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AIR FORCE

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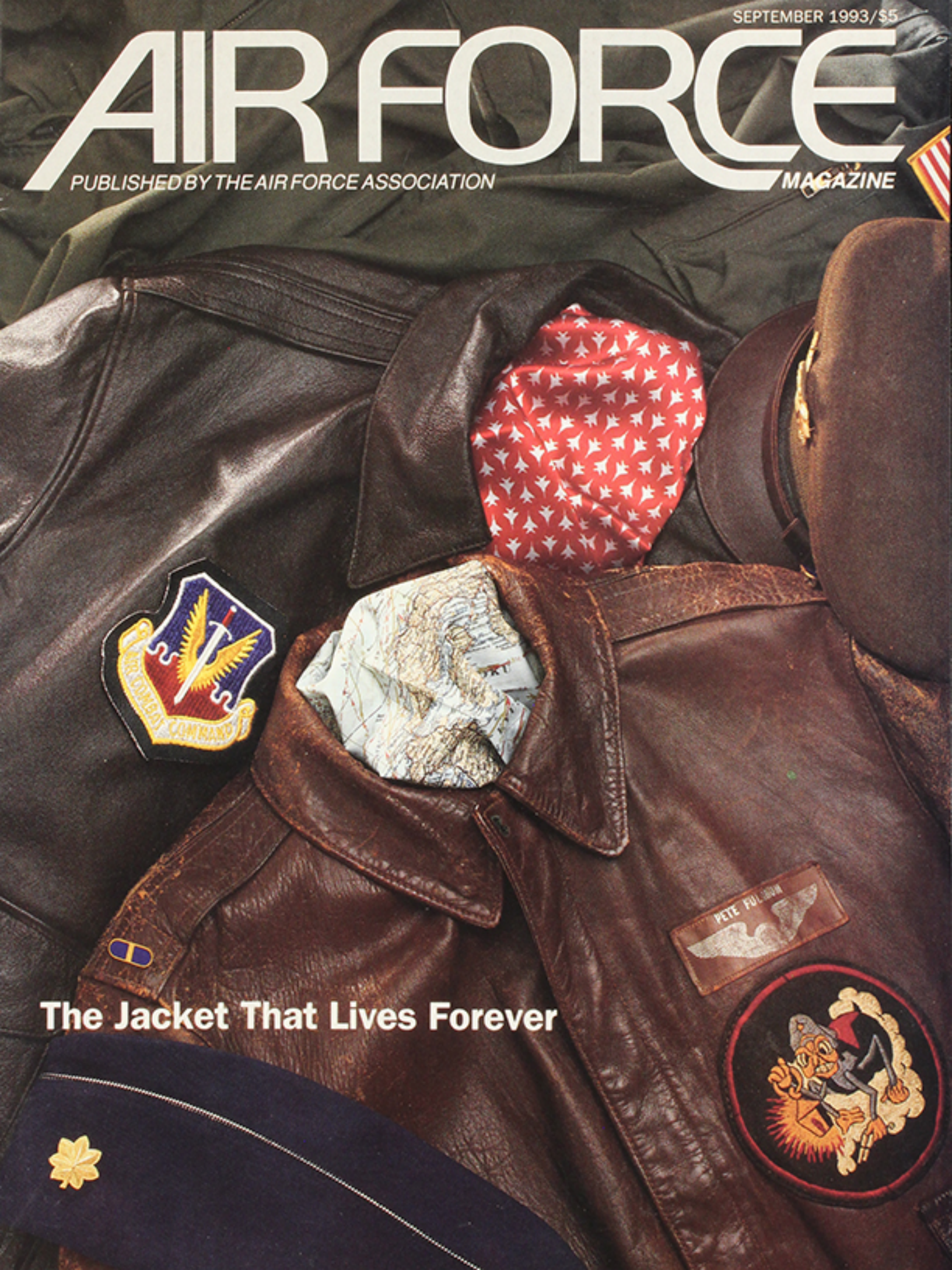
MAGAZINE



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September 1993, Vol. 76, No. 9

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

About the cover: A World War II A-2 flight jacket (right) poses with its modern counterpart. Photo by Paul Kennedy. Vintage A-2 from the collection of Robert Borrell, Sr.

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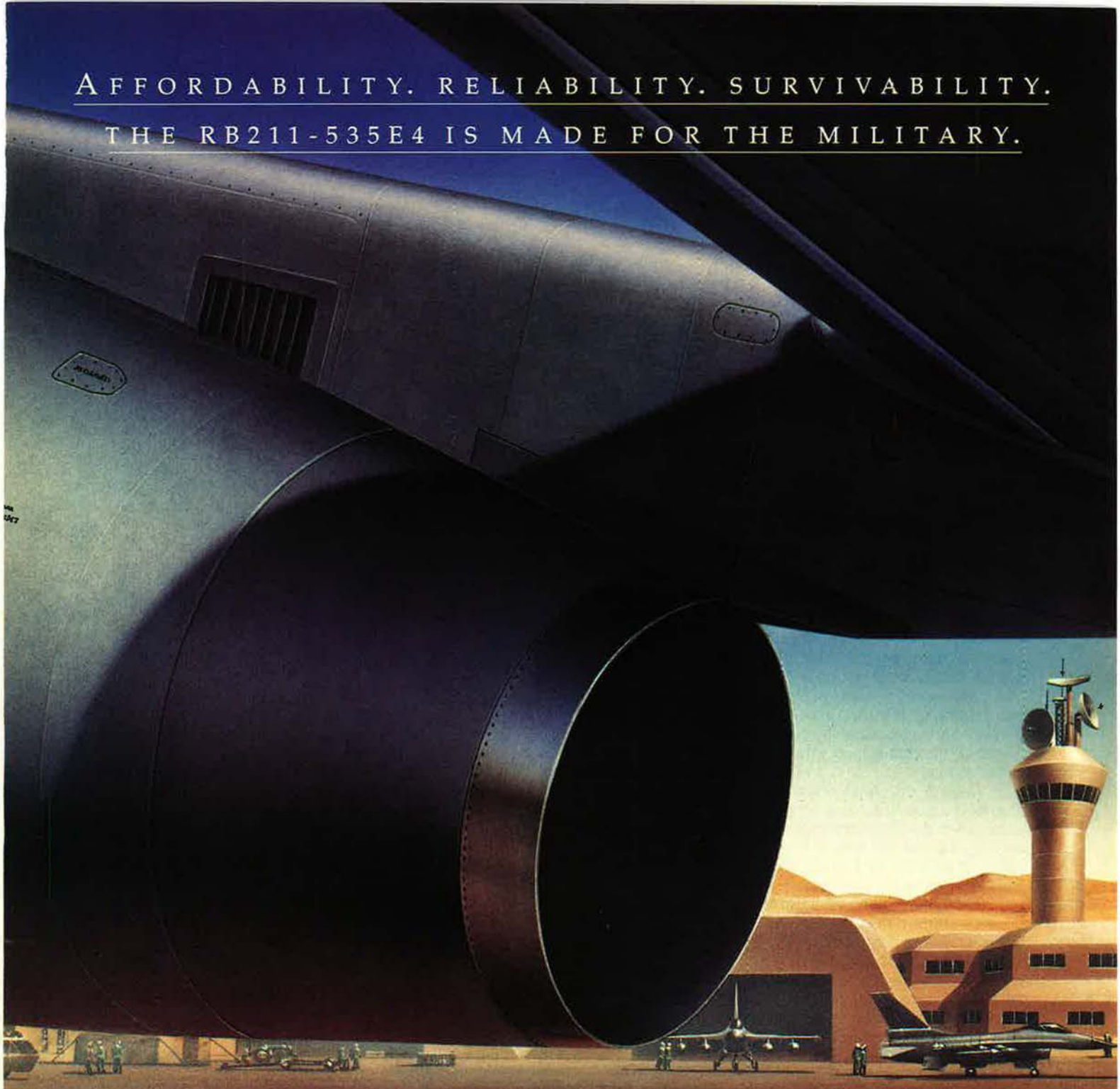

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Editorial

By John T. Correll, Editor in Chief

Two at a Time

BACK IN the olden days, some thirty years ago, the United States set as its standard for planning conventional armed forces the capability to fight 2.5 wars. The idea was that the nation should be ready to engage, simultaneously, the Warsaw Pact in Europe and the Chinese in Asia while handling a lesser, half-war contingency on the side. (The half war turned out to be in Vietnam, where we discovered certain abiding truths about "lesser" contingencies.)

Times have changed. Today the Clinton Administration is scrambling to make its new defense budget cover a strategy that is based on fighting, nearly simultaneously, two major regional conflicts. It is tough going, partly because regional conflicts are more complicated than they used to be and partly because the Administration took a blind leap with its budget proposal.

In March, the Administration announced a plan that cuts an already-emaciated defense program by another $131.7 billion over the next five years. It was left until later to decide what sort of force this budget would buy. It obviously won't fund the "Base Force"—26.5 fighter wings, twelve carriers, and twelve active Army divisions—projected by the Bush Administration. The Department of Defense has made one adjustment already, eliminating two fighter wings from the plan. Further economies were required. Strategy and objectives had to be reconsidered as well, since a smaller force would cover less.

Among the ideas hit upon was "Win-Hold-Win," a concept to prosecute fully one regional conflict and conduct a holding action on a second front until more forces were available. This strategy, widely ridiculed as "Win-Lose-Lose" and "Win-Hold-Oops," did not live long. "After much discussion and analysis," Secretary of Defense Les Aspin announced June 25, "we've come to the conclusion that our forces must be able to fight and win two major regional conflicts, and nearly simultaneously."

Unfortunately, there are several catches. Forces discussed for the two-war strategy—reported as twenty fighter wings, ten carriers, and ten active Army divisions—are the same as those identified earlier with Win-Hold-Win. The next catch is that the budget may not even support a force sized to Win-Hold-Win. Sen. John McCain (R-Ariz.) warns that the reduced budget will provide, at most, nineteen fighter wings, eight carriers, and nine active Army divisions. A credible-sounding analysis by Dov Zakheim and Jeffrey Ranney of System Planning Corp. is more pessimistic. They figure the possible outcome of the budget to be thirteen wings, six carriers, and seven divisions, with total active-duty strength falling to 1.04 million by 1999.

This budget won't cover the two-war strategy. It even looks short for "Win-Hold-Win."

What kind of force would be needed to fight two major regional conflicts nearly simultaneously? We have several indications to go on. For example, the Persian Gulf War (which the strategy rated as a major regional conflict) took the equivalent of eleven US Air Force fighter wings and eight more from coalition partners. By that measure, a two-conflict strategy calls for more wings than the 26.5 projected in the Base Force. Indeed, the 1992 Joint Military Net Assessment, published during the Bush Administration, said that "the Base Force is capable of resolving quickly—with low risk—only one major regional crisis at a time."

A study by the RAND Corp. computes the force for a single regional conflict as including ten fighter wings, eighty heavy bombers, three carrier battle groups, and five Army divisions. Two conflicts would require twice that, but there are complications. Some assets, such as Stealth fighters and B-2 bombers, are in short supply and would have to be shuttled from one conflict to the other.

The first conflict ties up ninety percent of the airlift fleet. RAND says, however, that there is a conceivable way to cover a second conflict, provided it does not begin for three weeks. After twenty-one days, fast sealift ships might be able to sustain the first conflict, releasing eighty percent of the available airlift for the second front. Planners comfortable with that, please raise your hands.

Thus, assuming the budget can field a twenty-wing force—which seems doubtful—we must pull everything that can fly out of the United States and the overseas theaters, then play shift and shuttle to make the two-conflict strategy work. RAND adds one more chilling reminder: "The US ability to forecast future force needs has been far from perfect. Peak US deployments in Korea, Vietnam, and Iraq exceeded planners' prewar expectations by a factor of two in critical areas."

It is said that technology will allow us to do more with less, but, concurrent with the force reductions, we see powerful factions working to cancel the C-17 airlifter, cut the Stealth fighter program, and curtail other system developments. If they succeed, the assumptions behind current planning no longer apply.

The Pentagon would have to pull an extremely large rabbit out of its hat to make the Administration's budget proposal match the two-conflict strategy. For that matter, it seems a little short for Win-Hold-Win.

It's time for a reality check. Mr. Aspin is noted for his attention to strategic analysis. From his long tenure as chairman of the House Armed Services Committee, he knows a great deal about military operations. He sincerely wants a force that is adequate to its task. We hope he will conclude, and make the case where it counts, that this deep-drop budget won't do it. ■

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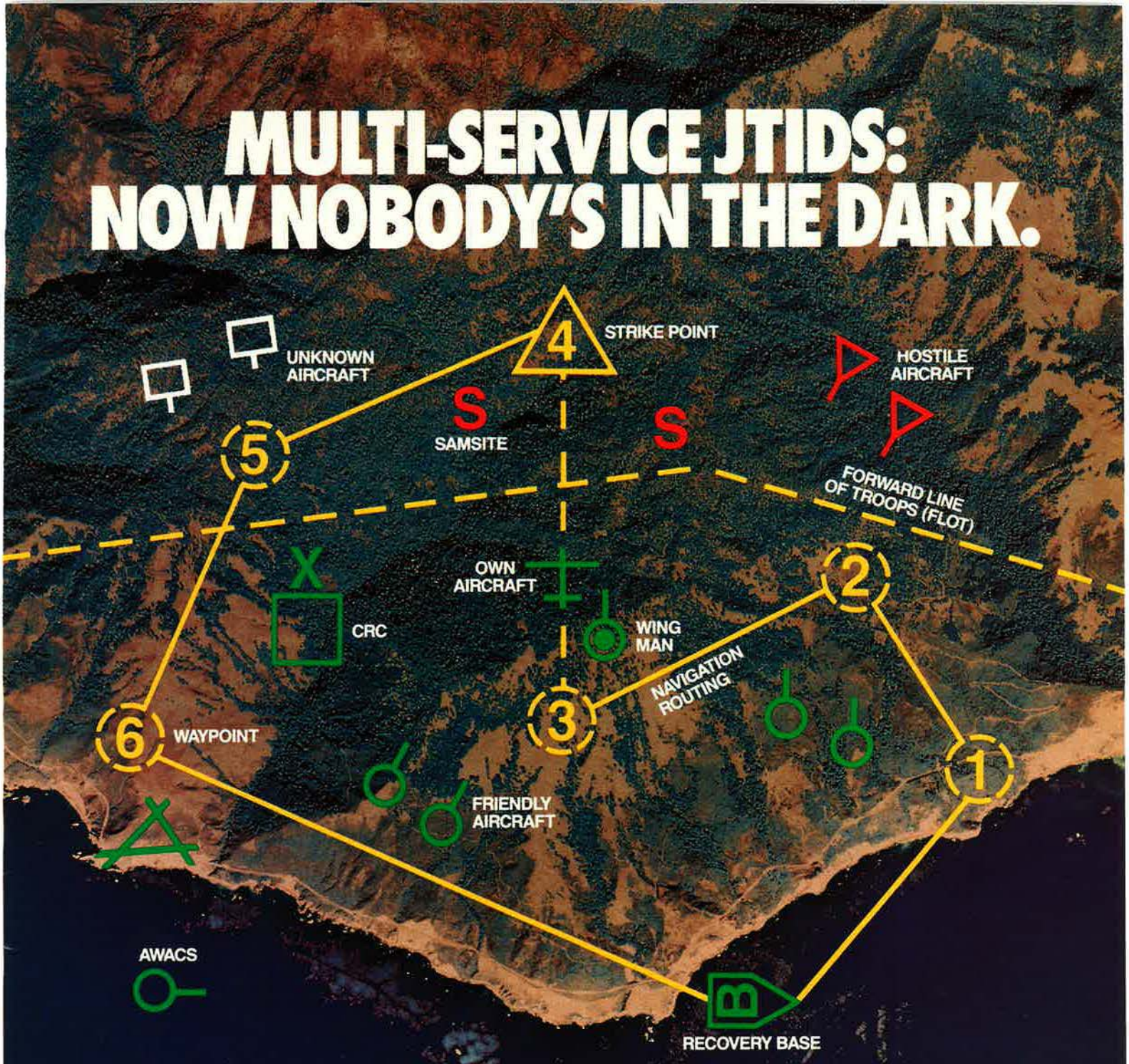

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Letters

The Other Lion's Share

I suspect that many of your readers agreed with "The Lion's Share of Power Projection" *[June 1993, p. 38].* I thought the article, like the draft RAND paper on which it was based, was pretty much one-sided.

The RAND results indicate that USAF forces account for eighty to ninety percent of the targets killed in the early days of a regional war. The modest showing of seabased forces is due to "the relatively slow deployment speed of warships, limited number of strike aircraft deployed on carriers, and comparatively modest payloads of these aircraft." The article concludes that "a rationale for investment in these forces cannot be found in an examination of large-scale air-to-ground operations."

The foundation of the study, like most similar studies, is rooted in the assumptions. They are flawed. Under other plausible assumptions, one can arrive at results quite different in terms of who provides the lion's share of early power projection.

Assumptions of any analysis can drive the answers. In the RAND paper, the deployment time lines are the key assumptions—and the most questionable ones. It's hard to believe that we will be able to deploy tactical air forces and all their support at roughly three times the rate of Operation Desert Shield, which is what the RAND results imply. This is not a reasonable assumption. In many cases, the results could be far worse than in Desert Shield. The Gulf War was an extraordinary anomaly in terms of favorable access to ports and bases. Moreover, and quite important, we didn't have to fight our way in.

The RAND assumptions on payloads and sortie rates are more reasonable, but they slightly understate the capabilities of Navy aircraft and overstate slightly the effective payload of long-range bombers. Rather than arguing about the details, I can illustrate the point by using alternative assumptions that replace the RAND deployment time lines with historical data from Operation Desert Shield and by making modest adjustments to payloads and sortie rates. These assumptions would also include F-14s in a strike fighter role.

Rather than calculate targets killed (clearly a debatable data point, since it is speculative), it seems reasonable to calculate cumulative strike payload delivered. . . . Using the RAND assumptions, USAF delivers the lion's share. With the other set of assumptions, naval forces account for half of the payload delivered for the first sixteen days. If one looks at the crucial first five days, naval aviation and Tomahawk land-attack missiles (TLAMs) account for almost two-thirds of the payload. That's the lion's share.

In this type of analysis, as in warfare, no single correct set of assumptions exists. Perhaps the RAND case is possible under optimal conditions, but it is improbable. Restrictions on base access are a reality and may well prevent early deployment of USAF tacair, as sometimes assumed by the Navy. Variables exist, and, rather than using one extreme (best case), it seems more reasonable to present a balanced set of assumptions.

The future continually defies prediction. We must be prepared to deal with surprise and a range of situations. That calls for the long range and large payload of bombers and the ability to project landbased tactical airpower rapidly. It also calls for the many important capabilities of seabased aviation. In other words, the US military needs a set of well-balanced capabilities because any component could end up being the key in a particular scenario.

Do you have a comment about a current issue? Write to "Letters," AIR FORCE Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be concise, timely, and preferably typed. We cannot acknowledge receipt of letters. We reserve the right to condense letters as necessary. Unsigned letters are not acceptable. Photographs cannot be used or returned.—THE EDITORS

Moreover, the components are synergistic. Seabased or landbased tactical aircraft can provide strike support to bombers; USAF fighters can support Navy strike aircraft; USN aircraft and TLAMs can provide Suppression of Enemy Air Defense for the Air Force as they did in the Gulf War.

Once US forces are fully deployed to the theater, the Air Force may well contribute the lion's share of airpower, as it did in Desert Storm. But who plays the lion in the crucial early days will depend on circumstances, and we should not base our decisions on the most favorable scenario. There's unlikely to be a surplus of airpower in the early days of a fast-breaking regional war. The US may well need all the early airpower it can muster.

Vice Adm. Leighton W. Smith, USN
Deputy Chief of Naval Operations
(Plans, Policy, and Operations)
Washington, D. C.

Total Force Coverage

I have just finished reading the July 1993 issue of AIR FORCE Magazine. As usual, it is excellent. Bruce Callander's "Testing the Limits of the Total Force" *[p. 26]* may be the best I've read on the subject. It should be required reading for anyone involved in force-structure development.

As good as this issue is, I think you missed an excellent opportunity to cover the Guard and Reserve in "Bosnia Airdrop" *[p. 52].* That mission has been a Total Force effort from the very beginning, with Air Force Reserve and Air National Guard crews flying the same missions as the active-duty force. Reservists fly in C-130 cockpits over Bosnia, and some are women.

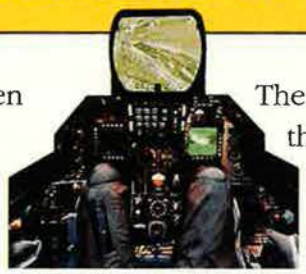
AIR FORCE Magazine is a quality product and a boon to everyone in the Air Force. You can always count on my support.

Maj. Gen. John J. Closner, USAF
Chief, AFRES
Washington, D. C.

Credit Where It Is Due

I am writing to thank David Lynch for his positive portrayal of tankers in "Tankers at the Rendezvous" *[June*

TIMES CHANGE. SO DO F-16S.



F-16 (Night Attack) Cockpit

The world has seen some dramatic changes since the first F-16 was introduced. The Berlin Wall has come down. The Soviet Union and Warsaw Pact have been dissolved. And new potential trouble spots have emerged.

Dramatic changes in weapon technology have also taken place. Fighter aircraft have improved radar capabilities, faster computers and more advanced weapons.

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The F-16 was the workhorse of Desert Storm. It flew 13,500 missions and had the highest readiness rate of any fighter in theater. With LANTIRN and GPS, F-16s were the premiere scud hunters.

The F-16 we're building today incorporates literally hundreds of new state-of-the-art technologies. The entire cockpit has been modernized. Engine thrust has been increased 25%, and there is a choice of the world's two best fighter engines manufactured by Pratt & Whitney and General Electric.

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While the F-16's combat capability has been significantly enhanced, it was not done at the expense of operation and support costs. In terms of reliability, maintainability, readiness and lifecycle cost, the F-16 remains the best frontline fighter in the world.

And that's something we never intend to change.

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Letters

1993, p. 54], in which he spells out some of the outstanding work tankers have done—work the military flying community has grown to expect and depend on. I wish to clarify the "official account" of the mission I was on that Mr. Lynch described in the article.

This "official account" makes it sound as if I single-handedly rescued a USAF F-117A during Operation Desert Storm. As much as I appreciate the accolades bestowed on me since then, it is essential that your readers understand that I was part of a well-trained team trying to get a crucial job done that night. I was certainly not alone in my KC-135 the night of January 17, 1991, but had a superb crew of professional aviators on board to get the job done: pilot Capt. Todd P. Beer, navigator 1st Lt. James M. Rubush, and boom operator SrA. John L. "Jay" Ley.

It was Jim Rubush whose situational awareness alerted me to our proximity to the F-117. It was Todd Beer who maintained constant communication with AWACS, advising them of our intentions so they could direct traffic out of our way—reducing the risk of a midair collision with other tankers and receivers in the area—while assisting me with the piloting duties.

Together, and not without a lot of assistance from the AWACS controller, we worked our way into a position about half a mile in front of the F-117 headed straight for Iraqi airspace. Jim informed me that the border was only six miles off our nose. Knowing that the F-117 didn't have the energy level for a 90° turn at our altitude and airspeed, I simply acknowledged the remark and continued straight ahead. That was a tough decision since, at this point, I was balancing the fighter pilot's survival as well. My crew accepted it without hesitation, and Jim proceeded to painstakingly plot our progress across the Saudi-Iraqi border and beyond.

The success of the refueling rested on the shoulders of Airman Ley. The receiver informed us that he had only about three minutes of fuel remaining, so we should send our best boomer back. (Jay didn't have the heart to tell him he was our *only* boomer.) Mr. Lynch quoted the F-117 pilot as saying, "We've got one shot at this." The rest of that quotation was, "Then I'll have to back up and get out of this thing." No pressure.

Jay reached out as far as the boom would allow and made that first, crucial contact. Then, after Todd pumped him a token offload, the F-117 fell out of the bottom of the refueling envelope; too high, too heavy, and too slow—way behind the power curve!

That's when we started the toboggan maneuver (and our turn southward), which allowed the F-117 pilot to maintain a comfortable position. This took us back through the severe weather and turbulence we'd tried so hard to climb out of minutes earlier. Credit for maintaining contact between the aircraft in the descent is shared by Airman Ley (He told me he had occasionally lost sight of the receiver on the end of the boom, less than twenty-five feet away. F-117s aren't known for their visibility, especially at night) and the F-117 driver who fought a mind-numbing battle to maintain position after a rather full night of flying.

Individual aircrew members work extremely hard to secure the trust and confidence in one another that, coupled with tireless training, makes the crew effective. In this instance, that synergy probably saved a highly classified USAF asset and, more important, the highly trained pilot inside.

I have never been able to thank the members of the AWACS team for their incredible support. I hope they're as proud of the job they did as we are of them. . . .

Capt. David B. Horton, USAF
Bellbrook, Ohio

Air Refueling Pioneers

I really enjoyed "Tankers at the Rendezvous." As a former tanker crew member, I've been involved in lots of in-flight refuelings, but I wasn't quite prepared for that statistic of 51,000 refuelings during the Persian Gulf War. That really got my attention!

Your history of in-flight refueling failed to mention a very important aircraft: the Boeing KC-97. This somewhat homely bird couldn't carry the loads of KC-135s and KC-10s, but, for the first half of the 1950s, we supported the SAC B-47s and B-52s, 50,000 pounds at a time. The bomber folks were always glad to see us at the rendezvous point. The KC-97 had the first production refueling boom system and created a whole new career field as "boomers" were trained to fly the nozzle into that refueling receptacle. The system worked, and worked reliably.

The airplane's main drawback was, of course, piston engines. Even the four 3,800-horsepower Pratt & Whitney engines could only take the airplane down the refueling track at about 250 knots, and that was just not fast enough for a B-47, which staggered along with a not-too-comfortable margin

above stall as its tanks filled up. (The B-52s seemed to handle better under the same conditions but usually needed two KC-97s to top them off.)

The KC-97 also lacked altitude capability. The top refueling altitude was about 15,000 feet, so the bombers had to descend to refuel and then climb back up, wasting some of the fuel. The weather at the lower altitude was generally not as good for refueling. The handwriting was clearly on the wall for piston tankers.

Even though several hundred KC-97s were built, it's hard to find anyone who ever heard of this great old bird. Like a lot of other fine airplanes, it had its moment of glory before being relegated to the aluminum scrap heap of history.

Capt. Mike Scherer,
USAF (Ret.)
W. Palm Beach, Fla.

Unneeded Jabs

I was surprised to open the April 1993 issue and see two consecutive letters by friends of mine, both about the "Bone." ("The B-1's Capabilities," by Captain Donahoo, and "The B-1's Limitations," by Captain Fenelon.) I had to pull out the February issue to see what all the fuss was about, and I have to admit I was disappointed by what I read. It wasn't just the bashing of the B-1 that got to me, it was the shortsightedness of those making the comments in the February issue.

As a former "Bone driver," I wish I could say I agree with all that Captain Liebman said, but I know a lot of personal pride went into writing the letter—pride that may have clouded his judgment. The B-1 is undoubtedly a tremendous aircraft, but I will never slight the B-52 or its capabilities, which have been proven in peacetime and in war. What matters is that these aircraft can work well together given the chance and the right crew training. I know Captain Fenelon was justifiably trying to defend his "BUFF," but the point is neither he nor Captain Liebman needed to take jabs at other pilots—or their weapon systems.

I think Captain Donahoo's arguments with Lieutenant Van Decar are well founded. The Lieutenant needs to remember two simple things: no matter what weapon system we belong to, we all train to do our best in all situations and against all threats; second, last I heard, the F-22 will be on our side, so I don't think we really want them to "get" any "Bones."

If we ever use these weapon systems in war, everyone (except the enemy) can rest comfortably knowing that F-22s, B-1s, and B-52s will be going the same direction, fighting the same enemy, and working together. I enjoy seeing the pride and competitive spirit among these people, but let's keep that competition going toward the right goal—teamwork.

We in the military will have to endure enough hostile scrutiny from our own lawmakers for the next few years. Let's not give them the pleasure of seeing us squabble with other blue-suiters.

Capt. Scott Land,
USAF
Edwards AFB, Calif.

Exploiting the B-1's Strengths

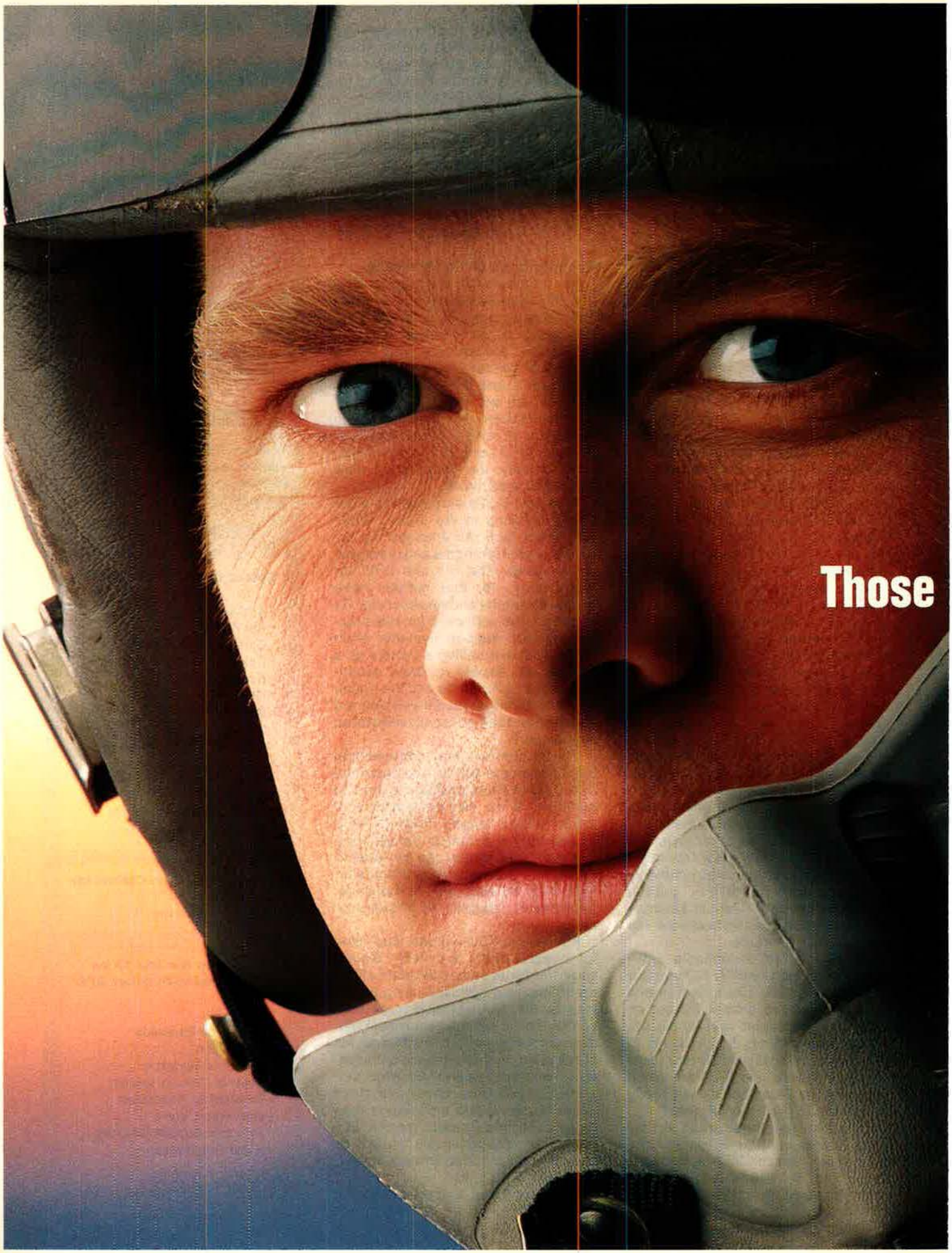
As members of an organization specifically tasked to develop and test new employment tactics for both the B-1 and B-52, we have been reading with some amusement and a fair amount of concern the exchange regarding B-1 and B-52 capabilities in the February and April 1993 "Letters." Captain Fenelon was quite correct in calling for a review of the facts regarding B-52 and B-1 capabilities. Unfortunately, the "facts" cited were dated and inaccurate.

B-1s and B-52s may well have differing missions in the future. Why? Any smart tactician employs his assets to exploit strengths and downplay weaknesses. The B-1 and B-52 (or any aircraft, for that matter) have unique strengths and weaknesses. As we see it, the political difficulties facing modern weapon systems often result from overselling a system as a "can do all" answer to future contingencies. The Air Force and the nation might be better served if we reported facts rather than politically motivated speculations.

The contention that conventional use of bombers will be accompanied by a sizable strike package is open to question. If we call on bombers to strike limited targets from CONUS bases early in a conflict before fighters and other forces can be forward deployed, the lone penetrator scenario may be accurate. In this case, penetration capability is of supreme importance.

The twelve-hour upload time cited for a deployed B-1 is in error. We assume this figure came from a late 1980s report studying turn time using an upload facility and installing three conventional modules. In a deployment situation, aircraft would arrive with modules installed and would not require a change-out unless the modules had failed. Operational units have developed much faster bomb-loading procedures than those described in early reports. Deployed units should be able to turn B-1s at a rate similar to that already demonstrated by B-52 units.

B-1 stores bay fuel tanks are not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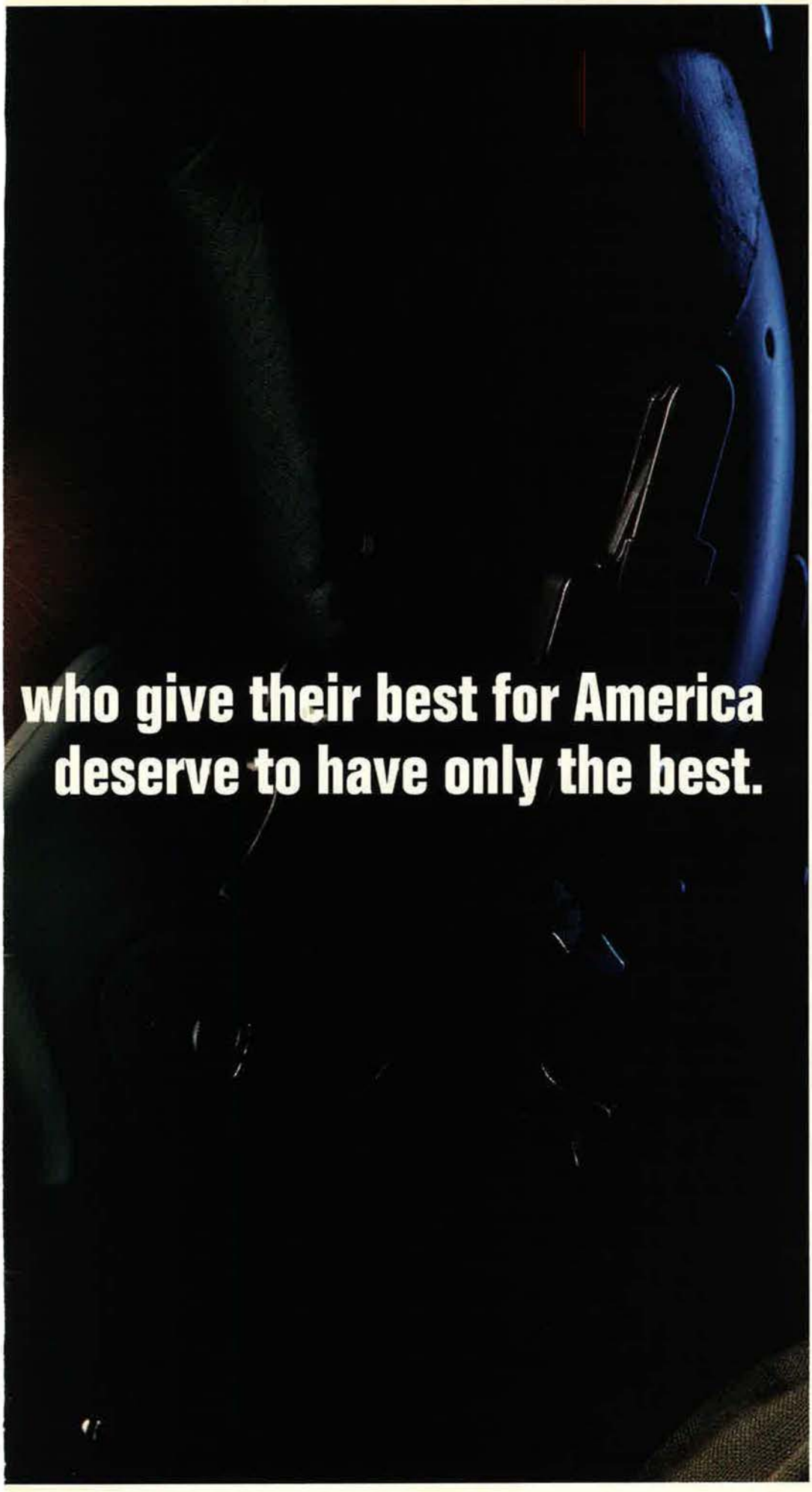

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Letters

"semipermanent" in any bay. They can be up- and downloaded in times comparable to weapons loading times. Any of the B-1's three stores bays can accommodate a fuel tank, a conventional module (up to twenty-eight Mk. 82s), or a rotary launcher. Bay tanks can carry 19,340 pounds of fuel each. In Captain Fenelon's scenario, a strike mission flying 1,000 miles at high altitude from a forward operating base would not require a stores bay tank, even without air refueling.

As for Operation Desert Storm, B-1 crews were indeed "minding the store" on nuclear alert with ICBM and SLBM forces, just as they were before the war. B-1 conventional capability was in its infancy, and it would have been foolish to use them when B-52 crews were already qualified. Comparing the numbers of B-1s and B-52s on alert is meaningless for two reasons. The numbers of aircraft in the available fleet were different, and numbers of warheads on alert were not considered.

The B-1's limited conventional capability can be blamed on lack of planning for conventional operations when the system was fielded—not on some fundamental flaw in the aircraft. Many people are mounting a significant effort to develop B-1 conventional capabilities that will serve the nation well.

We must decide what our mission is and tailor our efforts to its most efficient accomplishment. We must also constantly update our assumptions in order to avoid "fighting the last war." We have grown tired of constant airplane bashing and establishment of pecking orders at the expense of teamwork. Our Air Force includes a diverse set of capabilities that have demonstrated success in aerial combat. We specialize in the bomber portion of that team. . . .

Capt. Mitchell D. Sneck, USAF
364th Test and Evaluation Squadron
Ellsworth AFB, S. D.

■ *The letter was also signed by Captains David Kugler, Clay Van Meter, Daniel Grenier, Timothy Walsh, Michael Tellier, Randal Nuss, and Houston Sewell of the 364th TES.*—THE EDITORS

Overrunning the Boom

I enjoyed "Tankers at the Rendezvous." However, I noticed a small but significant error.

As an Instructor Weapons Director in AWACS aircraft, I saw quite a few point-parallel rendezvous in which the receiver executed a 180° turn and rolled out three miles ahead of the tanker, as Mr. Lynch's article states.

This was usually caused by either the tanker navigator or the AWACS Weapons Director calling for the 180° turn too early, and we called it an overrun (a euphemism for a mistake).

The correct final placement of a receiver in a point-parallel, or any type of refueling operation, is behind the tanker. Fortunately, most rendezvous end up this way.

Capt. Penny A. Heiniger, USAF
College Station, Tex.

Kaiser's Displays

As the manufacturer of the multifunction displays for the F/A-18C/D and the head-up display (HUD) for the A-6E and as a member of the Air Force Association, we are greatly distressed by your July issue's assertion that those displays are provided by some of our principal competitors.

On p. 76 of the "Gallery of US Navy, Marine Corps, and Army Aircraft," you attribute the F/A-18C's and D's "new cockpit displays" to Smiths. Kaiser Electronics, in fact, provides two new color multifunction displays for the F/A-18C and four new color multifunction displays for the F/A-18D in addition to the new HUD you correctly mentioned. Smiths Industries provides one dedicated map color display for the F/A-18C and two dedicated map color displays for the F/A-18D. . . .

On p. 77, you attribute the A-6E Intruder's new HUD to GEC Marconi. This is incorrect. Kaiser Electronics provides that wide-field-of-view HUD just as we do for the Air Force F-15E.

Another inaccuracy of the F/A-18A/B/C/E/F Hornet's description is its statement that the F/A-18 replaced the F-4 in the Navy and the A-7 in the Marine Corps. The A-7 was used by the Navy, not the Marines, who used the A-4 and later the AV-8B for the attack mission. The F/A-18 replaced the A-7 in the Navy and the F-4 in the Marine Corps.

Because Kaiser Electronics competes directly with Smiths and GEC Marconi in a competitive world, I believe it is important for AIR FORCE Magazine and other influential publications to be accurate in their attributions of the equipment of the armed services.

James P. Atkins
Kaiser Electronics
San Jose, Calif.

Erratum

On Page 81 of the August 1993 issue, the Robins AFB Museum of Aviation was misidentified. We regret the error.—THE EDITORS

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Capitol Hill

By Brian Green, Congressional Editor

The Rebuttable Presumption

A declaration of homosexuality can be refuted, but the standard of proof is difficult. No one has ever met it.

AFTER SIX contentious months, the Administration and Congress moved in July toward settlement on the issue of homosexuals in the armed forces. It had long been clear that President Clinton was going to fail in his bid to lift completely the ban on homosexuals. Even a compromise policy was critically dependent on acceptance by military leaders. Without that, there was little chance that Congress would let a revised policy stand.

All of the service chiefs, however, said they supported the "Don't Ask, Don't Tell, Don't Pursue" policy that the President announced in a July 19 speech at Fort McNair, D. C. As explained by President Clinton and Secretary of Defense Les Aspin, the services will not ask about sexual orientation and will not later conduct investigations without a credible indication of misconduct. Homosexual conduct would still be prohibited and would constitute grounds for discharge.

New controversy flared up almost immediately. Gay activists complained that President Clinton had broken his promise to lift the ban. Critics from the other side said the policy was full of ambiguities and loopholes, too heavy on "don't ask" and too light on "don't tell." Sen. John McCain (R-Ariz.) told Mr. Aspin, "You have laid the groundwork for an interminable thicket of lawsuits."

Contributing to the confusion was the pro-gay spin the President put on his remarks at Fort McNair. He said he was "deeply impressed" by the "devotion to duty and country" of homosexuals who have served "with distinction" in the past and that "there is no study showing them to be less capable or more prone to misconduct than heterosexual soldiers." He thanked those, including gay activist groups, who lobbied for change.

He also gave an incomplete description of a main provision of the policy, saying, "An open statement by a service member that he or she is a homosexual will create a rebuttable presumption that he or she intends to engage in prohibited conduct, but the service member will be given an opportunity to refute that presumption."

What Mr. Clinton played down was that prohibited homosexual conduct includes statements, verbal or nonverbal, demonstrating a *propensity* or intent to engage in homosexual acts. As Pentagon lawyers testified later, simple denial of propensity or intent does not rebut the "rebuttable presumption." The burden is on the individual to *prove* the presumption is wrong. Jamie S. Gorelick, the Department of Defense's general counsel, told the Senate that this standard of proof is so difficult to meet that "no one has ever done it."

Sen. Sam Nunn (D-Ga.), chairman of the Armed Services Committee, moved promptly to write his own version of the policy into law. A bill introduced in the House Armed Services Committee adopted identical language. Senator Nunn set up the provisions of his bill with a series of "findings," including the flat statement, "There is no constitutional right to serve in the armed forces."

Furthermore, the Nunn bill said, "military life is fundamentally different from civilian life" and "the presence in the armed forces of persons who demonstrate a propensity or intent to engage in homosexual acts would create an unacceptable risk to the high standards of morale, good order and discipline, and unit cohesion that are the essence of military capability." The grounds listed for discharge of homosexuals were remarkably similar to the rules that have been in effect since 1981.

Ms. Gorelick told the Senate that the Defense Department has always based its discharge of homosexuals on conduct—acts or statements—rather than on orientation, and that the "rebuttable presumption" rule was there all along, even if it was not called that. (The 1981 policy does prescribe the grounds for separation as a list of prohibited actions, and it does say that a declared homosexual will be separated "unless there is a further finding that the member is not homosexual or bisexual.")

Expression of opinion alone, such as marching in a gay rights parade, does not set up a presumption of homosexuality, Ms. Gorelick said, but "if someone marches with a T-shirt that says, 'I am here, I am queer,' that is a statement." Suppose, asked Sen. John Glenn (D-Ohio), "the sergeant is down there in drag, pink hair, with a dress on, and he is walking in the parade and the people recognize him as their sergeant. Now, he has not said, 'I am a homosexual.' What would happen?" Ms. Gorelick replied that "one can draw conclusions from activities that, if you will, speak louder than words."

According to the Pentagon's summary, commanders will not begin inquiries or investigations on the basis of suspicion alone or solely to determine an individual's sexual orientation. There must be "credible information that a basis for discharge or disciplinary action exists." That, according to the critics, throws too much of the problem to commanders, who will enforce the ambiguous rules.

Senator McCain told Pentagon witnesses that their response to case-specific "questions that you are answering, or attempting to answer—you are not doing a very good job of it—is the reason why most of us are concerned, because what you are doing is laying that burden on commanding officers, who are not legally trained as you are."

Officials maintain, however, that commanders will be able to interpret and apply the new policy and that it will stand up to legal review when challenged in court.

Secretary Aspin said in his July 20 testimony that homosexuals "would be much more comfortable pursuing a different profession than the military . . . . If [a homosexual person] . . . came to me and asked for my advice . . . I would say, 'You'll be much more comfortable in another career.' " ■

THE BEST WAY TO OVERSEE PEACE BUILDING.

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GRUMMAN

Advanced Land Remote Sensing System's concept definition studies will address a broad spectrum of remote sensing approaches into the next century. For nearly thirty years imaging sensors built by Hughes Aircraft Company have observed Earth from space, collecting more than three million images. Hughes' decades of experience in space-based remote sensing, communications, ground processing, and data exploitation for the national security, civil and commercial markets will continue to benefit the remote sensing and geographic information systems communities. Space-based remote sensors have proven to be an invaluable tool in monitoring day-to-day weather, environmental trends and global change research; management of water and agricultural resources; and land use planning. Hughes sensors have provided detailed imagery and data on natural and man-made disasters, including the recent flooding in the Midwest, deforestation of the rain forests, the nuclear accident at Chernobyl, the oil spill in the Persian Gulf, and the oil well fires in Kuwait. Today, national security, civil, scientific, and commercial mission requirements are being synergistically met with Hughes' broad operational expertise.

Hughes is working with the U.S. Air Force to reduce development time and costs for command and control centers. This research and development effort — the Portable, Reusable, Integrated Software Modules (PRISM) program — involves developing a generic command center that takes advantage of reusable software components. Hughes is identifying off-the-shelf reusable software components and establishing a way to qualify candidate components as integral parts of this generic command center. The goal of this program is to reduce command center systems development from six years to one year or less.

A new, high-power source of microwave energy could become the standard for next-generation electronic warfare. This Plasma-Assisted Slow-wave Oscillator (PASOTRON), developed by Hughes, is much smaller and lighter than conventional high-power microwave sources, and capable of generating high-energy microwave pulses approximately 1,000 times longer than present oscillator sources. High-power microwave sources such as PASOTRON could be especially useful in confusing or destroying an enemy's electronic equipment by causing logic faults, jamming, or burnouts. Their applications include mine clearing, anti-missile and anti-aircraft defense, and remote jamming.

In a concerted effort to save our planet, NASA will be enlisting 30 different sensors to collect data on key environmental conditions. At the heart of this multisatellite program, called Mission to Planet Earth, is Hughes' MODIS sensor — or Moderate Resolution Imaging Spectroradiometer. MODIS will help scientists estimate the amount of radiation that enters the Earth's atmosphere, the amount absorbed into it, the amount radiated back into space, and the amount trapped in our atmosphere — causing global warming. Expected to be launched in 1998, MODIS will be based on a polar-orbiting platform, where it will collect data for at least five years.

Hughes is applying the world's most sophisticated simulator technology to create the world's most thrilling entertainment experiences. Example, the Yamaha experience: a new 150 mph simulated ride on a British Superbike around the Oulton Park circuit in Cheshire, England. The Superbike experience is shot from a camera specially mounted on the rider's fuel tank. The Venturer thrill ride simulator's highly realistic motion system recreates the Yamaha's acceleration, braking and cornering, including a number of breathtakingly close maneuvers. Passengers in the Venturer capsule view the ride on large-screen, laser-quality, video projection with CD quality sound. The Venturer software library includes thrill rides ranging from rally cars to jet fighters.

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Aerospace World

By Frank Oliveri, Associate Editor

Fogleman: Give AMC a Breather

Once it puts the finishing touches on its new master plan, Air Mobility Command will seek a two-year respite from change so it can execute the program. So says Gen. Ronald R. Fogleman, AMC's commander, who is slated to present the command's new blueprint next month to Gen. Merrill A. McPeak, Air Force Chief of Staff.

General Fogleman said that he would also like to see consolidation of AMC assets on its own bases and the replacement of old equipment. A period of organizational stability is critical. "We need to get some stability in the force," he said. "We have had a tremendous year of change as we finished our first twelve months as Air Mobility Command," activated on June 1, 1992.

The General noted that AMC has gone through "a period of divestiture" in which the command shed ancillary missions and reorganized itself around the mobility mission. Uncertainty also has been caused by the Pentagon's "Bottom-Up Review," new base closings, the transfer of C-130 aircraft to Air Combat Command's US bases, and the command's acquisition of CONUS bases and nearly all CONUS-based tankers.

"I would like to be in a position to freeze change to the extent that I could for about two years," General Fogleman said. "We need about two years to execute that plan."

© Calyx Photo Service. Provided by *Aviation Week & Space Technology*

Two Russian MiG-29s collided during formation aerobatics in July at International Air Tattoo '93 at RAF Fairford, UK. Both pilots ejected safely, suffering only minor injuries, and no spectators were injured. The pilots had been flying in close formation for several minutes when the accident occurred.

US Hits Iraq With Tomahawks

The US Navy launched a Tomahawk missile strike against Iraqi Intelligence Service headquarters in Baghdad. The June 26 attack came in response to confirmed evidence of an Iraqi attempt on the life of former President Bush when he visited Kuwait in April. Twenty of twenty-three missiles hit their targets.

President Clinton, after reviewing evidence against Iraq, ordered the strike against the agency believed to have organized the attempted assassination.

The strike took place at about 2:00 a.m., Iraqi time, in an attempt to limit casualties. The strike resulted in the virtual destruction of the wing housing the offices of the director and the leadership of the Iraqi Intelligence Service. Three missiles landed outside the compound in residential areas, killing eight civilians, according to the Iraqi government.

C-17 Stages First Paratroop Drop

In July, twenty-four parachutists leaped from the rear exit of a C-17 airlifter over Edwards AFB, Calif., the Air Force said. They were the first to jump from the new plane.

Twelve Air Force and twelve Army personnel performed a high-altitude, low-opening exit from the cargo ramp at the rear of "T-1," the first test C-17. The jump took place at 12,500 feet at an airspeed of 145 knots. All jumpers landed safely. This test was the first in a series that will peak later this year when 102 paratroopers make the jump.

The plane has successfully dropped a 40,000-pound load and later this year will drop a 60,000-pound load. As of mid-July, the C-17 program had accumulated more than 1,600 flight hours on more than 440 flights.

Aspin Wants More Joint Ops

Secretary of Defense Les Aspin says the US can maintain an adequate overseas presence with a smaller force by making greater use of joint forces, concepts, and operations.

Secretary Aspin floated the idea in June remarks to a gathering of some sixty retired Air Force generals, assembled for the regular Air Force Senior Statesman Symposium at Andrews AFB, Md. "Right now we deploy joint task forces for crisis or conflicts," he said. "The same model could apply for peacetime overseas presence."

The Pentagon chief acknowledged that "in many places it's crucial that we display the flag to maintain regional stability, to send the message that we're committed to protecting US and allied interests."

Secretary Aspin suggested that Air Force bombers and Airborne Warning and Control System aircraft and Navy ships could function under one "purple"

command, bringing airpower, air defense, and ballistic missile defense into a single task force. He said USAF squadrons could rotate to forward bases for limited periods and alternate with Navy carriers in supplying forward-based air coverage.

Women in Gulf War Graded

The General Accounting Office, using interviews with unit commanders and fifty-nine focus group discussions, prepared a new study on the role of servicewomen in the Persian Gulf War. It reports that its respondents were generally positive about their actions and contributions.

The report, released in July, notes that women worked on a broad spectrum of assignments and tasks. About 41,000, or seven percent, of the personnel deployed to the Gulf were women. GAO visited ten support units that deployed to the Persian Gulf with men and women.

Most groups cited pregnancy as a cause for women to return early from deployment or to fail to deploy, though the study cited few actual cases. GAO acknowledged that, because of the nature of its sampling and methodology, the results could not be applied to all deployed servicewomen.

Deutch Approves JPATS Plan

Under Secretary of Defense for Acquisition John M. Deutch approved a new "one-contract" acquisition strategy in July for the Joint Primary Aircraft Training System (JPATS). He deleted requirements for a cost and operational effectiveness analysis. The deletion had been requested by the Air Force.

Mr. Deutch said the Air Force must make certain that JPATS can accommodate women and men equally, in light of the Defense Department's decision to permit women in fighter cockpits.

Mr. Deutch directed that the draft request for proposal contain source selection criteria that clearly favor proposals involving the lowest development risk and lowest overall cost. The service must solicit contractor recommendations for further streamlining actions to reduce costs.

Mr. Deutch said he plans to delegate milestone decision authority to the Air Force. He directed the Air Force and Navy to submit an updated Trainer Aircraft Master Plan this fall.

The F-16D Variable Stability In-Flight Simulator Test Aircraft used thrust vectoring for the first time in a July 30 test flight from Edwards AFB, Calif. The aircraft achieved angles of attack of up to 72°, compared to the limit of 25° for the standard F-16. In addition to AOA, yaw and roll rates will be expanded in VISTA/F-16 tests.

Nevada Air National Guardsmen (from left) MSgt. Steven Privette, TSgt. Mike Muniz, and SMSgt. Mark Frey of the 152d Reconnaissance Group adapt an RF-4C Phantom to carry AIM-9 Sidewinder missiles. The missiles will give the aircraft defense capability for the first time.

US Forces Strike Somali Warlord

On June 11, American quick-reaction forces working with other United Nations units struck Somali irregulars said to be responsible for a June 5 attack on UN forces in Mogadishu.

The joint attack focused on the forces of warlord Mohamed Farah Aideed. In a series of air and ground assaults, UN and US forces took control of Radio Aideed in downtown Mogadishu and militia ordnance, weapons, and equipment in three previously authorized weapons storage sites. The UN force destroyed a related clandestine military facility.

The attack responded to what President Clinton called a "savage" attack on UN troops. The Somali attack killed twenty-three Pakistani peacekeepers and injured three Americans.

Approximately 1,200 US soldiers were assigned to the strike. These included ground and aviation task forces. The Army force was augmented by Air Force AC-130 Spectre gun-

ships from the 1st Special Operations Wing at Hurlburt Field, Fla.

The US classified the operation as successful.

CRAF Personnel Honored

The Air Force presented awards in June to more than 12,000 civilian airline employees who assisted in the Gulf War effort.

In Memphis last June, Gen. Ronald R. Fogleman, commander in chief, USTRANSCOM, and commander, Air Mobility Command, presented awards to crews of Federal Express, one of twenty-five airlines to participate in the war through the Civil Reserve Air Fleet.

About 600 Air Medals were presented to CRAF aircrews that flew seven or more missions in theater during the height of the conflict. CRAF aircrews that have flown eighteen or more missions since August 1990, excluding the period of heightened conflict, will receive Aerial Achievement Medals.

Civilian Desert Shield/Desert Storm medals went to ground personnel and flight crews who entered the theater at least once during operations, and certificates of appreciation were presented to CRAF employees who supported the war effort from outside the theater.

CRAF aircraft flew more than 5,300 missions during the Gulf War, airlifting more than 705,000 passengers and 230,000 tons of cargo.

A Readiness Secretary?

The Pentagon is studying a proposal to establish an Under Secretary of Defense for personnel and readiness, who would serve as the focal point for readiness in the Office of the Secretary of Defense.

Deputy Secretary of Defense William J. Perry told the Senate Armed Services Committee in June that force readiness and quality are still high, though these qualities are vulnerable to even modest reductions in funding.

"It would not take much of a [drop] to require the Army to curtail its maneuvers, the Navy to keep ships in port, and the Air Force to reduce flying hours," he said, "and it does not take much inactivity for skills to erode and for US forces to dull the edge that determines victory in combat."

Mr. Perry said that the Senior Readiness Council, which he will chair; the Chairman of the Joint Chiefs of Staff; and military service chiefs will also keep a sharp watch on readiness.

Safety Trophies Awarded

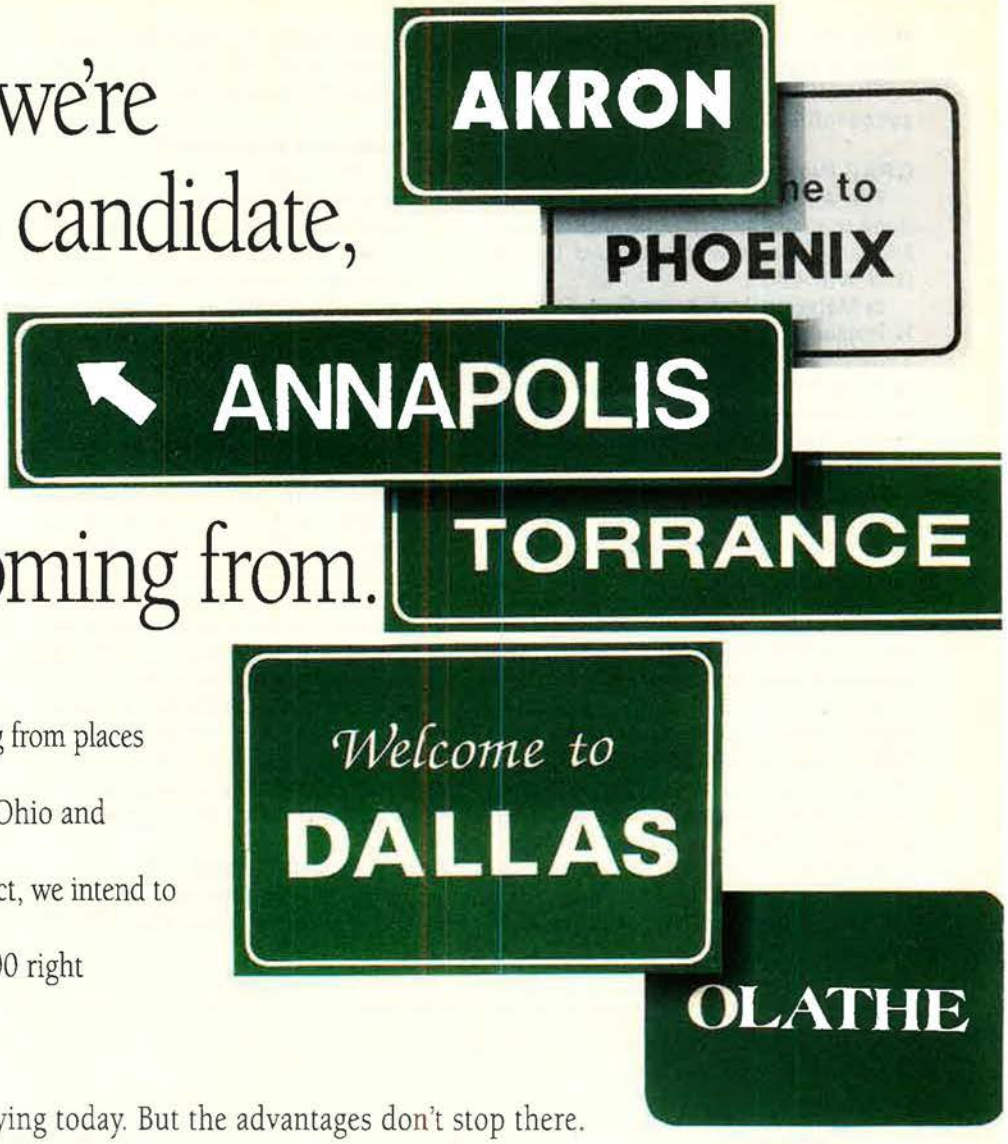
The Air Force selected four safety award winners in June. Maj. Mark E. Kennedy, based at MacDill AFB, Fla., won the 1992 Koren Kolligian, Jr., Trophy, awarded annually to the aircrew member who most successfully coped with an in-flight emergency caused by mechanical, human, or environmental factors. Major Kennedy was cited for safely landing an F-16D that had lost power during an in-flight emergency in November.

The 51st Fighter Wing, Osan AB, South Korea, won the 1992 Colombian Trophy, awarded annually to a wing-level fighter, attack, or reconnaissance unit for outstanding safety achievements. The wing flew more than 63,000 hours without a Class A or B mishap and participated in various exercises throughout the Pacific without a flight-related mishap.

The 435th Airlift Wing, Rhein-Main AB, Germany, won the 1992 System of Cooperation Among Air Forces of the Americas Flight Safety Award. The award is presented annually for outstanding achievement in defense, airlift, training, rescue, refueling, bombardment, strategic reconnaissance, or airborne control operations. The 435th AW was cited for delivering critically needed supplies to Sarajevo during Operation Provide Comfort.

Capt. Janice A. Benham of the 21st Test and Evaluation Squadron, Ran-

Before we say we're the best JPATS candidate, we want you to know where we're coming from.



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dolph AFB, Tex., won the 1992 Chief of Staff Individual Safety Award. Winners are selected for contributions to policy, programs and procedures, research and development, safety duties, or safety management. Captain Benham was cited for accomplishments that included developing and implementing an effective safety program for a newly activated squadron.

Overseas Basing Falls by Half

The Pentagon said in July that it plans to close or reduce operations at an additional ninety-two US military sites overseas. The number of sites overseas has been reduced by about fifty percent since January 1990. About 840 locations have been closed or reduced, 773 of which are in Europe.

The decision to reduce bases further was made by the Clinton Administration, which plans to cut troop levels in Europe to 100,000 by September 30, 1996.

The US Air Force will reduce operations at Bitburg AB, Germany, and will end operations at Soesterberg AB, the Netherlands. It will close or scale back operations in a number of smaller European sites.

Veterans Get New Training

The Pentagon has established a new job training program to help veterans find long-term employment.

The Departments of Defense, Labor, and Veterans Affairs are cooperating to set up the program under the Service Members Occupational Training and Conversion Act. Employers with approved training programs spanning six to eighteen months can be reimbursed for up to $10,000 for an eligible veteran's wages during the training period.

The reimbursement could reach $12,000 for training a veteran with a service-related disability of up to thirty percent.

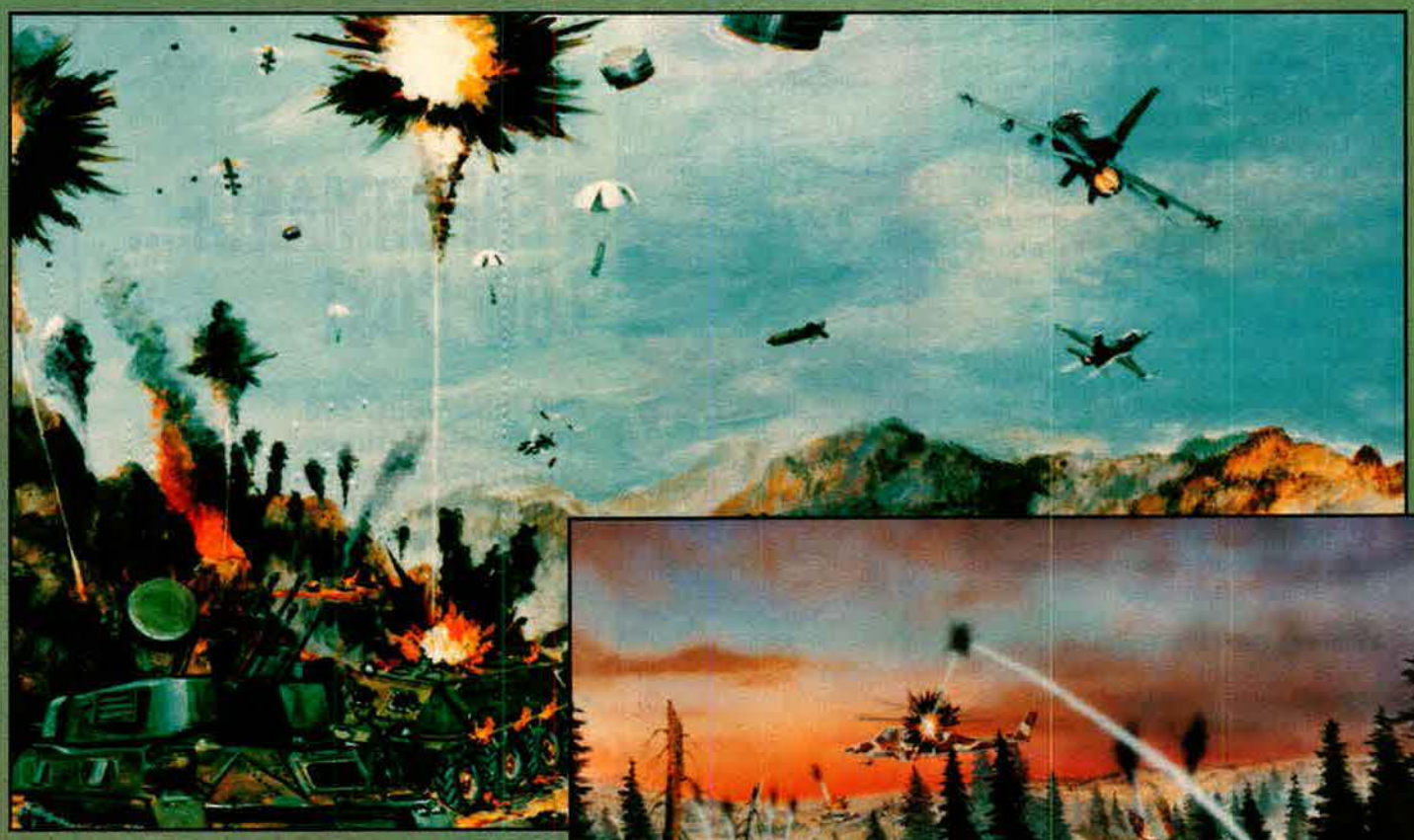
A veteran discharged on or after August 2, 1990, is eligible so long as he or she served in the active force for more than ninety days, left the service due to a service-related disability, and did not receive a dishonorable discharge.

The program also seeks to assist when:

- The veteran's primary or secondary occupation specialty is not readily transferable to the civilian work force.
- The veteran is unemployed at the time of application and has been unemployed for at least eight of the fifteen weeks immediately preceding application.

Sensor Fuzed Weapons

"the right force for the times"



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■ The veteran is entitled to disability compensation under Department of Veterans Affairs regulations.

Interested persons should contact the nearest local Employment Service Office or VA Regional Office for details. The VA's toll-free number is (800) 827-1000.

USAF Drops ATARS

In June, the Air Force canceled its contract with Martin Marietta Technologies Inc. to develop the Advanced Tactical Air Reconnaissance System.

Both parties agreed to halt all activity on the fixed-price contract. The system was to provide more timely tactical reconnaissance.

It was expected to have an electro-optical and infrared sensor suite and would have been carried on Air Force F-16s, Navy and Marine F/A-18s, and DoD's medium-range unmanned aerial vehicles.

The Air Force is examining uses for the residual equipment and has agreed to deliver some to the Navy.

Goodbye Gs, Hello Es

The Air Force has retired the last of its active F-111G fighters. The aircraft were removed from Cannon AFB, N. M., in July and sent to the Aerospace Maintenance and Regeneration Center at Davis-Monthan AFB, Ariz.

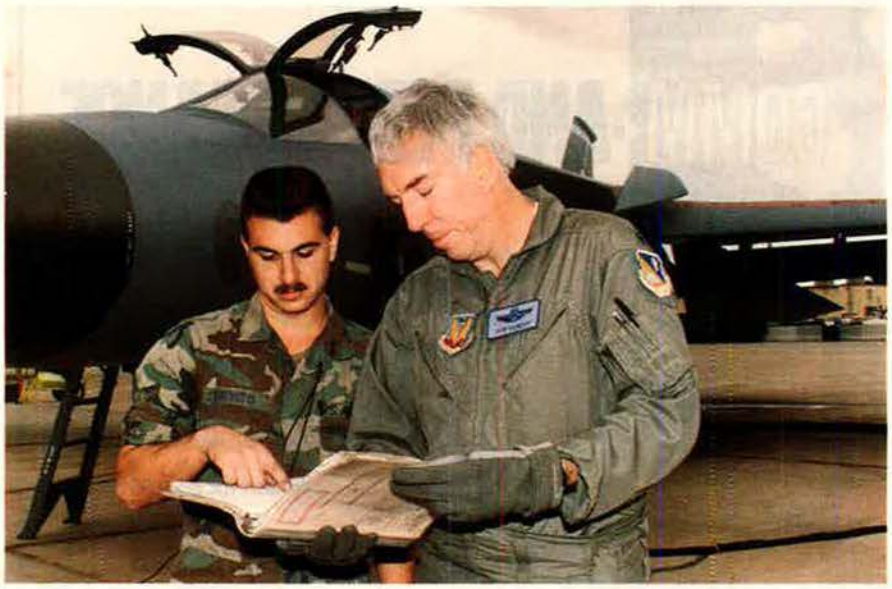
The G model, originally the FB-111A, was assigned to Strategic Air Command. The Gs were later transferred to Tactical Air Command and modified to the latest configuration. The G model began flying out of Cannon in the fall of 1990 as a training platform and accumulated 5,728 sorties and nearly 14,000 flight hours at the base. More than 400 aircrews have been trained in the fighter since its arrival at Cannon. The F-111E model will replace the G model in this role.

In June, Cannon also accepted the last EF-111A Ravens from Mountain Home AFB, Idaho. These joined the 27th Fighter Wing's newest unit, the 429th Electronic Combat Squadron, activated on June 29.

Multiaxis Thrust Vectoring Explored

A modified Air Force F-16D, sporting a new multiaxis thrust-vectoring (MATV) nozzle, began flight testing in July at Edwards AFB, Calif. The nozzle is integrated with the aircraft's flight-control system.

The Variable Stability In-Flight Simulator Test Aircraft (VISTA) F-16D will explore the advantages of the new system, developed by General Electric. The $30 million MATV program, managed by Wright Laboratory, will



Lt. Col. John Carnduff, Jr. (right), and A1C Anthony DeVito perform a preflight check on the last F-111G to leave Cannon AFB, N. M., for Davis-Monthan AFB, Ariz. The F-111G has been used for training at Cannon since the fall of 1990, accumulating almost 14,000 flight hours. It is being replaced by the F-111E.

examine a round, axisymmetric nozzle capable of pitch and yaw vectoring.

MATV testing will examine the fighter's capabilities in the high and low portion of the flight envelope. It will explore moderate to high angles of attack (AOAs) and low airspeeds. AOA will range from twenty-five to eighty degrees. MATV could contribute to the development of tailless or reduced-tail aircraft, which could be less expensive and have a smaller radar cross section.

ARPA Looks at Electric Vehicles

The Advanced Research Projects Agency (ARPA) selected six industrial coalitions in July to participate in the Electric and Electric Hybrid Vehicle Technology and Infrastructure Program. Electric vehicles use stored electric power, while hybrid vehicles employ an on-board generator.

Each coalition will work with a local military base and community in a two-year demonstration project. The base and community will use a fleet of small pickup trucks and medium-size buses to demonstrate the utility and efficiency of electric and electric hybrid vehicles for the military and commercial sectors. The ARPA program will cost about $23.5 million.

OC-135B Ready for Open Skies

The Air Force recently modified and tested a WC-135B to create a new plane, designated OC-135B. Its mission will be unarmed aerial observation flights over the US, Canada, other NATO nations, and former Warsaw Pact nations, including Russia, Belarus, Ukraine, Georgia, and Kazakhstan.

The modifications, which were completed in April by Aeronautical Systems Center's 4950th Test Wing at Wright-Patterson AFB, Ohio, added one panoramic and three framing cameras. The aircraft will monitor the Open Skies Treaty, signed by twenty-five nations in March 1992, which was designed to promote knowledge of military activities. Each nation signing the treaty agreed to allow forty-two annual observation flights.

The OC-135B can seat thirty-eight persons, including cockpit crew, aircraft maintenance crew, foreign representatives, and crew members from the On-Site Inspection Agency. OSIA will provide sensors and linguists for all active Open Skies missions and will escort foreign observation aircraft conducting missions over the US. The aircraft will be based at McClellan AFB, Calif., until October 1, when it will be turned over to Air Combat Command and based at Offutt AFB, Neb.

Base Closure Commission Acts

The Defense Base Closure and Realignment Commission made significant changes to the 1993 recommended list of closures, despite pleas from senior military leaders.

The commission's June report called for the realignment, instead of outright closure, of Homestead AFB, Fla. In addition, the panel voted to close Plattsburgh AFB, N. Y., which the Air Force had selected for major expansion as the site of the Northeast Air Mobility Wing. McGuire AFB, N. J., was chosen as the new expansion site.

The commission also voted to realign Griffiss AFB, N. Y., and March AFB, Calif., and close K. I. Sawyer AFB, Mich., O'Hare International AFRS, Ill., and Newark AFB, Ohio.

The recommendations were later approved by President Clinton and sent to Congress.

National Guard in Community Service

The Pentagon will spend about $57 million on National Guard pilot programs in urban and rural areas to help young people and communities short of medical services, DoD said in June.

President Clinton directed the Pentagon to release money for outreach programs Challenge and Starbase and the Los Angeles unified school district outreach program. He also authorized the Guard to assist state health authorities in administering inoculations, physicals, and basic preventive care in medically underserved areas throughout the nation.

The five-month Challenge program targets sixteen- to eighteen-year-old high school dropouts in ten states. It offers Graduate Equivalency Diploma completion, job and life skills development, and community service.

Starbase exposes inner-city school children and their teachers to applications of math and science through experimental learning, simulations, and experiments in aviation and space-related fields.

The Los Angeles outreach program provides classrooms with state-of-the-art math and science materials and equipment.

USAF Begins Youth Initiative

The Air Force is helping San Antonio and surrounding Bexar County, Tex., test a program to help juvenile delinquents. The plan is to enroll ten boys and girls, ages seventeen and eighteen, in basic military training at Lackland AFB, Tex., this month.

Air Education and Training Command describes the effort as a juvenile reorientation program to help young people learn the self-discipline needed to succeed. Col. R. Scott Summerfield, AETC's chief of Civil Law, said, "The purpose of the program is to allow these young people the opportunity to train with the very best America has to offer. Our basic

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military training instructors are top-notch, and our highly motivated trainees will be excellent peer role models."

Juveniles taking part in the program must have parental consent and may withdraw at any time.

USAF Hauls Troops to Macedonia

In July, Air Force C-141 and C-5 airlifters transported about 300 American troops to Macedonia, a former Yugoslav republic between Serbia and Greece.

The aircraft carried soldiers from the US Army's Berlin Brigade into the area to monitor UN peacekeeping efforts. The UN is concerned that Macedonia may be drawn into conflict in the Balkans. Macedonia has yet to become involved in the Balkan war, which has overwhelmed Serbs, Croats, and Bosnian Muslims.

Air Force units taking part in the operation were the 362d Tanker Airlift Control Element, Rhein-Main AB, Germany, and the 463d Tanker Airlift Control Element, Dyess AFB, Tex. The 362d is flying out of Tegel, Germany, and the 463d is working out of Skopje, Macedonia.

News Notes

■ Air Combat Command's 9th Wing sent a U-2 photoreconnaissance aircraft over the Mississippi and Missouri Rivers on July 13 to gather images of the flood-ravaged Midwest. After the plane landed at Beale AFB, Calif., technicians worked overnight to develop and analyze 5,000 feet of film. They produced some 400 enlargements of the Des Moines, Iowa, area, which accurately revealed the extent of the damage. Several days later, the plane made two other flights to document damage from St. Paul, Minn., to Dubuque, Iowa. Such missions will continue as needed.

■ For safety reasons, the Air Force destroyed a Minuteman I missile during a test flight seconds after its launch from Vandenberg AFB, Calif. Controllers on the western range detected a flight anomaly and decided to terminate the missile flight. USAF is investigating the anomaly.

■ In May, the Selective Early Retirement Boards identified 166 colonels, 292 majors, and 196 captains for early retirement, the Air Force said. Those selected will retire by January 1. The board for colonels selected eighty-four colonels from the 1966 year group and eighty-two from the 1968 year group.

■ A T-38 jet trainer crashed in July just outside of Reese AFB, Tex., but both crew members safely ejected from the aircraft. Capt. Roger Trenton, an instructor pilot, and 1st Lt. Brian Heagy, an undergraduate student pilot, were on a training mission when their aircraft crashed. The Air Force is investigating.

■ Pratt & Whitney said in June that its F100 turbofan engine has accumulated more than ten million engine flight hours in the F-15 and F-16.

■ Arnold Engineering Development Center at Arnold AFB, Tenn., has been assigned to investigate the large number of unexplained in-flight flameouts in the T-37 Tweet's J69 engines in recent years. AEDC's engine test facility will be used to assess the problem. The Air Force believes the problem may be related to its recent conversion to JP-8 fuel. The service is unsure when the problem will be resolved.

■ The 366th Wing at Mountain Home AFB, Idaho, deployed nearly 900 personnel and a large composite force

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strike package to the Volk Field Combat Readiness Training Center, Wis., and K. I. Sawyer AFB, Mich., in June. The deployment tests the air intervention composite wing's ability to deploy and then supply a large force as it would in combat. Thirty F-16Cs, F-15Cs, F-15Es, B-52Gs, and KC-135Rs took part in the successful deployment.

■ Pratt & Whitney's new axisymmetric, multidirectional, thrust-vectoring nozzle is ready for testing at NASA's Ames Dryden Flight Research Facility, Edwards AFB, Calif., early next year, the firm said. The nozzle will be tested on an F-15 powered by two F100-PW-229 engines. The program team of NASA, the Air Force, McDonnell Douglas, and P&W will assess the nozzle's performance and technology benefit. The new nozzle could radically improve aircraft maneuverability and control.

■ Beech Aircraft Corp. and Pilatus Aircraft Ltd. agreed in June that the Beech PC-9 Mk. II will be manufactured at Beech's Kansas facilities. The PC-9 will compete in the USAF-Navy Joint Primary Aircraft Training Systems program.

■ The US aerospace industry posted a $6.8 billion trade surplus in the first quarter of 1993, but the aerospace trade surplus declined thirteen percent from the last quarter of 1992. Cutbacks in national military expenditures contributed significantly to the decline.

■ The X-31 International Test Organization and the Command and Control Directorate of the Air Force's Rome Laboratory, Griffiss AFB, N. Y., separately received ARPA's Outstanding Performance Award in June. The X-31 program was honored for its accomplishments in spite of its unconventional management, while the C^2 Directorate was honored for its technical leadership, innovation, and creativity in managing its programs.

■ In June, Lockheed delivered the ninth AC-130H gunship in a series that has been updating the aircraft for US Special Operations Command over the past seven years. The gunships are receiving updated navigation, communications, sensors, and fire-control systems.

■ The Hypervelocity Launcher Product Office of the Army Space and Strategic Defense Command successfully completed the initial phase in the first field experiments of Hypervelocity Weapon Technology, conducted at Eglin AFB, Fla., in June. The new weapon is designed to shoot down incoming missiles over the battlefield.

■ Air Combat Command transferred 20th Air Force to Air Force Space Command in July. The transfer moves the day-to-day management of the nation's landbased ICBM force to a command familiar with missiles and rocket systems.

■ The Ballistic Missile Defense Organization's Lightweight Exoatmospheric Projectile missed an intercept during a test in June. The LEAP system missed its target by seven meters at a closing velocity of 750 meters per second. According to Phillips Laboratory officials who manage the LEAP program, the Rockwell International high-performance LEAP vehicle performed satisfactorily in its mission requirements to acquire, track, and pursue its target. The goal was not achieved due to a target positioning error. LEAP is a kinetic-kill vehicle.

■ The T-3A Firefly was rolled out in a July ceremony at the manufacturing facility of Slingsby Aviation Ltd. in York, England. The T-3A Enhanced Flight Screener will replace the T-41 training aircraft to evaluate Air Force Academy cadets and pilot candidates for fighter or transport pilot career tracks.

■ Maj. Mike Brill of the 419th Fighter Wing (AFRES) became the first American to reach the 3,000-flying-hour mark in the F-16 in July. Major Brill flew out of Hill AFB, Utah. He flew his first mission in an F-16 in 1980 with the 388th Tactical Fighter Wing.

Purchases

The Air Force awarded Smiths Industries a $7.2 million firm fixed-price contract for integration of the C-130 Self-Contained Navigation System with the Global Positioning System. Expected completion: July 1995.

The Air Force awarded General Electric Co. a $12.7 million face-value increase to a firm fixed-price contract for funding Fiscal 1992–93 long-lead requirements for twenty F118-GE-100 engines applicable to the B-2 aircraft. Expected completion: August 1995.

The Air Force awarded Pratt & Whitney Co. a $100 million face-value increase to a firm fixed-price contract for twenty F117-PW-100 engines for use on Lot V C-17 aircraft. Expected completion: December 1997. ■

Senior Staff Changes

RETIREMENTS: M/G Harold N. **Campbell;** M/G John M. **Davey;** M/G Robert E. **Dempsey;** B/G John L. **Finan;** B/G Ronald D. **Gray;** M/G Billy G. **McCoy.**

PROMOTION: To be **Major General:** Nolan **Sklute.**

CHANGES: Col. (B/G selectee) Donald G. Cook, from Chief, Senate Liaison, Dir., Leg. Liaison, Hq. USAF, Washington, D. C., to Cmdr., 21st Space Wing, Hq. AFSPACECOM, Peterson AFB, Colo., replacing retired B/G Ronald D. Gray . . . **M/G Brett M. Dula,** from Cmdr., 2d AF, ACC, Beale AFB, Calif., to Dep. Dir., Central Imagery Office, Ass't Sec'y of Defense, C^3I, OSD, Washington, D. C. . . . **B/G Marvin R. Esmond,** from Cmdr., 56th FW, ACC, MacDill AFB, Fla., to Comdt., Armed Forces Staff College, NDU, Norfolk, Va., replacing B/G Monroe S. Sams, Jr. . . . **M/G Bruce J. Lotzbire,** from Chief, Office of Defense Cooperation, Greece; and Senior US Defense Rep., Greece, USEUCOM, Athens, Greece, to Dep. IG, Hq. USAF, Washington D. C., replacing B/G George W. Norwood . . . **M/G James C. McCombs,** from Dir., Plans, Policy, Doctrine, Simulations, and Analysis, J-5, Hq. USSOC, MacDill AFB, Fla., to Dir., Resources, J-8, Hq. USSOC, MacDill AFB, Fla.

M/G David W. McIlvoy, from Cmdr., 319th BW, ACC, Grand Forks AFB, N. D., to Dep. Dir., Int'l Negotiations, J-5, Joint Staff, Washington, D. C., replacing M/G Gary L. Curtin . . . **B/G Thomas D. Pilsch,** from Cmdr., US Forces, Azores; and Cmdr., 65th Support Wing, AMC, Lajes Field, Azores, to Vice Cmdr., 21st AF, AMC, McGuire AFB, N. J. . . . **B/G Monroe S. Sams, Jr.,** from Comdt., Armed Forces Staff College, NDU, Norfolk, Va., to Cmdr., 89th Airlift Wg., AMC, Andrews AFB, Md., replacing retiring B/G Bobbie L. Mitchell . . . **B/G Michael C. Short,** from Dep. Dir., Ops., Hq. ACC, Langley AFB, Va., to Dir., Exercises, Training, Operational Standards, and Requirements, J-7, Hq. USLANTCOM, Norfolk, Va. . . . **M/G Nolan Sklute,** from Dep. JAG, Hq. USAF, Washington, D. C., to The Judge Advocate General, Hq. USAF, Washington, D. C., replacing retired M/G David C. Morehouse.

SENIOR EXECUTIVE SERVICE (SES) CHANGE: Janet C. Cook, from Spec. Ass't for Contracting Integrity, DLA, Cameron Station, Va., to Ass't Gen. Counsel, Contractor Responsibility, Hq. USAF, Washington, D. C. ■

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Index to Advertisers

The collaboration of tankers and airlifters in Restore Hope is seen as the prototype of future operations.

A Model for Mobility

By James W. Canan, Senior Editor

Staff photos by Guy Aceto

This C-5, KC-135R, C-130 lineup illustrates the blending of airlifters from MAC and tankers from SAC in Air Mobility Command. The unprecedented tanker-airlifter partnership makes AMC "a mobility command, not an airlift command." Opposite, a C-5 opens wide during Rodeo '93, showcase for AMC's "total force."

AIR FORCE tankers and airlifters teamed up on a grand scale in Operation Restore Hope, the US-led United Nations marathon relief mission to faraway Somalia. Their unparalleled partnership proved especially reassuring to US military planners. It showed that Air Mobility Command is as good as its name, capable of delivering US-based, rapid-reaction forces to distant lands in time to wage war or ward it off.

The Somalia mission was a test case and a major milestone for AMC. Asserts Gen. Ronald R. Fogleman, AMC's commander, "It marked the first time that we employed Air Mobility Command in its [new] configuration, the first time that we really started using—taking advantage of—the synergism between our tankers and our strategic airlifters."

By mid-1993, AMC KC-135s had flown more than 1,200 aerial refueling missions in support of C-5s and C-141s ferrying troops and supplies to Somalia. KC-10s, employed in their airlifter mode only, carried more than one-fifth of all Somalia-bound cargo.

At one point, AMC had to divert KC-10s to Saudi Arabia from their Somalia routes, turn them back into tankers, and use them to refuel fighters engaged in the Iraq-monitoring Operation Southern Watch. The switch underscored the importance of air mobility to both operations and showed again why AMC regards the KC-10s as "our classic example of air mobility," in the words of one officer.

The collaboration of tankers and airlifters in Restore Hope is seen as the prototype of future AMC expeditionary force operations. It was exactly what the Air Force had in mind


AIR MOBILITY COMMAND

in creating Air Mobility Command out of Military Airlift Command and tanker elements of Strategic Air Command. AMC and Air Combat Command came into being on June 1, 1992, as MAC, SAC, and Tactical Air Command went out of existence.

General Fogleman, who is also commander in chief of the triservice US Transportation Command, calls AMC "the cornerstone of [US] national military strategy." That strategy, promulgated by the Joint Chiefs of Staff, is pegged to "the rapid movement of forces from wherever they are to wherever they are needed . . . in response to regional crises," which is what AMC is all about.

Gotta Have It

Amid its drawdown of overseas forces, "the US is far more dependent than we've ever been on getting forces out of CONUS" to deter or wage war on foreign soil, General Fogleman claims. "We're building a CONUS-based contingency force, and it isn't going to go anywhere unless Air Mobility Command takes it there."

He declares, "With SAC gone, Air Mobility Command is the only operational command in the United States Air Force with day-to-day worldwide responsibilities."

AMC is obviously synonymous with global reach, but the significance of that half of USAF's "global reach, global power" motto has proved elusive, General Fogleman claims. "Everyone seems to understand global power," he says, "but the meaning of global reach somehow hasn't gotten through to the [military] community as yet. It tracks to the change in military strategy—a fundamental shift of emphasis to air mobility forces, to the combined tanker assets and airlift assets."

The biggest difference between the old MAC and the new AMC, the one that makes AMC "a mobility command, not an airlift command," as General Fogleman defines it, is the large tanker fleet organic to AMC.

This affords AMC unprecedented flexibility, enabling it to refuel airlifters in flight whenever and wherever it chooses, allowing the planes to make better time on long hauls and avoid the wear and tear of intermediate takeoffs and landings.

The new arrangement paid off big in the Somalia operation. AMC did something that MAC, lacking tankers in such abundance, would have been hard-pressed to do: It built a "tanker bridge" for its airlifters that extended halfway around the world. This made it possible for the airlifters to fly nonstop from as far away as the US west coast to staging bases in Egypt and Saudi Arabia, there to take on fresh crews and top off gas tanks before flying the final leg to Mogadishu.

The Somalia mission showed that "our tanker force is more of a force multiplier than we ever realized," General Fogleman declares.

In bygone days, Air Force tankers supported bomber and fighter operations more than they did airlift operations. SAC owned most of the tankers and devoted them, along with its bombers, to the Single Integrated Operational Plan (SIOP) for strategic nuclear war. Now those tankers belong to AMC, which is forging, says its commander, "a new air mobility culture" common to both the tanker and airlifter communities.

Finally Free

Some AMC KC-135 tankers would chop to US Strategic Command for the SIOP mission in the event of crisis or war, but they are relatively few, and the SIOP is only a shadow of its former self. Tankers are no longer on standby strategic alert and thus are free to do other things for AMC.

When the Air Force established ACC and AMC, it split the CONUS tactical tanker fleet between the new commands. On October 1, AMC will come into ownership of all CONUS-based tankers except the half-dozen KC-135s organic to ACC's 366th Wing, a composite air-intervention wing made up of many types of planes, at Mountain Home AFB, Idaho. ACC's two KC-10 squadrons at Seymour Johnson AFB, N. C., will be transferred to AMC.

In the beginning, AMC was organized around three numbered air forces, two devoted to airlift and one to aerial refueling. That arrangement was seen as separatist and was scrapped. AMC now comprises two "air mobility air forces"—15th Air Force at March AFB, Calif., and 21st Air Force at McGuire AFB, N. J.—each with tankers and airlifters. The nexus of their operational command and control is AMC's Tanker Airlift Control Center at command headquarters, Scott AFB, Ill. TACC schedules and coordinates AMC missions in support of the unified, triservice US Transportation Command *[see "Mobility Central," June 1993, p. 70]*, also headed by General Fogleman.

AMC is moving to mix tankers and airlifters in selected wings of both numbered air forces. "We plan to form three or four air mobility wings at bases where airlift and tanker assets are already collocated," General Fogleman says. "We'll also have two or three core airlift wings and two or three core tanker wings."

To help create a new class of mobility specialists, AMC has instituted a "mobility enhancement crossflow pro-

Staff photo by Guy Aceto

A KC-135 crew swings into action during a practice strategic alert. In bygone days, SAC devoted most USAF tankers to the Single Integrated Operational Plan. Now AMC owns the tankers and no longer keeps them on SIOP standby alert.

gram" in which airlift officers and tanker officers switch jobs to learn how the other half lives. This summer, AMC assigned the cream of its airlift and tanker colonels as operations group commanders in tanker wings and airlift wings, respectively.

AMC officials reject any suggestion that it is a lot less painful to combine tankers and airlifters in one command than it is to combine fighters and bombers, as ACC must do. They claim that big airplanes are about the only things that tanker and airlifter communities have in common and that their cultures are more dissimilar than outsiders might expect.

General Fogleman had little in common with either of them. He came from the fighter world and was the commander of 7th Air Force at Osan AB, South Korea, when he was tapped to take charge of AMC and USTRANSCOM.

He was under the impression, he recalls, that AMC comprised "two elements of our Air Force that historically were looked upon as second-class citizens"—the airlift element, stereotyped as "a bunch of 'trash haulers' going around with flight suit sleeves rolled up and plastic spoons sticking out of their shirt pockets," and the tanker units, long accustomed to underdog status on SAC bases that they shared with bomber outfits.

The problem, the new AMC commander soon discovered, was not lack of pride or self-esteem on the part of the airlifter and tanker communities; rather, they felt that their efforts and achievements had gone unappreciated in the Air Force. They also felt, he says, that "they had lost control of their lives" amid their no-letup operational work loads.

Staff photo by Guy Aceto

A C-130 and C-141 share the ramp at Little Rock AFB, Ark., site of Rodeo '93. AMC's CONUS-based C-130s are slated for transfer to Air Combat Command. AMC will assume ownership of all but a handful of tankers that now belong to ACC.

The Cutting Edge

General Fogleman quickly instituted programs to give AMC aircrews more time off from flying and to gain greater recognition for them inside and outside the Air Force. "I told them," he says, "that one of their biggest problems was that they were their own worst enemies—they made airlift and air refueling look so easy, out there on the cutting edge, that everybody thought it was a piece of cake. Well, it's anything but.

"I also told everyone that the world had better get ready for us, because Air Mobility Command was not going to be a second-class command—not because I'd come on the scene, but because world events, the national military strategy, and the restructuring of the US military were combining to give this command a whole new strategic importance."

General Fogleman stressed "how important it was for us to focus on our primary mission—air mobility. Everybody talked about airlifters or about tankers, but they hadn't really thought through their synergism and how it translated into something called air mobility."

Early on, General Fogleman decided to divest AMC of all former MAC bases, missions, and functions that had nothing to do with air mobility. As a result, for example, Hurlburt Field, Fla., now belongs to Air Force Special Operations Command, which has long been headquartered there; Kirtland AFB, N. M., home of much Air Force space-age research and development, went to Air Force Materiel Command; Altus AFB, Okla., was slated for midsummer transfer to the new Air Education and Training Command; and Air Rescue Service, which primarily supports tactical air forces, now comes under Air Combat Command.

AMC is preparing to relinquish its US-based C-130 tactical airlifters to Air Combat Command. C-130s operating in overseas theaters were previously transferred from former MAC air divisions, which were abolished, to the control of theater CINCs.

Assigning C-130s to theater combatant commands "is the right thing to do," says General Fogleman. "I was a theater air component commander in Korea, and I would have loved to have had control of my own theater airlift."

The transfer of CONUS C-130s to Air Combat Command stems from changes in the unified command structure involving ACC. US Atlantic Command at Norfolk, Va., formerly a Navy/Marine Corps maritime command under a Navy CINC, is being transformed into a unified command comprising CONUS-based commands of all four services—the Air Force's ACC, the Army's Forces Command (FORSCOM), the Navy's Atlantic Fleet, and the Marine Corps' Marine Forces Atlantic (MARFORLANT). The restructured unified command, to be renamed, is at the disposal of the national command authorities for deployment anywhere around the globe.

"In this," notes General Fogleman, "Air Combat Command becomes the air component for what is essentially a theater command. So if PACAF and USAFE own C-130s, then Air Combat Command should too."

The Air Force has yet to decide the final disposition of all AMC CONUS-based C-130s. Chances are, ACC will own all of them. Some will remain on call to TRANSCOM, however.

The Right Mix

"We need to make sure," says General Fogleman, "that TRANSCOM keeps enough C-130s—in the active

Photo by Ross Harrison Koty

Air Reserve Component crews like this one predominate in AMC's airlifter fleet and are on the increase in its tanker fleet. AMC is moving to mix tankers and airlifters in selected wings of its two numbered "air mobility air forces."

force, the Guard, or the Reserve—to fulfill its worldwide transportation responsibilities." The Joint Chiefs are drafting a "forces assigned" document that addresses, among other things, the apportioning of CONUS C-130s. "The right mix will work out over time," General Fogleman claims.

AMC has two major functions: supporting the Defense Transportation System as part of TRANSCOM and supporting US combatant commands and the air components of those commands as the wellspring of Air Force mobility. In both, it relies heavily, and increasingly, on its Air Reserve Component (ARC) units.

General Fogleman recalls that he set out, on assuming command of AMC, to "put fresh emphasis on our total force.... A big percentage of our strategic airlift pilots are Guard and Reserve pilots, and the only way this command can operate is with total force."

ARC crews predominate in the airlifter fleet. By AMC's latest reckoning, they account for fifty-eight percent of C-141 crews, sixty-two percent of C-5 crews, and seventy-one percent of C-130 crews. ARC crews are also on the rise in the tanker fleet, now accounting for forty-three percent of all KC-10 crews and forty-two percent of KC-135 crews. AMC officials expect that roughly half of all personnel throughout the "air mobility force structure" will belong to the Guard and Reserve by 1995.

General Fogleman predicts that the Air Force and AMC "will continue to get smaller in the active force, and we will need to get smarter about how we integrate and employ Guard and Reserve forces. . . . The United States has always been a militia nation, and a militia force is what we'll have to work with in the future."

The Civil Reserve Air Fleet will continue to play an important role in AMC's contingency plans and operations. The CRAF's commercial airliners-turned-airlifters did yeoman work in Operation Desert Shield. AMC is studying how to make better use of the CRAF, taking into account that CRAF planes cannot be refueled in flight, in future air mobility operations.

First Among Four

On taking command, General Fogleman sized up AMC as the key to "rapid global air mobility," as he puts it, and to "the entire defense transportation system." That system, he explains, rests on "four pillars—strategic sealift, strategic airlift, surface transportation, and prepositioned forces," and airlift is crucial to all others.

As CINCUSTRANSCOM, General Fogleman notes that "even our fast sealift ships take thirteen to fifteen days to get to Somalia," as opposed to less than a day for strategic airlifters. He points out that both sealift and prepositioning are "dependent on airlift" to fly Army, Marine, and Air Force troops to their sealifted or prepositioned equipment.

"Prepositioning, including maritime prepositioning, is not viable without airlift," he declares. "Before the troops ever show up to fall in on their equipment, we have to be in there with airlift, bringing in their headquarters elements, their communications gear, their satellite receivers."

What it comes down to, he says, is that "every regional US CINC depends on AMC's air mobility assets to provide the entrée for their forces" in contingency operations, such as Restore Hope and Southern Watch, in western hemisphere counternarcotics operations, and in such domestic relief efforts as those in the aftermath of hurricanes Andrew and Iniki. AMC contingents are responsible for staking out landing sites, setting up command-and-control centers and other operational facilities, and cleaning up when it's all over.

"Basically, we're the first guys in and the last guys out," says an AMC senior officer. "The fighter pilots don't like that very much, but that's the way it is."

In General Fogleman's view, air mobility is the key to "stabilizing potentially explosive situations around the world. If you're a combatant CINC, you want to get Americans on the ground as rapidly as you can. The first Americans are at great risk. The faster you can reinforce them, with more airborne troops and with fighter squadrons, or whatever, the faster their risk decreases. Mobility is crucial."

The US "has a lot of respect in the Third World," he notes, "and people there tend to pause at the thought of engaging Americans in combat."

To AMC officials, the Somalia mission said more about the air mobility potential of future US expeditionary forces than did the much more elaborate Operation Desert Shield, the three-month allied buildup to the Persian Gulf War. Aerial refueling of airlifters—much more extensive in Restore Hope than in Desert Shield—will be crucial to the success of US expeditionary missions to remote global regions more like Somalia than like Saudi Arabia.

No Fuel, No Nothing

In stark contrast to the sophisticated Saudi air bases, the Mogadishu airfield, where AMC airlifters had to deliver the goods, had no fuel and not

much else. C-5s and C-141s refueled in flight all the way from the US to staging bases in Egypt and in Saudi Arabia. Then they flew the final leg to Mogadishu, unloaded, returned to their staging bases, and flew back to the States, once again aerial refueling all the way.

"Using tankers to cut out the en route stops was vital because we didn't have five or six developed airfields in Somalia like we'd had in Saudi Arabia," General Fogleman explains. "We had one airfield, with no fuel available, and we had to make optimum use of it. If the Marine commander needed this or that, he couldn't wait for C-5s sitting broken at Torrejon or at Rhein-Main. He had to have stuff going in there on time, all the time.

"We couldn't have brought off the tanker bridge in the old days, because those tankers would have been sitting on alert someplace, committed to the SIOP. Timing is critical in a tanker bridge. We had to have control of our [tanker] crews and assets at all times. The whole concept requires tight command and control."

AMC tankers and airlifters pervade multiservice exercises staged by the Joint Chiefs of Staff in the furtherance of US "flexible response." Operation Ocean Venture, one such exercise last spring, "showcased our command's ability to operate in the joint arena," General Fogleman says.

Ocean Venture covered a large part of the southeastern US, the waters off Florida, and some Caribbean islands. As in any expeditionary endeavor, air mobility was the key. AMC airlifters moved all Army units into battle areas, along with some Navy and Marine Corps assets. AMC tankers refueled Air Force and Navy fighters, offloading more than 4.5 million pounds of fuel. Airlift and airdrop operations accommodated 1,000 paratroopers and 144 tons of parachuted cargo.

AMC is doing about as much as it can with what it has and is in danger of being stretched too thin, General Fogleman warns. He contends that the command's highly demanding, drumfire operations tempo "clearly validates our need for the C-17," the aircraft that the Air Force sees as its airlifter of the future. General Fogleman calls it the key to "making us much more capable of supporting CINCs anywhere in the world."

Photo by Ross Harrison Koty

The C-17 airlifter is the key to AMC's future. The command's operations tempo severely taxes its existing airlifters and their crews and "validates our need for the C-17," says Gen. Ronald R. Fogleman, AMC commander and CINCUSTRANSCOM.

General Fogleman notes that AMC's strategic airlift fleet is "tired" and that there are not enough C-130s to go around. AMC is doing everything possible to preserve its planes and get the most out of them. It is developing several varieties of "snap-on" equipment, including cargo-bearing roller beds for the bays of KC-135 tankers to make them as versatile—in the name of air mobility—as its KC-10s.

The key to AMC's future is the Air Mobility Master Plan, a roadmap for developing forces and equipment through the next twenty years. General Fogleman hopes to unveil the plan to Air Force leadership next month. Its purpose is to spell out AMC's role in national defense and spotlight air mobility trends and requirements.

General Fogleman says AMC ferries the forces of so many other nations these days that it might well be called "UN air mobility command." He fully expects its operational tempo to keep intensifying in support of US and UN operations "as air mobility becomes ever more vital" and "in scenarios that we've never imagined or envisioned." ■

Photo by Ross Harrison Koty

A KC-10 crew prepares to refuel from a KC-135. The KC-10 tanker/airlifter is AMC's "classic example of air mobility." KC-10s carried cargo to Somalia in Operation Restore Hope and were used as tankers in Operation Southern Watch.

Times may be hard, but Mikoyan and Sukhoi are showing their strength and producing impressive prototypes.

Russia's Hot New Fighters

By David R. Markov

RUSSIA's big fighter aircraft houses, in an unexpected show of strength, have launched a new class of warplanes, jets capable of competing with the latest Western designs.

The death of the USSR did not doom its military aerospace sector, as many predicted. The resilience of the fighter makers—Mikoyan and Sukhoi, principally—has been demonstrated anew in several recent developments.

Most significant was the decision by Mikoyan, under what it calls "Project 1.42," to build a flying prototype of a new tactical fighter that would stack up well against USAF's Lockheed-built F-22. A big aircraft, the 1.42 fighter would have low radar, visual, and infrared signatures; advanced avionics; and supercruising engines. Some experts say that the aircraft is ready to begin flight testing. Plans call for the new MiG to enter service after 2000.

Also in hand are less exotic but important new fighters.

- Working from the existing MiG-29, Mikoyan has developed the MiG-29M, which is viewed as a "radical upgrade" of the plain "Fulcrum." Compared to the standard airplane, the M variant is said to be 1.5 times more effective in air combat and 3.4 times more effective in air-to-ground operations, and it can carry an expanded load of "smart" Russian ordnance.
- Sukhoi's Su-35 "Super Flanker," an outgrowth of the original Su-27 design, incorporates aerodynamic improvements as well as new avionics, radars, and engines. It is thought to possess a sophisticated infrared search and track (IRST) surveillance system and a full-authority, digital fly-by-wire flight-control system, among other advanced features.

The Su-35 first appeared in the West at the 1992 Farnborough Air Show (opposite). A single-seat development of the Su-27K, it has incorporated aerodynamic improvements and new avionics, including the high-power, jam-resistant Zhuk radar.

Secret Fighter Projects?

These are the known projects. It is rumored that Sukhoi, like Mikoyan, is working on an F-22-class aircraft, though most analysts believe that Sukhoi's effort lags well behind Mikoyan's Project 1.42. Some Western analysts believe that Mikoyan is working on another long-range multirole fighter under a program called "Project 7.01." This aircraft would probably replace the MiG-31 "Foxhound." The best current assessment is that it is on the drawing board but lacks serious funding.

With less hope of success, the Yakovlev Design Bureau continues to work on its supersonic vertical takeoff and landing aircraft, the Yak-141.

Staff photo by Guy Aceto

Three prototypes were built, and one is flying. Yakovlev will need foreign investment to proceed.

Russia's fighters are under close scrutiny. The West is concerned about proliferation of new and deadly conventional equipment and the entry of yet another competitor into an already crowded fighter market. Wary Kremlin budgeteers, for their part, wonder where to get money to fund the projects.

Both camps have been impressed, not to say amazed, at the caliber of fighters the industry has managed to produce despite meager funds. The question is not whether Russia can produce fighters in a class comparable to the F-22 or advanced derivatives of the F-15 or F-16; prototypes exist. The critical question is whether Russian industry can be modernized to produce the aircraft in large numbers and at acceptable cost.

Because of their need to attract investment, Russian aircraft makers are now openly discussing fighter characteristics. At the recent Moscow Air Show and the 1993 Paris Air Show, industry officials gave long interviews, produced detailed brochures, and exhibited various aircraft.

Intense interest has centered on Mikoyan's pursuit of the next-generation fighter—Project 1.42. (Russians sometimes refer to this plane as the "MFI," for *mnogofonktsionalnii istrebityel,* "multirole fighter.")

Rostislav Belyakov, Mikoyan's chief general designer, contends that this aircraft is crucial to Mikoyan's ability to maintain a technology base strong enough to meet the needs of the Russian Air Forces through the end of this century. The aircraft, designed to be the next high-performance combat aircraft for the Russian air arm, is slated to enter service in 2006.

At the Paris Air Show, the prototype was touted by representatives of Moscow Aviation Production Enterprise (MAPO), a combine of the Mikoyan Design Bureau and factory organizations. They left little doubt that the jet is Russia's answer to the US Air Force's Advanced Tactical Fighter (ATF).

"There was the F-4 Phantom, and Mikoyan responded with MiG-21 'Fishbed,' " a MAPO official stated. "There was General Dynamics's F-16A, and Mikoyan built MiG-29C. There was F-16C, and Mikoyan countered with MiG-29M. And finally, to counter Lockheed's F-22, we are building our own ATF—Project 1.42."

Descriptions of the Project 1.42 fighter suggest that, from the start, the design included many features of the ATF effort, which culminated in the F-22. These features include a low multispectral signature, a reliable and superefficient engine, and an array of low-probability-of-intercept sensors.

Western experts expect the production aircraft to resemble the F-22 in composition and configuration.

A "Golden Compromise"

Last year, in an interview with *Jane's Defence Weekly*, one of Mikoyan's top designers suggested that the Russian program would follow the US lead of trying to blend high performance with low observability, keeping each in balance. Anatoly Belosvet, the first deputy general designer, stated that the Russian fighter will be a "golden compromise" of aerodynamics and stealth.

All evidence to date points to a new fighter with twin tails, a blended body construction of composite materials, and special coatings to enhance stealthiness. Russian and Western experts say these coatings will use radar-absorbent materials to reduce the radar cross section of the Project 1.42

aircraft. Mr. Belosvet has noted that Mikoyan is using a specially equipped MiG-23 to test improvements in radar cross section reduction. Those experiments, he said, have resulted in a tenfold reduction in that aircraft's radar signature. The implication is that these techniques have been applied to the new-generation jet.

In a statement to *Red Star*, Mr. Belyakov said that "a completely new aircraft has been assembled" and that "the airframe and its engine pioneer new technologies." In the same interview, however, the Mikoyan head implied that engine development work for this aircraft is behind schedule and may be delaying flight testing of the prototype.

Development of the engine apparently is an ambitious undertaking. As observers tell it, the powerplant not only will be strong enough to produce "dry" supersonic cruise but also will be fitted with thrust-vectoring nozzles to enhance the fighter's maneuverability. Plans call for the engine to have fewer parts and to reduce specific fuel consumption by some twenty percent, compared with the best Russian engine available today.

Reports from Mikoyan and other Russian aerospace analysts suggest that the Project 1.42 aircraft suffers from one of the problems affecting the F-22: weight growth.

At various air shows, Mr. Belosvet said that the new fighter is in "the thirty-metric-ton class," or about 66,000 pounds. This would be a big fighter, in roughly the same gross weight class as the USAF F-15C and measurably larger than the F-22, which is pegged to come in at under 60,000 pounds.

Though Mikoyan may have planned to build an aircraft of that heft, it appears more likely that the Russian fighter manufacturer is struggling to keep down the fighter's weight.

The precise official status of Project 1.42 has become a source of contention between Mikoyan's Belyakov and Gen. Col. Anatoly Malikov, chief of the Main Staff of the Russian Air Forces. Mr. Belyakov asserted that Russian Air Forces leadership does not support Project 1.42 and has not provided the funds to keep the program alive, leaving it to Mikoyan to scrape up the money to carry on. General Malikov responded that the service is not out to eliminate the program and would clearly like to have an aircraft of this capability. However, the Russian Air Forces evidently cannot produce the money required to execute the high-profile project.

Beefing to Boris

In a recent beef session with President Boris Yeltsin, Mr. Belyakov and other prominent aircraft designers proposed a major reorganization for the Russian aerospace industry, one that would provide more government backing. After the meeting with Mr. Yeltsin, the Russian central government appeared to be taking steps to assist Project 1.42 and other aircraft research and development programs.

One worry for this program is Sukhoi's reported attempt to build and fly its own advanced follow-on to the Su-27 "Flanker." This program, about which little is known, might well force the Russian Air Forces to choose between these two rival design bureaus.

Mikoyan has not concentrated exclusively on Project 1.42. It has also developed the MiG-29M (M for "modified"). Mikoyan will soon start producing MiG-29Ms for Malaysia, India, and, if funding holds, for the Russian Air Forces.

This radical upgrade of the MiG-29 made its overseas debut at the Farnborough Air Show in 1992. Mikhail Waldenberg, Mikoyan's MiG-29 programs director, stated that the design bureau intended to create a completely new aircraft that would make fullest use of the lessons learned from the MiG-29 program. The most important improvement was to be in the plane's air-to-air combat performance. The bureau also strove to increase its ability to deliver ground-attack weapons.

One of the MiG-29M's distinguishing features is its ability to deliver a host of Russia's more sophisticated missiles from up to nine hardpoints. The MiG-29M can carry up to 4.5 tons of bombs or eight air-to-air missiles. This new ability to carry air-to-ground smart munitions has been heralded in many of the MiG-29M's appearances at air shows, where the aircraft has been loaded up and exhibited bristling with smart munitions.

The new MiG variant employs a full-authority, fly-by-wire flight-control system and a modernized cockpit, though its basic architecture is still analog rather than digital, unlike that of many Western fighter aircraft. Russian military test pilots who have flown both the MiG-29M and the Su-27 tend to prefer the handling characteristics of the MiG-29M.

Top Radar

The aircraft has a new dual-mode radar, called "Zhuk," which is capable of both air-to-ground and air-to-air operation. The radar permits ground mapping of a target area and provides a modest terrain-following capability. This upgrade in radar potency will allow the pilot to track ten targets at once out to a range of 100 kilometers and to fire at two of those ten simultaneously. The radar allows the MiG-29M to carry

Staff photo by Guy Aceto

The MiG-29M, a "radical upgrade" of the MiG-29, also debuted at Farnborough in 1992. Aerodynamic modifications to give it relaxed stability make it more maneuverable and more efficient in cruise mode than its predecessor.

Staff photo by Guy Aceto

The MiG-29M can carry up to eight R-77s. This new Russian missile, characterized by honeycomb tailfins, is similar to the AIM-120 AMRAAM. Russia plans to include it as standard armament on all late-model aircraft.

and employ the R-77 missile, a new fire-and-forget, active radar-seeking, air-to-air weapon similar to the Air Force's AIM-120 AMRAAM.

The modernized cockpit houses two multipurpose monochrome displays providing flight data and weapon delivery information. The seat in the cockpit has been raised to provide better over-the-nose visibility, improving situational awareness.

This new-generation Fulcrum also has an improved IRST system. It contains a TV camera for target identification of air targets and autotracking of ground targets, allowing the MiG-29M to engage a target passively rather than by active radar signal.

The basic MiG-29 configuration has increased in volume by 2,500 liters, internal space usable either for fuel stores or new avionics. A new wing also permits storage of more fuel.

The airplane's enlarged dorsal spine runs the length of the fuselage. The additional weight is offset by the use of aluminum-lithium alloy that is as strong as, but lighter than, titanium. This enlarged spine holds many of the MiG-29M's new computers and electronic warfare boxes.

The MiG-29M has improved R-37 engines, which generate up to fifteen percent more thrust than is produced by the older R-33 powerplants. Moreover, the newest MiG-29M model has canards and a two-dimensional thrust-vectored nozzle configuration. This version, according to some reports, has been in flight testing for a number of years. According to Russian aerospace analysts, it is expected to be ready for series production in 1995.

Like its rival Mikoyan, Sukhoi has been busy producing new fighter prototypes and variants, most of them based on the Su-27 Flanker. The principal product to emerge is the Su-35, Sukhoi's latest and most capable offering in the fighter export market. At present, six prototypes are flying. This jet was first publicly seen in Russia in 1992 and debuted in the West later that year at Farnborough, where it drew immediate attention.

The Su-35 is slated to improve and enhance combat effectiveness in air-to-air and air-to-ground combat missions out to 2015.

Also known as the Super Flanker, the jet has incorporated aerodynamic improvements as well as new avionics. It can be refueled in flight and has an improved engine—the AL-35F produced by Saturn—providing up to fifteen percent more thrust than the AL-31F found on a standard Flanker. An Su-27 Flanker fitted with this thrust-vectoring system has reportedly been flying for five years.

The Russians claim impressive increases in the range and capabilities of the Su-35's modified Zhuk radar. It is a high-power, jam-resistant system that ensures air and surface target detection at long range. It can track more than fifteen targets at once and permit a pilot to ripple-fire weapons against six of those targets simultaneously. The radar allows the Su-35 to hit air targets out to 400 kilometers and ground targets out to 200 kilometers.

A grim joke making the rounds at recent air shows is, "If you see it before it shoots you down, it's the Su-27. If you do not see it before it shoots you down, it's the Su-35."

Three color displays provide terrain-mapping and terrain-following radar data to the pilot.

Over-the-Shoulder Shot?

It is also believed that the Su-35 has a rearward radar sensor in the tailsting, which formerly housed a braking parachute. Gen. Maj. Vasili Alexandrov, chief of the Central Scientific and Research Institute for the Russian Air Forces, has hinted that this rearward radar sensor could target trailing aircraft with a semiactive radar missile such as the R-27 "Alamo." The capability to make an "over-the-shoulder" missile shot in combat would have a major impact on air engagements.

The Su-35 is thought to possess an IRST of the type found on the MiG-29M and has a full-authority digital fly-by-wire flight-control system.

The plane can carry fourteen air-to-air missiles on twelve external stores. Its load could include up to seven KS-1.72s, a new super-long-range 400-kilometer air-to-air weapon produced by the Novatar Design Bureau. The missile is designed to engage E-3 Airborne Warning and Control System, E-8 Joint STARS, and airborne refueling aircraft.

The Su-35 also has a robust optical and electronic countermeasures suite in pods on the wingtips of the aircraft.

The Su-35 is a funded program that will likely begin production in 1995 or 1996, according to Sukhoi's First Deputy General Designer, Mikhail Pogosian. Sukhoi has also disclosed that the Su-35 has been ordered by the Russian Air Forces and that it has, in its view, excellent export potential. ■

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Of its many virtues, the greatest is flexibility.

The Key to Modern Airpower

By Gen. Merrill A. McPeak, USAF

This is the verbatim text of a speech given by General McPeak June 12 at Air Mobility Command's dining-in at Scott AFB, Ill.

THE BIBLE speaks of three virtues: faith, hope, and charity. They are not accorded equal rank; it says, "but the greatest of these is charity." We know that airpower also has virtues—certain valuable and, in combination, we believe, unique characteristics—speed, range, precision, lethality, flexibility. These are all marvelous features for combat forces to possess, but I'm convinced that, like the saving graces of the Scriptures, they should not be regarded as equals, for the greatest of airpower's virtues is flexibility.

We've all known this for a long time. When I was in a squadron, we shrugged off the inexplicable changes masterminded by teenage staff officers up in wing. Our ability to comply was easy to explain: "Flexibility is the key to airpower." We said it then, and I'm sure it is said, still, today. But when we think hard about flexibility, try to define it, measure it, figure out how to improve it, we come to realize how slippery a concept it is.

Exactly what is flexibility? The quality itself is not defined in the JCS *Dictionary of Military Terms*. Our own doctrine manual, AFM 1-1, includes a few words about flexibility/versatility, for some reason linking these two characteristics and asserting that together they constitute one of seven "tenets of aerospace power." The doctrine's author describes this tenet briefly: "the ability to concentrate force anywhere and attack any facet of the enemy's power."

Somehow, this doesn't add much to our understanding, in part, I suppose, because we all can imagine forces being concentrated and attacking at a point of our own choosing in a very inflexible way, as with the Charge of the Light Brigade or the murderous, brute-force assaults persisted in by the Allies during the First World War.

My conclusion is that, unless we've thought long and hard about it, most of us probably could not give flexibility a good, crisp definition, any more than we could quickly produce a clear meaning for the set of concepts wrapped up in the motto "Centralized command, decentralized execution," another icon in our small pantheon of household gods. No criticism is meant here. At our best, we are not a doctrinaire outfit. Odds are, most of us would say of flexibility, "I know it when I see it," and go back to trying to get on the flying schedule.

Four Problem-Solving Steps

Well, I checked, and there's no tail number with my name beside it tonight, so I might as well take a crack at defining the term. For openers, flexibility is the capacity to adjust to changing circumstances. But that's not all it is. To help get a grip on the entire concept, let us turn to [Lt. Col.] John Boyd [USAF (Ret)., a fighter weapons tactician], who, as you probably know, has proposed the concept of the "OODA loop" as a way to think about problem solving in a dynamic environment. "OODA" is an acronym for "Observation, Orientation, Decision, Action," the four problem-solving steps we go through.

Now, three of these OODA loop elements are quite unremarkable. We can easily grasp the idea of observation, of decision, of action. We sense a problem, make a choice, act on it. Very simple. In fact, these concepts correspond one-to-one and can be mapped directly onto attributes or qualities we seek in our people: observation to intelligence, decision to leadership, action to courage.

But what about this other "O"—orientation? What does it mean? What does it map to?

Boyd uses the example of the F-86 in Korea. This aircraft was in some important respects inferior to the MiG-15, but its powered controls gave it a much faster roll rate. Accordingly, it had the crucial advantage of being able to realign its guns much more quickly in any dogfight. Of course, a dogfight involves a series of OODA loops on both sides, with lots of fast transients in the loops. The F-86's roll rate advantage meant it could operate consistently inside the bandit's OODA loop time cycle. This fact had both offensive and defensive consequences. In the defense, it meant we could quickly counter enemy moves. In the offense, it meant we could ourselves generate rapidly changing combat conditions.

And here we come to a very important point. Flexibility has both these two aspects. It is, first, the capacity to respond well to changing circumstances, an important but somewhat passive virtue. For me, it is the [second,] active aspect—the ability to shape change, to make it work for you—that separates flexibility from mere adaptability.

I believe that we can regard this composite quality, the ability both to create change and to reorient on the new set of conditions constantly presented in any dynamic environment, as a technically better description of what we mean when we say "flexibility." In the OODA loop formulation, then, orientation corresponds with, or can be mapped directly onto, the quality of flexibility.

The future tasking of the Air Force will spring from new, nontraditional challenges.

The Long-Term Edge

Moreover, I put it to you that, over the long run, the other qualities—intelligence, leadership, and courage—are about evenly distributed in the world's population. Don't get me wrong. America will always produce smart, brave airmen. But we should never stake our country's fate on the notion that we are inherently smarter or braver or more gifted leaders than will be put forward by potential adversaries. On the other hand, the way our society works, my guess is we may be able to sustain a long-term competitive edge in flexibility. In my view, therefore, our best bet is to leverage this cultural strength, to aim at building an Air Force that orients better, to build the most flexible Air Force possible.

So you see why I wanted to talk about flexibility tonight. I spend adverbs like they were my own money, and I say flexibility is critically important. The first reason is that, like it or not, things do change. The environment is dynamic. Plans change. The good guy–bad guy lineup card changes. Technical capabilities change. Although we sometimes act as though they were immutable, even doctrine and employment concepts change. At the beginning of the 1967 war, Israel attacked Egyptian aircraft parked in the open. The world observed and reoriented. The Warsaw Pact decided to build aircraft shelters; NATO reacted with a shelter program of its own. Israel had used up a concept. In exactly this way, events consume alliances, plans, technology, doctrine.

So things change, and today the rate of change is accelerating. Technology provides perhaps the most convincing evidence of this fact. It is possible to argue, for instance, that by about 600 B. C., at the latest, humankind had already invented and was using the military hardware—the sword, lance, and shield—that was to dominate warfare for about the next 2,000 years.

To illustrate the point: When Alexander the Great first crossed into Asia Minor, he is said to have been given as a gift some body armor of Trojan War vintage. This would have made it about 900 years old. We are told that he subsequently wore this armor into battle. Apparently, no one considered this remarkable at the time. Today, we cannot imagine that weaponry would evolve at such a slow pace. (I admit that I recently piloted a C-141 that had 32,000 flying hours, but even it was well short of 900 years old!)

So, our technical environment is dynamic to a degree different from anything in human experience. But that's not the only variable in the equation.

The political context for using force is also changing quite rapidly. The Russians call Desert Storm "the first modern war." That's a very nice usage, but I wonder whether instead it may not be "the last ancient war," ancient in the sense that it involved a rather traditional cross-border aggression, clearly defined objectives on each side, straightforward employment of conventional forces, and so forth.

All this is very different from the variety of jobs your Air Force is finding for itself today. The drug war, operations in Somalia and Bosnia, the two nasty little Desert Storm cleanup details, nothing here bears much resemblance to the Cold War circumstances that shaped our Air Force over its first forty years. But it is from these new, nontraditional challenges that our future tasking will spring.

No "Niche" Air Force

Finally, as an added complication, we are getting smaller quite quickly. The budget is heading south, taking Air Force formations with it. Some have therefore suggested a "divestiture" strategy—that we figure out which functions are "core" to the Air Force and give up everything else. For my money, that just won't work. We are the Air Force of first and last resort for the United States and, for that matter, for others as well. The air forces of other countries or other services can specialize, become "niche" air forces. We cannot. We're never sure what the President will ask us to do. In the end, our residual force must be able to respond to a very wide range of demands across the entire spectrum of tasking in air and space, from global situation awareness to theater conventional operations to humanitarian airlift to—whatever.

So, flexibility is important—increasingly important as the pace of change quickens, as the variety of tasks we undertake widens, and as resources available to us are reduced. But we have not been standing still. We've been working to increase our flexibility in several ways.

The first effort has been to improve organizational flexibility. That I put organization first will surprise no one. The question of how to organize human activity to achieve particular results has always fascinated me. Immediately after becoming Chief, I kicked off "The Year of Organization," and we are still adjusting to the rather substantial changes called for as we restructure to the objective Air Force.

As you may know, the Air Staff has under way a total reform of Air Force regulations. I won't go into all that, except to point out that we recently produced in the new format a policy directive on organization, PD 38-1. Let me cite just a few lines from it.

Under the heading of desired characteristics in Air Force organizations, we find:

"Mission Orientation: Organizations should have a reason to exist and should be designed to achieve the [desired] outcome." Organizations should have a reason to exist! Some pretty advanced stuff here.

"Decentralization: Organizations should be designed so that lower echelons can achieve objectives without needing continuous control from above." Is this great policy, or what? And, finally:

"Flexibility: Organizations should be capable of adapting rapidly to changing external circumstances." Okay! That's what we've been talking about.

Flexibility is increasingly important as the pace of change quickens.

Shaping Change

The point of all this is we have a philosophy, an attitude, from which we are confident will spring organizational designs that make flexibility possible. We therefore require as a matter of policy that our organization be streamlined, delayered, decentralized, that we do not build inflexibility into our structure.

But we've gone beyond this to try to shape organizational change. There are many examples of this, but perhaps the best has been the creation of composite wings at bases where there had not before been a mix of equipment types. We've taken some criticism for this, which I have discounted because it comes from people who have no real appreciation of the greatly increased flexibility that is built into the wing by putting air capabilities together in this way. The theme here is that we are not merely adapting to change. Our reorganization effort shows the active face of flexibility. We are setting the agenda, shaping change, causing change.

In my second year, "The Year of Training," we took up the task of trying to enhance the flexibility of a wonderful resource—our people. Most of the effort involved improvements in training, but a very important initiative reworked the job classification system. In the process, we made a sizable reduction in the number of enlisted occupational specialties. Henceforward, our people will be more broadly used and accordingly must be more comprehensively trained, less specialized. There will be a whole series of changes to skill training and professional military education—including, for instance, the requirement for everybody to cycle back through technical training at midcareer. These changes mean our people will be better trained, no doubt about it. We can expect them to have a deeper understanding of their jobs. But they can also be expected to possess a broader range of skills. In other words, they will be more flexible.

So we have not been on autopilot lately. An interlocking set of reforms is under way that will give us a better organizational structure and people better prepared both to respond to and to create change.

Of course, 1993 is "The Year of Equipping the Air Force." Here it will be a little harder, I think, to score quickly. Quite frankly, we are saddled with an equipment acquisition process that is so bad it tends to throw even the occasional bright spots into shadow. The C-17 is a good example. This aircraft will carry twice the cargo of the C-141 into three times as many airfields as are available to the C-141. That, of course, would increase tremendously the flexibility of our mobility forces. The issue now is whether we will field the C-17, or whether it will evaporate in the friction generated by our way of buying military hardware.

But the fact is that our acquisition system, bad as it is, has often produced equipment of great inherent flexibility, which we subsequently were unwilling or unable to exploit. Why did it take us thirty years to install cargo rollers in the KC-135? What's the rationale for fielding the B-1 and B-2 without the capability to deliver precision guided conventional munitions? Why are we only now thinking about putting [high-speed antiradiation missiles] on the F-15C? These are human failures, failures of the imagination.

And so I turn, finally, to this most important point: All our efforts relating to the organization, training, and future equipage of the Air Force may be accepted and instituted and will make no difference whatever if, when the time comes, we do not

think about and use our forces in a flexible way.

For about the last 500 years—that is, over the period during which the principal implements of war have relied on chemical, rather than animal, energy sources—war at the top end has involved a contest between systems. To beat a system, it is necessary to direct against it another system either more powerful or more flexible. Often our first impulse is to try to overpower. The appearance of the U-boat in the North Atlantic at the beginning of World War II meant the Allies had to form up shipping in convoys. For a while, at least, the convoy system beat the U-boat system. But note what was given up in this approach. Individual ships could not leave port when they were ready; they waited for the convoy. They could not sail at their best speed, plot the course they thought right, zig and zag as they wished. They did what the convoy did. They traded flexibility for power, the strength of numbers.

We took much the same approach in bomber employment. Early on, we found that bombers had to be grouped in large formations to survive German defenses. Thus, we integrated, days in advance, the planning and operations of many bomber bases, and eventually fighter bases, too, as we were forced to adopt fighter escort. As you might expect, this sort of integration is the enemy of flexibility. We were not able to take full advantage of the high cruising speed of our bombers. The sedate pace imposed by formation maneuvering constraints actually helped solve the problem for German fighters and AAA. We settled into a sort of attrition war as prolonged and deadly and indecisive as anything on land.

It is interesting to read an account of these operations in our doctrine manual. Volume II has an essay titled "Aerospace Power Capabilities." This essay cites our World War II experience, "when more than 1,000 bombers launched from dispersed airfields in England, concentrated their striking power over targets on the continent, and then returned to their separate bases." Unhappily, a great many of them did not return. Perhaps by mistake, this awful experience appears in our doctrine manual under the heading of flexibility.

By the way, fighter operations in the Second World War did retain much of their flexibility because they did not have to be so highly integrated into more powerful systems. Aircrews sent in pairs or in easily maneuvered small formations were able, with comparatively little outside assistance, to search for, find, and destroy targets wholesale. We all know the devastating impact this had on German ground forces, isolating and breaking up some of the best units ever seen in battle.

The effective employment of airpower relies on thinking and attitude and imagination.

Detailed Choreography

However, in the decades since World War II, even our fighter force has become increasingly dependent on a variety of supporting systems—electronic warfare, AWACS, reconnaissance, and so forth. We ought to be concerned about this. The initial "alpha" packages of Desert Storm—those we flew before we could be fully confident of air superiority—were choreographed down to the last detail.

The clockwork precision of these first few days was really remarkable, considering the weather, the number and variety of sorties flown, and the fact that the air forces of eight other coalition nations, plus our own Navy and Marines, all had to be orchestrated. It puts to shame von Moltke's mobilization and deployment of Prussian troops against the French in 1870, when a million reservists and horses and thousands of tons of supplies had to be delivered to predetermined jump-off points in a short period of time.

Careful planning meant that contest, too, was decided almost before the first shot was fired. But it is said that the Franco-Prussian War, like the World War a generation or so later, was inevitable, the momentum irreversible, once mobilization had been ordered. It wasn't simply that no adjustment, no fine-tuning, was possible; it was an all-or-nothing proposition. The Prussians lost even the flexibility to stop the conflict short of actual hostilities. We should remind ourselves from time to time that our alpha packages, these great "gorillas," also involve a tradeoff of flexibility.

Don't get me wrong, there is a time and place for careful scripting, and the first days of Desert Storm were a good time and place. We were marvelously successful. Moreover, and most important, we did move quickly to flexible concepts, as units were fragged to kill boxes or Scud-hunt holding points with mission-type tasking. That is a memory we must keep alive. My worry is that the "gorilla" will become the model for the air campaign, the school solution, the stereotype of the air operation. That kind of mindset will make a hash of all our other efforts to build flexibility into our organization, our people, and our equipment. For me, this is the key point: The effective employment of air- and spacepower has to do not so much with airplanes and missiles and engineering as with thinking and attitude and imagination.

Ladies and gentlemen, we have every reason to be proud. We won the Cold War. We won Desert Storm. We've been on a roll lately. We all pray for our nation's continued success, hopefully in peace, but in war, if war there must be. And, if there must be war, we hope to bring to the battlefield a lopsided superiority in every martial aspect as, indeed, we did in Desert Storm.

But if this nation lasts another thousand years, as we pray it will, we can be sure of contests that will be much closer calls. When this happens to us, what will be important is our ability to combine organization, training, hardware, and doctrine into a single decisive whole that is flexible enough to respond in relation to the specific enemy and circumstances and purposes at hand; to adapt to change, to shape change, to compel change.

Ladies and gentlemen, I give you flexibility—the key to air- and spacepower. ■

Gen. Merrill A. McPeak is Chief of Staff of the Air Force.

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In the summer and fall of 1943, Eighth Air Force threw a heavy punch at Hitler's Germany.

Against Regensburg and Schweinfurt

By Alfred Price

Photos courtesy Jeffrey Ethell

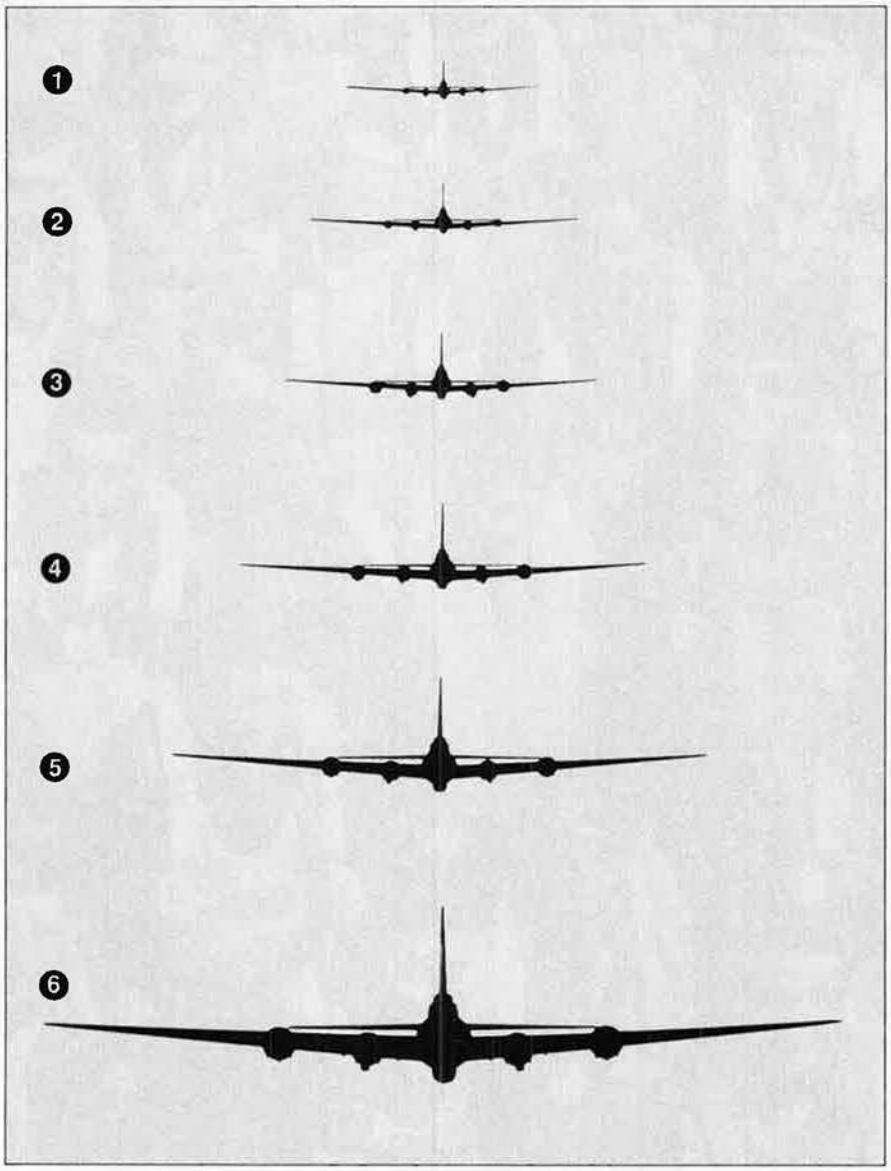
Eighth Air Force's massive strikes at the industrial heart of the Third Reich required unprecedented numbers of men and machines. Though the B-17s (above) carried up to thirteen guns and flew in defensive formations, Luftwaffe fighters countered with revised tactics and inflicted heavy losses.

On January 27, 1943, Eighth Air Force attacked Germany for the first time. Fifty-eight B-17 Flying Fortresses and B-24 Liberators hit the port of Wilhelmshaven. During the next seven months, the bombers ventured progressively deeper over the enemy homeland and in progressively greater force. These raids took the bombers far beyond the reach of US and British fighters. The bombers had only the concentrated crossfire of their .50-caliber machine guns to ward off attacks from German fighters.

The Luftwaffe slowly came to realize that these daylight attacks, if left unchecked, would undermine Germany's capacity to prosecute the war. German fighter units were pulled back from the battle fronts. During the first half of 1943, the day fighter force in Germany and the western occupied territories rose from 635 aircraft to more than 800.

German fighters initially found themselves short on firepower when engaging the sturdy, well-armored heavy bombers. When Luftwaffe officers examined wrecked B-17s and B-24s, they discovered that it took at least twenty hits with 20-mm shells fired from the rear to bring them down. Armament experts, after analyzing combat camera footage, learned that pilots of average ability hit the bombers with only about two percent of the rounds they fired. To obtain twenty hits, the average pilot had to aim 1,000 20-mm rounds at the bomber. The best German fighter, the FW-190, carried only 500 rounds.

Of course, the straight-shooting Luftwaffe "experts" (fighter pilots with more than twenty-five kills; the Luftwaffe did not use the term "ace")



These figures illustrate the apparent size of a B-17 during a head-on attack at 500 mph. Figure 1: At 800 yards, the fighter's nose must be aligned on the bomber. 2: One second later, 600 yards, fighter about to fire. 3: Half a second later, 500 yards, fighter commences firing. 4: Half a second later, 400 yards, fighter ceases firing. 5: Half a second later, 300 yards, pilot must begin his pass over the B-17. 6: Half a second later, 200 yards, one second until collision.

got a much higher percentage of their rounds on the target. But even they had problems when attacking formations of heavy bombers. Maj. Anton Hackl, who ended the war with 192 credited victories, explained: "If one came in from the rear, there was a long period, closing from 1,000 meters to our firing range of 400 meters, when the bombers were firing at us but we could not fire at them. This was a very dangerous time, and we lost a lot of aircraft trying to attack that way."

Meet Them Head-On

One solution was to attack the heavy bombers head-on. When the bomber was hit from that direction, its armor gave little protection, and four or five 20-mm hits were enough to knock down the plane. Moreover, the bombers had fewer guns firing forward, and the high closing speed gave them little chance to engage the fighters. The combined closing speed of nearly 500 mph allowed German pilots time for only a half-second burst of fire, commencing at 500 yards *[see illustration above]*, but if it was accurate, it was sufficient.

Major Hackl asserted, "The head-on attack was the only way to knock down the [heavy] bombers. One accurate half-second burst from head-on and a victory was guaranteed."

TSgt. William Murphy, a B-24 top-turret gunner with the 44th Bomb Group, described the difficulty of engaging German fighters making head-on attacks: "The only ones we ever got were those who made a bad pass and mushed off their speed as they tried to break away early or pull round on to us; if they did that, we stood a chance. But the experienced guys knew better than that, and they kept going straight through our formation, giving an extremely difficult target."

The head-on attack required skillful flying and accurate shooting. The best pilots amassed high victory totals using such tactics, but those of average or below average ability achieved little. The bottom line, from the German point of view, was that the Luftwaffe was shooting down an insufficient number of heavy bombers to halt the daylight raids. The Germans explored several ways to increase their fighters' effectiveness, but, before they took effect, the attackers made one deep penetration too many.

On August 17, 1943, Maj. Gen. Ira C. Eaker, commanding general of Eighth Air Force, launched his most ambitious operation up to that time—a twin strike on the Messerschmitt aircraft factory at Regensburg and the ball-bearing production center at Schweinfurt, both in southern Germany. Regensburg, the more distant target, was 430 miles inside occupied Europe.

Under the original plan, the two raiding forces, with a combined total of 376 Flying Fortresses, were to make the initial penetration flying as one compact force. South of Frankfurt, two bomb divisions with 230 aircraft were to split away, attack the Schweinfurt plant, and return to England. The remaining division of 146 B-17s would head straight to Regensburg. After bombing, that force would continue south over Austria and Italy and land at bases in Algeria.

Dawn on August 17 found the airfields of eastern England covered with thick clouds, which were forecast to thin as the day progressed. Had the raiding forces taken off early that morning as planned, they would have risked collisions during formation assembly, so the attack was rescheduled. The takeoff of the Regensburg force was delayed by one and a half hours (the maximum acceptable, if

the bombers were to reach the unfamiliar airfields in Algeria before dusk). The takeoff of the Schweinfurt attack force was delayed five hours.

Divide and Be Conquered

The change of plan meant that the two attack forces would penetrate enemy airspace separately. German fighters, rather than being divided to go against the two attacking forces, could concentrate on each force sequentially. Each group of bombers would have to face the full wrath of the defenses.

At 10:05 a.m., the leading elements of the Regensburg attack force crossed the Dutch coast, accompanied by a couple of dozen P-47 Thunderbolts. Three Luftwaffe groups with about sixty fighters moved into position to engage the intruders. The Thunderbolts broke up the attack of one group, but the small force of escorts could not cover every part of the bomber formation. The other two German units, I Group of Fighter Squadron 26 with FW-190s and III Group with Messerschmitt Bf-109s, got through to deliver head-on attacks on the bombers.

By the end of the encounter, four B-17s had been shot down and several others damaged, some so severely that they were forced to break formation and turn for home. Two more bombers fell to flak. As the B-17s neared the German frontier, the Thunderbolts reached the limit of their radius of action and turned back. From then on, the bombers were on their own.

The next action opened as the bombers passed Wiesbaden. Fighter Group 50 sent twenty-five Messerschmitt Bf-109s into action, backed by a score of Bf-109s and FW-190s flown by instructors from fighter training units in the area. These made head-on attacks, then turned around and attacked the bombers from the rear. Much of the subsequent action took place around the US 100th Bomb Group at the rear of the formation. Lt. Col. Beirne Lay, a staff officer from Hq. Eighth Air Force, flew as copilot in one of the group's B-17s to gain firsthand combat experience.

That he certainly did. "Swinging their yellow noses around in a wide U-turn," he wrote, "a twelve-ship squadron of Me-109s came in from twelve to two o'clock in pairs and in fours, and the main event was on. A shining silver object sailed over our right wing. I recognized it as a main exit door. Seconds later, a dark object came hurtling through the formation, barely missing several props. It was a man, clasping his knees to his head, revolving like a diver in a triple somersault. I didn't see his chute open.

"A B-17 turned gradually out of the formation to the right, maintaining altitude. In a split second, the B-17 completely disappeared in a brilliant explosion, from which the only remains were four small balls of fire, the fuel tanks, which were quickly consumed as they fell earthward. Our airplane was endangered by falling debris. Emergency hatches, exit doors, prematurely opened parachutes, bodies, and assorted fragments of B-17s and Hun fighters breezed past us in the slipstream.

"I watched two fighters explode not far beneath, disappearing in sheets of orange flame, B-17s dropping out in every state of distress, from engines on fire to control surfaces shot away, friendly and enemy parachutes floating down and, on the green carpet far beneath us, numerous funeral pyres of smoke from fallen aircraft, marking our trail."

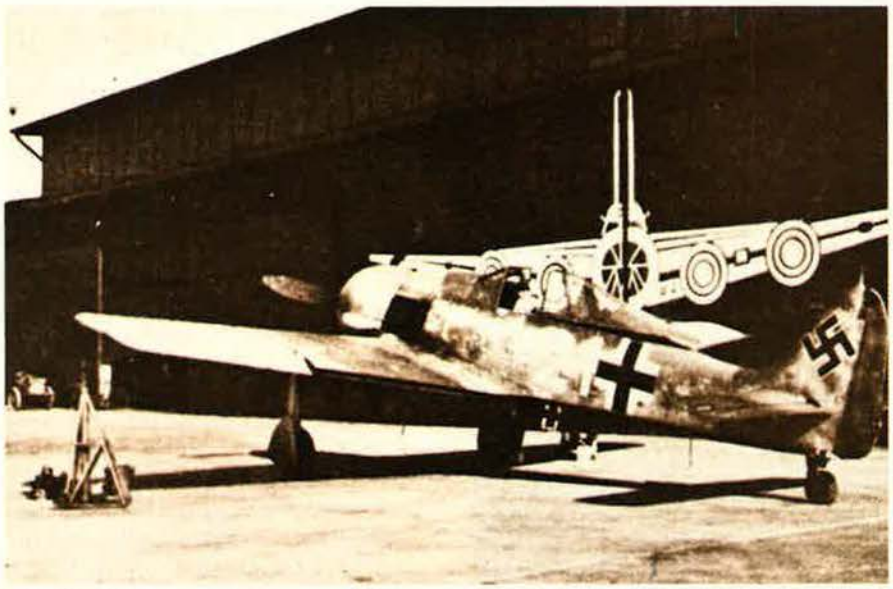
Nine B-17s, six from the embattled 100th Bomb Group, fell during the action.

Over Regensburg the raiders found cloud-free skies and visibility of more than twenty-five miles, perfect weather for an attack. The three batteries of 88-mm guns positioned around the target did their best to disrupt the bomb runs, but the leading bomb groups laid their patterns of bombs accurately. Then, as always happened during a large attack on a single target, dust and smoke from the explosions and fires obscured the aiming points, and subsequent bombing was less accurate.

After bombing the target, the B-17s continued south. Two damaged bombers left the formation and headed for neutral Switzerland. Seven more damaged planes went down on the way to Algeria.

Of the 146 heavy bombers that had set out for Regensburg, seven turned back, and 139 crossed the Dutch coast. Twenty-four of these were lost.

The Schweinfurt raiding force, comprising 230 B-17s, launched its attack later in the day. It too suffered heavily from the German fighters and flak, losing thirty-six bombers.



FW-190 pilots sought to know their enemy by painting a full-size silhouette of a B-17 on their hangar door. Once the bombing of their homeland began, German tacticians soon discovered that head-on attacks were by far the most effective.

Heavy Losses

Thus, of the 376 B-17 Flying Fortresses that set out from England to bomb the two important targets, sixty were destroyed. That was not the final cost. When the Regensburg force returned to England a week later, attacking an airfield near Bordeaux on the way, it was without another fifty-five aircraft, which had been damaged beyond immediate repair, and three more were lost during the return flight. In the short term, the twin attacks and that on the French airfield

deprived Eighth Air Force of 118 bombers—nearly one-third of the force committed on August 17.

Despite bomber crew reports to the contrary, their return fire did not inflict serious losses on the German fighters. The Luftwaffe lost only twenty-seven fighters during the two great air battles.

In the weeks that followed, the large-scale introduction of two weapons brought about a formidable increase in the firepower of German home defense fighters. The first was the Mk. 108 cannon, a 30-mm weapon that fired eleven-ounce, high-explosive incendiary rounds at a rate of more than 600 per minute; on average, three such hits were sufficient to down a heavy bomber.

The second "new" weapon was the 21-cm rocket, a German Army infantry weapon adapted for air-to-air use. Mounted in a tube that also served as the launcher, the 248-pound, spin-stabilized weapon carried a ninety-pound warhead powerful enough to destroy any bomber within thirty yards of the point of detonation. The missile was time-fuzed to explode at a preset flight distance, however, so the target's range had to be judged within fine limits before launch.

New Bf-109s were fitted with a 30-mm cannon firing through the propeller hub. These and the FW-190s were modified to carry one rocket launcher under each wing. In another move to buttress the fighter defenses, Destroyer Squadron 26 was reformed as a home defense unit with a nominal strength of eighty "bomber-destroyers." The unit's formidable twin-engine Bf-110s and Me-410s carried a forward-firing armament of four 20-mm cannon, two 30-mm cannon, and four 21-cm rocket launchers.

In action, the 21-cm rocket proved relatively inaccurate. It downed few bombers, but it often damaged planes sufficiently to force them out of formation so that other fighters could finish them off.

Eighth Air Force's heavy bombers resumed attacks on Germany on September 6, 1943, when 338 Flying Fortresses set out for Stuttgart. German fighter forces again reacted vigorously and effectively, and on this occasion the raiders had to contend with poor weather. The primary targets were blanketed by clouds, and the aircraft bombed "targets of opportunity" on the way home. The September 6 attack cost forty-five bombers.

Turning the Tide

On September 27, 1943, 305 B-17s set out for the German port of Emden. This raid was a milestone, marking the first attack against Germany in which the bombers enjoyed fighter cover all the way to the target. This protection was provided by Thunderbolts fitted with new seventy-five-gallon and 108-gallon drop tanks. The raiders lost only seven bombers. The escorts shot down about twenty German fighters, losing only one of their own. Five days later, Eighth Air Force executed a similar, 349-bomber attack on Emden, losing only two.

On October 4, a force of 155 B-17 bombers set out to attack Frankfurt am Main. More than 200 Thunderbolts escorted the raiders along much of the route, and only eight bombers were lost. Near Cologne, the 56th Fighter Group caught a group of about forty Bf-110s about to launch rockets into the rear bomb group and shot down about fifteen without a single loss to themselves.

From that point on, the unwieldy twin-engine bomber-destroyers were restricted to operations east of the Bremen-Kassel-Frankfurt line to keep them out of reach of the Allied fighter escorts.

During the second week in October, the heavy bombers launched a series of deep-penetration attacks. On October 8, a total of 389 American B-17 and B-24 bombers, escorted by 274 P-47 fighters, attacked Bremen, with a loss of thirty-one bombers and three fighters. The next day, 368 bombers set out on the deepest penetration yet, hitting Danzig, Gdynia, and other sites along the Baltic coast. Twenty-eight bombers were lost. On October 10, a group of 313 bombers took off to attack Münster, with the resulting loss of thirty planes. Bomber losses during these actions were in each case less than ten percent of the force committed, a rate considered "acceptable" in this campaign of attrition.

The stage was set for the next deep-penetration attack, launched against Schweinfurt on October 14, 1943. After the earlier raid, the name "Schweinfurt" could strike fear into the bomber crews. At the end of the mission briefing for the 385th Bomb Group at Great Ashfield, England, Col. Elliot Vandevanter concluded, "This is a tough job, and I know you can do it. Good luck, good bombing, and good hunting." At this, someone at the back of the room quipped, "And good-bye!" The comment drew a round of nervous guffaws from the crews.

A force of 291 Flying Fortresses set out for the ball-bearing production center. The defending fighters held back until the leading bombers had crossed the German border and the escorting Thunderbolts turned back for home. Making the most of its new weaponry, the Luftwaffe struck in a manner "unprecedented in its magni-

Photo courtesy Jeffrey Ethell

P-47 Thunderbolts with seventy-five-gallon and 108-gallon drop tanks were eventually able to escort the huge bomber packages to most targets, slashing USAAF's attrition rate and forcing the Luftwaffe to restrict operations.

Photo courtesy Jeffrey Ethell

B-17s, such as the* Mary Ruth *(above), had to contend with a new wrinkle once the Me-410s (below) went up against them. When the P-51 began escorting the Fortresses, however, there was no sanctuary left for the unwieldy "superdestroyers."

tude, in the cleverness with which it was planned, and in the severity with which it was executed," in the words of US official historians.

Nevertheless, a powerful raiding force got through. All three of the ball-bearing plants that were attacked suffered heavy damage. During the return flight, however, the bombers again came under sustained attack from German fighters, many of which were going into action a second time that day.

Schweinfurt lived up to its grim reputation as a target. Sixty B-17s were shot down, five more crashed or crash-landed in England, and twelve others were damaged beyond repair. The guns of the bombers and the escorting Thunderbolts destroyed thirty-eight German fighters and damaged twenty more.

Valuable Lessons

Both sides drew significant lessons from the October battles. To the Luftwaffe, the outcome of the air combat seemed to confirm the effectiveness of its new tactics and weapons. In the short term, the twin-engine bomber-destroyer seemed to offer the best counter to bomber formations venturing beyond the range of their escorts.

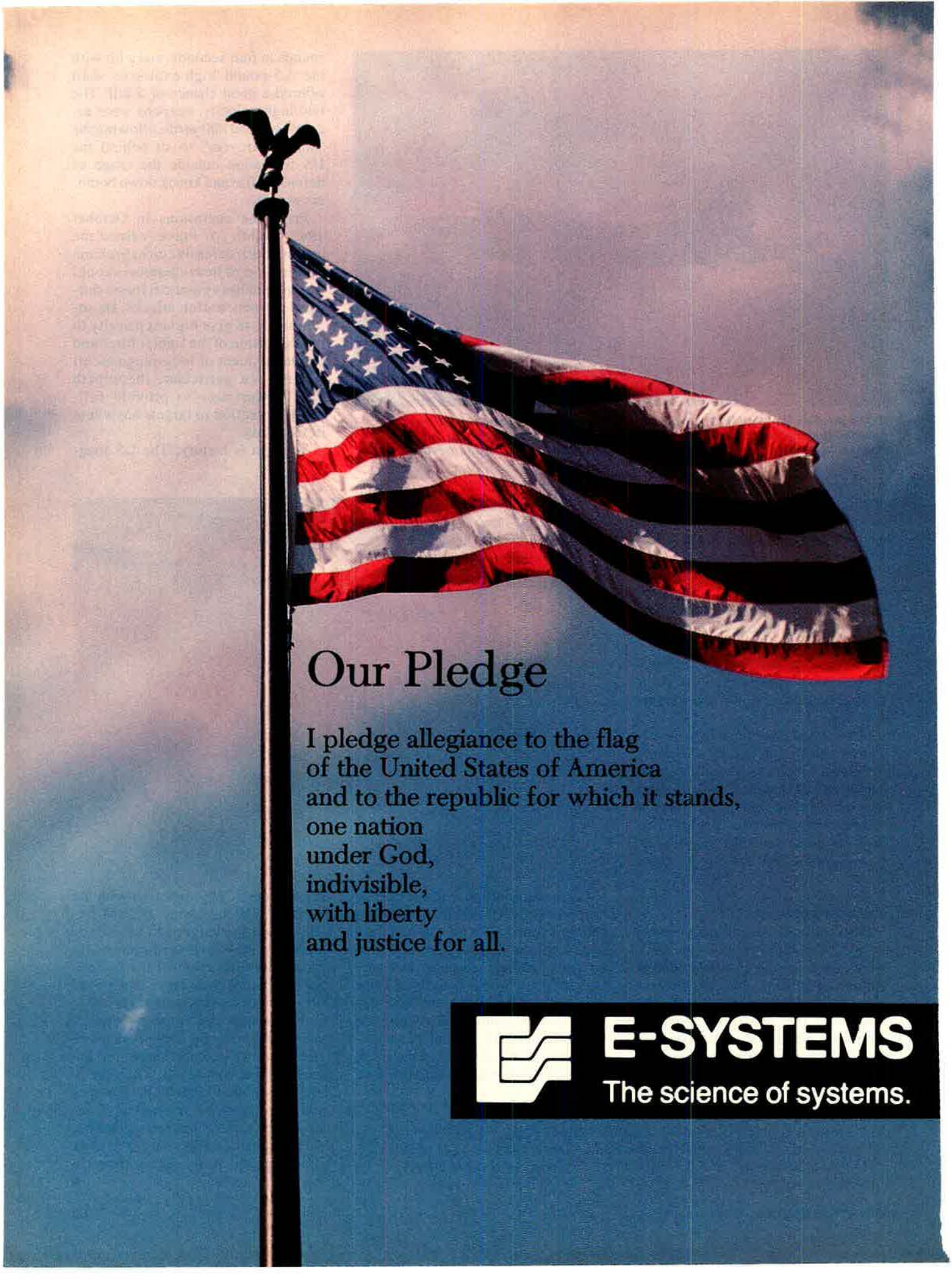
Plans were laid to build a fleet of "superdestroyers" fitted with heavy caliber cannon. The Bf-110 had been tested with a modified 3.7-cm anti-aircraft gun mounted under the fuselage, firing ten-ounce shells at a rate of about eighty per minute. The ultimate system, fitted internally in the Me-410, was the 5-cm tank gun modified for airborne use. Called the BK 5, the single-shot weapon could fire three rounds in four seconds, and a hit with the 3.5-pound high-explosive shell offered a good chance of a kill. The two high-velocity weapons were accurate beyond 800 yards, allowing the "superdestroyers" to sit behind the US formation outside the range of defensive fire and knock down bombers at will.

From the operations in October 1943, Eighth Air Force learned the hard way that defensive crossfire from a formation of heavy bombers could not prevent heavy aircraft losses during deep-penetration attacks. Its solution was to give highest priority to the expansion of the fighter force and the deployment of long-range escort fighters—in particular, the superb P-51B Mustang—to provide full-route protection to targets anywhere in Germany.

The rest is history. The US long-range escorts "got there first with the most." From the spring of 1944 onward, over the length and breadth of Germany, they fought a running battle of attrition that crippled the defending German fighter force and wiped out many of its sanctuaries.

By the time the "superdestroyers" were ready to begin operations, there remained no part of Germany in which they could operate safely. Their crews fought bravely to defend their homes and loved ones, but to no avail. Confronted by packs of marauding escorts, the twin-engine bomber-destroyer units simply melted away, like snowmen in the spring sunshine. ■

Alfred Price flew with the Royal Air Force for sixteen years. He has published some three dozen books, including The Spitfire Story, The Last Year of the Luftwaffe, *and, with Jeff Ethell,* Target Berlin. *His most recent article for* Air Force *Magazine was "To War in a Warthog" in the August 1993 issue.*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The Pentagon will try to build technology as it cuts production—and hopes the industrial base will be sufficient to meet the need.

Leaner Links and Tighter Squeezes

By Peter Grier

THE Air Force of today is the product of a procurement system that was founded in World War II and sustained by the Cold War. Looming threats—first from the Axis, then from the Soviet Union—created its main features: high-volume production, fast activation and retirement of weapons, and a constant search for the next modern aircraft.

That's over now. The end of the superpower standoff and growing public demand for a peace dividend have made the acquisition infrastructure as obsolete as a C-47, say service officials. The Air Force and commercial contractors are coming to grips with the implications of reduced production volume, delayed weapon starts, and stretched-out weapon lives.

One official calling for dramatic change in industry and government thinking is Gen. Michael P. C. Carns, Vice Chief of Staff of the Air Force, who addressed some of the defense industry's top players at the third annual Air Force Acquisition Conference. The conference, held last June in the Washington, D. C., area, was sponsored in part by the Central East Region of the Air Force Association in cooperation with the Air Force.

General Carns said that the Air Force needs to revise its concept of modernization. Instead of driving for low unit cost through large production runs, officials should think about updating the force's standards of output. One implication of this is that the Air Force might no longer tell Congress that the service wants to buy a specified number of aircraft each year. Rather, Air Force officials might talk about specific and easily understood measures of capability.

"We might say we intend to modernize the air-superiority capability of the USAF at the rate of 'x' squadrons per year, and that it will take 'y' years to do the job," said General Carns.

Industry might need to shift its focus to operations with dramatically lower overhead and to smooth production of unit-sized lots.

General Carns called this concept "lean production links." He said that production should be adaptable and should permit the insertion of new technology at all points in a weapon system's life cycle. Full use of advances in stealth, precision guidance, and information links will be crucial if US airpower is to maintain its edge in the future, said the General.

Without modern technology, General Carns pointed out, readiness means nothing. He noted the classic case of the Polish pilots who, though well-trained, were flying outdated planes and were soundly thrashed when they came up against a far better equipped Luftwaffe at the outset of World War II. "No matter how many trips to the range they had, they were not relevant when the Germans showed up," said General Carns.

Balancing Against the Budget

Future Air Force acquisition is thus going to be a delicate balancing act, with military strength, industrial viability, and the edge of technology all weighed against the need for lower budgets.

This "Balancing of Challenges" was the theme of the day-long AFA conference. Speaker after speaker expressed concern about the state of the military industrial base. Department of Defense officials promised they would try to improve acquisition policies but cautioned that change in this area often comes hard. Defense contractor representatives pleaded for policy moves to help their hard-pressed firms.

It was clear to all that continued budget reductions are in store. Deputy Secretary of Defense William Perry predicted that by 1997 total US defense spending will be roughly forty percent less than it was in 1987. About two-thirds of this reduction has already occurred, said Mr. Perry.

Defense Secretary Les Aspin has made readiness a top priority, so downward pressure on all other budget categories will be particularly intense. Force structure is shrinking. Modernization (procurement plus research and development funding) will be hit hard. By 1997 the modernization budget, in real terms, will be only half what it was at its peak in 1986, said Mr. Perry.

The Clinton Administration's strategy is to protect the technology base budget as much as possible, though that will mean reduced procurement of new weapons embodying such technology.

"Even our smaller forces will not be modernized at the rate they have been in the past," said Mr. Perry.

It is imperative that defense overhead be reduced so that optimal capability can be squeezed out of smaller budgets, he said. More facilities and depot capacity will be cut in the next round of base closures, scheduled for 1995. Moreover, he added, the acquisition system must become more efficient.

Mr. Perry said that he has rough calculations showing that thirty to forty percent of defense acquisition costs are attributable to management and control activities. The comparable figure for large commercial programs, he said, is about ten percent.

The gap might be reduced by reforming contract procedures, military specifications, and security requirements. Mr. Perry said he cannot give assurances that he will be able to carry out such changes, given the complex nature of the system. "I can only give you the confidence we will try, and try seriously," he told the AFA conference.

So far as many in the defense industry are concerned, reform cannot come soon enough. Tough times have already hit many workers.

One year ago, 2,000 people worked for Hughes in San Diego, Calif., producing the AGM-129A Advanced Cruise Missile, said Chuck Anderson, Hughes Missile Systems' director of quality and material. By May 1993, only 600 remained. Of the 1,400 employees who separated from the company, 900 were drawing unemployment in the San Diego area. Two engineers had jobs designing lawn sprinklers in Pomona, Calif. One particular Hughes employee, considered one of the brightest stars of the ACM program, has entered a very different line of work.

"We probably don't want [someone who is] perhaps the premier stealth engineer in the country working on a ranch in Wyoming," said Mr. Anderson.

What to do with laid-off defense workers is a staggering issue facing the country, Mr. Anderson told the conference. "I don't have a lot of answers," he said, "just a lot of questions."

Preserving Capabilities

Preservation of key defense industrial capabilities is another major concern. The US has cut weapons-building capacity after almost every major war it has fought and has lived to regret it, claimed Raytheon Chief Executive Officer Dennis J. Picard.

When Iraq invaded Kuwait, the US military had only three of the upgraded Raytheon Patriot missiles capable of intercepting incoming Scuds, said Mr. Picard, but the defense base supporting the Patriot had not been disassembled. Between August 1990 and January 1991, Raytheon's workers turned out 500 upgraded Patriots.

It is obvious that the defense industry is getting smaller, said the Raytheon chief. He worried that if things move too fast, crucial capability will be swept

Success in Technology Transfer

Running fairly smoothly at the moment is a little-known part of the USAF-industry acquisition relationship: technology transfer.

The US government is looking to adapt many defense breakthroughs to commercial products. Gen. Ronald W. Yates, head of Air Force Materiel Command, said Air Force laboratories are in the forefront of this effort.

Work in Wright Laboratory's Manufacturing Technology Directorate has reduced the per-unit cost of F-22 radar modules from about $8,200 to about $400. In addition to making the radar itself more affordable, the work has made modules so cheap that they can be installed on some school buses to warn drivers about vehicles in their "blind spots."

The system has already saved a life, according to General Yates. This occurred when a boy dropped his school papers under the bus, then went to retrieve them. "The driver was ready to go, but the alarm went off," said General Yates.

Working with technicians at the University of Dayton, Air Force researchers have developed something called a "smart dipstick." It is designed to pinpoint the moment when jet engine oil needs to be changed, based on the oil's actual viscosity rather than on some arbitrary elapsed time.

One industry likely to find this product useful is fast-food restaurants. Cooking oil is a large expense for them, points out General Yates.

"*R&D* Magazine recognized the smart dipstick as one of the 100 most technically significant product innovations of the past year," said General Yates.

To help speed such advances to industry, the Air Force has opened a technology transfer office at Wright-Patterson AFB, Ohio, to serve as a one-stop clearing house. AFMC is also developing an on-line database so potential customers can examine USAF technologies.

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away. "We need the Administration and . . . Congress . . . to slow down the cuts," he said.

Some speakers said the Administration and Congress could ease the pain of defense conversion by acting more as a partner with industry in pursuit of international sales. With worldwide overcapacity in military production, French, British, and now Russian companies are competing fiercely for available contracts. Often they come to the competition with government backing.

Mr. Picard sees a critical need for a defense export financing mechanism for US-approved sales to allies. The existing Foreign Military Sales program is limited, he said, with ninety percent of available funds already committed to only two nations—Egypt and Israel.

Industry strongly supports a Pentagon loan guarantee program, perhaps financed with defense conversion funds. Loans worth up to $5 billion can be guaranteed with only about $300 million in appropriations. "Every $1 billion in export sales employs 45,000 workers, directly or indirectly," claimed Mr. Picard.

The Depot Controversy

The Raytheon chief also said the Defense Department could help industry by changing its depot maintenance policy. It is shortsighted, he said, for depots to take work from a hard-hit industry. "In some cases, government depots are looking to take in work we in industry are already doing," he charged.

Depot competition is an emotional issue for Air Force and industry leaders. It caused tension at the conference, with each side appearing to doubt the motives of the other.

In past years, things were simpler. The big Air Force depots had two kinds of work: organic jobs done in-house and contracts let directly to industry. Today there is a third category: organic work loads that might be performed by contractors.

Air Force Materiel Command, headquartered at Wright-Patterson AFB, Ohio, has opened $800 million worth of in-house work to public-private competition. USAF officials claim that the taxpayer has saved $100 million so far, but industry has won only one-third of the contracts. Contractors are suspicious that the competitions are not really fair.

"It is a very big issue with us," said Ron Finkbinder, Lockheed's vice president of contracts. "It is essential to the continued existence of the private sector that we get as much modification and maintenance work as possible."

Lockheed is zero-for-two in big depot maintenance competitions. Mr. Finkbinder said that he does not believe the cost evaluations in the contests were fair, since the government is not a profit-making enterprise. Furthermore, he charged, such cost evaluations can never be made fair.

In the last several years, depots have increased facilities investment by thirty percent, said Mr. Finkbinder. Depot work forces have declined only six percent since 1986, while industry employment has been slashed by twenty percent over the same period.

When the Air Force considered assembling the F-22 at Warner Robins Air Logistics Center in Georgia, the issue really got Lockheed's attention. Mr. Finkbinder acknowledged that the politics are difficult, as the depots are major employers and have strong congressional support, but he would like to see USAF maintain a very narrowly defined core depot capability.

"There's room to cut the depots in half, maybe more," he said.

AFMC Commander Gen. Ronald W. Yates had a different view. He said that he is a "big fan" of depot competition and that he wants to sustain depot work load by competing for aviation work with the other services.

More Is Up for Grabs

General Yates rejected the notion that the Air Force is taking work from the private sector in an effort to hold on to its own employee force. He pointed out that none of the work put up for grabs had been done by industry before.

"Through depot maintenance competition we have not taken one penny out of the US defense industry," he argued.

He said that he is working hard to provide a level playing field and he is interested in infusing competition into a larger percentage of the depot work load. He pointed out that firms specializing in modifications and repair have done well in the competitions, while the manufacturers of the original equipment have not. Their overheads are too high, said General Yates.

"If they don't fundamentally restructure, they won't be competitive with depots, or with anybody else that does mod and repair," said the General.

By the broadest measure—including supplies, contract services, parts, and real property maintenance—seventy-eight percent of all depot dollars already flow to industry, according to the Air Force. With the force getting smaller, there may indeed be too many depots, said General Yates, "but I think our overcapacity is fifteen to twenty-five percent, not fifty percent."

While most conference participants praised the Air Force's acquisition system as being better than the Navy's or Army's, it is not without problems. The progress of the C-17, for example, has been bumpy enough to threaten the future of the program.

The actual acquisition chain may not be where the fault lies. "We've got good people. The military-industrial complex has the talent to do the job. I submit to you that the problem is that the DoD decision process is broken," said Maj. Gen. Stephen M. McElroy, Program Executive Officer for Conventional Strike Systems.

The Pentagon's demand for data continues unabated. The new cost analysis review required to get through a Defense Acquisition Board gate is incredible, said General McElroy, adding that to get Joint STARS through a recent DAB "we sacrificed at least [an] acre of trees."

Defense Department leadership is constantly applying new rules to old decisions. It relies too much on consensus, but the decisions it does make are far too unstable, General McElroy complained.

Fraud and waste are not rampant, from his point of view. Oversight is. Oversight groups pursue their own special interests with little regard for impact on the program, charged General McElroy.

"We have to put discipline back into the process," he said. ■

Peter Grier is the Washington, D. C., defense correspondent for the Christian Science Monitor *and a regular contributor to* Air Force *Magazine. His most recent article, "Keeping the Missiles Up," appeared in the August 1993 issue.*

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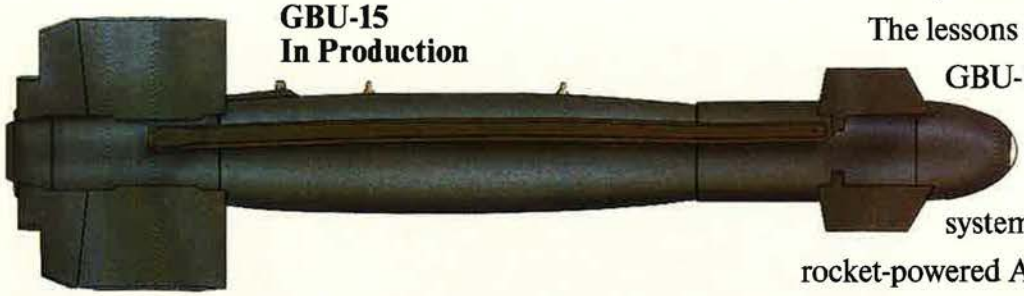

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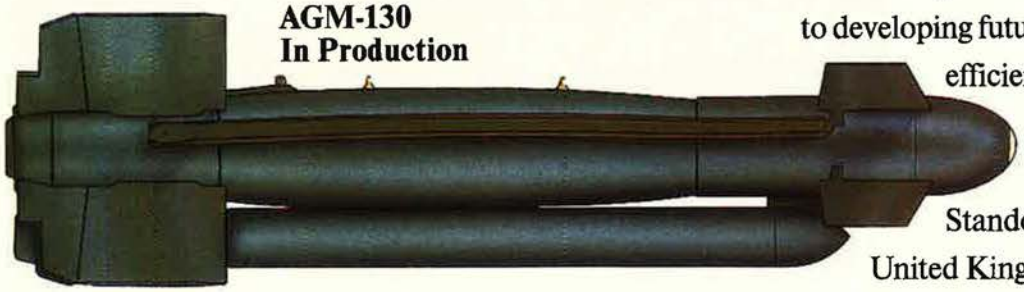

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The A-2 flight jacket, out of the inventory since the Korean War, was reincarnated for a new generation of flight crews.

The Jacket That Lives Forever

By C. V. Glines

Photo courtesy Jeffrey Ethell

The A-2 came to be an aviator's second skin. Above, Capt. Dick Perley stands in front of his P-47,* Kandy K II, *wearing the jacket he wore while flying it in World War II. Opposite is a jacket worn by Flight Officer Edwin M. Fulghum, a radar observer with the 419th Night Fighter Squadron, Thirteenth Air Force, during World War II, featuring the 419th's unofficial insignia, observer wings, and nameplate.

NOBODY who got one had any idea that the nice new leather jacket issued for flying duty during World War II would be a status symbol widely sought and highly valued fifty years later. Sometimes owners kept theirs when they transferred because their names and unit insignias were sewn on them. The jackets were comfortable, yet snug, and never wore out, except maybe around the knitted cuffs and waistband.

Flyers liked them, and many kept them after the war, never dreaming that two later generations would prize them and that a number of companies would sell copies at prices many times their original cost to the government. The A-2 jacket was reborn in 1987 for a new generation of pilots and flight crew members to commemorate the Air Force's fortieth anniversary and to rekindle *esprit de corps*.

The original article, known officially as the Type A-2 Summer Flying Jacket, was made of seal-brown horsehide and lined with light brown spun silk. When issued during World War II, it usually bore a decal of the Army Air Forces patch on the left shoulder; some flyers replaced this with their numbered air force patch sewn on the left shoulder and added an American flag on the right. Many pilots had their rank insignia sewn on the shoulders. Leather name tags were issued to be sewn above the left pocket.

The backs of some jackets sported beautifully painted artwork—a copy of an aircraft's nose art, a squadron slogan, or a picture of some sort. Pilots of the Flying Tigers, the 14th Air Force, and crews flying the Hump in the China-Burma-India (CBI) theater had an "escape flag" or "blood chit"

Jacket courtesy Robert Borrell, Sr., collection. Photo by Paul Kennedy


PETE PULCHUM

sewn on the back, along with US and Chinese Nationalist flags. Markings announced in Chinese that a reward would be paid to anyone who helped a downed American airman return to Allied lines.

"Murder Incorporated"

These decorated jackets did not always help their wearers when shot down. C. G. Sweeting, a former curator at the National Air and Space Museum, writes in *Combat Flying Clothing* that artwork and slogans on the jackets "seemed innocent enough until November 26, 1943, when the crew of a B-17 heading for Bremen was shot down near Eggese, Germany."

"Three of the crewmen were wearing A-2 jackets with 'Murder Incorporated' and the AAF insignia painted on the back," wrote Mr. Sweeting. "The German press carried photographs of

Jacket courtesy Robert Borrell, Sr., collection. Photo by Paul Kennedy

Above is a detail of a jacket from the Korean War. Below right is a 1944 photo of Lt. Phil Savides, looking rakish with his fifty-mission crush hat, turned-up collar, and buildog patch of the 313th Fighter Squadron.

Photo by Paul Kennedy

Photo courtesy Jeffrey Ethell

Lt. Kenneth Williams wearing such a jacket and claimed that the saying was an official slogan carried by all members of bomber squadrons. The Germans declared it was tantamount to a US admission that its air forces deliberately engaged in terror bombing of residential areas. The embarrassment caused the United States by the Nazi propaganda prompted AAF commanders to look for, and eliminate, any similar ill-chosen inscriptions or pictures on jackets and aircraft."

The incident apparently had an impact on Washington. The November 1944 issue of AIR FORCE Magazine reported the following: "Taking note of some of the strange and wonderful designs that have been etched onto field jackets and fatigues, the War Department has directed that the practice be discontinued immediately. Drawings, designs, mottoes, names—they're all out. Only authorized and prescribed decorations may be worn."

There is not much evidence that this edict reached those responsible for the creative pinup artwork on the A-2 jackets in many bomber and fighter units.

Some CBI crew members had problems with the flags sewn to the backs of their jackets. It was reported that a few who landed in Communist Chinese territory with the Nationalist flag emblazoned on their jackets had difficulty explaining their allegiance to the Nationalists. Maj. Gen. Claire L. Chennault and others had their flags sewn on the inside.

The history of the A-2 began with an Air Corps specification and Drawing No. 31-1415, 94-3040 issued in 1930. The jacket was to be "horsehide leather—spun silk lining; full leather collar and interlocking fasteners [zippers] instead of buttons; knitted wool wristlets." The first jacket was wear-tested in September 1930, and production was officially approved May 9, 1931.

Horsehide was specified, probably because horses were readily available in those days, but goatskin from Iran and Afghanistan was used on some jackets during World War II. The lining was originally light brown spun silk but later was made of rayon and cotton. Some fighter units allowed their aces to replace the lining with red silk as an emblem of their elite status.

The two patch pockets in the jacket were not very useful, although they could hold a pack of cigarettes or a small notebook. They were favored by the designers over roomier pockets because, according to clothes designer Bill Dasheff, the brass "didn't want the pilots standing around with their hands stuck in them. They thought it made them look like thugs or truck drivers."

Photo courtesy Jeffrey Ethell

Even though the uncomfortable climate of the China-Burma-India theater allowed for more casual dress, the trusty A-2 was much in evidence. Above are members of Hank Redmond's B-24 crew of the 12th Bomb Group.

"Something Better"

Thousands of the original A-2s were manufactured in the early days of the war, but Gen. Henry H. "Hap" Arnold canceled the order in 1942 because, as one writer says, he wanted "something better" for the thousands of pilots being trained. However, there were so many A-2s in the inventory by then that they were still being issued to pilots during the Korean War. Hundreds were sold later as surplus.

The "something better" that General Arnold wanted became the B-10 jacket, made of moisture-repellent, olive-drab cotton twill, an inner layer of half alpaca and half wool pile, and a fur collar. It retained the patch pockets and knitted cuffs and waistbands. It was warmer than the A-2, but flight crews never considered it as attractive.

Although the A-2 was not issued after the Korean War, it remained a symbol of USAAF's war years in the minds of those who served. It was revived in the 1980s when Project Warrior was established to remind blue-suiters about the fighting heritage of the Air Force and as a retention incentive.

One Project Warrior initiative came from Col. James S. "Stu" Mosbey, then assigned to 9th Air Force headquarters at Shaw AFB, S. C. A friend showed him an A-2 jacket his father had worn during World War II as a P-51 Mustang pilot. On its back was a painting of a Mustang named *Tokyo Express*. To Mosbey, the jacket expressed a sense of union, common interests and responsibilities, and the experiences of thousands of World War II pilots and crew members.

Colonel Mosbey wondered, "Why did the Air Force ever give up the A-2? It's a beautiful jacket that we all ought to be able to wear."

Mosbey approached a number of his fighter pilot friends. If permission were granted, he asked, would they like to buy and wear the A-2? The answer was a thundering "Yes!" Colonel Mosbey and others visited the Air Force Museum, chipped in $20 each, and bought an A-2 in the gift shop. As a group, they presented the jacket to Lt. Gen. William L. Kirk, commander of 9th Air Force, and made their pitch to be allowed to purchase the jacket with their own money and wear it as a symbol of Air Force heritage and *esprit de corps* among fighter pilots.

General Kirk agreed to the idea and took it "upstairs" to Gen. Robert D. Russ, commander of Tactical Air Command. General Russ authorized

Photo by Paul Kennedy

A detail of a current A-2 shows a patch from Air Combat Command. Unlike the early horsehide models of the 1930s and 1940s, today's jackets are made from goatskin imported from Nigeria, Tasmania, and Pakistan.

Mosbey and a team of pilots to visit other TAC bases with 600 questionnaires for pilots, hoping to gauge their enthusiasm. Ninety-five percent said they would wear the A-2. General Russ approved the jacket revival but thought it should be an item of government issue.

Photo courtesy Jeffrey Ethell

The A-2's water-repellent nature is demonstrated by the traditional dunking of this flyer following his last mission over Germany in World War II. The revival of the jacket was intended to foster such camaraderie.

The Obvious Choice

Col. Schumbert C. "Hoss" Jones, a former Thunderbird pilot assigned to TAC headquarters, was appointed project officer. He studied the regulations and researched the procurement sources. He found there were about a dozen kinds of flight jackets available, including Navy types, but "it always came back to the famous A-2" as the desired choice.

"Although it was intended originally only for TAC pilots," according to Colonel Jones, "the jacket idea quickly blossomed into an Air Force–wide project as other commands became involved." Gen. John T. Chain, Jr., commander of Strategic Air Command, "was very much in favor of his pilots also wearing the A-2," said Colonel Jones. "Other major commanders wanted their combat-ready pilots to be included."

As a result, the revival of the A-2 jacket took on a special status as a visible symbol of the modern Air Force pilot. According to one internal paper, the rationale given as the idea climbed upward in command channels was that combat-ready aircrews were "not adequately recognized and that reinstatement of the distinctive aviators' jacket would be a significant help." The Air Force estimated that the initial expense to outfit the operational forces would be less than $5 million.

Briefings were prepared as the idea gained momentum. A new regulation in 1987 permitting the wearing of A-2 flight jackets would commemorate the fortieth anniversary of the Air Force. The jackets would acknowledge outwardly the "fly and fight" mission of the Air Force and recognize "first-line" active-duty, Guard, and Reserve men and women. Jackets would be issued on a one-time basis only to combat-ready flyers (officers and enlisted) assigned to front-line units.

The defense budget included a line item for the jackets, but some on Capitol Hill thought the idea frivolous and too expensive. Nevertheless, although a number of Air Force programs sustained deep cuts, the jackets stayed in the budget after hard lobbying by those in and out of uniform who believed in their value.

Maj. Mitch Driggers, a navigator in charge of the clothing division in the Pentagon, was assigned to get the jackets back into the Air Force flight clothing inventory. As quoted in *Hell Bent for Leather* by Derek Nelson and Dave Parsons, a book about the A-2 and Navy G-1 jackets, Major Driggers did not find the job easy.

"The deeper I dug, I found out that there were no patterns," he said. "In the old days, a series of drawings [was] done, and then they figured out the general dimensions."

Photo by Paul Kennedy

This jacket belonging to the author retains vestiges of the Army Air Forces decal that came with the jacket originally. Some flyers replaced this decal with their numbered air force patch and added rank insignia.

Faraway Sources

Major Driggers received from the Air Force Museum an A-2 jacket made in 1936. He found two manufacturers (Avirex and Willis & Geiger) that were still making them because of public demand. When the contract notice was issued, ten other manufacturers sent in bids. The contract was won by the Cooper Sportswear Manu-

facturing Co. of Newark, N. J., which opted to make the jackets out of goatskin instead of horsehide. The manufacturer had to obtain goatskin from Nigeria, Tasmania, and Pakistan because no source in the US was large enough.

The Air Force chose December 31, 1987, as the deadline for awarding a contract. Specifications were issued, and the procurement process began. The initial contract was for 53,000 seal-brown goatskin "traditional" USAAF A-2 jackets, to be delivered at a rate of 5,000 jackets per month. They would be worn with a leather name tag embossed with name, rank, wings, and "USAF" in silver on brown leather and would bear a major command patch. The first jackets were delivered in May 1988.

According to the current regulation, the jackets will be issued only to officers or enlisted personnel who are in mission-ready, emergency-mission-ready, mission capable, or mission-support billets assigned at or below wing level who met the criteria on or after September 18, 1987, the Air Force's fortieth birthday. "Once a member is issued the jacket," according to the regulation, "he or she may continue to wear it after being reassigned from the duties [that] originally qualified him or her for the issue." It can be worn "with the flight suit, service uniform, or pullover sweater" but not with civilian clothes. After he or she retires, the wearer may keep the jacket.

Jacket courtesy Robert Borrell, Sr., collection. Photo by Paul Kennedy

Photo by Paul Kennedy

Photo courtesy Jeffrey Ethell

Many flyers personalized their jackets with patches, insignia, or original artwork, as on the Korean War jacket above. Below right, Albert T. Keeler proudly displays symbols commemorating his twenty-eight missions flown in World War II.

There are many so-called "authentic" or "original" A-2 reproductions on the civilian market today, but only two or three seem to come close to the original. They range in price from about $150 for a "bootleg" version that is far from the original in color and style to more than $800 for one that can be custom-made. Who's wearing the A-2s? Everyone from toddlers (at least one manufacturer makes miniatures) and teenagers to "old gentlemen" in their sixties and seventies, according to a Washington, D. C., shop owner.

"Authentic jackets have become increasingly valuable, and the trend shows no signs of leveling off," wrote Nelson and Parsons. "As a result, old A-2s are increasingly scarce. This volatile market has attracted thieves and even forgers. Chicanery is common, and caveat emptor is the rule." ■

C. V. Glines is a free-lance writer in the Washington, D. C., area. His most recent article for AIR FORCE *Magazine was "The Real John Birch" in the February 1993 issue.*

Some crews came to this year's airlift and tanker competition fresh from action in Bosnia and Somalia.

RODEO

By Frank Oliveri, Associate Editor

FOR FIVE hot midsummer days, dozens of mammoth airlifters and refuelers jammed the flight line at Little Rock AFB, Ark., like so many whales jostling each other at sea. It was Rodeo '93, the twentieth edition of Air Mobility Command's premier competition, but this one was a bit different.

Rodeo showcases airdrops and air refueling. It also tests the maintainers, combat control teams, and security police.

However, some of the usual competitive exuberance was missing, partly because most participants had recently engaged in the real thing. They had flown night missions to air-drop food and medicine to besieged Muslims in Bosnia. They had taken fire in Sarajevo. They had touched down in stricken Somalia and supported US forces in the Gulf War. No mere competition could excite them too much.

Exemplifying the prevailing spirit was TSgt. Rick Gehris, a loadmaster of the 435th Airlift Wing, Rhein-Main AB, Germany, and a veteran of combat missions all over the world. He took time out to describe one of his recent, real-world jobs.

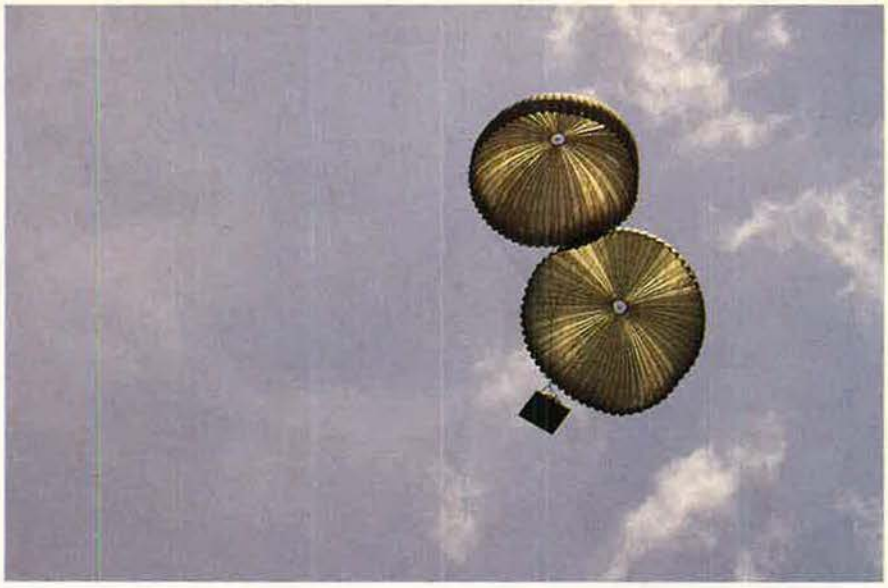
"The mission was to deliver twelve containers of MREs [meals, ready-to-eat] to a drop zone in Bosnia," he said. "It had a 'pucker factor' to it. I flew in the war and during the Kurdish problems, but there wasn't the real threat that we had on this mission.

"The biggest threat was not knowing what [Serbian gunners] had. They had small arms and AAA, but we didn't know if they would fire. It's a pretty vulnerable feeling [even with USAF fighters nearby]. The reaction time to intercept . . . who knows? Someone could get a missile off. We would never know what hit us. You have some pretty intense feelings."

He added, "This [the competition] is a break for me."

Even so, there was a serious purpose. "This competition allows us to identify our top crews," said Gen. Ronald R. Fogleman, AMC commander and head of US Transportation Command. "[It] allows us to bring our top crews together in one place where they can exchange information, get to know one another, and, in the end, strengthen the whole air mobility system. It gives us a chance to not only evaluate procedures, but listen to people to see if they have better ideas of how to do things. We discover those better ideas."

Staff photos by Guy Aceto



Here (and on previous pages), a C-130 Hercules performs one of its primary missions—air-dropping equipment from 500 feet. The Hercules has competed at Rodeo since the competition's inception in 1962.

AFRES Wins Again

Rodeo featured sixty-two teams representing the active-duty Air Force, Air Force Reserve, Air National Guard, US Marine Corps, and ten foreign air forces. Sixty-eight aircraft, 1,500 competitors, and 300 staffers took part. For the second straight year, top honors went to an AFRES unit. The 440th Airlift Wing from General Mitchell International Airport/ARS, Wis., won the Gen. William G. Moore, Jr., Award as the Best Air Mobility Wing. Last year, the 446th AW (AFRES) from McChord AFB, Wash., took first.

Brig. Gen. Bobbie L. Mitchell, who was in charge of the event, said Rodeo is nothing more than training. "The benefits of the training are that it brings all of our forces together—much as we do in our joint exercises."

Rodeo stresses realism. Much of what the contest aircrews and ground crews do on a daily basis is included in the competition. General Mitchell said that they must perform their tasks precisely. If they don't, "the consequences can be pretty drastic," he said.

Just getting to Rodeo is tough. Many of the teams had to compete as part of their regular training cycle at their own wings. The contest thus brought together the best crews from throughout the active-duty Air Force and highly experienced crews from the Reserve and the Air National Guard.

Capt. Bob Hamilton, a KC-135 instructor pilot from the 19th Air Refueling Wing at Robins AFB, Ga., said, "What we've learned is very valuable. . . . We can carry this information back and teach. We're instructors, . . . but this has furthered my experience tremendously."

In Rodeo '93, C-5s took part for the first time. The experience tracked with what C-5 crews do most of the time. "Aerial refueling?" said Capt. Joe Herron, a C-5 pilot from the 60th AW, Travis AFB, Calif. "We've been doing that, in relief efforts in Somalia. The 'engines-running' stop? That's something that we're using at our relief efforts at Homestead [the Florida base devastated by Hurricane Andrew]. So everything that we do here actually takes place" in operations.

Captain Herron said that, because wing cracking has compelled the Air Force to restrict the use of C-141 transports, the C-5 is being used in ways never envisioned. For example, the C-5 is now landing in airports far smaller than it had in the past. Captain Herron said, however, that the C-5 still requires a 6,000-foot runway.

"They're starting to see the capabilities of the C-5 and the amount of cargo we can carry," said the Captain. "As the -141s are getting more and more restrictions, we are definitely getting more tasking. We're flying missions now that we wouldn't have touched before."

Hitting Checkpoints

One of Rodeo's great challenges falls on the navigators. Precise timing and the ability to hit checkpoints are essential in this competition. This posed a particular problem for C-5 crews.

"They're talking about seconds," said Capt. Paul Guemmer, a C-5 pilot of the 60th AW. "It's not something we routinely plan. . . . If we're within ten minutes [on a regular mission], we're happy. This is a challenge for us. It gives us a little more airmanship. . . . Timing is everything. A C-5 would tie up some of these ramps, so we have to clear out quickly."

Airlifters and tankers from around the world, such as this C-130 from the 435th Airlift Wing, Rhein-Main AB, Germany, take part in Rodeo. In the background is a representative of the Israeli Air Force.

The Engine-Running Onload/Offload (above) is just one of the many events that test ground crews' abilities in day-to-day operations. Speed, strength, physical endurance, and mental resolve are prerequisites for the competition.

Aircrews were scored on their arrival times at Rodeo. Many crews arrived with their aircraft at "zero time" (a perfect score), while others landed one or two seconds early or late.

This is considered a remarkable achievement, given that pilots usually flew the final twenty seconds almost purely on instinct and "feel" for the upcoming landing time. They have to gauge their speed and altitude in those last seconds so that the wheels touch ground at the precise instant.

"When they arrive here, they are arriving at a precise time," General Mitchell said. "Every second you're late, you lose four points. In combat, you're flying a bunch of planes into a drop zone for safety reasons—because of the ground threat, which may be AAA, SAMs, or whatever. You don't want a bunch of airplanes lined up on the same path going across the drop zone. The first one will get through, but the second will probably get his tail shot off. So you want to come in from different directions and different angles."

The refueling mission also requires great precision. Aircraft must arrive at the rendezvous with the tanker at a specific air refueling control point. The tanker must dispense 10,000 pounds of fuel in twenty-five minutes.

Maj. Philip Pierce, a C-141 pilot from the 907th Airlift Group (AFRES) at Wright-Patterson AFB, Ohio, said, "There's very little margin for error. There is a definite comparison between this and combat. . . . You're measuring things in not minutes or hours, but seconds. With everything we've done, we worked with a stopwatch—to the second."

Staff photos by Guy Aceto

Capt. Tom Gomez, a copilot from the same unit, said this kind of precision is required operationally. "We have to be at a point at a certain time to get gas from the tanker," he said. "You have to land on time at a certain base around the world. We do that normally."

The mobility mission is becoming more challenging—the result of late-night departures, long days, double air refuelings, and little downtime. For example, Major Pierce's C-141 unit flies about 250 hours a month. In Somalia in December, he and his crew pulled three twenty-four-hour days during their first five.

Just Like Columbus

For the KC-135, a challenging mission is flying a celestial navigation route lasting an hour and a half. Capt. Doug Johnston, a KC-135 navigator from the 19th ARW, said the crew member navigates with reference to the sun and the horizon to determine the aircraft's position over the globe. The navigator must use a sextant. Though today's instrument is much more complex, "it has much the same performance . . . as what Columbus and Magellan used," Captain Johnston said. "It's pretty much unchanged, except the map has gotten much more precise. We took a heading shot and a celestial shot every two minutes for an hour and a half with the sextant."

Captain Hamilton said the meet strongly emphasizes navigation because that is where the greatest potential for problems lies. "As tanker guys, refueling is our business," he said. "Unless something strange happens, we're pretty much ready to do it at any time. Navigation is what will set people apart."

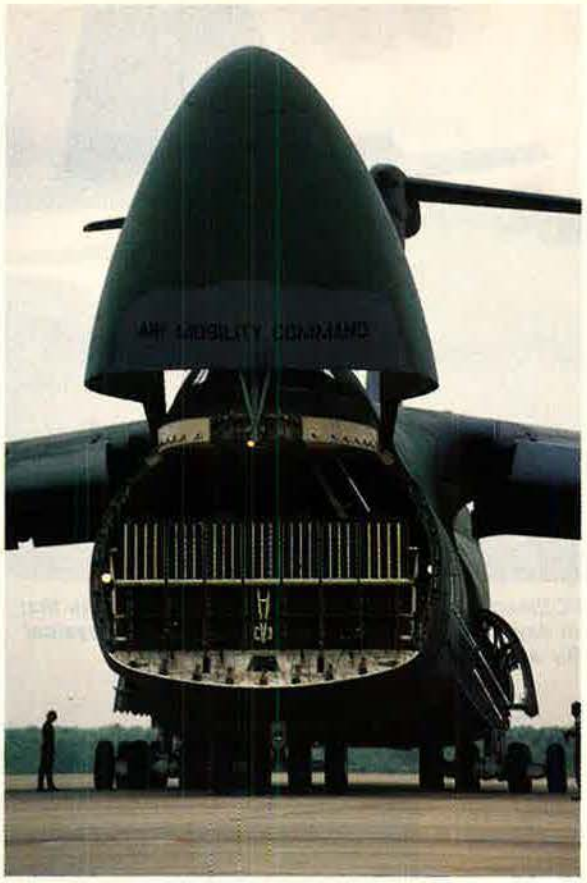
Airlift competitors were required to air-drop personnel from 800 feet and equipment from 500 feet, one of the primary missions of the C-130 and C-141. Capt. John Gordy, a C-130 navigator from the 3d Wing, Elmen-

dorf AFB, Alaska, said that the judges scored his crew on performance in six turning points on the heavy equipment airdrop.

Typically the route would be drawn by the planning staff. In the competition, however, the crews had to draw up their own routes, find headings, make their own times, and find the drop zones. "It's excellent training for us," Captain Gordy said. "There are unfamiliar routes, unfamiliar drop zones. It's a lot different from Alaska. You don't have as many roads and houses to look at up there."

The plight of the C-141 was on a lot of people's minds at Rodeo. Operating under flying restrictions, C-141s had to airdrop from 1,000 feet. Despite the restrictions, flyers seem enamored of the old bird. Major Pierce said, "I still feel real good about the airplane. I've been flying the airplane for about twelve years, and I really hope we can work through the improvements for it. . . . I think we need the flexibility provided by that airplane."

Gen. Merrill A. McPeak, USAF Chief of Staff, flew the Air Force's first C-17 transport to Little Rock to



Staff photo by Guy Aceto

The C-5 Galaxy made its Rodeo debut in 1993. Restrictions on the C-141 StarLifter have forced C-5s to demonstrate previously unseen versatility. Galaxys now perform tasks that would have been unthinkable only a few years ago.

Rodeo Winners

Competition	Unit	Base
Best Air Mobility Wing, C-130 Wing, Airdrop Wing, C-130 Aircrew, C-130 Airdrop Crew	440th Airlift Wing	General Mitchell International Airport/ARS, Wis.
Best Tanker Wing, KC-135 Wing, KC-135 Aircrew, KC-135 Maintenance, KC-135 SIOP Team, KC-135 Aerial Refueling Crew, KC-135 Preflight Inspection	305th Air Refueling Wing	Grissom AFB, Ind.
Best Aerial Refueling Team	9th Wing	Beale AFB, Calif.
Best Aerial Refueling Team, C-141 Aerial Refueling Crew, C-5 Engine-Running Onload/Offload	60th AW	Travis AFB, Calif.
Best International Wing	Portugal	
Best KC-10 Group, KC-10 Aircrew, KC-10 Aerial Refueling Crew, KC-10 Postflight Inspection	458th Operations Group	Barksdale AFB, La.
Best C-141 Wing, C-141 Aircrew, C-141 Maintenance, C-141 Airdrop Crew, C-141 Preflight Inspection	446th AW	McChord AFB, Wash.
Best C-5 Wing, C-5 Aircrew, C-5 Maintenance, C-5 Aerial Refueling Crew, C-5 Postflight Inspection, C-5 Preflight Inspection	436th AW	Dover AFB, Del.
Best KC-10 Maintenance, KC-10 Preflight Inspection	4th Wing	Seymour Johnson AFB, N. C.
Best C-130 Maintenance, Aerial Port Team, C-130 Shortfield Landing Crew	United Kingdom	
Best Combat Control Team	317th AW	Pope AFB, N. C.
Best Security Police Team, Combat Control Team Leadership Course, Aerial Port Combat Endurance Course Team, Security Police Combat Endurance	314th AW	Little Rock AFB, Ark.
Best KC-135 Aircraft Navigation Crew	96th Wing	Dyess AFB, Tex.
Best KC-10 Cargo Loading Team, KC-10 Postflight Inspection, Security Police Combat Tactics	22d ARW	March AFB, Calif.
Best KC-135 Postflight Inspection	19th ARW	Robins AFB, Ga.
Best C-141 Postflight Inspection, Combat Control Team Biathlon	62d AW	McChord AFB, Wash.
Best C-130 Postflight Inspection	Italy	
Best C-130 Preflight Inspection	Israel	
Night Tactical Overland Infiltration Award, HALO Parachute LZ Establishment	435th AW	Rhein-Main AB, Germany
Best C-141 Engine-Running Onload/Offload	514th AW	McGuire AFB, N. J.
Best C-130 Engine-Running Onload/Offload, Joint Airdrop Inspection Team	Japan	
Best Security Police Combat Patrol	439th AW	Westover AFB, Mass.
Best Security Police Combat Marksmanship	100th ARW	RAF Mildenhall, UK

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The F-22 program is on track–which means American air superiority will exist tomorrow and well into the future.

give participants a firsthand look at the Air Force's transport of the future. It is slated to replace the C-141.

Free Fall

Back on the ground, the combat control teams and Security Police were put through their paces in a separate part of Rodeo. The Arkansas heat and humidity sorely tested the airmen's physical strength and mental resolve.

Combat controllers parachuted from 6,000 to 10,000 feet, fell to 3,500 feet, and then popped open their chutes. Once on the ground, they established a mock landing zone, set up communications, and were put through grueling tests of fitness, marksmanship, and land navigation skills. Combat controllers also took part in the nighttime overland infiltration games, which test a team's ability to make a rendezvous at night and secure a helicopter landing zone while under fire from snipers using M-16s equipped with harmless laser scoring devices. Security Police took part in a similar course called the combat patrol. Those who participated on the two courses found them particularly tough and realistic.

The combat control supervisor, CMSgt. "Doc" Strange, said that the training for this event ties in directly to the standard "mission-essential" task list from which teams take their basic routine daily. "We see every team from all over the world," Chief Strange said. "You see their tactics, their techniques, and their equipment. We're way in front of them in equipment for sure, but the French team won last year, so sometimes technique overcomes equipment."

Staff photos by Guy Aceto

Air Combat Command KC-10s, such as this one from the 4th Wing, Seymour Johnson AFB, N. C., took part in the competition. The 4th Wing captured both the Best KC-10 Maintenance and Best KC-10 Preflight Inspection honors.

For combat controllers, demonstrating their capabilities appears paramount. Their job is not well known, and the Air Force has had trouble filling their ranks with the type of personnel needed for such a demanding job. Young recruits seeking the rigors of elite combat units often will join a special operations forces unit in the Army or Navy because they are unaware of the opportunities available in the Air Force.

"I'm sixty percent manned across the board," said Chief Strange. "People don't meet the standard. I have a training personnel requirement of 100 a year. I think we put out eighteen guys. The year before that was twenty-four. The primary mission is air traffic control. It's not too tough to train people to do that. It's the jumping, swimming, and scuba."

He said that many new recruits don't realize they can have what is offered to Special Forces and SEALs and still maintain the Air Force quality of life. "We know we have the best quality of life," Chief Strange said. "We just need to get the word out."

Rodeo keeps maintenance crews hopping. There is little chance for rest in the heat of the flight line.

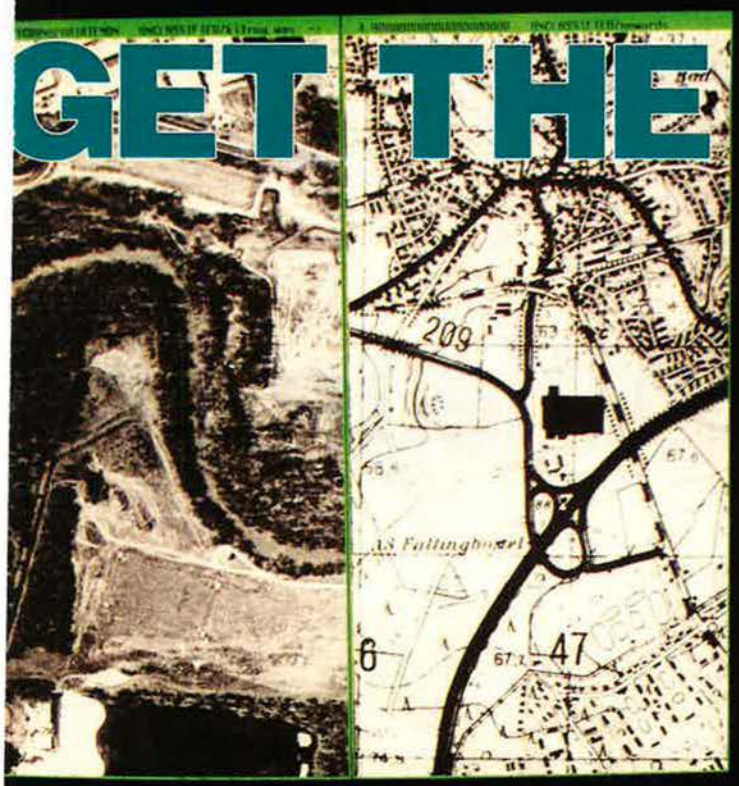
Aircraft are immaculate, and the maintainers, ever conscious of safety, are constantly watching for potential problems. They are graded on pre- and postflight inspections, in addition to fuel service operations.

CMSgt. John F. Gaul, Jr., of the 916th Air Refueling Group (AFRES) at Seymour Johnson AFB, N. C., said life on the Rodeo line was pretty much business as usual. Although he learned that he was taking a certain KC-10 only two days before the competition, it proved to be spotless, like new. He said the aircraft was maintained like that day in and day out.

"It's always like this," he said. ■

Not all Rodeo events are contested in the air. These Security Policemen from the 315th AW from Charleston AFB, S. C., competed in grueling tests of fitness, marksmanship, and land navigation skills.

GET THE PICTURE



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Excerpt from "Conduct of the Persian Gulf Conflict," an interim report to Congress, July, 1991.

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Violence is raging again in a vast, dirt-poor region that is among the oldest crisis zones on Earth.

The Battleground

# of Central Asia

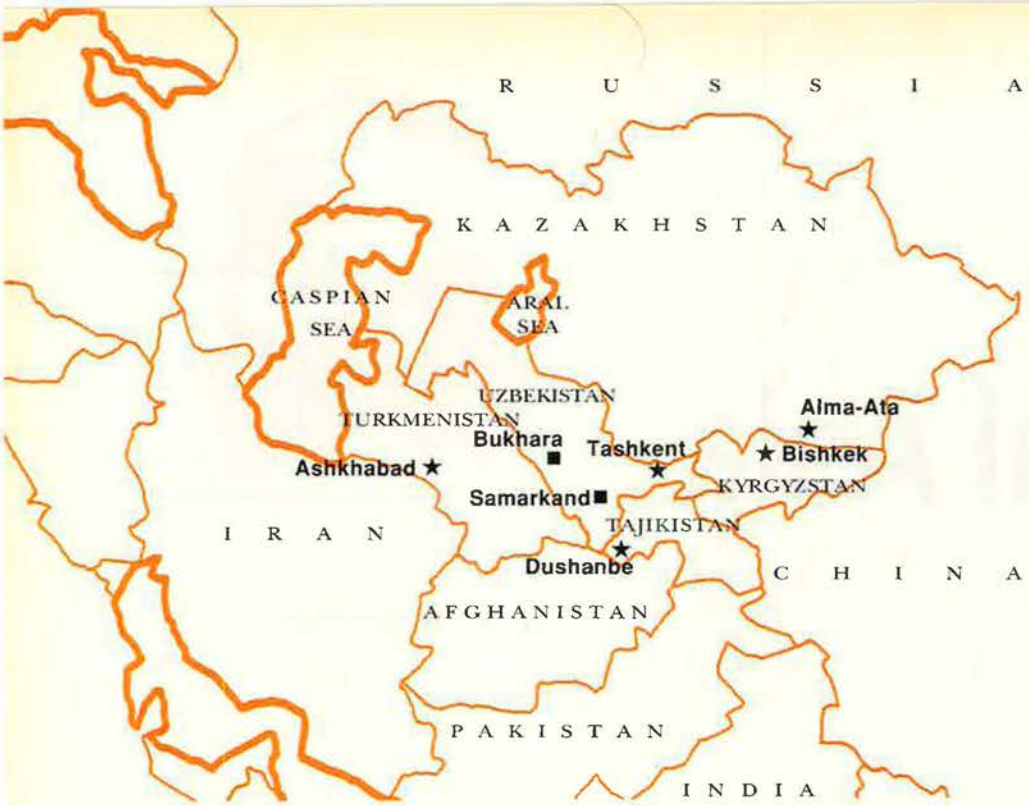
By Richard Mackenzie

JUST AS local Russian officers had long predicted, irregular Muslim troops finally attacked from the south in force. Four rebel units, each numbering 400 fighters, struck from the mountainous badlands of northern Afghanistan, where they had trained all winter, and tried to shoot their way into equally lawless Tajikistan.

The Islamic fighters were determined to take part in the Communist-vs.-Muslim civil war that was swallowing up the ex-Soviet central Asian republic. The snows had not melted, but weather did not hinder the attack. Only the Russians could do that. The Russian guards, sent to fortify Tajikistan's border against such incursions, drove many rebels away. Even so, battles raged more than a week later, leaving many Russians dead.

That's the way things are now in central Asia, the world's newest political grouping but one of its oldest crisis zones. The war shaking Tajikistan was the worst, but not the only, disturbance afflicting this vast, landlocked territory comprising the five predominantly Muslim republics of the old Soviet empire. In addition to Tajikistan, the states are Kazakhstan, Uzbekistan, Turkmenistan, and Kyrgyzstan.

To varying degrees, all face privation, rising political strife, and violence. In March, for example, two powerful Tajik militia warlords and fifteen bodyguards were killed in a shoot-out, which led to the mobilization of all available Tajik security



forces, a nationwide curfew, and a crackdown by the Tajik Interior Ministry, formerly a department of the Soviet KGB.

To most Westerners, central Asia is terra incognita—impenetrable, remote, and unimportant. That outlook is about to change. Within central Asia's boundaries lies an explosive mix of great mineral wealth, ethnic war, and long-range nuclear weapons (beached in Kazakhstan when the Soviet Union dissolved). Together, the five nations have a population of more than fifty million.

Central Asians live in a tough neighborhood, surrounded by some of the largest, most aggressive, heavily armed, and unstable nations anywhere. Russia lies to the north. On the southern rim, one finds Iran, Afghanistan, Pakistan, and India. To the east is China, and to the west, Turkey, Iraq, and the lands of the former Soviet Transcaucasus. All consider themselves to have vital interests in the region. The potential for large and medium-size powers to become entangled in central Asia is great.

The Russian Contingent

Russia is deeply engaged in the struggle for influence in the newly emerging central Asian nations and keeps a contingent of troops there. Indeed, the only stabilizing force in Tajikistan, say observers in the area, is Russia's 201st Motorized Infantry Division, whose troops have constantly been used to mount counterattacks against the rebels and to guard key buildings in Dushanbe, Tajikistan's capital.

Russian troops are unhappy about having to fight again in the central Asian mountains only four years after the end of the disastrous war in Afghanistan, where the Red Army learned to its grief that it was ill-equipped for combat in such terrain. They cannot do much about it. The commander of the 201st's tank unit, Lt. Col. Grigory Dyomin, sees no immediate way out. "I think we'll be here for a long time," he said.

Western experts see Tajikistan, with its ancient clan conflicts, as a keg of gunpowder that could explode at any time. "There is a general insecurity all over the country, and fear is widespread at all levels of society," said Liviu Bota, head of the United Nations office in Dushanbe. Human rights, she said with considerable understatement, "are being violated on a scale that should be considered unacceptable."

Tajikistan's Prime Minister Abdul Malik Abdulajanov said not long ago that 20,000 people had already been killed and 10,000 were missing in a bloody war between his pro-Communist government and Islamic rebels in his nation. As many as 60,000 fled as refugees to Afghanistan; hundreds drowned as they tried to cross the Amu Darya River. Entire villages have been burned.

The Prime Minister's estimates are almost certainly far too low. The International Institute for Strategic Studies, for example, reckoned that, in the first four months of fighting, the war brought the deaths of 40,000 to 60,000 people, created 600,000 refugees, destroyed 150,000 houses, and cost the economy around 200 billion rubles.

Experts foresee years of inflation, unemployment, and social inequities for central Asia as entrenched bureaucrats continue to fight change.

"Having risen from the rubble of the Soviet collapse, central Asia is emerging for the first time as an independent participant in world politics," say Rajan Menon and Henri J. Barkey, authors of *The Transformation of Central Asia*. They warn that the region "is virtually certain to face a prolonged period of instability."

Even outside Tajikistan, developments in central Asia give scant cause for optimism:

- Uzbekistan, rich in natural resources, has accused Pakistan of supporting domestic Islamic rebels. Hardline Uzbek President Islam Karimov has vowed to stop Islamic fundamentalism from taking root in his country. He mixes authoritarian politics with snail's-pace economic reform to try to avoid the kind of economic travail found in Russia. President Karimov wants to limit social dislocation and insulate his country from the instability spreading from conflicts in Tajikistan and Afghanistan.
- Turkmenistan, with huge supplies of oil and natural gas and foreign exchange reserves of $1 billion, is viewed by some as another Kuwait—small, wealthy, and vulnerable. The riches are grand enough for a top government official to boast, "We will have a Mercedes for every family."
- Kyrgyzstan has been proposed as a center of what some call "narco-agriculture." A group of local academics and businessmen, respected citizens all, recently suggested large-scale cultivation of the opium poppy as an easy way to solve that country's grave economic crisis. The land could produce 100 tons of raw opium a year, worth $1 billion, the proponents said. President Askar Akayev scotched the idea, at least for the moment. Kyrgyzstan has pursued a rapid pace of reform and permits a free press and political opposition to flourish.

■ Kazakhstan has 104 giant, ten-warhead SS-18 ICBMs and forty long-range bombers, weapons equipped with a total of more than 1,300 nuclear warheads. All became Kazakh property when the Soviet Union broke up in late 1991. Kazakhstan has signed the Lisbon accords, under which it, Ukraine, and Belarus agreed to abide by START I Treaty provisions, dismantle or remove the nuclear arms on their territory, and declare themselves nonnuclear states.

"Divide, Westernize, Russify"

While doing research in central Asia in 1991, journalist James Rupert witnessed firsthand the collapse of the Soviet system, predicting at the time that the region would go through a struggle more profound than that of eastern Europe. He put the problem succinctly.

"The steppes, mountains, and deserts of this region between the Caspian Sea and China are steeped in an ancient Islamic culture from historic tides of conquest by Turks, Persians, Arabs, and Mongols," Mr. Rupert wrote, "but for seven decades, the Soviet system worked to divide, westernize, and Russify the cultural identity of central Asia."

The result was often an identity crisis that has only intensified since the USSR collapsed and new nations began to define themselves. Traditionally dominant powers in the area are contending with newcomers for influence in central Asia. Turkey and Iran, old hands on the scene, are contending with new players, such as India, Pakistan, and even the fundamentalist forces in Afghanistan. All this is occurring for the first time since the Russian Empire conquered the area in the nineteenth century, says Mr. Menon, who adds, "This creates the potential for sharp competition."

Aside from having to cope with external pressures and intrigues, central Asian governments are frequently at odds with each other. At a January summit, the five nations pledged to cooperate in building a common economic market. Relations were complicated when Kyrgyzstan issued a new currency, the som, to replace the Russian ruble still used by its neighbors. On May 24, Uzbekistan's President Karimov accused Kyrgyzstan's President Akayev of trying to engage in political subversion.

Uzbekistan cut telephone, road, and air links with Kyrgyzstan and reduced Uzbek gas exports. These sanctions were soon lifted, but an embargo on grain to Kyrgyzstan by Kazakhstan is still in force. Both countries say they will not accept the som as payment for exports and have demanded hard currency.

Other sources of animosity exist. Some 800,000 ethnic Uzbeks live in southern Kyrgyzstan, and a clause in Uzbekistan's constitution, which President Karimov pointedly cited, states that Uzbekistan is responsible for the safety of Uzbeks living abroad. Apparently he is asserting a right to intervene or take other steps on their behalf if and when they are threatened.

Ethnic conflict among the central Asian states is at the root of many problems. The biggest conflict, between Uzbekistan and Tajikistan, goes back to 1924, when two centers of Persian culture, Samarkand and Bukhara, were included in Turkic Uzbekistan, not Persian Tajikistan.

In addition, nine million ethnic Russians live in central Asia. Having been there for generations, clinging to their native language, they now are disdained as outsiders. No Moscow government can afford to ignore their welfare, but with economic conditions as they are back in Russia, the expatriates are not planning to go home any time soon.

India on the Make

A recent visit by Indian Prime Minister P. V. Rao to Tashkent, capital of Uzbekistan, was an indication of the importance that India attaches to central Asia. Many diplomatic observers have noted the vigor of India's effort to cultivate ties in the region.

India has been especially keen to build relations with Uzbekistan (which, with twenty-two million people, is the most populous nation in central Asia) and to try to counterbalance the strong ties between Tashkent and India's rivals, China and Pakistan. India has pledged $10 million worth of export credits to help Indian companies export to Uzbekistan. It also has promised to finance a project to enable television viewers in Tashkent to receive ninety minutes of Indian programming every day.

India is troubled by Pakistan's evolving relations with central Asian states, which New Delhi believes may give Pakistan new ideological and political depth in its face-off with India. That development would make the current standoff on the subcontinent even more dangerous than it is today.

Though the potential for big-power competition exists, the biggest race so far has been between two medium-size "regional influentials"—secular Turkey and Islamic Iran. Each offers distinctly different political models. Iran's President Hashemi Rafsanjani and Turkey's President Suleyman Demirel have run frequent diplomatic missions throughout the area. In this, Turkey probably has the upper hand.

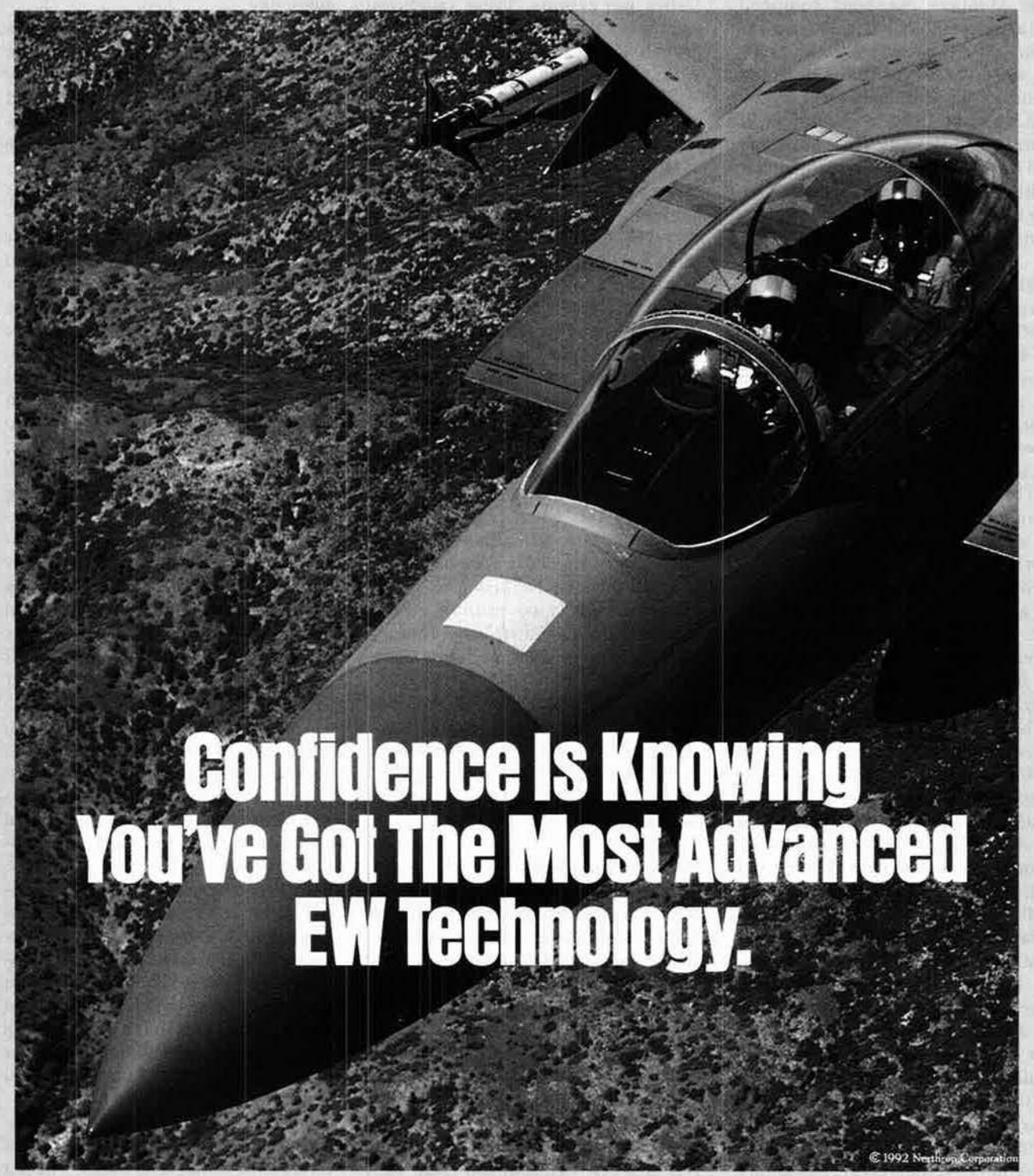
The most worrisome problem for Washington is the spread of conventional and nuclear systems and technology from central Asia to the outside world. As the local economies struggle, unemployment rises, and hard currency to pay for vital imports grows scarce, central Asian leaders will search for ways to appease popular discontent, Mr. Menon says.

"In these circumstances," he adds, "they may view the sale of arms, nuclear material, and nuclear technology as means to retain jobs in military industries and as a source of hard currency to pay for food and consumer goods."

Military industries abound in central Asia, especially in Kazakhstan. There is a uranium-processing complex, with the main facility at Chalovsk, Tajikistan. There are uranium mines and factories in Kazakhstan and Uzbekistan. US officials express deep concern about possible sales of arms or technology to Iran, Pakistan, Libya, or Syria.

For this reason alone, events in central Asia could have dramatic effects on regional strategic balances, whether between India and Pakistan or between Iran and Saudi Arabia in the Middle East. Those shifts, in turn, will increasingly engage the attention of the United States. ■

Richard Mackenzie, editor in chief of Global News Service, was a war correspondent in Afghanistan in 1987–92 and in the 1991 Persian Gulf War. His most recent article for Air Force *Magazine was "Nuclear Standoff on the Subcontinent" in the March 1993 issue.*



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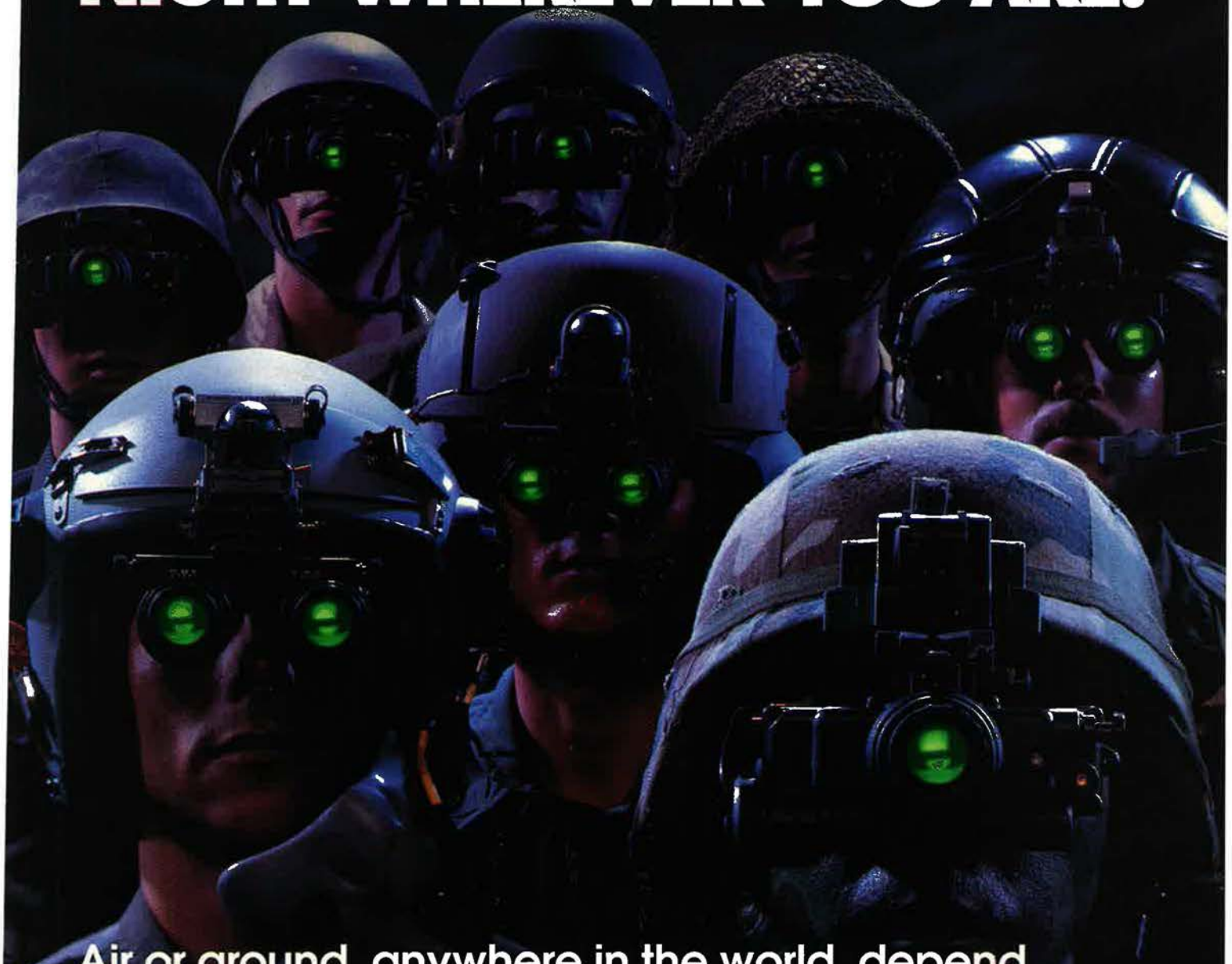

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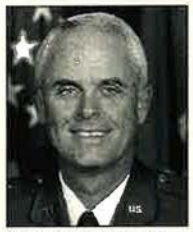

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Program Executive Officer Conventional Strike Systems
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Program Executive Officer Information Systems
John Gilligan
Washington, D. C.

Program Executive Officer Space Systems
Maj. Gen. Garry A. Schnelzer
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Tyndall AFB, Fla.

8th Air Force
Lt. Gen. Stephen B. Croker
Barksdale AFB, La.

9th Air Force
Lt. Gen. Michael A. Nelson
Shaw AFB, S. C.

12th Air Force
Lt. Gen. James L. Jamerson
Davis-Monthan AFB, Ariz.

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19th Air Force
Maj. Gen. Everett H. Pratt, Jr.
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USAF Recruiting Service
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Randolph AFB, Tex.

Wilford Hall USAF Medical Center (59th Medical Wing)
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Lackland AFB, Tex.

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Commander
Maj. Gen. Kenneth A. Minihan

Air Force Electronic Warfare Center
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Kelly AFB, Tex.

Air Force Cryptologic Support Center
Col. James M. Jackson III
Kelly AFB, Tex.

Foreign Aerospace Science and Technology Center
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Wright-Patterson AFB, Ohio

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Col. William E. Hall, Jr.
Ramstein AB, Germany

692d Intelligence Wing
Col. Michael A. McFarland
Hickam AFB, Hawaii

693d Intelligence Wing
Col. James R. O'Brien, Jr.
Kelly AFB, Tex.

694th Intelligence Wing
Col. Jon M. Swanson
Fort Meade, Md.

696th Intelligence Group
Col. Clarence L. Fairbrother
Andrews AFB, Md.

Air Force Materiel Command
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Commander
Gen. Ronald W. Yates

Aeronautical Systems Center
Lt. Gen. James A. Fain, Jr.
Wright-Patterson AFB, Ohio

Electronic Systems Center
Lt. Gen. Gordon E. Fornell
Hanscom AFB, Mass.

Human Systems Center
Brig. Gen. (Maj. Gen. selectee)
George K. Anderson
Brooks AFB, Tex.

Space and Missile Systems Center
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Air Force Development Test Center
Brig. Gen. Stewart E. Cranston
Eglin AFB, Fla.

Air Force Flight Test Center
Brig. Gen. (Maj. Gen. selectee)
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Edwards AFB, Calif.

Arnold Engineering Development Center
Col. Lawrence P. Graviss
Arnold AFB, Tenn.

Ogden Air Logistics Center
Maj. Gen. Lester L. Lyles
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Oklahoma City Air Logistics Center
Maj. Gen. Joseph K. Spiers
Tinker AFB, Okla.

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Maj. Gen. John F. Phillips
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Aerospace Maintenance and Regeneration Center
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Phillips Laboratory
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Rome Laboratory
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Col. David A. Herrelko
Wright-Patterson AFB, Ohio

Air Force Office of Scientific Research
Dr. Helmut Hellwig
Washington, D. C.

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Wright-Patterson AFB, Ohio

Materiel Systems Center
Col. Joseph E. Laposa
Wright-Patterson AFB, Ohio

Joint Logistics Systems Center
Brig. Gen. John R. Wormington
Wright-Patterson AFB, Ohio

Major Commands (continued)

Air Force Space Command
Hq. Peterson AFB, Colo.

Commander
Gen. Charles A. Horner

14th Air Force
Vacant
Vandenberg AFB, Calif.

20th Air Force
Lt. Gen. Arlen D. Jameson
Vandenberg AFB, Calif.

73d Space Group
Lt. Col. (Col. selectee) Michael W. Peterson
Falcon AFB, Colo.

Air Force Special Operations Command
Hq. Hurlburt Field, Fla.

Commander
Maj. Gen. Bruce L. Fister

1st Special Operations Wing
Brig. Gen. Maxwell C. Bailey
Hurlburt Field, Fla.

352d Special Operations Group
Col. Bennie D. Orrell
RAF Alconbury, UK

353d Special Operations Group
Col. Jerry L. Thigpen
Kadena AB, Japan

720th Special Tactics Group
Col. Robert W. Neumann
Hurlburt Field, Fla.

USAF Special Operations School
Col. Michael M. Flynt
Hurlburt Field, Fla.

Special Missions Operational Test and Evaluation Center
Col. Marvin Schott
Hurlburt Field, Fla.

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Commander
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Travis AFB, Calif.

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Tanker Airlift Control Center
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Air Combat Camera Service
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Defense Courier Service
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Yokota AB, Japan

7th Air Force
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Osan AB, South Korea

11th Air Force
Lt. Gen. Joseph W. Ralston
Elmendorf AFB, Alaska

13th Air Force
Maj. Gen. H. Hale Burr, Jr.
Andersen AFB, Guam

15th Air Base Wing
Brig. Gen. Dwight M. Kealoha
Hickam AFB, Hawaii

United States Air Forces in Europe
Hq. Ramstein AB, Germany

Commander
Gen. Robert C. Oaks

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Washington, D. C.

Commander
Col. Stephen E. Anno

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Air Force Operational Test and Evaluation Center
Kirtland AFB, N. M.

Commander
Maj. Gen. Marcus A. Anderson

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Air Education and Training Command
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CMSgt. Kenneth C. Maynard
Air Force Intelligence Command
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CMSgt. Michael Di Gregorio
Air Force Materiel Command
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Air Force Space Command
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CMSgt. Wayne G. Norrad
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CMSgt. David J. Campanale
Air Mobility Command
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CMSgt. James B. Livesay
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CMSgt. Robert W. Bailey
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CMSgt. Michael J. Bivens
Air Force Office of Special Investigations
Bolling AFB, D. C.

CMSgt. James A. Rossi
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Robins AFB, Ga.

CMSgt. Richard A. Moon
Air National Guard
Andrews AFB, Md.

CMSgt. Otis L. Scott, Jr.
Air Force District of Washington
Bolling AFB, D. C.

CMSgt. Nicholas S.P. Davis, Jr.
United States Air Force Academy
Colorado Springs, Colo.

Air Force Generals Serving in Joint and International Assignments

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Military Manpower and Personnel Policy
Ass't Secretary of Defense
Force Management and Personnel
Washington, D. C.

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Deputy Director, Central Imagery Office
Ass't Secretary of Defense (C^3I)
Washington, D. C.

Maj. Gen. John P. Jumper
Military Ass't to
Secretary of Defense
Washington, D. C.

Maj. Gen. Robert M. Marquette, Jr.
Director, C^3 Systems Management Support Office
Ass't Secretary of Defense (C^3I)
Falls Church, Va.

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Chief of Staff and Deputy to Under Secretary of Defense for Policy
Washington, D. C.

Brig. Gen. Ralph H. Graham
Director, Special Programs
Under Secretary of Defense for Acquisition
Washington, D. C.

Brig. Gen. Ellwood P. Hinman III
Chairman, DoD Civilian/Military Service Review Board
Andrews AFB, Md.

Department of Defense Agencies

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Director, Defense Intelligence Agency
Washington, D. C.

Maj. Gen. Lawrence P. Farrell, Jr.
Deputy Director, Defense Logistics Agency
Cameron Station, Va.

Maj. Gen. Kenneth L. Hagemann
Director, Defense Nuclear Agency
Alexandria, Va.

Maj. Gen. Raymund E. O'Mara
Director, Defense Mapping Agency
Fairfax, Va.

Brig. Gen. Billy J. Bingham
Ass't Deputy Director for Operations
National Security Agency
Fort Meade, Md.

Brig. Gen. Bruce J. Bohn
Director, Defense Network Systems Organization
Defense Information Systems Agency
Arlington, Va.

Brig. Gen. Richard A. Browning
Commander, Defense Construction Supply Center
Defense Logistics Agency
Columbus, Ohio

Brig. Gen. John H. Garrison
US Defense and Air Attaché, China
Defense Intelligence Agency
Beijing, China

Brig. Gen. Gerald E. Hahn
Deputy for Accounting
Defense Finance and Accounting Service, Denver Center
Denver, Colo.

Brig. Gen. Thomas E. Kuenning, Jr.
Deputy Defense Advisor
US Miss on to North Atlantic Treaty Organization
Brussels, Belgium

Col. (Brig. Gen. selectee) Claude M. Bolton, Jr.
Commandant, Defense Systems Management College
Fort Belvoir, Va.

Joint Chiefs of Staff

Gen. Merrill A. McPeak
USAF Member, Joint Chiefs of Staff
Washington, D. C.

Gen. Michael P.C. Carns
USAF Member, Joint Requirements Oversight Council
Washington, D. C.

Lt. Gen. James R. Clapper, Jr.
Director for JCS Support, J-2
Washington, D. C.

Lt. Gen. Albert J. Edmonds
Director, C^4 Systems, J-6
Washington, D. C.

Lt. Gen. Gary H. Mears
Director, Logistics, J-4
Chairman, Joint Materiel Priorities and Allocation Board
Washington, D. C.

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Ass't to the Chairman, Joint Chiefs of Staff
Washington, D. C.

Maj. Gen. David W. McIlvoy
Deputy Director, International Negotiations, J-5
Washington, D. C.

Maj. Gen. Kenneth A. Minihan
Director, Joint Electronic Warfare Center, J-3
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Maj. Gen. David J. Pederson
Deputy Director, Operations
National Military Command System, J-3
Washington, D. C.

Maj. Gen. Charles T. Robertson, Jr.
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Director, Operational Plans and Interoperability, J-7
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National Military Command Center, J-3
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Joint Service Schools

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Commandant, National War College
National Defense University
Fort McNair, D. C.

Brig. Gen. Marvin R. Esmond
Commandant, Armed Forces Staff College
National Defense University
Norfolk, Va.

US Atlantic Command

Gen. John M. Loh
Commander in Chief
US Air Forces Atlantic
Langley AFB, Va.

Maj. Gen. (Lt. Gen. selectee) Thad A. Wolfe
Vice Commander in Chief, US Air Forces Atlantic
Langley AFB, Va.

Brig. Gen. Thomas D. Pilsch
Commander, US Forces Azores
Lajes Field, Azores

Brig. Gen. Michael C. Short
Director, Exercises, Training, Operational Standards and Requirements, J-7
Naval Base Norfolk, Va.

US Central Command

Lt. Gen. Michael A. Nelson
Commander, US Central Command Air Forces
Shaw AFB, S. C.

Maj. Gen. Tad J. Oelstrom
Deputy Commander, US Central Command Air Forces
Shaw AFB, S. C.

Maj. Gen. Lloyd W. Newton
Director, Operations, J-3
MacDill AFB, Fla.

US European Command

Gen. Charles G. Boyd
Deputy Commander in Chief
Stuttgart-Vaihingen, Germany

Gen. Robert C. Oaks
Air Force Component Commander to US European Command
Commander, Allied Air Forces Central Europe, NATO
Ramstein AB, Germany

Maj. Gen. Vernon Chong
Command Surgeon
Stuttgart-Vaihingen, Germany

Maj. Gen. Charles D. Link
Director, Plans and Policy, J-5
Stuttgart-Vaihingen, Germany

Maj. Gen. Philip W. Nuber
Chief, Joint US Military Mission for Aid to Turkey
Ankara, Turkey

Brig. Gen. Michael V. Hayden
Director, Intelligence, J-2
Stuttgart-Vaihingen, Germany

Brig. Gen. Jerome A. Landry
Director, C^4 Systems, J-6
Stuttgart-Vaihingen, Germany

Brig Gen. Thomas J. Lennon
Deputy Director, Military-to-Military Contact Program
Stuttgart-Vaihingen, Germany

US Pacific Command

Gen. Robert L. Rutherford
Commander, Air Force Component, US Pacific Command
Commander, Pacific Air Forces
Hickam AFB, Hawaii

Lt. Gen. Richard E. Hawley
Commander, US Forces Japan
Commander, US Air Forces Japan
Yokota AB, Japan

Lt. Gen. Joseph W. Ralston
Commander, Alaskan Command
Commander, Joint Task Force–Alaska
Elmendorf AFB, Alaska

Maj. Gen. H. Hale Burr, Jr.
Commander, WESTPACSOUTH Air Defense Region
Andersen AFB, Guam

Brig. Gen. Ervin C. Sharpe, Jr.
Chief of Staff, Air Component Command, ROK/US Combined Forces Command
Vice Commander, US Air Forces Korea
Osan AB, South Korea

Brig. Gen. Floyd K. Tedrow
Director, Logistics and Security Assistance, J-4
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Space & Electronics Group

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Davis-Monthan AFB, Ariz.

Maj. Gen. James F. Record
Vice Commander, US Air Forces Southern Command
Davis-Monthan AFB, Ariz.

Maj. Gen. Walter T. Worthington
Deputy Commander in Chief, US Southern Command
Quarry Heights, Panama

Brig. Gen. David A. Sawyer
Commander, US Air Forces Southern Command Forward
Howard AFB, Panama

US Space Command

Gen. Charles A. Horner
Commander in Chief, US Space Command
Commander, Air Force Component, US Space Command
DoD Manager for Space Transportation System Contingency Support Operations
Peterson AFB, Colo.

Lt. Gen. Thomas S. Moorman, Jr.
Vice Commander, Air Force Component, US Space Command
Peterson AFB, Colo.

Maj. Gen. Phillip E. Bracher
Director, Command Control Systems and Logistics, J-4/J-7
Peterson AFB, Colo.

US Special Operations Command

Maj. Gen. Bruce L. Fister
Commander, Air Force Component, US Special Operations Command
Hurlburt Field, Fla.

Maj. Gen. James C. McCombs
Director, Resources, J-8
MacDill AFB, Fla.

Maj. Gen. Lloyd W. Newton
Director, Operations, J-3
MacDill AFB, Fla.

Brig. Gen. Charles R. Holland
Deputy Commanding General, Joint Special Operations Command
Fort Bragg, N. C.

Brig. Gen. C. Jerome Jones
Vice Commander, Air Force Component, US Special Operations Command
Hurlburt Field, Fla.

US Strategic Command

Gen. George L. Butler
Commander in Chief
Offutt AFB, Neb.

Maj. Gen. Gary L. Curtin
Director, Intelligence, J-2
Offutt AFB, Neb.

Maj. Gen. Robert E. Linhard
Director, Plans and Policy, J-5
Offutt AFB, Neb.

Brig. Gen. Orin L. Godsey
Deputy Director, Operations and Logistics, J-3/J-4
Director, Combat Operations Staff
Offutt AFB, Neb.

US Transportation Command

Gen. Ronald R. Fogleman
Commander in Chief
Scott AFB, Ill.

Brig. Gen. John W. Handy
Director, Operations and Logistics, J-3/J-4
Scott AFB, Ill.

Brig. Gen. Thomas L. Hemingway
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Scott AFB, Ill.

Brig. Gen. George P. Lampe
Director, C⁴ Systems, J-6
Scott AFB, Ill.

Brig. Gen. Charles H. Roadman II
Command Surgeon
Scott AFB, Ill.

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Deputy Chief of Staff
Fort McPherson, Ga.

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Fort McPherson, Ga.

North Atlantic Treaty Organization

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Commander, Allied Air Forces Central Europe
Commander, Air Force Component, US European Command
Ramstein AB, Germany

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Commander, Allied Air Forces Southern Europe
Allied Forces Southern Europe
Naples, Italy

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Allied Forces Northern Europe
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Deputy Commander and Chief of Staff, 4th Allied Tactical Air Force
Allied Air Forces Central Europe
Allied Forces Central Europe
Heidelberg, Germany

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Commander, Interim Combined Air Operations Center
Sembach AB, Germany

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Naples, Italy

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NATO Airborne Early Warning Force Commander
Supreme Headquarters Allied Powers Europe
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Deputy Commander, 6th Allied Tactical Air Force
Allied Air Forces Southern Europe
Allied Forces Southern Europe
Izmir AS, Turkey

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Allied Forces Central Europe
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Cheyenne Mountain AFB, Colo.

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Cheyenne Mountain AFB, Colo.

Brig. Gen. James S. Savarda
Vice Director, NORAD Combat Operations Staff, J-3V
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Deputy Commander, US Forces Korea
Commander, ROK/US Air Component Command, Combined Forces Command
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On November 1, the Air Force's restructured classification system will be up and running.

New Skill Codes for Everybody

By Bruce D. Callander

BEGINNING November 1, most of what you think you know about Air Force Specialty Codes will be wrong.

On that date, Air Force computers will convert all skill designations to a new alphanumeric formula. Some 450,000 servicemen and -women will receive their new AFSCs, and a restructured classification system will be up and running.

This will be the first major overhaul of the basic skill structure since 1951, when the new, independent Air Force got rid of its old Army military occupational specialty (MOS) codes and established the original AFSCs.

The change comes at a time when the Air Force is already going through the agony of reducing strength, reshuffling units, overhauling training, and restructuring units. So why add yet another unsettling factor to the equation?

Capt. Peg Lawson, chief of the Classification and Analysis Section at the Air Force Military Personnel Center (AFMPC), explained, "The new AFSCs are designed to match the restructured Air Force and to align career fields that have become fragmented over the years."

Links to the Objective Wings

Career Groupings

1 Operations	5 Professional (chaplains and judge advocates)
2 Logistics	6 Acquisition and Financial Management
3 Support	7 Office of Special Investigations
4 Medical	8 Special-Duty identifiers
	9 Reporting identifiers

Skill Levels (Airmen)	Qualification Levels (Officers)
1 Helper	1 Entry
3 Apprentice	2 Intermediate (copilots and missile launch officers only)
5 Journeyman	3 Fully Qualified
7 Craftsman	4 Staff (above wing level only)
9 Superintendent	
0 Manager	

When officials looked at the Air Force's new "objective wing" approach, they decided the old classification system needed more than just another face-lift. They went for a major overhaul.

This new force structure shortens the chain of command, reduces staff and headquarters positions, and puts more members in the operational units where the action is. The new AFSC system follows the same pattern, eliminating many of the old commander and director AFSCs and reorganizing the scattered specialties into a handful of career groupings.

The new system is designed to accommodate a smaller force. By removing some AFSCs and consolidating others, it will reduce the number of narrowly trained specialists and rely more on generalists who can be assigned to a broader range of jobs.

"Blank-Sheet" Approach

Describing the process of putting the new skill structure together, Captain Lawson said, "When we were asked to look at the AFSC system and possibly to make some changes, we were told to take a 'blank-sheet' approach, as if there were no existing system. We used a variety of methods to define what an AFSC is and does. We looked at the current skills and the new objective structure and tried to make the AFSCs make more sense in that environment."

The link to the objective wings is apparent in the regrouping of specialties. The old system spread officer skills over twenty career areas but made no similar groupings for enlisted AFSCs. The new system will concentrate both officer and airman specialties into just nine career groupings with a corresponding number (see box, opposite).

One of these will be the first digit in the specialty code of every officer and airman.

It is no accident that the three most heavily populated career groupings match the principal parts of the objective wing—operations, logistics, and support groups. Nor is it by chance that the new officer skill system, like the restructured Air Force itself, will have fewer staff specialties, and none below wing level.

As under the old system, AFSCs will include additional characters to identify the member's career field, individual specialty, and skill level. In another change, however, the new system will include letters as well as numbers. For officers, the alphabetical character will indicate a specialty. For airmen, it will show the member's career field.

In the new AFSC of 11F3, for example, the first "1" will place an officer in the Operations area, the second "1" will identify him or her as a pilot, the "F" will stand for the fighter specialty, and the "3" will indicate a fully qualified skill level.

"We broke away from the old grade-level distinction in the officer AFSC," Captain Lawson explained. "The grade level of a particular job already exists on the authorization for that job, so the AFSC needs only to tell you what the actual job is."

Typical Air Force Specialty Codes

Officer

(Fully Qualified Fighter Pilot—"11F3")

Career Grouping	Career Field	Functional Area	Qualification Level
1	**1**	**F**	**3**
Operations	Pilot	Fighter	Fully Qualified

Airman

(Airborne Radar Systems Craftsman—"1A572")

Career Grouping	Career Field	Career Field Subdivision	Skill Level	Specific AFSC
1	**A**	**5**	**7**	**2**
Operations	Aircrew Operations	Airborne Systems	Craftsman	Radar

Typical Prefixes

Officers

- **C** Commander
- **B** Squadron Operations Maintenance Officer
- **J** Parachutist
- **T** Technical Instructor
- **S** Safety Officer
- **L** Life Support

Airmen

- **X** Aircrew
- **A** Development Craftsman
- **B** B-2 Personnel
- **J** Parachutist
- **K** Aircrew Instructor

As a result, most officers will be coded only at the entry (1) or fully qualified (3) levels. There also is an intermediate (2) level, used only for copilots and missile launch officers, and a staff level (4), used only above wing level (see box, p. 96).

The change was largely a matter of recognizing that the grade-level identification meant little, Captain Lawson said. The final digits of the old AFSCs showed a "4" code for company grades and a "6" for field grades but, in practice, captains often filled field-grade billets even when they couldn't be promoted due to grade restrictions.

The new airman AFSCs, like those of the officers, begin with a digit showing the career grouping. The second character (a letter) indicates the career field, the third shows a career subdivision, the fourth marks the airman's skill level, and the fifth stands for his or her specialty (see box, p. 97).

The airman codes retain the skill levels of the old classification structure: helper (1), apprentice (3), journeyman (5), craftsman (7), superintendent (9), and chief enlisted manager (0) (see box, p. 96).

"In the enlisted structure," Captain Lawson said, "we use AFSCs for the airman assignment process as well as for promotion. Skill level is complementary to those uses, so there is a difference from the officer structure. For officers, skill level is more a snapshot of where they are in their careers, whereas on the airman side, it is tied to their entire career path."

Special Qualifications

Both officer and enlisted skills will continue to use letter prefixes and suffixes. Prefixes generally are related to special qualifications, such as aircrew member or parachutist, and there are relatively few of them. Suffixes usually relate to specific types of aircraft or equipment.

"We need that specificity," Captain Lawson said, "especially in our operations world so that we have clear identification of what kind of pilot or navigator we need in the inventory."

In another departure from the old system, however, many commanders who were given specialty codes now will be identified by a "C" within their AFSCs. An operations commander will be coded 10C0, for example, a logistics commander 20C0, and a support commander 30C0.

Although the new system still will allow for identifying fighter pilots, mechanics, and other technicians with specific planes and pieces of equipment, the thrust of the restructuring is away from narrow specialties. In fact, the number of officer AFSCs has been reduced by more than forty percent, largely through the elimination of staff, commander, and director skills and through combining similar specialties. Enlisted skills have been cut by only about ten percent, but Captain Lawson said that further consolidation is likely.

She explained that, in addition to the one-time overhaul of the structure, specialties are continually reviewed to reflect changes in missions and equipment. These more frequent

Typical Special-Duty Identifiers (8)

Officers	
81T0	Instructor
83R0	Recruiting Service Officer
82A0	Academic Program Manager
85G0	USAF Honor Guard Officer
Airmen	
8R000	Recruiter
8B000	Military Training Instructor
8G000	USAF Honor Guard
8P000	Courier
8M000	Postal Specialist
8F000	First Sergeant

Typical Reporting Identifiers (9)

Officers	
91W0	Wing Commander
93P0	Patient
90G0	General Officer
92T0	Pilot Trainee
Airmen	
9T000	Basic Airman
9T100	Officer Trainee
9P000	Patient
9G000	Airman Aide
9L000	Interpreter/Translator
9C000	Chief Master Sergeant of the Air Force

shifts are made with the help of AFMPC but are initiated by functional managers from the various career areas who oversee the manning in those areas.

"There are two separate things happening," Captain Lawson said. "The restructure was a redesign of the whole AFSC system and how it functions. But classification is an ongoing, dynamic process. We have changes to that every year. So, whether or not we had a restructure of the whole system this year, we would have some type of change in the AFSCs."

The large number of changes in the officer codes coincided with this year's restructuring process. "On the enlisted side," Captain Lawson said, "the functional managers are beginning to wrap up their review of their career field areas, and we anticipate seeing more consolidations over the next year."

The process involves more than simply rearranging numbers on the career field charts. AFMPC and functional managers also must look at the impact on the members involved.

"When we merge or consolidate or expand a person's AFSC," Captain Lawson said, "we have to look at what that individual is going to need . . . to function in the new AFSC. We may have to end training for some and build or expand training for others. It is tailored to the specific AFSCs involved."

Reclassify, Retrain

This cycle of assigning skills, then changing them and retraining members to match, has been going on almost as long as military aviation itself. So have the periodic swings from generalization to specialization and back again.

Soon after the Air Force traded its Army MOS codes for the tidier AFSCs, the skills began to multiply like rabbits. Jet propulsion, avionics, and missiles added whole new families of specialties, and even the support areas expanded as computers replaced the morning report and logistics became a global operation.

Narrow specialization had its advantages, of course. During World War II, it enabled the Army Air Forces to train troops fast and get them to operational units quickly. There was no need to give them broad training when most would go home at war's end. Even in peacetime, this "first job" concept made sense. Narrow training was quicker and cheaper.

Specialization also had its down side. Narrowly skilled members were difficult to assign because their specialties were used only by certain units. When the equipment on which they specialized was replaced, they had to retrain. When they were ready to move into broader supervisory and management levels, the Air Force faced the choice of broadening their training or narrowing the upper-level skills. It opted to narrow the advanced specialties and wound up with NCOs and field-grade officers who knew their jobs but had little experience in supervision or management.

Going into the 1990s, the classification system resembled a patchwork quilt. For both officers and enlisted, there were forty-one major career fields, most of them divided into two or more subdivisions and broken further into ladders and letter suffixes (shredouts). For airmen, the huge Manned Aerospace Maintenance (45) field had thirteen major subdivisions, thirty-five ladders, and several dozen shredouts. Other fields contained AFSCs only vaguely related to each other.

The officer fields were grouped into twenty-one career areas, but the numbering system was a nightmare. The heavily populated Operations area had five subdivisions and included pilots ranging from newly rated flyers to operations officers and staff officers. Navigators were identified in two separate areas with other fields dividing them. Almost 3,000 officers were identified by the Commander and Director code unrelated to any of the career areas.

Support and logistics skills were spread over a variety of fields, some of them related but others with little in common. Officer and airman structures were linked by common code numbers in some fields but not in others. A "10," for example, identified an officer as a pilot and an airman as a first sergeant. The "20" field was Space Operations for officers and Intelligence for airmen.

Drawing Skills Together

The restructuring will draw together some of the skills that have become scattered over the years. Typical is the Acquisition and Financial Management (6) area.

Early in the review, Captain Lawson said, officials planned to put Finance in the Support area but found that it didn't fit into the objective structure. They decided instead to make it a separate career area and add related skills from other areas. The result is a new career grouping covering everything from payroll to auditing and contracting.

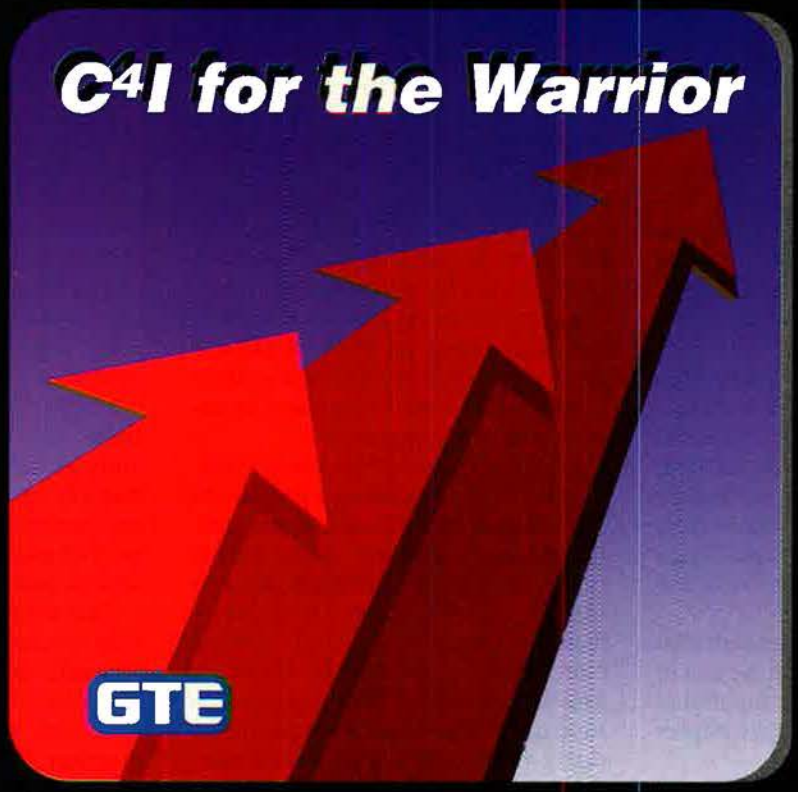
Under the same philosophy, career fields that back up the operational units are drawn together in the Support (3) area. Support includes fields once scattered broadly over such areas as civil engineering, manpower, personnel, and education and training.

The overhaul has involved more than renumbering AFSCs. It changes manning documents, career guides, and a host of other materials associated with specialties and skill progression. Both the active-duty establishment and the Air Force Reserve and Air National Guard are affected.

The impact on some members also promises to go well beyond changing their AFSCs. For those in skills that have merged or will merge in future consolidations, it may mean retraining or career broadening. Gen. Merrill A. McPeak, Air Force Chief of Staff, has already called for more schooling. In the airman areas, he set goals of giving recruits in all specialties some formal technical training and of returning more NCOs to school for advanced training. This will become more important as skills are broadened and the emphasis shifts from specialists to generalists.

It is unlikely the force will return to the jack-of-all-trades philosophy of its earliest days. As the Air Force has found, even pilots cannot be assigned to any flying job. With manpower at a premium, the trend certainly will be toward broadening the knowledge and responsibilities of the remaining members, where it is practical. ■

Bruce D. Callander, a regular contributor to Air Force *Magazine, served tours of active duty during World War II and the Korean War. In 1952, he joined* Air Force Times, *becoming editor in 1972. His most recent article for* Air Force *Magazine, "Testing the Limits of the Total Force," appeared in the July 1993 issue.*



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Enlisted Excellence

As AFIC liaison with the 6981st Electronic Security Group at Elmendorf AFB, Alaska, **TSgt. James G. Carter** served as a key Cope Thunder coordinator and was handpicked as joint exercise controller for Arctic Warrior, Fencing Indian, and Amalgam Warrior. His Russian language skills proved valuable when two Russian helicopters flying in Alaskan airspace stopped at Elmendorf. He translated key communications and airframe specifications and provided that information to a Royal Canadian Air Force pilot escort.

As superintendent of Presidential Radio Operations for the 89th Communications Group, Andrews AFB, Md., **MSgt. Catherine M. Danzy** emphasizes rigorous, constant training and one-on-one interaction with airborne and ground radio operators. This has brought top-quality service to such customers as the National Emergency Airborne Command Post and distinguished visitors flying with the Special Air Mission Fleet.

MSgt. Scott C. Fales's expertise as a top combat search-and-rescue (CSAR) planner was evident in Kopek Trade, the largest, most complex Joint Readiness Training exercise in ten years. As CSAR planner for the 24th Special Tactics Squadron, Pope AFB, N. C., he led a seventy-five-man special tactics team and developed a CSAR plan supporting 115 aircraft and 700 personnel from DoD's elite fighting units.

Chosen for a temporary duty assignment in Diego Garcia in the Indian Ocean to establish a technical order program, **SrA. Deleonard Fincher** also conducted a complete inventory of technical orders and started a training program. Based on Guam, Airman Fincher used a recent Technical Order inspection to ensure the proper maintenance of $1 million worth of equipment. For his initiative and follow-through, he received the Noncommissioned Officers Association's Military Excellence Award.

A cool head and steady nerves enabled **SrA. Sherrie L. French** to bring several fuel oil spills quickly under control, safeguarding personnel and the environment. A liquid fuels maintenance specialist with the 380th Civil Engineering Squadron, Plattsburgh AFB, N. Y., she won the first-ever AMC Civil Engineering Military Technician of the Year Award for 1992.

As a carpentry technician, **SSgt. Jerry W. Lewis, Jr.,** was assistant project manager on RED HORSE's largest project. His construction management expertise led the cantonments supervisor at Misawa AB, Japan, to handpick Sergeant Lewis to supervise construction of three facilities used for readiness training at Misawa.

The job title is "Purchase Order Clerk," but for **SrA. Dwight E. Lisle,** it's really resource management for the 86th Medical Group at USAFE's Ramstein AB, Germany. He saved more than $350,000 in providing supplies and equipment for Medflag '92, a DoD medical relief mission to Sierra Leone.

As launch support team chief for the 30th Space Wing, Vandenberg AFB, Calif., **MSgt. James E. Scott** became the first enlisted man to lead the team during all sixteen space and ballistic launches in 1992. He improved the team's response time by thirty percent. When a technician lost consciousness seconds before a launch, Sergeant Scott offered medical assistance, saving the countdown schedule and $800,000 worth of range time.

Voted NCO of the Year by the 47th Flying Training Wing, Laughlin AFB, Tex., **TSgt. David Sosa** graduated at the top of his Academic Instructor School class with a ninety-eight percent final average. He relocated Laughlin's Airman Leadership School to a base house and got it operating within twenty-four hours. Superiors called this a "phenomenal achievement."

MSgt. Trenda L. Voegtle, special assistant to ACC's Senior Enlisted Advisor, has resolved hundreds of issues concerning morale, welfare, and effective use of 135,000 enlisted personnel. She has arranged several conferences, coordinates the Chief Master Sergeant's TDY schedule, and serves as functional manager for SEA and First Sergeant career fields.

AFMC's NCO of the Year, **SSgt. Jeffrey C. Woffinden,** co-wrote and presented two papers at the American Geophysical Union Conference. His troubleshooting skills in laser radar computer support at Phillips Laboratory, Kirtland AFB, N. M., saved the analysis of water vapor data from White Sands Missile Range, N. M.

As aircraft loadmaster superintendent for the 335th Airlift Squadron, McGuire AFB, N. J., **CMSgt. Michael H. Wysong** developed a management training program for loadmaster flight chiefs. His new recruiting and retention programs have resulted in a zero failure rate for students and one of the highest retention rates in the 514th Airlift Wing. Sergeant Wysong was named 1992 AFRES Outstanding Senior NCO of the Year. ■

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First-Class Crews

Chennault Award
Best Aerial Warfare Tactician

Capt. Michael C. Wilson of the 39th Tactical Group and 7440th Composite Wing (Provisional), Incirlik AB, Turkey, was the focal point for all weapons, tactics, and electronic combat matters for Operation Provide Comfort, the coalition operation in Turkey and northern Iraq for relief of the Kurds. Captain Wilson worked with maintenance units to guarantee proper ordnance for the aircraft of the four coalition nations. His analysis of aircraft capabilities and deficiencies led to the deployment of F-4G "Wild Weasels" to help with threat suppression. Captain Wilson flew more than fifty F-16 combat missions into Iraq.

Tunner Award
Best Air Mobility Aircrew

This C-130 crew of the 314th Airlift Wing, Little Rock AFB, Ark., commanded by Capt. Steven W. Powell, was assigned to fly airlift missions to Belet Huen, Somalia, to support the International Red Cross in Operation Provide Relief. During a mission, the crew executed an emergency extraction of an Air Force combat control team, while under fire, from an austere dirt airstrip. The CCT was recovered without injury. In addition to Captain Powell (not shown), the award-winning crew consists of 1st Lt. Scott A. Schaefer, copilot; Capt. Thomas M. Cole, navigator; TSgt. Mark S. Atwell, flight engineer; SSgt. Kenneth L. Weber, loadmaster, and SSgt. Richard T. Beall, crew chief.

Space Operations Award

Best Unit in Air Force Space Command

Members of Delta Crew of the 20th Space Surveillance Squadron, 73d Space Group, Eglin AFB, Fla., configured a radar to track a self-destructing satellite within minutes of being notified. When the satellite entered radar coverage, the crew tracked the main segment and some twenty associated objects. During preparations for a preplanned launch, crew members updated the orbital element set manually after detecting a problem with the computer program. They then tracked all launch-associated objects. (Later, Delta Crew developed a more efficient computer program to update orbital element sets.) During the launch of a foreign satellite, crucial radar observations failed to reach the Space Surveillance Center. Delta Crew located and transmitted the data to the SSC. The crew consists of 2d Lt. Wendy J. Hacker, commander (above left, preparing satellite observation data for transmission); SSgt. David W. Martin, crew chief (left, updating a satellite data wall display); SrA. Clement S. Allard, console operator, and A1C George E. Riggs, Jr., console operator.

Power Award

Best Strategic Missile Combat Crew

1st Lts. Steven A. Coker and Stephen T. Hamilton, Crew S-210 of the 351st Missile Wing, Whiteman AFB, Mo., were Best ICBM Combat Crew and Best Improved Launch Control System Combat Crew at 1992's Olympic Arena, earning 291 out of a possible 300 points. Lieutenants Coker and Hamilton led the Operations Training Flight to an "excellent" rating during the Inspector General's last visit, which helped the wing win the Gen. Bernard A. Schriever Award for best inspection results this cycle. They developed a unique deactivation guidance procedure, which enabled the wing to deactivate the Minuteman II safely. Lieutenant Coker is assigned to the 351st Operations Support Squadron's Training Flight as an instructor. Lieutenant Hamilton is assistant chief of the Crew Force Operations Section.

O'Malley Award

Best Reconnaissance Crew

While on temporary duty to the 1700th Reconnaissance Squadron (RS) (Provisional) and the 6975th Electronic Security Squadron (ESS) (Provisional), Saudi Arabia, ACC/AFIC RC-135 Rivet Joint (RJ) crew members provided critical support to enforce compliance with the UN's mandated no-fly zone over Iraq. On December 27, 1992, an RJ crew detected an Iraqi MiG-25 flying south toward the thirty-second parallel. The crew passed this information to a US E-3 AWACS aircraft. Their reporting enabled a US F-16 to shoot the Iraqi aircraft down. RJ crew members from the 38th RS include (left to right) 1st Lt. Ronnie Brooke, navigator; Capt. Susan E. Rogers, navigator; Capt. Paul C. Hughes, aircraft commander, and 1st Lt. Michael S. Clay, pilot.

From the 6988th ESS, RJ crew members include (left to right) Sgt. Terry W. Webb, SrA. Cyndie A. Koch, MSgt. David Klein, SSgt. Carl H. Houghton III, and SrA. Timothy J. Weder.

From the 343d RS, RJ crew members include (from left) Capt. Edward C. Kraft III, Capt. James R. Bray, and Capt. Thomas W. Bluhm.

Other crew members who flew in the RC-135 and helped in the mission, but are not pictured, are (41st ECS) SSgt. Michael J. Clark; (343d RS) MSgt. Carl J. Miller; (6949th ESS) SSgt. Kelly B. Flanagan and SSgt. Kevin S. Gilkey; (6988th ESS) SSgt. Stephen P. Bateman, SSgt. David D. Eller, Jr., TSgt. John C. Lowery III, A1C William T. Pittman, TSgt. Andrew C. Puszman, and TSgt. Raymond G. Ulrich; (6990th ESS) Sgt. Michael R. Knipp and TSgt. Steven S. Staycoff; and (6994th ESS) SrA. Andrea K. Kottmeier.

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President's Award
Outstanding AFRES Crew

The 916th Air Refueling Group was commended for safety in 1992 by the USAF Chief of Staff. On September 24, 1992, during an airlift flight from Lajes Field, Azores, to RAF Mildenhall, UK, a passenger lapsed into unconsciousness. The 916th ARG crew revived the passenger, returned to Lajes where an ambulance met the aircraft, quickly re-serviced their KC-10, and resumed the mission, arriving at Mildenhall with scant delay. The crew consists of Lt. Col. Jay R. Memmelaar, commander; Maj. Thomas J. Knapik and 1st Lt. Khris W. Carrow, pilots; MSgt. Thomas R. Vines and SSgt. Dewey Powell, flight engineers; and (pictured, left to right) SSgt. Sean P. Martin, SMSgt. Ronnie L. Wade, and SMSgt. Bobby R. Drinnen, boom operators.

The Ricks Award
Outstanding Airmanship in the ANG

On July 7, 1992, Capt. Donald F. Knox and his crew, from the 118th Airlift Wing, Nashville IAP, Tenn., were flying a C-130H with fifty passengers from Nashville to Hagler AAF, Miss. As they landed, an engine malfunctioned, sending the aircraft out of control toward a group of hangars. Captain Knox determined which engine had failed, shut it down, and got safely aloft again. The crew then executed a successful three-engine landing. Left to right are MSgt. Michael J. Dwyer, TSgt. John L. Clark, Captain Knox, 2d Lt. Kevin J. Blaser, Maj. David R. Chesser, and Sgt. Mark A. Harris.

Photo © Joe Towers

Outstanding Reserve Unit

The 944th Fighter Group, Luke AFB, Ariz., deployed 325 personnel to Incirlik AB, Turkey, to support Operation Provide Comfort II. During the seven-week deployment, the unit flew 1,090 hours on 308 sorties, losing only one sortie due to maintenance problems. From April 1992 to March 1993, the 944th also deployed to Misawa AB, Japan, for a Checkered Flag exercise; Hickam AFB, Hawaii, for "war-at-sea" training; and Nellis AFB, Nev., for Composite Force Training with the USAF Fighter Weapons School. Back home, the 944th shone at the May 1992 Unit Effectiveness Inspection, earning an overall rating of "excellent" and "best seen to date" in nine areas. In January 1993, the unit received a second Air Force Outstanding Unit Award and a second consecutive Air Combat Command Flight Safety Award.

Chief Red Award

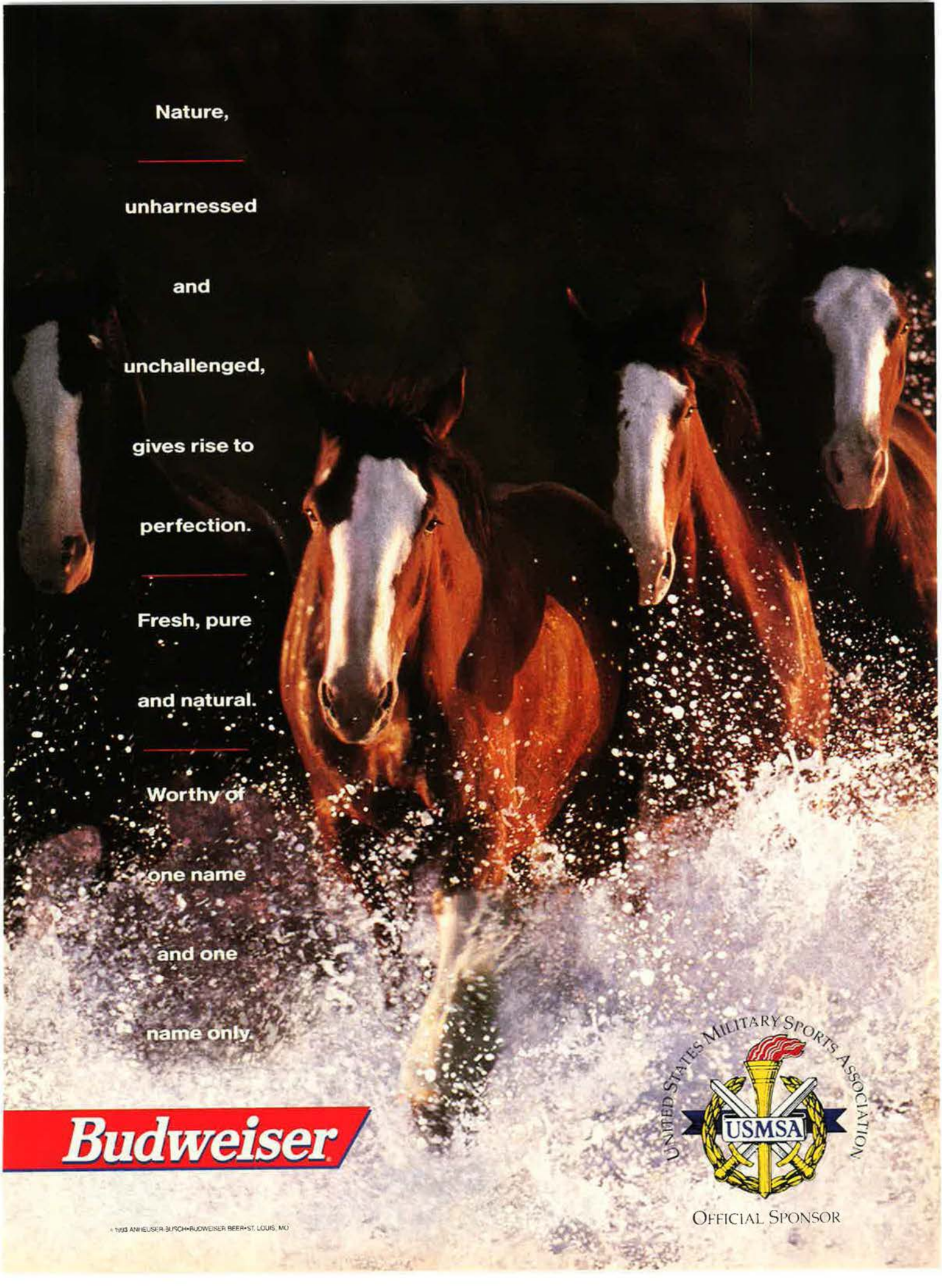
Outstanding Aerospace Maintenance

CMSgt. William T. Youngworth (left), maintenance control supervisor for the 175th Fighter Group, Martin State Airport, Md., helped increase the group's fully mission capable (FMC) rate from seventy-five percent to eighty-four percent while increasing scheduling effectiveness. He represented the National Guard Bureau on a Tiger Team formed to resolve problems with the Intermediate Automatic Test Station, increasing the FMC rate of the IATS from thirty percent to ninety-five percent. Chief Youngworth established a local ninety-day operational check of Pave Penny pods for the A-10, increasing the average number of units in service every month.

USAF photo by TSgt. Dan Eisenhart

Outstanding Guard Unit

The 193d Special Operations Group, Pennsylvania ANG, was nominated for the William W. Spruance Safety Award. Long known as "the most deployed unit in the Air National Guard," averaging twelve major deployments per year, the 193d has gone thirty-six years and more than 137,000 flying hours without a major accident. This span includes deployments to southeast Asia, Grenada, Panama, and the Persian Gulf. In 1992, the 193d completed a 120-day deployment to Kadena AB, Japan, in support of Pacific Command and 5th Air Force. Using only two aircraft, the 193d SOG flew almost 1,000 hours on 107 sorties, achieving an effectiveness rating of 100 percent.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and
unchallenged,
gives rise to
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and natural.
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name only.
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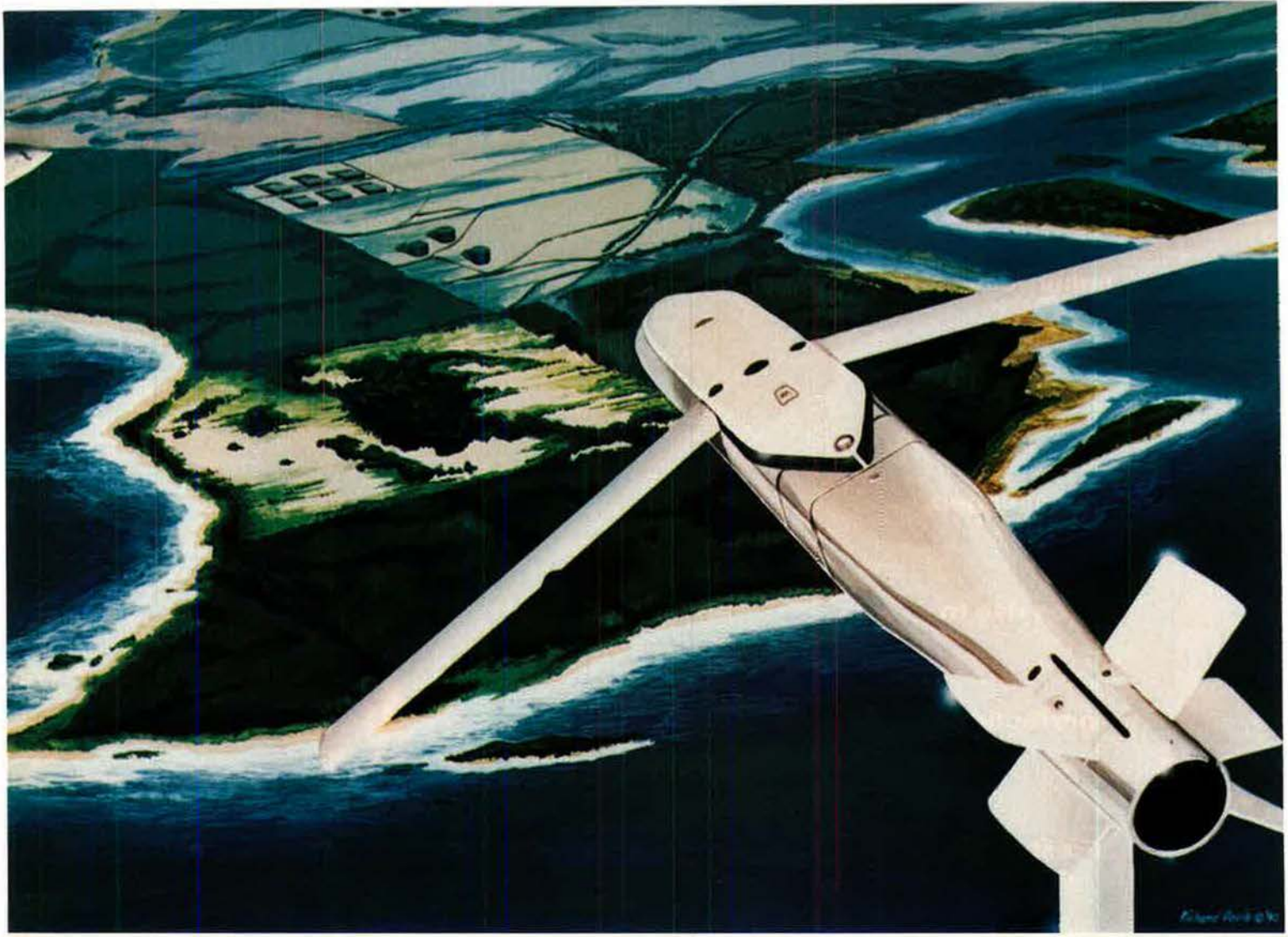

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JSOW is an all-weather day/night weapon system, designed to deliver BLU-97 Combined Effect Bomblets against a variety of targets – SAM sites, vehicles or troops in the field – from distances beyond most close-in air defenses. An antiarmor variant will deliver BLU-108B Sensor Fused Weapons against armored targets, also without overflight.

JSOW's design provides a direct path for growth through a Pre-Planned Product Improvement program. So, for years to come, JSOW will benefit from improvements and innovations in guidance packages, warheads and data links.

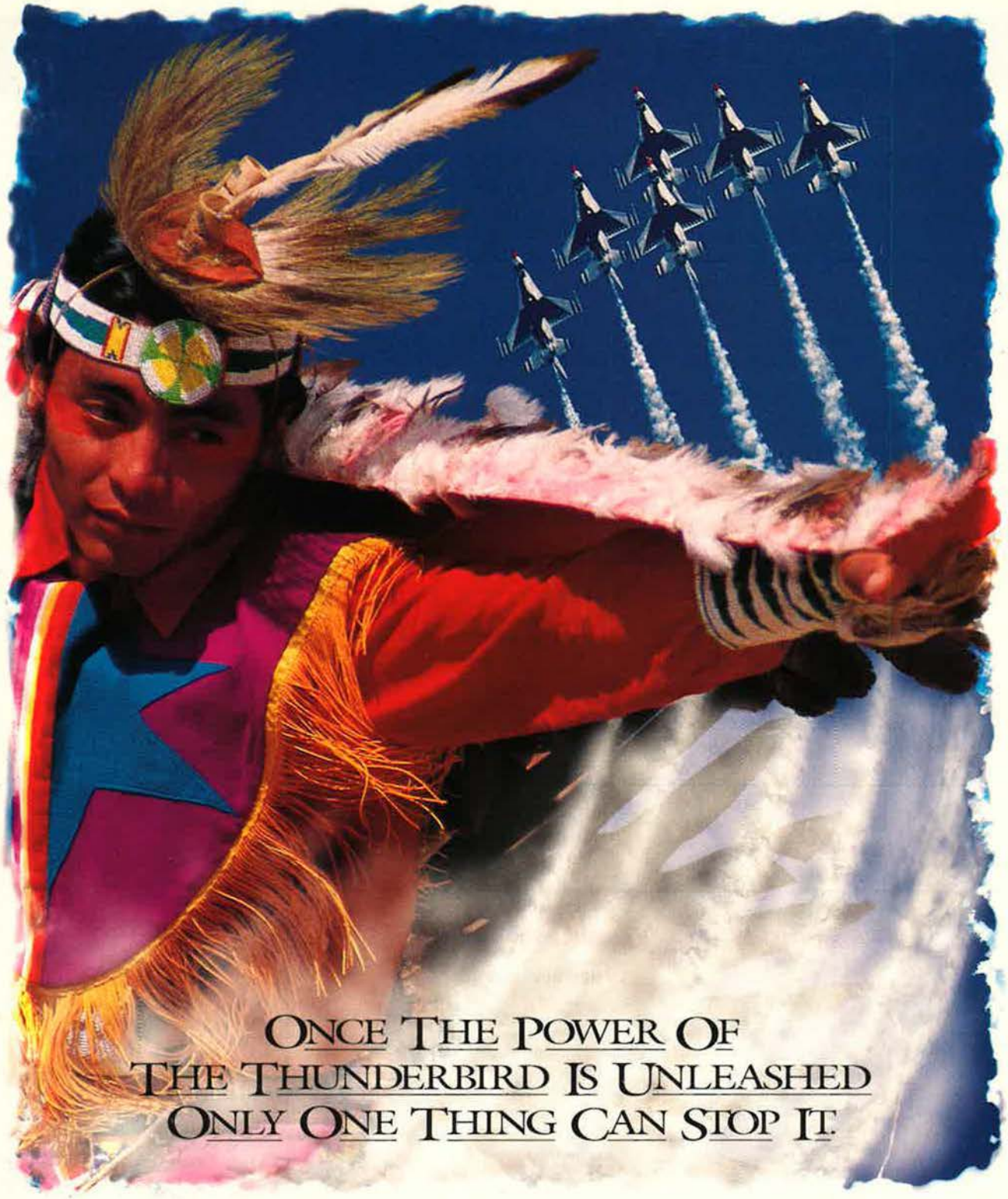
Constant contact and interaction with the ultimate user – pilots, weapon systems operators and ordnance loading crews – means TI will continue providing U.S. Armed Forces with high quality systems. Systems which will extend your reach through technology and teamwork.

Texas Instruments Incorporated
Defense Systems & Electronics Group
Dallas, Texas 75266

TEXAS INSTRUMENTS

Malcolm Baldrige National Quality Award 1992 Winner

01-JSW-932



Like their mystical Indian namesake, the Thunderbirds' F-16s wield a fearsome power, a power only a tough brake can tame. A lightweight brake that can handle high speed taxi stops and enhance performance on short, civilian runways. The legendary BFGoodrich SuperCarb™ carbon brake.

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For more information, contact: Manager, Military Programs, Aircraft Wheel & Brake Operations. (513) 339-3811. Fax (513) 335-1913.

BFGoodrich
Aerospace
Aircraft Wheel & Brake Operations

AFA/AEF Report

AFA's Network of Units Overseas

AFA UNIT	LOCATION
United States Air Forces in Europe (USAFE)	
Dolomiti	Aviano AB, Italy
Eifel	Bitburg AB, Germany
Lufbery-Campbell	Ramstein AB, Germany
Maj. Gen. Robert M. White	Heidelberg, Germany
Spangdahlem	Spangdahlem AB, Germany
Pacific Air Forces (PACAF)	
Keystone	Kadena AB, Japan
Manila	Manila, the Philippines
Misawa	Misawa AB, Japan
Tokyo	Tokyo, Japan
Supreme Headquarters Allied Powers Europe (SHAPE)	
General Lauris G. Norstad	Mons, Belgium

Aerospace Education Foundation Officers

YEAR	PRESIDENT	CHAIRMAN OF THE BOARD
1961–63	—	Dr. W. Randolph Lovelace II
1963–64	John B. Montgomery	Dr. W. Randolph Lovelace II
1964–66	Dr. Lindley J. Stiles	Gen. Laurence S. Kuter, USAF (Ret.)
1966–67	Dr. B. Frank Brown	Dr. Walter J. Hesse
1967–68	Dr. Leon M. Lessinger	Dr. Walter J. Hesse
1968–69	Dr. L. V. Rasmussen	Dr. Walter J. Hesse
1969–71	Dr. L. V. Rasmussen	J. Gilbert Nettleton, Jr.
1971–73	Dr. Leon M. Lessinger	J. Gilbert Nettleton, Jr.
1973–74	Dr. Wayne O. Reed	George D. Hardy
1974–75	Dr. William L. Ramsey	George D. Hardy
1975–81	Dr. William L. Ramsey	Sen. Barry Goldwater
1981–84	Dr. Don C. Garrison	Sen. Barry Goldwater
1984–86	George D. Hardy	Sen. Barry Goldwater
1986–87	Eleanor P. Wynne	George D. Hardy
1987–89	James M. Keck	George D. Hardy
1989–93	Gerald V. Hasler	James M. Keck

AFA Units of the Year

YEAR	RECIPIENT(S)
1953	San Francisco Chapter (Calif.)
1954	Santa Monica Area Chapter (Calif.)
1955	San Fernando Valley Chapter (Calif.)
1956	Utah State AFA
1957	H. H. Arnold Chapter (N. Y.)
1958	San Diego Chapter (Calif.)
1959	Cleveland Chapter (Ohio)
1960	San Diego Chapter (Calif.)
1961	Chico Chapter (Calif.)
1962	Fort Worth Chapter (Tex.)
1963	Colin P. Kelly Chapter (N. Y.)
1964	Utah State AFA
1965	Idaho State AFA
1966	New York State AFA
1967	Utah State AFA
1968	Utah State AFA
1969	*(no presentation)*
1970	Georgia State AFA
1971	Middle Georgia Chapter (Ga.)
1972	Utah State AFA
1973	Langley Chapter (Va.)
1974	Texas State AFA
1975	Alamo Chapter (Tex.) and San Bernardino Area Chapter (Calif.)
1976	Scott Memorial Chapter (Ill.)
1977	Thomas B. McGuire, Jr., Chapter (N. J.)
1978	Thomas B. McGuire, Jr., Chapter (N. J.)
1979	General Robert F. Travis Chapter (Calif.)
1980	Central Oklahoma (Gerrity) Chapter (Okla.)
1981	Alamo Chapter (Tex.)
1982	Chicagoland-O'Hare Chapter (Ill.)
1983	Charles A. Lindbergh Chapter (Conn.)
1984	Scott Memorial Chapter (Ill.) and Colorado Springs/Lance Sijan Chapter (Colo.)
1985	Cape Canaveral Chapter (Fla.)
1986	Charles A. Lindbergh Chapter (Conn.)
1987	Carl Vinson Memorial Chapter (Ga.)
1988	General David C. Jones Chapter (N. D.)
1989	Thomas B. McGuire, Jr., Chapter (N. J.)
1990	General E. W. Rawings Chapter (Minn.)
1991	Paul Revere Chapter (Mass.)
1992	Central Florida Chapter (Fla.) and Langley Chapter (Va.)
1993	Green Valley Chapter (Ariz.)

LEAR ASTRONICS CORPORATION NAMED F-22's "MOST VALUABLE PLAYER"

Implementation of the Avionics Integrity Program, along with developments in surface mount manufacturing, recently led the USAF and Lockheed management to name Lear Astronics Corporation its "Most Valuable Player" on the F-22 Advanced Tactical Fighter program.

The March announcement adds to an impressive list of awards and firsts for the company in advanced electronic systems for military and commercial aircraft. Over the last four decades, Astronics has pioneered the field of automatic landing systems technology and set the standards for advances in electronic systems for both military and commercial aircraft. The company has produced over 32,000 systems for more than 70 different types of aircraft. Its extensive background in the application of a wide range of technologies includes simple flight controls as well as complex Fly-By-Wire (FBW) systems.

Fifteen years ago, Astronics installed the first four-axis FBW system in a UHC-1 used as a NASA flight research tool. To date, the company has delivered over 2500 FBW computers for the F-16, the first production FBW aircraft, with over two and a half million operating hours logged. Astronics has contracts to supply equipment for the world's newest FBW aircraft including the Boeing 777 and the RAH-66 Comanche as well as the F-22.

Astronics has more active FBW experience than any other flight control developer. Its manufacturing facility has leading-edge capability in surface mount technology, flex circuits and statistical process controls aimed at enhancing product quality. Astronics engineering is a resource for solving problems creatively, using the latest tools and technology to help skilled people meet exacting standards and demanding schedules. Qualified to MIL-STD-1750 as demonstrated on the F-15E, F-111, F-117, B-2 and F-22 programs, the company is also fully qualified to strict MIL-STD-2000 requirements.

The first subcontractor to receive certification from General Dynamics for Statistical Process Control in 1991, Astronics also received a "Silver Supplier" rating from McDonnell Douglas in 1992, for excellence in multiple categories including quality, delivery and technical performance.

Contact Lori Miller at Corporate Headquarters, LEAR ASTRONICS CORPORATION, 3400 Airport Ave., Santa Monica, CA, USA 90406. TEL: 310-915-8185 FAX: 310-915-8384.

Lear Astronics Corporation was named "Most Valuable Player" on the F-22 program for its Avionics Integrity Program, as well as for delivery of a functional brassboard based on surface mount manufacturing techniques.

Lear Astronics Corporation designs and manufactures the actuator remote terminal for the USAF B-2 aircraft.

LEAR ASTRONICS

A HISTORY OF FIRSTS

- ***Awarded the Collier Trophy for the development of the world's first production autopilot for jet aircraft***
- ***First jet transport autopilot (KC-135)***
- ***First FAA-certified Category III (zero-zero visibility) flight control system with automatic landing (L-1011)***
- ***First commercial flight control system with automatic landing***
- ***First production Fly-By-Wire flight control system (F-16)***
- ***First commercial Fly-By-Wire actuator control electronics (B-777)***

Aerospace Education Foundation Fellows

The following is a listing of Individual Fellows who have become fellows since the last such listing in the September 1992 issue of this magazine.

Individual Jimmy Doolittle Fellows

(Listed in order of affiliation. Represents $1,000 contribution)

NAME	SPONSOR
1992	
R. Donald Anderson	Virginia State AFA
Russell A. Taylor	Paul Revere Chapter
Capt. William J. Cleckner, USAF	Air Force Ball of Mid-America
Col. Phillip Wayne Corbett, USAF	Air Force Ball of Mid-America
Mary R. Flanagan	Iron Gate Chapter
Lt. Gen. John E. Jaquish, USAF	Iron Gate Chapter
Col. Jay B. Welsh, USAF	Langley Chapter
James W. Plummer	The Aerospace Corp.
Lt. Gen. James R. Clapper, Jr., USAF	Iron Gate Chapter
1993	
SMSgt. Larry Brooks	Personal
Gen. Bernard A. Schriever, USAF (Ret.)	Central Florida Chapter
Tom Eden *(in memoriam)*	Albuquerque Chapter
George E. Nicklaus *(in memoriam)*	Chicagoland-O'Hare Chapter
Lt. Gen. Malcolm B. Armstrong, USAF	Iron Gate Chapter
Doris Renninger-Brell	Iron Gate Chapter
Men and women of the 30th Space Wing	Robert H. Goddard Chapter
Maj. Jack Weatherford, USAF (Ret.)	Air Force Ball of Mid-America
Robert Hardy *(in memoriam)*	Air Force Ball of Mid-America
Nuel Sanders	Ogden Chapter
Ethel M. Mattson	Thomas B. McGuire, Jr., Chapter
William W. Michael	Pope Chapter

Individual Ira C. Eaker Fellows

(Listed in order of affiliation. Represents $1,000 contribution)

NAME	SPONSOR
1992	
Donald Schwartz	Nevada State AFA and the Thunderbird and Dale O. Smith Chapters
Magna Group N. A.	Air Force Ball of Mid-America
Chester A. Curnane	Air Force Ball of Mid-America
Thomas M. Churan	Central Florida Chapter
1993	
Brewster H. Shaw, Jr.	Cape Canaveral Chapter
Embry-Riddle Aeronautical University	Central Florida Chapter
Greater Orlando Aviation Authority	Central Florida Chapter
Maj. Gen. John J. Closner III, USAF	Iron Gate Chapter
Maj. Gen. Philip G. Killey, USAF	Iron Gate Chapter
CMSAF Gary R. Pfingston	Iron Gate Chapter
Lt. Gen. Stephen B. Croker, USAF	Seattle Chapter
Lt. Col. Gayle K. McDonough, USA (Ret.)	Air Force Ball of Mid-America
CMSgt. William Warren, USAF (Ret.)	Air Force Ball of Mid-America
George Peterson	Nevada State AFA and the Thunderbird and Dale O. Smith Chapters
Roy Denney	Riverside Chapter

Barry Goldwater Fellows

(Listed in order of affiliation. Represents $5,000 contribution)

NAME	SPONSOR
1992	
Lt. Col. Marjorie O. Hunt, USAF *(in memoriam)*	Personal
Hon. Verne Orr	Los Angeles Air Force Ball
1993	
Gen. John Michael Loh, USAF	Langley Chapter

Aerospace Education Foundation 1992–93 AFJROTC Contest Winners

Subject: Our Best Community Service Project

First-Place Winner ($1,000)
Coatesville Area High School, Coatesville, Pa.

Second-Place Winner ($750)
Bay High School, Panama City, Fla.

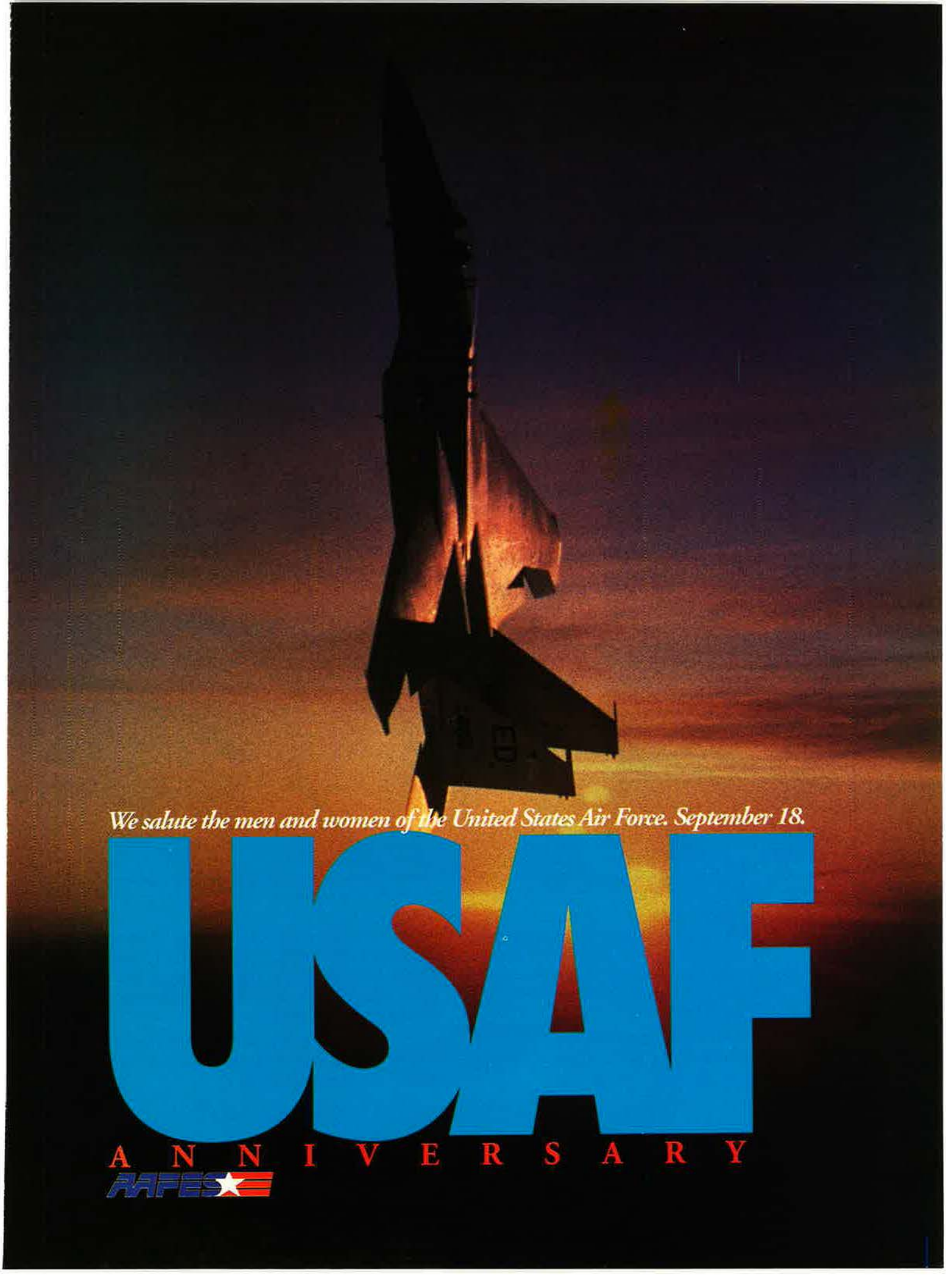
Third-Place Winner ($500)
Satellite High School, Satellite Beach, Fla.

Honorable Mention
Del Campo High School, Fair Oaks, Calif.
Pensacola High School, Pensacola, Fla.
Eau Gallie High School, Melbourne, Fla.
Northeast High School, Oakland Park, Fla.
Kailua High School, Kailua, Hawaii
North High School, Fargo, N. D.
Central Mid High School, Edmond, Okla.
McDowell Senior High School, Erie, Pa.
Lexington High School, Lexington, S. C.
Cooper High School, Abilene, Tex.

W. Stuart Symington Award Recipients

Since 1986, AFA's highest honor to a civilian in the field of National Security has been the W. Stuart Symington Award. The award, presented annually, is named for the first Secretary of the Air Force.

YEAR	RECIPIENT
1986	Hon. Caspar W. Weinberger, Secretary of Defense
1987	Hon. Edward C. Aldridge, Jr., Secretary of the Air Force
1988	Hon. George P. Schultz, Secretary of State
1989	Hon. Ronald W. Reagan, former President of the United States
1990	Hon. John J. Welch, Assistant Secretary of the Air Force (Acquisition)
1991	Hon. George Bush, President of the United States
1992	Hon. Donald B. Rice, Secretary of the Air Force
1993	Sen. John R. McCain (R-Ariz.)


We salute the men and women of the United States Air Force. September 18.
USAF
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-Tom Landry

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H. H. Arnold Award Recipients

Until 1986, AFA's highest Aerospace Award was the H. H. Arnold Award. Named for the World War II leader of the Army Air Forces, it is presented annually in recognition of the most outstanding contributions in the field of aerospace activity. In 1986, the Arnold Award was redesignated AFA's highest honor to a member of the armed forces in the field of National Security. It continues to be presented annually.

YEAR	RECIPIENT(S)
1948	Hon. W. Stuart Symington, Secretary of the Air Force
1949	Maj. Gen. William H. Tunner and the men of the Berlin Airlift
1950	Airmen of the United Nations in the Far East
1951	Gen. Curtis E. LeMay and the personnel of Strategic Air Command
1952	Sens. Lyndon B. Johnson and Joseph C. O'Mahoney
1953	Gen. Hoyt S. Vandenberg, former Chief of Staff, USAF
1954	Hon. John Foster Dulles, Secretary of State
1955	Gen. Nathan F. Twining, Chief of Staff, USAF
1956	Sen. W. Stuart Symington
1957	Edward P. Curtis, Special Assistant to the President
1958	Maj. Gen. Bernard A. Schriever, Commander, Ballistic Missile Division, ARDC
1959	Gen. Thomas S. Power, Commander in Chief, Strategic Air Command
1960	Gen. Thomas D. White, Chief of Staff, USAF
1961	Hon. Lyle S. Garlock, Assistant Secretary of the Air Force
1962	Dr. A. C. Dickieson and John R. Pierce, Bell Telephone Laboratories
1963	The 363d Tactical Reconnaissance Wing, TAC, and the 4080th Strategic Wing, SAC
1964	Gen. Curtis E. LeMay, Chief of Staff, USAF
1965	The 2d Air Division, PACAF
1966	The 8th, 12th, 355th, 366th, and 388th Tactical Fighter Wings and the 432d and 460th Tactical Reconnaissance Wings
1967	Gen. William W. Momyer, Commander, Seventh Air Force, PACAF
1968	Col. Frank Borman, USAF; Capt. James Lovell, USN; and Lt. Col. William Anders, USAF, Apollo 8 crew
1969	*(No presentation)*
1970	Apollo 11 team (J. L. Atwood; Lt. Gen. Samuel C. Phillips, USAF; and Astronauts Neil Armstrong, Col. Edwin E. Aldrin, Jr., USAF, and Col. Michael Collins, USAF)
1971	Dr. John S. Foster, Jr., Director of Defense Research and Engineering
1972	Air Units of the Allied Forces in southeast Asia (Air Force, Navy, Army, Marine Corps, and the Vietnamese Air Force)
1973	Gen. John D. Ryan, USAF (Ret.), former Chief of Staff, USAF
1974	Gen. George S. Brown, USAF, Chairman, Joint Chiefs of Staff
1975	Hon. James R. Schlesinger, Secretary of Defense
1976	Sen. Barry M. Goldwater
1977	Sen. Howard W. Cannon
1978	Gen. Alexander M. Haig, Jr., USA, Supreme Allied Commander, Europe
1979	Sen. John C. Stennis
1980	Gen. Richard H. Ellis, USAF, Commander in Chief, Strategic Air Command
1981	Gen. David C. Jones, USAF, Chairman, Joint Chiefs of Staff
1982	Gen. Lew Allen, Jr., USAF (Ret.), former Chief of Staff, USAF
1983	Ronald W. Reagan, President of the United States
1984	The President's Commission on Strategic Forces (the Scowcroft Commission)
1985	Gen. Bernard W. Rogers, USA, Supreme Allied Commander, Europe
1986	Gen. Charles A. Gabriel, USAF (Ret.), former Chief of Staff, USAF
1987	Adm. William J. Crowe, Jr., USN, Chairman, Joint Chiefs of Staff
1988	The men and women of the GLCM team
1989	Gen. Larry D. Welch, Chief of Staff, USAF
1990	Gen. John T. Chain, Commander in Chief, Strategic Air Command
1991	Lt. Gen. Charles A. Horner, Commander, US Central Command Air Forces and 9th Air Force
1992	Gen. Colin L. Powell, USA, Chairman, Joint Chiefs of Staff
1993	Gen. Merrill A. McPeak, Chief of Staff, USAF

AFA "Man of the Year" Award Recipients

State names refer to winner's home state at the time of the award.

YEAR	RECIPIENT(S)
1953	Julian B. Rosenthal (N. Y.)
1954	George A. Anderl (Ill.)
1955	Arthur C. Storz (Neb.)
1956	Thos. F. Stack (Calif.)
1957	George D. Hardy (Md.)
1958	Jack B. Gross (Pa.)
1959	Carl J. Long (Pa.)
1960	O. Donald Olson (Colo.)
1961	Robert P. Stewart (Utah)
1962	*(no presentation)*
1963	N. W. DeBenardinis (La.) and Joe L. Shosid (Tex.)
1964	Maxwell A. Kriendler (N. Y.)
1965	Milton Caniff (N. Y.)
1966	William W. Spruance (Del.)
1967	Sam E. Keith, Jr. (Tex.)
1968	Marjorie O. Hunt (Mich.)
1969	*(no presentation)*
1970	Lester C. Curl (Fla.)
1971	Paul W. Gaillard (Neb.)
1972	J. Raymond Bell (N. Y.) and Martin H. Harris (Fla.)
1973	Joe Higgins (Calif.)
1974	Howard T. Markey (D. C.)
1975	Martin M. Ostrow (Calif.)
1976	Victor R. Kregel (Tex.)
1977	Edward A. Stearn (Calif.)
1978	William J. Demas (N. J.)
1979	Alexander C. Field, Jr. (Ill.)
1980	David C. Noerr (Calif.)
1981	Daniel F. Callahan (Fla.)
1982	Thomas W. Anthony (Md.)
1983	Richard H. Becker (Ill.)
1984	Earl D. Clark, Jr. (Kan.)
1985	George H. Chabbott (Del.) and Hugh L. Enyart (Ill.)
1986	John P. E. Kruse (N. J.)
1987	Jack K. Westbrook (Tenn.)
1988	Charles G. Durazo (Va.)
1989	O. R. Crawford (Tex.)
1990	Cecil H. Hopper (Ohio)
1991	George M. Douglas (Colo.)
1992	Jack C. Price (Utah)
1993	Lt. Col. James G. Clark (D. C.)

Christa McAuliffe Memorial Award Winners

YEAR	RECIPIENT	SPONSOR
1986	Allen T. King	Fort Wayne–Baer Field Chapter, Ind.
1987	Betty Ann Mosen	Sacramento Chapter, Calif.
1988	John W. Barainca	Salt Lake Chapter, Utah
1989	Dr. Ben P. Millspaugh	Mile High Chapter, Colo.
1990	Sue Ellen Darnell	Lexington Chapter, Ky.
1991	Melba Iris Harris	Mobile Chapter, Ala.
1992	Arthur I. Kimura	Hawaii Chapter, Hawaii
1993	Dr. Joseph E. Ciotti	Hawaii State AFA

Sam E. Keith Aerospace Education Award of Excellence

YEAR	RECIPIENT	SPONSOR
1991	Jule Zumwalt	Sacramento Chapter, Calif.
1992	Col. Kenneth O. Wofford, USAF (Ret.)	General E. W. Rawlings Chapter, Minn.
1993	Pope Chapter	Pope Chapter, N. C.

John R. Alison Award Recipients

Established in 1992, the John R. Alison Award is AFA's highest honor for industrial leadership.

1992	Norman R. Augustine, Chairman, Martin Marietta Corp.
1993	Daniel M. Tellep, Chairman and Chief Executive Officer, Lockheed Corp.

AFA's Regions, States, and Chapters

The figures on the right indicate the number of affiliated members as of June 30, 1993. Listed below the name of each region is the National Vice President for that region.

CENTRAL EAST REGION	**15,481**
Mary Anne Thompson	
Delaware	**1,012**
Blue Hen	57
Delaware Galaxy	706
Diamond State	123
Henlopen Area	38
University	42
Wilmington	46
District of Columbia	**1,238**
Nation's Capital	1,238
Maryland	**3,212**
Baltimore*	920
Central Maryland	458
College Park Airport	118
Thomas W. Anthony	1,716
Virginia	**9,690**
Danville	49
Donald W. Steele, Sr., Memorial	4,096
Gen. Charles A. Gabriel	879
Jack Manch	110
Langley	3,059
Leigh Wade	116
Lynchburg	118
Northern Shenandoah Valley	52
Richmond	432
Roanoke	297
Tidewater	334
William A. Jones III	148
West Virginia	**329**
Chuck Yeager	329
FAR WEST REGION	**30,630**
H. A. Strack	
Arizona	**5,599**
Barry Goldwater	208
Cochise	116
Frank Luke	1,335
Green Valley	378
Phoenix Sky Harbor	1,240
Prescott	142
Tucson	2,180
California	**20,893**
Antelope Valley	870
Bakersfield	82
David J. Price/Beale	732
Fresno*	484
General B. A. Schriever Los Angeles	1,308
General Doolittle Los Angeles Area*	2,204
General Robert F. Travis	1,842
Golden Gate*	758
High Desert	361
Maj. Gen. Charles I. Bennett, Jr.	809
Monterey Bay Area	301
Orange County/Gen. Curtis E. LeMay	1,218
Pasadena Area	470
Redwood Empire	409
Riverside County	1,296
Robert H. Goddard	1,088
Sacramento	2,552
San Bernardino Area	1,466
San Diego	1,164
Tennessee Ernie Ford	1,178
Ventura County	301
Guam	**309**
Guam–Arc Light	309
Hawaii	**1,455**
Hawaii*	1,424
Maui	31
Nevada	**2,374**
Dale O. Smith	462
Thunderbird	1,912
GREAT LAKES REGION	**19,361**
Harold F. Henneke	
Illinois	**4,925**
Chicagoland-O'Hare	1,220
Greater Rockford	72
Illini	430
Land of Lincoln	227
Quad Cities	127
Richard E. Carver	87
Scott Memorial	2,229
West Suburban	433
Indiana	**2,020**
Central Indiana	453
Columbus-Bakalar	42
Falls Cities	51
Fort Wayne–Baer Field Area	94
Grissom Memorial	448
Gus Grissom	62
Lawrence D. Bell Museum	51
Lester W. Johnston	34
P-47 Memorial	58
South Bend	286
Southern Indiana	145
Terre Haute–Wabash Valley	96
Kentucky	**812**
Gen. Russell E. Dougherty	470
Lexington	242
West Kentucky	100
Michigan	**2,952**
Battle Creek	296
Hoyt S. Vandenberg	395
Huron	202
James H. Straubel	571
Kalamazoo	249
Lake Superior Northland	608
Lloyd R. Leavitt, Jr.	153
Mid-Michigan	86
Mount Clemens	308
PE-TO-SE-GA	84
Ohio	**7,349**
Buckeye Skypower	240
Capt. Eddie Rickenbacker Memorial*	706
Cleveland	497
Frank P. Lahm	315
Mid-Ohio	277
Steel Valley	212
Wright Memorial*	5,102
Wisconsin	**1,303**
Badger State	252
Billy Mitchell	712
Madison	339
MIDWEST REGION	**7,579**
Earl D. Clark, Jr.	
Iowa	**764**
All-Iowa	396
Gen. Charles A. Horner	122
Lancer	57
Richard D. Kisling	189
Kansas	**1,355**
Contrails	61
Lt. Erwin R. Bleckley	853
Topeka	441
Missouri	**2,295**
Central Missouri	520
Harry S. Truman	558
Ozark	221
Spirit of St. Louis	996

*These chapters were chartered prior to December 31, 1948, and are considered original charter chapters; the Major John S. Southrey Chapter of Massachusetts was formerly the Chicopee Chapter.

Nebraska	**3,165**
Ak-Sar-Ben	2,883
Lincoln	282
NEW ENGLAND REGION	**6,580**
Robert N. McChesney	
Connecticut	**1,236**
Central Connecticut	173
Charles A. Lindbergh	176
First Connecticut	193
Flying Yankees	174
General Bennie L. Davis	69
General George C. Kenney	84
Igor Sikorsky	134
Northern Connecticut	179
Sergeant Charlton Heston	54
Maine	**691**
Eastern Maine	219
Major Charles J. Loring, Jr.	325
Southern Maine	147
Massachusetts	**3,265**
Boston	257
Laurence G. Hanscom	262
Major John S. Southrey*	285
Minuteman	318
Otis	197
Paul Revere	1,343
Pioneer Valley	214
Taunton	189
Worcester*	200
New Hampshire	**894**
Amoskeag	320
Pease	574
Rhode Island	**248**
Metro Rhode Island	248
Vermont	**246**
Burlington	246
NORTH CENTRAL REGION	**3,489**
Doyle E. Larson	
Minnesota	**1,309**
General E. W. Rawlings	1,044
Richard I. Bong	265
North Dakota	**1,160**
General David C. Jones	486
Happy Hooligan	176
Red River Valley	498
South Dakota	**1,020**
Dacotah	274
Rushmore	746
NORTHEAST REGION	**12,541**
Eugene B. Goldenberg	
New Jersey	**3,680**
Admiral Charles E. Rosendahl	157
Aerospace Founders	55
Atlantic City Area	192
Brig. Gen. Frederick W. Castle	192
Garden State	19
Hangar One	170
High Point	90
Hudson*	91
John Currie Memorial	45
Mercer County	238
New Jersey Public Affairs	29
Passaic-Bergen*	260
Sal Capriglione	120
Teterboro-Bendix	37
Thomas B. McGuire, Jr.	1,433
Tri-County	71
Union Morris	414
Wings	67
New York	**5,015**
Albany–Hudson Valley*	434
Brooklyn "Key"	367
Chautauqua	76
Colin P. Kelly	775
Forrest L. Vosler	313
General Daniel "Chappie" James, Jr., Memorial	139
Genesee Valley	292
H. H. Arnold	290
Iron Gate	255
Lawrence D. Bell–Niagara Frontier	512
Lloyd Schloen–Empire	43
Nassau Mitchel	290
Plattsburgh	328
Queens	256
Suffolk County	194
Thomas Watson, Sr., Memorial	198
Westchester Falcon	253
Pennsylvania	**3,846**
Altoona	80
Beaver Valley	104
Brandywine	172
Bucks County	19
Colonel Stuart E. Kane, Jr.	165
Eagle	85
Erie	115
Freedom	378
Greater Pittsburgh*	490
Joe Walker–Mon Valley	139
Lehigh Valley	280
Lt. Col. B. D. "Buzz" Wagner	122
Metropolitan Philadelphia*	388
Mifflin County*	123
Olmsted	398
Pocono Northeast	210
Steel Valley	96
Total Force	213
York-Lancaster	269
NORTHWEST REGION	**8,551**
John Lee	
Alaska	**1,602**
Anchorage	1,129
Fairbanks Midnight Sun	473
Idaho	**870**
Boise Valley	559
Magic Valley	95
Snake River Valley	216
Montana	**749**
Big Sky	648
Bozeman	101
Oregon	**1,313**
Eugene	315
Klamath Basin	144
Portland*	854
Washington	**4,017**
Greater Seattle	1,335
Inland Empire	1,043
Tacoma	1,639
ROCKY MOUNTAIN REGION	**9,127**
Nuel E. Sanders	
Colorado	**5,960**
Colorado Springs/Lance Sijan	3,401
Flatirons	216
General Robert E. Huyser	114
Long's Peak	232
Mel Harmon	128
Mile High	1,869
Utah	**2,501**
Ogden	770
Rocky Mountain	436
Salt Lake City	503
Ute	569
Wasatch	223
Wyoming	**666**
Cheyenne Cowboy	666
SOUTH CENTRAL REGION	**10,811**
Bud Walters	
Alabama	**3,029**
Birmingham	414
Gadsden	38
Mobile	360
Montgomery	1,871
Tennessee Valley	346
Arkansas	**1,655**
David D. Terry, Jr.	1,218
Fort Smith	87
General Ira C. Eaker	140
Ouachita	51
Razorback	159
Louisiana	**2,179**
Alexandria	176
Ark-La-Tex	1,226
Baton Rouge	272
Greater New Orleans Area	505
Mississippi	**1,902**
Golden Triangle	526
Jackson	202
John C. Stennis	1,174
Tennessee	**2,046**
Chattanooga	133
Everett R. Cook	466
General Bruce K. Holloway	550
H. H. Arnold Memorial	332
Lt. Gen. Frank Maxwell Andrews	565
SOUTHEAST REGION	**26,138**
Stanley V. Hood	
Florida	**13,784**
Cape Canaveral	1,580
Central Florida	1,325
Citrus Belt	157
Eglin	2,881
Falcon	363
Florida Gulf Coast	297
Florida Highlands	155
Gainesville	159
General James R. McCarthy	314
General Nathan F. Twining	525
Gold Coast	464
Hurlburt	181
Indian River	115
Jerry Waterman	1,292
John C. Meyer	222
John W. DeMilly, Jr.	259
Miami	417
Morgan S. Tyler	249
Ocala	114
On Wings of Eagles	160
Panama City	1,301
Peace River	125
Southwest Florida	266
Spacecoast	92

St. Augustine	56
Tallahassee	277
West Palm Beach	438
Georgia	**5,133**
Athens	153
Atlanta	650
Carl Vinson Memorial	2,518
Chatahoochee Valley	89
Coosa Valley	63
Dobbins	855
Savannah	236
South Georgia	513
Southeast Georgia	56
North Carolina	**3,884**
Blue Ridge	259
Cape Fear	134
Eastern Carolina	81
First in Flight	50
Foothills	73
Kitty Hawk	74
Piedmont	392
Pope	1,008
Roanoke Valley	37
Scott Berkeley	1,054
Tarheel	449
Triad	273
Puerto Rico	**198**
San Juan	198
South Carolina	**3,139**
Charleston	993
Columbia	499
Ladewig–Shine Memorial	281
Strom Thurmond	338
Swamp Fox	1,028
SOUTHWEST REGION	**27,562**
Bob Cantu	
New Mexico	**3,190**
Albuquerque	1,664
Fran Parker	799
Llano Estacado	727
Oklahoma	**4,939**
Altus	731
Central Oklahoma (Gerrity)	2,857
Enid	874
Tulsa	477
Texas	**19,433**
Abilene	754
Aggieland	189
Alamo	7,084
Austin	1,585
Concho	517
Corpus Christi	152
Dallas	1,255
Del Rio	442
Denton	286
Fort Worth	2,657
Ghost Squadron	152
Heart of the Hills	176
Lee Glasgow–Waco	279
Lubbock	605
Northeast Texas	341
Panhandle	175
Paso Del Norte	212
Permian Basin	137
San Jacinto	1,362
Wichita Falls	1,073

AFA's National Presidents


James H. Doolittle (1946–47)


Thomas G. Lanphier, Jr. (1947–48)


C. R. Smith (1948–49)


Robert S. Johnson (1949–51)


Harold C. Stuart (1951–52)


Arthur F. Kelly (1952–53)


George C. Kenney (1953–54)


John R. Alison, Jr. (1954–55)


Gill Robb Wilson (1955–56)


John P. Henebry (1956–57)


Peter J. Schenk (1957–59)


Howard T. Markey (1959–60)


Thos. F. Stack (1960–61)


Joe Foss (1961–62)


John B. Montgomery (1962–63)


W. R. Lovelace II (1963–64)


Jess Larson (1964–67)


Robert W. Smart (1967–69)


George D. Hardy (1969–71)


Martin M. Ostrow (1971–73)


Joe L. Shosd (1973–75)


George M. Douglas (1975–77)


Gerald V. Hasler (1977–79)


Victor R. Kregel (1979–81)


John G. Brosky (1981–82)


David L. Blankenship (1982–84)


Martin H. Harris (1984–86)


Sam E. Keith, Jr. (1986–88)


Jack C. Price (1988–90)


O. R. Crawford (1990–92)


James M. McCoy (1992–93)

AFA's Board Chairmen

Pictured are Chairmen who never served as National President.


Edward P. Curtis (1946–47)


Carl A. Spaatz (1950–51)


James M. Trail (1958–59)


Julian B. Rosenthal (1959–60)


Jack B. Gross (1963–64)


Daniel F. Callahan (1979–81)


Edward A. Stearn (1985–86)

AFA's First National Officers and Board of Directors

This panel of officers and directors acted temporarily until a representative group was democratically elected by membership at the first National Convention.

OFFICERS

President James H. Doolittle
First Vice President Edward P. Curtis
Second Vice President Meryll Frost
Third Vice President Thomas G. Lanphier, Jr.
Secretary Sol A. Rosenblatt
Assistant Secretary Julian B. Rosenthal
Treasurer W. Deering Howe
Executive Director Willis S. Fitch

BOARD OF DIRECTORS

John S. Allard, H. M. Baldridge, William H. Carter, Everett Cook
Burton E. Donaghy, James H. Douglas, Jr., G. Stuart Kenney, Reiland Quinn
Rufus Rand, Earl Sneed, James M. Stewart, Forrest Vosler
Benjamin F. Warmer, Lowell P. Weicker, C. V. Whitney, J. H. Whitney

Unit Reunions

F-4 Phantom II Society
The F-4 Phantom II Society will hold a thirty-fifth-anniversary reunion October 21–24, 1993, in Birmingham, Ala. **Contact:** Jan Jacobs, P.O. Box 900174, San Diego, CA 92190-0174. Phone: (619) 689-9227.

2d Air Division Ass'n
The 2d Air Division will hold a fiftieth-anniversary reunion November 5, 1993, in Hilton Head, S. C. Veterans from all bomb groups of the 8th Air Force who participated in bombing missions of Norway on November 16–18, 1943, are invited. **Contact:** Forrest S. Clark, 703 Duffer Ln., Kissimmee, FL 34759. Phone: (813) 427-0371.

6th Bomb Group
Veterans of the 6th Bomb Group who served on Tinian in 1944–45 will hold a reunion October 14–17, 1993, in Grand Island, Neb. **Contact:** Mel Simpson, 3520 Poplar Pl., Lincoln, NE 68506. Phone: (402) 489-5311.

33d Photorecon Squadron
Veterans of the 33d Photoreconnaissance Squadron, 9th Air Force (World War II), will hold a reunion September 24–27, 1993, in San Antonio, Tex. **Contact:** Walter Olick, 613 Columbine, Sterling, CO 80751. Phone: (303) 522-3924.

Class 45-A
Members of Pilot Class 45-A (Moody Field, Ga.) will hold a reunion October 7–10, 1993, in Cocoa Beach, Fla. **Contact:** Edmund R. Galli, 108 Putney Ln., Malvern, PA 19355. Phone: (215) 296-2499.

51st Troop Carrier Wing
Veterans of the 51st Troop Carrier Wing and Headquarters Squadron are planning to hold a reunion September 16–19, 1993, at the Sheraton-Poste Inn in Cherry Hill, N. J. **Contact:** Lee E. Mittleman, 26 Regency Manor Dr., #4, New Brunswick, NJ 08901. Phone: (908) 846-8797.

Unit Reunions

57th Fighter Group
Veterans of the 57th Fighter Group (World War II) will hold a reunion October 4–7, 1993, in San Antonio, Tex. **Contact:** A. B. Nickels, P. O. Box 791431, San Antonio, TX 78279. Phone: (210) 344-5788.

Class 60-C
Members of Pilot Class 60-C (Greenville, Miss.) will hold a reunion in conjunction with open house at the former Greenville AFB on October 15–17, 1993. **Contact:** Brig. Gen. James W. Hart, Jr., AFRES, 1106 Meadowlark Ln., Sugar Land, TX 77478-3477. Phone: (713) 627-4900.

Readers wishing to submit reunion notices to "Unit Reunions" should mail their notices well in advance of the event to "Unit Reunions," AIR FORCE Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Please designate the unit holding the reunion, time, location, and a contact for more information.

64th Fighter-Interceptor Squadron Ass'n
Members of the 64th Fighter-Interceptor Squadron will hold a reunion October 8–10, 1993, in San Antonio, Tex. **Contact:** Lt. Col. J. Wally Leland, USAF (Ret.), 1110 Grey Oak, San Antonio, TX 78213-2015. Phone: (210) 341-6384.

86th Fighter-Bomber Wing
Veterans of the 86th Fighter-Bomber Wing who served in Germany will hold a reunion September 20–23, 1993, in San Antonio, Tex. **Contact:** A. B. Nickels, P. O. Box 791431, San Antonio, TX 78279. Phone: (210) 344-5788.

86th Fighter-Interceptor Squadron
Veterans of the 86th Fighter-Interceptor Squadron, 79th Fighter Group (Youngstown Municipal Airport, Ohio), will hold a reunion September 17–19, 1993, at the Union Plaza Hotel in Las Vegas, Nev. **Contact:** Ronald E. Meinert, 8725 Vander Stel, Newaygo, MI 49337. Phone: (616) 652-1774.

302d Tactical Recon Squadron
Veterans of the 302d Tactical Reconnaissance Squadron will hold a reunion September 30, 1993, in Colorado Springs, Colo. **Contacts:** Lt. Col. Roger Wilkes, USAF (Ret.), 1240 W. 1700 South, Salt Lake City, UT 84104. Phone: (801) 977-8264. Bud Wasserott, 7480 Vincent Dr., Colorado Springs, CO 80920. Phone: (719) 598-8145.

306th Bomb Wing
Members of the 306th Bomb Wing (McCoy AFB, Fla.) will hold a reunion November 3–7, 1993, in Melbourne Beach, Fla. **Contact:** Lt. Col. Joseph Demes, USAF (Ret.), 1585 Mercury St., Merritt Island, FL 32953. Phone: (407) 452-4417.

507th Fighter Group
Veterans of the 507th Fighter Group (World War II), which included the 463d and 464th Fighter Squadrons and Headquarters Detachment, will hold a reunion October 15–17, 1993, in Oklahoma City, Okla. **Contact:** James H. Mosbey, Jr., P. O. Box 163, Watkinsville, GA 30677. Phone: (706) 769-6236.

528th Fighter Squadron
The 528th Fighter Squadron, 311th Fighter Group (1943–45), will hold a fiftieth-anniversary reunion September 16–20, 1993, in Reno, Nev. **Contact:** Malcolm Rountree, P. O. Box 8414, Incline Village, NV 89452. Phone: (702) 832-2068.

Class 44-D
Seeking contact with members of Pilot Class 44-D (Luke Field, Ariz.) for the purpose of organizing a fiftieth-anniversary reunion. **Contact:** Harry D. Gandrup, 759 17th St., Nevada, IA 50201.

450th Air Service Group
Seeking contact with anyone with information about a reunion for the 450th Air Service Group (Brooks Field, Tex., 1946). **Contact:** John W. Sherwood, 2908 Harlanwood Dr., Fort Worth, TX 76109. ■

Bulletin Board

Seeking contact with **former SAC wing commanders** at Wurtsmith AFB, Mich., which closes this year. I am putting together photos and remembrances. I am also seeking information on **Gen. Curtis E. LeMay. Contact:** Andrew S. Biscoe, 1504 Coeur d'Alene Ave., Coeur d'Alene, ID 83814.

Seeking the whereabouts of **Lt. Curtis E. Taylor,** bombardier on a B-24 Liberator during World War II. He served with 8th Air Force in England and 15th Air Force in Italy in 1944. He later served at Chanute Field, Ill., F. E. Warren AFB, Wyo., and Parks AFB, Calif., and flew B-26s in the Philippines. He was born December 1, 1921, in South Bend, Ind. His wife's name is Irma Jean. **Contact:** Theodore Elman, 1111 University Blvd., W., Silver Spring, MD 20902.

Seeking contact with **Sgt. Robert Adams, MSgt. Ray E. Lee,** and **Sergeants Hollowell** and **Lane,** all of whom were stationed at RAF Sturgate, England, from 1954 to 1956. **Contact:** Ron Whitfield, c/o Ray A. Gaskins, H. S. Box 311, Hampden-Sydney, VA 23943-0311.

Author seeks anecdotes, photos, and other information from B-26 personnel stationed with the **3d, 17th,** or **452d Bomb Wings** during the Korean War. **Contact:** John Horne, 8/4 Chalmers St., Belmore, N. S. W. 2192, Australia.

Seeking information or photos from former members of **8th Air Force** to help stage realistic reenactments. **Contact:** Randy Saboosky, 10 Glenview Ave., Oil City, PA 16301.

Seeking information on the following crew members who flew on the aircraft *Spare Parts* in 1943–44: **Peter Bartkus** (last known address was Lowell, Mass.), **Frank Hazzard** (last known address Chicago, Ill.), **John Higgins** (last known address New York, N. Y.), **Paul Simpson** (last known address Detroit, Mich.), and **Elbert Will-**

iams (last known address Kansas City, Mo.). **Contact:** Kenneth L. Zeiger, 1535 Folkstone Ct., Mishawaka, IN 46544-5831.

Seeking contact with **Roy Buckland,** who was based with the 7100th Security Police Squadron, Wiesbaden, West Germany, from 1952 to 1955. **Contact:** Walter Nicholson, 1005-B Drummond Dr., Nashville, TN 37211.

Seeking information on **Walter J. Zelinski,** from Scranton, Pa., who was in 8th Air Force during World War II. He served in Germany from 1949 to 1952, and at either Fort Sill, Okla., or Fort Hood, Tex., after that. **Contact:** John M. Rizzo, 15631 King Pl., Lynnwood, WA 98037-2627.

Seeking information on **"Slick" Allison, Herbie Cohen,** and **"Mouse" Morris,** who were radar navigator bombardiers with Shellbank BOQ at Langley Field, Va., in 1944–45. Allison hailed from McKees Rocks, Pa., Cohen from Lawrence, Mass., and Morris may have been from Kentucky. **Contact:** Harry W. Sandberg, P. O. Box 166, Linden, CA 95236.

Seeking contact with crew members of the ***Lucky,*** a B-24 with the 93d Bomb Group in World War II. The crew participated in the August 1, 1943, raid over Ploesti, Romania. The *Lucky* eventually crash-landed in Sicily. Also interested in any planned commemoration of that raid or any planned group reunion. **Contact:** George L. Hastings, Jr., 3095 Madison Hill Ct., Alexandria, VA 22310.

Seeking photos, drawings, and information for a history of the **28th Aero** and **Bombardment Squadrons. Contacts:** Capt. R. Liebman, USAF, 384th BW, McConnell AFB, KS 67221. Lieutenant Atteberry, USAF, 28th BS, McConnell AFB, KS 67221.

Seeking contact with anyone who knew **Capt. Robert R. Hebert,** a B-29 pilot with the 372d Bomb Squadron, 307th Bomb Wing, Kadena AB, Japan, during the Korean War. His plane went down in January 1952. **Contact:** Michael R. Hebert, 4034 Danbury Dr., Champaign, IL 68121.

If you need information on an individual, unit, or aircraft, or if you want to collect, donate, or trade USAF-related items, write to "Bulletin Board," AIR FORCE Magazine, 1501 Lee Highway, Arlington, VA 22209-1198. Letters should be brief and typewritten; we reserve the right to condense them as necessary. We cannot acknowledge receipt of letters. Unsigned letters, items or services for sale or otherwise intended to bring in money, and photographs will not be used or returned.–THE EDITORS

Seeking contact with the man who is compiling the names (by class and location) of all **surviving World War II USAAF pilots** who graduated between 1942 and 1945. **Contact:** Robert A. Gibson, 1408 S. 6th St., Las Vegas, NV 89104-1627.

Seeking information on any personnel assigned to the **6993d Security Squadron,** Kelly AFB, Tex., between March 1972 and August 1975. **Contact:** Michael R. McCauley, 67 W. Van Buren St., Oswego, NY 13126.

Seeking several copies of ***The Look of Eagles,*** by Capt. John T. Godfrey. Will pay original cost plus shipping. **Contact:** Walter T. Prybyla, 29 Bentley St., Woonsocket, RI 02895.

Seeking information on novelist **Lawrence M. Weber,** who was stationed at RAF Molesworth, England, from 1953 to 1955. Among those who knew him there were 1st Lt. David R. Berzon, A2C Edmund S. Daher, TSgt. William R. Duggan, A2C Salvator J. Fidalio, 1st Lt. Richard E. Lewis, and A2C Charlie Ried. **Contact:** Ralph L. Fore, 1504 Louisiana St., Tallulah, LA 71282-5318.

Seeking information on **Sgt. Charles Billings,** formerly of Chandler, Okla. He was recalled from Korea in 1951 to Biggs Field, Tex., and he later served with FEAF. **Contact:** Capt. David F. Cook, AFRES, 1298 Scrub Oak, Boulder, CO 80303.

Collector seeks name tags from aviators of the **81st Tactical Fighter Squadron** at Hahn or Spangdahlem ABs in Germany. Also interested in name tags from aviators of the 10th TFS ("Fightin' Sabres") at Hahn. **Contact:** Martin Agüera, Goethestrasse 2, 55491 Büchenbeuren, Germany.

Collector wishes to trade **color slides** of military aircraft. **Contact:** Sükrü Alan, Ziya Gökalp cd., No. 31/15, Kizilay, Ankara 06420, Turkey.

Seeking information, history, memorabilia, photos, etc., from former B-17 crew members, flight-control personnel, and others stationed at **Ardmore AAB,** Okla., during World War II. **Contact:** Gabriel F. Aruffo, 106 Countryside Dr., Hackettstown, NJ 07840.

Seeking contact with former members of the **99th Air Refueling Squadron,** Westover AFB, Mass., 1964–73. Interested in photos of aircraft and crews. **Contact:** Robert J. Egloff, 99 Collins Ave., Chicopee, MA 01022.

Seeking contact with former members of the **302d Tactical Reconnaissance Squadron** who served at Shaw AFB, S. C., in 1952–53; Sembach AB, Germany, in 1953–58; and Laon AB, France, in 1958–59. **Contact:** Roger Wilkes, 1240 W. 1700 S., Salt Lake City, UT 84104.

Seeking information on **Lee Dennis** of Seattle, Wash., who was in USAAF Class 43-E. He may have flown B-17s and P-47s with 8th Air Force during World War II. **Contact:** J. E. Colson, 13030 Newbrook Dr., Houston, TX 77072.

Seeking information on **R. R. Delong, R. H. Dolan, Jr.,** and **C. A. Dubinski,** of Class 43-B, Moore Field, Tex. They were students of Lt. G. H. Howland, along with J. R. Dolny, R. L. Drew, and Enoch S. Duncan. All served in the 86th Fighter-Bomber Group. **Contact:** Enoch S. Duncan, 5157 Old Christoval Rd., San Angelo, TX 76904.

Author seeks contact with members of the **36th** and **803d Bomb Squadrons,** 8th Air Force, World War II, based at RAF Alconbury, Cheddington, and Oulton, England, in 1944–45. These units performed radar countermeasures using specially equipped B-24s and B-17s. Also interested in photos, records, diaries, and related information. **Contact:** Stephen M. Hutton, 4016 Old Sturbridge Dr., Apex, NC 27502-9799.

To compile a list of members for a possible reunion or association, seeking contact with members of the **623d Aircraft Control and Warning** and **2152d Communications Squadrons** who served during the Cold War. **Contact:** Larry E. Henry, 51628 Old Mill Rd., South Bend, IN 46637-1347.

Historian seeks photos of **509th Composite Group** aircraft taken on Tinian or after the group's return to Roswell AFB, N. M., to be shared with 509th CG personnel at their reunion. Photos will

Bulletin Board

be copied and returned. **Contact:** Robert Krauss, 366 E. Wagner Rd., Buchanan, MI 49107.

Seeking the whereabouts of **Lt. Philip Padulka,** a B-17 navigator with the 4th Bomb Squadron, 34th Bomb Group, 8th Air Force (World War II). He was stationed at Mendlesham, England, in 1944, and was shot down on a mission to Berlin October 6 of that year. His last known address was Chicago, Ill. **Contact:** Paul Perlongo, 5400 S. Walnut Pl., Downers Grove, IL 60515.

Seeking contact with the next of kin of **2d Lt. Dean Harvey, SSgt. William T. Karp, SSgt. Matthew Lazarowicz, Sgt. Louis N. Linhart,** and **SSgt. Raymond N. Reiss,** of the 427th Bomb Squadron, 303d Bomb Group. Their B-17 crashed on February 9, 1945, near Eisenberg, Germany. **Contact:** Uwe Benkel, 86th MWRS, PSC 01, Box 1805, APO AE 09009.

The **Bomber Airfield Society** is trying to acquire an original World War II airfield at which to recreate an authentic period air base. This base would be a living memorial to Allied air casualties. To receive further information, write to the following address. **Contact:** Peter Howard, 49 Southern Way, Wolverton, Milton Keynes MK12 5EH, England.

Author seeks data on and photos of the following aircraft for a book on the **10th Air Rescue Squadron** and **helicopter operations in Alaska:** the Sikorsky R-4B *Arctic Jitterbug* (#42-107243), tested at Ladd Field's Arctic Research Laboratory during 1943–44; Sikorsky H-19s (#52-4415, #52-7542, #52-7545, and #52-7546) of the 74th ARS during 1955–56; and the Lockheed F-80C and FT-429 rescued from the Alaskan bush by the 10th ARS. **Contact:** Dave Sternik, 12850 72d Ave. S., Seattle, WA 98178.

Seeking contact with members of the **61st Fighter Squadron,** from its activation at Selfridge Field, Mich., in May 1946 to the present. **Contact:** Capt. Larry Thompson, 925 Live Oak Terr. N. E., St. Petersburg, FL 33703.

Collector seeks **Military Payment Certificates** used in Vietnam from 1946 to 1975. **Contact:** Nick Schrier, Box 60104, Sacramento, CA 95860.

Seeking contact with members of the **50th Security Police Squadron,** Hahn AB, West Germany, from 1977 to 1979, particularly members of "Charlie Flight." **Contact:** Johnny "Hector" Lopez, P. O. Box 2053, Whittier, CA 90610.

Seeking information about the following men for a master's thesis on Gen. Bernard Schriever: **Lt. Gen. John B. Hudson, Maj. Roger H. Hebner,** and **Capts. David M. Fleming** and **Vernol L. Smith. Contact:** Capt. Scott D. Mattson, USAF, 1917 Kenmar Dr., Manhattan, KS 66502.

Seeking photos of the following **P-47s** flown by **John H. Payne, Jr.,** during the World War II Pacific campaign: the P-47D *Big Squaw,* with the 19th Fighter Squadron on Saipan; P-47D *Jack the Ripper,* 333d FS, Hawaii and Saipan; and P-47N *Icky and Me,* 333d FS, Ie Shima, Japan. Photos will be copied and returned. **Contact:** John E. Payne, 93 Pawnee Ave., Oakland, NJ 07436.

Seeking information about the **46th Supply Squadron,** 46th Air Depot Group, especially regarding records of the group and its reunions. **Contact:** Harry Kingsley, 689 Park Ln., Cedarhurst, NY 11516-1026.

Seeking information on **Capt. Jerry Hofmann,** bombardier with the 429th Bomb Squadron, 2d Bomb Group, in Amendola, Italy, from April 1944

until his death in 1945. **Contact:** Rob Hofmann, R. R. 1, Box 8282, Waterbury Center, VT 05677.

Collector seeks **USAF color patches** of flying units. Will exchange French Air Force patches. **Contact:** J. C. Cechetti, 53 rue du Cormier, 41200 Romorantin, France.

Seeking contact with anyone who knew **SSgt. Kenneth J. Moore,** a B-24 tailgunner with the 68th Bomb Squadron, 44th Bomb Group, at Shipdham, England, from March to July 1944. **Contact:** Glenn D. Moore, 1720-B Kent St., Roseville, CA 95661.

Seeking information on **2d Lt. Franklin E. Pate,** a P-38 pilot with the 71st Fighter Squadron, 1st Fighter Group, 15th Air Force, who was shot down May 17, 1944, near Modena, Italy. Also seeking contact with airmen of the **15th Air Force** for a book on World War II bombings of Modena. **Contact:** Carlo Mondani, Via Vivaldi 11, 41030 Bomporto (MO), Italy.

Seeking the whereabouts of **SSgt. Karen Ann Craig,** who served at Williams AFB, Ariz., RAF Bentwaters, UK, and Offutt AFB, Neb. (her last known location, 1986). She may have moved to California or Washington. **Contact:** MSgt. Bert D. Gardner, USAF (Ret.), 109 N. Sulleys Dr., Mesa, AZ 85205-8508.

Seeking the whereabouts of **Amn. Joseph Churella** and **MSgt. Rodman W. Nowers.** Churella was stationed at RAF Alconbury, England, and Langley AFB, Va., in the 1960s. Nowers was also stationed at Alconbury in the 1960s and later served at MacDill AFB, Fla., before going to Vietnam. **Contact:** Elizabeth DaSilva, 602 Jennings Ave., W. Hempstead, NY 11552.

Biographer seeks contact with anyone who served with **Maj. Merlyn Dethlefsen,** an F-105 pilot with the 354th Tactical Fighter Squadron at Takhli RTAFB, Thailand, in 1966–67. He was awarded the Medal of Honor. **Contact:** Phil Hickman, 1104 Crane Dr., Euless, TX 76039-2602.

Seeking contact with **Sgts. Urban Banas, Richard Hudson, Len Showalter,** and **Jim Whitall,** of the 58th Service Squadron, 376th Bomb Group, San Pancrazio, Italy, 1944–45. Also seeking contact with **Gerald Post,** also of the 58th, and later the 557th Service Squadron, 43d Service Group. They returned to the US on S. S. *Argentina* and later served at Sioux Falls, S. D. **Contact:** Floyd M. Black, 1356 Skyridge Dr. A, Crystal Lake, IL 60014-8933.

Collector seeks information on **silver PT boat chest insignia** issued to crew members of USAAF-operated boats. Need information about boat, its use, and verification of badge authenticity. **Contact:** Maj. James R. Chamberlain, USAF (Ret.), 1342 Oquaga Lake Rd., Deposit, NY 13754.

Seeking contact with **Thomas O'Connor** of the 602d Fighter Squadron, Nakhon Phanom RTAFB, Thailand, in 1968. **Contact:** Maj. Brian E. Powers, USAF, Hq. USEUCOM, Unit 30400, Box 636, APO 09128.

Historian seeks information about persons recruited by the **Clayton Knight Committee** to work with RCAF or RAF in 1939–42. **Contact:** Lt. Col. Robert E. Hays, Jr., USAF (Ret.), 9813 Brandywine Cir., Austin, TX 78750.

Seeking the whereabouts of **Capt. Norman L. McDonald,** a pilot with the 2d Air Defense Wing in North Africa in 1943. Theodore R. Sweetland belonged to his squadron. **Contact:** William E. Sweetland, 1251 Courtney Pl., Eugene, OR 97405.

Seeking information about **Capt. Perry Jefferson,** an intelligence officer killed in action with the Colorado ANG unit assigned to Phan Rang, South Vietnam, in 1968–69. **Contact:** Lt. Col. Manuel J. Bettencourt, USAF (Ret.), 1825 Summit Dr., Black Forest, CO 80921-2111.

Seeking contact with personnel assigned to **USAAF Engineer Fire Fighting Companies.** Interested in reunions and any records of these outfits. **Contact:** William L. Case, 2544 Glenn St., Bettendorf, IA 52722.

Seeking contact with members of **Pilot Class 1947-C** ("Guinea Pigs"), who trained at Randolph AFB, Tex. **Contact:** Bob Campion, Box 1712, Fulton, TX 78358.

Seeking contact with **Mark D. Davis,** who served at Whiteman AFB, Mo., in missile maintenance and job control. **Contacts:** TSgt. Jim Rossi, USAF, 115 Higganum Rd., Durham, CT 06422-3010. TSgt. Stuart Beck, USAF, 166 S. Cherry St., Poughkeepsie, NY 12601. ■

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Attained Age	High Option Plus	High Option	Standard Plan	Spouse	Each Child
20-24	$400,000	$300,000	$200,000	$50,000	$5,000
25-29	350,000	262,500	175,000	50,000	5,000
30-34	250,000	187,500	125,000	40,000	5,000
35-39	180,000	135,000	90,000	30,000	5,000
40-44	100,000	75,000	50,000	20,000	5,000
45-49	60,000	45,000	30,000	10,000	5,000
50-54	40,000	30,000	20,000	7,500	5,000
55-59	28,000	21,000	14,000	5,000	5,000
60-64	18,000	13,500	9,000	3,000	5,000
65-69	8,000	6,000	4,000	2,000	5,000
70-74	5,000	3,750	2,500	1,000	5,000
75-79	4,000	3,000	2,000	1,000	5,000
80-84	3,000	2,250	1,500	1,000	5,000

Eligibility. All members of the Air Force Association under age 55 are eligible to apply for this insurance. Once you're insured, you may retain this coverage until you reach age 85.

Effective Date of Coverage. All certificates are dated and take effect on the last day of the month in which the application for coverage is approved. AFA insurance coverage runs currently with AFA membership, and is written in conformity with the insurance regulations of the state of Minnesota.

Termination of Coverage. Other than your attaining age 85, your coverage can only be terminated if a) you are no longer an Air Force Association member in good standing, b) you do not pay your premium, or c) the AFA master policy is discontinued.

Exceptions & Limitations. Benefits for suicide or death as a result of intentionally self-inflicted injuries (while sane or insane) will not be effective until coverage has been in force for 12 months.

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To be completed by member:

Your name: _____
Last/First/Middle

Address: _____
Number and Street/City/State/Zip

Daytime Phone: _____ Social Security #: _____ Date of birth: _____ Height: _____ Weight: _____
Area code/Number Month/Day/Year

Primary beneficiary: _____
Name/Relationship

Secondary beneficiary: _____
Name/Relationship

In the past twelve months, I ☐ have ☐ have not used any tobacco products.

This insurance can only be issued to AFA members. Please check the appropriate box below:
☐ I enclose $25 for annual AFA membership dues (includes $18 for subscription to Air Force Magazine). ☐ I am currently an AFA member.

Please issue coverage as follows: ☐ Member Only ☐ Member and dependents

(Please select your preferred payment frequency and indicate the correct premium amount.)

Plan of Insurance	**Standard**		**High Option**		**High Option Plus**	
	Member Only	w/Dependents	Member Only	w/Dependents	Member Only	w/Dependents
Monthly Government allotment. I enclose 2 months premium to cover the necessary period for my allotment (payable to Air Force Association) to be established.	☐ $10.00	☐ $12.50	☐ $15.00	☐ $17.50	☐ $20.00	☐ $22.50
Quarterly. I enclose amount checked.	☐ $30.00	☐ $37.50	☐ $45.00	☐ $52.50	☐ $60.00	☐ $67.50
Semi-Annually. I enclose amount checked.	☐ $60.00	☐ $75.00	☐ $90.00	☐ $105.00	☐ $120.00	☐ $135.00
Annually. I enclose amount checked.	☐ $120.00	☐ $150.00	☐ $180.00	☐ $210.00	☐ $240.00	☐ $270.00

I am currently insured under the ☐ Standard ☐ High Option Plan. My certification number is _____.
Please increase my coverage to the ☐ High Option ☐ High Option Plus Plan.

☐ Monthly Government allotment. I enclose 2 months premium to cover the necessary period for my allotment (payable to Air Force Association) to be established.
☐ AFA Visa or AFA MasterCard No._____ Expiration date_____ ☐ Monthly ☐ Quarterly ☐ Semi-annually ☐ Annually

Names of Dependents to be insured, relationship, DOB, height, weight

_____

_____

The following questions should be answered for you and any dependents for whom you are requesting coverage:

1) Have you been hospitalized during the preceding 90 days? ☐ Yes ☐ No
2) In the past three years, have you received treatment or been told you had:
a. cancer, leukemia, Hodgkins Disease, or other associated malignancies? ☐ Yes ☐ No
b. heart disease, stroke, or other cardiovascular disease? ☐ Yes ☐ No
3) Within the past two years, have you had persistent cough, pneumonia, chest discomfort, muscle weakness, unexplained weight loss of ten pounds or more, swollen glands, patches in mouth, visual disturbance, recurring diarrhea, fever, or infection? ☐ Yes ☐ No
4) Has any application made by you for life or health insurance been declined, postponed or issued other than as applied for? ☐ Yes ☐ No
5) Are you receiving, entitled to receive or would be entitled to receive upon timely application any benefits due to sickness or injury (other than medical expense benefits) under any private policy or plan or government program, whether insured or non-insured? ☐ Yes ☐ No

If you answered "Yes" to any of the above questions, please give the names of the persons to whom your answer applies and provide details, dates, diagnosis, treatment and the names and addresses of the health care provider(s) and hospital(s). Use additional sheets of paper if necessary.

_____

_____

Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid. I understand that the coverage will not become effective until approved by MetLife.

I understand that if on the Effective Date I am not eligible for such insurance by reasons of (i) age or (ii) membership status, insurance will not become effective on my life. "Hospitalized" means inpatient confinement for: hospital care, hospice care, or care in an intermediate or long-term care facility. It also includes outpatient hospital care for chemotherapy, radiation therapy, or dialysis treatment.

Authorization to furnish medical information

For underwriting and claims purposes, I hereby authorize any physicians or other medical practitioner, hospital, clinic or other medically related facility, insurance company, or other organization to furnish MetLife, on my behalf, with information in his or its possession, including the findings, related to medical, psychiatric or psychological care or examination, or surgical treatment given to the undersigned. The authorization shall be valid for two years. A photocopy of this authorization shall be considered as effective and valid as the original.

Member's Signature _____ Date _____ 19_____

Send application with remittance to: Insurance Division, AFA, 1501 Lee Highway, Arlington, VA 22209-1198 Phone Number: 1-800-727-3337 9-93

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The Underwriting Process: MetLife (hereinafter "we") will evaluate the information given by you on this enrollment form and tell you if we cannot give you the coverage you asked for. We will also tell you in general terms the reason for our decision. Upon written request, more specific reasons will be given to you.
Information Collection: This enrollment form is our main source of information. To properly evaluate your request for coverage, we obtain additional medical data from third parties about any person to be insured. For instance, we may ask physicians, hospitals, or medical care providers to confirm or add to the medical data you have given us.
Information Disclosure: In most cases, the information we have about you will be sent to third parties only if you authorize us to do so. In some cases where disclosure is required by law or necessary to conduct our business, we may send the information to third parties without your consent.
Access and Correction Information: Upon written request, we will make information we have about you available to you. You have certain access and correction rights with respect to the information about you in our files.
Further Information About our Practices: Upon written request, we will send you more information about our underwriting process and your access and correction rights. Also, upon your written request we will give you more information about the circumstances under which we will disclose the information about you to third parties without your authorization. Please write MetLife at the following address about these matters:

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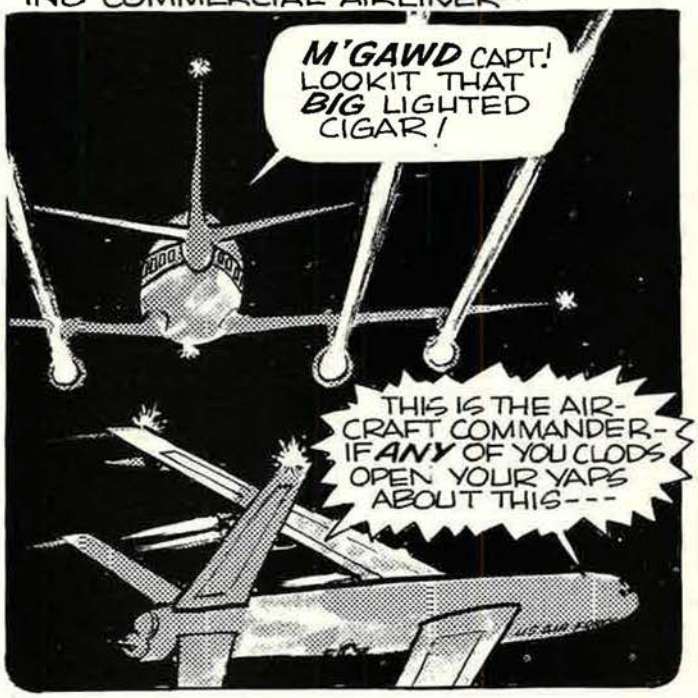
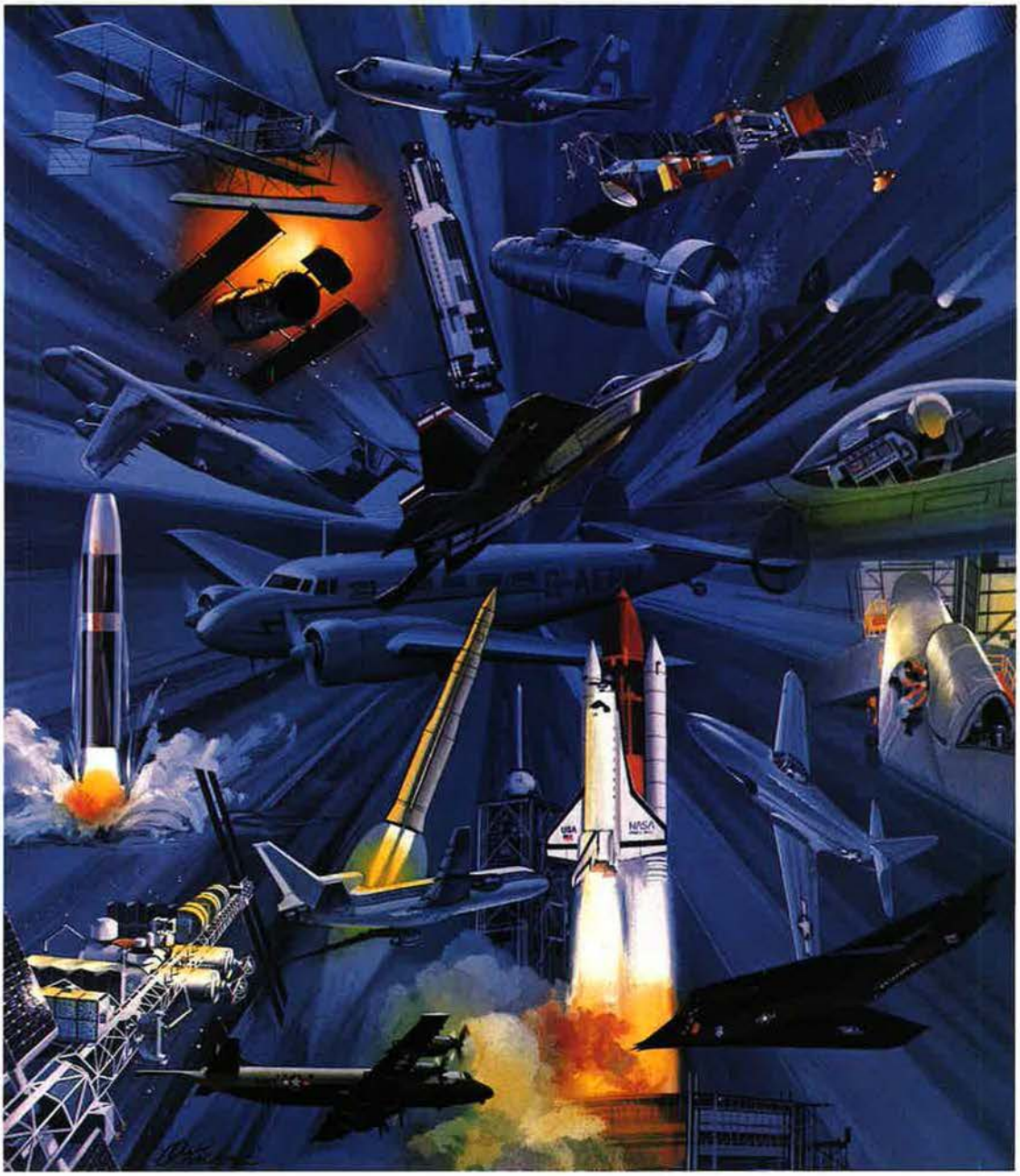
ONE INCIDENT INVOLVED A B-52 ON A NIGHT REFUELING MISSION WHICH MISTAKENLY TRIED TO HOOK UP TO A PASSING COMMERCIAL AIRLINER—



F-86Ds SCRAMBLED AT WRIGHT-PAT FOR NIGHT INTERCEPT OF, SAY, THE MOON WOULD BECOME "TARGETS" TO KEEP THE GROUND OBSERVERS HAPPY.

YOURS TRULY WAS SCRAMBLED TWICE FOR UFOs...

...ANOTHER TIME OUR FLIGHT BECAME SEPARATED IN WEATHER—



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5 Round-the-Clock Operations With High Fly Rates
6 Operates in All Weather
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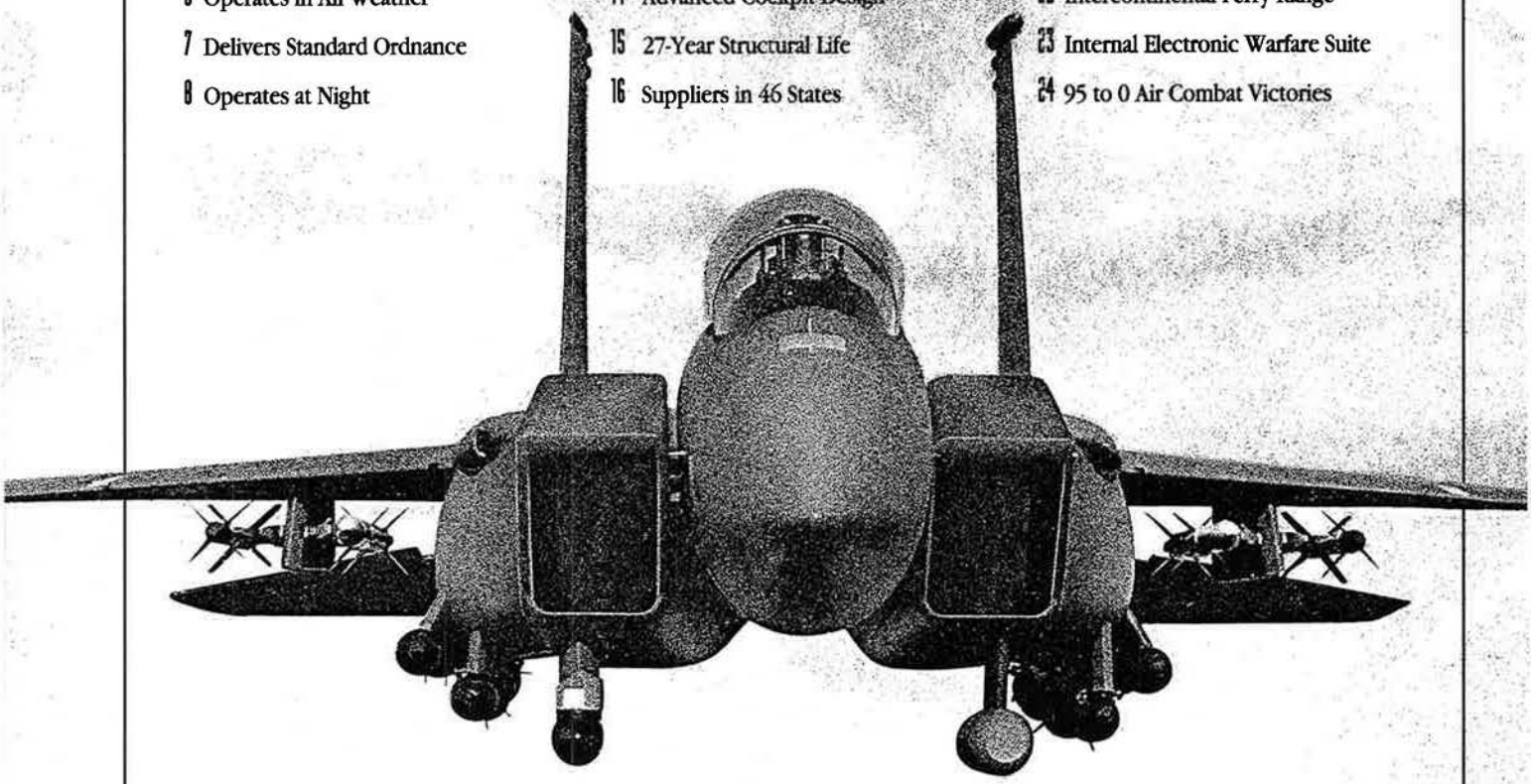
21 Carries 4 Medium-Range and 4 Short-Range Air-to-Air Missiles
22 Intercontinental Ferry Range
23 Internal Electronic Warfare Suite
24 95 to 0 Air Combat Victories



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