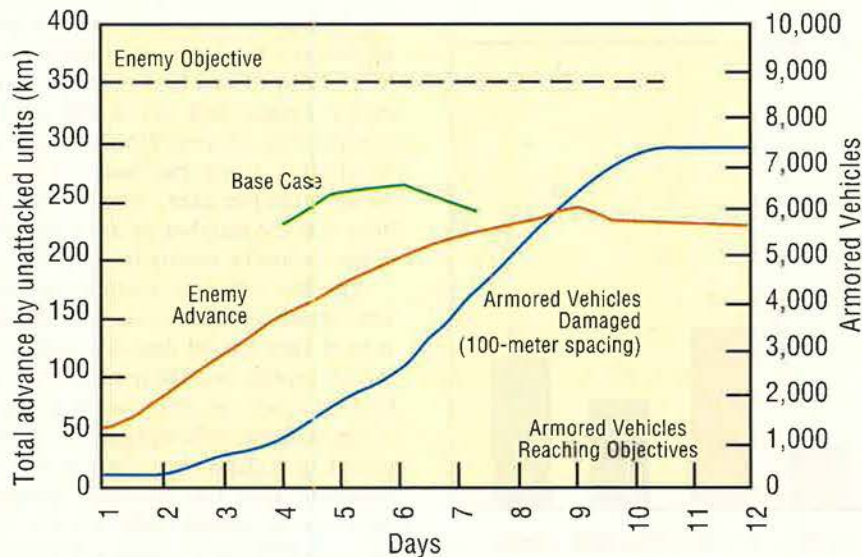
conflict, when US forces are few in number and preoccupied with gaining freedom of action. Given that secondary roads or off-road routes will always have less capacity than major roads, and given the added complexity of coordinating movement of a large mechanized force along multiple axes, some trade-off between the number of axes and average velocity seems inescapable.

Another obvious counter to area anti-armor weapons, such as Skeet, is to reduce target density. Enemies could spread out their armored vehicles more widely so that each weapon delivered engaged fewer targets. Fig. 8 shows one such case. It is assumed that the average spacing between armored vehicles on the move is 200 meters rather than 100. The number of axes and the average velocity remain the same as in the previous case.

By extending the spacing between vehicles, the enemy has indeed decreased its vulnerability to individual attacks by most of the area weapons. As one would expect, this reduces both the number of armored vehicles damaged and the rate of damage in the opening days of the war. But the enemy has paid a price as well. By opening up the distance between vehicles, it has reduced the number of armored vehicles that can occupy any particular avenue of advance at any one time. The overall transit time for the force is increased. The capability of limited area weapons, such as the Sensor Fuzed Weapon, to maintain a given damage expectancy over a kilometer of enemy column is unaffected. And the halt potential of one-on-one weapons (such as Maverick or Hellfire) or broad area weapons is increased.

The net result is similar to the 100-meter spacing case—a penetration of about 240 km into friendly territory and around 6,700 armored vehicles damaged, with halt imminent on Day 13. This case illustrates an important point: When faced with a mix of US weapons, the opposing commander has no simple options for vehicle spacing. Tighter spacing may improve the speed at which the force can be massed but will dramatically increase the vulnerability of the armor of area weapons like Skeet. Wider spacing both slows the force and actually improves the halt potential of one-on-one weapons.

Fig. 7



This result highlights the importance of a mix of weapons and joint forces.

Later-arriving firepower assets play a larger role in this case, as the number of armored vehicles damaged in the very early days is reduced. Also noteworthy is that a substantially higher number of air-delivered anti-armor weapons are needed to enforce the halt (17,000 Skeet—dispensing weapons, as opposed to fewer than 11,000 in the base case). Even so, this weapon remains by far the best armor killer for high-payload aircraft such as B-1B and F-15E, but larger quantities of area anti-armor munitions would be needed if greatly increased spacing is regarded as a tactically viable countermeasure by the enemy.

Confronting the WMD Threat

Adversaries would face enormous risks and uncertainties should they use Weapons of Mass Destruction. However, such use cannot be ruled out in the halt phase. How might joint commanders react, and what might the effects be on the halt campaign?

First, the threat of WMD use can be expected to affect the ways in which outside forces deploy to the theater. At a minimum, US leaders would want to minimize personnel and assets within range of the most numerous enemy delivery systems. We therefore assume that no fixed-wing, land-based US aircraft are deployed to bases within 500 km of enemy territory. Bases under attack will experience reductions in tempo for some period of time, as opera-

tions are interrupted to assess the extent of each attack and as personnel are forced to work in protective suits.

Fig. 9 provides our assumptions about operations tempo degradation

to aircraft that participate in attacks on moving armor in the halt phase. Essentially, we assess the effect if WMD reduced by one-half the sortie rates of all but the longest-range land-based aircraft. We assume that carrier sorties and ATACMS are not affected. Attack helicopters remain forward, but they move frequently to reduce vulnerability to targeting.

Fig. 10 shows the effect of this change on our chief measures of effectiveness: enemy penetration distance and armor kills. Not surprisingly, we see enemy forces penetrating further than in the base case—340 km as opposed to 260—and aircraft destroying 850 fewer vehicles. The main point is that we do not see a catastrophic reduction in the effectiveness of US firepower assets in the halt phase, even when the sortie rates of land-based aircraft are substantially reduced. The halt force remains effective, because the most capable attack platforms (B-1Bs and F-15Es) are based beyond the range of most of the enemy's

The Carriers in Three Cases

Our analysis assumed that carrier operations were not affected by enemy use of WMD. This assumption may or may not be warranted. Three cases shed light on the sensitivity of their results to changes in carrier operations.

1. Delayed Access. We assume that the enemy, using constricting terrain, sophisticated mines, and quiet submarines, delays access of reinforcing maritime forces to the theater for a period of two weeks or so. In this case, the carrier that is in the region at the outset of the conflict continues operations unimpeded, but the second carrier, which arrives on D+7, operates at only half the normal sortie rate because it is constrained to less-favorable operating areas pending success in anti-submarine and mine-sweeping efforts.

Our analysis found the effect of the changes on the outcome is minimal relative to the base case.

2. Denial of Access. The carrier on the scene at D-day might be affected by enemy action. We examine a case in which no carrier sorties are available. More enabling forces must be deployed by air early in the conflict, and more time passes before US forces can shift their efforts to heavy attacks on the enemy's armored formations.

In the absence of carrier-based aviation, land-based assets require an additional two days to provide the same number of sorties available in the base case to suppress enemy air defenses and missiles. This need to replace carrier sorties in the enabling portion of the halt phase results in lost sorties for attacking armor for several days. Enemy forces are able to penetrate more deeply than in the base case, almost to their objective. To achieve a result at least as good as the base case, USAF elements would need to be allocated 100 additional tons of daily intertheater airlift capacity—a 12 percent increase.

3. Carriers Only. Carrier-based airpower is especially useful to help speed the enabling portion by striking enemy air defenses and high-leverage fixed targets. This utility, however, is quite distinct from the ability, claimed by some observers, of carriers to serve as a hedge against the possibility that US air forces might not gain access to theater land bases in wartime.

We examined a case that eliminated USAF, Marine, and Army air forces in the base case. We replaced it with a truly robust naval force: two battle groups and three arsenal ships (each with 250 ATACMS) on D-day; a third carrier on D+3; and a fourth on D+7. The first two carriers conduct enabling operations that allow all sorties from the others to go to anti-armor attacks. We found that, even if all sorties used high-quality munitions, this armada could not halt a determined invasion: Enemy ground forces start to accumulate at the objective by Day 9. By Day 12, 3,500 armored vehicles are in place at the objective.

missiles to begin with; because attack assets are equipped with highly capable munitions; and because each day additional attack capacity is deployed into the theater and brought to bear against the enemy. This approach to power projection, in short, appears to be fairly robust.

The analyses summarized above point to our conclusion: Modern, longer-range firepower systems, properly supported with timely information and battle management capabilities and equipped with advanced anti-armor munitions, can effectively engage and heavily damage mechanized forces moving in large numbers. In operational terms, this means that in theaters that do not feature heavily foliated or urbanized terrain, joint US forces can rapidly halt armored invasions even in stressing scenarios, provided that sufficient investments are made in emerging concepts and systems.

Many of the systems most needed to provide robust halt and enable forces are most at risk to budget-driven delays generally reside in less-conspicuous programs. These include:

- Advanced munitions, such as smart anti-armor munitions and standoff attack weapons.
- Sensor-to-controller-to-shooter communication links.
- Upgrades to avionics and other systems on existing platforms that will allow them to integrate and employ advanced information and munitions.
- Theater surveillance sensors and platforms, to locate and characterize both enemy maneuver forces and mobile air defenses.
- Pre-positioned assets.
- Improved concepts and capabilities for finding, engaging, and destroying advanced SAM systems, such as the SA-10.

In our rough estimation, additional sustained investments of \$2 billion to \$2.5 billion per year in these capabilities over a 10-year period should suffice to avoid further debilitating delays and cancellations in these low-profile but critical areas. Fairly modest cuts in later-arriving forces—on the order of 10 to 15 percent—should suffice to generate these funds. ■

Fig. 8

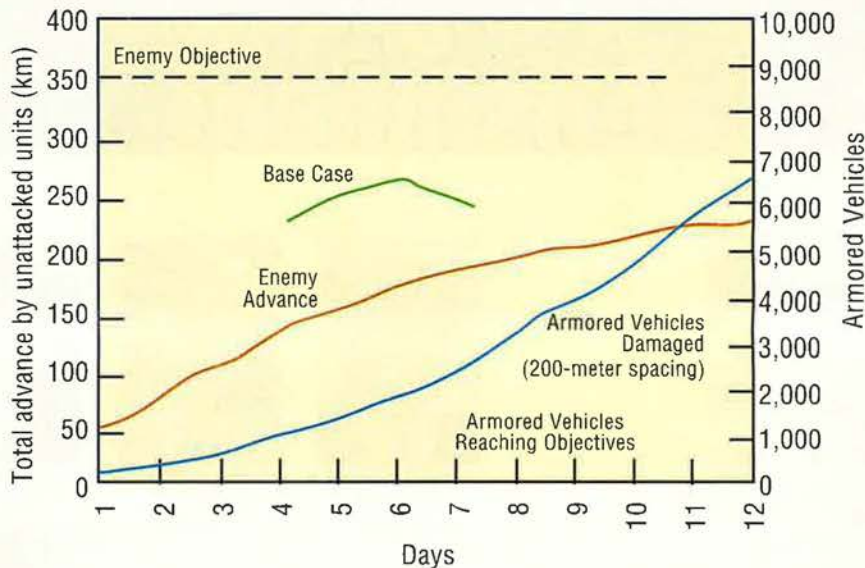
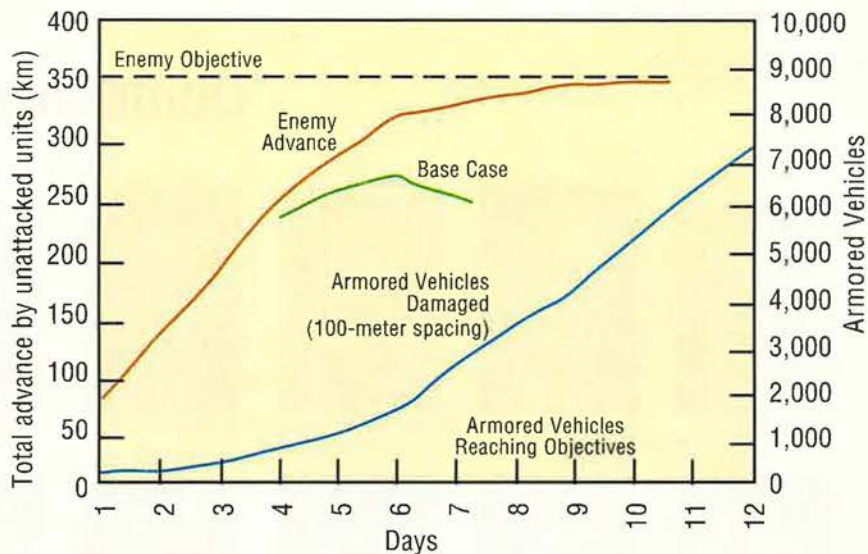


Fig. 9 Comparative Sortie Rates for Land-Based Forces

F-16	2.0	1.0
A-10	2.0	1.0
AH-64	2.0	1.0

Fig. 10



David A. Ochmanek, Edward R. Harshberger, David E. Thaler, and Glenn A. Kent, are analysts with RAND. This article is adapted from a longer research document, To Find, and Not to Yield: How Advances in Information and Firepower Can Transform Theater Warfare, published in late 1998.

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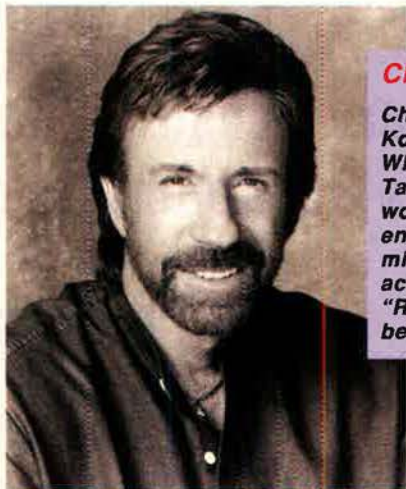


Daniel K. Inouye
Hawaii

Many enlisted members achieved fame and success in politics

FAMOUS *and* Formerly Enlisted

At the Air Force Enlisted Heritage Research Institute, Gunter Annex, Maxwell AFB, Ala., photos of some 100 individuals can be found on a special Wall of Achievers. The wall calls attention not only to USAF "mustangs"—enlisted troops who became officers—who went on to become generals but also some of the many enlisted members who subsequently achieved fame and success in politics, the arts, entertainment, business, and the like. What follows is a sample.

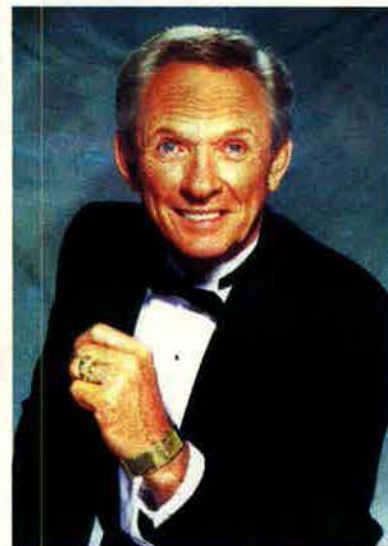


Chuck Norris, Martial Arts Expert and Actor

Chuck Norris, who joined the Air Force after high school, was stationed in Osan, South Korea, which was lucky for him. There he began a "life-changing" study of martial arts. When he returned to the US, he competed for the March AFB, Calif., judo team, studied Tae Kwan Do, and started a Tang Soo Do club. Norris was discharged in 1962, and, by working days at Northrop Aircraft and evenings teaching martial arts, he quickly saved enough money to open his own studio. In 1968, Norris became the professional world middleweight karate champion and held the title until 1974. One of Norris' students, actor Steve McQueen, urged him to go into movies, and he soon made his first film, "Return of the Dragon," with another martial arts friend—Bruce Lee. In 1996, Norris became the first Westerner to be awarded an eighth-degree black belt in Tae Kwan Do.

Mel Tillis, Country Music Legend

In the early 1950s, Lonnie "Mel" Tillis was an airman stationed in Okinawa, working as a baker. There, he began a performing career with a musical group called the "Westerners." Just one year after he was discharged from the service in 1955, Tillis' song "I'm Tired" was recorded by Webb Pierce, and his professional career as a singer-songwriter was launched. Tillis' songs over the decades have been recorded by artists such as Brenda Lee, Charley Pride, Ricky Skaggs, George Strait, and Kenny Rogers. In 1976, he was inducted into the Nashville Songwriters Hall of Fame. Tillis still performs regularly at his theater in Branson, Mo., where he also works with the Branson Veterans Task Force.

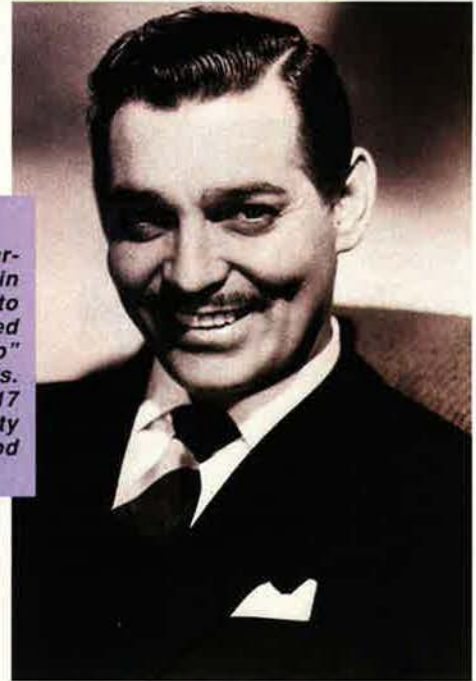


the arts, entertainment, and business. Here are some of them.

By Juliett Kelsey, Staff Editor

Clark Gable, Hollywood Legend

Well beyond draft age and an established major Hollywood movie star, 41-year-old Clark Gable enlisted as a private in the Army Air Forces on Aug. 12, 1942, in Los Angeles. Gable didn't stay in the enlisted ranks for long. He was sent to Officer Candidate School and was commissioned Oct. 28, 1942. He then attended aerial gunnery school, and in February 1943, at the behest of Gen. H.H. "Hap" Arnold, he went to England to make a motion picture featuring aerial gunners. Assigned to the 351st Bomb Group at Polebrook, UK, Gable flew on several B-17 combat missions over Europe. In 1944, he was relieved of his active duty obligation because he had become overage for combat. He returned to Hollywood where he made 21 more films. He died in 1960.



"Box Car Willie," Noted Entertainer

Lecil Travis Martin—the original name of the man who was later to become known to the country music world as "Box Car Willie"—joined the Air Force in 1949 and served for more than 11 years. He became a flight engineer with the rank of master sergeant by the time he was discharged in 1960. Martin adopted the Box Car Willie persona in the mid-70s, and the good-natured singing hobo was a massive hit in England. That popularity carried over to the United States in the early 1980s. In 1981, he gained a spot on the Country Music Hall of Fame's Walkway of the Stars and became a member of the Grand Ole Opry in Nashville, Tenn. He has remained a favorite of country music fans in Europe and the US in the 1990s.

Arthur A. Hartman, Distinguished Diplomat

Eighteen-year-old Arthur A. Hartman enlisted in the Army Air Corps in 1944 near the end of World War II. As a radio operator, he flew several missions over "The Hump"—the Himalaya mountains—in the China–Burma–India theater of operations and on new routes between Hawaii and Japan, Canton, Manila, Nanking, and Wake Island. He left the service as a corporal in 1946, graduated from Harvard, and then embarked on what would prove to be a distinguished career as a foreign service officer. The highlight of his decades-long service came in the Reagan Administration, which he served for over five years as the US ambassador to the Soviet Union in Moscow. In 1987, Hartman retired from public service at the level of career ambassador, the highest rank in the US Foreign Service. He now advises corporate executives on foreign business development.



Flip Wilson, Irreverent Comedian

Clerow Wilson was born into an impoverished home in Jersey City, N.J., and quit school in 1950 at age 16 to join the Air Force. He served for four years and was discharged in 1954 but not before he had made a reputation as an entertainer and acquired the nickname "Flip" for his irreverent brand of humor. After his discharge, Wilson spent nearly a decade working at odd jobs and developing a comedy act at various night clubs. It wasn't until Hollywood began to actively seek out black entertainers in the 1960s that he got his first big break. He made his TV debut on "The Tonight Show" in 1965, and that led to many other appearances and, ultimately, his own popular variety series in 1968. He won one Emmy for performance and one for writing in 1971. Wilson died in 1998.

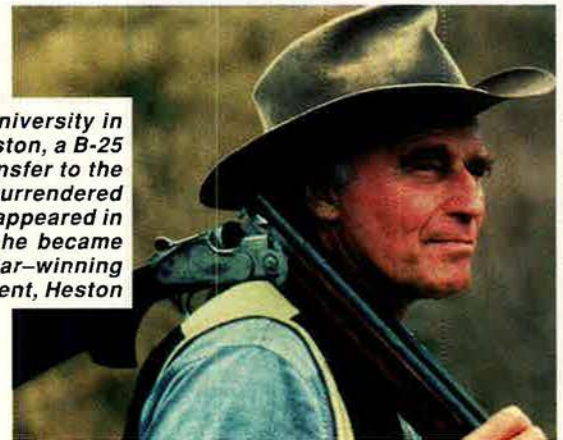


Clifton L. Taulbert, Acclaimed Author

*Clifton L. Taulbert began his service in the Air Force in 1964 at the 3320th Technical School in Amarillo, Texas, where he was chosen as squadron leader for his barracks. In 1967, Taulbert received an appointment to the prestigious 89th Presidential Wing, located in Washington, D.C. An account of his service time in the national capital was the starting point for his third book, the memoirs of his early adulthood, *Watching Our Crops Come In*. Taulbert also is the author of *The Last Train North* (nominated for a Pulitzer Prize), *Once Upon a Time, When We Were Colored*, and *Eight Habits of the Heart*. Taulbert is the 1996 recipient of the NAACP Image Award.*

Charlton Heston, Actor and Political Activist

During World War II, Charlton Heston was a student at Northwestern University in Evanston, Ill., but he left college to join the Army Air Forces in 1943. Heston, a B-25 radio operator and gunner, was part of a unit that was scheduled to transfer to the Pacific as part of Operation Olympic, the invasion of Japan, but Tokyo surrendered before the operation was launched. Heston was discharged in 1946. He appeared in his first major motion picture, "Dark City," just four years later, and he became known as Hollywood's pre-eminent epic actor, culminating in his Oscar-winning performance in "Ben Hur" (1959). A six-time Screen Actor's Guild president, Heston now serves as president of the National Rifle Association.



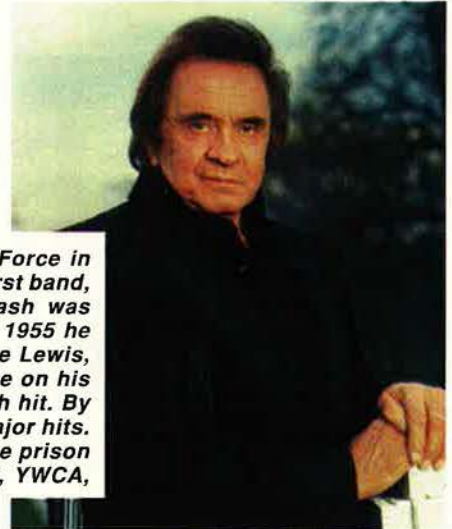
George C. Wallace, Governor of Alabama

George C. Wallace, a new law school graduate, entered the Army Air Forces in 1942 and served as a B-29 flight engineer in the Pacific. He was discharged in 1945 and immediately jumped into Alabama politics, getting elected to the state House of Representatives the next year. He ran twice for governor, succeeding on his second try and taking office in 1963 with the notorious rallying cry, "Segregation forever." He ran unsuccessfully for President three times; in his 1972 campaign, he was shot and paralyzed in an assassination attempt. However, he was elected to two more terms as governor. In 1982, he declared that he had been wrong to promote segregation. For the next 16 years, he freely apologized and openly repudiated the hard racist line he took early in his career. He died in 1998.



Jack Price, President, Aerospace Education Foundation

Jack Price enlisted in the Air Force in 1947 and was discharged as a sergeant in 1953. His active duty service marked only the beginning of a long association with the Air Force and aerospace issues, however. He worked many years as an Air Force civilian at Ogden Air Logistics Center, Utah, rising to hold key positions such as chief of the Missile and Aircraft Systems Division, chief of the Aircraft Division, and deputy director of distribution. He served as national president of the Air Force Association (1988–90) and AFA chairman of the board (1990–92). He currently is president of AFA's Aerospace Education Foundation.



Johnny Cash, Singer–Songwriter

The “Man in Black” bought his very first guitar while stationed with the Air Force in Landsberg, Germany, in the early 1950s. It was there, also, that he formed his first band, “The Landsberg Barbarians,” to play in nearby clubs and honky-tonks. Cash was discharged as a sergeant in 1954 and promptly moved to Memphis, where in 1955 he signed a recording contract with Sun Records, joining Elvis Presley, Jerry Lee Lewis, and Carl Perkins. His first Sun recording was “Hey Porter,” a song Cash wrote on his return home from the Air Force. The flip side, “Cry, Cry, Cry,” became a smash hit. By 1956, Cash had recorded “Folsom Prison Blues” and “I Walk the Line,” both major hits. During a long and successful music career, Cash has generously supported the prison reform movement, mental health organizations, the American Cancer Society, YWCA, Youth for Christ, Native American causes, and humane societies.



Carroll H. Shelby, Race Car Driver and Designer

Eighteen-year-old Carroll H. Shelby enlisted in the Army Air Forces in November 1941, serving four years as a flight instructor. He was commissioned toward the end of his tour and was discharged as a second lieutenant. In 1952, he entered his first auto competition—a quarter-mile drag race—and within five years was named Sports Illustrated Driver of the Year. He built the CSX, the first Cobra sports car, in 1962; a year later, the Cobra won the US Road Racing Championship. Ford Motor Co., impressed with the maverick race car designer, asked him to develop a high-performance Mustang fastback, which he did. Shelby was elected to the Automotive Hall of Fame in 1992.

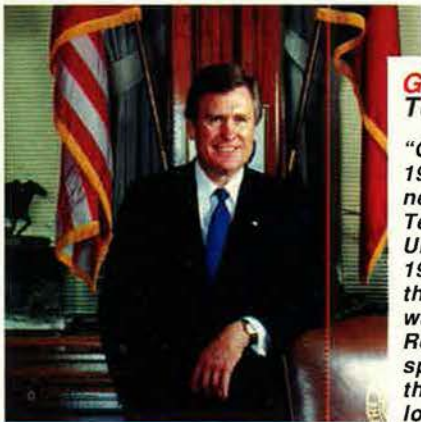


Gene Autry, Film, Recording, and Radio Star

Gene Autry was sworn into the Army Air Corps in Chicago in 1942, during a broadcast of his nationally famous radio show, “Melody Ranch.” He entered the service as a technical sergeant and, after attending basic training, he served with a squadron at Luke Field, Ariz. Eventually, Autry was accepted for flight school. He became a flight officer and was transferred to Air Transport Command. When the war in Europe ended in May 1945, Autry was reassigned to Special Services and toured with a USO troupe in the South Pacific. After the surrender of Japan, Autry was discharged and resumed his civilian career in 1946 as America’s favorite singing cowboy. Autry is the only entertainer to have five stars on the legendary Hollywood Walk of Fame—one each for radio, records, film, television, and live performance. He died in 1998.

Terry Everett, Member of Congress

The son of a south Alabama sharecropper, Terry Everett entered the Air Force in 1955 and served as an intelligence specialist in Europe, where he also participated in community theater as an actor and publicist. Discharged in 1959, he returned to his home of Dothan, Ala., and began a civilian career as a farm and police beat reporter for the local newspaper. He eventually became the owner of a chain of newspapers throughout the southeastern US. In 1992, he began his first political campaign as a virtual unknown and wound up defeating a man with the most famous name in Alabama politics, George C. Wallace Jr., son of the former governor and Presidential candidate. With that victory, he became representative for Alabama's second district. He is a member of the House Armed Services and Veterans' Affairs Committee.



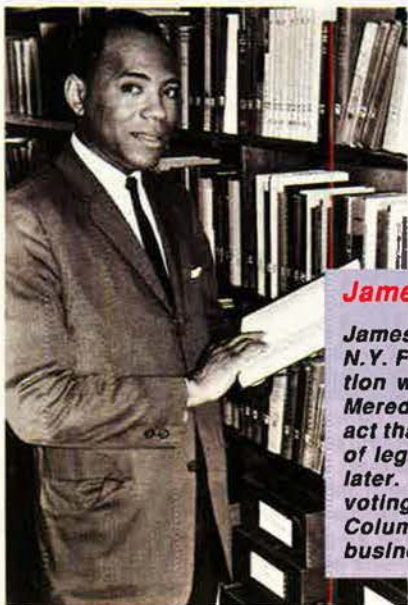
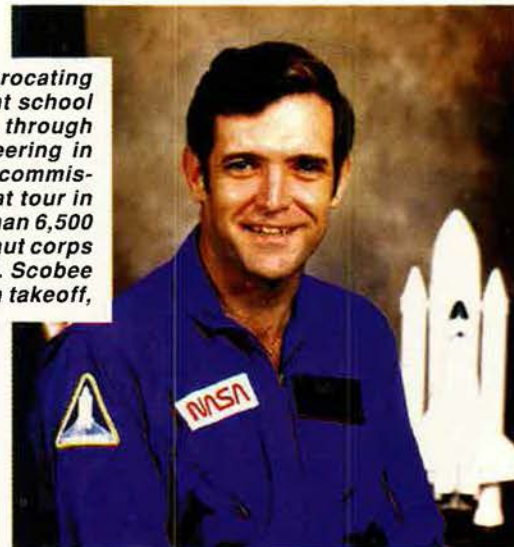
Gibson D. Lewis, Speaker of Texas House

"Gib" Lewis entered the Air Force in 1956 and served as a B-52 aerial gunner. While stationed at Carswell AFB, Texas, he attended Texas Christian University and, after his discharge in 1961, took a sales job for three years, then started his own business. He was elected to the Texas House of Representatives in 1971. He became speaker in 1983 and was re-elected to that post four more times, serving longer than any predecessor.



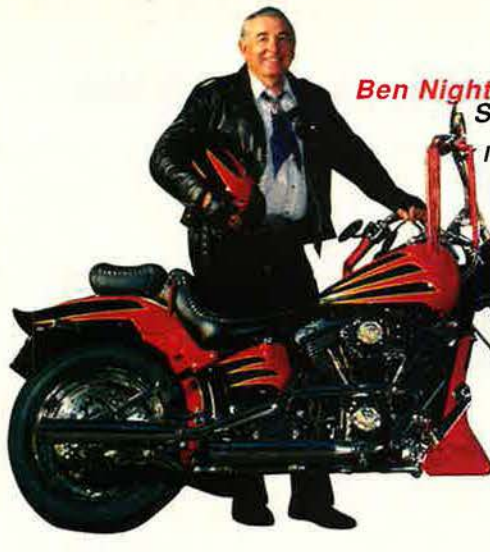
Francis Richard Scobee, Astronaut

Dick Scobee enlisted after high school and received training as a reciprocating engine mechanic, but he was driven by a desire to fly. After attending night school he was selected for the Airman's Education and Commissioning Program, through which he won a degree at the University of Arizona in aerospace engineering in 1965—making an officer's commission and pilot training possible. He was commissioned in 1965 and, a year later, received his wings. He completed a combat tour in Vietnam and went on to become a test pilot for the Air Force, logging more than 6,500 flight hours in 45 types of aircraft. In 1978, Scobee entered the NASA astronaut corps and made his first spaceflight in 1984 as the pilot of the shuttle Challenger. Scobee was the shuttle commander when, on Jan. 28, 1986, Challenger exploded on takeoff, killing all members of the crew.



James H. Meredith, Civil Rights Pioneer

James H. Meredith joined the US Air Force in 1951, attending basic training at Sampson AFB, N.Y. From then until his discharge in 1960, he waged a campaign against racial discrimination wherever he encountered it in the armed services. After his stint in the Air Force, Meredith returned to Mississippi to apply for admission to the University of Mississippi, an act that led to his being the first African-American to attend the institution. After two years of legal wrangling, he integrated the "Ole Miss" student body in 1962, graduating a year later. Meredith pursued civil rights causes, and in 1966, he was shot while conducting a voting rights march from Memphis, Tenn., to Jackson, Miss. After getting a law degree from Columbia University in 1968, he worked on Wall Street for several years, then ran several businesses. He has also authored numerous books.



Ben Nighthorse Campbell, US Senator

In 1951, Ben Nighthorse Campbell left high school to join the Air Force. First stationed at Lackland AFB, Texas, as a model maker, he was—at his request—reassigned to Air Police School and then to South Korea, where he served until he was discharged in 1953 as an airman second class.

Campbell acquired a GED diploma while in Korea and intensified his training in judo. After he left USAF, he attended San Jose State University, from which he graduated in 1957. He became a college All-American in judo and was captain of the US judo team at the 1964 Summer Olympic Games in Tokyo. Campbell, who is a Republican, was elected to the Colorado legislature in 1982, the US House in 1986, 1988, and 1990, and the US Senate in 1992 and 1998. Campbell became the first Native American to serve in the Senate in more than 60 years.



Mike Connors, TV Actor

During the years that he served as an enlisted man in the Army Air Forces of World War II, he was still Krekor Ohanian of Fresno, Calif. Not long after his discharge, though, he became Mike Connors, one of the most recognizable actors in Hollywood. Ohanian, while attending UCLA after the war on a basketball scholarship, was discovered by director William Wellman, who encouraged him to pursue an acting career. He did. In his first movie, he starred opposite Joan Crawford in 1952's "Sudden Fear." Connors starred in three television crime dramas, "Mannix," "Tightrope," and "Today's FBI." He has made hundreds of television appearances and was nominated for three Emmys and several Golden Globes—winning one in 1970—as best actor in a drama series.



Walter H. Beech, Aviation Pioneer

Walter H. Beech made his first flight at age 14 in a glider made out of his mother's bed sheets and a wooden frame, a flight that ended in disaster for the aircraft but which did not dim his enthusiasm for flying. In 1917, he joined the Aviation Section of the US Signal Corps and was assigned to Kelly Field, Texas, where he provided services as both a pilot instructor and aircraft engine specialist. He was discharged in 1920 and began barnstorming in war-surplus Standards and Jennies. In 1923 Beech was placed in charge of field work for Swallow Airplane Manufacturing Co., but he left in a dispute over whether a new aircraft should use metal—his choice—or wood. In 1925 he co-founded a new company, Travel Air Manufacturing Co., which merged with Curtiss-Wright Corp. In 1932 he co-founded Beech Aircraft Corp., which supplied 7,400 military aircraft during World War II. He died in 1950.

Mack F. Mattingly, Senator, Diplomat

Mattingly joined the Air Force in 1951 at age 20 and left four years later after attaining the rank of staff sergeant. After discharge, he graduated from Indiana University and moved to Georgia. There, Mattingly entered politics and, in 1980, became the first Georgia Republican since Reconstruction to be elected to the US Senate, where he served one term. In 1987, the Georgian was chosen to serve as NATO assistant secretary general for defense support in Brussels, Belgium, a position he held until 1990. Mattingly later served as US ambassador to the Seychelles, 1992-93. He is active in both the Georgia Republican Party and the national GOP and works as a speaker and author on defense, foreign policy, and economic issues. In 1998, he became chairman of the Southeastern Legal Foundation.



It may be necessary to change the spending caps to stop the decline of the armed forces, he says.

Inhofe on Readiness

SEN. James M. Inhofe promises that the Senate Armed Services Subcommittee on Readiness and Management Support, which he chairs, will pursue an "ambitious agenda" in the new Congressional session to reverse the erosion in military capability.

"We've got to stop the hemorrhaging of readiness," Inhofe said in an interview.

The nine hearings the Oklahoma Republican plans to hold before the committee marks up the Fiscal 2000 defense authorization will focus on readiness at the operational command level, rather than on the overall services. A senior commander from Air Combat Command will be the lead-off Air Force witness, for example.

The initial hearings also will examine the impact the heavy load of contingency operations is having on readiness, said Inhofe, who fought against US involvement in Bosnia and is "strenuously opposed" to a new commitment in Kosovo.

And because of the expanded jurisdiction of his panel due to a reorganization of Senate Armed Services, Inhofe has scheduled three hearings on the effort to reform Pentagon business practices and financial management.

"We believe there are tens of billions of dollars that can be saved through better business practices," he said. Those savings can "significantly benefit readiness, modernization, and quality of life in the armed services."

But the main thrust this year "is to try to get the overall funding for defense up to where the chiefs and the Chairman want it," Inhofe said,

referring to Joint Chiefs of Staff Chairman Army Gen. Hugh Shelton and the other service chiefs.

That will require an additional \$25 billion a year in defense spending for six years, he said.

Waiting for the Dough

Although President Clinton said he was adding \$112 billion to the six-year defense plan, "the reality is, we never get there," Inhofe said. That referred to the Administration's history of offering less in each budget year than had been projected for that year in previous spending plans.

Even in the first year of the new defense plan, Inhofe said, the announced \$12 billion increase "really is only \$2 billion of new money." Another \$8 billion is in inflation adjustments, credits, and rescissions, and \$2 billion is claimed by using the Fiscal 1999 level that Clinton proposed, not what the Pentagon actually got, he said.

"Even if taken at face value, the President's proposal does not meet the full requirements for military readiness spelled out by the Joint Chiefs in their testimony last November," Inhofe said in a release. "I believe we can and must do better to provide adequately for our nation's military strength."

The Senator conceded that despite the unexpected large surplus predicted next year, the GOP majority cannot provide additional funds for defense within the spending limits, or caps, set by the balanced budget agreement.

"We're going to have to bust the caps and address it somewhere else," he said.

By Otto Kreisher

That could mean shifting part of the total discretionary spending allowed by the budget act from social programs to the Pentagon budget.

Inhofe pointed out the large increases in defense spending that were approved in the early 1980s to correct the massive readiness problems reflected in what became known as the "hollow force."

"We could argue that we're back to that state," he said.

"I don't look at this as something that's not doable," he declared.

Inhofe said the committee would seek to maintain a "deliberate balance between modernization and quality-of-life issues" in deciding where to add funds.

One of the biggest quality-of-life concerns, he said, is the deplorable state of the services' family housing and barracks.

"I've been in rainstorms in barracks where it rains on you inside," Inhofe said. "Putting people inside those kinds of buildings is no way to maintain a quality force."

In a recent press release, Inhofe said national defense will be a key issue on the GOP agenda for the 106th Congress. That is demonstrated by the early push for the service members' "Bill of Rights" legislation, which would provide the first substantial increase in pay and military benefits in 15 years, he said.

The bill, approved by Senate Armed Services with some Democratic support, would give a 4.8 percent general pay raise, in place of the Administration's proposed 4.4 percent hike. It also would provide for higher pay hikes for midcareer personnel and restoration of the 50 percent retired pay after 20 years.

"Republicans in Congress are determined to restore national defense to the priority it deserves on the national agenda," Inhofe said.

Clinton's "Anti-Military" Legacy

"In a world of growing threats, we must begin to reverse the debilitating anti-military legacy of the Clinton years. We must take bold steps to improve readiness and morale, to embark on a long-delayed modernization of our forces, and to commit to the deployment of the most affordable and technologically feasible national missile defense system," he said in the statement.

The President's proposed defense

budget "remains inadequate to the needs that are unfilled and the threats that are growing," Inhofe said.

An experienced civilian pilot, Inhofe also objected to the new budget's proposed level of funding for flight hours, particularly for the Air Force.

Of the four categories of flight hours set out in the budget, one is increased by what amounts to "six minutes per month" while two others "are down considerably," he said.

In addition to cutting flight hours, "they're also bringing down the advanced combat training at Nellis [AFB, Nev.] by one-third," he added.

That vital training is being cut "because they are starved for funding," Inhofe said.

The money is going to pay for "deployments to areas where we shouldn't be ... instead of keeping skills where they should be," he said, citing particularly the Balkans.

Inhofe recalled that he has made many visits to Air Force and Navy installations in an attempt to find the causes of plunging pilot retention rates and that the departing aviators cited concerns over poor maintenance, lack of spare parts, and excessive cannibalization.

The pilots are not leaving just because there are a lot of jobs on the outside, he said, contending, "It's the loss of mission in this country. That's what those guys say."

Inhofe is a staunch, unwavering member of the Congressional Depot Caucus who has resisted DoD efforts to outsource jobs and has been one of the strongest opponents of additional rounds of base closing. As such, his new focus on saving money by improving Pentagon business practices and management may seem to be something of a switch. However, Inhofe states plainly that he thinks there is a place for some privatization of defense jobs, but not in all areas. The services can save large sums by improving the acquisition process and other business practices, he added.

Inhofe said his feelings on reauthorizing the Base Realignment and Closure Commission process "is unchanged." By that, he said, "I believe we have excess infrastructure and we ought to do something about it. I'm not opposed to BRAC, but we saw the President and [Vice President] Al Gore politicize that issue the last time," he said.

Execution

Inhofe referred to Clinton's efforts to soften the economic blow of the 1995 BRAC decision to close USAF Air Logistics Centers at Kelly AFB, in San Antonio, and at McClellan AFB, in Sacramento, Calif. On the eve of his 1996 re-election campaign, Clinton promised the citizens in the two vote-rich states a "privatization in place" program that could have meant private contractors taking over most of the government jobs at the two depots, instead of transferring the work to other ALCs.

That would have left the three remaining Air Force depots—including Oklahoma City ALC in Inhofe's state—underutilized and vulnerable for closure in another BRAC round.

In the first rounds of the closely watched competition between public depots and private aerospace contractors, however, the Air Force awarded most of the McClellan workload to the Ogden ALC, at Hill AFB, Utah, and to Boeing, a private contractor using old Air Force facilities at Kelly.

The last portion of the 1995 controversy was resolved Feb. 12 when the Air Force awarded a contract that would have the effect of shifting to another location most of the engine repair work that until now has been performed at Kelly. The winner of the new 15-year, \$10.2 billion contract was a public-private industrial team led by the Oklahoma City ALC, which is located at Tinker AFB, Okla.

"This decision affirms essential fairness in the BRAC process, which had been called into question during the 1995 base closing round," Inhofe said in a statement. He also noted that the contract "means more jobs and security for Tinker."

Inhofe now wants to study the Kelly contract process in detail. "Assuming he's satisfied it was a fair and reasonable process, he's leaning toward supporting another round of BRAC," spokesman Gary Hoitsma said.

Until the latest contract award, Inhofe had always maintained that, because "this President has demonstrated that he will circumvent the BRAC process if it's to his advantage," he could not support additional closure rounds while Clinton is in office and "until they fulfill the

requirements in the 1995 BRAC report."

Defense Secretary William S. Cohen, a former Republican Senator, has asked Congress to authorize BRAC rounds in 2001 and 2005, both of which would come after Clinton leaves office.

Inhofe said he also objected to the way the old process forces every community with a military installation to endure "BRAC purgatory" until the commissions issue their final reports. The most recent BRAC rounds saw potentially vulnerable communities spend millions of dollars hiring lobbyists "to protect their interest" during the process, he said.

If the services would be more specific in the kinds of bases they need to close, a lot of communities would not have to go through that process, Inhofe said.

He and others pressed Cohen during the initial defense budget hearings to provide that kind of information.

Although Cohen implied that the services do not have a list of bases they would like to close, Inhofe said they must, or they could not offer such precise predictions of how much they would save through two more closure rounds.

A lot of Inhofe's own constituents could experience BRAC purgatory in any future rounds as his state is home to two large installations—Tinker AFB and the Army's Ft. Sill—and two smaller Air Force bases—Altus and Vance.

National Missile Defense

Inhofe is one of the Senate's strongest advocates of ballistic missile defense, particularly championing a national defensive system to protect the US homeland from attack.

He gets openly angry over Clinton's declaration in his State of the Union speech two years ago that "not one missile is aimed at American children."

Even if the Russians really have removed the targeting data on American cities from their nuclear-armed missiles in response to the US de-targeting agreement, Inhofe said, "He knew Chinese missiles were aimed at us."

And although most Americans believe the nation has the missile defense shield that then-President Ronald Reagan first advocated in

1983, there is no such system, and the US would not be able to block a single incoming missile, he said.

In a statement after Clinton's most recent State of the Union address in January, Inhofe complained that the President never mentioned missile defense in the 77-minute speech.

He noted that when Cohen made an announcement on missile defense the following day, he finally acknowledged that "what Republicans had been saying for the last three years was true: that the missile threat to the United States is real, immediate, and growing."

But the Administration has still refused to commit to deployment of a national system, deferring a decision until mid-2000, Inhofe said. And Cohen delayed the expected date for an operational national defense by two years, to 2005, he noted.

Although the land-based system currently being planned for the national defense has not been developed or tested, Inhofe and others believe that a limited national shield could be provided sooner by using the Navy Upper Tier theater missile defense system.

The Navy Upper Tier, or theaterwide system, also has not been tested. But it would build on the lower tier or area defense system being developed to use the capabilities of the powerful Aegis air-defense systems on a fleet of Navy cruisers and destroyers.

Inhofe supports the decision in the Fiscal 2000 budget to combine funding for the Navy Upper Tier program and the Army's Theater High Altitude Area Defense, or THAAD, system, which has had five straight test failures.

"I've felt all along that Navy Upper Tier is the sensible way to go," he said.

By concentrating funds on the Navy program, Inhofe said, the nation could have in place in 18 months a sea-based system that could defend deployed forces and much of the United States against small-scale missile attacks.

Inhofe served in the US Army, but he has become a strong advocate of air superiority and airpower. He sup-

ports provision of full funding for the big tactical aircraft programs, including the Air Force's F-22 fighter and the multiservice Joint Strike Fighter.

He also supports the planned improvements in strategic airlift capabilities, including buying extra C-17s and improving the C-5s.

Inhofe also is a champion of the National Guard and Reserves, pointing to the increasing reliance all of the services place on their part-time warriors in the current rash of contingencies.

He plans to have the Army National Guard commander testify in the same readiness hearing with the commanders of the Army's four active duty combat corps.

"That will send a good message to the Army and the Guard," he said.

Inhofe said that, after clearing the authorization, his panel will hold more hearings into the readiness of the Special Operations Command and US forces in Korea, the status of the arsenals, ammunition plants, and munitions requirements, and pre-positioned assets.

The subcommittee then will examine the status of family housing privatization programs, training for combat in urban terrain, just-in-time logistics, maintenance, and wartime sustainability.

And, with the dual interest as the military readiness panel chairman and as a Senator from an oil-producing state, Inhofe plans to hold a hearing on the potential threat that the nation's growing dependence on foreign oil poses to military readiness and national security.

America currently imports over 56 percent of its oil needs, which is more than it took in prior to the second major oil crisis, which erupted in the late 1970s. "Today, our domestic oil and gas industry is in crisis," he said. "Domestic producers are overregulated compared to their overseas competitors, and many are being forced to sell below cost because of the flood of foreign imports. This situation not only threatens readiness but also increases our vulnerability to armed conflicts in other parts of the world." ■

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If the Air Force does not integrate space into its operations and culture, it could lose the space mission.

The Move Into Space

THE Air Force must get serious about fully integrating the use of space into its operations and its culture, or it will risk losing the space mission to some other organization.

That warning was issued by a panel of former senior Air Force officers and civilian experts at a Jan. 12 forum held by the Eaker Institute, the public policy and research arm of the Air Force Association's Aerospace Education Foundation.

"The Air Force must get on with aerospace integration, and we must get it right," said retired Gen. Thomas S. Moorman Jr., a former Air Force vice chief of staff and former commander of Air Force Space Command.

Retired USAF Gen. Howell M. Estes III, former commander in chief of US Space Command, issued a blunt warning. "If we don't change the culture of the Air Force to an *aerospace* culture, you can kiss space goodbye," Estes said. "It is not going to stay in the Air Force."

Much the same message was delivered by Rebecca Grant, who has been an advisor to top Air Force leaders and is now president of IRIS, a defense consulting firm. Said Grant:

By Otto Kreisher



"Either the Air Force will continue to integrate its capabilities, improving its aerospace power, or the march to space will continue on without it."

The panel of experts also included John M. "Mike" Borky, a retired Air Force officer who now is a senior technical fellow with TRW, Inc. He recently led an Air Force Scientific Advisory Board study that produced a new space roadmap for the service. Borky and the other members of the panel took special note of the rapid growth of commercial space assets and warned that the Air Force must make greater use of those capabilities and not try to duplicate them with its limited budget.

Striking From Space?

Grant asked the panelists if the Air Force also must think about acquiring the ability to apply force from space, "either on other things in space or on things on the surface of the Earth."

Borky said he approaches the question of applying force from space exactly as he would consider putting a new munition on an aircraft. "The question ought to be: What is the most operationally and economically effective means of prosecuting a target? Space has some tremendous advantages, speed and assured access being high on that list."

Moorman said, "People have been thinking about striking things from space for some time." At some point in the future, a situation will emerge in which the United States needs that capability and "it will be criminal if we have not worked the technology problem," he said.

The panel members agreed that the Air Force must prepare now to defend all of the critical US space assets, both commercial and military, against the inevitable attempt to attack this vital national resource.

The overriding message was that space is of rapidly escalating importance to US military and commercial strength and the Air Force must adapt or risk becoming irrelevant.

Moorman and Estes pointed out that the Joint Chiefs of Staff's "Joint Vision 2010," the Army's "Army After Next," the Navy-Marine Corps' "... From the Sea," and the Air Force's "Global Engagement" all depend heavily on space assets.

"That key enabler is information," Estes said. "Virtually all the infor-

mation that is going to flow to warfighters—air, land, and sea and space forces—is going to flow through space. Space has been critical to the military in the past. It is growing in importance."

"The 20th century was an airpower century," noted Grant. "The 21st century belongs to aerospace power. But now, the key issue is: How will the Air Force step forward and take that leadership?"

To demonstrate the possible competition for the space mission, Grant cited a Navy publication's declaration that space is an "ocean" and that "an ocean is where navies go."

The Panelists

Dr. John M. "Mike" Borky: A technical fellow with TRW and chief engineer, Technical and Training Services Strategic Business Unit for TRW. He has served on many government and industry study groups concerning military and space operations. He has extensive experience managing programs in spacecraft electronics and avionics.

Gen. Howell M. Estes III, USAF (Ret.): Former commander in chief of US Space Command. He also served as director for operations on the joint staff and during the Gulf War was the deputy chief of staff for operations at Strategic Air Command.

Gen. Thomas S. Moorman Jr., USAF (Ret.): Served as Air Force vice chief of staff prior to retirement from the Air Force in 1997. He also served in a variety of intelligence and reconnaissance related positions and as commander of Air Force Space Command.

Dr. Rebecca Grant (moderator): President of Independent Research and Information Services, Corp. (IRIS). She is a former RAND analyst who also served as a member of the personal operations staff for former Secretary of the Air Force Donald B. Rice and former Air Force Chief of Staff Gen. Merrill A. McPeak.

Although not mentioned at the forum, the institutional danger for USAF could be seen in a proposal by Sen. Bob Smith (R-N.H.), a Senate Armed Services Committee member, to create a separate service, if necessary, to incorporate all the space assets and functions now spread over three military services and various civilian agencies. Smith's goal, in part, would be to give the space mission stronger institutional clout.

Beyond the risk of losing the space mission to another organization, the Air Force must make better use of space if it is to meet future requirements, panel members agreed.

The way the Air Force handles the challenge of integrating air and space will shape its future and "impact everything in the 21st century," said Moorman. This, he said, would include doctrine, operational concepts, weapon systems, education and training, and personnel policies, as well as issues of "how we fight, ... how we think about ourselves, and how we think about our craft."

Major "Cultural" Shift

"Accordingly," Moorman continued, "the integration of air and space, I believe, will require major cultural change. ... It will also require a new operational paradigm."

Borky pointed out that the world security environment is changing rapidly and that contingencies may arise anywhere in the world. What is more, there is "a growing level of ambiguity about the threat," the veteran systems engineer said.

That makes it hard for commanders to know if they have picked the right course of action, and it puts "a premium on flexibility," he said. The Air Force will be expected to react more quickly and to "deliver exquisitely precise application of force," Borky continued.

"There is effectively no way to do that, which I can see, that doesn't involve an integrated air and space force," he concluded.

The Air Force is becoming a US-garrisoned force with global commitments, Borky said, and for that reason, "the magic word today is expeditionary." However, there is no effective way to deploy, set up, employ, and sustain an expeditionary force that does not require "far more effective use of space than we are able to make today," he said.

Moorman emphasized the same point, declaring, "The expeditionary forces are enabled by space, but we've got to make that linkage a lot tighter to get the kind of leanness that we need."

All of the panelists noted that the Air Force has started the required process of evolution, first described by Gen. Ronald R. Fogleman, the former Chief of Staff, in 1996 as a slow transition from today's *air* force to an *air* and *space* force on the way to becoming a *space* and *air* force.

The Air Force already "provides integrated aerospace power to the joint warfighter," Grant said.

The US military started using space heavily late in the Vietnam War. The defense establishment began to get organized in a major way in the 1980s by creating the three service space commands and a multiservice unified space command. It used space capabilities in a more visible way in Grenada, Libya, and Panama, Moorman observed.

However, said Moorman, it was in 1991's Operation Desert Storm that "space really became appreciated for ... what it brings to the fight."

Already, Estes noted, the Air Force has transferred all or part of five missions to space and will shift more missions there for the same reason. "You can do the missions better from space," Estes explained.

Moorman and Borky agreed. "An integrated aerospace force is the most operationally effective way to employ forces for the joint and the coalition fight," Moorman said. "Aerospace forces will allow us to find, fix, track, target, engage, and assess any target, any opponent, globally, 24 hours a day, all-weather. ... We are not totally there yet, but we are pretty close."

Because the US military of the near future can expect to operate with "severely constrained resources," Borky said, "every military task has got to be approached from the standpoint of: What is the most affordable way to accomplish it?" In most situations, he argued, that will involve using a "system of systems," which will be tied together by space assets.

Commercial Explosion

Moorman, expanding the discussion somewhat, noted that the importance of the commercial space world is "exploding" and will continue to grow for a long time. "What that means is, we are going to have a different world in the 21st century," he said.

Spending on commercial space is growing 20 percent a year, compared to a growth rate in the government space field of just 2 percent, Moorman said. At that rate, there soon will be "trillions of dollars in assets" in space.

Borky expanded on that theme.

"As commercial space becomes overwhelming, ... there will be options to provide space capabilities from commercial, or at least non-developmental, sources, far more affordably than what we have been accustomed to thinking about in the past," he said.

The Air Force must "find much more effective ways to use commercial space, both products and services, to satisfy military needs," Borky said.

That will require an active and continuing dialogue with industry, he said. To determine the best way to fill a military space requirement, the military "has to know what commercial space can bring to the party," he said.

At present, "a host of obstacles" in law, in regulations, and in culture stand in the way of the effective use of commercial products and service, Borky said. However, he added, "I can see no affordable solution that does not involve overcoming those barriers."

Estes picked up on that issue, declaring that anyone who does not believe that space is emerging as "an economic center of gravity for our country ... [is] not paying attention" to what is going on. "It is a fact—lots and lots of money [is] going to space worldwide and lots of investment in this country," the recently retired space commander said.

There is no way the Air Force can match what the commercial space sector is doing and no reason it should try, Estes said.

One problem with the rapid improvement in commercial space facilities, Moorman said, is "the availability of data to adversaries. ... They can get remote sensing data, navigation data, and communications data" at a relatively affordable price.

"Hell to Pay"

Another concern is that as commercial space becomes an imperative for US national security and its way of life, "there will be hell to pay" if it were interrupted, Moorman said.

"The United States Air Force, as the space service, will be required, I believe, to protect those resources," he said.

The Air Force has worried about national security satellites for years but now must think about protecting the investment in commercial space, Moorman said.

Estes also pointed out that as space becomes more important to the US and the global economy, as well as to the military, it will be "a source of national power for nations."

And if it is a source of national power, "somebody is going to come along and challenge it," he said.

"We've got to pay attention to protecting this huge investment that this nation and other nations are making in space," Estes added. "If we don't do that ... we are going to find ourselves in a position where we find them at risk and are unable to respond to it."

Borky agreed that as space becomes a vital national economic interest, it will "sooner or later tempt our adversaries to find and exploit weaknesses."

That means the Air Force inevitably will be "called upon to protect not just the property but the freedom of action of our nation's citizens."

"Space is going to be thrust upon us as a security challenge in its own right, and we had better be getting ready to meet it," Borky said.

Moorman pointed out that Space Command always has considered protecting US national security space assets part of its mission.


"But, as all the speakers have pointed out, the commercial world demands we understand ultimately how to protect that asset," he said. "By the way, right now, they are not real interested in being protected." ■

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The big guns pouring it on from a pylon turn can ruin an enemy's whole day.

The Awesome Power of Air Force Gunships





This time exposure shows the concentration of firepower from an AC-119 as it pours out the "dragon's breath" on enemy positions in Vietnam.

By Walter J. Boyne

IN warfare, timing is critical, and few weapons have had better timing than the gunship, the epitome of on-scene firepower in the Vietnam War. History, requirements, resources, and—most of all—personalities, all came together at a critical moment to create a piece of side-firing airborne artillery, a weapon North Vietnam considered one of the most important of the war.

Whether they were Puffs, Spookys, Spectres, Shadows, or Stingers, the gunships brought intense, lethally accurate fire to the enemy's doorstep, busting trucks and saving the lives of countless friendly personnel.

Putting a fixed side-firing weapon on an aircraft was first proposed in 1926, when 1st Lt. Fred Nelson experimented with a de Havilland DH-4 at Brooks Field, Texas. Nelson mounted a .30-caliber Lewis machine gun on the wing and flew "pylon turns" to keep the gun on target, thus demonstrating the very essence of the concept almost 40 years before it appeared on the battlefield.

The United States did not have a monopoly on the idea. In 1932, French military designers installed a fixed side-firing Schneider P.D. 12 75 mm cannon in a four-engine Bordelaise A.B. 22 bomber. The A.B. 22 was intended for use in France's colonial possessions, one of which, ironically enough, would become the venue for US gunships—Indochina.

In April 1942, 1st Lt. Gilmour C. MacDonald of the 95th Coast Artillery proposed fitting a Piper Cub



with a side-firing machine gun for anti-submarine operations. MacDonald's gunship idea was passed over, but he resurrected it in 1961 when, as a lieutenant colonel, he advocated transverse firing of rockets and machine guns by liaison aircraft. This time, he was backed by Ralph E. Flexman, an assistant chief engineer at Bell Aerosystems, who was intrigued by the challenge of limited war and counterinsurgency actions and was drawing inspiration from an unusual source.

Missionary Work

Flexman had heard stories of a missionary named Nate Saint who had been able to air-deliver mail and supplies to remote villages by lowering them in a weighted pouch. The pouch remained stationary over a point on Earth at the end of a long rope as he flew pylon turns around the point. Flexman reasoned that the straight line of the rope would translate into a straight line of gun fire at a single point on Earth if the gunship were flown in a similar pylon turn.

The requirement for additional firepower in Southeast Asia gave impetus to the side-firing idea. Preliminary tests of the concept were conducted at Air Force Systems Command's Aeronautical Systems Division at Wright-Patterson AFB, Ohio, by Capt. John C. Simons, as a part of Project Tailchaser. Simons encountered opposition; many people believed that a side-firing aircraft, particularly the C-47, would be far too vulnerable to enemy fire. There was



USAF photo

The first gunships—designated FC-47s—began operations, using the call sign "Puff," out of Bien Hoa, South Vietnam, in December 1964. The designation was soon changed to AC-47, like this one (top), photographed at Bien Hoa in 1965. Above, airmen check over an original homemade mount for a minigun aboard an AC-47.

also doctrinal concern that use of a fixed-wing gunship was playing into the hands of the Army, which was becoming ever more dependent upon the helicopter gunship.

Nonetheless Simons persisted, "bootlegging" missions in a North American T-28. No guns or sights were fitted, but Simons was able to validate the concept by marking the canopy with a grease pencil and flying the pattern.

More experiments were done by Capt. J.D. Boren and Capt. J.A. Birt in 1964, using a Convair C-131B. Cameras were used in place of guns,

and SSgt. Estell P. Bunch developed a gun sight for the pilot, Capt. Edwin J. Hatzenbuehler.

The stage was set for arrival of Capt. Ronald W. Terry as project pilot. Working with 1st Lt. Edwin Sasaki, Terry brought a unique combination of skills to the program. He had great common sense; while using existing technology, he kept his eye on the latest developments to improve the system. Terry was able to work the bureaucracy to his advantage, finding those who could say yes to his program needs and avoiding those who might say no.

The results were gratifying; Terry is one of the few individuals in military history who helped create a totally new weapon system and tested

it in combat himself. He then went on to create improved systems and test them in battle, as well. By taking available equipment and conforming it to new requirements, he was able to compress development into amazingly brief periods; as an example, he took the first gunship from project to combat in only six months.

For Lt. Col. Jack S. Ballard, author of *Development and Employment of Fixed-Wing Gunships, 1962-1972*, MacDonald rated as the "originator," Flexman the "catalyst," Simons the "tester," and Terry the "seller" of the gunship system.

Terry was the architect of the first and all subsequent gunship weapon systems, proving them in design, test, and combat evaluation. His small team designed and built the installations themselves, scavenging parts and ideas. They combined the most innovative technology (first use of low-light-level devices and infrared sensors in combat) with a 1935-era airframe.

LeMay Says Go

A personal briefing to Gen. Curtis E. LeMay, Air Force Chief of Staff, on Nov. 2, 1964, secured permission for Terry to modify a C-47 and test it in combat. The need was great. With Viet Cong guerrillas and North Vietnamese regulars infiltrating the South, a flexible, rapid, and effective means of defense was required. The gunship offered a solution.

Terry began operations out of Bien Hoa AB, South Vietnam, during December 1964. The Air Force had created two FC-47s ("FC" meant "Fighter Cargo," an unusual designation) by installing GE SUU-11A 7.6 mm Gatling guns, a gun sight cobbled up from a crosshair reticle and a 16 mm camera reflex viewfinder, and a supply of flares. Terry trained crews of the 1st Air Commando Squadron in techniques of gunship operation, which involved boresighting the equipment, acquiring a target, entering an orbit pattern, and then adjusting it as required to fire on the target.

Dec. 15 marked the first of several successful day missions with Capt. Jack Harvey as aircraft commander. Eight days later, the first night mission had a double success. The first part of the sortie was flown at Thanh Yend, in the Mekong River Delta, where the FC-47 dropped 17 flares and expended 4,500 rounds of ammunition, causing the Viet Cong to break off their assault. Then it was sent to Trung Hung, where, under a barrage of 4,500 rounds of ammunition, the Viet Cong again were forced to leave.

Reports streamed in validating the usefulness of the weapon. There were challenges: A night illumination system was needed, and the flares, some dating to World War II, often did not work. But no one who saw the fountain of fire pouring from the FC-47s could ever forget it. The very sound and fury of the FC-47 raised



USAF photo

This view from the open cargo door of an AC-47 shows the fountain of fire the gunships unleashed. Looking for an aircraft that could carry more equipment and weapons safely for longer periods, USAF then converted C-130s to gunships.

South Vietnamese morale even as it "spooked" the VC, and the aircraft soon got affectionate nicknames such as "Puff" and "Dragonship." The call sign "Spooky" was assigned to early gunship operations.

In summer 1965, Pacific Air Forces asked to have a 16-gunship squadron in place by the following November. The 7.62 miniguns were excellent weapons but were in short supply. Terry improvised, getting authorization from the commander of Air Force Logistics Command, Gen. Mark E. Bradley, to take 300 old M-2 .30-caliber machine guns from a McClellan AFB, Calif., warehouse and install them, 10 at a time, in four C-47s.

The 4th ACS arrived at Tan Son Nhut on Nov. 14, 1965, and began combat training a week later. It was soon operating on a full-time basis, defending hamlets in South Vietnam and flying day armed reconnaissance in the Steel Tiger area of Laos. By the end of 1965, the 4th ACS had flown 277 combat missions—but had lost two aircraft. The gunships, now designated AC-47s, had to operate low, slow, at night, and in bad weather. Forty-seven AC-47s went to Vietnam, but the courageous men who flew them were aggressive and determined to bring the war to the enemy. Casualties were inevitable, and 12 were lost.

The success of the AC-47s set in motion a dynamic that continued through the war and beyond. Spooky's

mission expanded to include interdiction of roads, trails, and rivers, and this greatly increased the demand for its services.

Communist Reaction

As Terry fought to improve the AC-47s, he pointed out the advantages a larger, faster aircraft would bring, particularly in halting supply efforts. On the other side, the North Vietnamese responded to each improvement in gunship capability by increasing the number and the caliber of their anti-aircraft guns and by positioning them as far south as possible. It took a maximum effort by Terry and his team to measure the real requirement for gunships, create their improvements, get them into the theater within the limitations on manpower, and then develop the tactics to use them effectively.

A major fact of the war was that Communist troops, trucks, and supplies all moved along the extensive Ho Chi Minh Trail, which in various forms had been used for centuries. Some 1,500 square miles of territory were woven together by the complex and ever more sophisticated network of roads, supply depots, truck stops, barracks, hospitals, repair yards, and other elements necessary to keep the rice and bullets moving south. Most of the route was covered by a jungle canopy that made reconnaissance difficult by day and almost impossible by night.

Nonetheless, the US had to try to



In summer 1967, this AC-130 in camouflage was tested off the coast of Eglin AFB, Fla., for the Gunship II project. The AC-130 prototype arrived in South Vietnam that fall and proved to be three times more effective than the AC-47.

interdict the flow of supplies, and the best tool for the job was obviously an improved gunship. In the meantime, the pitifully few AC-47s (parceled out in twos, threes, and fours at five different bases) valiantly defended the strategic hamlets. It was the air commando's proud boast that none was ever lost when a gunship was overhead.

A surprisingly wide variety of aircraft, ranging from the Cessna Model 337 to the Boeing B-47, were considered for the role of improved gunship. The goal was an aircraft that could carry more equipment for longer times with greater safety. A high wing was preferred for ease of gun and sensor installation.

Terry proposed Project Gunboat, based on a converted C-130A with improved sensors and weapons, more ammunition, and immensely improved performance. (The maritime Gunboat designation was soon replaced by the more logical Gunship II title.) Four 7.62 miniguns and four M-61 Vulcan 20 mm cannons were installed in Gunship II, along with a side- and forward-looking radar, a Starlight scope night observation device, and a computerized fire-control system linking sensors and guns. Also installed were overt and covert illuminators, armor plate, and better navigation equipment. Fuel tanks were "inerted" against ground fire.

Gunship, Times Three

A prototype arrived at Nha Trang

AB, South Vietnam, on Sept. 21, 1967, for combat evaluation. It was a resounding success. After a brief refurbishment, Gunship II re-entered combat in February, flying out of Ubon RTAB, Thailand, against the Ho Chi Minh Trail in Laos. Codenamed Spectre, the AC-130 was an unmitigated success, destroying hundreds of trucks. It was then returned to operations in South Vietnam. Analysis of results showed that the AC-130 was about three times as effective as the AC-47.

Air Force Secretary Harold Brown had authorized the C-119G as the AC-47 replacement. Gen. John P. McConnell, Chief of Staff, continued to press for the AC-130, stressing it had a "search and destroy" capability in addition to a close-support mission. The two most telling arguments for the AC-130 were its survivability and its effectiveness. It cost \$5,100, on average, for Gunship II to destroy or damage a truck. For an F-105, the cost per vehicle was \$118,000.

The opposing views were ultimately reconciled in a costly compromise that led to the creation of three types of gunships in the fleet—AC-47s, AC-119s (Gs and Ks), and AC-130s.

In December 1968, four Gunship II aircraft arrived at Ubon. Operated by 16th Special Operations Squadron, the four AC-130s were pressed into combat and forced to adapt to a variety of missions, but they con-

centrated on night interdiction. (The Air Commando Squadron designation changed to Special Operations Squadron Aug. 1, 1968.) Within three months, the four aircraft, with still-inexperienced crews, had destroyed 607 trucks, more than a quarter of the theater total.

The 16th SOS continually experimented and improvised as it gained experience in operating the advanced Gunships. As massive numbers of anti-aircraft guns moved in to defend the Ho Chi Minh Trail, new tactics were devised. Among them were the F-4-AC-130 teams that operated together to kill trucks and suppress anti-aircraft fire. It was an unlikely combination, given the vast difference in their performance, and the tactics were inherently dangerous. When the guns opened up on the Spectre, the Phantoms would pass through the AC-130's orbit twice, first to drop its cluster bomb unit, then again on the climb back to altitude. The combination proved effective against both trucks and the defending anti-aircraft guns.

It was hazardous work, and an AC-130 was hit by anti-aircraft fire March 3, 1969. Only a few weeks later, Gunship II strength was reduced by a quarter when on May 24 the Air Force lost its first Spectre. Severely hit by 37 mm anti-aircraft, the AC-130 crashed on landing at Ubon. Two crew members were killed, and the aircraft was destroyed.

Meanwhile, Terry had become chief of the AC-130 Gunship Program Office. He and a small band of enthusiasts in July 1969 proposed the first of a series of improvements to the Spectre. Their aim was to improve lethality and survivability.

They did so with heavier armament, a digital fire-control system, an air-to-ground moving target indicator system, and a low-light-level television to improve target acquisition at night. The four 7.62 miniguns were replaced by two 20 mm Gatling guns and two 40 mm Bofors guns. A two-kilowatt illuminator and a Paveway I laser designator were added to facilitate cooperation with tactical aircraft. The location of detected targets could be stored in an inertial navigation system, for later use.

Surprise Package

Terry's proposal received quick approval. The improved aircraft,

dubbed "Surprise Package," was tested at Eglin AFB, Fla., in late October 1969. Things went so well that it was deployed to Southeast Asia on Nov. 25, where it proved to be a great advance over the earlier AC-130.

The advanced AC-130 was less vulnerable because it was able to operate at higher altitudes and was better armored. Its 40 mm guns and laser designators made it far more lethal; it destroyed or damaged trucks at a rate of 7.34 per sortie. The standard AC-130 was its closest competitor, with an average of 4.34.

The success of Surprise Package altered opinions in the Pentagon. Estimates were that about 200 trucks per day were sent down the trail. Previous interdiction efforts peaked at 30 truck kills per day. Now, a force of 18 AC-130s and 26 AC-119K aircraft could kill 100 to 200 trucks per night.

In these days, there was a running bureaucratic debate about the proper number of gunships and the degree to which they should be modified. By the summer of 1970, no fewer than five AC-130 gunship programs were under way.

A fleet of six "new" AC-130 gunships entered combat in November 1970, initially with disappointing results. The aircraft were more advanced and the new crews did not have sufficient experience in operating them. Terry, now a lieutenant colonel, was assigned to correct the

"Move Back 18 Feet"

Brig. Gen. Carl A. Hagan of US Army Forces Command, speaking at an Air Force Association symposium in February 1990, shared a soldier's view of the awesome power of the Air Force gunship. Hagan's son Steve, a captain in the 82d Airborne Division, had taken part in Operation Just Cause in Panama in December 1989. On the first night, his unit found itself in a difficult spot.

Fortunately, the captain told his father, there was an AC-130 gunship overhead: "We explained our situation and the guy [in the gunship] said, 'Where are you?' and we showed him, and he said, 'Where are the bad guys?' and we showed him that. There was a pregnant pause for a couple of seconds, and then he said, 'You need to move back 18 feet.'"

"They did that," the elder Hagan reported, "and the AC-130 did its thing and eliminated all opposition. Now, that's close air support."

situation, and under his tutelage, the success rate on truck kills rapidly improved.

Interdiction efforts in Laos were intensified, and the war was expanded to include missions in Cambodia. As experience was gained, the success of the gunships continued to rise; by March 1971, they were destroying an average of 13 trucks per sortie, with as many as 3,240 destroyed and 787 damaged per month, almost 90 percent of the number attacked. By June, a total of almost 14,000 trucks had been destroyed and damaged, three times as many as in the previous year. The claims, doubted at first as being too high, were subsequently validated as accurate. Unfortunately, trucks were less expensive than gunships, and the Soviet Union supplied them in quantity, with as many as 8,000 per month rolling down the trail.

In 1971, a decision was made to acquire six additional AC-130Es, and the need to decrease further their vulnerability resulted in the *Pave Aegis* program. The *Pave Aegis* aircraft received a 105 mm gun in addition to the 40 mm and two 20 mm guns. It also had improved radar and was provided with a Mk 24 flare capability, to counter the Surface-to-Air Missile threat.

It should be noted that the unusual monsoon cycle of weather in Southeast Asia allowed gunship modifications to be made during the rainy season and available for combat as soon as the weather cleared.

Project Hornet

A contract was awarded in 1968 for project *Combat Hornet*, for a total of 52 additional gunships. The first 26 were to be AC-119Gs, equipped with four 7.62 GAU-2B/A miniguns, gun sight, armor, night observation sight, DPN-34 and SPR-3 radars, 20 kw airborne illuminator, and an LAU-74/A flare launcher. The second 26 were to be AC-119Ks, with similar equipment plus two 20 mm Vulcan guns, AN/APQ-133 beacon tracking radar, FLIR, and a Doppler navigation system. The AC-119Ks were almost five times as expensive as the AC-119Gs.

The Gunship III program was not without its difficulties, but four AC-119G *Shadows* arrived at Nha Trang by the end of December 1968, along with advance elements of the 71st SOS, whose personnel were largely called up from reserve units. Combat operations began Jan. 5, with the *Shadows* operating in South Vietnam. All 18 aircraft assigned arrived by March 1, and the AC-119Gs proved acceptable in all the roles accomplished by the AC-47 except for that of forward air control. (In

Staff photo by Guy Aceto



Pave Aegis upgrades added a 105 mm gun to the AC-130, making for less space in an already cramped gunner's station. The yellow safety cage protects crewmen from the gun's recoil. This gunship was photographed in the late 1980s.



and Stingers worked from their Thai and South Vietnamese bases against targets in Cambodia, South Vietnam, and Laos. As North Vietnam stepped up its efforts, the work of the gunships expanded to provide more close support of the South Vietnamese army. The Pave Aegis AC-130s were particularly successful, using their 105 mm gun to destroy tanks and the increasingly heavy artillery being deployed. There were many instances when the heavy fire from gunships halted overwhelming assaults on South Vietnamese positions, as in the defense of An Loc.

The importance of the gunship had grown out of all proportion to its numbers. It was a hands-on, into-the-

June 1969, the 71st SOS became the 17th SOS.)

In 1969, the AC-119Gs would fly more than 3,700 sorties over 14,251 combat hours, fire almost 35 million rounds of ammunition, and expend 22,000 flares. They killed some 1,500 enemy troops and, most important, had allowed no outpost to be overrun while they were overhead. Flying the Shadow was not without hazard; many recorded hits from AAA. One was lost to ground fire, and another crashed on takeoff.

By the end of 1970, the AC-119s were spread over four bases: Phan Rang (seven AC-119Gs and three AC-119Ks), Tan Son Nhut (nine AC-119Gs) and Da Nang (seven AC-119Ks) in South Vietnam, and Nakhon Phanom (six AC-119Ks) in Thailand. The 17th SOS had been replaced by the activation of the 18th SOS, which was given duties primarily in the Steel Tiger area of Laos. The 18th SOS distinguished itself in truck-killing operations from the very first. By April 1970, less than two months after the arrival of the last AC-119K, the unit claimed its 1,000th disabled truck.

Countless men and supplies poured down an expanded Ho Chi Minh Trail, now defended by heavier anti-aircraft guns and SAMs. In March 1972 two AC-130s were shot down in the Steel Tiger area in Laos. In May, the brand new SA-7 Strela was introduced. This SAM was a shoulder-fired weapon with an infrared seeker for which there was no immediate defense. The North Vietnam-



The Gunship III program included the AC-119G (top), which began to arrive in South Vietnam in December 1968. The even more deadly looking AC-119K had two small jet engines under the wings, newer sensors, and 20 mm guns. Today, gunships, in the form of AC-130 Spectres, remain a vital part of AFSOC.

ese also responded to American technology with more sophisticated techniques, including better camouflage, better convoy discipline, and the increased use of waterways.

Airpower became increasingly important as North Vietnam began its spring 1972 offensive. The most sophisticated methods were employed to oppose it. The Spectres

teeth-of-the-storm weapon, flown by courageous crews under hazardous conditions. And the gunship continued to distinguish itself in USAF service after Vietnam. Today, eight AC-130Hs and 13 AC-130Us form a vital part of the Air Force Special Operations Command. If the need arises for a new generation of gunships, the technology is available. ■

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, "El Dorado Canyon," appeared in the March 1999 issue.

By John L. Frisbee, Contributing Editor

The Saving of Spooky 71

A1C John Levitow had only seconds to save the lives of eight crewmen aboard the battle-damaged gunship.

Heroism knows neither age nor rank. During World War II and Vietnam, five airmen earned the Medal of Honor. Junior among them was 23-year-old A1C John L. Levitow, loadmaster on an AC-47 gunship, Spooky 71, that on the night of Feb. 24, 1969, went to the aid of besieged troops at Long Binh Army Post a few miles northeast of Saigon. It was John Levitow's 181st combat sortie.

On operational missions, loadmaster Levitow was responsible, among other duties, for setting the ejection and ignition controls of the Mk 24 magnesium flares carried by USAF gunships in Southeast Asia. The flares provided illumination for troops on the ground, for the gunship's pilot to aim his three side-firing 7.62 mm miniguns, and for fighters that might be called in to help suppress enemy fire.

Once the controls were set, the Mk 24, packed in a three-foot-long metal tube and weighing about 27 pounds, was passed to a gunner who triggered the arming mechanism and then tossed the tube out the plane's cargo door. Ten seconds after release, an explosive charge opened the flare's parachute, and in another 10 seconds the magnesium ignited, generating a light of 2,000,000 candlepower. At 4,000 degrees Fahrenheit, the flare could burn through metal. The Mk 24 was not to be treated casually. Improperly handled, it could be lethal.

On that February night, Spooky 71 had been in the air for 4.5 hours when Maj. Kenneth Carpenter, the aircraft commander, was directed to an area south of the Army post where enemy mortars were laying down a heavy barrage. As the plane arrived at its target area, Levitow handed a flare to Amn. Ellis Owen, who put his finger through the safety pin ring, preparatory to tossing the flare through the door at Carpenter's command.



Suddenly Spooky 71 was rocked by a tremendous blast. An 82 mm mortar shell had exploded inside the gunship's right wing, showering the cargo compartment with shrapnel. In the rear of the airplane, five crew members were hurled to the floor and were bleeding from shrapnel wounds. Spooky 71 fell into a steep, descending turn to the right, momentarily out of control. The flare, torn from Owen's hands by the blast, rolled around the aircraft floor fully armed amidst several thousand rounds of minigun ammunition.

Through a haze of pain and shock, Levitow, with 40 shrapnel wounds in his legs, side, and back, saw one of the crew lying perilously close to the open cargo door. As he dragged the wounded man to safety, Levitow spied the armed, smoking flare rolling erratically around the cargo compartment. How long had it been since the safety pin was pulled inadvertently—five seconds? Fifteen seconds?

Levitow had no way of knowing. He did know that the timing mechanism could have been damaged, which might result in premature ignition. In a matter of seconds the flare would ignite, its intense heat turning the stricken gunship into an inferno.

Weakened from loss of blood and partially paralyzed by his wounds, Levitow tried vainly to pick up the

flare as it skidded around the floor. The plane was still in a 30-degree bank. Seconds ticked by. Finally, in desperation, he threw himself on the flare, dragged it to the open door, a trail of blood marking his path, and pushed it out just as it ignited in a white-hot blaze. Levitow then lapsed into unconsciousness.

Carpenter managed to regain control of the gunship, its wings and fuselage riddled by 3,500 shrapnel holes, one of them 3 feet in diameter. Ambulances and a medical evacuation helicopter were waiting on the flight line at Bien Hoa AB, South Vietnam, Spooky 71's home base, when the battered plane landed with its five injured crewmen—two of them, including John Levitow, seriously wounded. Levitow was flown to a hospital in Japan. After he recovered, he flew 20 more combat missions before returning to the States to complete his enlistment as a C-141 loadmaster at Norton AFB, Calif.

On Armed Forces Day, May 14, 1970, President Richard M. Nixon presented the Medal of Honor to Levitow in a ceremony at the White House. The young airman's heroism in the night sky over Vietnam had added another chapter to the saga of valor that is a vital element of the Air Force heritage. ■

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Compiled by Chanel Sartor, Editorial Associate



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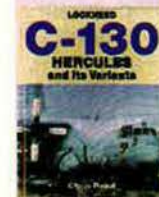
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AFA/AEF National Report

By Frances McKenney, Assistant Managing Editor

AFA Co-hosts Capitol Hill Reception

The Air Force Association joined the Air Force Office of Legislative Liaison on Capitol Hill in early February to host an educational symposium and reception on USAF's operational readiness.

Thirty-one members of the 106th Congress, including Speaker of the House J. Dennis Hastert (R-Ill.), attended the early evening reception in the Rayburn House Office Building.

As in previous receptions, a key feature was a series of information panels using photos and text to display facts on, for example, how modernization is falling behind, some reasons for increasing losses of Air Force personnel, and the impact of the high operations tempo.

Rep. Floyd C. Spence (R-S.C.), chairman of the House Armed Services Committee, attended the reception, along with fellow Republican committee members Herbert H. Bateman (Va.), James V. Hansen (Utah), Curt Weldon (Pa.), Joel Hefley (Colo.), Steve Buyer (Ind.), Roscoe G. Bartlett (Md.), James A. Gibbons (Nev.), and Steve Kuykendall (Calif.).

Armed Services Committee Democrats who attended were Reps. Gene Taylor (Miss.), Victor F. Snyder (Ark.), Mike McIntyre (N.C.), and Mike Thompson (Calif.).

Other Congressional Representatives in attendance were Doug Bereuter (R-Neb.), Shelley Berkley (D-Nev.), Howard Coble (R-N.C.), Vernon J. Ehlers (R-Mich.), Bob Goodlatte (R-Va.), Ralph M. Hall (D-Texas), Tony P. Hall (D-Ohio), Stephen Horn (R-Calif.), Sam Johnson (R-Texas), Nicholas V. Lampson (D-Texas), Ken Lucas (D-Ky.), Michael R. McNulty (D-N.Y.), Grace F. Napolitano (D-Calif.), Doug Ose (R-Calif.), Mark E. Souder (R-Ind.), John R. Thune (R-S.D.), and Wes W. Watkins (R-Okla.).

Former Congressman G.V. "Sonny" Montgomery, who retired in 1995 af-



House Armed Services Committee Chairman Rep. Floyd Spence (R-S.C.) joined AFA National President Thomas McKee (left) and USAF Chief of Staff Gen. Michael Ryan (right) at an educational reception on Capitol Hill that focused on Air Force operational readiness issues.

ter a 30-year career in the House that included development of the Montgomery GI Bill, also attended the event.

Among the more than 30 Air Force officials present were acting Secretary of the Air Force F. Whitten Peters, USAF Chief of Staff Gen. Michael E. Ryan, Vice Chief of Staff Gen. Ralph E. Eberhart, and Assistant Vice Chief of Staff Lt. Gen. David L. Vesely.

AFA National President Thomas J. McKee, who is in the process of meeting with all newly elected members of Congress, was joined by National Director Charles G. Durazo in representing AFA at this event.

"Legends" To Air on Cable

The "Legends of Airpower" videos, produced by Three Roads Communications with AFA, have been picked up as a series by The Military Channel.

The series will begin airing this month on the cable TV channel, now available to two million viewers. The Military Channel is scheduled to expand its service by midyear, extending its coverage to 12 million viewers.

The 13 Legend episodes completed or in production cover Henry H. "Hap" Arnold, Randy "Duke" Cunningham, Benjamin O. Davis Jr. and the Tuskegee Airmen, Jimmy Doolittle, AFA National Director Emeritus Russell E. Dougherty, Francis S. "Gabby" Gabreski, John Glenn, Charles A. Horner, Curtis E. LeMay, Billy Mitchell, Bernard A. Schriever, Jimmy Stewart, and Chuck Yeager.

Florida Gala

The 15th annual Air Force Gala, sponsored by the Central Florida Chapter and the Aerospace Education Foundation, honored air refueling operations with the theme "Air Refueling—Extending Global Reach."

"Tankers are prepared and in place when and where they are needed," the gala's program noted. "Refueling crews and their equipment allow the sustained operations necessary for the projection of modern strategic, tactical, and mobility forces throughout the world."

Gala chairman Martin H. Harris, an AFA national director emeritus and

Photo by Paul Kennedy



AEF's vice president, opened the event and introduced special guests that included Gen. Michael Ryan, USAF Chief of Staff; Gen. Ralph Eberhart, USAF vice chief of staff; and New Zealand Air Commodore James S. Barclay, dean of the foreign air attaches. Other guests included Robert D. Bauerlein, deputy undersecretary of the Air Force for international affairs, and Ruby B. DeMesme, assistant secretary of the Air Force for manpower, reserve affairs, installations, and environment.

During the awards portion of the evening, four Individual Ira C. Eaker Historical Fellows were recognized, reflecting the theme of air refueling operations: KC-135 Crew E-114, KC-10 Crew Gold 11, KC-135 Crew Bass 24, and The Boeing Co. The Central Florida Chapter will donate \$1,000 to AEF in their names.

The February black-tie gala was held in Lake Buena Vista, Fla., in conjunction with the AFA Air Warfare Symposium.

Bockscar's Pilot

Retired Maj. Gen. Charles W. Sweeney, pilot of the B-29, *Bockscar*, that dropped the atomic bomb Aug. 9, 1945, on Nagasaki, Japan, recounted the mission to more than 100 guests at the New Hampshire State Convention in December.

Sweeney had also piloted the observation B-29, *The Great Artiste*, on the first atom bomb mission, over Hiroshima, Japan. He was a major at the time and commander of the 393d Bomb Squadron, based on Tinian island in the Northern Marianas.

Along with his presentation on the preparation and executions of these missions that ended World War II, Sweeney also signed copies of his book *War's End: An Eyewitness Account of America's Last Atomic Mission*. He said he hopes to maintain the distinction of being the person who commanded the last atomic mission. Sweeney is a member of the **Minuteman (Mass.) Chapter**.

The New Hampshire convention also honored three Granite State natives: retired Brig. Gen. Harrison

AFA Membership Directory Available Online

(To Members Only)

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

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

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

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

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

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

Telephone: 703-247-5800

Toll Free: 1-800-727-3337

Fax: 703-247-5853

E-Mail: custserv@afa.org

Mail: Air Force Association, Attn: Customer Service, 1501 Lee Hwy., Arlington, VA 22209-1198



Rep. Cliff Stearns (R-Fla.) attended the Air Warfare Symposium in Orlando, Fla., where he spoke with Gen. Michael Ryan (right) and Martin Harris (center), AFA national director emeritus and AEF vice president. Stearns, who is organizing the bipartisan Air Force Caucus, served in USAF 1963-67, attaining the rank of captain. He is on the House Committee on Veterans' Affairs.

USAF photo by Ron Hall



AEF President Jack Price (center) celebrates with a thumbs-up the funds raised by the Central Florida Chapter's 15th annual gala, held in conjunction with the Air Warfare Symposium. At left is Martin Harris, AEF vice president and gala chairman. At right is Timothy Brock, Central Florida Chapter president.

R. Thyng, a World War II–Korean War double ace (five victories in each war); Capt. Joseph C. McConnell Jr., USAF's leading ace from the Korean War (16 victories); and Capt. Harl Pease Jr., who voluntarily flew an unserviceable airplane to help his group on a bombing raid on Rabaul, Papua New Guinea, in August 1942. He posthumously received a Medal of Honor.

New Hampshire Gov. Jeanne Shaheen, a **Pease (N.H.) Chapter** member, presented the families of these heroes with AFA Citations. She also paid tribute to the Gold Star mothers in the state.

The convention was organized by New Hampshire AFA. The state's two chapters are the **Amoskeag Chapter**, headed by John W. Meehan, and the Pease Chapter, whose president is the governor's aide-de-camp, Baldwin M. Domingo.

World War II—in the Pacific

The **Richard Asbury (Ill.) Chapter** featured as guest speaker retired Marine Sgt. James A. Thompson, who was among the first Marines to land on Tinian in July 1944. These Marines captured the airfield, which enabled the B-29 operations against Japan.

An amphibious tractor crew chief-gunner with the 2d Amphibian Tractor Battalion, Thompson had also been in the first wave of Marines who landed at Tarawa in November 1943. Nearly a thousand Marines died in the four-day battle. Thompson was blown out

of his amtrac into the water during this invasion but after being hospitalized in Hawaii returned to duty and was among the first Marines to land at Saipan in June 1944 and Okinawa in March 1945.

In his talk to the AFA chapter, he described the invasions of these islands, illustrating his remarks with maps and personal recollections.

First Person

Civil Air Patrol legend Edmond I. "Eddie" Edwards, who received the first Air Medal of World War II, described his coastal patrol experiences at a "First Person" program organized by the **Diamond State (Del.) Chapter**.

In his talk Edwards recounted the July 1942 incident for which he received the medal, personally presented by President Franklin D. Roosevelt at the White House.

Edwards, then a CAP lieutenant, and CAP Maj. Hugh R. Sharp Jr. had rescued Henry Cross, who had ditched his CAP aircraft at sea, about 20 miles from Rehoboth, Del. At the crash scene Edwards climbed onto the hull of his amphibious rescue aircraft and pulled Cross—who had a broken back—aboard. Edwards then perched on the wing of the rescue craft to counterbalance a pontoon that had been damaged during the rescue landing. He clung to the wing for hours, as the unflyable aircraft was towed to shore.

Edwards' talk was the third in the Diamond State Chapter's series of

First Person educational programs that feature speakers who give first-hand accounts of events in aerospace history. Previous programs were presented by Flying Tiger Peter Wright and retired Navy Capt. Edward A. Davis, a Vietnam War POW who, as a lieutenant junior grade, survived 7.5 years of captivity after his A-1 Skyraider was shot down Aug. 26, 1965.

Jonestown 20 Years Later

Owen A. "Al" Heeter, who was among the US military forces that recovered bodies from the mass suicide at Jonestown, Guyana, in November 1978, spoke about the experience at a joint meeting of the **Lawrence D. Bell Museum (Ind.) Chapter**.

Heeter was a colonel and director of operations for the 24th Composite Wing, stationed in Panama, when California Rep. Leo J. Ryan and four others, who were investigating cult leader Jim Jones, were killed at Jonestown. Jones then led more than 900 followers to commit suicide.

Heeter said the Joint Chiefs of Staff deployed him to Guyana, where US military personnel bagged each body—nearly one-third of them children—and flew them out on H-53s to Guyana's capital, Georgetown. Heeter monitored the C-141 traffic that flew empty coffins in then flew filled coffins back to Dover AFB, Del.

In his Air Force career, Heeter served two tours in Southeast Asia and had more than 5,000 hours in helicopters. He participated in the first H-53 flight across the Pacific in 1970. An AFA member since 1971, he recently moved to Indiana, where Harold E. Lucht, chapter president, paid him a "house call." It is something Lucht routinely does to welcome every chapter newcomer, and it's how he learned of Heeter's experience with the aftermath of the largest mass suicide in history.

The joint meeting of the Lawrence D. Bell Chapter at which Heeter spoke included members of the local American Legion and Kiwanis Club and cadets from the AFROTC detachment at Notre Dame University.

Congressman at the Podium

Rep. Frank A. LoBiondo (R-N.J.) spoke to a **Brig. Gen. E. Wade Hampton (N.J.) Chapter** meeting in early December, held at a country club in Cape May Courthouse, N.J.

LoBiondo is a member of the House Transportation and Infrastructure Committee and the Small Business



At a Del Rio (Texas) Chapter meeting, Lt. Col. Jason Barlow (right), president, and MSgt. Shirley Norman (left), treasurer, presented awards to A1C Melissa Stanley and chapter member TSgt. Mark Riddle, recognizing their outstanding performance as Airman and NCO of the Quarter, respectively.

Committee and has been in Congress since 1995.

Chapter President 2d Lt. Ronald L. Williamson, an Active Guard Reservist, reported that after LoBiondo spoke, questions from the 35 audience members sparked discussions on the topics of readiness, pilot retention, optempo, pay, and erosion of benefits.

Special guests at the chapter meeting included Col. Gary A. Corbett, commander of the 177th Fighter Wing (ANG) at Atlantic City Airport, N.J., and Col. Eugene Chojnacki, 177th Support Group (ANG) commander.

What a Ride!

Jack H. Steed, national vice president (Southeast Region), and two other community leaders recently flew on a Joint STARS mission from Robins AFB, Ga.

Joining Steed were Jeane W. Paris, Carl Vinson Memorial (Ga.) Chapter secretary, and Joe Cade, a local businessman. Brig. Gen. (sel.) Joseph P. Stein, commander of the 93d Air Control Wing at Robins and a chapter member, invited the group for the orientation flight as part of the wing's effort to thank community leaders for supporting USAF and the base.

The E-8C took off at 8 a.m. on the seven-hour mission and headed for the Ft. Bragg, N.C., area, where it flew an elliptical orbit between Goldsboro and Wilmington, N.C. Steed said on its northbound orbits, the crew monitored vehicles on the roads and could see Ft. Bragg's facilities and everything on the airfields "including the areas shaded by trees." On the

southbound leg, the orbits focused on the coastline and ship activity in the Atlantic. Steed said even coastal jetties could be identified.

He was impressed by the superb teamwork of the Joint STARS crew members—from the Air Force and the Army—as well as the technical capabilities of the surveillance aircraft.

"If every citizen could see the effectiveness of Joint STARS and those who operate the system, then no one would question the need for at least 19 E-8C aircraft," he said.



National Vice President (Southeast Region) Jack Steed received an orientation flight on a Joint STARS aircraft out of Robins AFB, Ga., with chapter member Jeane Paris and Joe Cade. Brig. Gen. (sel.) Joseph Stein (far left), 93d Air Control Wing commander, arranged the flight to thank the local community leaders for their support.

Web Team

Oklahoma State AFA, the **Central Oklahoma (Gerrity) Chapter**, and the Tinker Retiree Activities Office at Tinker AFB, Okla., teamed up to add a new feature to the state's and the chapter's web sites.

The two web pages now allow people to add their name to electronic mailing lists to receive automatically, by e-mail, chapter and state newsletters, notices about local events, and news on retiree issues. Subscribers can receive information from the **Altus, Central Oklahoma (Gerrity), Enid, and Tulsa Chapters** and from Tinker's retirees office.

TSgt. Michael Blunt, the Central Oklahoma (Gerrity) Chapter's vice president for electronic communications, is stationed at Tinker's Oklahoma City Air Logistics Center. He created the state and chapter web pages and arranged with a local computer consultant to establish the mailing list feature. Blunt said creating the list was a way to fulfill the AFA charter of assisting the more than 27,000 retirees in the Sooner State. "We felt this was a good start in the right direction," he said.

The Oklahoma State AFA home page is located at www.geocities.com/capecanaveral/hangar/6227.

Spotlight on Safety

At the **Del Rio (Texas) Chapter's** New Year's mixer in January at the Laughlin AFB, Texas, Officers' Club, Chapter President Lt. Col. Jason B. Barlow presented two chapter Safety

USAF photo by SSgt. Leslie McCoy

Awards of Merit. The first went to Carl Riordan, a T-37 maintainer at Laughlin, for his heroism in rescuing 40 people during Del Rio's August 1998 flood. The flood cut off the two access roads to Laughlin AFB and disrupted water and electricity on base. The second award went to Maj. Timur Housum from the 85th Flying Training Squadron. During a student sortie, Housum recovered a T-37 from an engine failure.

Barlow said the chapter works closely with the 47th Flying Training Wing safety office to recognize outstanding performers each quarter.

State President Speaks

Illinois State President John Bailey spoke about the "Air Force of the 21st Century" at a joint meeting of the **Greater Rockford (Ill.) Chapter** and a local chapter of the National Contract Management Association.

Bailey presented an assessment of the challenges faced by USAF and how it is preparing to meet them. He showed three videos, including "A Salute to the US Air Force 50th Anniversary," available from AFA's video library, "Flight Path to Tomorrow," and "Eye in the Sky."

Larry L. Ackerman, chapter president, said the audience of about 75 people asked Bailey questions about the Air Force's current actions in the Gulf and wanted to know the relationship between AFA and the Air Force. Ackerman added that the audience members told him Bailey delivered quality information.

Outstanding Airmen

Richard I. Bong (Minn.) Chapter honored four airmen of the year from the 148th Fighter Wing (ANG), Duluth IAP, Minn. MSgt. Patricia K. Beaudry, TSgt. Lisa K. Erikson, and SrA. Andrew C. Venne received AFA Citations and 50th anniversary commemorative coins at the chapter dinner.

They have also already been nominated for the 1999 USAF Outstanding Airmen award.

MSgt. Jeffry P. Knepper received a new chapter award, Outstanding First Sergeant of the Year. Community Partner Albert J. Amatuzio, who retired from the 148th, made the awards presentations.

Ray Skelton, environmental and government affairs director for the Seaway Port Authority of Duluth, was guest speaker for the evening. He described his experiences as an enlisted submariner with the US Pacific Fleet during the Cold War.

Keiko for the Cadets

The **Lloyd Schloen-Empire (N.Y.) Chapter** presented a program to CAP cadets on USAF's C-17 airlift of Keiko the killer whale—star of the 1993 movie "Free Willy"—from Oregon to Iceland last September.

Chapter Vice President Maxine Donnelly emphasized the Air Force role, presenting a video provided by Capt. Maria Carl, project officer for the Keiko airlift, and a video from the public affairs office at Charleston AFB, S.C., home of the C-17 used in the airlift.

William G. Birnbach, chapter president, and Fred DiFabio, **Nassau Mitchel (N.Y.) Chapter** president, spoke to the audience about AFA and described some of their chapters' activities. The event was held at the Rosemary Kennedy School in Wantagh, N.Y.

More AFA/AEF News

■ **McChord AFB (Wash.) Chapter** President Thomas O. Hansen and Karl Berg, chapter vice president for veterans affairs, presented an oak rocking chair to the American Lake Veterans

Affairs Hospital in Tacoma. It will be used in the ward for patients with Alzheimer's disease. Virginia Scott, chief nurse on the ward, told the chapter the chair makes a big difference because it is something "familiar looking" to her patients. "Please let your association know how very much we all appreciate the beautiful rocking chair," she wrote. The McChord Chapter was formerly the Tacoma Chapter.

■ The **Gen. Robert E. Huyser (Colo.) Chapter** helped organize the Veterans Day parade in Grand Junction, Colo., working with area veterans groups, the Veterans Committee of Western Slope, and a local warehouse store. The chapter arranged for a CAP color guard and an ANG F-16 flyby, performed by the 120th Fighter Squadron (ANG), Buckley ANGB, Colo.

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. ■

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G9 (Not shown) Satin Podium Banner. White with screened "Air Force Association" and full-color AFA logo. 28"x42" (w) with fringe, crossbar, and tassel cord. **\$65**

G10 (Not shown) Table Banner. 28"x44" (w). See G7 for description. **\$55**

Seeking information on B-25 *Gal From Kalamazoo* loaned or leased to the RAF in June 1943. **Contact:** Robert H. Barnes, PO Box 1697, Battle Creek, MI 49016.

Seeking contact with or information on **James "Pat" Patterson or Pattison**, who was stationed at RAF Sculthorpe, UK, in 1959. **Contact:** Karen Abercrombie Lalloff, 4030 E. 225th St., Cicero, IN 46034 (317-877-0314) (snuv26b@prodigy.com).

Seeking recollections, memorabilia, and photos from **USAAF and USAF veterans** of the China-Burma-India Theater (1942-46) and the Cold War (late 1940s-60s). **Contact:** George E. Dively, PO Box 10743, Alexandria, VA 22310 (jordy@erols.com).

For a book, seeking information on **radio procedures** and methods fighter pilots used for instrument flying, approaches, and general formation flying. **Contact:** Don Biondich, 4163 Chaparral Pl., Castro Valley, CA 94552 (510-357-4562) (mccyclebum@aol.com).

Seeking photos, information, and contact with anyone involved with ferrying aircraft for disposal to **Searcy Field**, OK, 1945-46. **Contact:** John L. Dienst, PO Box 6042, Enid, OK 73702 (Dienst@hotmail.com).

Seeking information on **TSgt. Delbert L. Bartz** of the 77th BS, Aleutian Islands, AK, listed as MIA Nov. 23, 1942. **Contact:** Jerry R. Strong, 1307 N. Carol Ln., Oklahoma City, OK 73127.

Seeking information on the tape "**What the Captain means is . . .**," created by members of the 12th TFW around 1965. **Contact:** John E. Arnet, 407 Parish Hill Rd., North Windham, CT 06256.

Seeking contact with **Moonglow** aircrew members who flew RB-57Es in the Patricia Lynn program, 1963-73, out of Tan Son Nhut, South Vietnam. **Contact:** Roger Wilkes, 1341 North 3175 East, Layton, UT 84040 (801-546-2258) (Rwilkes2@aol.com).

Seeking contact with **Waldo Schoss**, a crew member of the B-26 Marauder #4131968, 322d BG, Ninth AF, who was rescued by local inhabitants when his plane crashed near Cherbourg, France, April 13, 1944, and was hidden until July 1944. **Contact:** Albert Tapin, 22 rue Segondat, Cherbourg, Normandy, France 50100.

Seeking USAF personnel stationed at **Munich-Oberschleissheim airfield**, 1945-56. Also seeking **816th Engineer Aviation Battalion** and **8884th Labor Supervision Co.** personnel. **Contact:** Dieter Groschel, 150 Terrell Rd. E., Charlottesville, VA 22901 (804-979-0970) (dhg@virginia.edu).

For a book, seeking photos and contact with former flight and ground crewmen of the **Fairchild C-82s** flown by ATC/MATS, TAC, SAC, ARS, AACs and AWS. **Contact:** Nick Williams, 1002 Ridgewood Blvd., Waverly, IA 50677-1114.

USAF recently awarded the Air Force Outstanding Unit Award to the **72d Recon Sq.** for its once-classified strategic reconnaissance of the Arctic region from Oct. 13, 1947, to June 1, 1949. "This was accomplished in spite of potential hostile actions, numbing cold, difficult navigation, and other dangerous conditions that placed major burdens on both aircrew, maintenance, and support personnel," stated the Air Force.

For a book, seeking contact with and information on pilots who landed or crashed in **Portuguese**

territories during WWII. **Contact:** Carlos J. Guerreiro, R. Dr. Arnaldo Vilhena, 17-1 dt, Faro, Portugal 8000-317 (351-89-862847 or 872233) (c.guerreiro@ip.pt).

Seeking information on **Robert Kenneth Arwyn**, Eighth AF, who was shot down over France in late 1943 or early 1944 and joined the Resistance. After his group was betrayed, he was sheltered by the French at Sassy and taken to a safe house near Argentan by Pasquier d'Audiffret. **Contact:** James E. Dillon, 31 Dowhills Park, Blundellsands, Liverpool, UK L23 8SS.

For a book, seeking photos, reports, and drawings of the **North American F-107A** and contact with people who worked on its production and maintenance. **Contact:** William J. Simone, 1340 East Ave., J-12, Lancaster, CA 93535 (home: 805-948-8580) (work: 805-572-4894 or -7272).

Seeking information on the Navy pilot qualification of **3d Emergency Rescue Sq**, Fifth AF (WWII), pilots who flew OA-10s. Also seeking data on "**Tokyo Trolley**" insignia. **Contact:** V.R. Brook, 902 N. Main St., #128, San Angelo, TX 76903 (915-657-0522).

Seeking a manual showing various **warheads** and the colors they were painted. **Contact:** John F. McCabe, 1090 Maxwell, Box 357, Victoria, KS 67671-0357.

Seeking USAF chief warrant officer W-3 and W-4 **insignia**. **Contact:** Joseph G. Gamble, 11602 Savannah Dr., Fredericksburg, VA 22407.

Seeking contact with former **344th Sq, 98th BG, 15th AF**, pilots, bombardiers, and navigators. **Contact:** Ed Aymes, 10368 Sunset Bend Dr., Boca Raton, FL 33428.

Seeking contact with **Col. Kalman Levitan**, assigned to the Office of the Chief of Chaplains, 1972-73. **Contact:** R.W. Burlingame, 1357 River Rd., Yardley, PA 19067 (215-493-2151).

Seeking information on a crash at Nha Trang AB, South Vietnam, between August 1966 and August 1967, when a **Beechcraft** caught the prop of a **C-130**, spinning the lighter aircraft into a Vietnamese bus and an Army truck. **Contact:** Tom

Jacobs, 224 Mathews Rd., Boardman, OH 44512-3015 (330-783-1185) (TJBuffalo@aol.com).

Seeking the book **Zero** by Masatake Okumiya and Jiro Horikoshi with Martin Caidin. **Contact:** W.H. Warren (805-528-5317).

Seeking information on the Jan. 15, 1943, crash in Dutch Guiana of a Trans Western Airlines airplane, under contract to Air Transport Command, carrying **Maj. Eric Knight**. **Contact:** Elizabeth M. Cowan, PO Box 810, Twin Peaks, CA 92391 (swenolga@inreach.com).

Seeking information on **SSgt. Charles Andersen**, 534th BS, 381st BG, a ball turret gunner on the B-17 *Carolina Queen*, who was KIA May 24, 1944, near Tempelfelde, Germany. **Contact:** Joan A. Liepe, 2947 Cologne Ave., Mays Landing, NJ 08330.

Seeking information on **James Johnson** who was stationed in Nakhon Phanom, Thailand, in 1973. **Contact:** Melvin R. Sibley, 379 California Rd., Gouverneur, NY 13642.

Seeking **Russell (or Clifford) E. Marcks**, who was with the 84th BS, 47th BG, Sculthorpe, UK, in the late 1950s to early 1960s and who knew June Daws. **Contact:** Penny Starling, 49 Stafford St., Norwich, Norfolk, UK NR2 3BD (01603-471802).

Seeking **Robert John Wilbanks** of Memphis, TN, the son of Chuck and Phyllis Wilbanks. He was possibly a USAF recruiting officer. **Contact:** Robert Howe, 13 Cashel Ave., Waterford Rd., Kilkenny, Ireland.

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 Hwy., Arlington, VA 22209-1198. (E-mail: bulletin@afa.org) Letters must be signed. Items or services for sale, or otherwise intended to bring in money, and photographs will not be used or returned.

AFA Conventions

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|----------------|--|
| April 30-May 2 | New Jersey State Convention , Cape May, N.J. |
| May 7-8 | South Carolina State Convention , Columbia, S.C. |
| May 7-8 | Tennessee State Convention , Knoxville, Tenn. |
| May 13-16 | California State Convention , Sacramento, Calif. |
| June 4-6 | Arizona-Nevada-New Mexico State Convention , Laughlin, Nev. |
| June 4-6 | Iowa State Convention , Sioux City, Iowa |
| June 4-6 | New York State Convention , Binghamton, N.Y. |
| June 4-6 | Ohio State Convention , Dayton, Ohio |
| June 11-12 | Mississippi State Convention , Jackson, Miss. |
| July 9-10 | Oklahoma State Convention , Oklahoma City, Okla. |
| July 16-18 | Pennsylvania State Convention , Trevese, Pa. |
| July 17 | Minnesota-So. Dakota-No. Dakota State Convention , Minneapolis, Minn. |
| July 17-18 | Virginia State Convention , Arlington/Alexandria, Va. |
| July 23-25 | Texas State Convention , McAllen, Texas |
| July 30-31 | Florida State Convention , Daytona Beach, Fla. |
| July 30-31 | Washington-Oregon State Convention , McChord AFB, Wash. |
| Aug. 7-8 | Missouri State Convention , Branson, Mo. |
| Aug. 14 | Georgia State Convention , Warner Robins, Ga. |
| Aug. 20-21 | Colorado State Convention , Colorado Springs, Colo. |
| Aug. 21 | Indiana State Convention , Indianapolis, Ind. |
| Aug. 27-28 | Arkansas State Convention , Fayetteville, Ark. |
| Sept. 13-15 | AFA National Convention , Washington, D.C. |

1st AACS Mobile. Sept. 30–Oct. 3, 1999, at the Best Western Palmer House in Colorado Springs, CO. **Contact:** Norman Anderberg, 1341 Forest Way, Denver, CO 80222 (303-756-1315) (Gusswede@aol.com).

8th AF Historical Society. Oct. 28–31, 1999, in Savannah, GA. **Contact:** Harold C. Rutka, 11 E. Artavia St., Duluth, MN 55811-2330 (218-724-1667).

13th BS Assn (Korea). Sept. 29–Oct. 2, 1999, at Sheraton World Resort in Orlando, FL. **Contact:** Charles Hinton (407-773-6665) (chinton@iu.net) or Don Mathews (407-254-4095) (DonellM@aol.com).

20th Air Depot Gp, Hq and Repair Sqs (WWII, N. Africa and Italy). Aug. 20–21, 1999, in Columbus, OH. **Contact:** Scott Ide, 195 Patrice Ter., Williamsville, NY 14221 (716-634-2197).

22d TFS. May 20–23, 1999, at The Menger Hotel in San Antonio. **Contact:** Gordon Eells, 1615 Santa Fe Trail Dr., San Antonio, TX 78232 (210-499-5217).

30th AD, Willow Run AFS, MI (1950s). May 20–23, 1999. **Contact:** Dan Benstrom, PO Box 825, Gwinn, MI 49841 (906-346-3567) or Leon Boone (800-671-6318).

34th BG (H) Assn. Sept. 16–19, 1999, in Des Moines, IA. **Contact:** Harold C. Rutka, 11 E. Artavia St., Duluth, MN 55811-2330 (218-724-1667).

39th BG (Guam, 1945). Aug. 12–15, 1999, in Oklahoma City. **Contact:** James W. Wyckoff, 2714 Hayts Corners East Rd., Ovid, NY 14521-9708 (607-869-2574) or Bob Weiler, 2045 Hyde Park St., #3, Sarasota, FL 34239-3941 (941-365-8287).

41st FS, Fifth AF (WWII). May 17–21, 1999, at the Marriott Hotel Dayton in Dayton, OH. **Contact:** Robert Messerly, 2619 Hankins Rd. N.W., Massillon, OH 44646 (330-833-4578).

42d BW (Loring AFB, ME, 1960s). Oct. 14–17, 1999, in Colorado Springs, CO. **Contact:** Paul Maul, 4605 Bobolink Dr., Castle Rock, CO 80104 (303-688-0967) (Pablomaul@aol.com).

51st FIW, former units, and all former personnel. Sept. 9–12, 1999, at the Ramada Branson Grand in Branson, MO. **Contact:** Robert C. McNamee, 6904 N. Central St., Gladstone, MO 64118 (816-468-4224) (RCanary690@aol.com).

81st FW (WWII and later). Oct. 6–9, 1999, at the Doubletree Hotel Seattle Airport. **Contact:** Frank Palmer, 70 Rilla Ln., Sequim, WA 98382 (360-683-4697) (fspalmer@olyprn.com).

107th Tactical Recon Sq. Sept. 12–15, 1999, in Savannah, Ga. **Contact:** Ernest C. Holland, 3516 Aquamarine Way, Zephyrhills, FL 33540 (813-780-4209).

303d BG (H) Assn (Molesworth, UK, WWII). Oct. 8–11, 1999, at the Marriott Oklahoma City in Oklahoma City. **Contact:** Ed Miller, 422 S. Walnut Ave., Temple, OK 73568-0219 (580-342-5119) (edmiller@pldi.net).

315th FS, 324th FG (WWII). July 7–11, 1999, at the Holiday Inn Select at the Pyramids in Indianapolis. **Contact:** Eugene J. Orlandi, 311 Third St., East Northport, NY 11731 (516-368-9193).

340th BW (SAC) and support units, Whiteman AFB, MO (1953–62). Oct. 27–31, 1999, in Nashville, TN. **Contact:** Henry Whittle, 13707 Castle

Grove Dr., San Antonio, TX 78231-1911 (phone: 888-340-BOMB or fax: 210-493-5419) (henrywhittle@juno.com).

362d FG (WWII). Sept. 7–12, 1999, in Dayton, OH. **Contact:** Frank Larouere, 468 Carlotta Dr., Youngstown, OH 44504 (330-744-3511).

388th Fighter–Bomber Wg. Sept. 2–6, 1999, in Colorado Springs, CO. **Contact:** John W. Dawson, 16145 Stone View Rd., Monument, CO 80132 (719-481-3986).

435th TCG and 76th, 77th, and 78th TCS (WWII). Sept. 23–26, 1999, at the Holiday Inn Riverfront in Covington, KY. **Contact:** Al Forbes, 1614-B Berwick Ct., Palm Harbor, FL 34684 (727-785-6075).

450th BG (H). Sept. 23–26, 1999, at the WestCoast Ridpath Hotel in Spokane, WA. **Contact:** Doid K. Raab, 5695 Ireland Rd. N.E., Lancaster, OH 43130 (740-536-7635).

459th BG (H), Fifteenth AF, and support units (WWII). Sept. 9–13, 1999, at the Doubletree Hotel Boise, Riverside in Boise, ID. **Contact:** Emmet Herndon, 111 N. Curtis Rd., Box 7645, Boise, ID 83707 (208-375-0961) or John Devney, 90 Kimbark Rd., Rochester, NY 14610 (716-381-6174).

601st TCS and 601st AC&WS, ACS, and TCS. Oct. 6–9, 1999, in Tucson, AZ. **Contact:** Harry E. Ambrose, 18720 Dallas Ln., Little Rock, AR 72223 (501-821-3509).

602d AC&W Sq, Birkenfeld AB, West Germany (1948–69). Sept. 16–19, 1999, in Seattle. **Contact:** Jackie King, 212 Islandia Ct. W., Nashville, TN 37217 (615-366-5626).

613th, 847th, and 848th AC&W Sqs, 39th AD (ADCC), and 511th AC&W Gp. Sept. 27–30, 1999, in Las Vegas. **Contact:** Don Simmons, 704 S. Grove Rd., Richardson, TX 75081-5116 (972-231-6518) (dona7112@iadfw.net).

1198th OE & T Sq Assn. May 20–22, 1999, at the Holiday Inn Southeast in Louisville, KY. **Contact:** Robert L. Gonterman, 4312 Cavelle Ave., Louisville, KY 40213-2106 (502-366-2124).

7167th Air Transport Sq SAMS and 2d Aero Med Gp, Rhein Main and Wiesbaden, Germany (1950s and 60s). Sept. 12–15, 1999, at the Marines' Memorial Club in San Francisco. **Contact:** Don Larson, 63 Grande Vista, Novato, CA 94947 (415-892-2971) (dklarson@cmc.net).

7499th Spt. Gp and 7405th, 7406th, and 7407th Spt. Sqs. April 28–May 2, 1999, in San Diego. **Contact:** Evan Myers, 7500 Wittig Ave., Las Vegas, NV 89131 (702-656-8720).

AF Public Affairs Alumni Assn. Apr. 29–May 2, 1999, in Satellite Beach, FL. **Contact:** AFPAAA, PO Box 540, Fairfax, VA 22030-0540.

American Fighter Aces Assn and German Fighter Pilots Assn (ETO, WWII). Sept. 26–Oct. 4, 1999, in Geisenheim, Germany. **Contact:** Clayton Kelly Gross, 6352 S.W. Capitol Hwy., Portland, OR 97201 (503-244-1158 or 360-254-2829) (parprob@aol.com).

AAF Classes 43–45, Eagle Field, CA, June 11–13, 1999, Dos Palos, CA. **Contact:** Joe Davis (209-392-8264).

B-57 Canberra Assn. Oct. 8–11, 1999, at the Hope Hotel, Wright–Patterson AFB, OH. **Contact:** Bob Winters, 2633 Ehrhart Dr., Springfield,

OH 45502 (937-322-3716) (kaybob@erinet.com or batman@erinet.com).

Madrid and Torrejon (Spain) High Schools (1957–95). July 15–18, 1999, in Scottsdale, AZ. **Contact:** Sherry McCullough, 1012 Fairfax Ct., Arlington, TX 76015 (817-784-1954).

Pilot Class 42-I, all bases. April 21–25, 1999, in Fort Myers FL. **Contact:** Martin Nolan, 210 W. Calle Melendrez, Green Valley, AZ 85614.

Class 43-E Assn, all cmds. May 17–21, 1999, in Las Vegas. **Contact:** Paul Murphy, 7013 Bellrose Ave. N.E., Albuquerque, NM 87110 (505-884-5687).

Pilot Class 43-K (Central Flying Tng Cmd only). Oct. 27–30, 1999, at the Hilton Tucson East in Tucson, AZ. **Contact:** Harold A. Jacobs, 17545 Drayton Hall Way, San Diego, CA 92128 (619-485-9422) (Jakes43k@aol.com).

Pilot classes of 1944. Sept. 22–26, 1999, in Branson, MO. **Contact:** Stan Yost, 13671 Ovenbird Dr., Fort Myers, FL 33908 (941-466-1733).

Pilot Class 49-B. July 1, 1999, at the US Air Force Museum, Wright–Patterson AFB, OH. **Contact:** Joe Drach, RD-1, Box 119, Sycamore, PA 15364 (724-852-1002) (drachjrmick@alltel.net).

Pilot Class 52-D, Webb AFB, TX, students, instructors, and staff. April 30–May 2, 1999, in Big Spring, TX. **Contact:** Jack Drain, 733 Hunters Glen Ct., Bedford, TX 76021 (phone: 817-268-5725 or fax: 817-282-7847) (jdrain@flash.net).

Tactical Recon aircrews. Sept. 2–5, 1999, at the Hilton Downtown in Salt Lake City. **Contact:** Roger Wilkes, 1341 N. 3175 E., Layton, UT 84040 (801-546-2258) (RWilkes2@aol.com).

USAF Weapons School (formerly USAF Fighter Weapons School and Air Force Gunnery School) graduates and former instructors. June 16–20, 1999, at Nellis AFB, Nev., and the Hilton & Tower Flamingo in Las Vegas. **Contact:** Maj. Robert Wagner (702-652-6764 or DSN 682-6764) (www.nellis.af.mil/usafws/reunion.htm).

Wilson and Bonfils AAF Flying School (Chickasha, OK, 1941–42). **Contact:** Ron Baker, 23 Walnut Dr., Ninnekah, OK 73067 (405-224-5343).

Seeking **Pilot Class 56-V, Spence AFB, GA,** and Bryan AFB, TX, for a reunion. **Contact:** George Partridge, 106 Quail Run, Prattville, AL 36067-3810 (geopat56@mindspring.com).

Seeking **Pilot Class 60-F** and instructors, all bases, for a reunion. **Contact:** Orin Knutson, PO Box 96, Kensett, IA 50448-0096 (515-845-2244) (aidaorin@netins.net).

Seeking **Pilot Class 73-06, Laredo AFB, TX,** for a reunion. **Contact:** Jim Olson, 7624 Old Bicycle Rd., Panama City, FL 32404 (850-871-2555) (jimolson@aol.com).

Seeking members of the **474th Fighter–Bomber Gp (428th and 429th Sqs), Kunsan, Korea,** for a reunion. **Contact:** David Day, 8920 Twelve Oaks Dr., Shreveport, LA 71118 (318-688-5073) or Bill Oliphant (423-525-7948) (billolly@juno.com).

Seeking maintenance personnel of the **526th FIS, 86th FIW, Ramstein AB, Germany (1955–60),** for a reunion. **Contact:** Jerome P. Burton, 2712 W. 76th St., Torrance, CA 90504 (310-217-9317) (jpburto@twa.com).

AFA State Contacts



Following each state name are the names of the communities in which AFA chapters are located. Information regarding these chapters or any of AFA's activities within the state may be obtained from the appropriate contact.

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ARIZONA (Green Valley, Phoenix, Prescott, Sedona, Sierra Vista, Sun City, Tucson): **Angelo Di Giovanni**, 973 Vuelta Del Yaba, Green Valley, AZ 85614 (phone 520-648-2921).

ARKANSAS (Fayetteville, Hot Springs, Little Rock): **John L. Burrow**, 352 Rollston Ave. #1, Fayetteville, AR 72701-4178 (phone 501-751-0251).

CALIFORNIA (Apple Valley, Bakersfield, Edwards AFB, Fairfield, Fresno, Los Angeles, Merced, Monterey, Orange County, Palm Springs, Pasadena, Riverside, Sacramento, San Diego, San Francisco, Sunnyvale, Vandenberg AFB, Yuba City): **Paul A. Maye**, 1225 Craig Dr., Lompoc, CA 93436 (phone 805-733-5102).

COLORADO (Colorado Springs, Denver, Fort Collins, Grand Junction, Pueblo): **Howard R. Vasina**, 1670 N. Newport Rd., Ste. 400, Colorado Springs, CO 80916-2700 (phone 719-591-1011).

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DISTRICT OF COLUMBIA (Washington): **Rosemary Pacenta**, 1501 Lee Hwy., Arlington, VA 22209-1198 (phone 703-247-5820).

FLORIDA (Avon Park, Broward County, Daytona Beach, Fort Walton Beach, Gainesville, Homestead, Hurlburt Field, Jacksonville, Leesburg, Miami, New Port Richey, Orlando, Palm Harbor, Panama City, Patrick AFB, Spring Hill, Tallahassee, Tampa, Vero Beach, West Palm Beach): **David R. Cummock**, 2890 Borman Ct., Daytona Beach, FL 32124 (phone 904-760-7142).

GEORGIA (Atlanta, Peachtree City, Savannah, Valdosta, Warner Robins): **Zack E. Osborne**, 306 Lake Front Dr., Warner Robins, GA 31088 (phone 912-953-1460).

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Donald E. Persinger, 1725 2d Ave., South Sioux City, NE 68776 (phone 402-494-1017).

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Pieces of History

Photography by Paul Kennedy

More Than Airplanes



In addition to having more than 300 aircraft, missiles, and drones, the US Air Force Museum at Wright-Patterson AFB, Ohio, also possesses 34,500 artifacts in its collection. The museum maintains warehouses packed with items ranging from diaries, medals, and military uniforms to an original Wright brothers wind tunnel and vintage trucks, cars, and other vehicles. Whether it's for

a large exhibit depicting an ambulance meeting an incoming bomber at the flight line or a small detail like the appropriate mission logs and checklists used by an ICBM missile crew, the museum's vast store of artifacts helps present the exhibits in proper context.

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