SEPTEMBER 1988/$5

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIA

MAGAZINE

The Best In The Force

The Top Crews

Outstanding Airmen of 1988

Warriors and Achievers

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We cannot display it, or diagram it, or illustrate it.

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ATF-23

The Northrop/McDonnell Douglas Team

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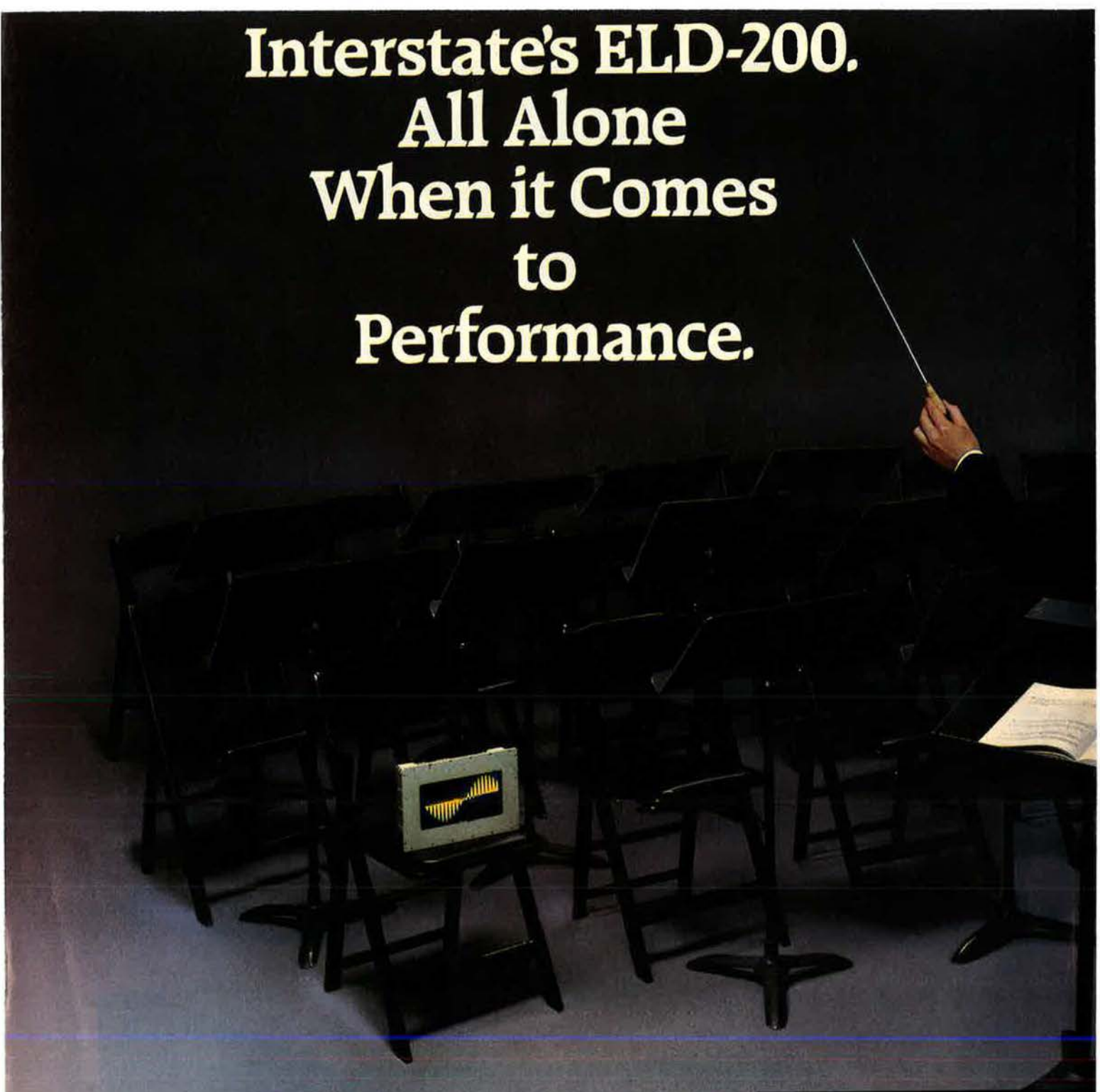

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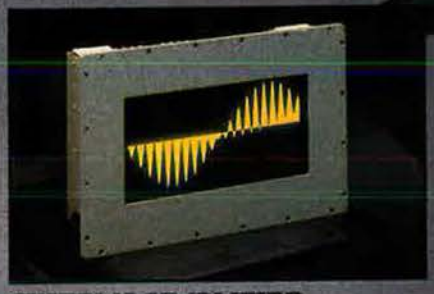

SYSTEMS SIMPLIFIED.

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SEPTEMBER 1988
VOLUME 71, NUMBER 9

AIR FORCE MAGAZINE

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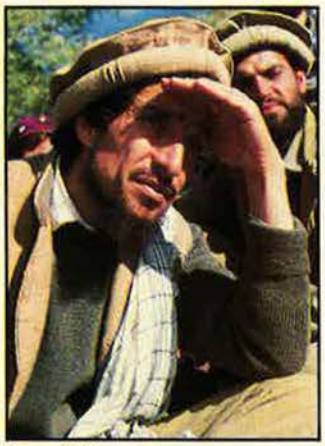

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About the cover: This portrait of a C-130 loadmaster in his element was painted by Lawrence Salk for the Air Force Art Program. For more highlights of the program, see p. 104. A special section paying tribute to "Warriors and Achievers" begins on p. 58.

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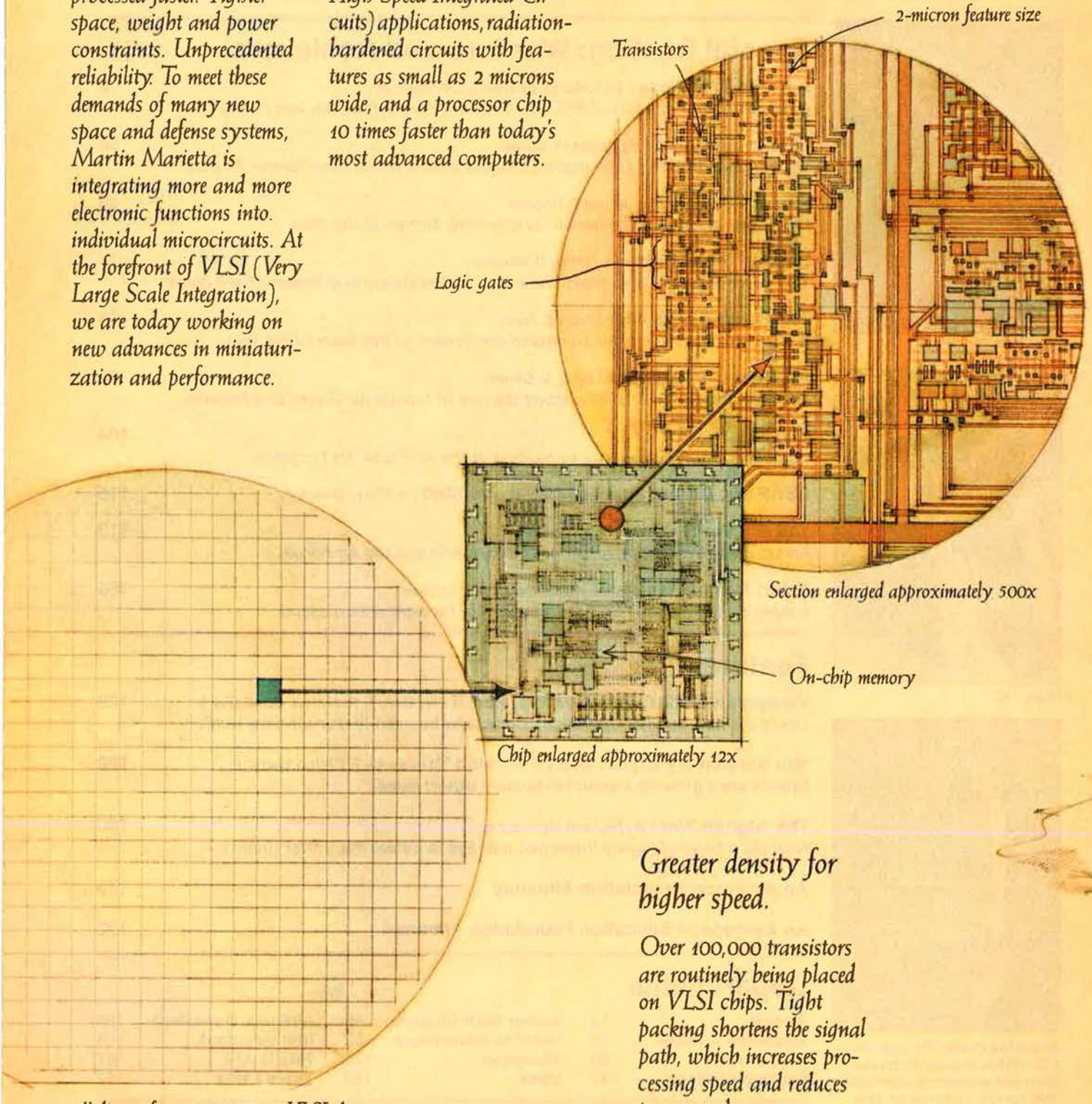

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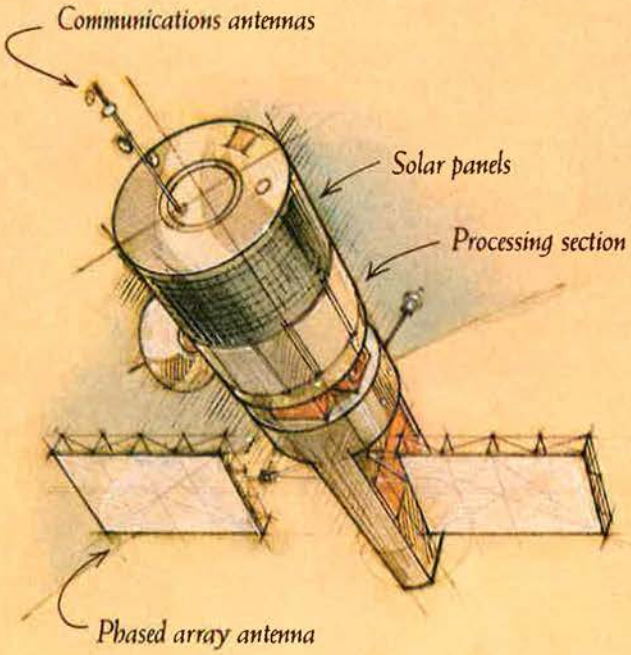

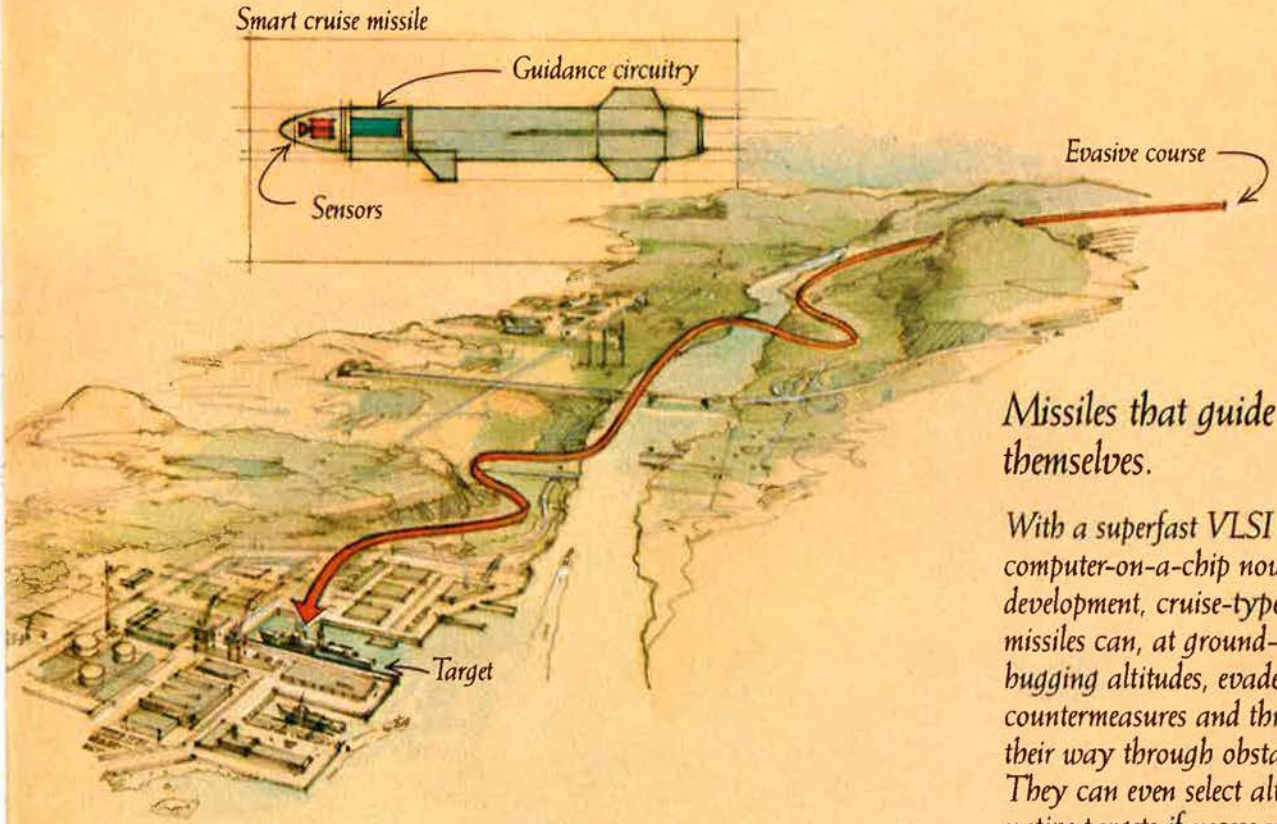

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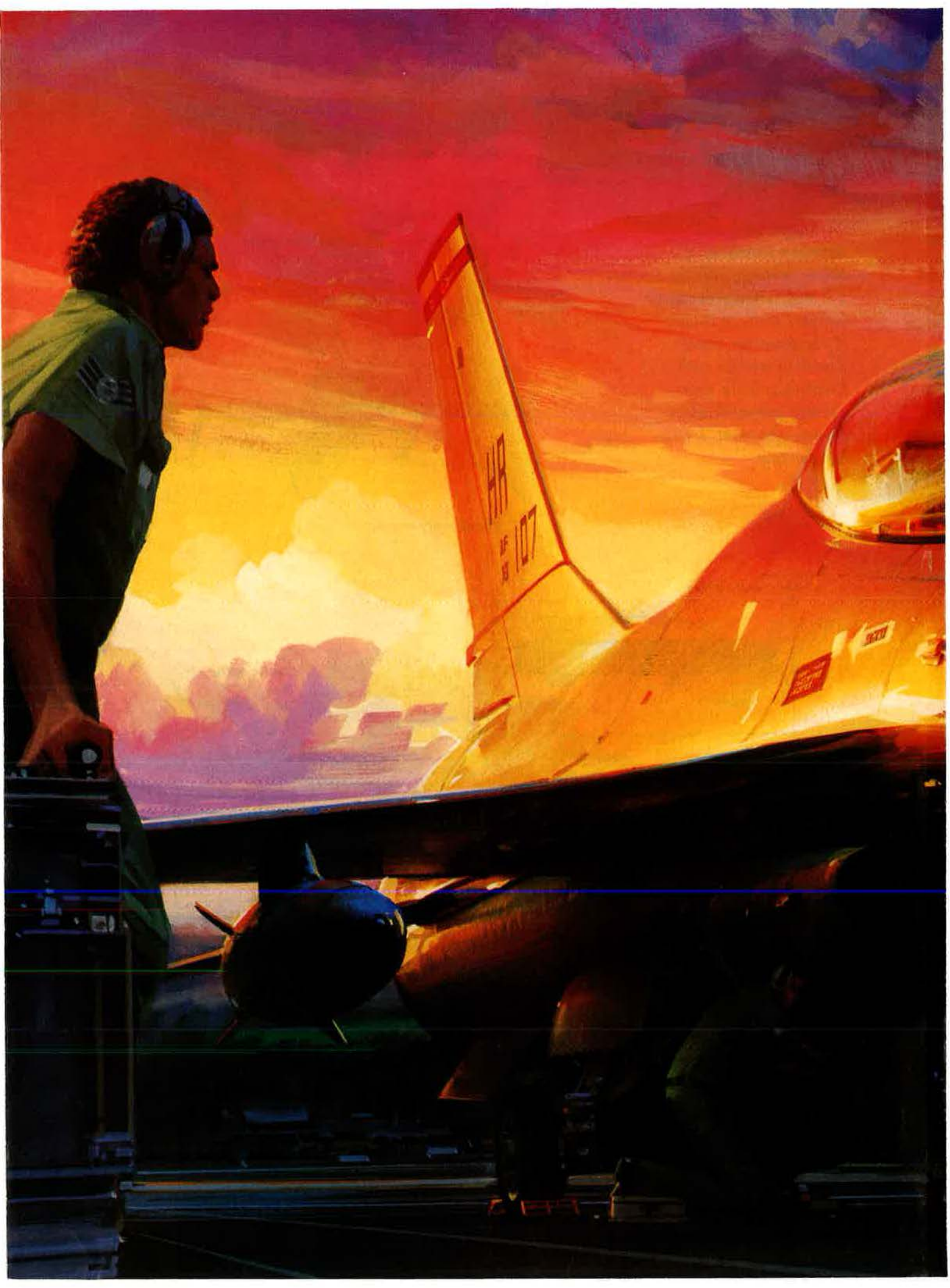
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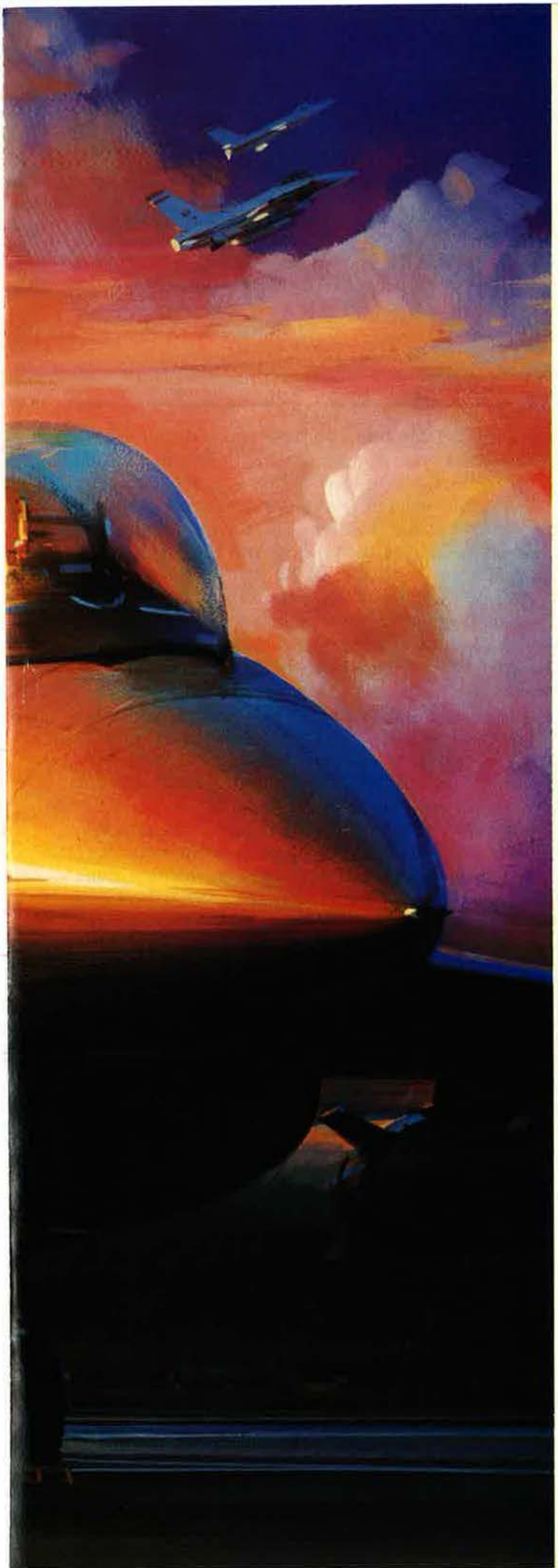

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An Editorial

A Creed to Believe

By Charles L. Donnelly, Jr., PUBLISHER

SINCE coming to the staff of the Air Force Association six months ago, I have had cause to reflect on our great organization, our goals, and our dedication to freedom and liberty.

Viewing our nation's capital from our national headquarters, you can see the spires of Georgetown and the National Cathedral, knowing that just beyond them are the churches, synagogues, and mosques of a free people (One Nation Under God). The eye then turns and focuses on the monuments of our great Presidents who were so instrumental in developing our great nation (Indivisible). And finally, there is the Capitol building, the White House, and the Supreme Court, glistening white in the light of freedom (With Liberty and Justice for All).

We enjoy freedom every day, but seldom think of the sweat, toil, and sacrifices of our forefathers, who flocked to our shores because freedom was denied them elsewhere. We sometimes forget that in their day, freedom was rare—a radical idea to which they bravely pledged their lives, their fortunes, and their sacred honor.

When fifty-six of them signed their names to the principles in the Declaration of Independence, they were not committing themselves to empty words. In the ensuing war, nine of them were killed in action, five died as prisoners of war, twelve had their homes burned, several lost sons, one man's wife died in prison, and seventeen (including Thomas Jefferson) went broke. The legacy of these patriots was summed up by Thomas Paine when he said that those who expect to reap the blessings of freedom must, like men, undergo the fatigue of supporting it.

But are we carrying our load today? Most of us are. However, some, in the name of peace, believe we should sharply reduce our defenses that help guarantee our freedoms. A close friend once pointed out that in our concern for peace, the measure of commitment may be seen by what a person is willing to sacrifice.

Herein lies the great paradox. If you grant the assumption that commitment is measured by sacrifice and risk, the greatest commitment to peace is seen in the military—by those who risk their lives in war to attain peace. However, this is not always a popular position. Our free world is full of peace signs and slogans, but many of them seem destitute of goals for which one is to risk life. If peace is defined as a condition in which no one need risk life, then we have survival, but we are hard-pressed to find a reason to live. It may well be that in finding a reason to die, we find a reason for living.

Men and women of our country have given the ultimate sacrifice for freedom. The Revolutionary War claimed 25,324 lives, the Mexican War 13,283, the Spanish-American War 2,446, World War I 116,708, World War II 407,316, the Korean Conflict 54,246, and the Vietnam War 58,302. More military lives have been lost in peacetime training and in such places as Lebanon, the Persian Gulf, and the lonely stretch of water approaching Libya.

Loss of life is always tragic, but death for a good cause is an honorable death. Conversely, death forced on people by demagogues is a horrible waste. A recent study calculated that 119,000,000 people have perished in this century because of political persecution.

Our country has been without war for fifteen years; Western Europe has been without war for forty-three years, the longest period of peace in the history of the continent. So it appears to some that, having achieved peace in their time, it is logical to hammer the swords that have protected freedom into plowshares of economic prosperity and social ease.

Let us not be lulled into the complacency of the good life and come to believe, like the Athenians of old, that peace is more important than freedom. As Plato said so many years ago, only the dead have seen the end of war.

Freedom is not free. But it is also not possible to put a price on freedom. The debate will continue for years to come about how much defense we need. Some will argue that we need less defense; those of us who are better informed will argue for a strong defense that ensures the freedoms bequeathed to us by our forefathers.

As we enter a new year in the life and dedication of our Association to our country, let us reflect upon the words of President Jefferson, who said in 1775, "In our native land, in defense of the freedom that is our birthright and which we ever enjoyed until the late violation of it; for the protection of our property, acquired solely by the honest industry of our forefathers and ourselves; against violence actually offered; we have taken up arms. We shall lay them down when hostilities shall cease on the part of the aggressors and all danger of their being renewed shall be removed, and not before." ■

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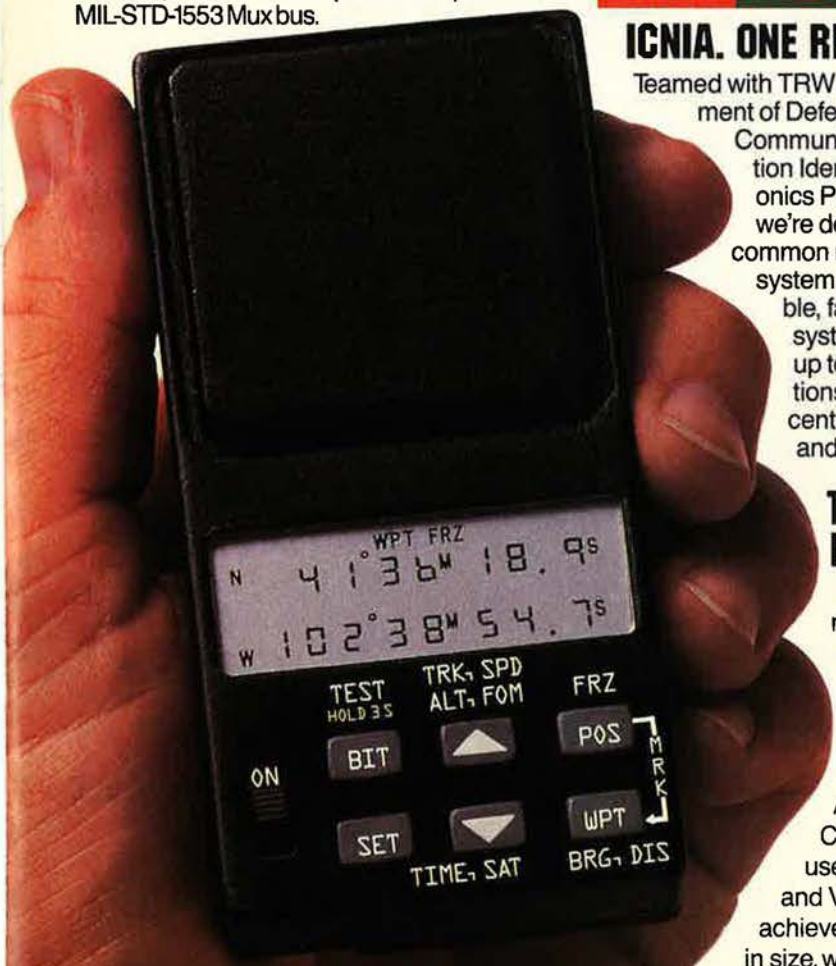

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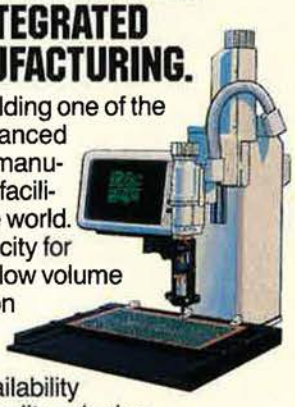

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Together we're shaping a weapon system to help America insure stability in the world.

ATF

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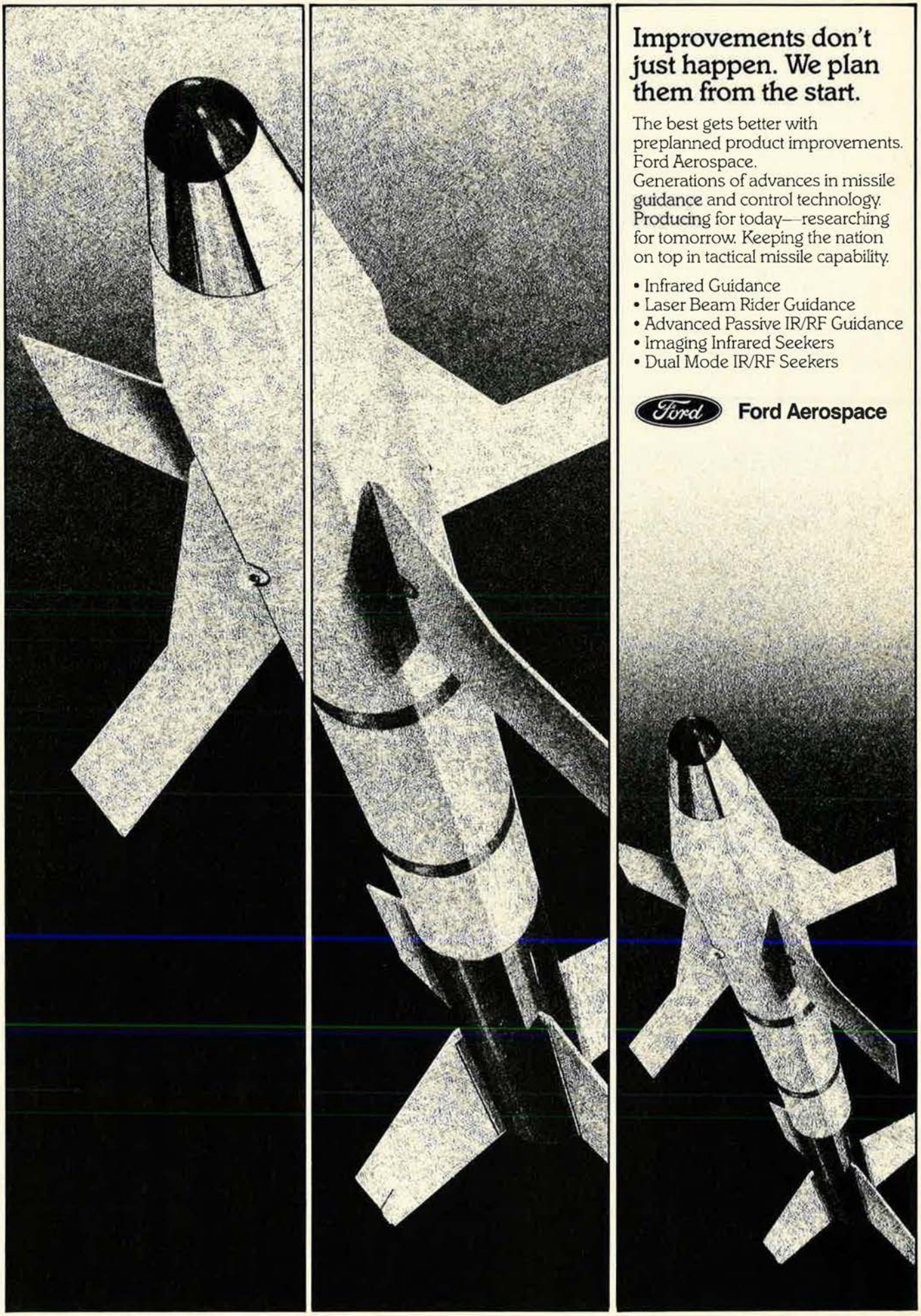
Be sure to visit the exhibits of Lockheed (Booth #1100), Boeing (Booth #1106) and General Dynamics (Booth #3208) at the Air Force Association Annual Convention in Wash., Sept. 20–22. And don't miss the special surround-sound video presentation, "The F-22, A Look Forward in Time," in the Lockheed theater.


U.S. AIR FORCE



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Airmail

The Military and Drugs

As a charter and Life Member of the Air Force Association, I was greatly interested in your lead editorial, "Military Drugbusters," in the July 1988 edition of AIR FORCE Magazine. I recognize that your editorial position reflects the Air Force and Department of Defense party line. On the other hand, I can remember several times in the past when the Air Force Association quite courageously broke with formal Air Force positions in the interest of keeping us all more fully informed.

I believe the American people have a right to know that if they really want to fight an all-out war on drugs, our armed forces could make a hell of a contribution, with little or no budgetary increase and without degradation of their primary mission capability.

Conversely, the wisdom of taking such action is open to question. We fielded a team in Vietnam with an overwhelming war-winning capability, and we didn't have the guts to let them win. The same people who sat on the sidelines and cheered for the NVA and marched and protested and screamed their heads off are still with us today.

In any all-out war against drugs, particularly if the military is involved, they will be on the side of the drugs. They don't have to admit this today because our efforts against the drug overlords are so ineffective that these efforts can be ignored, but once we bring in the military and really go for the jugular and start to *win,* they'll come out of the closet. It will be Vietnam all over again.

Maybe, as you editorialize, we should keep the armed forces out of the whole mess, but we should make it clear that it's not because the capability isn't there. The decision is really up to the American people, and the facts should be on the table if the correct decision is to be made. You would serve us all well to develop the full story, not just feed us the party line.

I've been speaking on this matter locally, and I've attached a copy of that talk. I hope you'll be able to use at least part of it to help alleviate the myopia of your current positions.

Lt. Gen. James V. Edmundson, USAF (Ret.)
Longboat Key, Fla.

• *The following is part of what General Edmundson says in his talk.*—THE EDITORS

During Vietnam, the Navy developed what it called "riverine" forces to assure control in the restricted waterways in the Mekong delta. The Navy's current operations in the Persian Gulf are a classic example of attempting to maintain control in a shallow, restricted body of water against high-speed, clandestine forces. Certainly the defense of our national coastal and estuarial waters has application to a very real Navy mission.

This does not mean that the entire United States coastline should be hermetically sealed. It does mean that the forces to be exercised should be moved around randomly, concentrating on areas that our intelligence pinpoints as hot spots.

A key mission of the Army is to be prepared to conduct limited warfare. Many of the experts in this art are running around in the piney woods of North Carolina wearing green berets. These forces are trained to infiltrate unfriendly territory, either on the ground or from the air, to live off the land, and to control the locale in which they operate. What more realistic training could be provided than for them to be inserted into low-population areas to disrupt such activities as illegal use of primitive landing strips, the illicit cultivation of marijuana, or other drug-related activities?

How about the Air Force? The classic Air Force mission is control of the air both on a global basis and in limited areas, such as over the ground battlefield. The broader aspects of air surveillance are exercised by long-range airborne warning and control aircraft serving as airborne radar platforms.

What better training could AWACS aircraft and crews receive than to be vectored, on a random basis, to high-threat, drug-infiltration areas for practice in locating and tracking small aircraft so that their flight paths could be correlated with filed flight plans and covert operations exposed? AWACS aircraft would also serve a useful purpose in coordinating with naval and Coast Guard forces in the surveillance of small boats.

The Air Force also has mobile ground radar units that can be deployed to unprepared sites to exercise control over limited airspace above strategic ground locations. These units could hone their skills by participating in the antidrug war.

During the Vietnam War, we became concerned because the North Vietnamese had a free hand in supporting their operations in the south by means of a constant flow of men and equipment on a road network through the Laotian jungles that came to be known as the Ho Chi Minh Trail. One response to this problem was unique.

Sensors were developed by the Air Force that could be airdropped into sections of the Ho Chi Minh Trail. Some of the sensors were camouflaged and hung in trees. Some buried themselves in the ground, leaving exposed only their small antennas. There were many types of sensors, and they used a variety of technologies—sonic, infrared, seismic, chemical, and other—to acquire their information. The sensors radioed their information to an Air Force control center in Nakhon Phanom, Thailand, where it was tabulated and then plot-

Do you have a comment about a current issue? Write to "Airmail," AIR FORCE Magazine, 1501 Lee Highway, Arlington, Va. 22209-1198. Letters should be concise, timely, and legible (preferably typed). We reserve the right to condense letters as necessary. Unsigned letters are not acceptable, and photographs cannot be used or returned.

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Publisher
Charles L. Donnelly, Jr.

Associate Publishers
Charles E. Cruze, Richard M. Skinner

Editor in Chief
John T. Correll

Senior Editors
James W. Canan, Robert S. Dudney

Aeronautics Editor
Jeffrey P. Rhodes

Staff Editor
Colleen A. Nash

Military Relations Editor
James A. McDonnell, Jr.

Contributing Editors
John L. Frisbee
Brian Green
Gen. T. R. Milton, USAF (Ret.)
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Managing Editor
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Assistant Managing Editor
Hugh "Thor" Winkler

Director of Production
Robert T. Shaughness

Art Director
Guy Aceto

Research Librarian
Pearlie M. Draughn

Editorial Assistants
Grace Lizzio, Daniel M. Sheehan

Administrative Assistant
Ronda M. Ryan

Advertising Director
Charles E. Cruze
1501 Lee Highway
Arlington, Va. 22209-1198
Tel: 703/247-5800
Telex: 44-0487 COURTESY
Telefax: 703/247-5855

Director of Marketing Services
Patricia Teevan—703/247-5800

Assistant Director of Marketing Services
Elizabeth B. Smith—703/247-5800

AREA ADVERTISING MANAGERS
East Coast and Canada
By Nicholas—203/357-7781

Midwest
William Farrell—312/446-4304

West Coast
Gary Gelt—213/641-7970

UK, Benelux, France, Scandinavia, Germany, and Austria
Richard E. Ewin
David Harrison
Overseas Publicity Ltd.
46 Keyes House
Dolphin Square
London SW1V 3NA, England
Tel: (44) 1-834-5566
Telex: 24924 OPLIM G
Telefax: (44) 1-630-5878

Italy and Switzerland
Dr. Vittorio F. Negrone, Ediconsult Internationale S.A.S. Piazzo Fontane Marose 3
16123 Genova, Italy
Tel: (010) 543659
Telex: 211197 EDINTI
Telefax: 10-566-578

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Airmail

ted on maps. Some of the sensors were so accurate that walking men could be counted and types of vehicles could be recognized. Movements of specific units could be tracked from one sensor field to the next, and campsites where the units holed up during the day could be pinpointed. The speed of the nighttime movement of individual units down the trail also became known.

As this vast amount of information was studied and understood, we developed a fairly complete picture of how the trail was being used by the enemy, and we were able to plan our own action to have maximum effect. This, of course, was twenty years ago, and given the quantum leaps in the state of the art in electronics, greatly improved sensors should be available today.

This technology would seem to have application to our southern border. It is sparing in the use of manpower. And once we have a means of knowing what goes on along our southern border, we will be in a position to determine what action will be appropriate to meet the situation.

More on Military Drugbusting

Re: Your editorial "Military Drugbusters" in the July 1988 issue of AIR FORCE Magazine.

First it was a senior Army officer testifying before the US Congress, and now you too are spreading misinformation about the armed forces' military police.

I agree with you wholeheartedly that the military should not be used to patrol and apprehend drug smugglers, but to say that the military is not trained is a gross disservice to the thousands of men and women who serve and have been trained in current law-enforcement techniques and procedures.

We teach restraint to our military police, using the same Constitutional concepts our civilian law-enforcement brethren follow. Our military police not only learn the self-incrimination warnings of Article 31 of the Uniform Code of Military Justice—they also know and use the Fifth Amendment warnings when a civilian is detained on a military installation.

We treat suspects and detainees with the same courtesy and professionalism found in the civilian world. Yes, the average military person would be no better suited for civil enforcement than the average civilian, but the Army and Marine Military Police, the Navy's Shore Patrol, and the Air Force's Security Police could handle a civil apprehension as well as any civilian law-enforcement officer. . . .

You say that "warfare is an exercise in maximum force," but any modern commander knows that present political-military doctrine does not allow the use of maximum force when the military option is exercised by our Commander in Chief. Witness the measured response during the Libyan raid, the limited action in Lebanon, the retaliation against the oil platforms in the Persian Gulf, the debacle of Vietnam, even Korea. We have not used a maximum-force doctrine since World War II, and short of a nuclear World War III, we probably never will again.

The military as an instrument of national policy is used only in limited fashion—when we are employed, we are permitted only to use a prescribed and measured amount of force to accomplish an international political objective.

No, the role of the military in our society should not be drug interdiction, but please don't join other misinformed people by saying the military is not trained. There are thousands of us in the military who are trained and who are actively involved in fighting drug activity on our own installations and vessels, often in close cooperation and coordination with civilian police agencies.

Capt. Timothy G. Hardy, USAF
Tinker AFB, Okla.

Gen. T. R. Milton, USAF (Ret.), is in step with the Pentagon in decrying the use of the military in fighting the influx of illegal drugs into the United States *(see "The War That's Fizzling," July '88 issue, p. 102).* But like his active-duty counterparts, he seems to be grasping at straws, using specious arguments to prove that the military isn't the answer.

The Vietnam parallel isn't convincing. I'm beginning to think the opponents to military involvement are afraid that the services may actually succeed or at least make a visible impact.

Does anyone, Congress included, believe that the armed forces will seal the borders and stop the drug traffic? I don't think so. But whenever the military speaks up, it seems to be saying that since it can't stop drug smuggling completely, it shouldn't be asked to sacrifice readiness in a lost cause.

We don't know precisely what impact the full participation of the military would have, because we haven't

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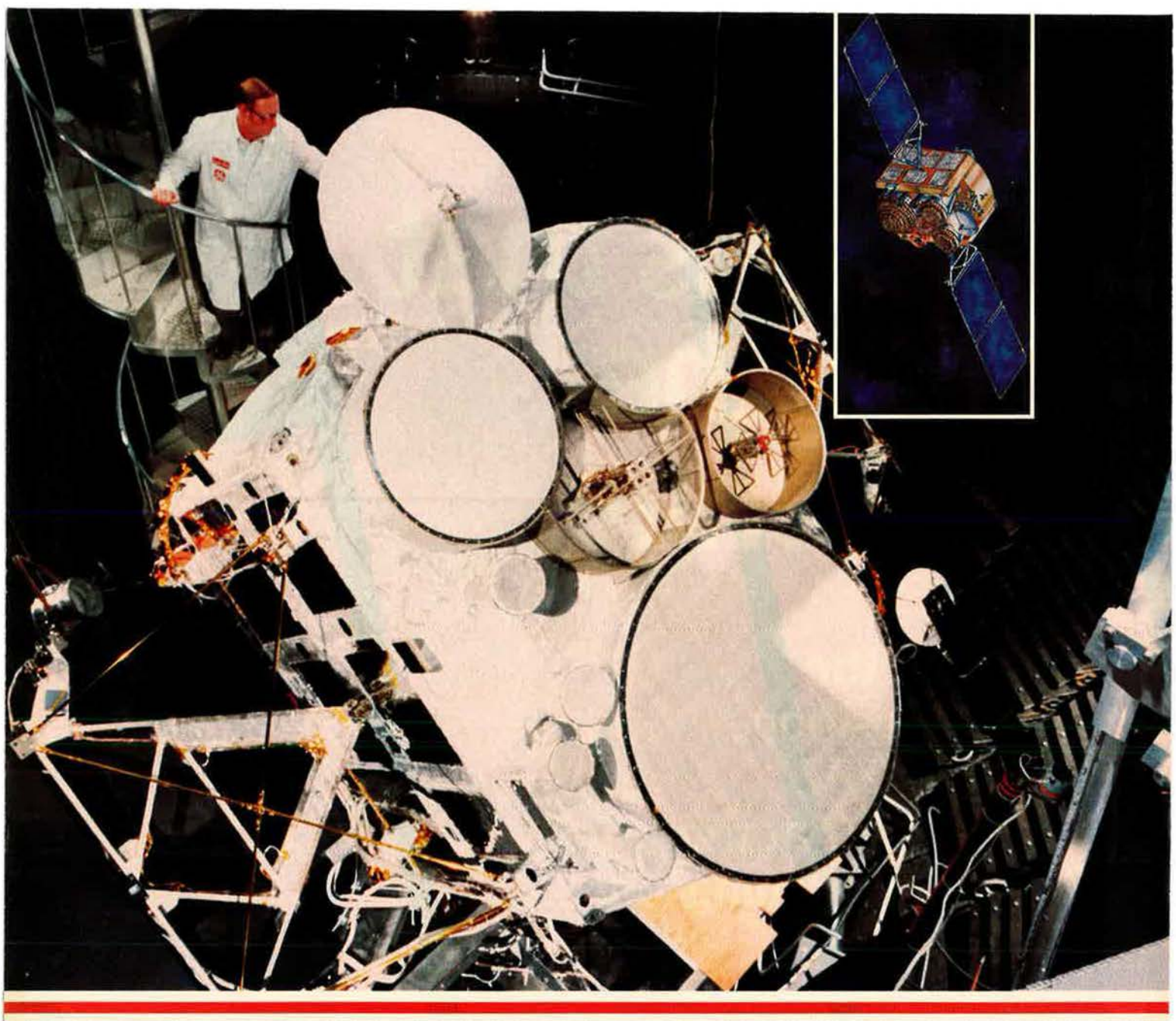

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tried it. It's been said before, but it bears repeating—we are already fighting a war, and the longer we wait to apply meaningful pressure, on a variety of levels, the worse it's going to get.

Granted, interdiction is only half of the problem. The dealers wouldn't be making billions of dollars without the willing participation of their customers. And unless General Milton wants to start summarily executing drug users, interdiction must go hand in hand with education, stiffer penalties for use, etc.

Arguing that military readiness will suffer is nonsense. We're not talking about major force restructuring. Much of the drug battle will be conducted by units that are already in place. Using elements of the US Second Fleet to intercept illegal runners would depend on joint-service coordination, problem-solving skills, and sharp reconnaissance and intelligence—and the list goes on. This is good training. . . .

The military isn't going to stop the drugs, but if used properly, it can't help but make a meaningful impact. And if it doesn't, at least then we'll have empirical evidence to take to Congress that demonstrates why it was a foolish idea.

Let's stop looking for reasons why it won't work. Let's figure how it will. Attitude can make a big difference.

Maj. Harry H. Wilkins, USAFR
Fort Meade, Md.

• *For more on the question of military interdiction of drug smuggling, see General Milton's article "Military Drugbusters, Part II" on page 126 of this issue.*—THE EDITORS

Dead Ducks?

The article "No Sitting Ducks" by Gen. Robert D. Russ in the July 1988 issue of AIR FORCE Magazine showed some intriguing diagrams comparing the turn rates of the A-10 and the F-16. I decided to do a bit of calculating myself, because the claims made somehow didn't ring true.

Of course, if you constrain the A-10 to the same turn radius as the F-16, the F-16 gets around the turn sooner. The F-16, at a calibrated 500 knots, must pull *almost 8.5 Gs* to turn 180 degrees in 9.7 seconds. The A-10 is only easing around at slightly over three Gs when tracking the F-16's turn at a respectable 300 knots. Although the Falcon can readily pull 8.5 Gs, I don't believe it can do so with a load of ground attack armaments. If it jettisons its load, it is simply doing aerobatics in the field of fire when it should be getting on home to reload.

On the other hand, if the A-10 bends around at a still acceptable six Gs, it will complete the half turn in 8.25 seconds—a full 1.4 seconds faster than the F-16, and the A-10 can keep its stores! What's more, the A-10 will have a turn radius of only 1,330 feet at six Gs and 300 knots, while the Falcon is staggering around under 8.5 Gs with a turn radius of 2,607 feet! How can anyone claim that the F-16 will be exposed for a lesser amount of time to those nasty heatseekers? . . .

My feeling is that the F-16 will not be much more survivable than the A-10 in the modern war environment. To a heatseeking missile moving at Mach 5, 300 knots and 500 knots look about the same. Survivability will require standoff weapons, smart bombs, fire-and-forget systems, and RPVs, as well as the ECM and chaff mentioned by General Russ.

My view is that we should keep the A-10s for use in the more tolerant environments and develop the F-16 as a fast delivery platform for the best standoff weapons we can build for use in the high-threat environments.

Airmail

I shudder to think of us learning the hard way what the Six-Day War should have taught us and what the loss of our Navy pilot over Lebanon further underscored: Send the weapons in, but keep the pilots at standoff distances so they can live to fight another day. . . .

Lt. Col. William E. Haynes,
USAF (Ret.)
Rancho Palos Verdes, Calif.

Once again fighter pilots have forgotten an important lesson from Southeast Asia *(see "No Sitting Ducks," July '88 issue, p. 92).* Survivability may consist of five main factors, the main one speed, but what about the mission of finding and knocking out the enemy? Speed may help in survivability—it depends on your altitude and the threats—but speed often means you cannot find the target. Repeat sorties to hit targets missed or not found place fighters at risk because of an alerted enemy and prolonged exposure.

In Europe, buildings, terrain, and weather will limit a fast mover's ability to support infantry, interdict supply and communications, and attack mobile ground threats. Once again, it will require slow-moving forward air controllers to find and mark the targets. Even the increased accuracy of smart bombs is wasted if the target area cannot be defined precisely enough to get the munition in the right general area.

Why use a middleman again to mark the target for another aircraft? Let the initial aircraft be slow enough to find the target and take it out rather than just mark it with smoke.

The article's sustained-turn comparison is far too simplistic. The consideration of operational altitudes and terrain masking raises the possibility that the F-16—at a higher altitude, although faster—will be in sight of hostile threats longer than a slower and lower aircraft. The tactics (type of aircraft as well as munitions) used in a flat area with layered defenses controlled by an efficient command network will be different from those used in an area with rolling, forested terrain or an area defended by unlinked defenses. . . .

In this era of integrated defenses, a sacrifice of speed for terrain masking and increased ability to acquire a target and hit it with one aircraft the first time is a valid and necessary tradeoff. Most targets will not be worth the type of force package that the article cites to penetrate threat areas. Many targets will still require the use of airpower to assist the ground forces.

The Air Force must maintain a mix of aircraft and should not dismiss slower and lower aircraft as unsurvivable. Faster may mean that you are unable to find and take out a target.

Maj. Charles D. Brown, USAF
March AFB, Calif.

I enjoyed the article "No Sitting Ducks" by Gen. Robert D. Russ in the July '88 issue of AIR FORCE Magazine.

I thought it was a very interesting discussion of close air support survivability, but it should raise a question of tradeoffs between aircraft characteristics that improve survivability and those that optimize the ability to locate and destroy CAS targets.

I hope that a future article will address the characteristics that improve an aircraft's ability to attack CAS targets successfully, compare those to the characteristics that contribute to survivability, and define the trades related to the requirements for a CAS aircraft that can attack and survive.

Ed Flynn
Stuart, Fla.

The Skyhook

My July 1988 issue of AIR FORCE Magazine came this week, and as usual, you did a masterful job. C. V. Glines's article "The Skyhook" in that issue leaped right out of the time tunnel from some forty-plus years ago and grabbed me by the throat.

As a twenty-year-old flight officer assigned to the 1st Troop Carrier Squadron, I had occasion to witness at least one of the appearances of the YR-4 on the ramp at Myitkyina in early 1945. As I recall, it went something like this.

We had just landed in our trusty C-47 and taxied to a loading revetment to pick up our drop load for a forward operating site well south of Myitkyina. As we were turning in the revetment, the copilot spotted the YR-4 hovering right next to the control tower.

He said something like, "What the hell is that?" My reply was an opinion that these mosquitoes were even bigger than the ones at Sookerating, our home base.

The tower operator advised us that this was something new from the States that had just been uncrated and was being used in some sort of jungle rescue mission. Now, after forty-three years, I understand the significance of what we saw that day!

Col. William H. Ramsey,
USAF (Ret.)
North Little Rock, Ark.

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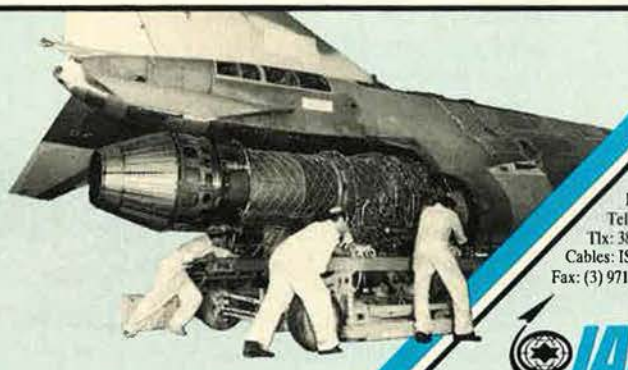

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Airmail

Vietnam Victories

Re: The item on page 39 of "Aerospace World" in the July 1988 issue regarding the retirement of F-4D 66-0267 at Homestead AFB, Fla.

The referenced aerial victories accomplished by then-Capts. John Madden and Charles DeBellevue on September 9, 1972, made the weapon systems officer, Captain DeBellevue, the highest-scoring ace (six credited victories), but not the first of the Southeast Asian conflict.

Actually, Captain DeBellevue was the fourth, preceded by Navy Lts. Randy Cunningham and Willy Driscoll on May 10, 1972, and USAF Capt. Steve Ritchie on August 28, 1972. Additionally, the aircraft downed on September 9, 1972, by Madden and DeBellevue were MiG-19s, not MiG-17s.

Thanks for your consideration and excellent publication—just trying to keep it straight!

CMSgt. Tom H. Brewer, USAF (Ret.)
Huber Heights, Ohio

• *Chief Brewer is correct.*—THE EDITORS

Bombing of Rome

Re: The "July Anniversaries" box on page 38 of the July 1988 issue.

The box states that Rome was first bombed on July 19, 1943. I submit this is in error.

I was lead bombardier of the 301st Bomb Group in the first bombing of Rome on July 18, 1943. This was a seven-hour, forty-five-minute raid from our base in Tunisia. On July 17, the day before the Rome raid, we bombed Naples in a seven-hour mission. We bombed Rome again on August 13.

I enjoy your good magazine, but do want to correct this error.

Lt. Col. Roy L. Atherton, USAF (Ret.)
Gresham, Ore.

• *Colonel Atherton may be correct in his claim, but our sources say that Rome was first bombed on July 19. Resolution of this discrepancy may hinge on whether or not Colonel Atherton's group bombed Rome proper or only the outskirts of the city.*—THE EDITORS

Brewery Wagon

Of all the great missions of World War II, my personal favorite has always been the great Ploesti mission of August 1943. As an avid builder of model aircraft, I have always wanted to build a model of the *Brewery Wagon*, which by default became the lead ship for the mission when the plane carrying the lead navigator failed.

In 1966, I contacted John Palm, the pilot of *Brewery Wagon*, who sent me a letter and some photographs of the plane. One shows the port side of the nose with one crew member (presumably Major Palm) standing alongside and the rest of the crew perched atop the nose and cockpit. This photo gives a fairly good view of the nose art.

The other photograph was taken in flight and shows the starboard side of the nose and the nose art. From these, I have been able to sketch a fairly good copy of the nose art. What I need now is some information about the colors in the picture. Can anyone give my any information about the nost art? Also, can anyone give me the names that are written under the windows at the various crew positions?

Any information will be appreciated. You may contact me at the following address.

L. B. Groover III
103 Appleseed Court
Peachtree City, Ga. 30269
Phone: (404) 487-9363

• *For more on the Ploesti mission, see "Into the Mouth of Hell" on page 159 of this issue.*—THE EDITORS

Flying Cadet Classes

I am working on a documentation of all flying cadet classes, starting with the first class in 1931, whose members completed the primary, basic, and advanced courses at Randolph Field and Kelly Field. I am in need of a representative from each of those classes to assist in obtaining a data base.

To my knowledge, this information does not exist in a cohesive form anyplace. Time is passing by, and in a few short years, this information will be lost forever. There are approximately twenty-six full-year cadet classes involved, consisting of a lower class, upper class, and graduating class. (The first class in 1931 may have commenced as the upper class.)

Any assistance will be greatly appreciated and will go toward ensuring that a firsthand information base is established. Please list your class year of graduation when responding.

Col. Robert N. Maupin, USAF (Ret.)
5774 Old Ranch Rd.
Oceanside, Calif. 92056

AFCC Visitors Center

Air Force Communications Command is planning a Visitors Center for the new headquarters building at Scott AFB, Ill. The Center will portray the history of communications and the command.

We are looking for contributions of memorabilia to enhance this display. We would appreciate any help that readers can provide.

Anyone who would like to contribute to the Center should contact me at the address below.

Darlene J. Fuller
Hq. AFCC/PA
Scott AFB, Ill. 62225-6001
Phone: (618) 256-4396

Collectors' Corner

I am active-duty Air Force and a serious collector of scarves and patches worn by Air Force fighter pilots or by any aircrew members from any era.

I would like to obtain a particular scarf or patch worn by any aircrew member of the 42d Tactical Electronic Warfare Squadron stationed at Takhli, Thailand, from 1968 to 1970. The 42d was equipped with the EB-66E Destroyer.

Any contributions or donations will be greatly appreciated, and I am willing to trade or buy any scarves or patches, particularly from the Korea or Vietnam era. Please contact me at the address below.

TSgt. John D. Manion, USAF
5-720A "G" St.
Elmendorf AFB, Alaska 99506
Phone: (907) 753-2465

I am a collector of USAF patches. I am trying to build up my collection of Vietnam-era special ops patches.

I am especially interested in patches from units that flew the following aircraft: AC-130, AC-119, AC-123, A-1, OV-10, O-1, O-2, and any helicopter models.

SrA. Jeffry W. Gatlin, TennANG
5595 Scottsdale Ave.
Memphis, Tenn. 38115

I am trying to locate a patch from the 60th Fighter-Interceptor Squadron. The patch depicted a crow with a submachine gun and, to the best of my memory, the words "60th FIS." I served with this unit at Otis AFB, Mass., from 1960 to 1964. At that time, the squadron flew F-101 Voodoo interceptors.

I would be willing to pay any reasonable price for this patch. I also have one or two photos of 60th FIS fighters flying in formation that I might be willing to trade for other 60th memorabilia.

Ernie Mondou
60 Harding St.
Milford, Mass. 01757

I am a collector of USAF aircraft photographs, specifically any photographs pertaining to the B-36 program.

Any information, memorabilia, and photographs related to the B-36, especially concerning the B-36s of the 92d Bomb Wing at Fairchild AFB, Wash., would certainly be appreciated.

Robert G. Trentman
1829 "C" PL S. E.
#A
Auburn, Wash. 98002
Phone: (206) 939-0141

I am a fourteen-year-old AFA member who is looking for any F-15 Eagle memorabilia. I am interested in any squadron patches, pictures, etc. I will gladly pay a reasonable price for any material.

Please contact me at the address below.

Danny Ginsberg
5661 Woodsong Dr.
Atlanta, Ga. 30338
Phone: (404) 396-4173

Roll Call

I am trying to locate two individuals who were on the crew of the B-29 *Forever Amber* and who served with the 39th Bomb Group on Guam during World War II. Dennis C. Murphy and Leo F. Baker were blister gunners on the crew at the time.

Thomas A. Wacht
5260 N. Pueblo Villas Dr.
Tucson, Ariz. 85704
Phone: (602) 293-9185

I am attempting to find a Col. Coley Hunsucker, whom I met while at the Army and Air Force Exchange Service in Wiesbaden, Germany.

His last known address was at Homestead AFB, Fla. He may have retired in the last two or three years.

Anyone who knows how I might locate Colonel Hunsucker is asked to contact me at the address below.

Harley Maddock
368 Pikes Peak Dr.
Grand Junction, Colo. 81503
Phone: (303) 241-5186

Two of our World War II B-24 crew members who served with the 376th Bomb Group have not been heard from since 1945.

Any information about Cliff Mabry and Omar Holman would be greatly appreciated.

Henry C. Kellenbence
54 Deerfield Dr.
Manahawkin, N. J. 08050
or
Thomas Brown
104 Lake Fairfield
Greenville, S. C. 29615

I would like to contact the following bombardier classmates from the Midland, Tex., Class of 42-8: Milton S. Fonorow, John T. Sparks, John T. Walior, and Charles L. Wiggins.

When these men are heard from, I will have accounted for all ninety-three classmates!

James Craig
32 Birchwood Dr.
Rye, N. H. 03870
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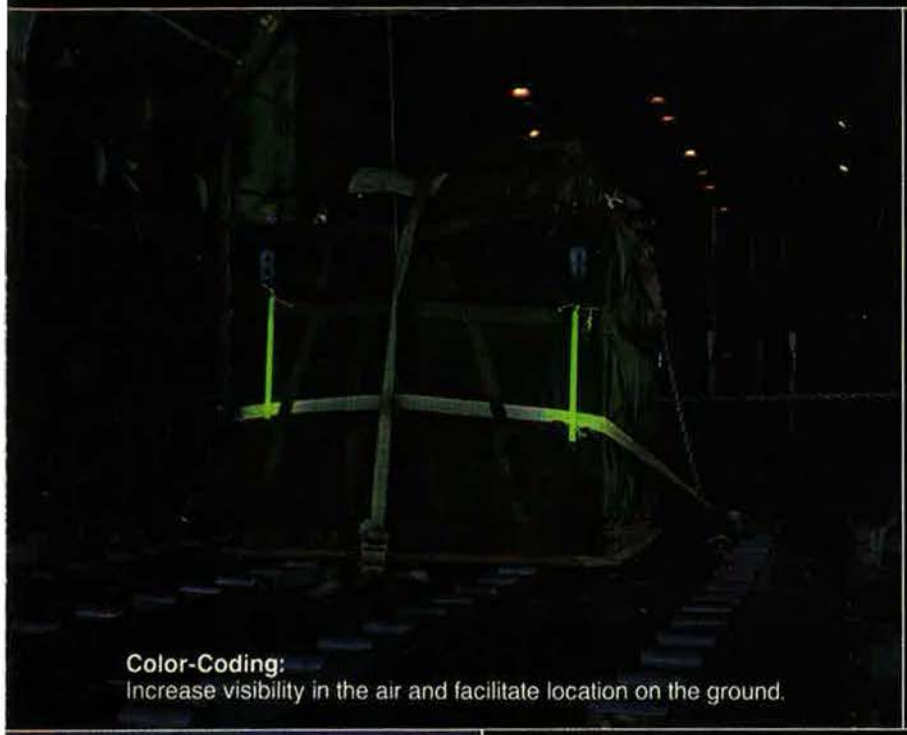

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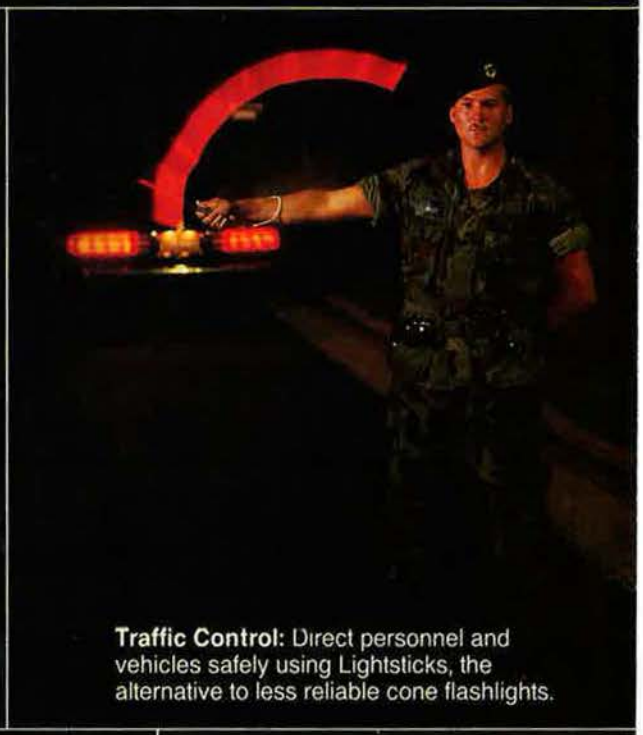

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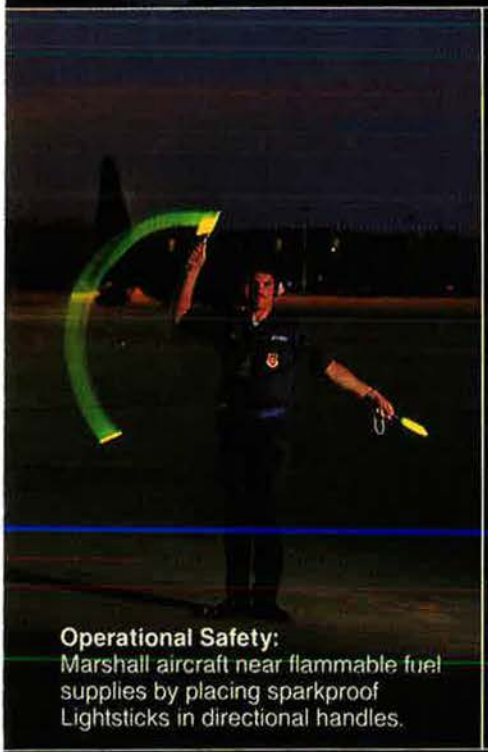

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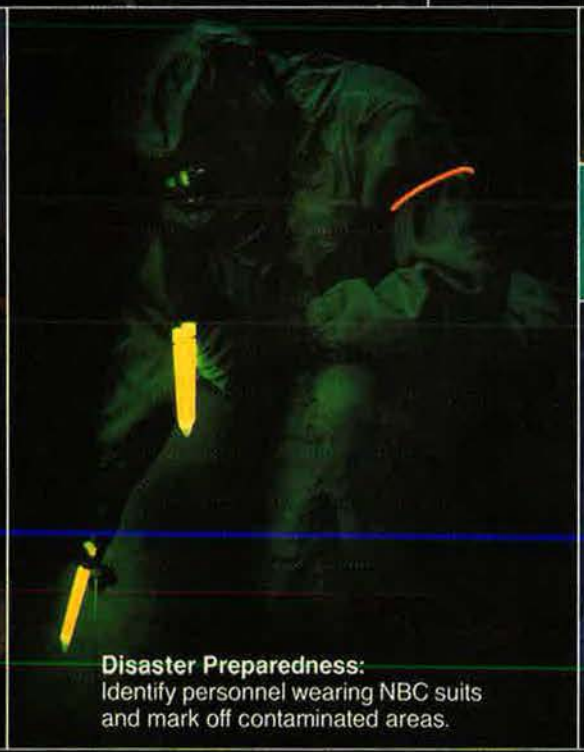

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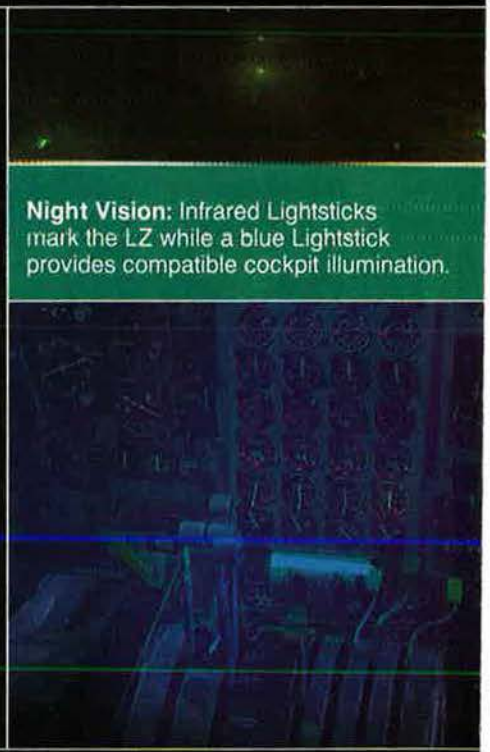

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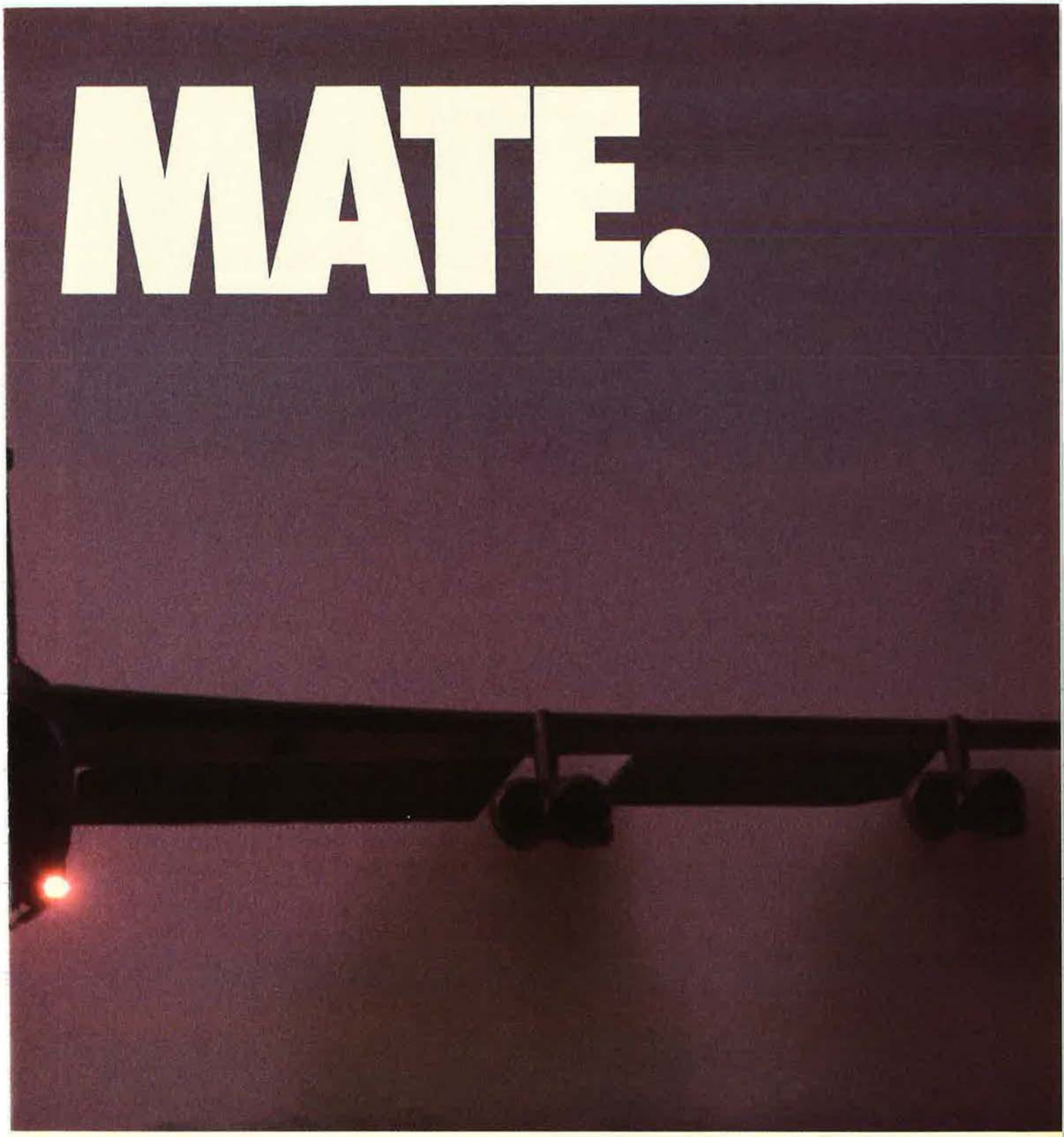

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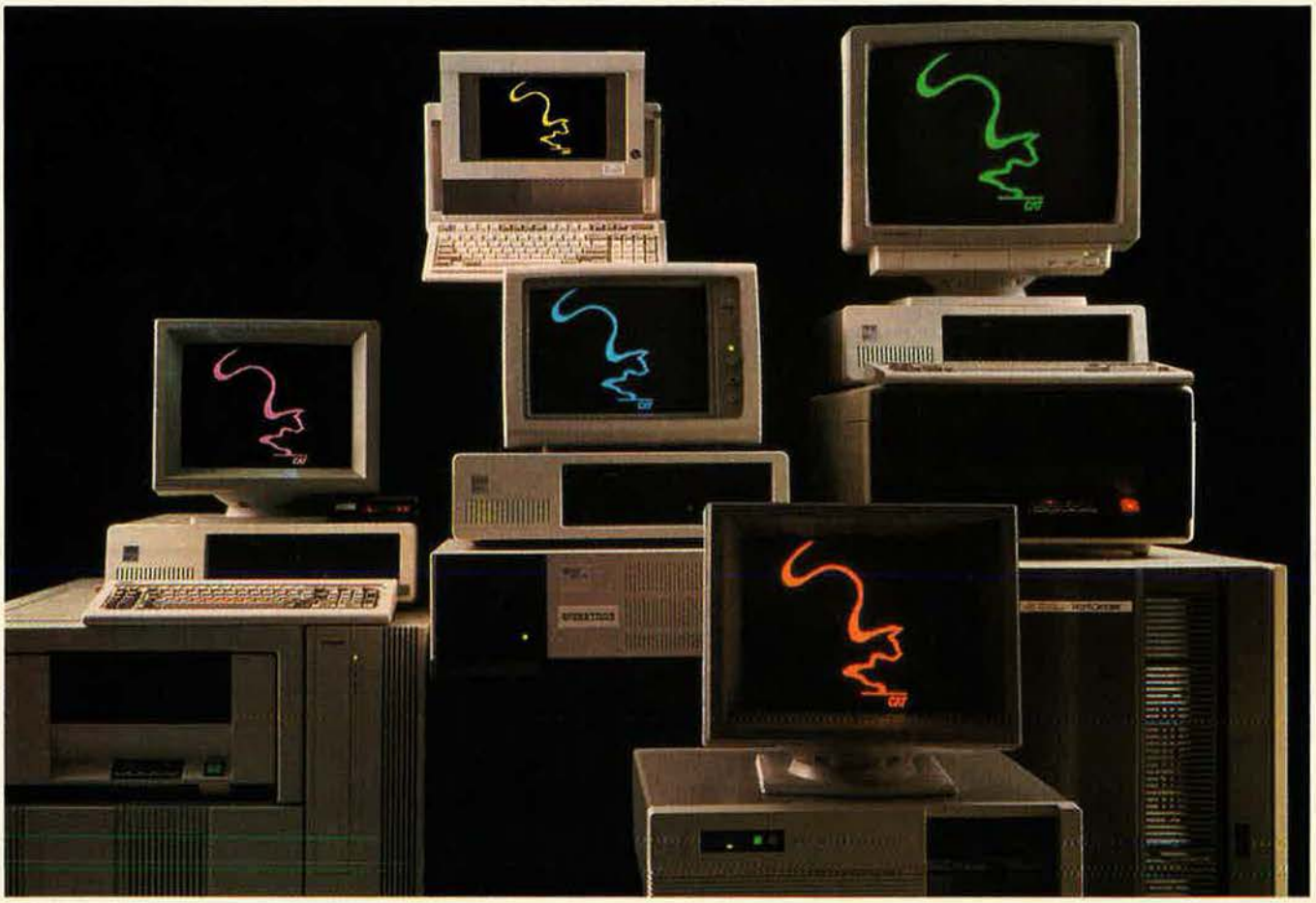

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Costello's Action Plan

By John T. Correll, EDITOR IN CHIEF

The Pentagon is creating new offices and task forces to work on the industrial base problem. It says that more information is needed—and so are better relations with industry.

Washington, D. C. The Pentagon, after struggling with the problem of the defense industrial base for more than a year, presented its report in July. Dr. Robert B. Costello, Under Secretary of Defense for Acquisition, called the study an "action plan to bolster defense industrial competitiveness." The action it prescribes for the near future, though, is mostly organizational and preparatory. It would create various new offices and task forces in the bureaucracy to wrestle with the problem and to gather more data.

The industrial base issue is hot in Washington power circles. Many in Congress want to move faster than Dr. Costello's plan proposes. On Capitol Hill and elsewhere, the prevailing opinion is that the Defense Department has handled the problem poorly up to now. Indeed, the report acknowledges that the Pentagon's industrial base strategy has led to "insufficient resource allocations, confusion, and lack of effectiveness."

The situation, as confirmed by the report, is serious. The United States is rapidly losing jobs, business, and high-technology leadership to foreign nations. We have become dependent on those nations for critical weapon system components. The US defense industry is undercapitalized, and its physical plants are outdated. The industry is falling behind in both quality and productivity. Frequently, government policies have unforeseen side effects and often make bad circumstances worse. Our schools and colleges are not meeting the requirement for technically prepared manpower.

Dr. Costello's plan does not address an older aspect of the industrial base problem that has worried defense professionals for many years: that US industry has no real capacity for wartime mobilization or surge production.

Additions to the bureaucracy have begun, however. A Defense Manufacturing Board—modeled on the highly regarded Defense Science Board—has been established. It will work with a Defense Manufacturing Strategy Committee that the National Academy of Sciences has agreed to set up. A "production advocate"—a Deputy Under Secretary of Defense for the Production Base and International Technology—will be appointed. Reporting to this new official will be a Strategic Planning Task Force.

One of the assignments given to the study team was to identify "defense-critical" companies. It found that there are 215 of them and that they account for about ninety-five percent of defense purchases from the manufacturing sector. Between 1980 and 1985, these firms were below the US average in productivity growth, capital investment, and additions to their productive capacity. The report says that the 215 companies achieved average or above-average profits during that period.

The defense procurement process focuses on prime contractors, although materials and components from subcontractors amount to fifty to eighty-five percent of the total cost of purchases. The report admits frankly that "the Department of Defense does not know the extent to which foreign-sourced parts and components are incorporated in the systems it acquires" and that there is "no reliable system even to identify such dependencies, not to mention systems to minimize them."

To improve the storehouse of information on the state of the industrial base, Dr. Costello wants to merge and adapt two programs now in their formative stages, the Defense Industrial Network and a Defense Intelligence Agency project named SOCRATES.

The plan calls for an integrated review of tax, trade, and domestic policies with a view to making them coherent. It observes, for example, that present tax policy provides no incentive to industry to invest in plant and equipment improvements or upgrade training for its work force. It also says that "the policies of other governments to subsidize and protect their industries are not matched by the United States government," whose "policies and actions to level the playing field in international trade have been inadequate."

It further says that "United States tax laws should differentiate between *wealth-producing* activities and *wealth-redistributing* activities in treating amortization and depreciation. Productive investment could receive more favorable tax treatment than such activities as stock-market speculation. Rare instances of United States government efforts to foster domestic manufacturing are best characterized as efforts to correct the results of prior neglect and usually focus on lagging rather than leading industries."

Commentary in the report about practices of the Defense Department and the services should be read with special interest. Dr. Costello has not yet consolidated his power as the "acquisition czar" that Congress wants him to be, but the clout of his office is significant, and the philosophy expressed in the plan may be as important as some of the specific actions.

"The separation in the industrial base between defense and commercial production is nearly absolute," the report says. "There are few examples of firms that produce both military and commercial products in the same plants. There are firms that serve both markets, but they invariably maintain rigid separation between the two lines of business.

"These firms, however, do have a

more informed view of the difficulties involved in attempting to integrate production of military and commercial products. Their perceptions are that barriers to integration range from immense burdens imposed on defense contractors by government rules and regulations (including, for example, cost-accounting standards that require defense contractors to keep two sets of books) to the unique requirements of thousands of detailed process and product specifications (which frequently are obsolete by the time they are promulgated). In many product and process technologies, commercial practice has surpassed defense practice, with the result that the Department of Defense often pays more for less advanced products."

The relationship of defense and commercial markets is central to the industrial base problem, especially in electronics. The armed forces, once the primary customers of the semiconductor industry, now buy only three percent of the total quantity produced. The market is driven by commercial demand, not by military considerations. *(See also the article "Our Endangered Industrial Base," October '87 issue.)*

Dr. Costello and his staff contend that "the deeply ingrained adversarial relationships between government and industry and between management and labor are major causes of declining American industrial competitiveness." In a personal postscript, Dr. Costello writes that "one key recommendation in this report, perhaps the highest priority, is directed to forging better relations with industry."

The report is anything but a love note to industry, declaring that "the findings of this study are, collectively, an indictment of management in American firms." It contends that many top managers "continue to view the nature of markets as national, not international, and the nature of product requirements as *good enough*, not *world class*."

In his postscript, DoD's acquisition chief says that "proper cooperation between industry and government is essential for creating a *win-win* situation for both parties and ensuring the existence of a healthy and vital industrial base from which the Department can draw its mission effectiveness."

Few would argue that this is essential. But there is considerable doubt about whether this plan is adequate to make it happen.

The Volunteer Cost

Selective Service sent out its last draft call in December 1972. The last conscript entered the US Army on June 30, 1973. Fifteen years later, though, the All-Volunteer Force is still controversial. Two recent assessments reach radically different conclusions about the relative cost of volunteer forces and conscript forces.

One evaluation appears in "Citizenship and National Service," published by the Democratic Leadership Council, whose chairman is Sen. Sam Nunn (D-Ga.). It proposes a "Citizens Corps" in which young Americans would perform one or two years of civilian or military service at subsistence wages. In return, they would earn vouchers that could be used to pay for college expenses, vocational training, or down payments on homes. Polls say that Americans, young people especially, like the idea.

Two recent studies reach radically different conclusions on the relative cost of volunteer and conscript forces.

The Citizens Corps envisions a two-tiered military. Those joining under the new concept would be assigned to labor-intensive specialties in combat units. They would get no bonuses and would be required to live in dormitory housing. They would serve for two years and be paid at half the regular rate. After active duty, they would remain in the reserves for two years.

To support its proposal, the Council quotes sociologist Charles Moskos, who says that manpower costs in the all-volunteer era are sixty-six percent higher (inflation factored out) than they were during the draft. It also cites research by Martin Binkin of the Brookings Institution. Since the number of eighteen-year-old males in the United States is declining, Mr. Binkin says, the Army in 1991 will have to recruit fifty-five percent of all young men eligible to serve in order to hold its strength at present levels.

An altogether different picture on cost emerges from a new study done for the Department of Defense by Syllogistics, Inc. It says that a conscript force with the same mix and effectiveness as the volunteer force of 1985 would have been about $1.1 billion more expensive. Even a less-experienced force mix, approximating the one of 1965 in the draft era, would have cost $500,000 more than the 1985 volunteer force did. Syllogistics says that favorable cost comparisons for conscript forces are usually achieved by substituting, on a one-for-one basis, draftees with less than two years of service for volunteers with four years of experience.

In reality, an appreciably greater number of draftees would be required to achieve comparable results. Training wave after wave of conscripts is costly, and it also diverts experienced people from operational units to training functions. Under a draft, it is cheaper to acquire people initially, but more costly to build a force mix with the proper levels of experience and effectiveness.

"Most or all of the savings that are expected to result from implementing conscription are actually the result of reducing effectiveness by decreasing the size of the career force," Syllogistics reports.

In testimony to the Senate earlier this year, Grant S. Green, Jr., Assistant Secretary of Defense for Force Management, attacked the "mistaken belief" that "the declining youth population will make it impossible to attract enough qualified recruits. . . . When the youth population peaked in 1979, none of the services achieved their recruiting objectives. When the youth population bottoms out [in the 1990s], we will need a smaller proportion of the youth population than was required in 1974—a very good recruiting year."

Gorbachev's Industrial Base

If the US industrial base is a problem, its counterpart in the Soviet Union qualifies as a nightmare. Halfway through the Twelfth Five-Year Plan (1986–90), worker productivity is still low, the quality of industrial machinery is still poor, and things are not improving very rapidly.

The Central Intelligence Agency and the Defense Intelligence Agency, in their annual report to Congress on the Soviet economy, said that Soviet GNP grew by less than one percent last year, the lowest rate since the 1970s. Industrial production was up by only 1.5 percent, about on a par

with the poor rates achieved in 1981–85.

The machine-building industry—centerpiece of General Secretary Mikhail Gorbachev's modernization plans—actually struggled to keep production levels from falling. The machine builders, according to the report, are "being forced to do everything at once: retool, increase quality, conserve resources, change the product mix, and accelerate production." As with other sectors of Soviet industry, they are finding the new quality-control program *(gospriyemka)* disruptive and overwhelming. One Soviet economist blames *gospriyemka* for thirty-five percent of the failures to achieve machine output goals. At one point, inspectors were rejecting twenty percent—and sometimes far more—of the products they checked.

There is pressure, some of it from Mr. Gorbachev himself, to reallocate resources from defense to other sectors of the economy, such as food processing. Defense procurement appears to have grown by about three percent last year, though, and major programs continued on track.

The CIA-DIA report says that "defense industrial participation in the civil modernization program is unlikely to affect weapons production capabilities greatly, at least for the next few years. As a result of the large-scale modernization in the defense industries in the 1970s, the sector has in place most of the equipment it needs to produce weapon systems scheduled for deployment through the early 1990s. Therefore, any investment forgone in weapons plants to supply tooling for civilian production could only delay the introduction of future weapon programs, but would not be likely to slow current output.

"Nonetheless, Soviet defense industry is not without its own pressing needs. In the near future, if not this year, it must begin serious commitments to support the next generation of Soviet weapons. Any move to reallocate resources from defense industry, however—even if it affects only future weapons production—would be controversial and could spark opposition from more conservative elements in the leadership."

Packard on Pentagate

David Packard—whose Blue-Ribbon Commission wrote the book on defense procurement reform—gave the Senate Armed Services Committee a blistering perspective on the so-called "Pentagate" allegations of bribery and fraud in defense contracting.

"In my opinion, the [Defense] Department, the Administration, and Congress together have created an environment in which honest and efficient military acquisition is impossible to implement," Mr. Packard said during his testimony.

He told the Senators that "many of the things that have come to light are not the problems but rather are symptoms of the problems" and that the underlying cause is that "defense procurement has been micromanaged to death." He expressed his agreement with Secretary of Defense Frank C. Carlucci that the process invites abuse and improper attempts to influence contract awards.

In a July 9 speech, Secretary Carlucci said that "the procurement process has become exceedingly cumbersome and complex—characterized by multiple decision points, each of which provides opportunities for congressional micromanagement and influence by special advocates.

As a result, the process creates incentives that reward precisely what we want to avoid. The traditional risk-reward ratios used by business have driven contractors to maximize short-term profits and seek advantage in the political arena," and "the best way for contractors to do that in our current system is to invest in 'market intelligence,' a euphemism for hiring consultants and lobbyists to intervene in the process in the executive branch and on Capitol Hill."

Mr. Packard said that he was all for audits and investigations to ferret out criminals and bring them to justice, but added that "this country has long-established procedures to deal with crime. They should not be preempted in the name of military reform."

The government has gone overboard in emphasizing competition among contractors, Mr. Packard said. He charged that on most big programs, the competition has been chiefly in "tons of paperwork describing how the bidder would meet a bunch of Mickey Mouse requirements that have absolutely nothing to do with doing the job right."

Congress has been reluctant to implement two-year budgets and multiyear funding of major programs, features that the Packard Commission said were essential to procurement reform. Mr. Packard charged that "the real reason Congress will not approve multiyear funding, in my opinion, is that to do so would severely limit their pork-barrel opportunities."

He also denounced "the disgraceful congressional practice of funding programs for equipment that is not really needed by our military forces" and asked, "How can Congress expect ethical behavior from the DoD and the defense industry when it sets such a bad example of ethical behavior at the top?"

Mr. Packard called for an end to the source-selection dickering that culminates in a call for each competing contractor to make its "Best and Final Offer." "That practice should be stopped," he said. "It is operating military acquisition like an Iranian bazaar." Others have noted that it is when the government begins this round of last-minute bid revisions that the competition frenzy peaks and insider information becomes most valuable. At a July 25 press conference, Secretary Carlucci said the Pentagon is "attempting to restrict our contractors to one best and final offer."

The best thing Congress could do to improve military acquisition would be to add "a large measure of common sense to the process," Mr. Packard said.

"The breakdown of the procurement system is caused by two things: the attempt by Congress to impose competition in a situation in which real competition in the conventional context is virtually impossible to achieve and [the attempt] to try to impose competition by a myriad of unrealistic rules and regulations enforced by what I consider to be identical to police-state tactics."

Mr. Packard chastised the services for failure to streamline the procurement bureaucracy. The Commission intended to give a message to the armed forces that there should be only one chain of command in system acquisition, he said. But "so far," he charged, "they have flunked out on this issue.

"It may be that the only way to deal with this issue is for Congress to mandate a reduction on the order of twenty percent in the number of people in the DoD and in the services who are involved in acquisition. I am absolutely sure a better job would be done with twenty percent fewer people. I would not recommend such a reduction unless a corresponding reduction were made in the number of people on congressional staffs." ■

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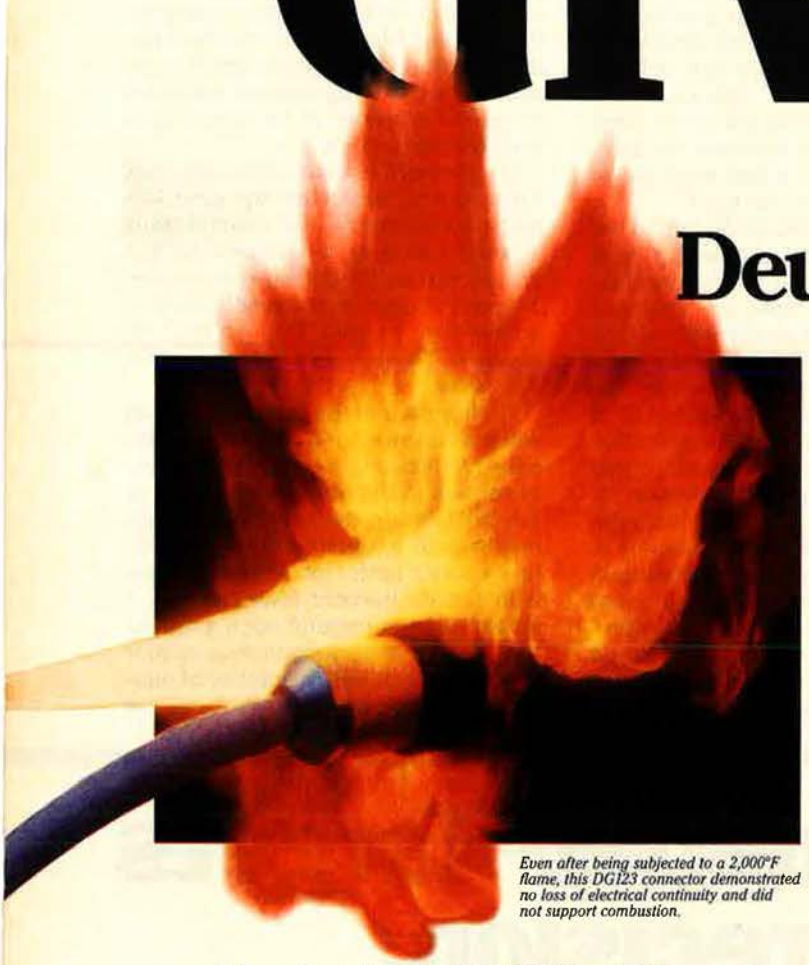

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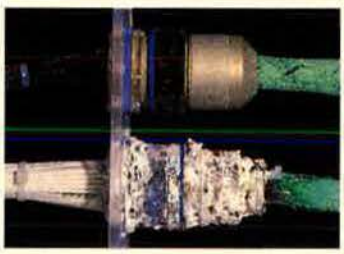

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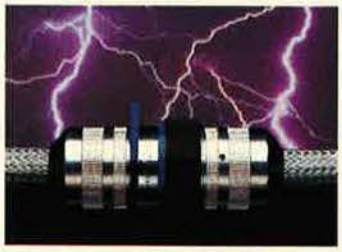
Composite connectors weigh substantially less than comparable aluminum connectors.

M HELL

nectors are at their best are at their worst.



DG123 and ABC composite connectors offer outstanding EMI/RFI protection.

Outstanding EMI/RFI protection.

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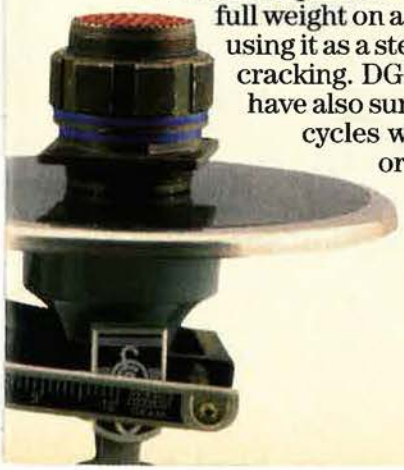
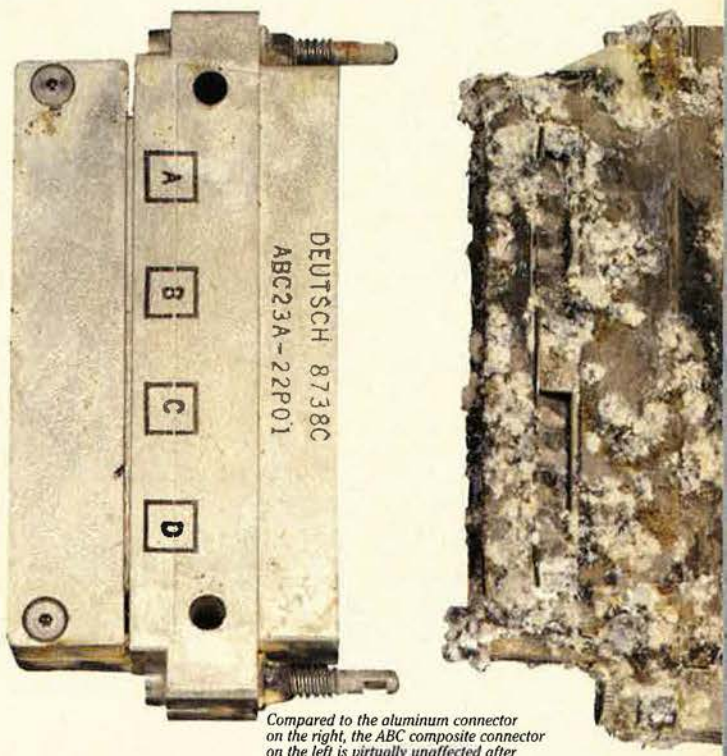
In many instances, composite connectors will give, rather than break under stress.





Compared to the aluminum connector on the right, the ABC composite connector on the left is virtually unaffected after 1000 hours of salt spray testing.

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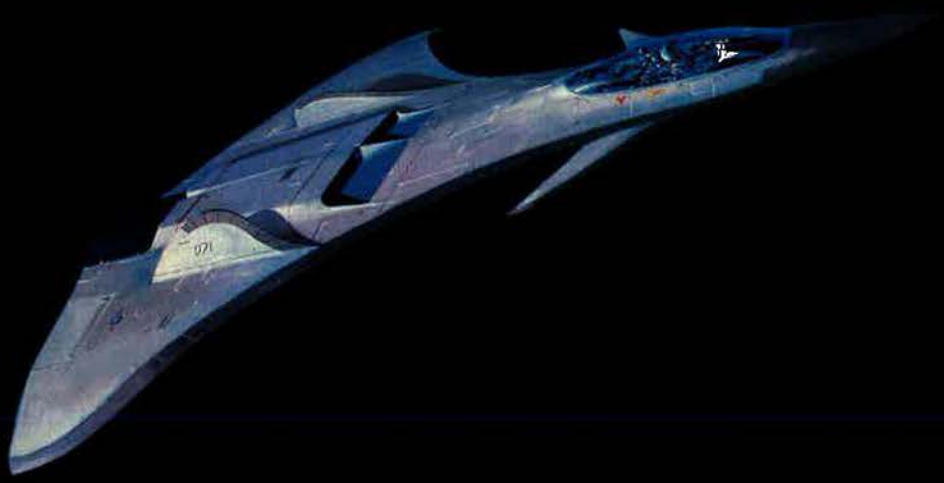

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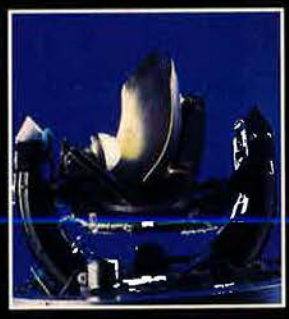

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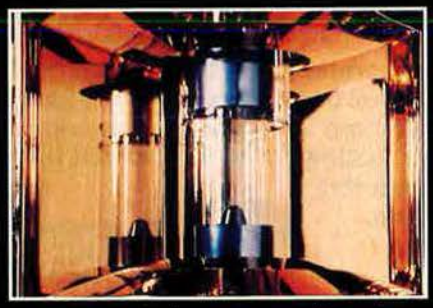

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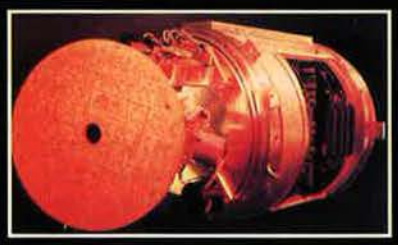
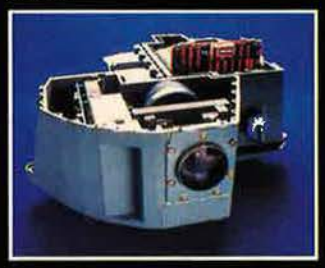


DSMAC (Digital Scene Matching Area Correlator) guides missiles to targets.



Expendable flares and chaff distract radar-guided and heat-seeking missiles.

ALQ-178/RAPPORT system for the F-16 is the first integrated, self-protection system for tactical aircraft from a single supplier.

Capitol Hill

By Brian Green, CONGRESSIONAL EDITOR

Washington, D. C.

Authorization Conference

The House and Senate finally approved an FY '89 defense authorization bill that provides $299.5 billion in budget authority (the authority to obligate money). This budget is one percent smaller than last year's. The House-Senate conference on the bill finally concluded when conferees insisting on revision of the so-called Davis-Bacon provisions (that pertained to DoD's obligation to hire labor at prevailing local wages—often union scale) dropped their demands.

The bill provides a 4.1 percent military pay raise and a seven percent increase in BAQ. The pilot-retention bonus program was limited to $36.2 million of the $54 million requested.

The B-2 Stealth bomber and the advanced cruise missile were both funded at almost the full amount requested. The amount of $15 million was authorized to explore alternatives to the B-1B bomber's electronic countermeasures (ECM) suite. A sense-of-Congress amendment was approved stating that SDI should focus on development of an accidental-launch protection system (ALPS) compliant with the ABM Treaty. ALPS was first proposed by Senate Armed Services Committee (SASC) Chairman Sen. Sam Nunn (D-Ga.).

The conferees cut funding for space-based interceptors (those that destroy ballistic missiles and warheads by colliding with them). Full funding was provided for ground-based interceptor systems as envisioned in ALPS.

Speculation on Capitol Hill suggests that President Reagan may veto either the defense authorization bill or, when it is finally approved, the defense appropriations bill. The Administration is displeased with the authorization bill's arms-control provisions and the compromises on strategic programs.

Base-Closing Bill

The House passed a "base-closing" bill very close to the original version proposed by Rep. Dick Armey (R-Tex.) and rejected versions that would have greatly complicated base-closing procedures.

The Armey bill creates a commission that would recommend a list of bases for closure. The Secretary of Defense would then have the option of approving or disapproving the entire list. One of the few approved amendments to the original Armey bill gives Congress the option of voting to disapprove the list. If Congress does nothing, the bases on the list would (after the Secretary's approval) be closed. The measure authorizes up to $300 million to cover the cost of base closings.

The House rejected versions that would require extensive environmental and economic impact studies that could have delayed base closings for years and made the process very expensive.

The Senate passed similar legislation in conjunction with its authorization bill, but dropped it from consideration in the authorization conference because the House had not acted on the measure at the time. Staffers now suggest, however, that the Senate may be able to find a way to join the House in a conference on base-closing legislation without having to push the bill through the Senate again.

Scandal Legislation

The recent procurement irregularities at the Pentagon have provoked another flood of reform legislation in both Houses of Congress.

Sen. Alan Dixon (D-Ill.) of the SASC introduced a bill that would make the Under Secretary of Defense for Acquisition (USDA) a true acquisition "czar." The bill would:

- Assign control over the services' competition advocates to the USDA.
- Require the services' Senior Acquisition Executives to report to the USDA and limit their authority to that delegated by the USDA.
- Authorize the USDA to review and approve each contract for major weapon systems.

The measure was introduced in spite of testimony by USDA Robert Costello that he did not need any more authority to perform his duties. Secretary of Defense Frank Carlucci, in recent testimony, also voiced caution concerning "piecemeal reforms, which could do more harm than good." Secretary Carlucci noted that "one major cause of procurement waste, and possibly fraud, is instability. . . . Reducing [it] requires a comprehensive effort and must include Congress." He advocated two-year budgeting and more multiyear procurement.

Other bills have been introduced that would create an inspector general's office independent of DoD, require registration of all consultants, and create an independent acquisition agency. Another, introduced by Rep. Charles Bennett (D-Fla.), would further toughen "revolving-door" legislation by banning any move from DoD to a position with a defense contractor within two years of leaving DoD if the employee were significantly involved with the contractor while at DoD.

VA Cabinet Post Approved

By a vote of 84–11, the Senate finally approved the bill to create an executive Department of Veterans' Affairs. The House approved its version of the bill last November. Minor differences remain to be worked out between the two bills.

"A Political Football"?

Reports drawing on a classified briefing to the House Armed Services Committee that claim that flaws in the electronic countermeasures (ECM) system will prevent the B-1B bomber from performing its mission have prompted Air Force Chief of Staff Gen. Larry D. Welch to charge that the B-1B "remains a political football." He argued that "in every respect, except ECM capability, the aircraft meets or exceeds expectations; and no informed person can seriously doubt the capability of the B-1 to perform its design mission today."

The B-1's ECM can protect the plane from the highest priority threats, but the Air Force remains "far from satisfied with the development of the the baseline ECM system." ■

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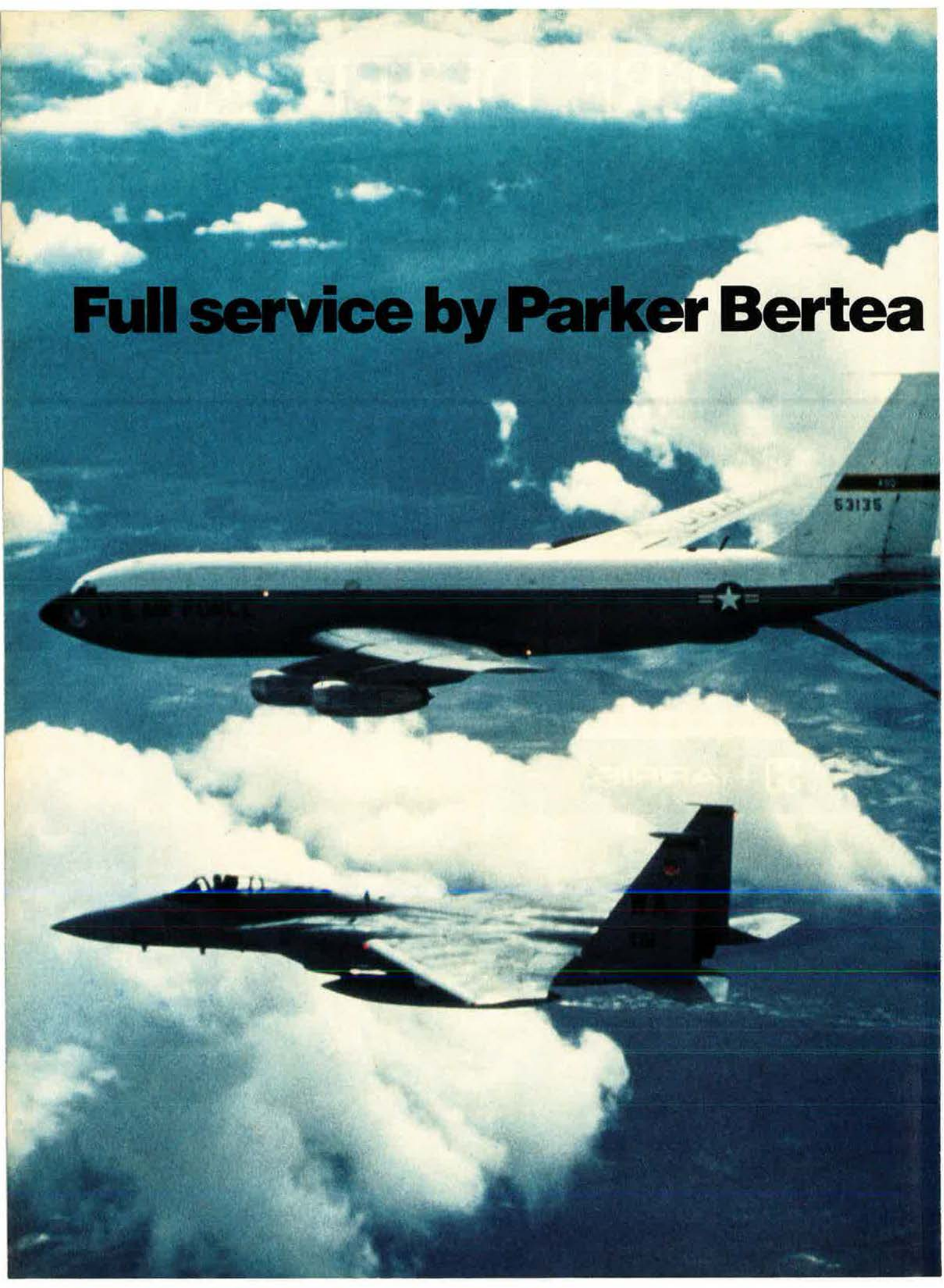
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Aerospace World

By Jeffrey P. Rhodes, AERONAUTICS EDITOR

Washington, D. C.

★ The Supreme Court, in a 5–4 decision, held that defense contractors are entitled to the same kind of immunity the government has from lawsuits in cases of deaths or personal injuries caused by negligently designed or defective equipment.

On April 27, 1983, Marine Lt. David A. Boyle died after the CH-53D helicopter he was copiloting crashed off Virginia Beach, Va., during a training exercise. Although Lieutenant Boyle survived the crash, he was not able to escape from the wreckage and drowned. Lieutenant Boyle's father filed suit against Sikorsky, the helicopter's manufacturer.

At trial in Federal District Court, Mr. Boyle's lawyers alleged that Sikorsky had (1) defectively repaired the CH-53's automatic flight control servo, which caused the crash, and (2) defectively designed the copilot's emergency escape system. The jury awarded Mr. Boyle $725,000.

The Court of Appeals reversed the decision, saying that Mr. Boyle had failed to demonstrate that Sikorsky's repair work, and not that of the Navy, had caused the crash and that Sikorsky could not be held liable for the design of the escape system because, on the evidence presented, it satisfied the requirements of the "military contractor defense."

Justice Antonin Scalia wrote for the majority in the June 27 decision: "First, petitioner contends that there is no justification in federal law for shielding contractors from liability for design defects in military equipment. . . .

"It makes little sense to insulate the Government against financial liability for the judgment that a particular feature of military equipment is necessary when the Government produces the equipment itself, but not when it contracts for the production. . . .

"Liability for design defects in military equipment cannot be imposed . . . when (1) the United States approved reasonably precise specifications; (2) the equipment conformed to those specifications; and (3) the supplier warned the United States about the dangers in the use of the equipment that were known to the supplier but not the United States."

The experimental Grumman X-29 forward-swept wing demonstrator flew its 200th mission on June 8, setting a record for most flights of a single X-series aircraft. NASA test pilot Rogers Smith crewed the flight, which included this simulated aerial refueling to evaluate handling qualities.

Mr. Boyle's second contention, that this case did not apply under the "military contractor defense," was also rejected by the Court. His third point (quoting Justice Scalia), "that the Court of Appeals erred in not remanding for a jury determination of whether the elements of the [military contractor] defense were met in this case," was remanded to the Court of Appeals for clarification of the language it had used.

If the lower court determines that no reasonable jury could find the "military contractor defense" was inapplicable, the judgment the Court of Appeals reached the first time would be upheld. Otherwise, the court will have to undertake an inquiry into the proper sufficiency of the "contractor defense."

Chief Justice William H. Rehnquist and Justices Byron R. White, Sandra Day O'Connor, and Anthony Kennedy joined Justice Scalia's opinion. Justice William J. Brennan, Jr., wrote the dissenting opinion, joined by Justices Thurgood Marshall and Harry A. Blackmun. Justice John Paul Stevens dissented separately.

Justice Brennan felt that the decision meant that a military contractor could avoid liability because of "perhaps no more than a rubber stamp from a federal procurement officer who might or might not have noticed or cared about the defects, or even had the expertise to discover them."

He also said that "the Government contractor defense was breathtakingly sweeping." The Justice noted that it could be applied not only to military equipment but "to any made-to-order gadget that the Federal Government might purchase" and that it could be used to deny suits brought by military personnel, government employees, or anyone injured by a contractor's negligent design, including "the children who might have died had respondent's helicopter crashed on the beach."

Justice Stevens felt that the Court

was engaging in a "lawmaking venture" and that "we should defer to the expertise of the Congress" in that area.

★ An era ended on July 7 when the last Convair F-106 Delta Dart interceptor was taken off alert, marking the first time since 1959 that there was not a "Six" standing on the five-minute ready pad. Other than a small number of test and drone aircraft, the Delta Dart was the last of the Air Force's "Century Series" of fighters in active use. The F-106's air defense mission is now handled by F-4s, F-15s, and F-16s.

The 177th Fighter Interceptor Group, an Air National Guard unit based at the Atlantic City International Airport in New Jersey, was the last unit to fly the F-106. Its Delta Darts will be sent to the Aerospace Maintenance and Regeneration Center at Davis-Monthan AFB, Ariz., by September. The F-106s will then be converted into drones and next summer will take over the role of target from the last remaining QF-100s. The 177th FIG is the fourth air defense unit to convert to the General Dynamics F-16A/B aircraft.

Over the course of its career, the F-106, a follow-on to the F-102 Delta Dagger, was repeatedly modified (provisions for in-flight refueling and a 20-mm cannon, for instance) to keep the interceptor current. The first F-106 flew on December 26, 1956, at Edwards AFB, Calif. A total of 277 F-106A single-seat aircraft and sixty-three F-106B tandem-seat trainers was built at the Convair plant in San Diego, Calif. The last F-106 was delivered to the Air Force in 1961.

—USAF photo by Susan E. Lord-Patercsak

The Air Force Contract Management Division at Kirtland AFB, N. M., is one of two sites (ESD is the other) testing the Air Force's new standard Defense Data Network (DDN), which will replace the AUTODIN communications network for data transmission. Here (from left), SMSgt. Henry Hill, MSgt. Charles Dear, Jr., Frank Allegretti (seated), and Jim Sanders, representatives of the various organizations developing and using the system, are running a test.

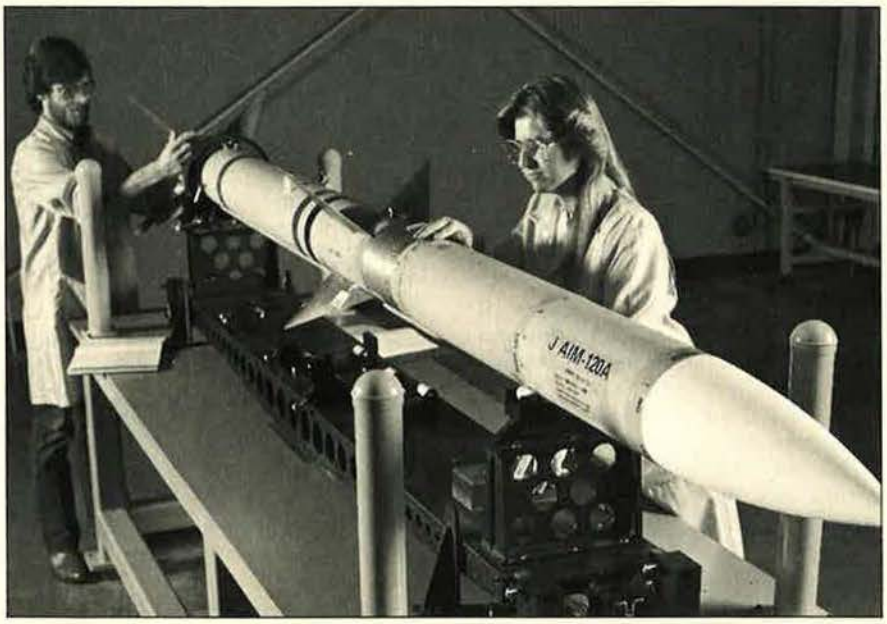
★ Work is progressing steadily on the AIM-120A advanced medium-range air-to-air missile (AMRAAM) program. Here is the latest rundown.

Hughes, the lead contractor, produced its 128th missile in early July, thus completing delivery requirements for the full-scale development (FSD) test program. Construction of the FSD missiles began in 1981. Hughes is building the missiles at its Tucson, Ariz., plant and will deliver the first of 105 production missiles to the Air Force this month.

On July 15, Air Force Systems Command's Armament Division at Eglin AFB, Fla., awarded both Hughes and Raytheon, the second-source manufacturer of the missiles, Lot 2 production contracts worth $184.3 million and $162.3 million, respectively. Hughes will build 223 missiles (200 for the Air Force and twenty-three for the Navy), and Raytheon will build 200 AMRAAMs for the Air Force. The two contractors will compete head-to-head for Lot 3 production.

Raytheon, which builds the AIM-120s at its plant in Lowell, Mass., is well along on qualifying itself as the second source. Five of the fifteen qualification missiles called for have been delivered, and these AMRAAMs are undergoing environmental and reliability testing. Raytheon will build seventy-five Lot 1 missiles.

Meanwhile, a new office has been set up at Eglin to oversee the acquisition of AMRAAMs for foreign countries. The new office, called the International Directorate, is a merger of AMRAAM's former International Office with the Representatives of Germany and the United Kingdom Offices. Germany and the UK have the option to acquire AIM-120s directly from the manufacturers or through the Foreign Military Sales (FMS) program. Other options include assembling the missiles in Europe or dual-producing them there. Norway has re-



The 128th and final missile in the Advanced Medium-Range Air-to-Air Missile full-scale development effort is prepared for weight and balance testing at the Hughes facility in Tucson, Ariz. First deliveries of production AIM-120s will begin this month. Raytheon is the second-source manufacturer for AMRAAM.

cently applied to be a participant in the AMRAAM program.

The nearly twelve-foot-long, 335-pound AMRAAM, with its active radar seeker, will replace the semiactive AIM-7 Sparrow, which dates back to the early 1950s. The Air Force plans to acquire 17,000 AIM-120s, and the Navy is to receive an additional 7,000 missiles.

★ Two pilots who gained fame in the atmosphere and two who were notable for exploits above it were enshrined in the National Aviation Hall of Fame in Dayton, Ohio, on July 23. These inductees bring the total number of aviation notables entered into the Hall to 122.

This year's Hall of Famers:

Gen. John C. Meyer (1919–75) recorded twenty-four aerial victories in World War II and then added two MiG-15s to his score in Korea. His total of twenty-six victories puts him in a tie with Eddie Rickenbacker for seventh place on the all-time Air Force ace list. After Korea, General Meyer served in several staff jobs before becoming commander of Twelfth Air Force in 1963. After a tour in the Organization of the Joint Chiefs of Staff, he served as Vice Chief of Staff of the Air Force from 1969 to 1972.

He retired from the Air Force as Commander in Chief of Strategic Air Command. His decorations include the Silver Star with oak leaf cluster, Legion of Merit, and Distinguished Flying Cross with six oak leaf clusters. The award given to the F/FB-111 unit with the highest damage expectancy at SAC's annual bombing and navigation competition is named for General Meyer.

Bob Hoover (born 1922), almost as famous for his Panama hat as for his flying, has flown more than 300 types of aircraft and has flight-tested a considerable number of fighters. Mr. Hoover was shot down over France while flying Spitfires for the 52d Fighter Group and spent sixteen months as a prisoner of war. He later flew for the Flight Evaluation Group at Wright Field in Dayton, Ohio.

Mr. Hoover began a thirty-six-year association with North American Aviation in 1950. He was the first pilot to fly the Navy's XFJ-2 Fury fighter and T-28 Trojan trainer aircraft. He also did experimental work with the F-86 and F-100. He holds four airplane records, and he is the only person to serve two terms as president of the Society of Experimental Test Pilots. Mr. Hoover currently serves as vice president for special projects for Evergreen International Aviation, Inc.

Col. William J. "Pete" Knight (born 1929) could still be called "the fastest man alive." Twice he pushed the North American X-15 rocket plane past Mach 6. He set the unofficial absolute world record of Mach 6.72 in October 1967 in the X-15A-2 and was later awarded the Harmon Trophy. He also received astronaut wings for a flight that reached 280,000 feet, or a little more than fifty-three miles.

Colonel Knight is a graduate of both the Air Force's Experimental Flight Test Pilot School and Aerospace Research Pilot School at Edwards AFB, Calif. After a combat tour in Vietnam, he was named test director for the F-15 System Program Office and later the director of the Fighter/Attack SPO, both at Wright-Patterson AFB. He ended his career in 1982 as vice commander of the Air Force Flight Test Center at Edwards. He is currently mayor of Palmdale, Calif.

Capt. John W. Young (born 1930) is the only person in history to fly into space on six separate flights. He was involved with two "firsts" in America's space program—he flew on the first Gemini mission (with Virgil "Gus" Grissom) in 1965 and was commander of the first Space Shuttle mission (STS-1) in 1981. Captain Young served as commander of *Gemini-10, Apollo-16* (the fifth moon landing), and STS-9. He also flew as command module pilot for *Apollo-10*. He logged a total of thirty-four days, nineteen hours, and forty-two minutes in space.

After a tour flying Navy fighters, Captain Young graduated from the Navy Test Pilot School in 1959 and was assigned to the Naval Air Test Center at NAS Patuxent River, Md. He retired from the Navy in 1976. He is now Special Assistant to the Director for Engineering, Operations, and Safety at NASA.

★ **HONORS**—This year's **Omaha Trophy,** presented annually since 1970 to Strategic Air Command's top wing, was awarded to the **97th Bombardment Wing** at Eaker AFB, Ark. The

September Anniversaries

- *September 17, 1908:* Signal Corps Lt. Thomas E. Selfridge becomes the first person killed in a powered-aircraft accident when the Wright Flyer he was riding in crashes at Fort Myer, Va. Orville Wright, at the controls, suffers serious injuries.
- *September 25, 1918:* For actions on this date, Capt. Edward V. Rickenbacker of the 94th Aero Squadron would receive the first Medal of Honor given for air activity.
- *September 4, 1923:* First flight of the airship USS *Shenandoah* (ZR-1) is made at NAF Lakehurst, N. J. The airship would make fifty-seven flights in two years before being destroyed by a storm near Marietta, Ohio.
- *September 22, 1928:* The number of people whose lives have been saved by a parachute passes 100 when Lt. Roger V. Williams has to bail out over San Diego, Calif.
- *September 4, 1933:* Jimmy Wedell sets a world landplane speed record of 304.98 mph in the Wedell-Williams racer over Glenville, Ill.
- *September 29, 1938:* Brig. Gen. Henry H. "Hap" Arnold is named Chief of the Army Air Corps, succeeding Maj. Gen. Oscar Westover, who was killed in a plane crash September 21.
- *September 12, 1943:* German commandos led by Capt. Otto Skorzeny help Italian dictator Benito Mussolini to break out from a hotel in Gran Sasso where he was being held prisoner. Captain Skorzeny and Il Duce escape in a Fieseler Fi-156 Storch observation plane.
- *September 15, 1948:* Air Force Maj. Richard L. Johnson, flying a North American F-86, recaptures the world speed record for the US, streaking over a three-kilometer course at Edwards AFB, Calif., at a speed of 670.981 mph.
- *September 11, 1953:* A Grumman F6F-5K Hellcat drone is destroyed in the first successful interception test of the N-7 (AIM-9) Sidewinder air-to-air missile at China Lake, Calif. The Naval Ordnance Test Station, which had fashioned the missile basically out of spare parts, conducted the test. Close to 150,000 Sidewinders have been produced since.
- *September 21, 1953:* North Korean pilot Lt. Noh Kum Suk defects and flies his MiG-15 to Kimpo AB, near Seoul, South Korea. He is granted asylum and is given a reward of $100,000. The aircraft is now on display at the Air Force Museum.
- *September 1, 1958:* The first group of Air Force master sergeants is promoted to the newly created grade of senior master sergeant. Also on this date, the first jet-to-jet air refueling takes place between a Boeing KB-47 and a "standard" B-47.
- *September 26, 1958:* A Boeing B-52D crew sets a world distance record of 6,233.98 miles and a speed record of 560.75 mph (over a 10,000-meter course) during a two-lap flight from Ellsworth AFB, S. D., to Douglas, Ariz., to Newbury, Ore., and return.

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TN 2215 60 minutes $29.95

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An exciting overview of America's current front-line jet fighters that put you in the cockpit for a 9G ride you won't soon forget. This is a close-up look at the F-14, F-15, F-16, F/A-18, and the new F-20. *Jet Fighter* puts you in the cockpit as you can experience dogfights and weapon demonstrations that will leave you speechless. *All action!*
FG 9101 45 minutes $39.95

Air War in Vietnam
The most awesome display of aerial firepower ever was unleashed in Vietnam. *Air War In Vietnam* uses the pick of air combat footage to tell the story from the first U.S advisor to the massive U.S. bombings. Also included is captured North Vietnamese footage of their anti-aircraft defenses.
ST 6016 60 minutes $59.95

U.S. Air Power
The aircraft and the weaponry the U.S. Air Force deplos are the most devastating in military history. *U.S. Air Power* tells the full story of these amazing war machines, utilizing specially declassified footage that shows how they react in combat situations. Essential viewing for every aviation and military enthusiast.
ST 0600 60 minutes $59.95

Kamikaze
One of the most extraordinary films is now available on video. Witness the raw realism amid the heat of battle as camera crews captured the horror of the Kamikaze. For 82 days the Japanese launched a "one-way air force" that sank 164 allied ships and caused more than 10,000 casualties. This was the advent of the "human death machine." *Gripping!*
NF 1100 84 minutes B & W $29.95

Military Aircraft Video Report #2
The Blue Angels put on a great show in their brand new F/A-18s. Also included is rare footage of the F8 Crusaders first super-sonic flight, and sit back and enjoy the fast paced world of the S-3 Viking. Also included are special profiles of the latest F-15E, A-7 upgrade project and the Navy F-16. If you're into military aircraft, this is for you.
PC 8012 60 minutes $39.95

The Wild Blue Yonder
The history of the Air Force is magnificently told in this grand video. From its early beginning in 1909 to the present, this is one film any Air Force enthusiast cannot do without. *Great aerial footage!*
MP 1184 45 minutes $29.95

Falcon Domain


The F-16 Fighting Falcon was designed to out-fight any aircraft in the sky and is armed to dominate. In this full color panorama, you get a detailed look at the systems, weapons, and "magic" that make the F-16 a 21st century fighter plane. You'll be strapped in the cockpit during gut-wrenching dogfights as the pilots take the F-16 to the edge. From the Lantirn infra-red night attack system to the high-powered ride with the "Thunderbirds", *Falcon Domain* is a stunning film to add to your collection. A great musical soundtrack featuring, "Thunderbirds in Blue" and "Performance Envelope" makes this an audio and visual experience! **ST 0800 90 minutes $59.95**

Vietnam: Siege and Dissent
This brilliant film, narrated by Richard Basehart, covers the siege of Khe Sanh and the explosion of the Tet Offensive. These battles intensified growing anti-war sentiment.
NE 7637 98 minutes $29.95

Vietnam: Time of the Locust
This award-winning compilation on the Vietnam War utilizes footage from numerous sources, including suppressed footage shot by Japanese television. *Warning: This film contains brutal and explicit scenes of excessive violence.*
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trophy is awarded for success in command-wide competitions, inspections and management evaluations, achievements, safety record, and participation in exercises and deployments. This marks the first time the 97th BMW has won the award.

In late June, the new **NCO Professional Military Education Center** at Holloman AFB, N. M., was **named in honor of the late TSgt. Joel C. Mayo,** one of the eight servicemen killed in the April 24, 1980, attempt to rescue American hostages held in Iran. Sergeant Mayo, a member of the 8th Special Operations Squadron at Hurlburt Field, Fla., was chosen because of his dedication to duty, his professionalism, and his courage in volunteering for the Iranian hostage-rescue mission. Only two other Air Force PME centers have been named in honor of enlisted troops who died in the line of duty.

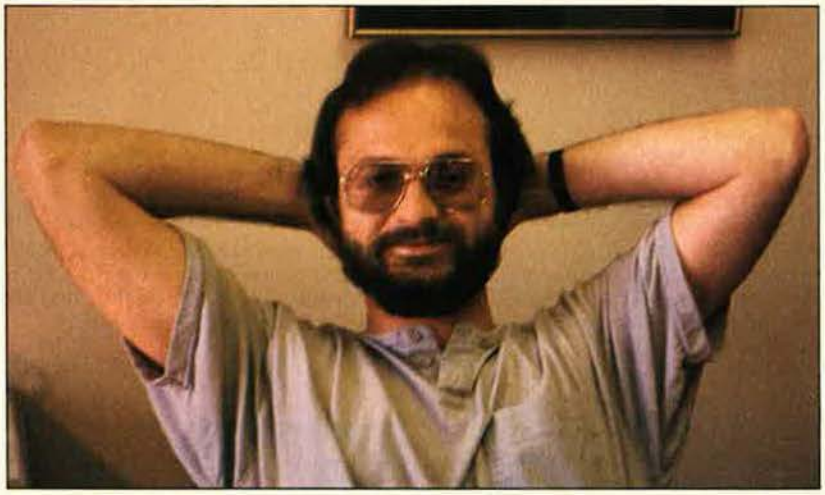
Gen. Jack I. Gregory, subsequently retired Commander in Chief of Pacific Air Forces, **was inducted into the PACAF Order of the Sword** in June 21 ceremonies at Hickam AFB, Hawaii. The award recognizes individuals whom noncommissioned officers hold in high esteem and choose to honor. General Gregory was cited for "making a tremendous impact on the enlisted force." He is the tenth recipient of the PACAF Order of the Sword since the command adopted the program in 1974.

★ **PURCHASES—Raytheon Corp.'s Equipment Division** in Wayland, Mass., was awarded a $167 million contract by Air Force Systems Command's Electronic Systems Division on June 30 to **upgrade the Ballistic Missile Early Warning System** (BMEWS) radar at RAF Fylingdales. The current BMEWS radar will be replaced by a three-faced, solid-state phased-array radar built in a seven-story triangular building. The British government will pay for all facility construction, design, and management expense. The Royal Air Force will operate and maintain the radar.

Some **recent sales proposed by the Pentagon** under the **Foreign Military Sales** (FMS) program include 1,400 AGM-65D/G Maverick air-to-ground missiles (plus 100 training rounds) and spares and support to West Germany for $300 million, 144 AGM-65Ds to Egypt for $27 million, 500 FIM-92 Stinger shoulder-mounted antiaircraft missile systems plus 1,000 reload missiles to Greece for $124 million, and eight F-16s to Malaysia plus spares and support for $292 million. Hughes and Raytheon will compete for the Maverick sales. Malaysia will be the nineteenth air arm to fly F-16s. Congress has thirty days to reject each of the sales before they go into effect automatically.

Rafael of Israel was awarded a $39 million contract plus options by Air Force Systems Command's Armament Division on June 10 for **initial operational test and evaluation of the Have Nap** standoff missile. Have Nap, called Popeye by Rafael, is an air-launched, TV-guided missile that has a range of about fifty miles. Live-fire launches of the 3,000-pound missile will be conducted from B-52s during the sixteen-month contract. Rafael will team with Martin Marietta if Have Nap goes into full production.

In late June, **British Aerospace** received an Air Force contract for two **Microdome low-level air defense trainers.** The trainers will be installed in Turkey, where they will be used to train personnel in the use of the Rapier antiaircraft missile. The Microdome has a radius of sixteen feet, and both the operator's missile and potential targets are computer-generated and projected by laser onto the internal surface of the dome. These realistic simulators even include aircraft, missile, and battlefield sounds.



Assistant Managing Editor Hugh Winkler, a member of the magazine staff since 1979, resigned his position at the end of August.

A Farewell to Hugh Winkler

This is the last issue of AIR FORCE Magazine that will benefit from the presence on the staff of Assistant Managing Editor Hugh Winkler, who's been the skilled guardian of what we say and how we say it since back in mid-1979. Then, newly graduated from Georgetown University, he joined our midst, and we've been the better for it. During these years, he has each month conducted the letters-to-the-editor column "Airmail" and "Airman's Bookshelf," making it look easy.

Mr. Winkler can spot a redundancy at twenty paces. He downs solecisms before they get off the launchpad. He shows clichés no mercy. He has, in addition, made computers do things the manufacturer thought quite impossible.

Some of Hugh's colleagues, given the chance to add to this farewell, had this to say:

Editor in Chief John Correll: "Winkler doesn't just work with the English language. He *enforces* it."

Senior Editor Jim Canan: "I've delighted in his company and his craftsmanship, and I cheer him on."

Senior Editor Bob Dudney: "The word is irreplaceable."

Aeronautics Editor Jeff Rhodes: "Hugh actually makes my copy better. That's painful to say, but it's true."

Production Director Bob Shaughness: "A true asset lost! I wish him success in future endeavors."

Art Director Guy Aceto: "An artist's editor, the definition of a team player."

Editorial Assistant Dan Sheehan: "I'll miss his generosity with time and expertise."

As he leaves us now to spend the coming months in travel, we wish him bon voyage and happy word-processing and thank him for his many contributions to our publication and to our lives.

—R.M.S.

The US Customs Service has a new weapon in its fight against drug smugglers—the first Lockheed P-3 Airborne Warning and Control (AEW&C) aircraft. Now flying training missions, the aircraft, dubbed "Blue Sentinel" by Customs, will be used to detect and track suspected drug smugglers and relay information to other Customs Service aircraft and crews.

★ **DELIVERIES**—The **first of 130 Shorts Tucano T.1 turboprop trainers** was delivered to the **Royal Air Force's Central Flying School** at RAF Scampton in Lincolnshire on June 12. The aircraft will be used for engineering acceptance checks and for developing a training syllabus. The first Shorts Tucano, a modification of the Brazilian Embraer EMB-312 Tucano, was to have been delivered by the end of 1986, but engine teething problems and canopy changes caused delays. The T.1 will replace the Jet Provost T.3, in use since the mid-1950s, for basic training.

The General Services Administration (GSA) transferred **seven Lockheed C-130As to the US Forest Service** on June 10. The aircraft, excess to USAF needs, are stored at Davis-Monthan AFB, Ariz., and will be ferried to Stockton, Calif., where they will be modified for the firefighting role. The aircraft, transferred at no cost to the Forest Service, are expected to be serviceable for another fifteen years. The C-130s will be based in California and will replace several unflyable Fairchild C-119s.

The **US Customs Service** began flying training missions with its new Lockheed **P-3 Airborne Warning and Control** (AEW&C) aircraft in early July. The aircraft, nicknamed "Blue Sentinel" by the Customs Service, will be patrolling the southern US border, the Caribbean, and the Gulf of Mexico to detect and track drug smugglers. The aircraft, to be based at Corpus Christi, Tex., is equipped with a General Electric AN/APS-125 radar housed in a twenty-four-foot rotodome that can provide surface surveillance of 196,250 square miles at a time. Customs has an option on three more aircraft.

★ **MILESTONES—David H. Hilland,** an engineer at the Air Force Weapons Laboratory at Kirtland AFB, N. M., **has invented a device to protect individual electronic chips,** rather than the whole circuit board, from high voltage. The invention is a tiny component called a metal oxide varistor, and it is an integral part of each leg of the many-legged metal sockets that the chips normally plug into. The varistors shunt excess voltage away from the chips, much as a home pressure cooker vents excess steam. Developed to increase the reliability of military electronic systems, the invention could also benefit home electronic devices.

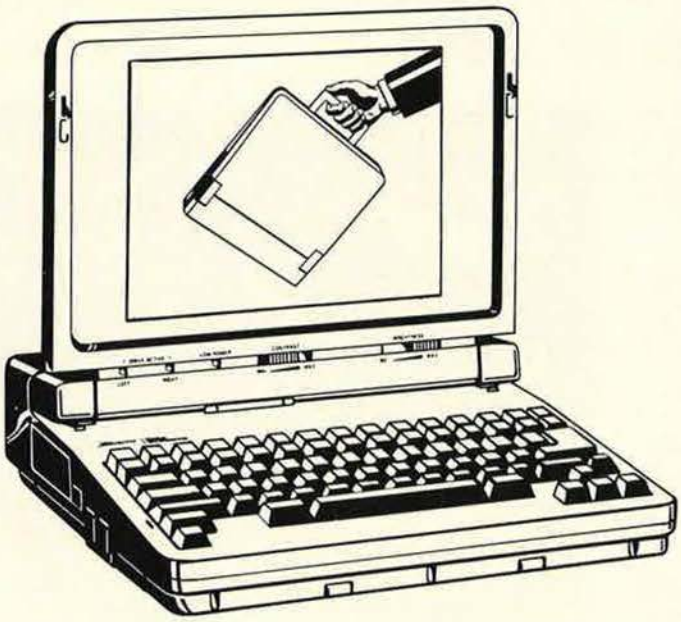
Senior Staff Changes

PROMOTION: To be **Lieutenant General:** Donald O. **Aldridge.**

RETIREMENTS: B/G Richard A. **Ingram;** B/G Larry R. **Keith;** B/G Roger C. **Smith;** M/G Richard E. **Steere.**

CHANGES: M/G (L/G selectee) Donald O. Aldridge, from Cmdr., 1st STRAD, SAC, Vandenberg AFB, Calif., to Vice CINC, Hq. SAC, Offutt AFB, Neb., replacing retiring L/G Kenneth L. Peek, Jr. . . . **B/G Frank Cardile,** from Cmdr., 374th TAW, MAC, Clark AB, the Philippines, to Dep. Cmdr., Tactical Systems, JTIDS & AWACS, ESD, AFSC, Hanscom AFB, Mass., replacing B/G Kenneth E. Staten . . . **ANG M/G John B. Conaway,** from Dir., ANG, Washington, D. C., to Dir., ANG, and Vice Chief, Nat'l Guard Bur., Washington, D. C. . . . **Col. (B/G selectee) Lewis E. Curtis III,** from Ass't DCS/Material Mgmt., Hq. AFLC, Wright-Patterson AFB, Ohio, to DCS/P&P, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing B/G (M/G selectee) Dale W. Thompson, Jr. . . . **B/G Dennis D. Doneen,** from Dep. Dir., Log. Plans and Prgms., DCS/L&E, Hq. USAF, Washington, D. C., to DCS/Product Assurance and Acquisition Log., Hq. AFSC, Andrews AFB, Md., replacing M/G David J. Teal.

M/G Trevor A. Hammond, from C/S, Hq. AFLC, Wright-Patterson AFB, Ohio, to Cmdr., Sacramento ALC, McClellan AFB, Calif., replacing retiring M/G Lee V. Greer . . . **L/G Charles McCausland,** from Vice Cmdr., Hq. AFLC, Wright-Patterson AFB, Ohio, to Dir., DLA, Cameron Station, Va. . . . **B/G Kenneth E. Staten,** from Dep. Cmdr., Tactical Systems, JTIDS & AWACS, ESD, AFSC, Hanscom AFB, Mass., to Cmdr., AD, AFSC, Eglin AFB, Fla., replacing retired M/G Richard E. Steere . . . **B/G (M/G selectee) Dale W. Thompson, Jr.,** from DCS/P&P, Hq. AFLC, Wright-Patterson AFB, Ohio, to C/S, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G Trevor A. Hammond . . . **B/G Walter T. Worthington,** from Dep. Dir. of Deployment, USTRANSCOM, MacDill AFB, Fla., to Cmdr., 836th AD, TAC, Davis-Monthan AFB, Ariz., replacing retiring B/G Larry R. Keith. ■



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Flying in the Trees

"Isn't there something missing on that helicopter?" is a question frequently asked when people first see McDonnell Douglas Helicopter Co.'s NOTAR (No Tail Rotor) demonstrator, a modified OH-6A. But the system that has been created to replace the tail rotor is well along toward becoming the biggest advance in helicopter technology since the introduction of turbine engines in the 1950s.

One of the essential parts needed for flight on a conventional helicopter is a tail rotor. Essentially a variable-pitch propeller mounted sideways, the tail rotor is critical to countering the torque that tries to spin the helicopter fuselage in the opposite direction from the direction the main rotor blades are turning and to providing directional control. Torque can also be overcome by tandem or by counterrotating main rotors.

The NOTAR system, though, takes a different approach. Consisting of a hollow, slotted tailboom, a rotating direct-jet thruster at the end of the boom, and an enclosed variable-pitch fan at the fuselage/boom juncture, the NOTAR system uses blown high-volume, low-pressure air to counter torque and provide directional control.

The fan keeps the boom pressurized at a differential pressure of about 0.5 psi. The twenty-four-inch-diameter fan is turned at a speed of 6,300 rpm by a gearbox driven by the tail rotor drive shaft. The fan is about fifty percent efficient on the NOTAR demonstrator. Wear and tear on the rotor transmission is greatly reduced because it only has to drive a small fan rather than the tail rotor system.

Running almost the length of the boom are two slots located at about the 70° and 140° low positions. Between the downwash of the main rotor blades and the air blown by the fan, these slots act like airfoils and produce "lift" (which, here, is actually antitorque) through a phenomenon known as the Coanda effect. This lift provides sixty percent of the antitorque needed.

The other forty percent of antitorque (and yaw control, too) comes from the thruster. The rotating thruster, controlled by the pilot's pedals, allows regulated amounts of air to exit on the left and right sides of the boom and thus provides lateral control of the helicopter.

Because the idea of a rotorless tail on a helicopter is so radical, McDonnell Douglas Helicopter recently brought the NOTAR demonstrator and a conventional MD500E helicopter to Washington to let congressional, Pentagon, and other government officials see the system for themselves. In between officials, AIR FORCE Magazine was given the chance to fly in both machines. What an eye-opening experience!

The MD500E is the top of the civilian evolutionary line springing from the OH-6A. After takeoff, company pilot George Ross put the 500E through a series of standard maneuvers, demonstrating how the pilot has to coordinate the movements of the collective stick (vertical motion) with his left hand, the cyclic stick (how the helicopter moves forward and back) with his right hand, and the pedals (which control direction) to get the machine to fly. The passenger on the orientation flights then got the chance to manipulate the controls one at a time.

Moving on to the NOTAR, the first thing that becomes obvious is the relative lack of noise compared to the 500E. There is only one set of blades beating the air. On a conventional helicopter, the tail rotor rotates in the "dirty" air created by the main rotor downwash, but since there is no tail rotor creating its own vortex ("tube") of dirty air, vibration on the NOTAR is considerably reduced.

Company experimental test pilot Chan Morse demonstrated how insensitive the NOTAR is to wind direction by setting the thruster in a neutral position and flying sideways down the Davison AAF runway (going both left and right) at thirty-five knots with relative ease. He then put the NOTAR through a series of left and right pedal turns at close to 100° per second (which would result in a complete circle in three and a half seconds) while holding the helicopter steady to demonstrate thruster effectiveness.

The McDonnell Douglas NOTAR helicopter can back its boom into the trees without fear of catastrophe.

All of these maneuvers were easy for the passengers to duplicate (except not so fast) because so much less coordination is needed between the controls. In fact, the NOTAR reduces the pilot's work load so much that people who learn to fly on NOTARs may not be rated as conventional helicopter pilots by the FAA. Federal Aviation Administration officials who have flown the NOTAR feel that pilots who start on NOTARs may not have been exposed to all the skills necessary to fly a conventional rotorcraft.

After demonstrating some maneuvers that could lead to loss of tail-rotor effectiveness (and produce a fatal spin) on a conventional helicopter, pilot Morse then pulled out the stops. While showing how Army helicopter pilots have to face the trees while performing some types of observation missions to keep rotor clearance, he turned the NOTAR's tail around and stuck it in the trees. "The mechanics hate it when I do that," he said. "It scratches the paint."

This maneuver would have been fatal for any other helicopter. The Army notes that forty-nine percent of all tail-rotor accidents are caused by the rotor making contact with such stationary objects as trees, powerlines, or the ground. If any branches or leaves stick in the NOTAR boom, the fan simply blows them out.

The NOTAR system is also considerably safer for ground personnel. There are no tail-rotor blades whirring around at ground level—or, for that matter, contributing to the radar signature of the helicopter.

The low-pressure boom offers good ballistic tolerance, too. McDonnell Douglas says that the NOTAR boom offers thirty-five percent reduced vulnerability to 12.7-mm fire and sixty percent reduced vulnerability to 7.62-mm fire when compared to the OH-6A. Softball-size holes would have little effect on the airflow produced by the fan.

McDonnell Douglas Helicopter is building two preproduction MD500N NOTAR aircraft for certification by the FAA. The boom on the production aircraft will be considerably lighter than the one used on the demonstrator, and production models will have a more efficient fan (which the company has demonstrated can be made up to eighty-five percent efficient). A refit kit will be offered to current owners of MD500s.

McDonnell Douglas and Bell Helicopter are teamed for the Army LHX (Light Helicopter Experimental) program, which will eventually replace thousands of Vietnam-era helicopters in several roles. An LHX with a NOTAR system is one option that will be offered to the Army. The NOTAR system can be scaled up in size, so large helicopters could also benefit from the concept.

—J.P.R.

Military Airlift Command aircrews recently completed their **fiftieth relief flight to Afghanistan** since the program began in March 1986. The Department of Defense has now transported more than 2,800,000 pounds of humanitarian cargo (some came by sealift) and has airlifted 584 wounded Afghans and their escorts to hospitals in the US, Europe, Egypt, and Canada. Eighteen percent of the wounded were children. The most unusual cargo carried was 690 mules on six MAC-contracted commercial flights.

Hamilton Standard recently shipped the **13,500th propeller in its 54H60 line.** First flight-tested in March 1958, the 54H60 propeller and its variants have gone on to pull several Lockheed aircraft, including all C-130s (the 54H60 was refitted on A models), P-3 Orions, and L-188 Electras; the Convair 580; and the Grumman E-2B/C and C-2 aircraft.

The 13.5-foot-diameter 54H60 propeller features solid Duralumin blades from a single forging and is arranged so that safety-of-flight functions are independent of aircraft electrical and hydraulic systems. The type has logged more than 80,000,000 flight hours. The milestone prop will be fitted to a C-130.

The **first privately owned and operated Air Combat Maneuvering Instrumentation (ACMI) range** will be built in the North Sea. The range, to be built and installed by the San Diego, Calif.-based Cubic Corp., will be owned by British Aerospace. Flight time will be leased to forces of the US, Great Britain, and the Netherlands. The facility will consist of six linked data relay towers forming a circle thirty miles in diameter about eighty miles off the east coast of England. The towers will monitor and record live training missions of up to thirty-six aircraft at a time, with the data from the towers being transmitted to the control center to be built at RAF Marham in Norfolk, England. This new ACMI range, scheduled to open in 1990, will greatly relieve crowding at the range at Decimomannu, Sardinia, and will be the fifteenth instrumented range built by Cubic since 1973.

Bear was certainly in season for Alaskan Air Command during June. During the four-day period from June 14–17, **AAC F-15s intercepted a record twelve Soviet military planes** off the coast of Alaska, mostly Tupolev Tu-95 Bear-G and Tu-142 Bear-H long-range bombers. As of June 21, Alaskan F-15s had been scrambled twenty-one times in 1988 to intercept thirty Soviet aircraft. Other June milestones for AAC included intercepting three flights of Soviet aircraft in one day and scrambling F-15s out of Eielson AFB for the first time.

★ **NEWS NOTES**—On August 4, the Air Force revealed that final checkout had begun on the first **Northrop B-2 Advanced Technology Bomber (ATB)** in preparation for its first flight sometime this fall. The Air Force also revealed that the B-2 will have a crew of two, will be powered by four General Electric F118 engines, is approximately seventeen feet high and sixty-nine feet long, and has a span of 172 feet. The flying-wing shape of the B-2 means that it is only six feet longer than an F-15 and has a span ten feet shorter than that of a B-52. The first six B-2s will be assigned to the flight-test program to be conducted at Edwards AFB, Calif. Five of those aircraft will eventually join the operational fleet of 132 bombers. The Air Force also said that the second B-2 was well into assembly.

Secretary of the Air Force Edward C. Aldridge, Jr., announced on July 5 that **all aircrew positions on TR-1,**

U-2, TU-2, EC-130, and C-29 aircraft will now be open to women. In June, the Air Force opened 2,700 positions in highly mobile civil-engineering units (RED HORSE teams) and in mobile aerial port squadrons. All officer and all but four enlisted career fields are now open to women. Women make up 12.7 percent of the Air Force.

The White House Medical Office has ordered that the **complimentary cigarette packs handed out on *Air Force One* be replaced by candy** on all future flights. The switch to M&Ms (both plain and peanut) was made aboard the President's plane prior to the Moscow summit. The candy-coated chocolate comes in special boxes with the Presidential seal and President Reagan's signature on them.

A Lockheed UGM-133A **Trident II,** or D5, submarine-launched ballistic missile **malfunctioned** one minute after liftoff from a flat pad at Cape Canaveral AFS, Fla., on July 7. The missile **was destroyed** by radio command from range safety officers. The cause of the malfunction is under investigation. This was the second D5 failure in thirteen attempts since testing began in January 1987.

On July 1, the **House Armed Services Committee approved the shifting of $36.3 million** from Air Force maintenance monies to payroll accounts, thus **keeping Air Force Logistics Command from having to furlough its 84,000 civilian employees.** The unpaid furloughs (to have begun August 1) were earlier approved to offset some $1.7 billion in cuts to operations and maintenance accounts. The Senate Appropriations and Armed Services Committees and the House Appropriations Committee had previously approved the transfer.

You think the collection of junk in your attic is bad? Since 1957 (when Sputnik was launched), **US Space Command has cataloged some 19,000 objects** that were put in orbit. Of that total, **more than 7,000 items are still up and being monitored.** These items include both operational and nonoperational satellites as well as space debris ranging in size from small bolts and springs to such large objects as spent rocket boosters.

Dr. Russell Ramsey, professor of National Security Affairs at the Air Command and Staff College at Maxwell AFB, Ala., has done research into **Olympic medalists who have service ties to the Air Force or its predecessor organizations.** Dr. Ramsey's research reveals that twenty-four athletes have won forty-one medals, including twenty-three gold and nine silver medals. Lt. Col. (Col. selectee) Micki King Hogue, who won a gold medal in diving in 1972, is manager for the US Diving Team at the Seoul games, which start this month.

★ **DIED—Mildred Gillars,** the infamous "Axis Sally" during World War II, on June 25 in Columbus, Ohio. She was eighty-seven. Miss Gillars was convicted of treason in 1949 for making Nazi propaganda radio broadcasts, and she served twelve years in the federal penitentiary in Alderson, W. Va.

★ **UPDATE—**Navy officials investigating the **inadvertent shootdown of an Air Force RF-4C** by a Navy F-14 last September during a NATO exercise *(see "Aerospace World," December 1987)* have assigned **responsibility for the incident** to the Tomcat pilot, Lt. Timothy W. Dorsey. Lieutenant Dorsey's flight status has been terminated, and he has been assigned administrative duties.

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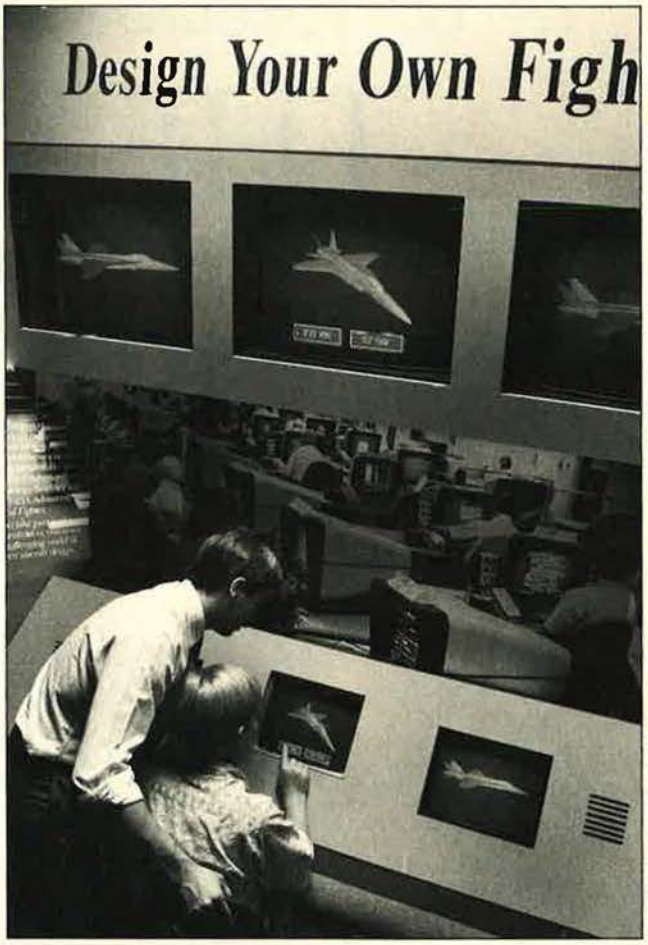
The Display Determination exercise in the Mediterranean was set up for aircrews to participate in Dissimilar Air Combat Training (DACT) missions. During the course of the DACT mission, Lieutenant Dorsey was ordered to engage the RF-4C (meaning maneuvering to get in a position to shoot, but not actually to release weapons). He had previously identified the RF-4C as an Air Force aircraft.

The F-14's missiles had their seeker heads uncaged (looking for targets), and Lieutenant Dorsey was quoted in the Inquiry Board's findings as saying, "Jesus, do they really want us to shoot him?" There was no response from his Radar Intercept Officer (RIO) in the Tomcat's back seat. Lieutenant Dorsey then pressed the launch button and said he heard a "strange whoosh" as the AIM-9 left the rail. The incident occurred about 3:50 p.m.

Rear Adm. J. M. Boorda, commander of the cruiser/destroyer group, was involved with the review of the incident and concluded that "his [Dorsey's] actions were the product of extremely poor judgment." There was some question as to why Lieutenant Dorsey's F-14 went up with live missiles, though. It is a standing exercise order that aircraft will not carry live rounds during DACT missions. ■

Northrop's "Design Your Own Fighter" exhibit was a big hit at the Dayton, Ohio, Air Show in late July. Visitors to the "hands-on" interactive exhibit (which will be at AFA's Briefings and Displays program this month) can design a modern fighter aircraft by means of a touch-screen computer that offers more than 200 options. Northrop is one of the contractors involved in the Air Force's Advanced Tactical Fighter (ATF) program.



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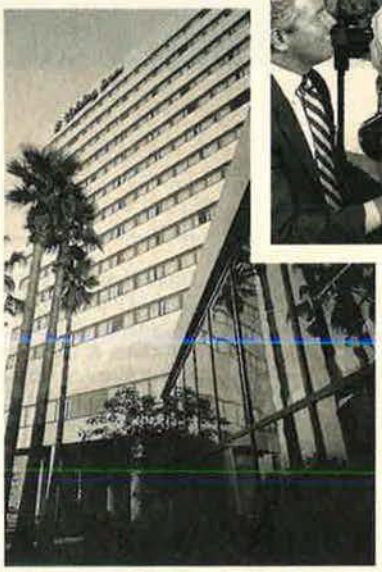

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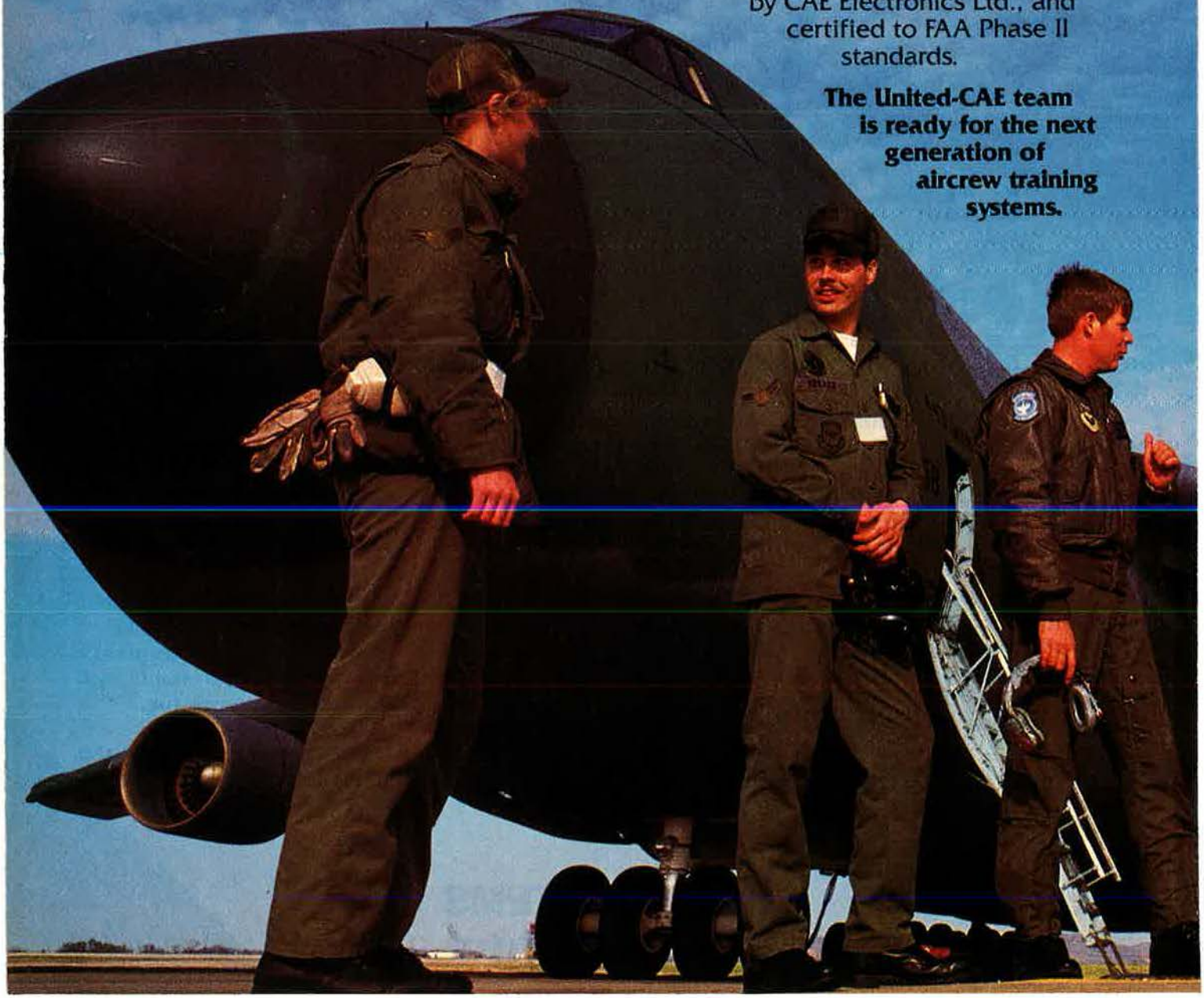

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First in the Force

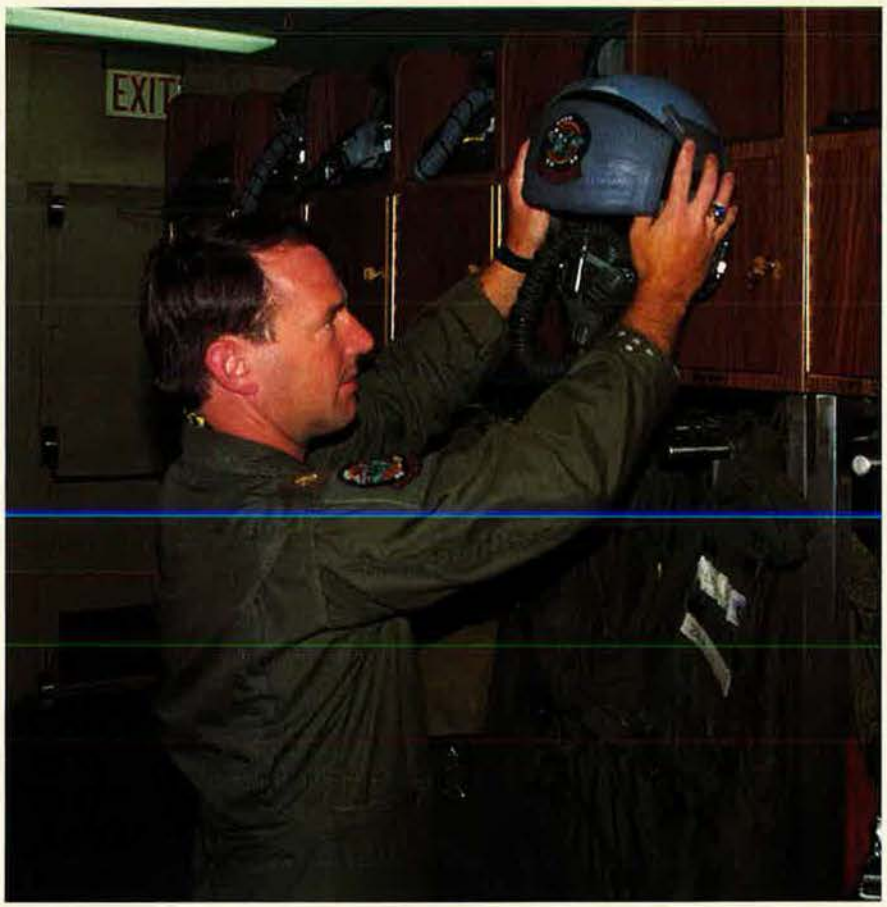
BY JAMES W. CANAN, SENIOR EDITOR

MODERN aircraft, missiles, and other weapon systems and the men and women who develop and maintain them are indispensable to the combat capability of the Air Force. But a special niche is reserved for those who make the weapons work—the aircrews and missile crews who personify the airpower that is USAF's reason for being, who are identified most closely with the operational Air Force, and for whom combat is the name of the game.

So there is no greater distinction than to be chosen by the Air Force as the winner of the Air Force Association's annual crew award in each of five mission categories.

The 1988 winners will be honored at the AFA National Convention this month with the Lt. Gen. Claire Lee Chennault Award for the outstanding aerial warfare tactician, the Gen. Curtis E. LeMay Award for the top strategic aircrew, the Gen. Jerome F. O'Malley Award for the best reconnaissance crew, the Gen. Thomas S. Power Award for the best strategic combat missile crew, and the Lt. Gen. William H. Tunner Award for the best aircrew in MAC.

The awards are based on achievements in 1987.



Maj. Steven W. Rapp gets ready for work as chief of the F-15 Tactics and Test Division, 57th Fighter Weapons Wing, Nellis AFB, Nev. Major Rapp will receive the 1988 Lt. Gen. Claire Lee Chennault Award at the AFA National Convention this month in Washington. The award is presented annually to USAF's outstanding aerial warfare tactician.

Aerial Warfare Tactician

Maj. Steven W. Rapp, chief of F-15 Tactics and Test Division, 57th Fighter Weapons Wing, Nellis AFB, Nev., will receive the 1988 Lt. Gen. Claire Lee Chennault Award. In the words of Air Force Vice Chief of Staff Gen. Monroe W. Hatch, Jr., "Major Rapp's performance as an innovator and practitioner of aerial warfare tactics puts him first among a very select group of fighter pilots."

Indeed, reports Tactical Air Command, Major Rapp "has greatly improved the warfighting capability of the tactical air forces" and is "a dynamic leader and tactician who identifies tactical shortcomings, envisions and evaluates solutions, and disseminates the results to the fighter community."

This is quite an accolade but no exaggeration, for it can truly be said of Major Rapp that he has "written the book" on modern fighter tactics in several important respects.

As the leader of Tactical Fighter Weapons Center's Advanced Tactical Fighter team, Major Rapp played a major role in developing concepts for the use of avionics aboard the ATF. He was in charge of the first tactical air forces (TAF) "concept of employment" symposium for the ATF and led the way in designing the tactical scenario for the fighter, which means so much to USAF's future.

"His part in the ATF development will greatly affect the capabilities of the TAF well into the twenty-first century," TAC asserts.

But Major Rapp has built his reputation on a much broader basis. He also "recommended invaluable changes" in Multi-Command Manual (MCM) 3-1—the so-called "fighter pilot's bible"—throughout its series of volumes. He revised the manual's volume on tactical employment of F-15s and its segment on "threat and countertactics" that Air Force, Navy, and Marine Corps fighter pilots rely on so heavily.

"This single-handed effort significantly helped the TAF's capability to understand and prepare for future aerial combat," TAC reports.

Major Rapp was also a key player in working up Tactics Development and Evaluation (TD&E) for fighter protection of High-Value Airborne Assets (HVAA)—such as AWACS, EF-111, Compass Call, and tanker and command post aircraft.

"When tactics used in the initial HVAA TD&E proved ineffective, he designed new F-15 employment tactics and 'commit' criteria," TAC reports of Major Rapp, adding: "And he flew to validate the tactics he developed."

He also traveled widely to brief NATO air units and USAF units in Europe, the Pacific, and Stateside on those newly developed tactics. His "pioneering efforts in this area led to a much better understanding within the TAF and NATO of employment of these HVAA force-multipliers," TAC declares.

In addition, Major Rapp is the project manager of the Tactics and Test Division's "All-Aspect Adversary Countertactics TD&E." Of this, TAC reports that he created a tactics test that "encompasses more than 1,000 fighter sorties" and is "by far the largest and most comprehensive tactics development since the Aerial Combat Evaluation (ACEVAL)."

TAC declares that the test devised by Major Rapp "will revolutionize air-to-air tactics" in an environment characterized by "multiple bogeys, intense electronic countermeasures, and all-aspect infrared and radar missiles."

The Major has briefed TAF units around the world on the results of his all-aspect adversary tactics development and testing as they bear on such subtopics as HVAA, F-15 operational flight programs, F-15 three-ship employment, night/adverse weather air-to-air employment, and infrared missile defense.

Strategic Aircrew Award

Superior airmanship and performance across a broad spectrum of activities, including operational exercises and command-wide competitions, won the 1988 Gen. Curtis E. LeMay Strategic Aircrew Award for crew S-01 of the 42d Bombardment Wing, Loring AFB, Me.

Crew S-01 of the 42d Bombardment Wing at Loring AFB, Me., will be honored with tne 1988 Gen. Curtis E. LeMay Strategic Aircrew Award. Crew members include (from left) TSgt. Dan Danish, gunner; Capt. Mitch Namendorf, electronic warfare officer; Capt. Steve Kasemeier, radar navigator; Maj. (Lt. Col. selectee) Chuck Patrum, aircraft commander; 1st Lt. Mike Byrne, navigator; and 1st Lt. Craig Thomas, pilot.

This B-52 crew, described by Strategic Air Command Commander in Chief Gen. John T. Chain, Jr., as "best among the best," includes Maj. (Lt. Col. selectee) Chuck Patrum, aircraft commander; 1st Lt. Craig Thomas, pilot; Capt. Steve Kasemeier, radar navigator; 1st Lt. Mike Byrne, navigator; Capt. Mitch Namendorf, electronic warfare operator; and TSgt. Dan Danish, gunner.

"They are designated Crew S-01 for a reason—they are the number-one crew of the 42d Bombardment Wing," declares Wing Commander Col. Thomas C. O'Malley. "There is no doubt in my mind that Crew S-01 has a list of accomplishments unmatched in Eighth Air Force and the Strategic Air Command."

Those accomplishments began amassing in January 1987, when the

crew deployed its B-52 to Castle AFB, Calif., for Red Flag exercises. Attacking some of the most heavily defended targets on the Red Flag range, the B-52 crew consistently dropped its iron on time and on target.

A few months later, in May, the crew deployed to England for Exercise Busy Brewer 87-A, a mission of "extremely high visibility." It entailed dropping the first live weapon on German soil from an American strategic bomber since World War II.

All bombs landed precisely on targets, a resounding show for NATO allies of US strategic airpower superbly applied.

On the way home, Crew S-01 demonstrated the B-52's proficiency in its maritime mission in a joint exercise with Royal Air Force Nimrod aircraft. In August, the crew sowed mines in the harbor at Charleston, S. C., with surgical accuracy and then became the first to fire a Harpoon missile from the forward inboard pylon of a B-52, thus demonstrating the aircraft's weapons-carriage versatility.

The Harpoon scored a direct hit on its target ship, a success that led to SAC's broadening of the B-52 Harpoon flight envelope.

Crew S-01 was subsequently selected to take part in an Air Force-Navy program to test the suitability of the Navy's LAMPS Mark III helicopter as a Harpoon-targeting platform. The test went well, thereby increasing the Navy's confidence in the targeting of enemy warships bent on attacking its surface-action groups from a distance.

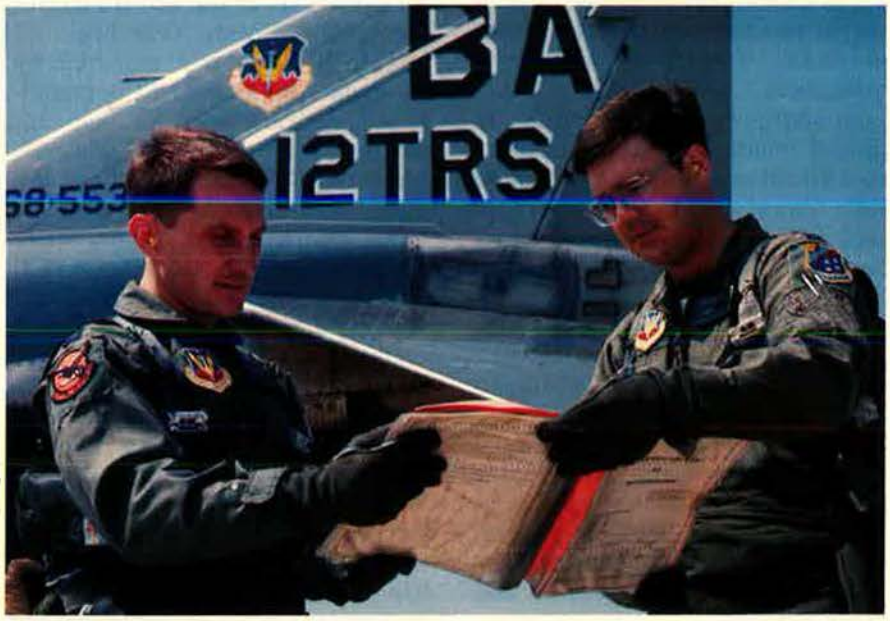
In 1987, Crew S-01 also led a four-ship B-52 Red Flag mission to bomb at night under marginal weather conditions and a three-ship Copper Flag mission to deliver ordnance at Eglin AFB, Fla.

In both instances, all weapons were delivered in a timely and accurate manner.

In all 1987 exercises involving live bomb drops, Crew S-01 scored the highest in its squadron ("as always") as the squadron "demonstrated SAC's ability to mobilize quickly and deploy to a bare-base environment and successfully launch sorties day after day with excellent results."

Crew S-01 also led a two-ship mission to the Mediterranean for Mighty Strike, a twenty-three-hour exercise that was described as "a visible demonstration of strategic airpower in an extremely volatile area."

The crew's overall accomplishments in 1987 were "unmatched by any crew in the Strategic Air Command," according to Brig. Gen. Stanley O. Smith, Commander of the 45th Air Division.



—USAF photo by SSgt. Samuel F. Shore

Capt. Victor L. Hnatiuk, left, and Capt. Douglas D. High prepare for a mission in their RF-4C. Members of the 12th Tactical Reconnaissance Squadron, 67th Tactical Reconnaissance Wing, Bergstrom AFB, Tex., they won the 1988 Gen. Jerome F. O'Malley Award as the best reconnaissance crew.

Best Reconnaissance Crew

The RF-4C aircrew of Capt. Victor L. Hnatiuk and Capt. Douglas D. High of the 12th Tactical Reconnaissance Squadron, 67th Tactical Reconnaissance Wing, Bergstrom AFB, Tex., is the winner of the 1988 Gen. Jerome F. O'Malley Award.

"As a team, they are unbeatable," declares an Air Force report documenting the reasons for their selection. It calls them "the cornerstone" of their wing's combat capability and "by far the finest crew" the wing has to offer.

Captain Hnatiuk and Captain High coauthored a tactical contingency plan to carry out "a real-world objective" that was judged by the Commander, Twelfth Air Force, as the best of all such plans he had ordered up from his units. The keys to its success were its integration of reconnaissance assets with all other air assets and its procedures outlining how all such assets could achieve "minimal exposure to the threats" they faced.

The two reconnaissance crew Captains planned their squadron's European deployment last year in an elaborate exercise that involved multiship formations, air refueling, airfield diversion, and arrival procedures at Zweibrücken AB, West Germany, as well as redeployment from that base.

During a readiness exercise while at Zweibrücken, the Hnatiuk-High crew was rated "outstanding" for its central role in leading and executing a no-notice tactical mission that had been pressed on their squadron.

The Captains were handpicked last year to lead a six-ship practice deployment as part of exercise Coronet Lightning, which came off flawlessly. Moreover, according to the Air Force: "Their tactical expertise, combined with a polished professional style, makes them an exemplary briefing duo. Their two-ship tactical employment and four-ship AAR briefings were videotaped for [widespread] viewing."

Captain Hnatiuk was his squadron's project officer for Green Flag 88-3 and is one of only a few experienced aviators in the 67th TRW who are entrusted with "supervisor of flying" (SOF) responsibilities.

As his squadron's Chief of STAN/EVAL, Captain High developed a comprehensive check-ride prepara-

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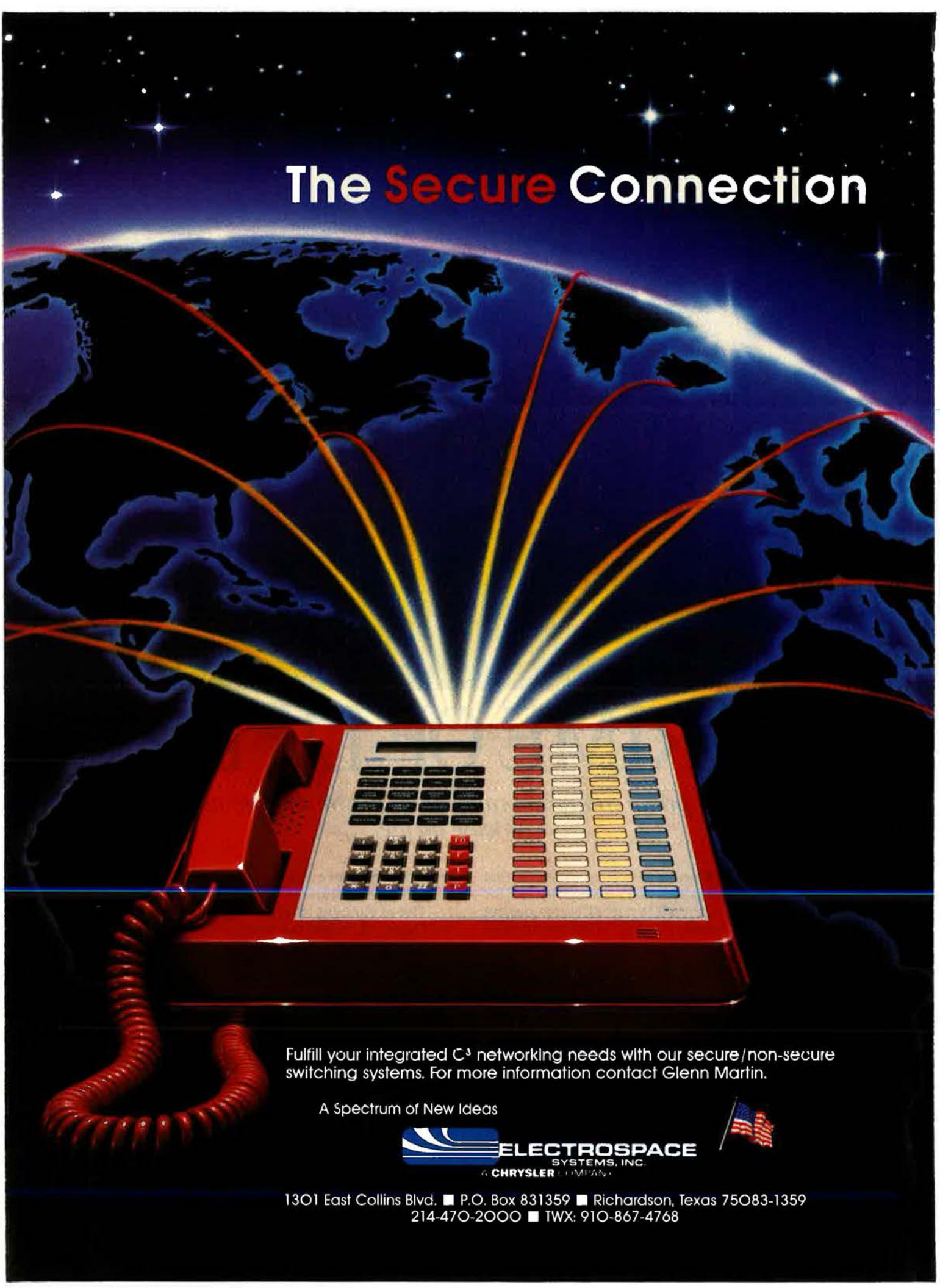
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tion guide that is credited with having greatly improved the squadron's check-ride performance in 1987. Captain High also became the youngest WSO in the wing to move up to instructor status.

When all is said and done, reports the Air Force, this crew's "dedication to mission, critical eye for detail, and unparalleled understanding of tactical reconnaissance make them irreplaceable assets."

Best Strategic Combat Missile Crew

Capt. Stephen G. Cullen and 1st Lt. Rodney L. Holder of the 90th Strategic Missile Wing at F. E. Warren AFB, Wyo., will receive the 1988 Gen. Thomas S. Power Strategic Missile Crew Award based on their "sustained superior performance, professionalism, and contributions . . . at the forefront of the Peacekeeper deployment" at the base.

Captain Cullen and Lieutenant Holder make up the wing's Senior Peacekeeper Standardization and Evaluation Crew S241A. They distinguished themselves in leading the wing through the Peacekeeper deployment toward full operational capability of the force of ICBMs and its attendant command control and communications. In this, they handled some extremely difficult situations with great aplomb.

At one point, while maintenance teams were working in (had "penetrated") three Peacekeeper launch facilities, another such team at the launch control center accidentally put the wing into an undesirable single-flight operational mode. Captain Cullen and Lieutenant Holder corrected the problem, restored full operational capability of the missile force, and then began the necessary retargeting.

This process took them all night and required them to troubleshoot the data system for numerous "targeting faults" that cropped up and also to resolve faults in the SAC Digital Information Network (SACDIN) that bedeviled their efforts.

The Cullen-Holder crew also won high praise last year for working through a ticklish security situation in which a topside launch facility had been entered by an unidentified intruder.

Yet another distinction came to the crew for its yeoman work at an alternate command post (ACP) controlling wing activities for an airborne launch control center (ALCC) exercise. In this, the crew handled three times its normal work load by managing the maintenance and security activities in *three* missile flights.

Capt. Stephen G. Cullen, left, and 1st Lt. Rodney L. Holder won the 1988 Gen. Thomas S. Power Strategic Missile Crew Award, which will be presented at the AFA National Convention this month. They are outstanding members of the 90th Strategic Missile Wing at F. E. Warren AFB, Wyo., where USAF's new Peacekeepers are now operational ICBMs.

When the ALCC was unable to achieve its desired results in the exercise, Captain Cullen and Lieutenant Holder worked with the crew of the ACP and those of other squadron launch control centers to solve the problems and get results.

"From the first SFO [single-flight operation] during Peacekeeper deployment to the most recent one, this crew has been at the leading edge of the activity," the Air Force reports. "If they aren't on alert during the SFO, they are at the command post, since they are the most experienced, knowledgeable crew in leading the wing through these critical operations. . . . During the first Peacekeeper code change—using new, untested procedures—this crew's leadership was catalytic. . . .

"In this most stressful environment, they shouldered the responsibility of weapon system advisors to the battle staff. Had it not been for their ability to quickly analyze, anticipate, and solve problems, the wing would have gone into a 'no-flight' operation, with no launch control center controlling the ICBMs."

What is more, notes the report on the achievements of Captain Cullen and Lieutenant Holder, their contributions to updating the software vital to Peacekeeper missile procedures trainer (MPT) computers were "without equal."

As the wing's senior evaluators, the Cullen-Holder crew was responsible for ensuring the proficiency of all others in the entire Peacekeeper force at F. E. Warren AFB. Perhaps the best gauge of its success were the "excellent" mission effectiveness and personnel effectiveness ratings that the 90th SMW received under the heavy pressure of deploying its new ICBMs and bringing them up to full operational capability.

"Crew S241A has accomplished more during 1987 than most crews accomplish in an entire career," declares the USAF document that placed the crew into nomination for the AFA award and called it "the best missile combat crew in Fifteenth Air Force, SAC, and the Air Force."

The Best Crew in MAC

A Military Airlift Command crew of the 20th Special Operations Squadron, 1st Special Operations Wing, at Hurlburt Field, Fla., won

the 1988 Lt. Gen. William H. Tunner Award on the strength of its "outstanding" performance during an in-flight emergency with its MH-53 helicopter on December 1, 1987.

Capt. Paul R. Schumacher headed the crew as aircraft commander. With him were Capt. Jeffrey D. White, copilot; SSgt. Timothy R. Hill, SSgt. James A. Roth, and Sgt. Harold T. Hinson, Jr., flight engineers; and TSgt. Keith E. Moore, SSgt. Michael A. Warren, and SrA. Thomas J. Brothers, aerial gunners.

The crew members, ranging in experience from student to flight examiner, had to cope with the emergency during a routine daytime training mission. Captain Schumacher was on his first flight as pilot-in-command in the 20th SOS.

On the initial approach to a landing zone used for "hover" work only, the aircrew heard an explosion from outside the helicopter. A caution light indicated that one of the main rotor blades had lost its structural integrity. At the same time, the right main landing gear fell off, a mishap that caused massive leakage of hydraulic fluid and much smoke.

Aircraft commander Capt. Paul R. Schumacher, left, and copilot Capt. Jeffrey D. White check out their MH-53 helicopter. Their crew, part of the 20th Special Operations Squadron, 1st Special Operations Wing, Hurlburt Field, Fla., won the 1988 Lt. Gen. William H. Tunner Award.

TSgt. Keith E. Moore, left, and SSgt. Michael A. Warren of the 1988 Tunner Award-winning crew try out their equipment. Sergeants Moore and Warren, along with other members of the crew, performed coolly during an in-flight emergency.

Captain Schumacher had a bad problem—he could not land. Trees covered the terrain, and even if he had been able to find a clearing, the helicopter would be in danger of tipping over on its "asymmetrical gear," with its rotor making disastrous contact with the ground. The crew was unable to raise the gear because its extension system had malfunctioned.

As he sized up this bleak situation, Captain Schumacher realized that the main rotor could become unbalanced at any moment, causing him to lose control of the aircraft.

The commander chose to head for the nearest airfield and land the helicopter, if possible, on mattresses. En route, Captain White arranged for the mattresses after declaring the crew's emergency.

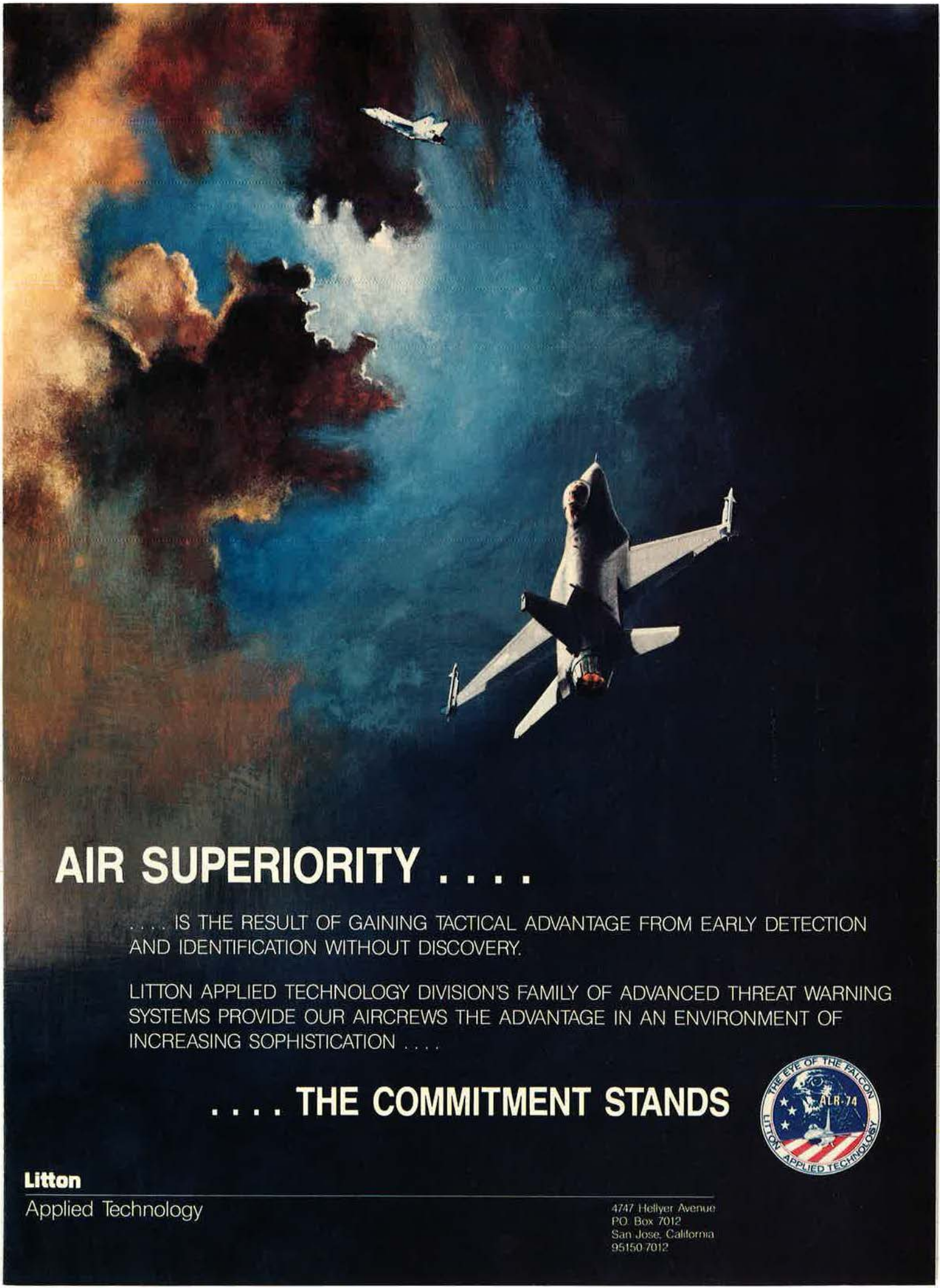
By the time the helicopter arrived, it was vibrating so badly that it had to be landed at once. The Captain decided to land it on a slope in the infield in order to compensate for the lopsided condition of the landing gear—but first to hover just above the slope to enable crew members who were not required for the landing to jump from the helicopter.

Then there was the problem of the damaged gear strut. It would surely pierce the soft ground and cause the chopper to tip. This was taken care of while the helicopter hovered inches above the ground and with main rotor failure imminent.

From the cabin, Sergeant Roth removed a two-foot-by-five-foot inertial navigation system protective-covering table. Sergeant Warren and Airman Brothers crawled underneath the helicopter to put the table into position as a makeshift landing pad for the strut.

The helicopter landed safely. But the crew had an even closer call than it had bargained for. The landing gear strut shot upward through the aircraft's sponson and ripped a big hole in one of the six rotor blades.

"Due to the crew's quick thinking, courage, and ingenuity, damage was limited, and a valuable national asset was saved," says the Air Force report on the crew's great work. ■



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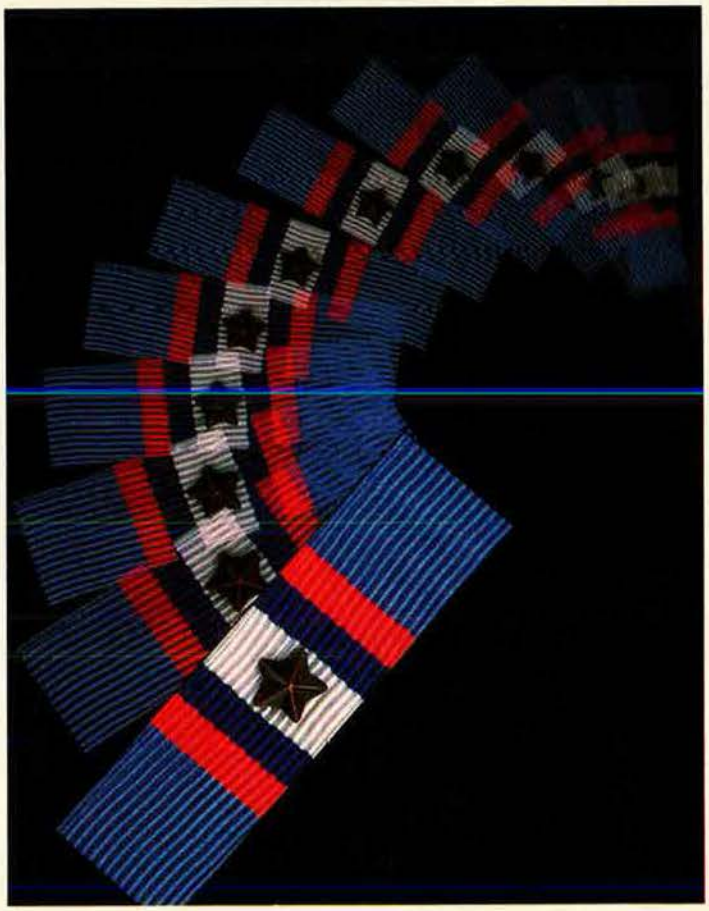
USAF and the Air Force Association honor the twelve Outstanding Airmen of the Year.

Stars in Stripes

BY JEFFREY P. RHODES, AERONAUTICS EDITOR



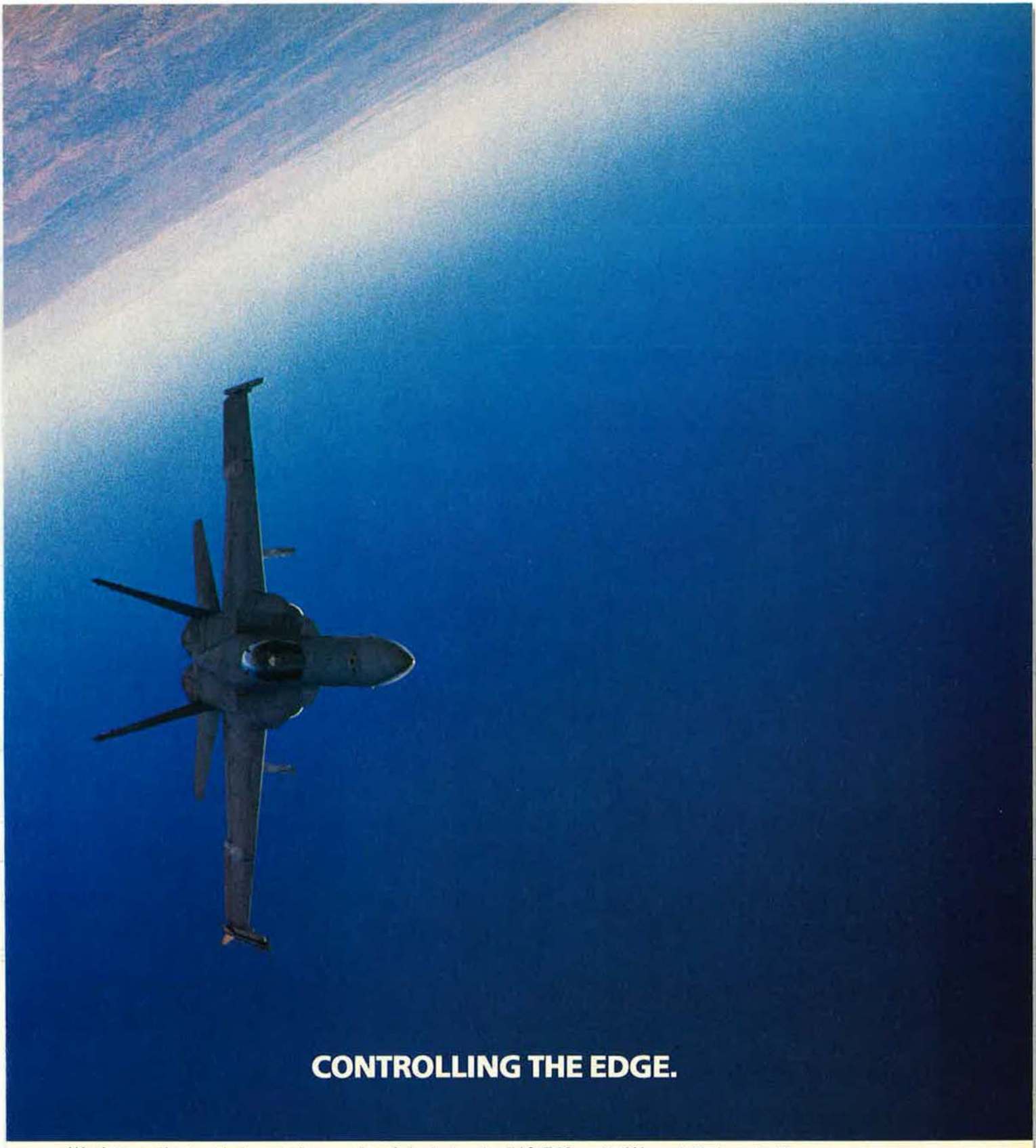
TWELVE people will be joining very select company when they step into the spotlight at the AFA National Convention this month. They are the US Air Force's Outstanding Airmen of the Year—a recognition accorded to only 495 people since AFA initiated the program in 1956.

For the next twelve months, the Outstanding Airmen of 1988 will wear a distinctive badge on their uniforms that signifies their status. Next September, they will take off the badges when the Outstanding Airmen of 1989 put them on. But so long as they are on active duty, they can be spotted by the Outstanding Airmen of the Year ribbon with the bronze star device in the center.

Here are the special twelve for this year:

CMSgt. Roy R. Arakaki

• **CMSgt. Roy R. Arakaki,** Chief Wing Aircrew Standardization/Evaluation Loadmaster, 455th Military Airlift Wing (Associate), Norton AFB, Calif. Chief Arakaki is a command aircrew loadmaster with more than 7,800 flying hours and thirty-eight C-141 combat missions in Vietnam. He flew in Operation Homecoming and many other high-profile operations. In a recent Operational Readiness Inspection, he planned, organized, and supervised



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the preflighting and loading of all the wing's C-141s—without a single delay or safety violation scored. Military Airlift Command picked him above all active and Reserve loadmasters as the arbitration umpire at Airlift Rodeo. He developed a configuration for the C-141B that allows medical crews to double their training on a single mission.

Chief Arakaki has an associate degree in computer science from San Bernardino Valley College (dean's list, 3.97 grade point average). He earned another associate degree from the Community College of the Air Force and was honored as the Air Force Reserve outstanding graduate. He is a committee member of the Japanese/American Community League in Riverside, Calif.

A1C Melissa A. Bigham

• **A1C Melissa A. Bigham,** Law Enforcement Specialist, 6510th Security Police Squadron, Edwards AFB, Calif. Airman Bigham has made a big splash in a very short time. She completed her five-skill-level on-the-job training in less than half of the allotted time (with a ninety-eight percent average, no less) and is the only airman in a squadron of 250 people to qualify for Law Enforcement Desk Sergeant. She was handpicked by the base commander to work three undercover assignments that resulted in the recovery of more than $50,000 worth of property. In addition, twenty-two culprits who were apprehended through the help of her efforts have either been convicted or are awaiting trial in the federal court system.

Airman Bigham is working on a criminal-justice degree through the Community College of the Air Force and is actively involved with the Special Olympics and the Base Youth Services program. She was named to the Air Force Flight Test Center Blue Eagles Honor Guard and was chosen as Air Force Systems Command's Outstanding Airman of the Year. Airman Bigham is also active with her unit's racquetball teams.

Sgt. (SSgt. selectee) Terry L. Cavallo

• **Sgt. (SSgt. selectee) Terry L. Cavallo,** Cryptologic Technician, 6981st Electronic Security Squadron, Elmendorf AFB, Alaska. Absolute perfection is impossible to achieve, but Sergeant Cavallo came pretty close last year. He scored 100 percent in every data reduction processor format accuracy evaluation given and received "outstanding" ratings on every content evaluation. In the five no-notice, random, quality-control evaluations, Sergeant Cavallo processed 110 different activities over five days totaling 1,134 minutes of highly perishable mission product and committed only one minor format error. He enjoys his crypto work so much that he volunteered to certify in the second job skill of mission systems operator.

Sergeant Cavallo is one of just a handful of military personnel to complete the very tough National Cryptologic School Summer Language Program (SLANG) at the Monterey Institute of International Studies in California. He will soon earn his associate degree from the Community College of the Air Force. Always the good listener, Sergeant Cavallo is also a volunteer phone operator for the Anchorage Suicide and Crisis Prevention Center.

• **SSgt. Neil A. Crow,** Military Training Instructor, 3704th Basic Military Training Squadron (BMTS), Lackland AFB, Tex. Sergeant Crow's impact on the Air Force will be felt for years to come, because six of the eight flights of basic trainees he instructed in 1987 were selected as "Honor Flights." The 400 people in his training flights also recorded the lowest number of demerits during basic last year. The BMTS Standardization Division selected Sergeant Crow as a "superior performer," rated his dormitory "outstanding," gave him a 100 percent pass rate in individual training areas, and recognized him for "outstanding" appearance among all drill instructors.

SSgt. Neil A. Crow

Sergeant Crow has completed all available Disaster Preparedness courses, and he developed a disaster preparedness plan for BMT. He is an honor graduate from the Air Training Command NCO Academy and a Master Military Training Instructor awardee. Sergeant Crow is pursuing dual associate degrees from the Community College of the Air Force. He also helps maintain the Children's Association for Maximum Potential (CAMP) facility at Lackland.

MSgt. Forrest D. Earley

• **MSgt. Forrest D. Earley,** Fire Protection Supervisor, 145th Civil Engineering Squadron, Douglas Municipal Airport, Charlotte, N. C. This Air National Guardsman is used to wearing badges—in addition to being an ANG and civilian

fireman, he is a North Carolina Highway Patrolman. Sergeant Earley played the major role in planning and organizing improved training plans for aircraft crash rescue, structural fire protection, fire prevention, and ground safety operations. All of his firefighters attained 100 percent of all skill-level requirements last year. He was selected NCOIC of the ANG Fire Department team for "Readiness Challenge '87," a worldwide civil engineering competition, and he spent many extra training days preparing for the event.

Sergeant Earley was one of a small number of North Carolina Highway Patrolmen to be awarded Advanced Law Enforcement Certification, and he is a distinguished graduate of the ANG NCO Academy in residence. He is an active participant in a program in which law-enforcement officers pay expenses to allow children to attend summer camp. His job is also his hobby, since he is a member of the West End Volunteer Fire Department.

MSgt. Michael J. Lynch

• **MSgt. Michael J. Lynch,** Jet Engine Intermediate Shop NCOIC, 96th Field Maintenance Squadron, Dyess AFB, Tex. Sergeant Lynch is on the cutting edge of engine technology developments. He skillfully directed the first complete disassembly, inspection, and reassembly at field level of the B-1B's F101 engine. He represented Strategic Air Command during the factory acceptance and proof load testing of the T-9 sound suppressor overhead engine thrust adapter, and he completed qualification and acceptance testing of the first upgraded test cell fuel system. His test cell was rated "outstanding" by Quality Assurance on three consecutive inspections, and the branch received an "outstanding" rating and a "Standard of Excellence" award from the SAC Inspector General.

Sergeant Lynch was the 96th Bomb Wing's only Stripes for Exceptional Performers (STEP) promotion to master sergeant in 1987. He is working toward an associate degree from the Community College of the Air Force, and he is enrolled in the Senior NCO Academy correspondence course. He served as a team leader during the American Heart Association's residential drive last year.

MSgt. Noreen M. Macias

• **MSgt. Noreen M. Macias,** Materiel Storage and Distribution Branch Superintendent, 48th Supply Squadron, RAF Lakenheath, United Kingdom. There is usually a better way to do things, and Sergeant Macias has found most of those ways. She formulated, coordinated, and controlled the rewarehousing of three major supply facilities, greatly increasing storage space. By identifying aircraft parts in heavy demand and relocating them to the center of the maintenance complex, Sergeant Macias reduced average delivery times of those parts from twenty-five minutes to ten minutes. She instituted the use of personal computers in the squadron, and she developed training classes for civilian employees that increased job knowledge and performance.

Sergeant Macias earned an Associate of Applied Science degree from the Community College of the Air Force and is well along toward earning a bachelor's degree. She was named the squadron, wing, and Third Air Force Senior NCO of the Year for 1987. She is active in squadron fund-raising events, and she also drives and chaperones autistic people on weekly outings.

TSgt. Paul D. Murphy

• **TSgt. Paul D. Murphy,** Specialist Flight Chief, 461st Aircraft Maintenance Unit, 405th Aircraft Generation Squadron, Luke AFB, Ariz. Sergeant Murphy is a man who speaks Eagle fluently—F-15, that is. As AMU Specialist Flight Chief, a position routinely reserved for senior NCOs, he directly supervises more than sixty people in eight different specialties. After Sergeant Murphy developed an incentive program to recognize outstanding performers, the F-15s his unit services had their fully mission capable rate rise twelve percentage points (to eighty-seven percent) in just two months. He devised an effective cross-talk self-inspection program and also reconstituted the initial evaluation and newcomers briefing program. His consistently superior performance has earned him a spot on the F-15E conversion team at Seymour Johnson AFB, N. C., the location of the first operational F-15E unit.

Sergeant Murphy is a distinguished graduate of the TAC NCO Academy, and he has earned two associate degrees from the Community College of the Air Force. He is a volunteer "E-parent" in a program that helps assist young children during emergencies, and he is involved in the Arizona Special Olympics.

• **TSgt. Glenn E. Palmer,** Combat Control Team NCOIC, Det. 1, 1723d Combat Control Squadron, Rhein-Main AB, Germany. A man who likes to jump feet first into his work, Sergeant Palmer played a crucial role in important airdrops in three major Joint Chiefs of Staff-directed exercises, including one with Belgian Para-Commandos. He is charged with the day-to-day management of manpower and equipment to support all assault-zone activity throughout Europe and North

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- the HF communications system for the F-16 Air Defense Fighter;
- and EFIS and communications/navigation/identification (CNI) for the 8G, fully-aerobatic PC-9 international military trainer.

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Africa. Even though he and every member of his team are TDY for an average of 180 days per year, he ensured that every member of the detachment met the training requirements. Sergeant Palmer was awarded his third Air Force Commendation Medal last year for his part in a sensitive, classified, diplomatic evacuation mission. He is also a holder of the Bronze Star.

TSgt. Glenn E. Palmer

Despite being on the road so much, Sergeant Palmer completed with a 4.0 average twelve hours of study from Embry-Riddle Aeronautical University in a six-month period. He is also close to attaining his associate degree from the Community College of the Air Force. He is involved in the Base Advisory and NCO Advisory Councils.

SSgt. Rickey T. Pierce, Jr.

• **SSgt. Rickey T. Pierce, Jr.,** Aircraft Maintenance Expediter, 418th Aircraft Generation Squadron, Kadena AB, Japan. Generating aircraft sorties is Sergeant Pierce's business, and he certainly got the job done last year. While a dedicated RF-4C crew chief, his jet had a mission-capable rate of 94.8 percent and a delayed discrepancy rate of 2.3, well below Pacific Air Forces' mark of 9.0. As team chief during a Cope North exercise, Sergeant Pierce generated twenty on-time takeoffs with zero deviations. Later, as night-shift expediter during Team Spirit '87, he directed seventy-six maintenance personnel working on eighteen aircraft, and his team recorded a remarkable 282 sorties flown with a mission-ready rate of 91.3 percent. He also designed and procured, at his own expense, an aircraft centerline external refueling adapter to eliminate spills. This idea is currently awaiting approval for Air Force-wide use.

Sergeant Pierce has completed the PACAF NCO Academy correspondence course and is pursuing an associate degree from the Community College of the Air Force. He is founder and president of both the squadron Safe Driver's Club and People Against Drunk Driving (PADD).

TSgt. Thomas C. Voegtle

• **TSgt. Thomas C. Voegtle,** Personnel Support Branch Chief, 1003d Space Support Group, Peterson AFB, Colo. A good indication of Sergeant Voegtle's skills is his selection over a substantial number of senior NCOs to fill a senior master sergeant's position as branch chief. Some of his highlights from last year include singlehandedly developing all personnel programs for the activation of the 3d Space Wing, establishing an information network to identify and resolve critical Air Force Specialty Code shortages at several locations, and establishing solid procedures for the timely processing of more than 950 decorations and 1,200 personnel reports. His reorganization plan for the conversion of orderly-room personnel to the personnel career field was approved for implementation. As a morale builder, his branch prepares and dispatches more than 200 letters a month signed by the wing commanders in recognition of promotions and completion of professional military education courses.

Sergeant Voegtle is a distinguished graduate of the Air Force Space Command NCO Academy and is currently enrolled in his final class for completion of a bachelor's degree in business administration. He volunteers to help the elderly in Colorado Springs.

TSgt. Donald E. Wallace

• **TSgt. Donald E. Wallace,** Supply Systems Analyst, Deputy Chief of Staff's Office for Distribution, Hq. Air Force Logistics Command, Wright-Patterson AFB, Ohio. Sergeant Wallace's knowledge of computers has substantially improved Air Force-wide supply data system performance and support. He developed supply computer software and operating procedures that enabled five AFLC centers and two other command organizations to attain more than twenty hours per day (a twenty-five percent increase) of on-line computer processing. He developed computer software and conversion plans for activation of the "wholesale module" concept for the European Distribution System (EDS), and he also developed software and computer linkages for the innovative Automated Warehouse System. He is a leader in the development of the new Air Force standard "Issue/Receipt Release" document. Software that he developed permitted the first-ever rehome of supply satellite accounts from one host computer to another. It is estimated that his work will save more than $6 million per year for twelve installations.

Sergeant Wallace earned an associate degree from the Community College of the Air Force, and he is actively involved in several youth programs. ■

The year's top units and crews illustrate how far the Guard and Reserve have come since the days when "Total Force" was a target in the distance.

Beyond Buzzwords

BY JEFFREY P. RHODES, AERONAUTICS EDITOR

"TOTAL Force" is no longer just a buzzword. The Air Force Reserve and the Air National Guard are fully integrated into almost every phase of Air Force operations. In fact, the two organizations have responded so well to the increased emphasis placed on them—in the form of new equipment and better training—that merely being good hardly attracts attention.

Today, with every group or wing being so proficient at what they do, the criteria for selection as one of the Air Force Association award recipients eliminate all but the truly exceptional.

The people who will be honored as the winners of the President's Award (top AFRES flight crew), the AFRES and ANG Outstanding Units, and the Earl T. Ricks Award (airmanship in the Guard) at the AFA National Convention this month are just that—truly exceptional.

An HC-130N aircrew of the 305th Aerospace Rescue and Recovery Squadron based at Selfridge ANGB, Mich., captured the President's Award as the top Air Force Reserve flight crew. Pictured above are aircraft commander Maj. Oral W. Carper and copilot Maj. Danny R. Blackburn.

The President's Award

Check rides are never fun, but an evaluation flight last December nearly turned into a nightmare for one 305th Aerospace Rescue and Recovery Squadron crew. Only the professionalism and coordination

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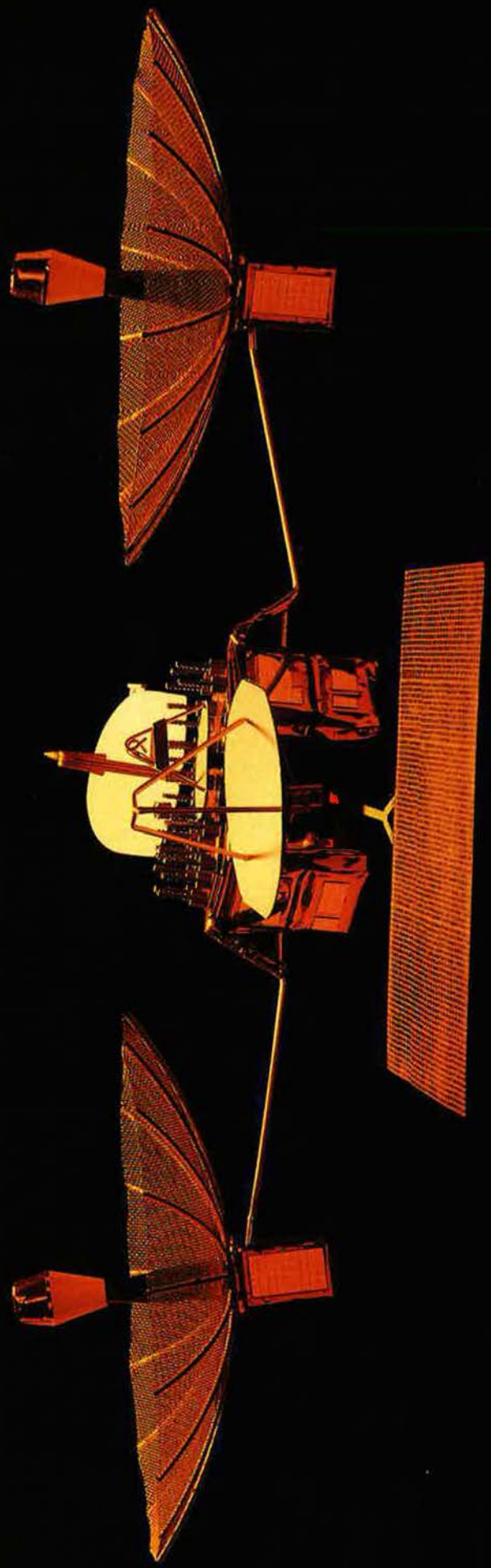

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exhibited by the two officers and two enlisted men aboard the HC-130N saved the day, the aircraft, and the Aircrew Standardization and Evaluation Team (ASET).

During landing-gear retraction, the crew, commanded by Maj. Oral W. Carper, heard a loud but muffled double popping sound. Suddenly, power to all four engines dropped dramatically, surged, then dropped again.

Believing this phenomenon to be an electrical problem that had been written up in a recent safety supplement, Major Carper ordered the flight engineer, MSgt. Henry G. Palma, to turn off the No. 2 generator. Although the other three generators took up the load, power did not return to the engines.

Severe vibrations then rocked the aircraft. Major Carper and his copilot, Maj. Danny R. Blackburn, checked the instruments and noticed the gauges for the No. 3 (right inboard) engine were fluctuating wildly. Unable to maintain level flight, Major Carper began a slow descending turn back toward home, Selfridge ANGB, Mich. Meanwhile, Major Blackburn notified the control tower of the emergency, Sergeant Palma monitored the gauges, and MSgt. Niki Zachary, the loadmaster, took the ASET people off the flight deck and prepared them for landing.

Two right-wing overheat lights were next to wink on. Major Blackburn identified the problem as a bleed air leak, Major Carper directed isolation of the bleed air system, and Sergeant Palma shut off the valves. Normal power returned to the engines, although the aircraft was still vibrating severely. Major Carper was now able to maintain an altitude of 500 feet.

To complicate matters further, the No. 3 and No. 4 generators both dropped off line, leaving only the No. 1 generator to provide all necessary power. The flight engineer immediately reset both generators, and fortunately both came back on line.

On final approach, things got even worse. The instruments for the No. 4 engine (right outboard) began giving highly erratic readings, and the No. 4 throttle started to bind and then became immovable. The flight deck crew quickly shut down the engine and feathered the propeller. Flaps were set at 100 percent, and Sergeant Zachary, the loadmaster, looked out the window and notified the pilots that the surfaces were extending correctly.

MSgt. Henry G. Palma, flight engineer for the 305th ARRS crew that won the President's Award, struggled with balky generators during an in-flight emergency that threatened to flare into tragedy for crew and aircraft.

As the crew flared the airplane for touchdown, the No. 3 throttle started to bind, but could still be moved. The brakes and inboard engines were used to stop the HC-130 after a normal touchdown. An emergency engine shutdown was performed on the runway, and the crew and passengers got out as quickly as possible.

Once the ground crews and firefighters secured the aircraft, the cause of the emergency became readily apparent. The bleed air duct in the right wing root had exploded. The force of the blast had taken more than forty inches off the leading edge of the wing inboard of the No. 3 engine. Part of what remained of the leading edge had curled up inside the wing and was chafing against the throttle cables. The hot bleed air had also scorched and damaged wire bundles leading out to the engines.

The coordination of the crew had kept a bad situation from turning into a disaster and undoubtedly

Loadmaster MSgt. Niki Zachary, a member of the HC-130N crew honored this year as the best in AFRES, prepared an on-board stan/eval team for a possible crash-landing and then assisted the pilots of the HC-130N by monitoring the activation of flap surfaces during the landing approach.

earned the crew high praise (although an evaluation is canceled during an in-flight emergency) from the ASET folks. Interestingly enough, an HH-3E crew from the 305th ARRS won the President's Award in 1986.

AFRES Outstanding Unit

While it is not easy for an Air Force Reserve unit to distinguish itself enough to win the AFRES Outstanding Unit award once, it is very hard to keep the same level of intensity and commitment the next year and win the award for a second time. The 315th Military Airlift Wing, a Reserve Associate Wing at Charleston AFB, S. C., has risen to the challenge and is once again the top unit in the Air Force Reserve.

It was a busy year for the 315th MAW's three flying squadrons. Crews recorded 12,653 hours of flight time (520 hours more than were scheduled) in the C-141Bs "owned" by the active-duty 437th MAW. The 315th MAW was a regular participant in such exercises and deployments as Team Spirit, Elf One, Fuertas Caminos, and Reforger and flew more than 800 airdrop and air-refueling missions all over the world. The crews were also tasked with 193 "add-on" missions not originally on the monthly operations plan.

In addition, the 315th MAW provided logistics support on President Reagan's trip to Italy last year, and it conducted an orientation flight for employers. There were also two missions that could be labeled "unique."

On the first one, Maj. Alan Price's C-141 was intercepted by Peruvian fighters while in international airspace on the return leg of a humanitarian mission to Chile. Major Price ignored the order from Peruvian controllers to land, and the fighters departed without incident. On the second flight, Maj. Robert Lancaster overcame multiple in-flight emergencies, including complete loss of pressurization while at 28,000 feet, and got his forty-eight passengers and his airplane down safely. If an accident had occurred then, it would have broken the wing's streak of nineteen consecutive years without a major mishap.

A majority of flights were real-world airlift and medical evacuation missions, but training was also carried out. Crews were trained in the new Military Airlift Command combat airdrop policy of each aircraft in the formation dropping on cue from instructions provided by its own inertial navigation system (INS) computer rather than off the lead aircraft. All loadmasters and engineers were instructed in Combat Aircrew Training System (CATS) techniques, in which "how-to" courses were given in map reading, window scanning, and plotting safe areas for escape and evasion.

Training also went on at ground level. The 31st Aeromedical Evacuation Squadron (AES), which flew on 158 missions (thirteen of which were rated "urgent" or "critical") with 2,051 patients, trained members of the 1st AES at Pope AFB, N. C., and of the 60th AES at Andrews AFB, Md. Flight engineers from the 70th Military Airlift Squadron themselves built a part-task trainer (PTT) of the engineer's panel so that others could be trained. In all areas, the wing achieved an effectiveness rate of 100 percent for the year, with zero percent overtime in on-the-job training. Nine members of the wing graduated from the Community College of the Air Force during the year.

The 315th MAW also stood out in other areas as well. The wing set the AFRES standard—well over ninety percent—for attendance at Unit Training Assemblies (UTAs), and the retention rate was very high (near ninety-eight percent). The 315th MAW's maintenance complex worked side-by-side with the maintenance troops from the 437th MAW to achieve a launch reliability rate of 94.5 percent. Additionally, more than 400 members of the maintenance complex accomplished their annual tour of duty overseas.

Several people in the maintenance complex won awards from MAC's Twenty-first Air Force, while members of the wing's 38th Aerial Port Squadron and 315th Air Base Group won awards from the Reserve's Fourteenth Air Force.

The wing also collected and distributed $1,400 worth of toys and clothes to mentally handicapped children, and a technician in the field maintenance squadron found a way to turn 237,000 drink can tabs into fifty-five days' worth of time on a kidney dialysis machine for needy individuals.

The 315th Military Airlift Wing, a Reserve Associate wing based at Charleston AFB, S. C., has been honored for the second year in a row as the top unit in the Air Force Reserve. Pictured above are members of a 315th MAW aircrew doing what they do best.

ANG Outstanding Unit

It was a series of comings and goings (mostly goings) that set the 161st Air Refueling Group apart from the other Air National Guard units last year. From Iceland to Wake Island and from Colombia to Alaska, the 161st AREFG was there.

All told, the 161st AREFG, based at Phoenix, Ariz., supported Air National Guard, Air Force Reserve, and active-duty units in twenty-five

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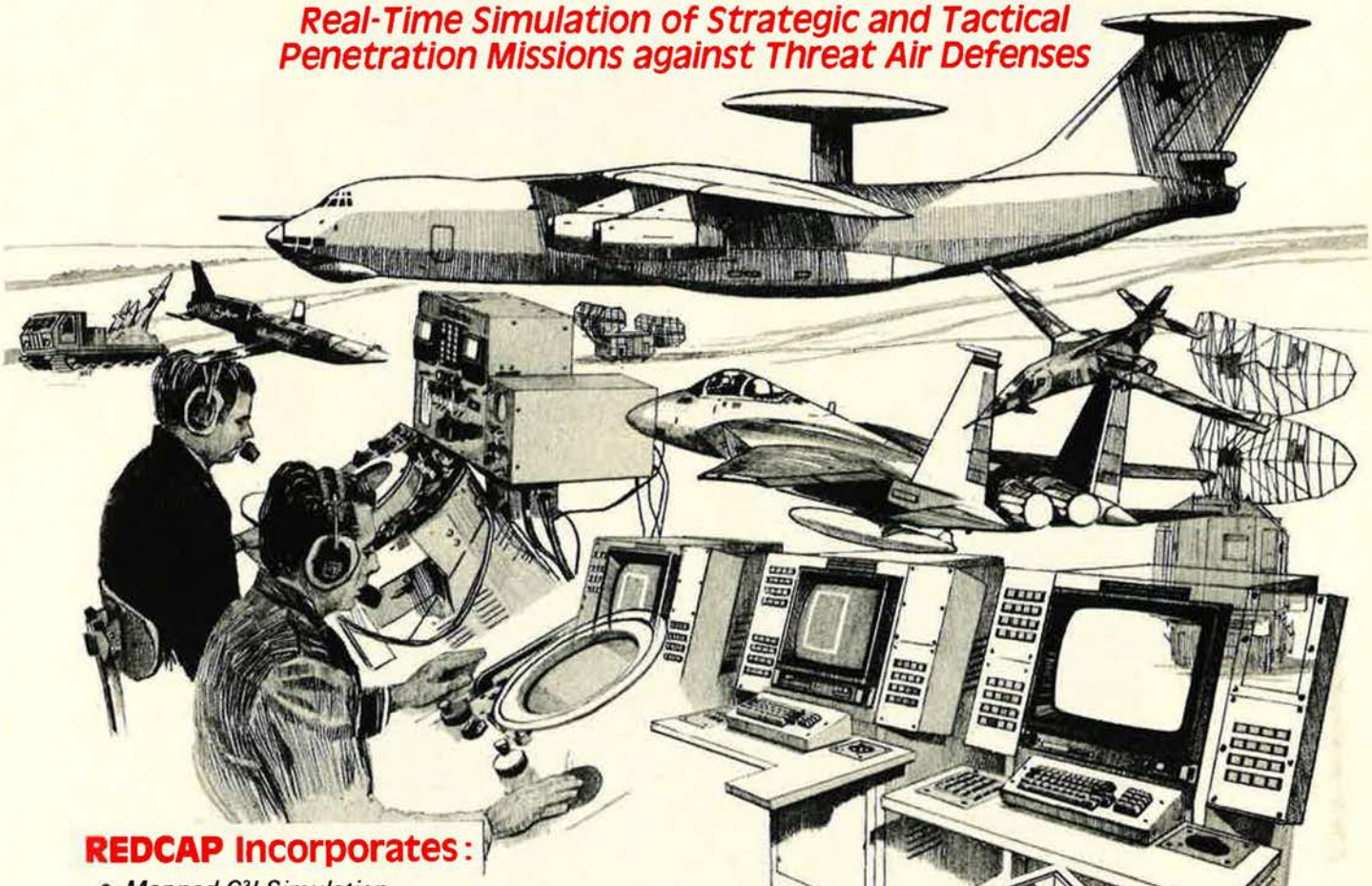

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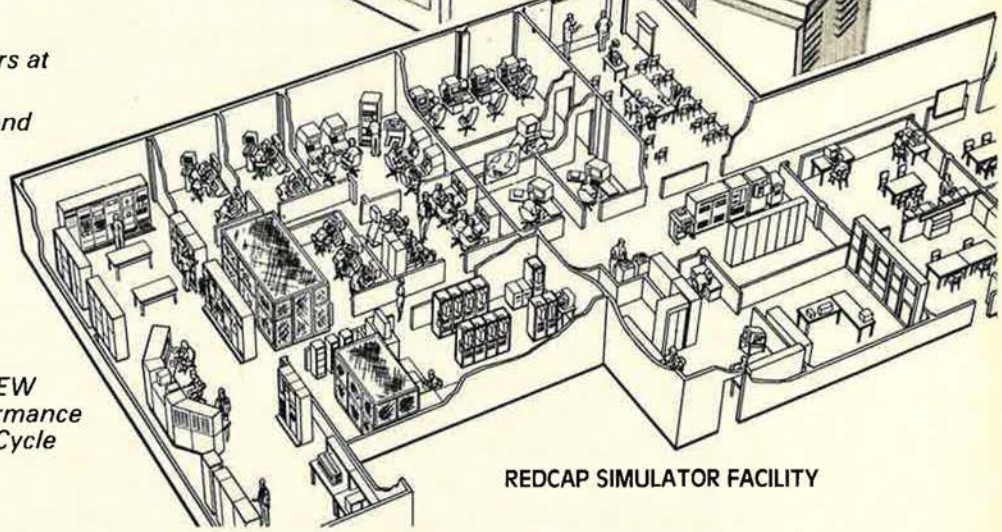

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states (including Alaska and Hawaii) and seven overseas locations. The KC-135E unit helped support forty-two mobility exercises with fuel and opportune airlift of troops.

The 161st AREFG provided more than half of the F-15 and F-16 aircrew refueling-qualification training for the active-duty 58th and 405th Tactical Training Wings at Luke AFB, Ariz., and the Guard A-7 "schoolhouse" operations conducted by the 162d Tactical Fighter Group at Tucson, Ariz. Aircraft from fifty-six Tactical Air Command or TAC-gained units and seventeen Strategic Air Command, Military Airlift Command, and Air Force Systems Command units "filled up" at one of the 161st's tankers.

During the last quarter of the year, the 161st AREFG had a utilization rate of 2.12 receivers refueled for every flying hour flown. In contrast, the overall Guard average was 1.23, and the SAC average was .52 receivers refueled per flying hour during the same period. There were 3,044 aircraft refueled on 5,650 contacts made by the 161st during the year.

The group was also one of three tanker units that made up the Air National Guard White Team during the 1987 SAC Bombing and Navigation Competition. This composite team won the Bruce K. Holloway Trophy for best demonstration of navigational skills and was second for the Saunders trophy for best overall tanker operations.

The Air National Guard's 161st Air Refueling Group at Phoenix, Ariz., has been named as the ANG Outstanding Unit for the year. Above, SSgt. Mark Cowles, a boom operator for the KC-135E-equipped unit, flies his boom into position to refuel approaching receivers.

Among the "comings" the unit experienced over the past year was SAC's tasking of the unit to bring the concept of Low-Altitude Air Refueling (LAAR) into reality. The 161st wrote the plan and then put it into practice for refueling missions at altitudes down to 1,000 feet. The unit also supported visits by President Reagan, Vice President Bush, and Pope John Paul II.

Neither a "coming" or "going" but a "continuing" is the unit's role as the Guard and Reserve's KC-135E Flight Simulator Office of Primary Responsibility (OPR). Working with the simulator contractor, the 161st AREFG has developed some of the best simulator training in the Air Force. Among the more innovative procedures the unit has developed are techniques for dealing with windshear and other types of severe weather.

The unit received "outstanding" ratings in the areas of mission effectiveness, aircrew Emergency War Order (EWO) knowledge testing, combat mission folders, and aircraft generation for wartime tasking during a recent Operational Readiness Inspection (ORI). Other highlights included an "excellent" rating for the safety office and repeat "outstanding" ratings for the procurement and social actions offices.

The unit also won several Air National Guard-level awards, and the 161st State Rifle Team won first place for precision shooting and twelve individual awards at the Sixth Army Reserve Championship Match at Fort Ord, Calif.

The 161st AREFG also passes along fuel of a different sort. The unit donated more blood, per capita, than did any other organization in the Phoenix area last year. The group also annually sponsors the Children's Special Olympics and a number of food drives.

—Photo by Peter J. Mancus

SAC tasked the 161st AREFG, winner of this year's ANG Outstanding Unit award, to put into practice the concept of Low-Altitude Air Refueling. The unit wrote the plan for the concept and then demonstrated it at altitudes down to 1,000 feet. Above, a KC-135 tanker prepares to refuel A-7s.

The Ricks Award

The C-130 technical manual warns that the complete loss of hydraulic boost assistance to the flight controls "is an emergency condition that would probably never be experienced" because of the redundant hydraulic system design. Never say never, because that is exactly the situation Maj. John R. Cole and his C-130A crew from the 118th Tactical Airlift Wing found themselves in on one flight last August.

The crew, based in Nashville, Tenn., was flying in the traffic pattern around Huntsville, Ala., when the airplane experienced catastrophic failure of all hydraulic systems. The cargo hold was immediately awash in the highly inflammable hydraulic fluid, and the aircraft became difficult to control.

It took the coordinated strength of both Major Cole and Capt. Kevin D. Heusinkveld, the copilot, to move any of the flight control surfaces at all. Aircraft controllability was marginal at best, and once the Hercules started to move, it required significantly more opposite control input to arrest the motion.

The two pilots planned an emergency landing using a wide pattern with a ten-mile final approach to minimize the need for control inputs. The crew notified the Huntsville tower of the emergency and the intended plan of action. Meanwhile, the loadmaster, MSgt. Harold L. Johnson, was trying to contain the hydraulic fluid in the hold.

—TennANG photo by MSgt. Robert S. Wilkinson

This C-130A crew of the 118th TAW based in Nashville, Tenn., is the winner of this year's Earl T. Ricks Award for outstanding airmanship in the ANG. They are (kneeling, from left) MSgt. Ralph K. Barrett and MSgt. Harold L. Johnson; (standing, from left) Capt. Kevin D. Heusinkveld and Maj. John R. Cole.

Major Cole directed MSgt. Ralph K. Barrett, the flight engineer, to make the throttle movements on final approach, while both pilots made coordinated attempts at flight control movement. Landing is often a difficult operation for a pilot by himself, but the difficulty of this effort was compounded by having three crew members at the controls.

The Tech Order notes that nose-down pitching will occur during landing. Being aware of this, the crew was prepared when the pitching began. The pitching was more severe than anticipated, but the skill of the crew averted disaster. The aircraft was brought to a stop on the runway by the use of emergency brakes and with the help of reverse engine thrust.

The crew's cool professionalism in coping with this emergency earned it the Earl T. Ricks Award for outstanding airmanship in the Air National Guard. ■

MSgt. Gary Cole has been honored for his outstanding work in aerospace maintenance.

Chief Red Award Goes to MSgt. Gary Cole

MSgt. Gary D. Cole, a top-rated aircraft fuel system technician from Berry Field in Nashville, Tenn., is the winner of AFA's "Chief Red" Award for 1988. Established in 1984—and named for legendary maintenance man CMSgt. Dick Red of the Arkansas Air National Guard—this award goes annually to an enlisted Guardsman for outstanding contributions to aerospace maintenance.

Sergeant Cole joined the Tennessee Air Guard in 1956 and after basic training began his career on the flight line at Berry Field. For the next eleven years, he was a crew chief, working on T-33s, RF-84Fs, and C-97s. In 1967, he volunteered to set up a fuel system repair shop at Berry Field. He trained for the job at Chanute AFB, Ill., and thus entered the specialty in which he would make his distinctive mark.

His efforts soon started to reach beyond the 118th Consolidated Aircraft Maintenance Squadron and the Berry flight line. On several occasions, Sergeant Cole has been tapped to work with the depot at the Warner Robins Air Logistics Center to solve fuel system problems or devise procedures and system modifications. More recently, he was the driving force in obtaining a C-130 fuel cell mockup trainer for his organization. At the time, it was the only one of its kind in the Air Force outside of the technical training center at Chanute, and it did wonders for upgrade and proficiency training in the 118th.

Sergeant Cole is a veteran of numerous exercises and was awarded the Tennessee Distinguished Service Medal for his work on flood relief in Panama during one of them. He's also active in the community. Among other things, he operates the sports scoreboard for games at McGavock High School. The scoreboard works very well, which should be no surprise. Sergeant Cole does the maintenance on it.

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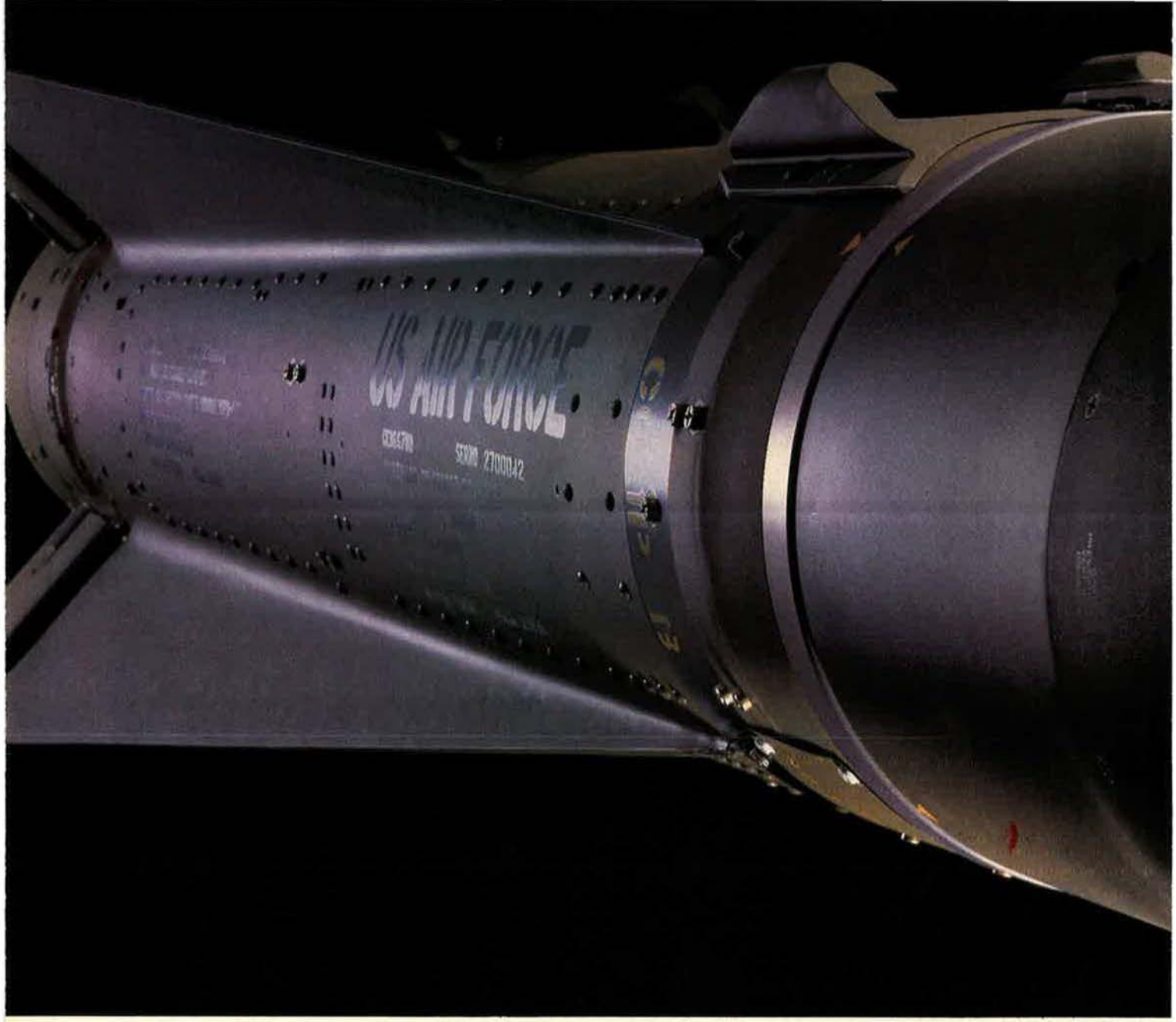

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15. Sea Dart shipborne area-defence missile
16. Seawolf shipborne anti-missile system
17. ASRAAM (Advanced Short-Range Air-to-Air Missile)
18. Hawk 200 single-seat fighter
19. Tornado Air Defence Variant
20. EFA (proposed European Fighter Aircraft)
21. EAP (Experimental Aircraft Programme)
22. Skynet military communications satellite

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AFA salutes the tactical air command controllers as the Team of the Year.

The Black Berets

BY COLLEEN A. NASH, STAFF EDITOR

A HANDPICKED group of "black berets"—tactical air command controllers—were honored at an Air Force Association salute last May as the 1988 Team of the Year. These are the troops trained to deploy forward with the Army in combat and provide a link to the tactical airpower supporting the land forces.

The mission has seldom been described better than by TSgt. Dennis A. LeVick, speaking on behalf of the Team of the Year:

"We are a small career field—anonymous to most of the blue-suited Air Force simply because we are not usually stationed at Air Force installations. We are 'adopted Army,' attached to combat fighting units around the world, from the Korean DMZ to the Fulda Gap in Germany. Wherever soldiers are trying to take a hill or reach an objective, there's a small band of well-trained, mission-minded Air Force professionals called a tactical air control party [TACP] there to assist.

"Using our communications equipment, our field skills, and our knowledge of tactical airpower, we bring to the arena the sting of close air support attack aircraft. By integrating close air support into the

The tactical air control parties are trained to deploy to forward areas with the Army in combat and provide a link to tactical aircraft supporting the land forces. This Black Beret is one of this year's Team of the Year members, TSgt. Todd W. Armstrong, phoning home base during a training exercise.

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Here's the 1988 Team of the Year:

• **TSgt. Todd W. Armstrong** of Det. 6, 507th Tactical Air Control Wing, Fort Polk, La., consistently excelled as the NCOIC of divisional TACP operations. Sergeant Armstrong introduced several innovative unit-training routines, such as rappelling and water survival. He also coordinated with the aviation brigade to incorporate a helicopter-reconnaissance mission and TACP drop at night, followed by foot navigation to a remote area where tactical air control training took place the next morning.

As a supervisor, he regularly works long hours in order to explain, demonstrate, and set a good example. He is an honor graduate of the Army leadership school and the Air Force supervisory course.

The TACP controllers integrate close air support with the Army's battle plan and also have final control of the strike aircraft coming into the target area. Here, one of the "adopted Army," TSgt. Dennis A. LeVick (left), calls in an air strike during a recent exercise.

• **TSgt. Dennis A. LeVick** of Det. 1, 326th Air Division, Schofield Barracks, Hawaii, was selected to be the NCOIC of a brigade tactical air control party in the Army's newest light division. One senior Air Staff observer judged Sergeant LeVick's party as "the best I have ever seen in PACAF." While deployed to Hawaii's Pohakuloa Training Area for Opportune Journey 87-3, Sergeant LeVick scheduled evaluations, controlled air strikes, conducted training classes, and supervised all enlisted personnel. This was the largest training event ever attempted by his unit.

Sergeant LeVick is also a talented instructor. He developed a new block of instruction and literally wrote the book for his specialty course at Hurlburt Field. He also developed events and tests used for the first three annual worldwide tactical air command and control competitions.

• **Sgt. Frankie A. Mabry, Jr.**, of

Sgt. Frankie A. Mabry, Jr., developed the best physical training program to date in Alaskan Air Command. During an exercise last year, he deployed as a single-man tactical air control party, successfully interfaced with a scout company, and exercised ground control of close air support.

SSgt. Mitchell P. Quinn (right) was the first enlisted man in the Air Force to be designated as a forward air controller. Here, he is troubleshooting his communications gear during a recent exercise.

the 3d Air Support Operations Center Flight, Fort Richardson, Alaska, is a tactical air command and control specialist. He has completed airborne training and Army Ranger school and is a master parachutist with more than 250 jumps. Last year, Sergeant Mabry was selected to train more than 1,000 soldiers in the Army's air assault courses. He is credited with developing the best Air Force physical training program to date in Alaskan Air Command.

During the Joint Chiefs of Staff Brim Frost '87 exercise, Sergeant Mabry deployed as a single-man tactical air control party to the remote long-range radar site at Camp Newenham, Alaska. In spite of the harsh winter weather, he managed to interface successfully with an Alaskan scout company and demonstrate ground control of the close air support mission.

• **SSgt. Mitchell P. Quinn** of Det. 1, 601st Air Support Operations Group, Gonsenheim, West Germany, is a tactical air control specialist. He was the first enlisted man to be designated a forward air controller in the Air Force and the first staff sergeant in the 7th Infantry Division to be named a brigade NCOIC. When his air liaison officer was unavailable, Sergeant Quinn adeptly planned, coordinated, and executed a battalion live-fire exercise involving artillery, fighters, 500 infantrymen, and a joint air attack team.

Renowned for his leadership qualities and knowledge of the close air support system, he is currently taking two Army correspondence courses in order to learn more about that sister service.

The front line is not the safest place to work. That's why the TACP controllers also have to be proficient in the use of weapons. Here, TSgt. Douglas F. Tillman, TAC's Specialist of the Year for 1986, performs one of the controller's other jobs, that of armed reconnaissance.

• **TSgt. Douglas F. Tillman** of the 24th Tactical Air Support Squadron, Howard AFB, Panama, is a tactical air command and control technician. His squadron regards him as the foremost expert in all tactical air control party matters. His superiors agree—Sergeant Tillman was named the Tactical Air Command Specialist of the Year in 1986.

His track record as a field coordinator and operator is superb. On one occasion when four Army medical helicopters became stranded high in the Bolivian mountains because of inclement weather, Sergeant Tillman took effective action immediately. While hovering at 10,000 feet and using FM homing procedures, he expertly guided the helicopters to safety. ■

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The role of today's Air Guard and Reserve owes much to the work of the Johnson Board in 1953.

Prelude to Total Force

BY C. V. GLINES

IF YOU were in the Air Force Reserve in the late 1940s, you know how confused things were at that time. Before the Korean War, training periods were often nothing but bull sessions, and time was taken up with World War II training films. The rated personnel used the aircraft assigned to their flying units for personal cross-country trips. Few seemed to know what they were training for, and many couldn't have cared less. There was little *esprit de corps*, and the mission of many units was vague.

The Air National Guard was better organized, and its members enjoyed a different status, serving under their respective governors, who had political clout and used it to the units' advantage. Still, the Guard took the short end of the logistics stick when its supply needs ran up against those of the active-duty Air Force.

In 1947, after unification of the services (accompanied by great wrangling over roles and missions) had become a fact, the battles for funding became intense. Interservice rivalry had become so rancorous that some suggested that the

As the Korean War wound down, many observers in and out of the military called for a fresh examination of the status and role of the nation's air reserve forces. The Air Force Chief of Staff at the time, Gen. Nathan Twining, appointed a special board to look into the air reserve program. Chairing the board was Lt. Gen. Leon W. Johnson, Commander of Continental Air Command. Pictured above are General Johnson, left, and A1C William J. O'Connell.

Air Reserve, the Air National Guard, or both should be disestablished because their financing took funds away from the regular establishment.

But two significant events occurred in 1949—the first nuclear explosion by the Soviets and the total evacuation of Chiang Kai-shek's government and the Nationalist Chinese forces to Formosa (now Taiwan). Despite these developments, the recommended defense budget for FY '51 contained only enough funds for an Army of ten divisions, a forty-eight-group Air Force, and a Navy with 238 major combat ships.

When the North Koreans launched a surprise invasion of the south in the summer of 1950, the United States mobilized to assist the South Koreans in repelling the attack. Mobilization of the Air Guard and Reserve, however, went anything but smoothly, prompting the eventual formation of the Johnson Board to examine the air reserve program. At left, airmen prepare to leave the US for the fighting in Korea.

Cut Fat, Not Muscle

When Secretary of Defense Louis A. Johnson succeeded James V. Forrestal in the late 1940s, he came into office determined to cut the "fat" out of the Defense Department. In his semiannual report for the period July 1 to December 31, 1949, Secretary Johnson said that the national military establishment "was still suffering from costly war-born spending habits. It was like a fat man—and, like a fat man, was in poor condition to run a race until the fat could be transformed into muscle."

In a speech delivered that December, he assured the audience that the country's military forces were strong and that no enemy could defeat the United States by a sudden "four o'clock in the morning attack." He confidently announced that if the US were attacked, it could quickly "launch a successful counterattack spearheaded by the Air Force."

As if to challenge Johnson's words, a "four o'clock in the morning attack" was launched by the Communist North Korean People's Army against the Republic of Korea. The date: Sunday, June 25, 1950. It was an attack strangely reminiscent of another Sunday morning eight and a half years earlier—the Sunday that would "live in infamy."

The subsequent mobilization of the Air Force Reserve and Air National Guard for the war in Korea was badly bungled. One example was the mobilization of a Reserve light bomb wing manned by Reservists and administered by the permanent party personnel of an Air Force Reserve Training Center. The morale of the wing had been high after summer camp in 1949, when the unit scored exceptionally well on simulated bombing missions. Its pilots had upgraded from C-45s and AT-6s to the Douglas B-26s without a single accident.

When the call came to mobilize the wing, the B-26s were quickly ferried to Langley AFB, Va., by permanent party personnel to be used for transition training of regular pilots. The Reserve wing was broken up, and many of the pilots were sent to B-29 transition schools. Few, if any, ever flew the B-26 again. Their morale was shattered, and they became bitter at the Air Force for causing their unit to disintegrate. As a result, many later resigned their Reserve commissions or opted for inactive status as soon as they could. There were many such stories around the country as Reservists and Guardsmen were called up to fight a war for which they felt ill-prepared.

The mobilization snafus that received much adverse publicity, coupled with the overt aggression by the Communists in Korea, marked the beginning of serious consideration of a new military policy for the United States. There was no longer any doubt that the Communists had been encouraged by our military weakness to resort to open warfare. As Secretary of Defense George C. Marshall said later, "The final recognition of this fact by the American people made it possible to start the rebuilding of the armed forces to the minimum strength required for the security of the United States."

The Twining Memo

In the spring of 1951, as the Korean War escalated, Gen. Nathan F. Twining, Air Force Vice Chief of Staff, was convinced that the Air Staff had to shape up and exercise more responsibility for reserve programs. He sent a memo to the Air Staff criticizing its members for fail-

Some critics contended that the US couldn't afford both an Air Reserve and an Air Guard, but General Johnson believed that both could and should be maintained. The Johnson Board found that the Guard benefited from being organized on the basis of location, while the Reserve suffered from dispersal. Above, a Hawaii ANG unit answers a scramble call.

ing to meet their responsibilities toward the reserves and directed that they take action to integrate reserve programs, plans, and policies with similar activities for the regular establishment. Unfortunately, his program fell short of its objectives.

According to Charles J. Gross, an Air Force historian, "The political ramifications of reserve programs were illustrated by growing congressional involvement with reserve components' policy during the Korean War. Despite the changes that the Defense Department and the individual armed services had made in their reserve programs in 1951, Congress and the reserve components' associations pressed for new legislation. Hearings on Capitol Hill in January 1951 were the political result of the poorly handled mobilization for the Korean War."

As soon as President Dwight D. Eisenhower assumed office in January 1953, he prescribed a reevaluation of military strategy and requirements for the military forces in recognition that the end of the war in Korea did not necessarily mean the end of Communist aggression. It was quickly dubbed the "New Look." In *Mandate for Change*, the book about his first term in office, he defined the New Look as "a reallocation of resources" that "called for a new outlook by the men concerned. This was not easy to acquire, for, as it turned out, the reallocations resulted in an increase in the Air Force, whereas the bulk of the reductions were primarily in the Army and secondarily in the Navy. This came about partly because during the Korean War the Army had expanded far beyond its necessary peacetime size.

"This change in emphasis came at a time when the Administration was exerting every effort to cut the costs of government everywhere," Eisenhower wrote. "Protests against the planned changes came from many quarters. Numbers of people were merely prejudiced in favor of one service as against the other two; others were interested in producing, for example, equipment for the Army and Navy rather than the Air Force; still others, in political life, disliked any closing down of military installations in their respective geographical constituencies. All were ready to accuse us of endangering military security for the political plaudits we might receive for reducing the budget."

One observer quipped, "The Democrats gave us the 'New Deal' and the 'Fair Deal,' so the Republicans have to give us a 'New Look.'" But the President explained in his State of the Union message that the new military policies were taking into account a growing stock of Soviet nuclear weapons and the effective means to deliver them. It had become increasingly clear that future wars would depend more on forces in being when the war started. Never again would this nation have time to train its reserves of manpower behind a shield provided by allies abroad. An essential feature of the New Look was, therefore, an effort to provide reserve forces that could be mobilized rapidly to fulfill a wartime role without extensive additional training.

Competition for Resources

The relationship between the regular Air Force establishment and its reserve forces (the Air National Guard and the Air Force Reserve) had been badly strained in the competition for resources; priority for equipment and facilities had always favored the regular units. Inadequate planning and administration of the reserve forces had been a continuing problem for the Air Force since it had become a separate service. As a history of the Air National Guard states, "Theoretically, these responsibilities had been distributed throughout the directorates of the Air Staff. In practice, however, that had seldom been the case. Reserve matters were frequently neglected or relegated to a low priority."

The problems had not been solved as the war wound down. In July 1953, General Twining, by then Air Force Chief of Staff, appointed a top-level board to investigate continuing problems with the air reserve programs, especially the Air Force Reserve. The board was a response to the call for action voiced by the reserve component associations (including the Air Force Association), Congress, the press, high-ranking officials of the Eisenhower Administration, and the President himself.

The board was chaired by Lt. Gen. Leon W. Johnson, Medal of Honor winner and Commander of the Continental Air Command. The board's seven members included two representatives from the regular Air Force, three from the Air Force Reserve, and two from the Air National Guard. In a recent interview, General Johnson recalled that there were many critics who said the country couldn't afford to

have both an Air Force Reserve and the Air National Guard, but he personally believed both could and should be maintained. He announced at the board's first meeting that the board should not come up with any recommendation that would call for elimination of either. "We're going to have both," he told them, "so let's make them efficient."

Recalling those days thirty-five years ago, General Johnson said, "Many people contended that there was no place for the Air National Guard," he said, "because if you had to go to war and pulled a whole unit from one town and it was decimated, it would put all the [personnel] losses in one place." He recalled that some communities had suffered disproportionate losses during the Korean War because members of some heavily hit ground Guard units all came from one locality.

AFA National President Arthur F. Kelly testified before the Johnson Board, giving the Association's views on the air reserve program.

No Cut-Rate Solutions

The Johnson Board held sessions for five weeks and heard testimony from many sources, including officials of civilian associations and representatives of the Army, Navy, and Air Staff. (Col. Arthur F. Kelly and Col. James H. Straubel testified for AFA.) In its final report, the board concluded that "weakness of a reserve forces plan and program is more serious to the entire establishment than just the loss of trained reserve individuals and units. Such weakness can result in a lack of influence and support for the entire Air Force by the public and the Congress." The report stated that "even with support at all echelons of the Air Force, including the reserves themselves, there is no quick or 'cut-rate' solution of all reserve problems."

The report added that of the two components of the Air Reserve Forces, "the Air National Guard is working to greater effectiveness than the Reserve. There are certain fundamental and legal differences between the two components, and comparison can be made only in regard to Reserve wings vs. National Guard wings. The greater percentage of the Reserve personnel, both officer and airmen, because of technical qualifications and the geographical location of their domiciles, is precluded from joining these wings. Therefore, many cannot be trained except through the medium of self-training courses in voluntary units or through correspondence.

"No fundamental facts were established to show that the comparable parts of the Air National Guard and the Reserve could not be trained and developed on an equally effective basis, provided that each had the same or comparable facilities and equipment."

James H. Straubel, former AFA Executive Director, also gave testimony to the Johnson Board. The Board found that many of the reserves' problems could be traced to the regular establishment's attitude toward the reserves.

Commenting on the board's findings at the Guard's Diamond Jubilee in October 1953, General Johnson said, "[T]he Air Reserve has so many problems which do not apply to the Guard. It also quickly became evident that the Guard was doing a better job in organized units than the Reserve. We tried to pinpoint the reason; we considered facilities, we considered budget and all of the factors we could, but the only one that seemed conclusive was pride in the existence of, and close public support for, a local unit. We concluded that there is no reason why the Air Reserve could not become as effective with proper supervision and support."

During the board's deliberations, it was clearly evident that the regular establishment did not understand or appreciate the Reserve program. It was essential that emphasis had to be placed on quality rather than quantity and that the regular establishment had to "realistically approach the Air Force's present ability to equip, recruit, and train its Reservists."

General Johnson told the author it was a matter of attitude toward the reserve forces by the regular establishment that was the root of the problem. The system could be made to work if everyone wanted it to work. Thus, the failure of the reserve program was laid directly on the active-duty establishment.

The board rejected any thought of universal military training and endorsed continued reliance on voluntary participation in Guard and Reserve training programs. The board made twenty-three recommendations that laid the groundwork for today's reserve forces. These included:

- Establishment of an Office, Assistant Chief of Staff, Reserve Forces.
- Provision for stabilized active-duty tours of Reservists from the local areas to furnish permanent party support for Reserve wings.
- Organization of some Reserve flying wings on a detached squadron basis.
- Merging of District Headquarters and Specialist Training Centers into Air Reserve Centers.

- Increasing the number of paid drills for mobilization assignees to "at least" twenty-four per year.
- Establishing an office at USAF Headquarters to coordinate Reserve information activities and creating Air Reserve Advisory Councils composed of influential citizens "to assist in the promotion of Air Force activities."
- Establishing procedures whereby outstanding reserve airmen could obtain commissions while on inactive status.

Another Honor for Gen. Leon Johnson

Gen. Leon W. Johnson, USAF (Ret.), World War II Medal of Honor winner for exploits at Ploesti *(see also this month's "Valor," elsewhere in this issue)*, postwar commander of Continental Air Command, and chairman of the 1953 board to examine air reserve problems, will be honored on December 6 at the 1988 General Jimmy Doolittle salute.

The Doolittle Salute is presented annually by AFA's affiliate, the Aerospace Education Foundation, and takes place in the Smithsonian Institution's National Air and Space Museum, Washington, D. C. The event recognizes AEF Corporate Doolittle and Eaker Fellows whose contributions help support AEF's educational outreach programs. Recent honorees have included President and Mrs. Reagan, Mrs. Anne Morrow Lindbergh, former Sen. Barry Goldwater, and (last year) actor/aviator Brig. Gen. Jimmy Stewart, USAF (Ret.).

In today's Total Force, the Guard and Reserve are proud members of the Air Force team. The Reserve and the Guard are no longer having to make do with outdated equipment and are being assigned modern, first-line aircraft, such as the F-16 Fighting Falcon in AFRES colors pictured above.

- Establishing policies concerning availability for training and recall of Reservists in critical industries.
- Taking a "more affirmative and conscientious approach . . . toward informing individuals in the active establishment of reserve forces programs prior to their release from active duty."
- Taking appropriate action "to impress students in service schools of the importance of the reserve forces."

Coming Out of the Woods

In a speech at the September 1953 AFA Convention, General Johnson reported what the board had accomplished in its five weeks of intense discussions and said, "I believe we are going to come out of the woods and get a reserve which we have to have, because as the regular establishment goes down, the reserve must go up and the country must depend on it more and more."

Although there have been refinements and fine tuning of these recommendations over the years since 1953, time has shown that the conclusions of the board were taken seriously and the reserve forces have now become completely integrated into the Air Force's TAC, SAC, and MAC missions.

The Air Force Reserve now consists of fifty-eight flying squadrons and 450 mission support units. Reserve pilots fly a multitude of aircraft types from HH-3 helicopters and F-4 fighters to giant C-5A transports and KC-135 tankers.

Some Air National Guard units are flying the world's finest air-superiority fighters, the F-15 Eagle and its brother, the F-16 Fighting Falcon; others are flying C-130s, F-4s, A-7s, and A-10s. The Guard accounts for eighty-six percent of the nation's fighter-interceptor force, fifty percent of the reconnaissance force, thirty-nine percent of tactical air support, thirty-five percent of tactical airlift, twenty-five percent of tactical fighters, eighteen percent of the air refueling capability, and seventeen percent of the rescue capability of the total Air Force.

Guard flying units had their safest year ever in FY '87 with only five Class-A flight mishaps. Personnel strength reached an all-time high of 114,600 members in FY '87.

The farsighted wisdom about the reserve forces demonstrated by the seven-man Johnson Board has resulted in an Air Force today that can fly and fight successfully against any of the world's air forces. The Total Force concept was adopted in 1973, and there are some 200,000 members of the Air Force Reserve and Air National Guard who make it work.

Today, we have a smaller, leaner, and less expensive regular Air Force because it is backed by citizens ready, willing, and able to mobilize when they are needed. The Air Reserve Forces are the initial and primary source of Air Force augmentation in any future emergency.

As General Johnson said, the system works now because everyone wants it to work. ■

C. V. Glines is a regular contributor to this magazine. A retired Air Force colonel, he is a free-lance writer, a magazine editor, and the author of numerous books. His by-line most recently appeared here with the July issue feature "The Skyhook."

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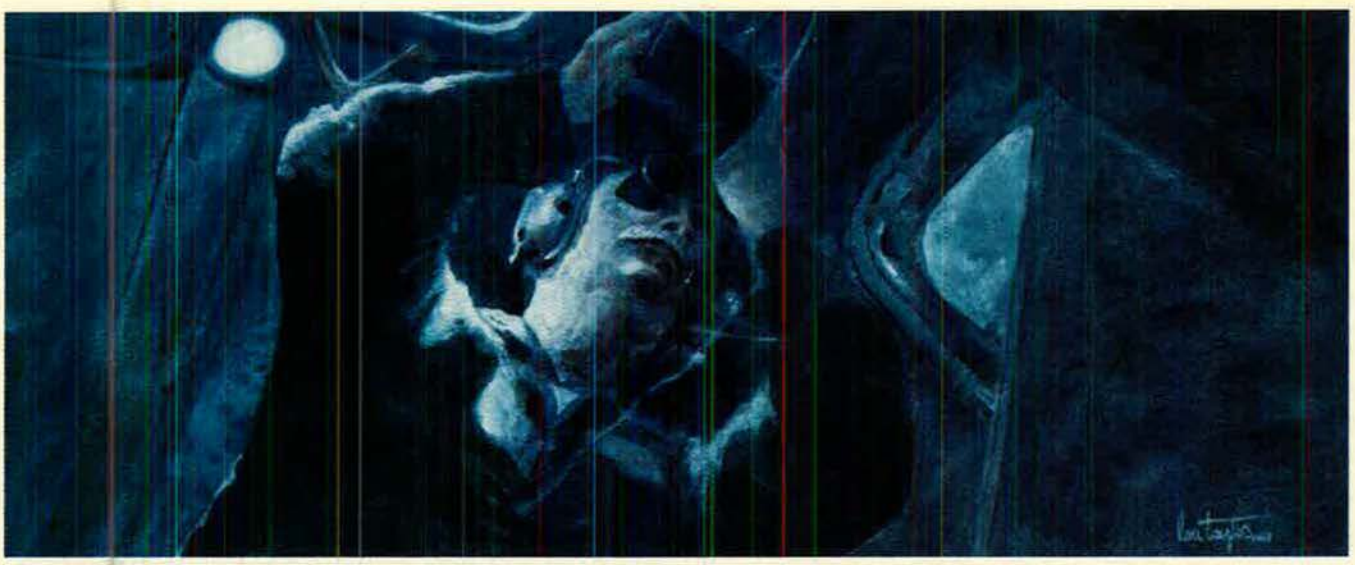

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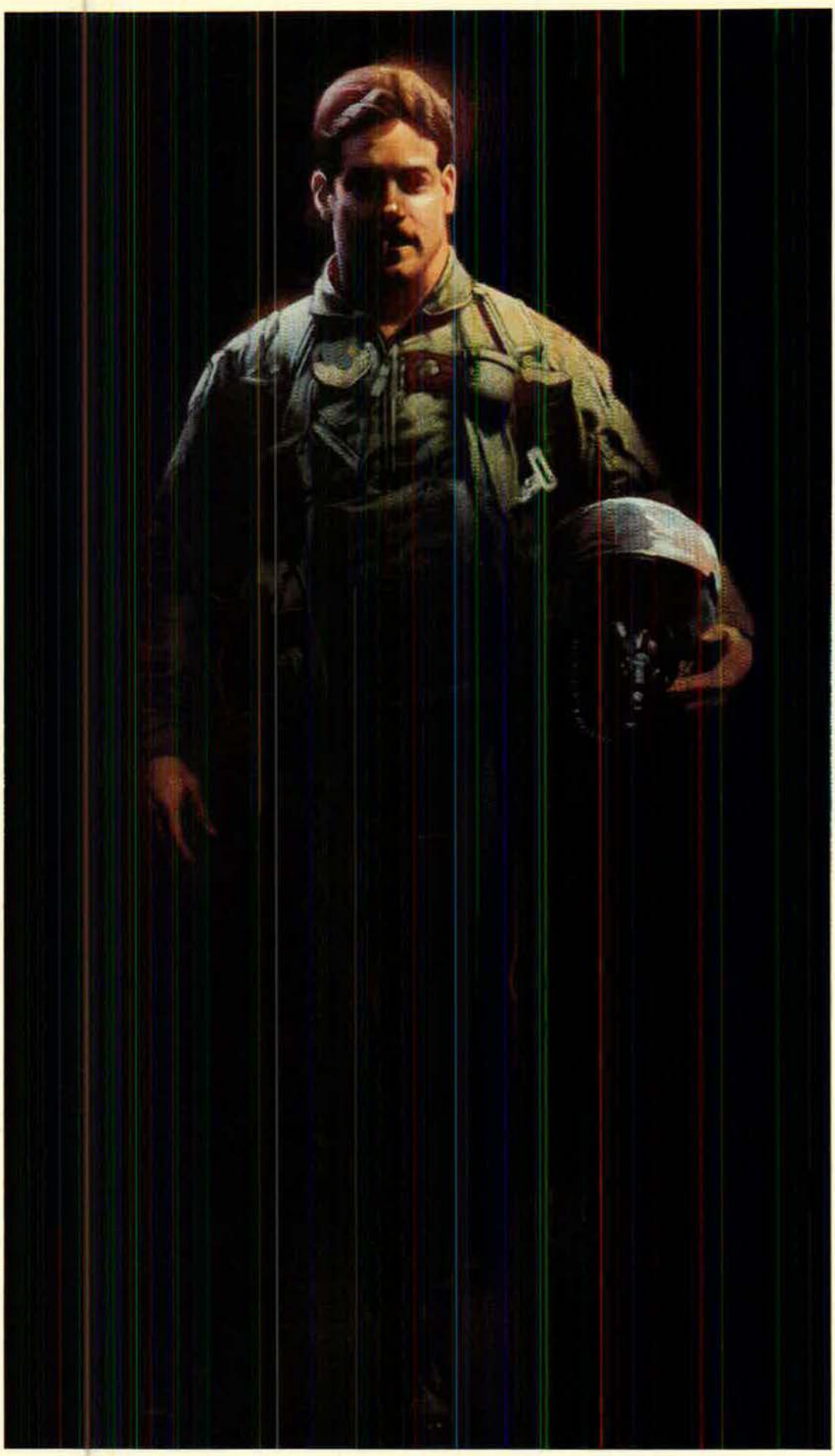

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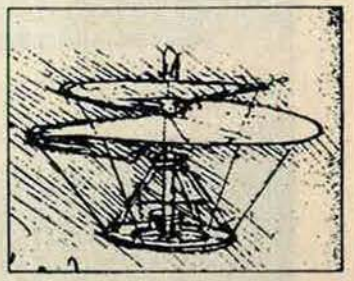

Listen to a famous military engineer who traveled more than 400 years in time to visit with you to explore the technological advances he envisioned that today protect our freedom. This fascinating presentation at the Rockwell International exhibit is our salute to the U.S. Air Force, the best in the world.

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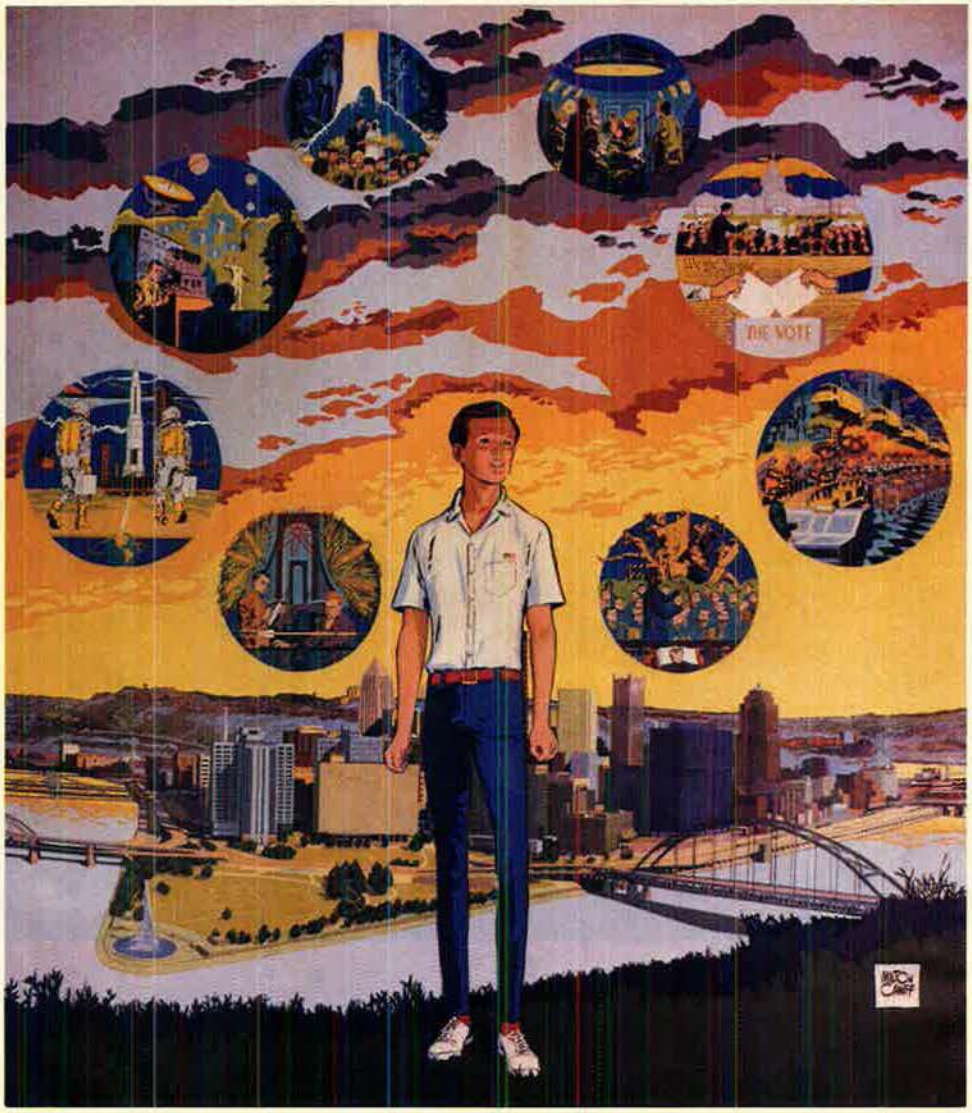

YOU ARE THE FLAG

AT EACH SUCCEEDING MILEPOST ON THE HISTORY TRAIL WHICH
BRINGS YOU TO THIS MOMENT IN YOUR SPAN,
YOU'VE BEEN AWARE THAT BITS OF CLOTH, STITCHED INTO ENSIGNS,
ARE THE SYMBOLS OF THE VIBRANT YOUTH OF OTHER DAYS,
WHO ANSWERED WHEN THE BURDEN FELL ON THEM TO CARRY FREEDOM'S
TORCH ANOTHER STEP AHEAD OF APATHY AND FEAR;
WHEN AVARICE OR DESPAIR BECAME A THREAT TO WHAT HAD BEEN
ACHIEVED BY TOIL AND EARNEST SEEKING TO IMPROVE.

IT NOW SEEMS EASY TO ASSUME THAT YOU'D HAVE RALLIED TO THE NEWBORN
COLORS FLOWN AT BUNKER HILL AND IN THE COLD OF VALLEY FORGE,
BUT AGONIZING CHOICE DIVIDED MEN OF DECENCY AT EVERY MOMENT IN THE
AWESOME SEQUENCE OF TRAVAIL WHICH FACED THE COLONIES,
AND SPAWNED A WAY OF LIFE UNKNOWN BEFORE YOUNG PATRICK HENRY
SPOKE OUR INVOCATION IN A VOICE WHICH THUNDERS DOWN THE YEARS.

THE BATTLE FLAG OF DIXIE CANNOT TRULY TELL HOW DEEP THE CHASM
IN THAT PHASE OF GLORY AND DEFEAT SO CLOSE TO HOME.
YET FROM THE CLASH OF BROTHERS CAME THE HOPEFUL BASTION OF A BREED
ALONE IN CONFLICT WITH A WORLD OF BLIND OBEDIENCE TO POWER.
AS FREE MEN FALTER IN FAR PLACES, NOW THE STARS AND STRIPES LOOM LARGER
AS THE DIKE OF HOPE AGAINST THE TIDES OF RED WHICH POUND OUR SHORES.

UNDER THIS MANTLE GREW THE REEDS AND MAYOS IN THE HEALING ARTS. WASHINGTON
AND LINCOLN PIONEERED IN GOVERNMENT, NATIVE BORN AND GROWN.
BUSINESS PRODUCED A CARNEGIE AND FORD. ELLIOTT AND EINSTEIN FLOWERED IN
THE FIELDS OF EDUCATION. CARVER AND SALK TOOK SCIENCE ROUTES TO
TRIUMPH AND RENOWN. THE WRIGHTS AND GLENN BROKE BOUNDS OF AIR, THEN SPACE.
EDISON AND BELL GAVE VOICE AND EAR TO ALL MANKIND. WHILE WORSHIP,
FREE FROM FEAR, FOUND HAVEN HERE — ALLOWING MATHER AND CABRINI RIGHTS
UNKNOWN IN OLD WORLD SHADOW PLACES.

IN THIS STILL VAST, REWARDING LAND, WHERE TROUBLE IS, AS ALWAYS,
OPPORTUNITY DISGUISED IN WORKING CLOTHES...
WHERE, IN THE MIDST OF WAILS OF DISADVANTAGE AND DECAY,
THERE YET ARISE UNSHACKLED MEN WHO SCOFF AT WHINING ODDS.
WE ARE A PEOPLE OF OUR OWN DESIGN AND PURPOSE — YOUNG ENOUGH A NATION
THAT THE ATROPHY OF DISMAL PORTENT HAS NOT COOLED OUR ZEAL...
HENCE, IN THIS BLOODED HERALDRY THERE LIE UNFINISHED SEGMENTS
OF A SCENE OF LONG HORIZONS, PAST AND FUTURE; THEN AND NOW.

YOU'LL HEAR THE WEASEL WORDS OF HARPIES BENDING TO THE BLOW OF
TEMPORARY HURT, BUT WHEN THE GOING'S TOUGH, THINK BACK
ON ALL THE YOUNG AMERICANS, MUCH LIKE YOU, WHO PASSED THE TEST
WHEN BLEAKNESS DULLED THE FUTURE OF THEIR LAND.
THE TATTERED BANNERS SYMBOLIZE HOW WELL THEY STOOD AND HELD
AGAINST THE FLOOD WHICH NEVER FULLY STOPPED, NOR EVER SHALL.

NOW THE DAY IS YOURS! DON'T WAIT FOR 'OTHER GUYS' TO DO THE JOB —
TO CARRY HIGH THE HALLMARK OF OUR FAITH IN WHAT WE'VE WON.

THE 'OTHER GUY' IS YOU! — YOU ARE THE FLAG!!

MILTON CANIFF

A longtime friend of USAF and AFA, cartoonist Milton Caniff, died on April 3, aged 81 and in his fifty-first year of cartooning. In his memory and thanks to the National Flag Foundation, we are proud to present this art-essay. —The Editors

For The Tanker, Transport, Training System

EXPERIENCE IS THE BEST TRAINER

Implementation of Air Training Command's Tanker, Transport, Training System (TTTS) will be the most significant change in USAF pilot training methodology in 30 years. It will affect every aspect of the United States Air Force pilot training system.

The day-to-day operation of this program is no place for beginners. Proven Performance, Recognized Safety, and Demonstrated Reliability plus Economical Operation are vitally essential to overall success.

Cessna's T-47 "Silverwings" has all the required credentials and more. Its durability, efficiency and safety have been proven by over 50,000 flight hours in a real-life military training environment. The Cessna T-47 "Silverwings" was developed from its commercial counterpart, the Cessna Citation. Cessna was recently presented the Collier Trophy for Aeronautical Excellence for its unparalleled safety record of the worldwide

fleet of Citation aircraft. Other past Collier Trophy recipients include Orville Wright, Glenn Curtis, Neil Armstrong and the F-16.

The TTTS is a totally integrated pilot training system including a myriad of components required for a student to earn the coveted silverwings of a USAF pilot.

Cessna, together with its team members: General Dynamics and Link Training Systems, offers USAF the most effective combination of proven training aircraft, large scale system integration experience, off-the-shelf flight simulators, and curriculum development expertise.

When training our nation's Air Force pilots, there is no substitute for actual experience and proven performance.

Cessna
a General Dynamics company

Peacekeeper Rail Garrison: On the right track...

...with thousands of miles of tracks from which to choose. That's what makes Peacekeeper Rail Garrison survivable. And since the track is already there—cost-effective.

No new bases are needed for this system since the missile trains will be garrisoned on existing Air Force installations. This feature, plus the use of existing track, dramatically avoids costs. In time of national need, the trains can be moved almost anywhere on the nation's rail network shortly after receipt of a dispersal directive.

In December 1986, a National Security Defense Directive was issued directing the Air Force to develop the Rail Garrison system for basing Peacekeeper missiles. This development is consistent with the spirit of the Report of the President's Commission on Strategic Forces (known as the Scowcroft Commission) that identified the need for diversification of our strategic forces to maintain deterrence.

The highly survivable Peacekeeper Rail Garrison System reinforces and complements the capabilities of our other ICBM systems and the rest of the Triad.

How to do the job best—with less—is the challenge being met by the Air Force, TRW and Associate Contractor team with Peacekeeper Rail Garrison, an innovative program as American in spirit as railroad legends John Henry and Casey Jones.

Once again, with Peacekeeper Rail Garrison, TRW is privileged to provide systems engineering leadership in addressing this country's strategic concerns.

TRW

TRW Ballistic Missiles Division
Defense Systems Group

Office of the Secretary of the Air Force

An Air Force Magazine Directory

(As of August 15, 1988)

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Special Assistant to DCS/L&E for Reliability and Maintainability
Brig. Gen. Frank S. Goodell

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Senior Enlisted Advisor

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Scott AFB, Ill.

Engineering Installation Div.
Col. Robert A. Reinman
Tinker AFB, Okla.

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Col. Frederick A. Zehnle III
Kapaun Barracks, Germany

Pacific Communications Div.
Col. David J. Warren
Hickam AFB, Hawaii

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Colorado Springs, Colo.

Standard Systems Ctr.
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Gunter AFB, Ala.

Strategic Communications Div.
Brig. Gen. Stancil L. Dilks, Jr.
Offutt AFB, Neb.

Tactical Communications Div.
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Langley AFB, Va.

Air Training Communications Div.
Col. Jan P. Huggins
Randolph AFB, Tex.

Logistics Communications Div.
Col. John D. Enloe
Wright-Patterson AFB, Ohio

Research and Acquisition Communications Div.
Col. Paul G. Patton
Andrews AFB, Md.

Air Force Logistics Command

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CMSgt. Jack E. Bowerman
Senior Enlisted Advisor

Ogden Air Logistics Ctr.
Maj. Gen. Robert P. McCoy
Hill AFB, Utah

Oklahoma City Air Logistics Ctr.
Maj. Gen. William P. Bowden
Tinker AFB, Okla.

Sacramento Air Logistics Ctr.
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Warner Robins Air Logistics Ctr.
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USAF Medical Center
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Wright-Patterson AFB, Ohio

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Wright-Patterson AFB, Ohio

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Commander

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Peterson AFB, Colo.

2d Space Wing
Col. Lester J. Weber
Falcon AFB, Colo.

3d Space Support Wing
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Peterson AFB, Colo.

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Hq. Andrews AFB, Md.

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CMSgt. Dennis M. Desjardins
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Lt. Gen. John M. Loh
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Norton AFB, Calif.

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326th Air Div.
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Barksdale AFB, La.

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Ramstein AB, Germany

42d Air Div.
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Grand Forks AFB, N. D.
(as of September 1)

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Pease AFB, N. H.

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3d Air Div.
Maj. Gen. Donald L. Marks
Andersen AFB, Guam

4th Air Div.
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Ellsworth AFB, S. D.
(as of September 1)

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57th Air Div.
Brig. Gen. Raymund E. O'Mara
Minot AFB, N. D.

1st Strategic Aerospace Div.
Maj. Gen. (Lt. Gen. selectee)
Donald O. Aldridge
Vandenberg AFB, Calif.

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9th Air Force
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Eglin AFB, Fla.

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65th Air Div.
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Sembach AB, Germany

316th Air Div.
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Hq. Lowry AFB, Colo.

Maj. Gen. Charles D. Metcalf
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Hq. Norton AFB, Calif.

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Col. Paul F. Heye
Commander

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Col. Joseph C. Ramsey, Jr.
Commander

research & development

"Vitro has made a substantial commitment to independent research and development, because we view IR&D as an essential investment for meeting future program requirements."

Seymour L. Moskowitz
Vice President
Advanced Development

Dr. Richard B. Marsten
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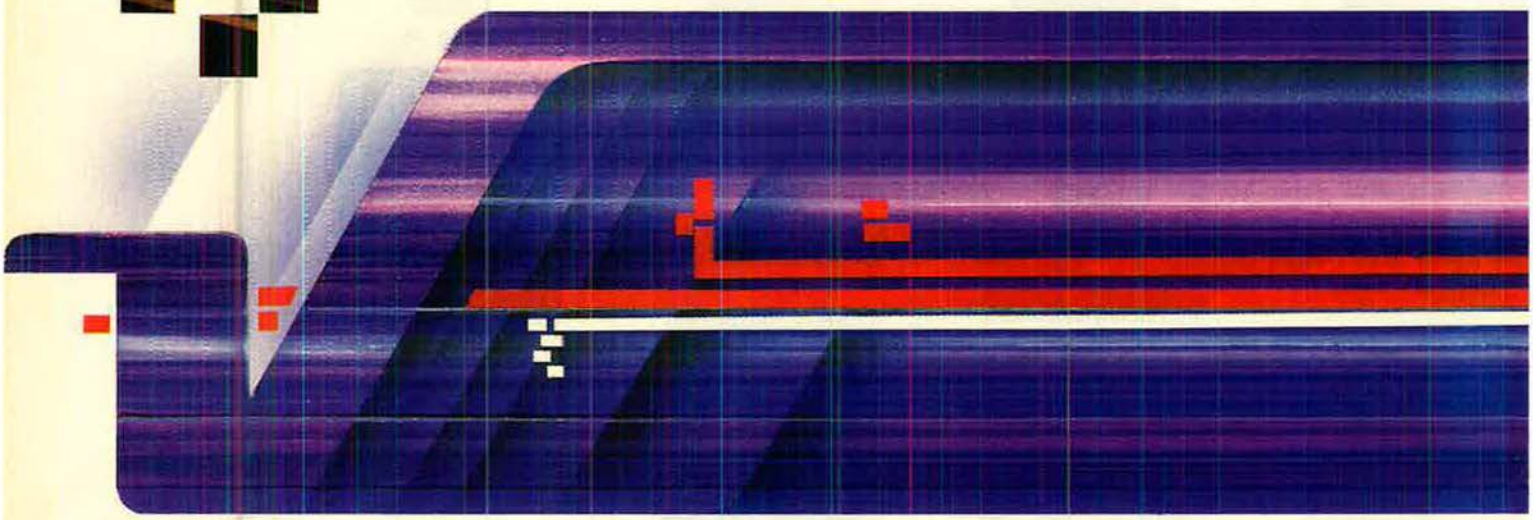

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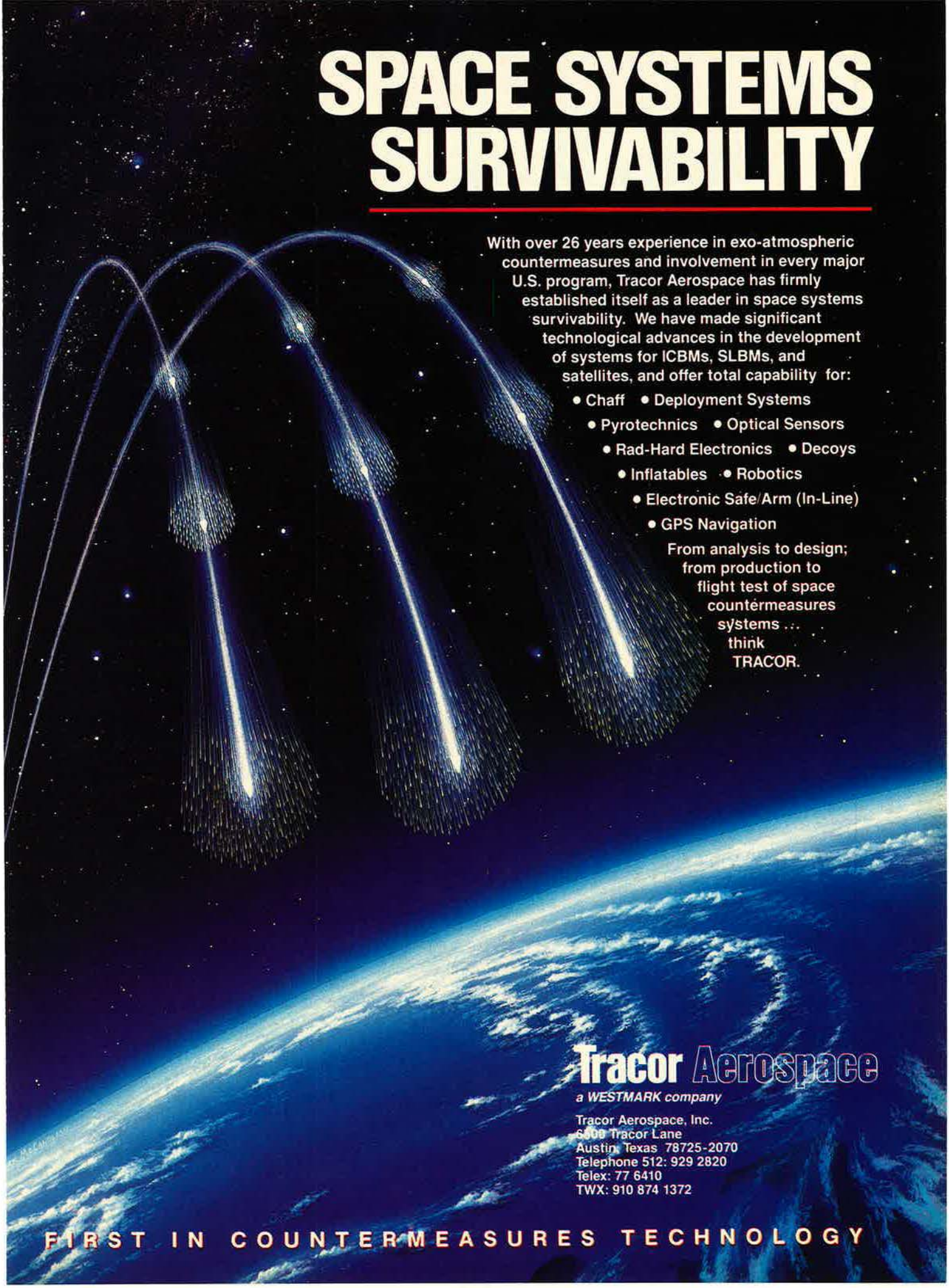
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Viewpoint

Military Drugbusters, Part II

By Gen. T. R. Milton, USAF (Ret.), CONTRIBUTING EDITOR

Could the new Special Operations Command, with its focus on unconventional warfare, disrupt the drug traffic? Could it at least introduce an element of uncertainty?

A friend sent me a thoughtful letter the other day, suggesting, nicely enough, that I had gone off half-cocked in a recent column on drugs and the military *(see "The War That's Fizzling," July '88 issue, p. 102)*. While agreeing that enforcement of drug laws should not be a principal task for the armed forces, he pointed out that we now have a Special Operations Command made up of sizable contingents from all the services. The mission of this new command is focused on limited and unconventional warfare.

The drug war is limited, at least in the military sense, and is decidedly unconventional, so perhaps it does fit the charter of the new command. Certainly, these special operations types could ruin the day for a good many drug traffickers. Depending on how they were allowed to behave—the reading of Miranda rights has never been part of a Green Beret's manual—and provided that the always potent combination of civil libertarians and high-priced lawyers didn't block their activities, they might discourage a substantial amount of drug traffic.

The melancholy fact remains, however, that drugs have become part of the American scene. Without question, they have permeated our society, even surfacing in our elementary schools. The youth-gang phenomenon has begun to drift across the country, from Los Angeles to Denver and points east, and inner cities are finding themselves hostage to these violent adolescents who distribute such substances as crack. Turf wars are now fought over distribution rights rather than territory, but the result is the same: lethal shootouts that put whole neighborhoods at risk. There seems no way to stamp out these hoodlum congregations so long as the profits outweigh the probable penalties.

Prohibition didn't do a thing toward reducing alcohol consumption. If anything, the law made buying booze easier, since bootleggers, already outlaws, were under no legal restraint as to Sundays and closing hours. The end result of our Prohibition experiment was an admission of failure and the entrenchment in our society of organized crime. Like today's big-time drug lords, the gang chieftains of the 1920s and 1930s had little to fear from the law; their real life-and-death worry came from gang rivals. It is an amusing travesty that Al Capone ended up in Alcatraz for income-tax evasion and was never convicted of any major crime.

The Economist, a London-based magazine not given to hip-shot opinions, believes that the solution to the drug plague lies in legalization and the discouragement of drug use through education. In support of this approach, *The Economist* cites the decreasing use of tobacco and hard liquor.

But when we talk of legalization, the first question that comes to mind is, legalization of what? Marijuana, we can assume, would be first on the list, and after that, what? Cocaine, with its various derivatives, appears to be the major source of trouble these days, so presumably, cocaine would become legal. Since heroin use is already in decline, perhaps that deadly and addictive substance could remain on the forbidden list, along with such manufactured brain destroyers as LSD and PCP, known as "Angel Dust."

The presumed result of drug legalization, based on our Volstead Act experience, would be the loss to the underworld of the profit motive, a powerful incentive to adopt this course. In certain quarters, however, the very thought of legal narcotics brings on nightmares. The airlines and the police come to mind and, most especially, the military.

For all the harm it does in the world, alcohol does have some redeeming features; most people don't drink to get drunk, and drunkenness itself is easily spotted. Detection does not require a urine test or expert methods. A drug user can hide behind more subtle symptoms, although basically, he may be as addled as the inebriate. We have seen the difficulties professional sports managers have encountered. The first sign of drug use may be indistinct, like a falling off in performance—not enough for drastic action. Sometimes, the drug user is never discovered, simply owning up to it when his playing days are over.

Flying airplanes is a far more serious business than shooting baskets, and any slight lapse in performance can be fatal. In the military, legal drugs would be the source of intolerable uncertainty, for drug use would no longer be a crime, only, at most, a violation of regulations, and even that would be hard to enforce if the law held that drugs, like beer, were a citizen's right.

And so, we are back to square one. The drug war continues, a battle against a national menace with no end in sight, and legalization conjures up new threats to our security.

There is another possibility, as my friend suggests: Turn loose the Special Operations Command. Drug interdiction could provide realistic training for the low-intensity conflict visualized for this command. Although there is, of course, far too much territory to cover, that could be turned into an advantage. Shifting from one place to another, our commandos could introduce an element of uncertainty, always a good tactic. And people in the special operations line of work need a little excitement to keep their skills honed.

In the process, they could give some of our sleazier characters a very bad time before the ACLU came to their rescue. ■

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Some say it's bribery. Others see it as a business fact of life. But either way, offsets are a growing element in military export sales.

You Scratch My Export and I'll Scratch Yours

BY F. CLIFTON BERRY, JR.

"I TERM offsets a form of bribery," Kenneth R. Bernhardt, General Defense Corp., told a congressional committee.

"We should seek to limit the use of offsets," John A. Richards, a Commerce Department official, told the same committee.

"Offsets are a form of international payola," said William G. Phillips of the National Council for Industrial Defense.

What are offsets, and why are people saying nasty things about them?

Offsets are a condition of doing business in the international defense marketplace. They were a factor in 346 significant sales of US military export deals in the five years from 1980–84. Those sales totaled $21.84 billion, which included offset obligations of $12.06 billion, or 55.2 percent.

Two years later, in December 1986, Boeing won the contract to provide the UK with seven E-3A AWACS aircraft valued at $1.172 billion. In winning the deal, Boeing and its subcontractors agreed to offset obligations in the UK of 130 percent of the value, or $1.5 billion. A few months later, Boeing gave the same commitment, 130 percent offset, to France for four aircraft worth $600 million.

With options for additional aircraft, the E-3A AWACS sales to the UK and France totaled $2.176 billion. But the 130 percent offset obligation means that Boeing and its subs have to generate $2.829 billion in business in those two countries as a condition of winning the deals.

Why are offsets such a big chunk of military exports, and what are their effects on the competitiveness of key US defense industries? Are jobs and technologies lost in the offset process?

What are offsets, and why are people saying such nasty things about them?

Offsets Defined

To define offsets, begin with countertrade. Countertrade involves commercial transactions with linked trade obligations. That is, the seller undertakes to buy goods or services in the buyer's country, to transfer technology, or to provide other services. In exchange, the buyer commits to buying the goods and services offered.

Offsets are a special type of countertrade. In international trade practice, "offset" is usually applied to defense, aerospace, and high-technology contracts. Within the US government, the term "offsets"

has been defined as a result of deliberations of an interagency committee headed by the Office of Management and Budget (OMB). The agreed definition:

A range of industrial and commercial compensation practices required as a condition of purchase of military-related exports, *i.e.*, either Foreign Military Sales (FMS) or commercial sales of defense articles and defense services, as defined by the Arms Export Control Act and the International Traffic in Arms Regulations (ITAR).

Offsets may be both direct and indirect. Direct offsets involve goods and services that are pertinent to the system purchased. For an aircraft system such as the AWACS, a simple direct offset would be signing up British subcontractors to provide parts for the aircraft.

Indirect offsets are contractual arrangements involving goods and services unrelated to the systems sold. Those are the hotel building, food marketing, tourism promotion, and other types of nondefense activities that sellers undertake as part of the offset obligation.

Whatever the precise form or forms of an offset agreement, the principle is simple. The US seller agrees to offset the buyer's costs of the purchase. That is done by buying goods or services in the seller's country or by taking other actions to help the buyer pay for the deal. That latter clause, "other actions," has led US defense contractors into undertakings far removed from their usual business.

For example, in one of the earliest offset deals, McDonnell Douglas found itself distributing Yugoslavian foods to Canada as an offset for Yugoslavia's 1966 agreement to buy DC-9 transport aircraft. Northrop sold F-5 Freedom Fighters to Switzerland in 1975. As an offset obligation, Northrop agreed to market $450 million worth of Swiss products in the Middle East.

Another example: General Dynamics agreed to invest $800 million in Turkish development projects as a condition of selling F-16 fighters. Among the projects were a powerplant, four hotels, and a fruit-exporting company. Lockheed agreed to promote tourism to Australia as part of a sale there and took office furniture in payment for an offset deal with Canada. All those were indirect offsets.

Types of Offsets

- *Coproduction:* Overseas production based on a government-to-government agreement that permits a foreign government or producers to acquire the technical information needed to manufacture all or part of a US-origin defense article.
- *Licensed Production:* Overseas production of a US-origin defense article based upon transfer of technical information under direct commercial arrangements between a US manufacturer and a foreign government or producer.
- *Subcontractor Production:* Overseas production of a part or component of a US-origin defense article. The subcontract does not necessarily involve license of technical information and is usually a direct commercial arrangement between the US manufacturer and a foreign producer.
- *Overseas Investment:* Investment arising from the offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country.
- *Technology Transfer:* Transfer of technology that occurs as a result of an offset agreement and that may take the form of research and development conducted abroad, technical assistance provided to the subsidiary or joint venture of overseas investment, or other activities under direct commercial arrangement between the US manufacturer and a foreign entity.
- *Countertrade:* Three types of commercial countertrade arrangements are highlighted. *Barter* is a one-time transaction, bound under a single contract that specifies the exchange of selected goods or services for another of equivalent value. *Counterpurchase* is an agreement by the initial exporter to buy (or to find a buyer for) a specific value of goods from the original importer during a specified time period. *Compensation (or buy-back)* is an agreement by the original exporter to accept as full or partial repayment products derived from the original exported product.

Offsets a Fact of Life

In the global marketplace for defense systems, offsets are now a condition for doing business. That has only become true in the past decade for the major industrialized Western nations.

The countries of the Soviet bloc have long practiced offsets and countertrade because of their hard-currency shortages. Up to fifty percent of those countries' trade with the West is estimated to be in some form of countertrade. According to ACECO, the French countertrade group, "Countertrade became [for the cash-poor countries of the Bloc] a *sine qua non* for the realization of economic dreams: services, licensing arrangements, and the transfer of technology."

The same was true of less-developed countries' use of countertrade. It became a means of paying for goods and services when short of hard currencies. Western industrialized countries resisted such deals, preferring straight commercial transactions payable in real money.

All that changed with the 1973 oil shock and the energy crisis. The economic disruptions over the succeeding fifteen years have widened the application of countertrade. The major powers have had to find ways for customers to pay for their exports and, in the process, have discovered the advantages of countertrade. ACECO notes that it was about this time that France began to use countertrade to expand its worldwide sales of aerospace and defense equipment.

When offsets in military exports started in the 1960s, they were at the ten to thirty percent level or at no stated level. That modest level continued for many years. For example, the deal with the UK for Trident submarines included offsets only as a "best endeavor."

However, as the practice spread, the offset percentage increased. McDonnell Douglas broke the 100 percent level with its sale of F/A-18 Hornets to Canada in 1982. Since then, 100 percent has been commonplace. The 1986 and 1987 AWACS deals with the UK and France hit 130 percent, still the record.

Now, more than half the countries in the world require some level of countertrade as a condition of doing business. And it is not only the less-developed countries that require offsets for military deals. The Department of Commerce notes that seventy-five percent of our offset commitments are to such industrial-

ized allies as Canada, Japan, and the European NATO countries, countries with which we have major trade deficits.

William Winpisinger is President of the International Association of Machinists and Aerospace Workers, the IAM. Commenting on the AWACS deal with the UK, he said, "Boeing would gain a $1.3 billion contract, but to get it would give away $1.6 billion worth of other business to the United Kingdom. With deals like those, no wonder we are losing the trade war."

The Buyers' Viewpoint

In the case of the industrialized countries, lack of hard currency is not the driving factor in requiring offsets. Certainly budgets are tight everywhere, and buyers should seek the lowest prices and best terms. But other factors are at work.

The international military marketplace is not like that for such commodities as oil and grain. In OMB's analysis, it closely resembles an oligopsony, a market with a relatively small number of buyers exerting a disproportionate influence. At the same time, notes OMB, it is like an oligopoly, since there are only a small number of sellers. In advanced military aircraft and electronics, for example, there may be only one or two suppliers per country, and that situation obtains mainly in only the major countries.

With only a few buyers and sellers, the market is distorted and subject to other influences besides cost and performance. In many cases, purchasing governments are also sellers, with a need to continue providing employment to skilled scientists and engineers.

So other countries require offsets not only to improve their military capabilities by purchase from the US but for many reasons. Among them: to maintain or increase employment, to acquire advanced technology that will enhance their competitiveness, to improve targeted sectors of their domestic industries, and to gain entrance into new markets.

British policy on offsets highlights the targeting. It does not state a desired level, but seeks 100 percent. Offset work let in the UK for defense products should be new work or from new suppliers, and a large proportion should be in high technology. The purpose is to develop new capabilities in British industry in high technologies and to enhance British competitiveness. While other nations may not be so clear in stating their reasons for offsets, the objectives are similar: to acquire advanced technologies and improve their defense sector.

At the same time that offset requirements have been growing, other countries have improved their military export industries, which have increasingly supplanted those of the US. The Arms Control and Disarmament Agency reports that the US share of world arms exports fell from 59.7 percent in 1969 to twenty-two percent in 1984. At the same time, the other NATO nations nearly doubled their share of the market, from 13.2 to 24.3 percent.

Offsets cannot be blamed for the loss of market share; too many other forces also contributed. However, since offsets are required by virtually all potential customers, US industry must allow for them in marketing and pricing. Furthermore, with the advent of offsets at the 100 percent and higher levels, US industry must become more creative in finding ways to meet the obligations once the sales are made.

Hands-Off View

For the present, industry must go it alone, without government help. The executive branch takes a hands-off view on offsets. Since being formulated during the Carter Administration in 1978, DoD policy has been to shun government-to-government offset arrangements. When a foreign government requests offsets on a purchase from a US company, the Department of Defense sidesteps. It lays responsibility for negotiating the offset arrangements on the US contractor involved.

DoD acknowledges that offsets are a requirement of doing business, but avoids participation except when "there is no feasible alternative" and the deal is "of significant importance to United States national security interests (*e.g.*, rationalization of mutual defense arrangements)." The quotations are from a May 4, 1978, memo by Deputy Secretary of Defense Charles Duncan that was cited in the OMB report released in February 1988.

Other departments of the government take a stronger position against offsets. In October 1987, the Under Secretary of State for Economic Affairs, W. Allen Wallis, told a German-American assembly on NATO issues:

"America's allies have continued to raise their offset requirements despite dramatic improvements in their economies. . . . This is an area that cries out for reform. . . . Such offset requirements undermine our collective security by weakening the competitive position of industries vital to our common defense. I believe the time has come to develop multilateral understandings within the Alliance to limit the use of offsets."

In March 1988, the Commerce Department's John Richards, who deals with industrial resources, including defense production, said offsets are inefficient and raise the cost of weapon systems. "We

The Top Six
(in millions of dollars)

Country	Sales	Offsets	Offset %
Canada	2,632	2,810	106.7
Spain	2,906	2,404	82.7
United Kingdom	1,437	1,748	121.6
Israel	4,163	1,477	35.4
Australia	3,366	1,156	34.3
Turkey	1,893	1,071	56.6

SOURCE: Office of Management and Budget

This chart shows the top six foreign nations that have sales from the US with offset obligations greater than $2 million. These figures cover the period 1980–84 and are given in millions of US dollars. The figures for the United Kingdom include the 1986 E-3A AWACS sale to that nation.

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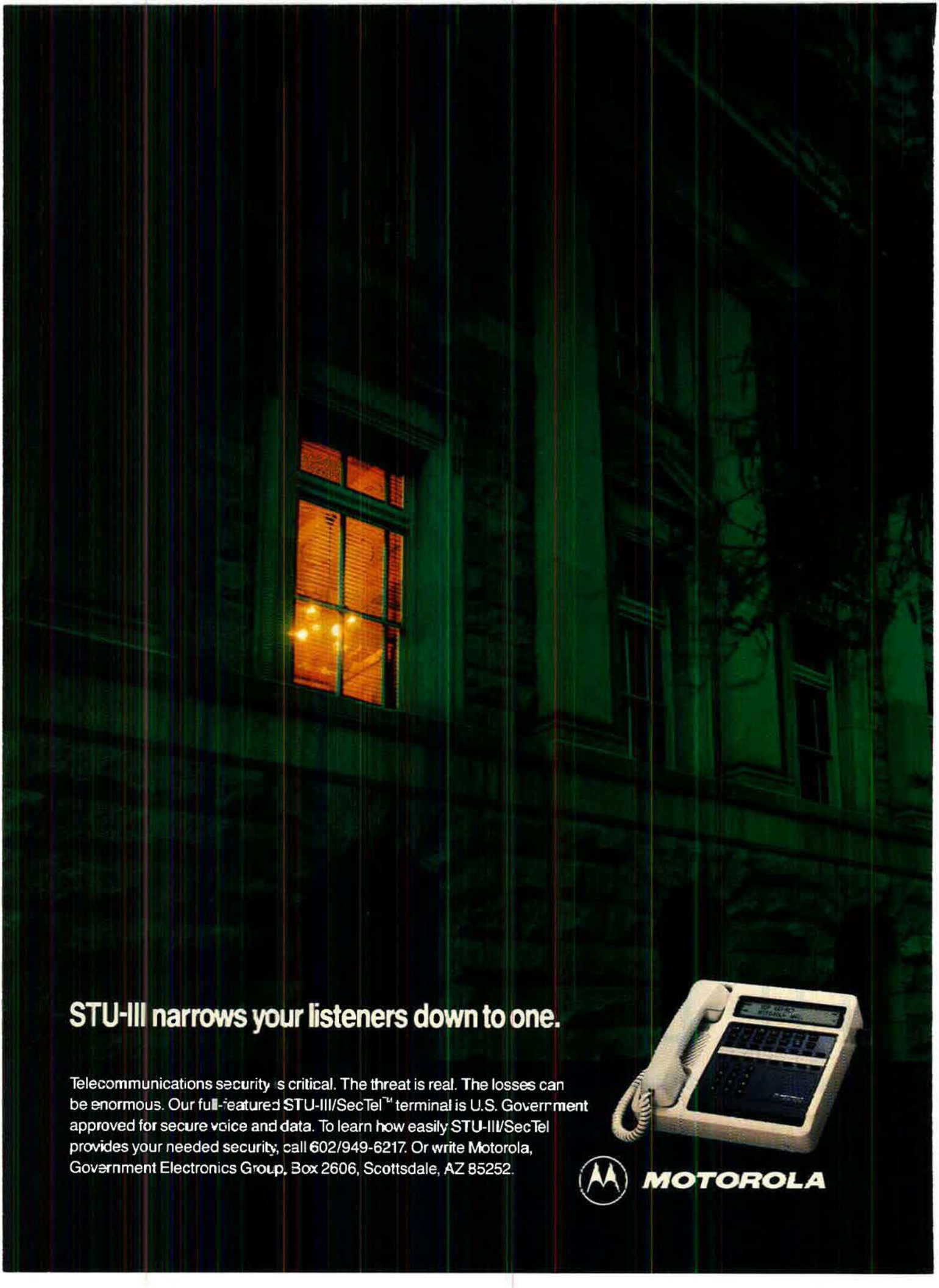
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should seek to limit the use of offsets on a bilateral or multilateral basis," he declared. "We recognize that unilateral action would prove ineffective and could lead to a decrease in US military exports." The US cannot go it alone—if it swears off offsets, someone else will get the business.

So US industry faces a situation in which the US government stands aside but foreign governments demand offsets and take part in the negotiations. OMB found that foreign governments were either the sole negotiator or an active participant in ninety-one percent of cases involving offset agreements. Foreign governments, especially the NATO allies, Japan, and Israel, have clear trade policies focused on their own national interest.

By contrast, US trade policy, including military exports and offsets, is fragmented at best. Under Dr. Robert B. Costello, a draft paper was prepared in mid-1987 on a Department of Defense initiative on the US industrial base. It noted that US trade decisions "are split between twenty-five executive branch agencies and nineteen congressional subcommittees."

Often within those multiple agencies, different offices are advocating actions at odds with each other. On one hand, DoD policy on Rationalization, Standardization, and Interoperability (RSI) is designed to strengthen the NATO industrial base. But another DoD policy on the US mobilization base works to support critical industrial capacity in the US and Canada. The draft says dryly, "The two policies may be in conflict if either is carried to extremes."

But it is difficult to know when a policy is carried to an extreme. The Commerce Department is concerned, says John Richards, "that offsets, particularly coproduction, licensed production, subcontracting, and technology transfer, have a negative effect on some subsectors of the US industrial base." Those factors are at the heart of NATO RSI. In short, helping NATO may be hurting the US. But no one can pinpoint precisely which segments of the defense industrial base are bearing the brunt of the effects of such offset arrangements and the extent they are being affected.

Offsets are increasing foreign competition at the critical subcontractor level.

Impact of Offsets on the US

Costello's draft on the industrial base initiative called the problem a "balance between international cooperation and domestic capability." At the national level, it said that technology transfer to foreign competitors by US industry has had a serious impact on US competitiveness. Dropping to the DoD level, it acknowledged the fact of life that offsets are required for US defense contractors to participate in the international market and remain competitive. But it noted, "Offsets are increasing foreign competition at the subcontractor level and may be contributing to the erosion of the US subcontractor base."

How much erosion has taken place is still not known. That is partly because until only recently has even scanty data been made available on offsets and their impact.

Congressional concerns on the topic led to amendments to the Defense Production Act (DPA) in 1984 and 1986. Section 309 of the DPA requires detailed annual reports from the President on the impact of offsets on US defense preparedness, industrial competitiveness, employment, and trade. The law also requires interagency studies to determine the long- and short-term effects of offsets resulting from technology transfer and "the direct and indirect effects of offsets on lower-tier defense subcontractors" and nondefense industry.

Under direction of OMB, a working group from several departments and agencies (including Defense) prepared the annual impact reports. They were dated December 1985, 1986, and 1987. Much data for the reports came from a survey of 154 US defense companies conducted by the International Trade Commission and made available to the OMB working group, some of it as recently as November 1987. (Where OMB is the source of data in this article, the data comes from the 1984 survey, including the 1987 update.)

OMB reports that no interagency studies have been published as required by Section 309. It also reports that in 1986 the Administration proposed to repeal Section 309. In 1987, the Administration opposed an offset/countertrade reporting requirement in the House version of the trade bill and succeeded in having the provision omitted from the Senate version. It was joined in opposition by industry representatives. That opposition included the American League for Exports and Security Assistance (ALESA), a grouping of more than a score of defense companies and several labor unions.

Four Areas

Despite those misgivings, the OMB-led working group prepared the required assessment of the impact of offsets in four areas: defense preparedness, industrial competitiveness, employment, and international trade.

• *Defense preparedness.* On defense preparedness, it waffled, saying that "there is no evidence to show that offsets, broadly considered, are incompatible with defense preparedness." In reaching that conclusion, it finessed the question of effects on subcontractors. The working group noted that much offset subcontracting went to Canada, "part of the North American defense industrial base," and that other work went to allies or friends, such as Israel.

However, William Phillips of the National Council for Industrial Defense contends that there has been a loss of subcontracts and jobs. He says that lobbying by large US

primes has assured funds for multi-billion-dollar sales, but at the expense of subcontractors and jobs in smaller American firms. He does not provide specifics.

● *Industrial competitiveness.* As for industrial competitiveness, the group concluded that the technology advantages enjoyed by US defense industry have narrowed in recent years and that technology transfer through offsets may have played a role. It also acknowledged that offsets have led to a transfer of know-how to foreign companies that enables them to compete successfully with US firms.

On the AWACS sale to the UK and France, Siemens AG of Germany is a major subcontractor to Boeing for data displays. As part of the offset deal, Siemens is subcontracting to Racal of the UK for data displays and controls. Hazeltine, a US firm, provided those parts for AWACS in the past. However, as part of the offset requirement for the earlier NATO AWACS, Hazeltine had to subcontract with Siemens. Now, says OMB, Boeing has selected Siemens, which in turn tapped Racal, because of Siemens's ability to take on a substantial offset burden. Hazeltine is still competitive on price and quality, but loses because Siemens/Racal counts against the offset.

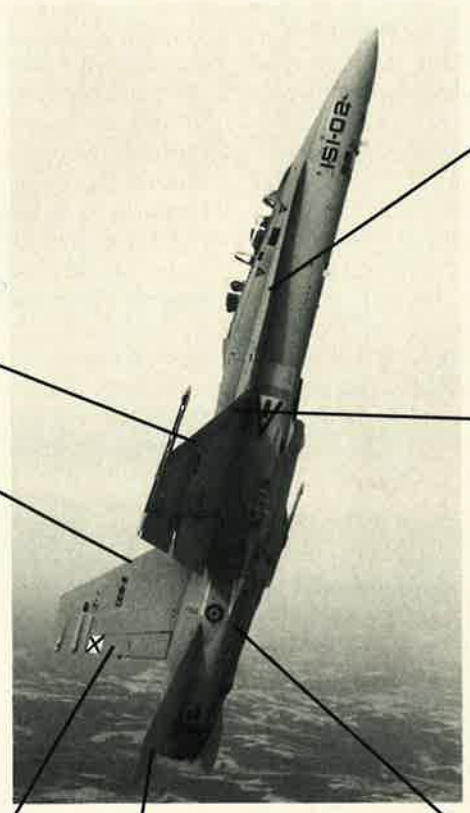
Another example reported on September 10, 1987, in *The Wall Street Journal* involves an interested subcontractor, Menasco Texas. Menasco is a builder of aircraft landing gear, including those for the F-16. Under terms of the offset obligations in the F-16 sale to the European Purchaser Group, Menasco was required to teach a Dutch company, DAF, how to build the F-16 gear. Now Menasco reports that DAF competes against it around the world, using the knowledge gained from Menasco.

Summarizing its conclusions on industrial competitiveness, the OMB group acknowledged their broad nature and imprecision. In short, American defense companies have to offer offsets to stay competitive in the international marketplace. Offsets are increasing foreign competition, particularly at the subcontractor level *(see above).* But without offsets, US industry could lose business, and, at any rate, "The health of the industry depends primarily on US government purchases."

● *Employment.* As for the effects of offsets on employment, the OMB group lamented the lack of data and valid input-output models, but made a valiant stab nonetheless. It concluded that offsets are economically inefficient, but that it cannot claim an overall loss of jobs due to offsets. However, it does find an adverse effect. Offsets "tend to shift workers from industries and activities in which they have a comparative advantage toward the production of goods and services in which they have a comparative disadvantage, thereby reducing real output both here and abroad." This is not good. Total employment may not be reduced, but its quality is shifted in the wrong direction.

Taking US-Canada offsets as an example, the study estimated a reduction in US jobs in avionics, aircraft, and guided-missiles industries at 8,287 employee-years. Those are sectors in which the US has a comparative advantage. Canada gains jobs in the high-tech industries in which it has been at a disadvantage, but loses in other sectors,

The Spanish F/A-18 Offset Deal



When McDonnell Douglas landed a contract with Spain to provide seventy-two F/A-18 Hornet aircraft, the company had to agree to an offset deal worth more than $1.5 billion against the F/A-18 contract price of $1.8 billion. The offset package called, among other things, for the Spanish to coproduce for the fighter aircraft the seven component assemblies listed above.

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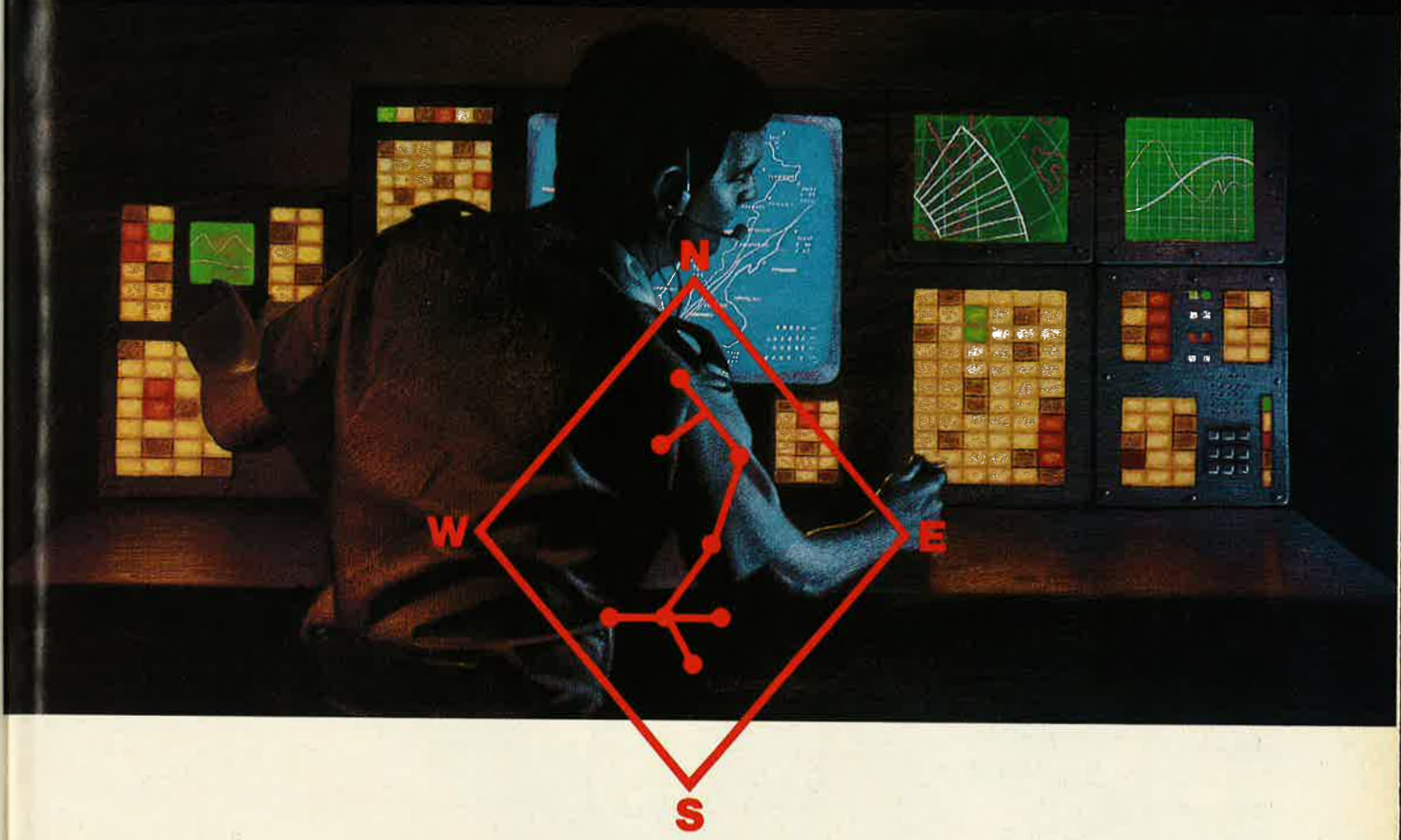

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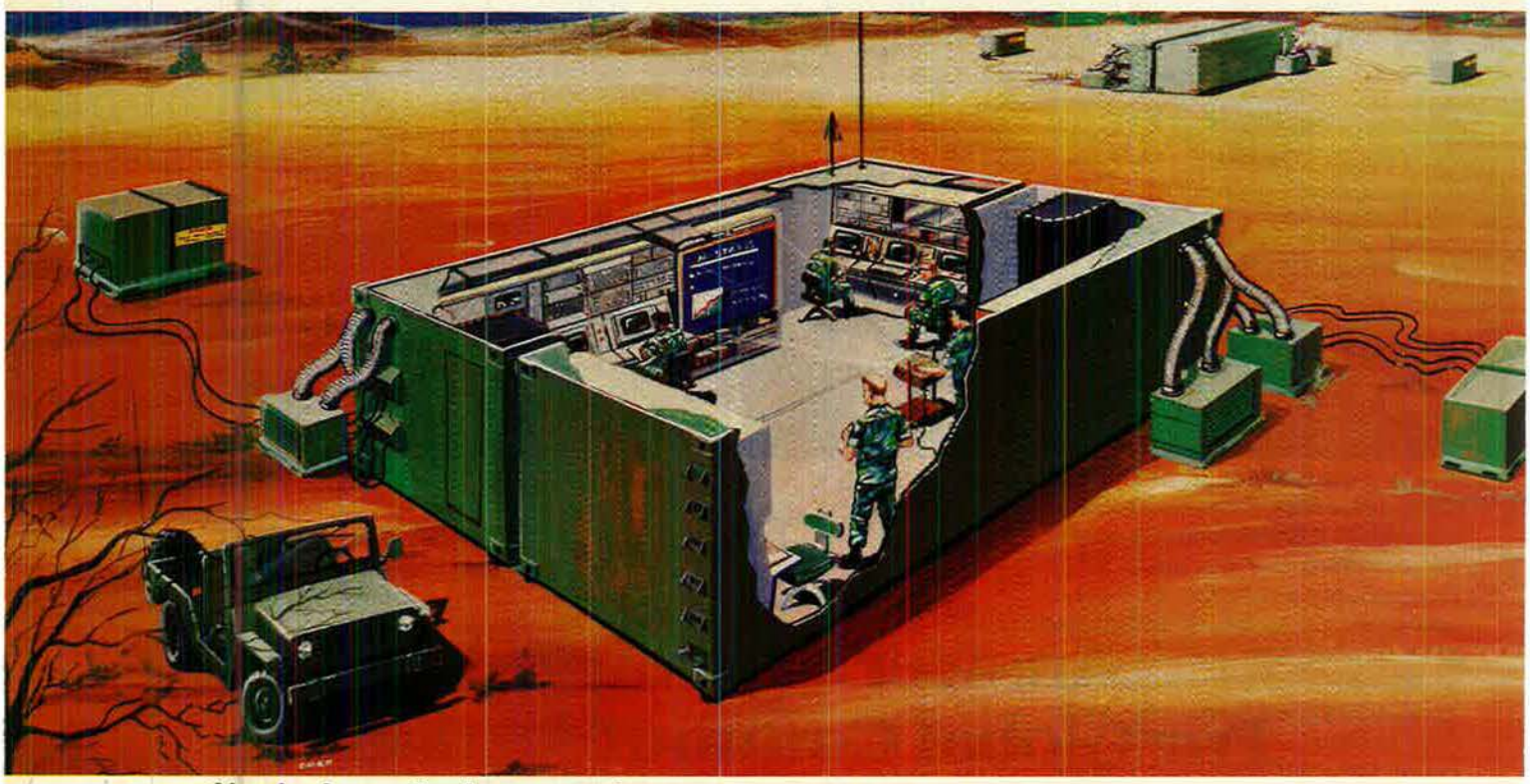

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such as motor vehicles, in which it has had an advantage (estimated at 3,279 employee-years).

Considering the AWACS sales to the UK and France, Boeing estimates that its 2,000 employees on the program are guaranteed stability for several years. Without the AWACS sales (and the 130 percent offsets), Boeing would have had to reassign the 2,000 people within the company. At Westinghouse, jobs for about 700 workers were stabilized by the deal.

Another view comes from Kenneth Bernhardt of General Defense Corp. He asserted to Congress that in satisfying offsets by awarding contracts to foreign companies for ammunition and other products, "we have lost thousands of jobs."

• *International trade.* Precise effects are impossible to calculate. However, assertions can be made with fair confidence.

On the demand side, foreign governments seek offsets for three major reasons: to conserve foreign exchange, provide business for domestic industry, and satisfy internal political pressures from defense industries and labor unions for domestic production. The Thatcher Government was able to overcome objections to its selection of the Boeing AWACS over the homegrown Nimrod by pointing to the thousands of jobs to be created in the UK by the 130 percent offset.

On the supply side, US industry has little choice. Where offsets are required—and this is by most customers nowadays—it must prepare offset packages simply as a condition of making a bid. In this big poker game, offsets are a condition of sitting down at the table.

What's Ahead?

Offsets will not soon go away, nor will the problems associated with them. They are too much a part of the fabric of the international arms market. Here in the US, no clear-cut consensus exists on whether offsets are a problem. It depends very much on who is affected, where, and how.

Smaller subcontractors and major unions believe offsets cost jobs and hurt the defense industrial base. They assert the case with more vigor than details. The Departments of Commerce and State believe offsets have a negative effect, but without supporting data. DoD is schizophrenic. Offsets may hurt the domestic industrial base, but help NATO's.

No clear-cut consensus exists in the US on whether or not offsets are a problem.

The OMB working group says more information is needed to reach definitive conclusions. Key members of Congress have drafted legislation to require more detailed information, but the Administration opposes it. Sens. Alan J. Dixon (D-Ill.) and Jeff Bingaman (D-N. M.) drafted language in the defense authorization bill that includes modest reporting requirements for new offsets and requires the Secretary of Defense to conduct a comprehensive study of the effects of current offsets.

In the House, Rep. Mary Rose Oakar (D-Ohio) is chair of the banking subcommittee responsible for the industrial base (including offsets). She and several cosponsors introduced a bill and held hearings on a comprehensive set of amendments to the Defense Production Act. The purpose of their bill, H.R. 4037, is to ensure that the domestic defense industrial base gains the capability to produce essential defense products. That includes determining the effects of offsets on the domestic defense industrial base.

The major prime contractors, through groups such as ALESA, oppose more detailed reporting of offsets. Their position is that exposure of details of specific deals will give foreign competitors an edge and lead to a loss of business. However, a new group of more than fifty major aerospace companies, the Defense Industry Offset Association, has worked with OMB to design a survey that will produce relevant information without compromising individual deals.

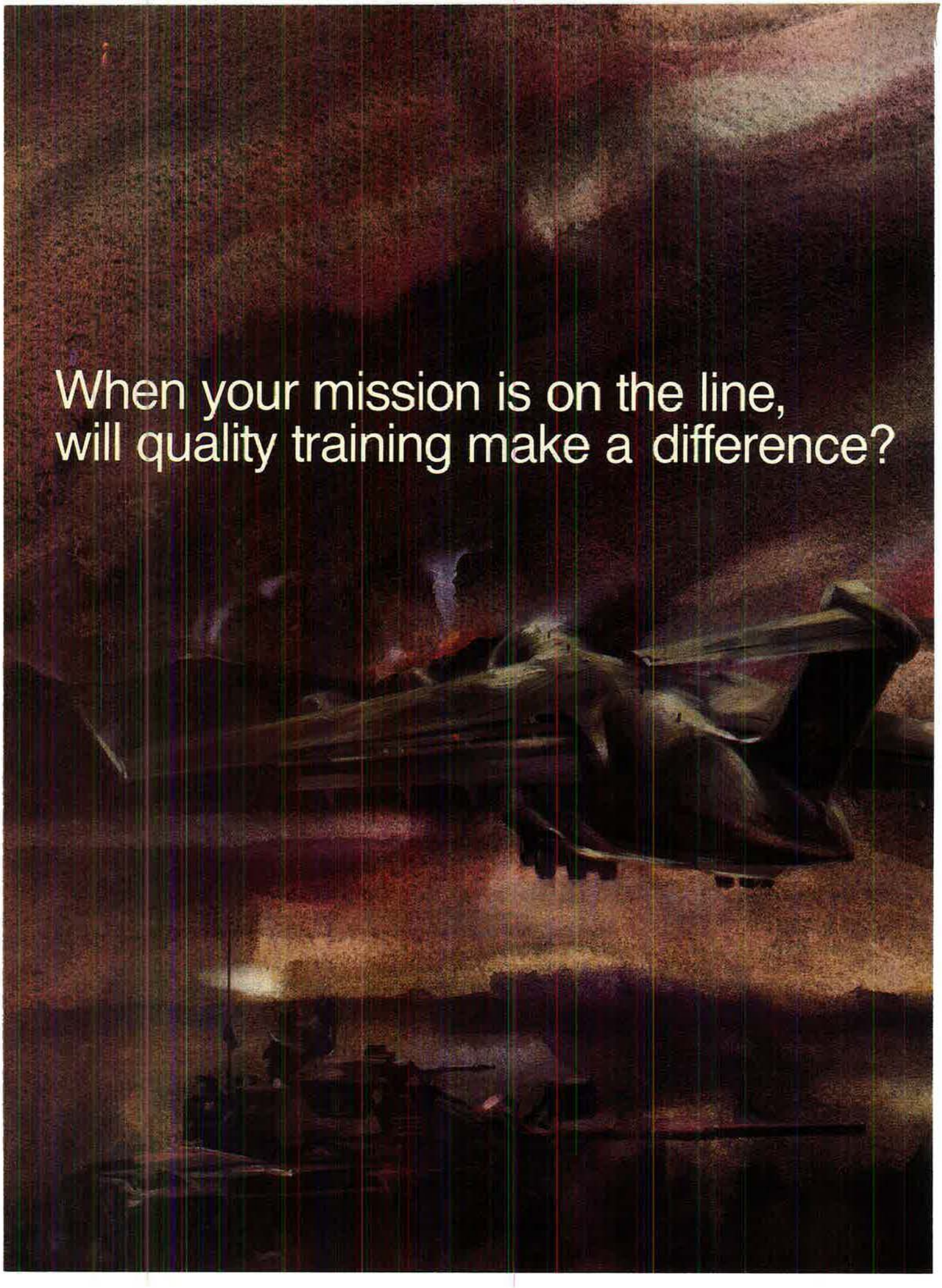
When that survey is completed and the results analyzed by the OMB working group, more definitive conclusions should be possible. But that will be in 1989. A new President will be in the White House, with a full plate of issues to digest more vexing than offsets.

So offsets will remain a fact of the international defense business, a necessary cost of doing business. That they somehow hurt the defense industrial base seems obvious, but because the precise nature of the damage cannot be quantified, little will be done to remedy the effects.

In that regard, offsets are similar to the other factors affecting the defense industrial base. Each considered in isolation may be hurtful, but by itself does not assume crisis proportions. Nowhere are the dozens of industrial base issues being addressed as a whole and coherent policies being articulated.

What is worse, industrial base issues (with a few exceptions) seem to be considered purely defense or industry problems, not a national problem. Until a consensus on the national problem is reached among industry (large and small), labor, Congress, and the executive branch, little that is constructive is likely to be done. ■

F. Clifton Berry, Jr., is a former Editor in Chief of AIR FORCE *Magazine. He has written on international security topics for some twenty years. He saw USAF service in the Berlin Airlift, 1948–49. Later, he was a paratrooper and an officer in the 82d Airborne Division. He commanded airborne and infantry units in the US and Korea and saw Vietnam combat as operations officer of a light infantry brigade. He is a principal in FCB Associates, an information service on international aerospace topics. His most recent article for* AIR FORCE *Magazine was "Fallacies and Facts About Aerospace" in the February '88 issue.*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How did a band of ragtag tribesmen manage to defeat the Soviet Union in its own backyard?

The Afghan War

BY RICHARD MACKENZIE

WATCHING Muslim rebels conceive, plot, and execute a classic guerrilla strike against Soviet-backed outposts in the remote Keran Valley, you get a close-up look at how the war is being won—and lost—in Afghanistan.

In the meticulously planned assault, small units of highly motivated Muslim irregulars, fortified with reasonably good weapons and extraordinary intelligence data, surprise and utterly rout the heavily equipped but slow-footed and demoralized soldiers of the Afghan Army garrison.

The Keran Valley operation, which I witnessed during a bone-wearying, three-month journey through the Hindu Kush mountains with Afghan rebels last fall and winter, was only one battle. Yet it, in a nutshell, sums up the war's basic realities.

Those realities are yielding major consequences. Following Geneva talks in April, Moscow and its client in Kabul agreed to a nine-month timetable for a complete Russian troop withdrawal. The Soviet retreat, the first since 1942, now appears in full swing.

What kind of conflict was the Afghan war, really? How, in fact, did a ragtag band of Muslim tribesman stymie one of the two military superpowers—in its own backyard, at that? How was the conflict fought day-by-day on the ground?

For a look at the eccentricities, tactics, goals, strengths, and weaknesses of the combatants, one need look no further than the planning and execution of the October 29, 1987, battle for Keran.

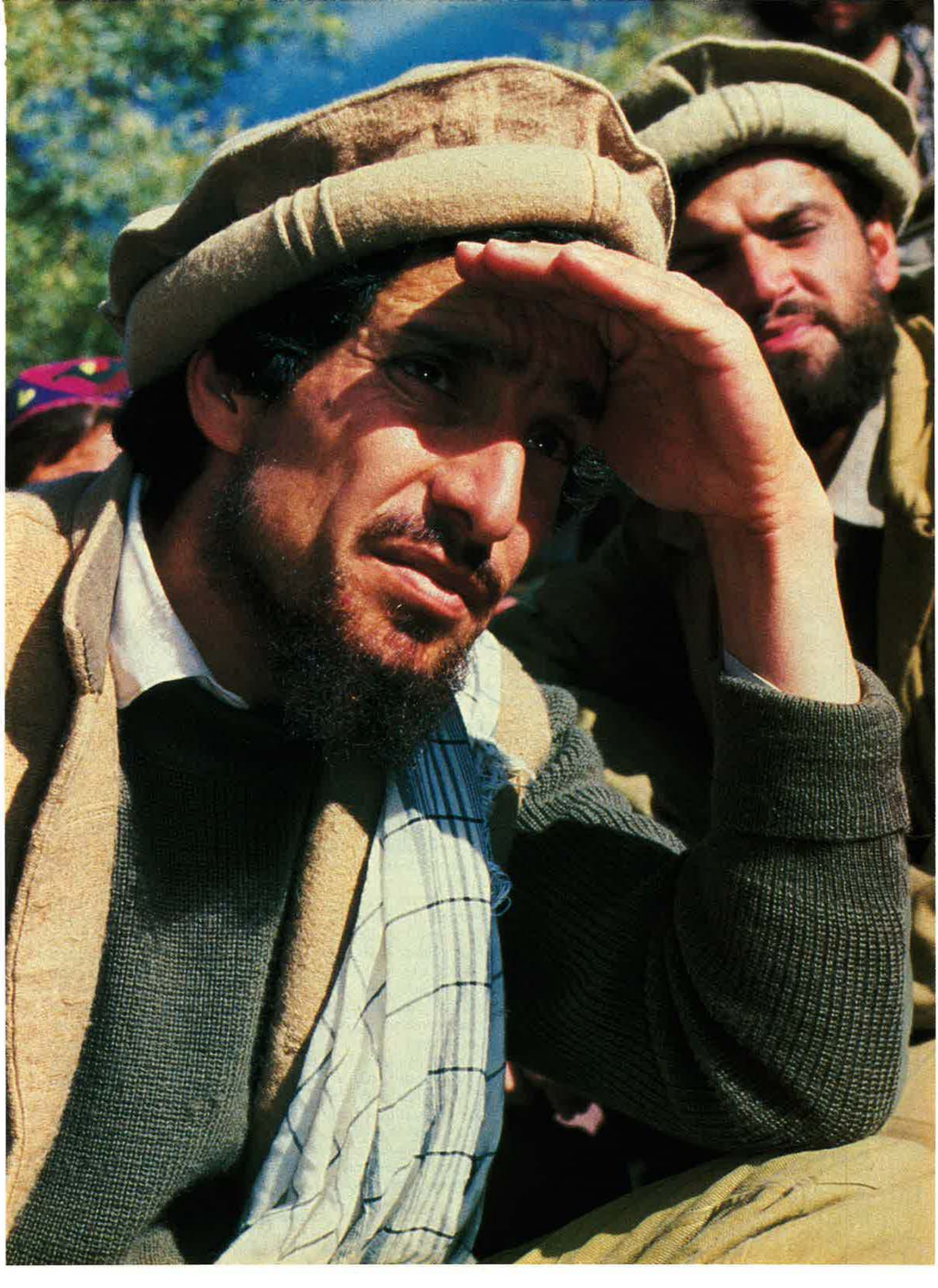
Planning the Offensive

The Afghan mujahedeen had been planning this offensive for months. The objective was to capture seven Soviet-supported Afghan Army bases in northeastern Afghanistan. Taking the bases would dramatically reduce travel time for supplies from Pakistan. What's more, it would further boost morale for the rebels in their eight-year war against Soviet occupation forces.

The rebels' long logistics tail began in Garam Kishmar, or "Warm Waters," a village at the tip of the northwest frontier province of Pakistan. There, the Muslim forces re-

Ahmad Shah Massoud—the "Lion of Panjshir"—learned his guerrilla warfare skills from the masters. Emphasizing speed, stealth, and maneuver—and with a pipeline to the enemy's closest secrets—his mujahedeen fighters scored a big success at the Battle of the Keran Valley and kept on winning. The skill of such local leaders as Massoud is the big reason that Soviet troops are marching out of their Afghan quagmire.

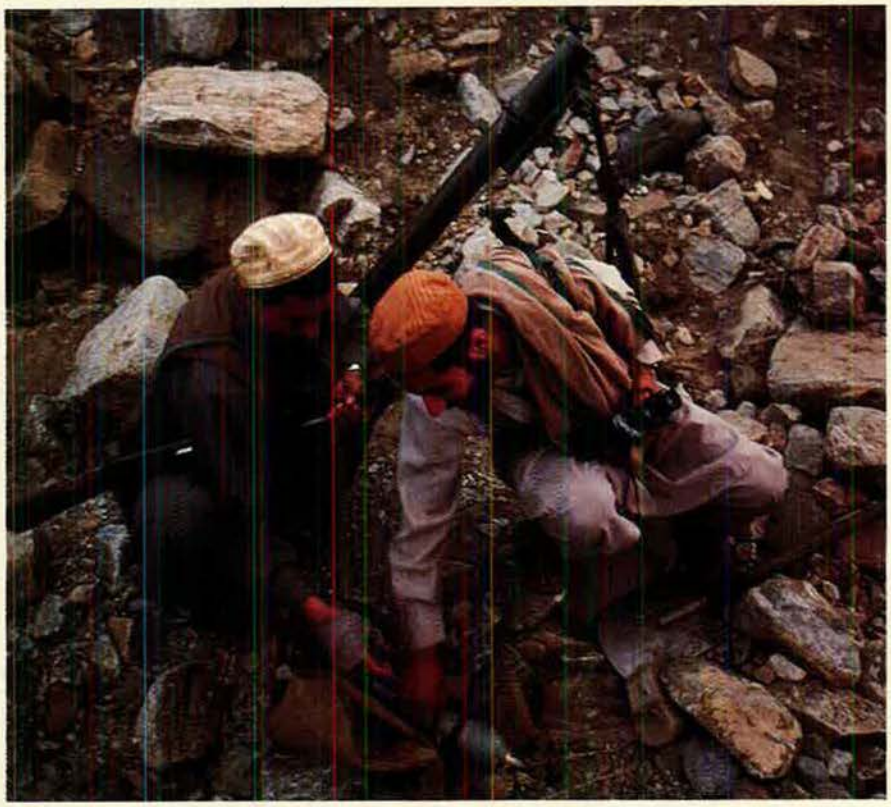
—Photo by Richard Mackenzie



ceived Chinese guns and rockets. They are purchased and distributed by Pakistan with $600 million a year in US aid. Then, the equipment had to be trekked overland into Afghanistan.

The extreme dedication of the rebels is evident in such arduous endeavors. In a blizzard, a team of mujahedeen was forced to stop on a mountain path when one of its horses dropped dead under the ammunition load it was carrying. One of the men took up the weight that killed the animal, threw it on his back, and wordlessly continued the climb. Such a sight is not uncommon—not on the guerrilla side.

On the side of the Soviet and Afghan armies, by contrast, morale throughout the war has remained low. Initially, the problem stemmed primarily from the fact that many of the original Soviet soldiers were raw reserves whose units often received



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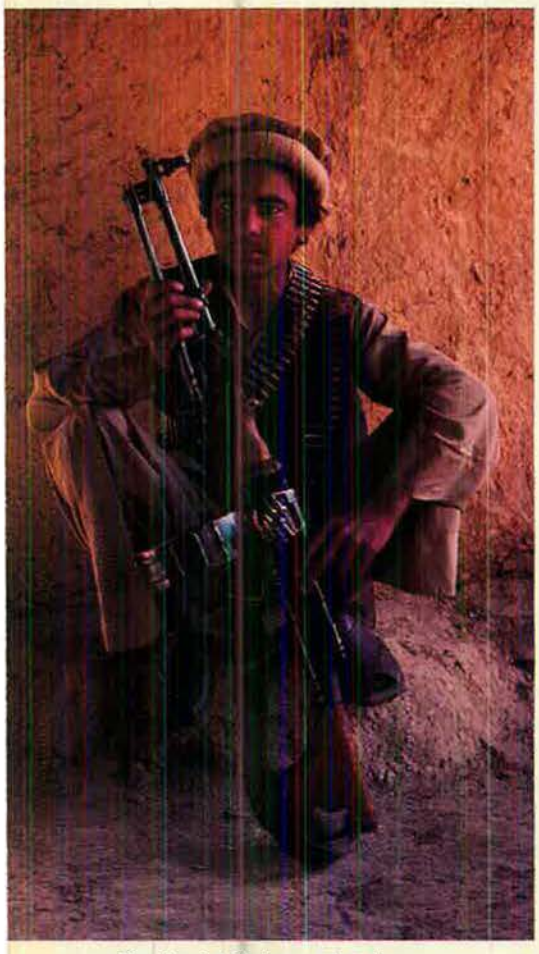
Though never equipped with a preponderance of modern weaponry, the Afghan rebels have begun to acquire more arms in recent years. Among such arms are mortars, rocket launchers, antiminefield weapons, communications gear, and—most critical of all—Stinger antiaircraft missiles from the US.



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The Soviet Union seriously underestimated the tenacity of the Afghan resistance. Moreover, Soviet commanders had to cope with Soviet troops who began to sympathize with their religious brethren in the resistance.

third-rate equipment. By the summer of 1980, Soviet military leaders realized their errors, however, and began substituting conscripts for the reserves.

Even then, Red Army forces who entered the fray had only the poorest tactics and most pathetic training.

What's more, the high command felt obliged to send home Muslim soldiers from Soviet Asia for fear that they would sympathize with their rebel coreligionists—as many of them in fact did.

Primitive medical care and hygiene practices took their toll on morale. With little water available, the average Soviet soldier is said to bathe about once every other month. Infectious hepatitis had spiraled out of control. And the hygiene situation was worse among indigenous Afghan troops.

The ordeal of Afghanistan has led to alcohol and drug abuse, not to mention acts of brutality by Soviet soldiers that have been inflicted on fellow troops as well as on civilian Afghans. Bullying of newcomers by "old soldiers"—those who have been in country a year or more—contributed to widespread Soviet desertions. A few of these deserters have actually gone over to the mujahedeen.

"It is hard to imagine a war in which Russia's conscript army would be less well suited than it is in a counterinsurgency in mountainous Afghanistan," says Mark Urban, a British scholar of the war.

Future analysis may yet produce a complete answer as to why the Soviet Union chose to ignore history and invade Afghanistan, a land known throughout history as a graveyard of imperial ambition. Whatever their motives, however, they clearly believed it would be a relatively easy task to subdue a country immediately to their south, about the size of Texas.

Moscow seriously miscalculated. Certainly, Soviet leaders underestimated the tenacity of the Afghan resistance. But it also overestimated the value of armor and massed firepower.

Soviet Invasion

The Soviets came in with great force, hoping to score a knockout punch. First came a logistical

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buildup of Soviet troops north of the Amu Darya, the "Oxus River," which separates the two countries. A reinforced Air Assault Division at the Soviet Union's 105th Guard Headquarters was primed to seize key military and political targets in Kabul.

The operation itself went smoothly. On December 6, 1979, a regiment of the task force was flown to Bagram, a principal Afghan fighter base north of Kabul. From there, troops fanned out to the Salang Pass, the road route from the Soviet Union to Kabul. For four days beginning December 22, the Soviets flew some 350 transport sorties into Kabul and Bagram, carrying men and supplies in Antonov and Ilyushin airlifters. Shortly before midnight on December 24, the Soviets began airlifting more troops into Shindand, a key air base in the far west of the country, and others went to Kandahar in the south.

Finally, on December 27, the decisive phase was launched. Paratroopers moved into downtown Kabul, and KGB commandos stormed the Darulaman Palace south of Kabul. There, they executed Hafizullah Amin, leader of the inept Afghan regime, and replaced him with handpicked Babrak Karmal.

All was accomplished in days, with only one and a half air assault divisions and four motor rifle divisions totaling between 15,000 and 20,000 men. Reinforcing troops brought the total to 100,000 by January 5, 1980.

The relatively small size of the invading force suggests the Kremlin pursued only limited objectives—to take key cities and the roads that linked them.

Moscow could not have known it, but this was the high-water mark of Soviet occupation. Nearly nine years of trouble were to follow.

Divided on ethnic, linguistic, and tribal lines, Afghanistan has always been a decentralized country—with a vengeance. For that reason, control of Kabul and major cities does not mean control of the nation. Quite the contrary.

The Soviets seemed to willfully ignore this reality. The US ambassador to Afghanistan from 1966 to 1973, Robert G. Neumann, watched an enormous buildup of Soviet advisors in Kabul. "They had hundreds of them—most of whom should have known better than to try to control the country centrally. But that's what they did." It was, in fact, a guiding military principle.

Afghan resistance leaders have been able to rely on a widespread network of informants among Afghan government forces and the populace at large. Such inside information has been crucial to the rebels in planning their raids from high in the rugged mountain country that dominates much of the nation.

In the first six months, the Soviets pursued tactics that observers deemed better suited to a land war in the European theater. It was a centrally controlled, high-intensity, mechanized operation totally unsuited to the harsh terrain, climate, and lack of infrastructure in Afghanistan—not to mention the elusive foe.

They even brought along an SA-4 antiaircraft missile brigade, the importance of which was not exactly paramount in a war against guerrillas carrying on their fight without a single plane.

Throughout the war, notes Urban, Soviet infantry firepower was "massively increased" in Afghanistan, particularly with respect to the individual infantryman. Soviet troops now carry the AGS-17 automatic grenade launcher and the RPO flamethrower—a weapon that provides the foot soldier with a portable napalm weapon. Also in use is the new AK-74 automatic rifle. Its round tumbles on impact, causing dreadful wounds. The mujahedeen refer to AK-74 projectiles as "poison bullets."

Exploiting Airpower

The biggest and most successful innovation was the introduction, within a year, of helicopters to the war in massive numbers. In June 1980, for example, it is estimated that there were only forty-five to sixty Soviet helicopters in Afghanistan. A short time later, Western observers began reporting Soviet use of as many as eighteen attack helicopters in attacks on single villages.

Their best weapon became the Hind helicopter gunship, a kind of flying tank, which was used to rain indiscriminate terror on the Afghan people and to soften up rebel positions in advance of a ground assault. It did, at least, until US-supplied Stinger antiair missiles came into widespread use.

All the effects of this massive firepower were on display in the dozens of burned-out villages in the tactical-assembly areas that the Afghan rebels used in preparing for Keran.

A short walk up the Anjuman River from the barren, rocky spot of its confluence with the Kokcha River in the desolate northeast of Afghanistan, perched atop a hill more than 9,000 feet above sea level, sat the ruin of what was once a town called Escarza. Most of the stone and packed-mud houses lay in rubble. Bomb craters marked the spots where other buildings once stood.

Most of the residents were long gone. Dozens were killed in a series of Soviet air raids on the area. Several hundred more fled to neighboring Pakistan, joining more than 3,000,000 other refugees from across their country. This day, a few old women and children left in Escarza were hauling water in buckets up the long hill from the river. There never has been electricity, running water, or conveniences in this forsaken place.

But as night fell, dozens of young Afghan men began arriving, walking silently through the darkness. Some had trekked for more than a week through the rugged, overwhelming mountains of the Hindu Kush range. On the second floor of a ruined house, Mohammad Karim Jalili, a handsome, soft-spoken, twenty-two-year-old man with dark eyes, sat wrapped in an Afghan blanket, explaining his role in the war.

The young fighter epitomized the eclectic ingredients that have gone into the war. Born in Kama, near the city of Jalalabad, the son of a district court judge in Badakshan Province, educated in commerce at a college in Pakistan, he was now a member of the mujahedeen fighting in a primitive war of liberation.

Karim was part of the Central Corps of the most renowned and effective resistance commander in the war, thirty-five-year-old Ahmad Shah Massoud. He was one of Massoud's Stinger operators, trained in Pakistan in the use of the surface-to-air missile. He explained that he was the first in the corps to use a Stinger to down a Soviet plane, a MiG-21.

The increasing firepower of the guerrillas themselves was only too apparent at numerous stops on the journey to Keran. The small squad of men with whom I traveled moved down the Anjuman River to where it meets the Kokcha. After another five hours—and two stops for prayers—they reached another bombed-out village that, in the darkness, at first seemed deserted. Inside a mosque, some forty other young guerrillas pushed closer together to make way for the newcomers. Every rebel sported a Soviet Kalashnikov assault rifle. Stacked in an adjoining stable were a dozen or so recoilless rifles and fifty or so Chinese-made rockets.

Across Afghanistan, the story is much the same. The US has reportedly stepped up supplies of bazookas, heavy mortars, grenade launchers, and recoilless rifles to the mujahedeen. Especially welcome is the arrival of new anti-minefield rockets used to clear obstacles placed by the Soviet Army. Some authorities report that the mujahedeen even possess short-range surface-to-surface rockets with which to hold Soviet strongholds at risk.

Growing Professionalism

Secretly, silently, over the ensuing days, 530 mujahedeen gathered in half a dozen villages throughout the area, preparing for an assault on the seven bases of Keran.

That the guerrillas could put together such an operation, getting tactical orders across hundreds of miles to dozens of their troop sites while maintaining security, was evidence of what is plainly the growing professionalism of the fighters and greater local military coordination.

Part of this is due to the emergence of young, well-educated leaders who have taken over from many of the older, more suspicious tribal chieftains who have tended to fight in clan organizations and defend specific pieces of territory—even against fellow rebels.

In the northeast quadrant of Afghanistan, this impressive network

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of fighters is the handiwork of Ahmad Shah Massoud—known as "the Lion of Panjshir."

When the war began, Massoud, then twenty-seven, began to emerge as the commander of resistance efforts in the strategic Panjshir River valley, which runs for 100 miles from Kabul to the northeast. A son of an Afghan Army general, Massoud adopted his third name, which means victory, as a *nom de guerre*.

A brilliant leader, quite serious in demeanor but not without a sense of humor, Massoud has learned the skills and tactics of the best guerrilla fighters, having long studied the methods of Mao, Guevara, and Ho Chi Minh.

He was only fifteen in 1967 when the Arab-Israeli Six-Day War broke out. Classmates recall how he pinned a map on the wall to give daily briefings on the movements of the opposing forces, explaining to friends why the Israelis were so effective in battle.

Though he is young, Massoud's experience is extensive. Long before the 1979 Soviet invasion, he had been involved in resistance efforts against the Soviet-backed Communist regime in Kabul, moving back and forth between resistance bases in Pakistan, where he was given some basic military training, and the anti-Communist underground in Kabul.

Massoud's personality has drawn in some impressive young intellectual fighters. In a nation of almost total illiteracy, many of his troops are college graduates. He has also developed an intelligence-gathering operation that reaches into the heart of Kabul.

Like other young Muslim commanders, Massoud's approach to war has matured greatly. In the early years, he says, his attacks were sporadic, consisting mainly of ineffective hit-and-run ambushes along the Salang Highway between Kabul and the Soviet border.

As time passed and Massoud's tactics became more sophisticated, he became a far greater concern to Soviet military men in Afghanistan. Indeed, the perceived power and prestige of Massoud engendered nine major Soviet invasions aimed at driving him from his home turf in the lush Panjshir Valley—though with notable lack of success.

© Philippe Flandrin/BLACK STAR

Mobility in the forbidding terrain of Afghanistan is imperative for the Afghan resistance. Rebels often lug artillery by hand over dozens of miles.

The Panjshir Offensives

The first Soviet offensive, later known to the Afghan war analysts as "Panjshir 1," was launched in late 1980. Panjshir 9 was unleashed in 1985. There has been none since. The Soviet Army is apparently resigned to the reality of Massoud's iron grip.

The Panjshir operations provide a kind of microcosm of the Soviet military fate in Afghanistan: the ability to win tactical victories at will while strategic gains remain elusive.

Of the nine Soviet offensives, Panjshirs 5, 6 (1982), and 7 (1984) were the biggest. In each case, some 15,000 Soviet and Afghan Army troops pushed up the valley. More Soviet troops came down from the north in a pincer action. Once the ground troops had sealed off the valley, Soviet fighter-bombers began bombing from Bagram and bases across the Soviet border. Soviet Su-25s, Su-17s, and MiG-21s were used, blasting many villages into oblivion.

Rakhman Beg, a twenty-seven-year-old Panjshiri who grew up in Jishta, a small village in the north of the valley, recalls the black day in 1984 when the Soviet planes came. He grabbed his four-year-old sister in his arms and started to run. A bomb struck nearby, and he spun around, cradling the little girl to his chest to protect her. He was hit in the face, shoulders, back, and legs by shrapnel. He saved the child, but lost nine brothers, his father, and two uncles.

After a week of such bombardment in May 1982, the raids stopped, and a regiment of air assault troops landed in helicopters, all from the 103d Air Assault Division. They showed little experience of the terrain, failing to dig in or conceal themselves, exposing themselves to constant ambushes by the mujahedeen, who escaped unscathed into the hills.

In Panjshir 5, the destruction was particularly brutal. In that 1982 action, Soviet attacks into tributary valleys were so successful that Massoud reluctantly ordered a temporary evacuation of the Panjshir inhabitants. He also worked out a temporary truce between his forces and the enemy. This was a controversial move that brought Massoud great criticism from other mujahedeen groups. It proved to be a strategic masterstroke that allowed his fighters to regroup and, probably, to survive to continue the war.

In any case, by April 1984, Massoud was back, again on the attack against the critical Salang Highway. His success in this endeavor led directly to the Soviets' Panjshir 7, again performed by 15,000 Soviet-led troops, and this time with little result. After trying two more of their Panjshir operations, the Soviets pulled back.

Why the Soviet Failures?

Why do these gigantic Soviet operations turn out poorly, not just against Massoud, but nearly everywhere in Afghanistan?

One principal reason, say many, is that these sweeps are almost always conducted using large numbers of nervous, frightened, and inexperienced recruits. They rarely dismount from their fighting vehicles. Because they seldom leave the roads, they do not pursue fleeing Afghan forces.

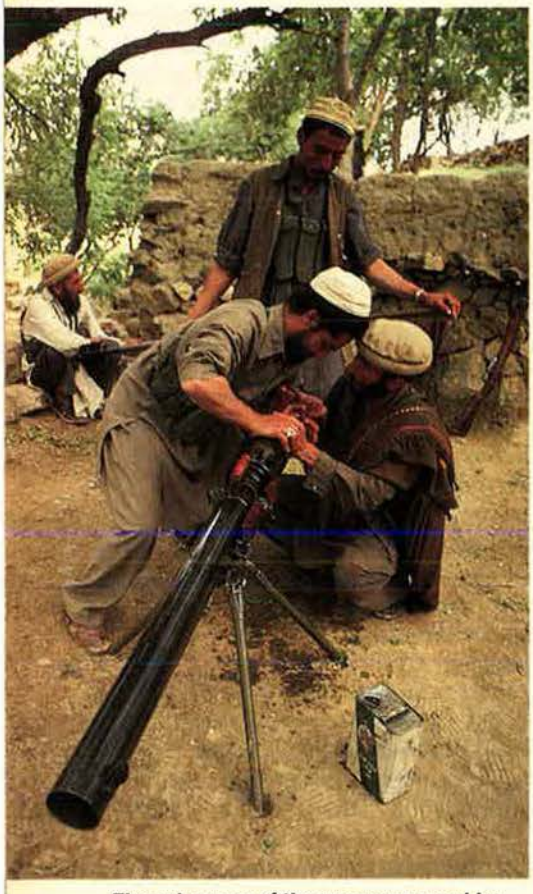
"The mountains," observed one of Massoud's guerrillas, "are our best friends."

These Soviet units, mostly motorized rifle infantry forces, have scant knowledge of their Afghan enemy. What's more, most have no idea how to handle their own equipment.

It is true, say experts, that portions of the Red Army improved in performance over time. Analysts note that the Soviets developed a substructure of the Red Army in Afghanistan, a kind of antiguerrilla or quasicounterinsurgency force.

With units once totaling an estimated 20,000 to 25,000 crack troops, the force was filled with airborne or air assault soldiers, but long-range patrol and intelligence forces were included. The emphasis was on speed and stealth rather than brute force and mass. Members of the units got special training in combat skills peculiar to Afghan conditions.

In their heyday, the units conducted imaginative, even daring, operations—including dangerous and unheard-of nighttime ambushes in the countryside. Soviet helicopters, on occasion, have swooped into gatherings of unsuspecting rebels, as commandos would blaze away.



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Though many of the weapons used by the Afghan rebels would be considered museum pieces in Western armies, more modern weapons, such as this recoilless rifle, have filtered into the country from border bases in Pakistan.

Yet the elite forces tended to function only in short-term operations. Even the isolated commando operations have tailed off significantly in recent years. One possible reason: high casualty rates. The Soviet garrison army, rarely leaving its bunkers, loses few troops. The counterguerrilla forces, however, took extremely high casualties, with some units losing up to two-thirds of their fighters within a year.

As he labored to prepare his forces for the attack on the Keran forts, Massoud betrayed little concern about attack from the Soviet units. He had divided his several thousand men into three groups. They are his Central Corps, other mobile units, and stationary defense forces in the villages of his region. All were relatively well protected.

Their biggest concern, said one Massoud fighter, was the possibility that Soviet MiG aircraft would be dispatched from Kabul or from inside the Soviet Union, scramble, and be on the scene of the battle in quicktime. The young man was philosophical. "Inshallah," he said. If God is willing.

When it comes to combating Soviet air operations, it's now clear that the turning point came in 1985 when the United States began supplying Stingers to the resistance. Massoud Khalili, a political officer in the Jamiat-e-Islami Afghanistan party, agrees that Stingers changed the face of the war. He says the impact of the weapon became apparent within one year. Whereas up until 1985 the Soviets used the skies over Afghanistan with impunity, Soviet helicopters and low-flying bombers were rarely seen by late 1987. They remain absent.

Stinging the Bear

It is clear that the ubiquity of the Stinger has had a major impact on Soviet air combat operations. Soviet pilots clearly fear its effectiveness and have been careful to avoid most low-level engagements that could leave them prey to the weapon.

Bombing raids on the Kunar River valley, which I witnessed late last year, were all conducted from altitudes of at least 20,000 feet. This put the raiding jets far out of Stinger range. It also made the Soviet bombing inaccurate and ineffective.

Many believe that the dwindling of direct Soviet air support has been a severely demoralizing factor for Soviet and Afghan Army troops.

With its air arm constrained, the Soviets began to rely more on artillery than on airpower, with predictable results. Mujahedeen simply moved to heavily fortified strongholds high in the Afghan mountain gorges, impervious to artillery fire.

Even so, Massoud left no possibility untended during the time that he prepared in a little village called Jangal for the battle of Keran. In the days before he gave his major briefing on the battle, his intelligence officers and cartographers painstakingly built a giant sandlot replica of the entire Keran Valley to give a vivid, three-dimensional view of the battlefield.

Starting with a grid almost the size of a football field end zone, they built up the hills and the surrounding mountains, putting in every ridge and craggy tip. They created the river that ran down the middle, put in cardboard replicas of every house, hut, and barrack. They also made replicas of their weapons and the enemy's from cigarette packets.

His advance intelligence was phenomenal, in part because the second in command of the Army base at Keran had been a Massoud spy, working inside for him for two years. Some days before, four of Massoud's officers met with the man, Abdul Rias, a thirty-two-year-old Afghan army captain. For almost two hours, he helped Massoud's intelligence officer come up to speed, pointing to weapons caches and troop concentrations.

The results were startling. The day before the attack was to take place, Massoud called his key officers together, placing each in the position around the model where he would lead his men. For two hours he paced back and forth, repeating again and again every significant detail.

Massoud was able to tell his men not only which buildings to attack and when but also which windows to fire into. He knew how many

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weapons the enemy possessed. He knew where each of the 300 Army soldiers and the hated Khad secret police agents slept. Also, Massoud knew the exact locations of mines on the valley surrounding the target.

"The first company is in the garrison," says Massoud. "It has three officers and thirty-seven soldiers." He lists the number of rounds of ammunition. There are 340 Kalashnikovs. He also knows that they have 200 bags of flour and one barrel of oil. "Understand?" Massoud asked. "Any questions?"

In retrospect, the outcome of the battle at that point was foreordained. Throughout the night, rebels gathered their weapons, hauling some onto their backs and strapping others onto the few horses and donkeys they had on hand, heading for positions.

A Clear Victory

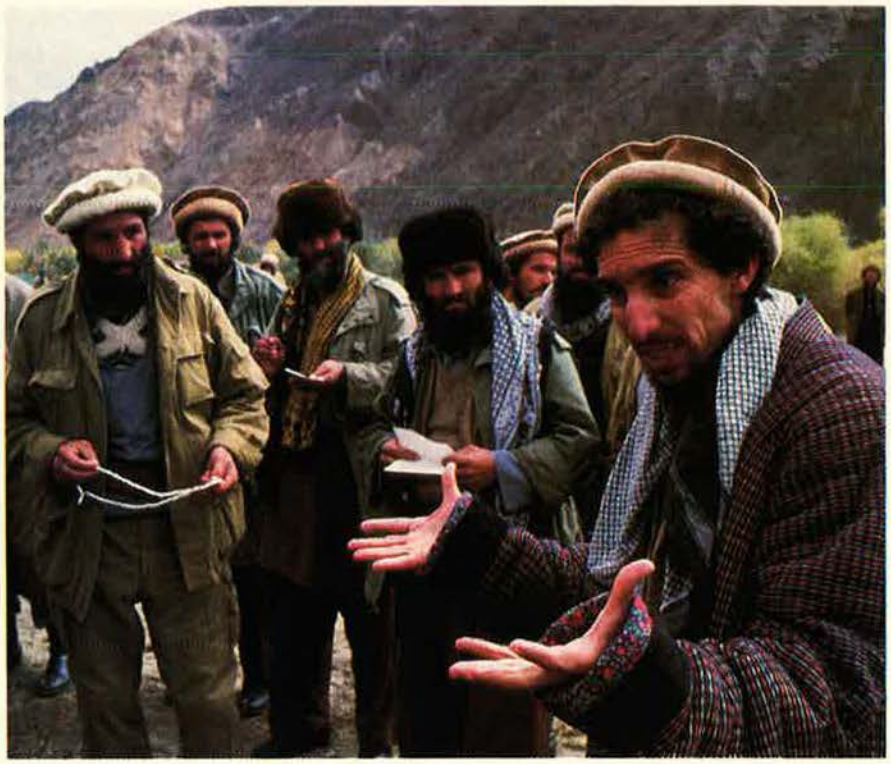
The battle was scheduled to begin shortly after 6:00 a.m., but half an hour before that, an enemy soldier walked out of his barracks and headed toward an open area used as a lavatory. When he unexpectedly came upon a squad of mujahedeen who had slipped into a garden at the edge of the perimeter, he sounded an alarm, and the battle commenced.

Above, on a mountainside, Massoud's heavy-weapons men were still struggling as they tried to haul guns into the prearranged spots. Even so, reluctant to sacrifice the tactical initiative, Massoud gave the order to attack—though he realized that fewer than half the heavy weapons were where they should be.

"God is great!" he cried into a two-way radio, and the valley exploded with bullets, rockets, and tracer shells.

The Army base fell in forty minutes. As mujahedeen raced across the valley floor, following paths they had been told were clear of mines, only a few of the Afghan conscripts inside the main base put up any sort of a fight. Bedraggled, shocked, without spirit, and with no fight in them, most threw down their weapons. In the midst of what battle there was, the commander of the base fled.

Gunfire continued around the area held by the Khad men. These armed intelligence forces, as expected, were prepared to fight to the last man. Above all, they feared what would happen to them if they were captured alive. They are so hated by Afghans at large for their atrocities and torture that they knew what kind of end they could expect to meet. "They fight to the last bullet," says one guerrilla, "and keep that for themselves."



—Photo by Richard Mackenzie

Rebel leader Ahmad Shah Massoud, gesturing at right, briefs his troops minutes before the battle at Keran. In a scant forty minutes, his rebels overran the Afghan army base, capturing more than 300 government soldiers and inflicting twenty-nine casualties. Massoud's careful preparations held his losses to fourteen mujahedeen killed and eleven injured. Other government bases up the valley were later taken without firing a shot.

Help in the form of Soviet airpower never came. Toward the close of the fighting, two MiGs roared high overhead, obscured in part by thick clouds. The guerrillas glanced up nervously and waited. The sounds continued for a some seconds before they passed on by, their pilots apparently oblivious to the defeat being administered below. Mohammad Karim Jalili, the Stinger operator, simply shrugged, disappointed at the missed opportunity.

Despite some shortcomings, the operation represented a clear victory for the partisans. A total of fourteen mujahedeen were killed and eleven others injured. But the Soviet-backed forces got the worst of things by far. For their part, government troops lost twenty-nine killed, with more than 300 taken captive.

The attack was supposed to be only the first of a series of assaults on Soviet-supported forces in the area. But other bases operated by Afghan militia further up the valley were less of a challenge. To take them, Massoud sent an elderly local resident with a letter, offering to treat them well if they surrendered. About half did. The remainder fled.

Today, Soviet fortunes have come full circle in the war in Afghanistan. They began by establishing a static defense around key bases and important roads. When that didn't work, they began to venture out, as in the attacks on the Panjshir. But by 1987, they were figuratively back in their bunkers again, looking for a way out.

The Battle of Keran helps to explain why. ■

Richard Mackenzie, a native of Australia, has been a senior writer for Insight *magazine since 1985. Mr. Mackenzie spent three and one-half months in Afghanistan in late 1987. He returned to the Afghan camps on the Pakistan border this spring.*

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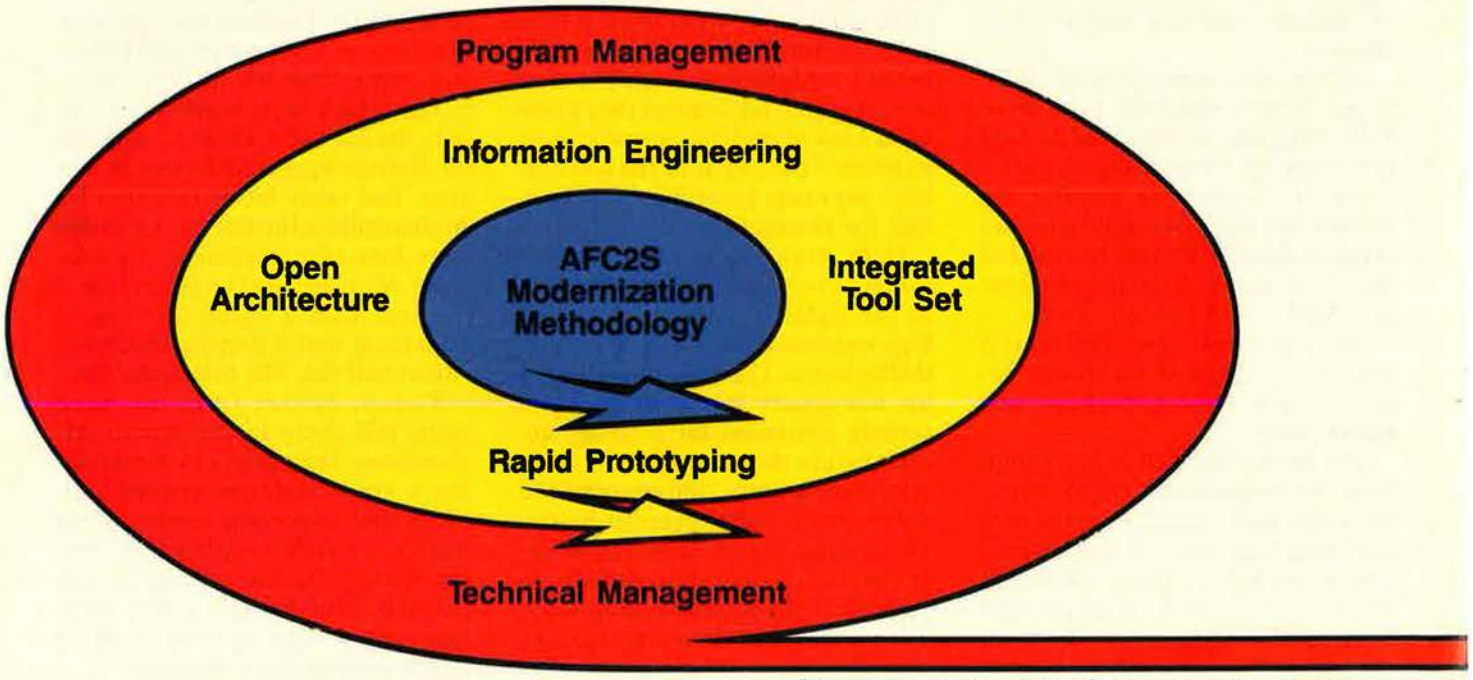

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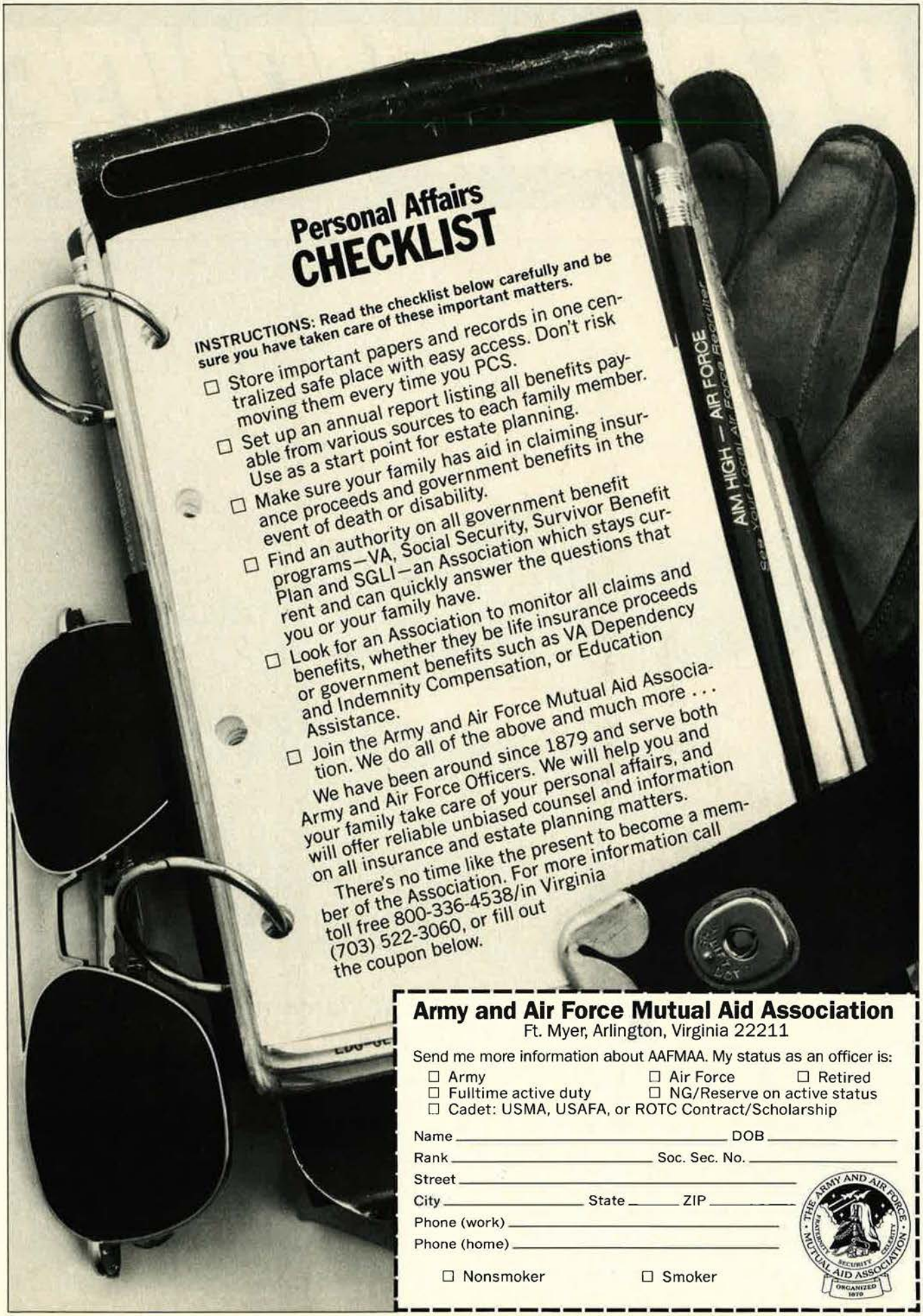

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SHORTS

Losses on the first large-scale Ploesti raid were staggering, heroism unsurpassed.

Into the Mouth of Hell

BY JOHN L. FRISBEE
CONTRIBUTING EDITOR

TRADITION rests on a foundation of great deeds done together in the past. A keystone of Air Force tradition is the August 1, 1943, bombing attack on oil refineries at Ploesti, about thirty miles north of Bucharest, Romania. That mission stands as a monument not only to the skill and courage of Air Force crews but also to the ability of our combat leaders to pull together strands of a broken plan and salvage limited success from the apparent certainty of disaster.

The Ploesti raid was unique in several respects. It was the first large-scale, low-level strike by heavy bombers against a well-defended target and the longest—1,350 miles from base to bombs-away—of World War II up to that time. For extraordinary heroism that day, five men were awarded the Medal of Honor, a record that may hold for all time.

Why did Ploesti merit that unprecedented effort? In mid-1943, seven refineries in and near the city were producing an estimated thirty-five percent of Germany's oil and an equal proportion of her aviation gasoline. Some Allied planners thought that destruction of the refineries might even force the Nazis out of the war.

The task force put together for Ploesti was composed of two Ninth

A B-24 Liberator over a burning Ploesti, Romania, during the daring August 1943 raid. American airmen flew the longest mission of the war at the time against a heavily defended target in hopes of drying up Nazi fuel supplies.

Air Force B-24 groups—the 376th and 98th—based in North Africa and three B-24 groups from Eighth Air Force—the 93d, 44th, and the recently arrived 389th—that were moved from their UK bases to fields in North Africa near Benghazi, Libya. The attack was set for Sunday, August 1, in order to minimize casualties among impressed workers at the refineries. It was meticulously planned and thoroughly rehearsed, including two full-scale practice missions against a simulation of the Ploesti targets, laid out in a remote area of the desert.

Surprise and Precision

In concept, if not in execution, the plan of attack was simple, its essence: surprise and precision. The bomber stream would be led by the 376th Group under Col. Keith K. Compton, followed by the 93d, 98th, 44th, and 389th in that order. Specific buildings within the five refineries in Ploesti; the refinery at Campina, eighteen miles northwest of the city; and one at Brazi, five miles to the south, were assigned to elements of the five groups.

The task force, totaling 177 B-24s with Brig. Gen. Uzal Ent as mission commander flying in Colonel Compton's aircraft, would take off between 0400 and 0500 hours, fly north in a tight column of groups to Corfu (off the coast of Greece), then climb over the mountains of Albania and Yugoslavia to the Danubian plain, where they would descend below enemy radar coverage. At Pitesti, the first Initial Point (IP), the 389th would break off to the left and proceed to the refinery at Campina. The four leading groups would drop to 500 feet and continue to the final IP at Floresti, where they would begin a thirteen-mile bomb run on five refineries in the city and the one at Brazi, descending to treetop level for bomb release. All six refineries would be hit almost simultaneously by a single wave of bombers, flying line-abreast, that would saturate the defenses. That was the plan.

Winston Churchill is credited with observing that "in war, nothing ever goes according to plan except occasionally, and then by accident." Ploesti was no exception. In the long flight over the Mediterranean, the column lost some of its cohesion, with the 376th and 93d Groups slightly ahead of the other three. Then, near Corfu, the lead aircraft with the route navigator went out of control and crashed. (General Ent and Colonel Compton were not in the lead bomber, but in a position to assume the lead when a final turn to the bomb run was made.) A second 376th aircraft bearing the deputy route navigator followed down to look for survivors. Unable to climb back in time to rejoin the group, it returned to Benghazi.

Now ahead of the formation towering cumulus clouds rose above the mountains. The two lead groups threaded their way through or under the clouds, while the 98th, 44th, and 389th penetrated the cloud line at varying altitudes. By the time those three had reformed a column and resumed a heading for Pitesti, the first two groups were twenty minutes ahead of them.

Because of radio silence, General Ent and Colonel Compton could not contact the trailing groups. Not knowing whether or not those groups had turned back, they decided to follow the operations order even though they might have to go it alone. Thus, the five groups actually proceeded toward Pitesti as two widely separated forces. A surprise attack on the refineries in Ploesti by a single wave of some 140 bombers, that dominant key to success at an acceptable cost, was beyond redemption.

The Wrong Turn

The chain of circumstance was not yet complete. The 376th and 93d Groups made their turn at Pitesti and headed for the final IP at Floresti. Halfway between the two IPs lay the town of Targoviste, which closely resembled Floresti. Flying at very low altitude, the 376th mistook Targoviste for the IP and turned southeast on the briefed bomb-run heading, which took the two groups to the west of Ploesti—an error that wasn't discovered until they were on the outskirts of Bucharest. At that point, General Ent broke radio silence, ordering

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Lt. Col. Addison Baker pressed the attack on the Columbia Aquila refinery.

Maj. John Jerstad was awarded a posthumous Medal of Honor.

the two groups to turn north and attack targets of opportunity in the complex of refineries.

The 93d Group, led by Lt. Col. Addison E. Baker, a National Guard officer who had been called to active duty in 1940, caught a glimpse of refineries off to the left. He and his pilot, Maj. John Jerstad, who had completed his combat tour but volunteered for the mission, bored in on an unidentified refinery, which turned out to be Columbia Aquila, a 44th Group target. Enemy defenses, much heavier than anticipated, were thoroughly aroused. More than 230 antiaircraft guns, supported by many barrage balloons and smoke pots, surrounded the refineries, with perhaps 400 fighters in the area.

Into a maelstrom of ground fire, Colonel Baker led the group. Short of the refinery, his B-24 was hit and burst into flames. Baker and Jerstad could have bellied in on open fields or pulled up to bailout altitude and probably saved themselves and their crew. But this was a mission on which some thought the outcome of the war might hinge. Without wavering, they led the bombers straight on to the refinery before crashing into the ground. Both Addison Baker and John Jerstad were awarded the Medal of Honor posthumously.

Off to the right of their funeral pyre, a second element of the 93d bombed two refineries assigned to the 98th Group. Meanwhile, five B-24s of the 376th Group led by Maj. Norman C. Appold hit the Concordia Vega refinery, originally assigned to the 93d, and "emerged covered with soot" as other 376th bombers unloaded on various segments of the Ploesti complex.

While the 376th and 93d were making the best of a bad situation, the other three, led by veteran pilot Col. John R. "Killer" Kane, commander of the 98th, turned at Pitesti as planned. The tail-end 389th under Col. Jack Wood broke off to the northeast, bombing the refinery at Campina to complete destruction. Four aircraft were lost to flak, one of them piloted by twenty-one-year-old 2d Lt. Lloyd H. Hughes, who was on his fifth combat mission. His B-24, hit by ground fire, leaked streams of gasoline from wing and bomb-bay tanks.

2d Lt. Lloyd Hughes drove his damaged bomber to a fiery bombs-away.

Planners had intended for the bomber force to hit Ploesti in a single wave at low level, but the vagaries of weather and war disrupted that plan of attack. The commanders and airmen on the scene nonetheless elected to press on against the odds and salvaged limited success from the attack.

Below lay wheat fields, where Hughes could have landed, but instead he drove on through the smoke and flame created by the bombers ahead of him, struck his target, and came out with his left wing sheathed in flame. His desperate attempt to save the crew by crash-landing on a lake bed failed when one wing of the blazing B-24 hit a river bank and the plane exploded. The mission's third posthumous Medal of Honor was awarded to Lieutenant Hughes.

No Turning Back

When Colonel Kane's 98th Group and the 44th, commanded by Col. Leon W. Johnson, a 1936 graduate of the Military Academy, turned at Floresti on their bomb run, they saw ahead columns of black smoke

laced with flames and torn by explosions, the result of bombs dropped by the 376th and 93d Groups minutes earlier.

Both men knew that beneath those black clouds, which hid barrage balloon cables and tall chimneys, lay many delayed-action bombs that would detonate at random. With only about half the number of bombers planned for a simultaneous attack, enemy defenses would be far from saturated. They would have been fully justified in abandoning the attack. The probability of survival was low, but the rewards of success could be immeasurably high. For those two courageous leaders there was no turning back.

Colonel Kane led forty-one of his B-24s straight into a scene that resembled the background of a medieval painting of hell, losing fifteen Liberators to flak and fighters in the target area and three more to fighters over Bulgaria. His own plane, with one engine out at Ploesti and fatal battle damage from flak, was demolished in a crash landing at an Allied field on Cyprus.

Col. John R. Kane led forty-one B-24s into the mouth of hell at Ploesti.

Colonel Johnson, followed by fifteen of his 44th Group crews, flew through flak, explosions, heavy smoke, and blistering heat, avoiding by a hair some 376th Group B-24s that were coming off a target, and successfully attacked the already burning Columbia Aquila refinery. Only nine of the sixteen survived the gauntlet of fire. Colonel Johnson's plane was hit repeatedly, but made it back to Benghazi more than thirteen hours after takeoff. While

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Col. Leon W. Johnson got back to Benghazi thirteen hours after takeoff.

he was attacking his target, twenty-one of his B-24s led by Lt. Col. James Posey had a clear shot at the untouched refinery at Brazi, which they leveled, but lost two aircraft to fighters on the way home.

Both Leon Johnson, now a retired four-star general, and Col. John Kane were awarded the Medal of Honor for their courageous decision to press on, regardless of the consequences, against targets the planners had considered so important as to justify the loss of half the attacking force. In fact, more than thirty percent of the B-24s that reached the target area were lost to enemy action or landed in neutral Turkey with battle damage and were interned.*

There are enough other stories of heroism on that mission to fill a book. The Distinguished Service Cross, second highest decoration for valor, was awarded to several men, among them General Ent, Colonel Compton, Col. Jack Wood, Lt. Col. James Posey, Maj. Norman Appold, and then-Capt. William R. Cameron of the 44th Group, like John Jerstad a volunteer for the mission.

Improvisation and raw courage overcame the vagaries of war—inaccurate intelligence on enemy defenses, unforeseen weather, human error—and a plan that perhaps demanded too much of too many in a strategy and tactic that had not been tried before. We honor the men who met the tests and trials of an historic mission and the nearly 500 who did not come back that day. ■

**Figures relating to the mission vary considerably according to source. Those that appear to be most thoroughly researched are from a study by T. E. Davidson, Jr. They are: B-24s launched, 177; actually attacking a target, 161; combat-related losses, 44; interned in Turkey, 7. One B-24 crashed on takeoff at Benghazi. Also thanks to Gen. Leon Johnson, Lt. Gen. Keith Compton, and Col. William R. Cameron, who helped resolve some conflicting information about the mission.*

John L. Frisbee was Editor of Air Force *Magazine from 1969 until 1980. During his Air Force career, he served as fighter and bomber pilot, a planner on the Air Staff and at major commands, and as a teacher at West Point and the Air Force Academy. He also served as a special assistant to the Secretary of the Air Force. He holds bachelor's degrees in economics and Latin American studies and a master's in international relations. A graduate of the Armed Forces Staff College and the Canadian National Defence College, he retired as a colonel. He now makes his home in Richmond, Va., and contributes his "Valor" articles as a regular monthly feature of this magazine.*

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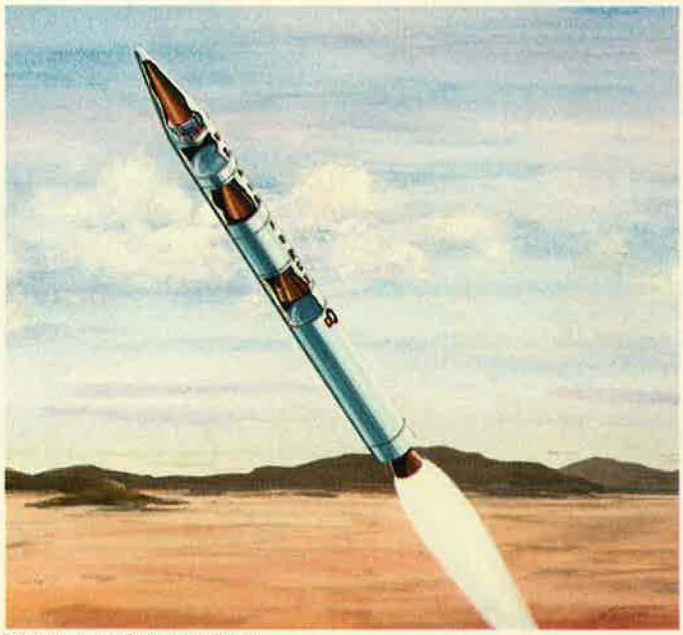
MINUTEMAN STAGES I AND III



SMALL ICBM STAGE I

PEACEKEEPER STAGE I

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Airman's Bookshelf

Things to Come

Future Flight: The Next Generation of Aircraft Technology, by Bill Siuru and John D. Busick. Tab Books, Blue Ridge Summit, Pa., 1988. 192 pages with illustrations and index. $15.95.

December 17, 2003, will mark the centennial of one of man's most important technological accomplishments: the beginning of powered flight. The authors of *Future Flight* predict that the remaining fifteen years until that aviation milestone hold great promise for progress and development in all areas of aviation.

Retired Air Force colonels Bill Siuru and John Busick are well qualified to survey what lies ahead for aviation during the next decade and a half. Colonel Siuru served as commander of the USAF Academy's Frank J. Seiler Research Laboratory and in the Aeronautical Systems Division at Wright-Patterson AFB, Ohio, while Colonel Busick served twenty years in the Air Force as a fighter pilot.

The authors depict the process of aviation development in three parts—needs, technology, and concepts. After a brief look at past aviation lessons and future needs in aviation development, they launch an in-depth discussion of four key areas of aircraft design: aerodynamics, propulsion, avionics, and materials/manufacturing. The book concludes with chapters each devoted to a more specific look at the three major categories of aircraft to be expected: military, commercial, and general.

This book is neither a "pie-in-the-sky," futuristic treatment of aviation nor an aeronautical engineering textbook. There are no Buck Rogers or Starship *Enterprise* designs found in these pages. The authors' look into the future is "limited to technologies and concepts that are possible and feasible based on current scientific knowledge."

Their look at aviation needs of the future provides an excellent basis for understanding the question, "What types of aircraft are we going to need?" In military missions, the authors discuss bombers, interceptors, close air support aircraft, reconnaissance/surveillance platforms, and spacelaunch vehicles. They also look at commercial passenger/cargo service, general aviation, and future Soviet aviation needs.

As one might expect, there is little of a specific nature that they can offer about Soviet aircraft plans or intentions, but they do provide good coverage of the way in which the Soviets design their aircraft and why some of their designs seem to bear an uncanny resemblance to those of Western aircraft.

Each of the chapters covering the different components of aircraft design—aerodynamics, propulsion, avionics, and materials—is written for both the general and expert reader alike. The chapter on aerodynamics begins, for example, with a thorough look at a variety of wings—flying, swept-back/swept-forward, supercritical, mission adaptive, oblique, joined, canards, and winglets. The chapter concludes with a brief look at flight controls, survivability, and advanced methods of research and development.

The chapter on propulsion opens with the most complex design—the combined-cycle engine, designed for the National Aerospace Plane. This engine would operate like a normal turbojet at low speeds, transition to a ramjet as the aircraft accelerates, and then function as a scramjet. It is even possible that the engine could be designed to operate as a rocket in space. The rest of the chapter looks at the proposed engine for the Advanced Tactical Fighter (ATF) and closes with more conventional engines: rotary, diesel, and reciprocating. The authors also examine fuel technologies for the years ahead.

Avionics is the area of technology expected to have the greatest impact on aircraft of the next century. Of course, computers will form the basis for many of the technological advances, and this is particularly true for the very-high-speed integrated circuit (VHSIC) computer. Other advances in optics and artificial intelligence are expected to make aircraft more capable and efficient.

Airliner cockpit instrument panels are expected to see the greatest benefit from such avionics as the Electronic Flight Instrumentation System (EFIS), which incorporates computer-generated graphic displays. Military cockpits are expected to take the head-up display (HUD) a step further by providing increased information from the aircraft's sensors and avionics. The last items discussed are Navstar and what we can expect in future simulators.

The chapter on materials and aircraft manufacturing opens with a look at aluminum alloys and superalloys and then devotes a section to composite materials. Computer-integrated manufacturing methods are also examined.

The chapter on specific future military aircraft covers in greater depth a variety of designs, including the National Aerospace Plane, the ATF, the Stealth fighter/bomber, lighter-than-air craft, and remotely piloted vehicles (RPVs). V/STOL aircraft, the X-wing, helicopters, and airlift transports are also discussed at length.

The chapter on commercial aircraft shares a few predictions on the future of supersonic aircraft, but dwells primarily on some of the possibilities for meeting the burgeoning air transport needs of the future. The authors predict four very interesting designs: (1) the spanloader, which will use the same basic design as the flying wing bombers of the 1940s and 1950s, (2) multibody aircraft using dual or multiple fuselages for much increased cargo-carrying capability, (3) the flatbed, an aircraft designed, like a flatbed truck, to carry cargo tied down on the fuselage exterior, and (4) the wing-in-ground-effect aircraft designed to fly at less than 100 feet with large gross weight cargoes.

The final chapter on general aviation aircraft covers the myriad spin-offs from the military and commercial aviation areas that have been appearing and will continue to show up in business, lightplane, and homebuilt

aircraft technologies. Much-improved instruments and avionics, aircraft materials, and designs will be the rule in the days ahead.

Future Flight is a well-written, thoroughly readable, and exceptionally well-illustrated survey of what we can expect to see in the air during the next fifteen to twenty years. It will provide an excellent update for those already well-versed in state-of-the-art aircraft technology and a very thorough look at the near future for those who would like to be better informed on what to expect in aviation from now until the centenary of the first flight of the Wright brothers.

—Reviewed by Maj. Don Rightmyer, USAF. Major Rightmyer is Editor of Tactical Air Command's safety publication, TAC Attack.

Anything, Anywhere, Anytime

The Berlin Airlift, by Robert Jackson. Patrick Stephens Ltd., Wellingborough, UK, 1988. 160 pages with photographs, appendices, glossary, and index. $19.95.

There are available at least a dozen good books on the Berlin Airlift, including a good chapter in the book *Over the Hump* by the officer who commanded the Airlift, Lt. Gen. William H. Tunner. (General Tunner earlier directed the wartime movement of supplies and troops from India to China over the daunting Himalayas—the "Hump.") However, it falls to retired Royal Air Force officer Robert Jackson to be the first to capture the total essence and complexity of the Airlift in this compact yet comprehensive and readable work.

Described by British Prime Minister Clement Attlee as "one of the wonders of the world," the Airlift was the response that demonstrated the early resolve of the Western democracies to keep communism off the backs of those who did not choose it. It and the blockade leading up to it marked the falling of the "Iron Curtain" and the beginning of the Cold War—the catalyst for the creation of the North Atlantic Treaty Organization (NATO). No one should doubt that the Airlift is the reason why there are two Berlins today—and why one of them is free.

Of great importance to airmen-warriors, the Berlin Airlift demonstrated the value of airlift as an essential element of modern logistics and at the same time helped improve airlift doctrine. It was *the* operation that proved to all nations that, in General Tunner's words, the United States Air Force can haul "anything, anywhere, anytime."

Jackson opens with a combined military, political, economics, and legal lesson covering the tumultuous period starting with the Nazi surrender in May 1945 and ending three years later in June 1948 with the Soviet blockade of train, Autobahn, and barge traffic into and out of the American, British, and French sectors. These sectors were home for more than 2,000,000 people.

We see a victorious Red Army that systematically raped and murdered Berliners and methodically looted, sacked, pillaged, and plundered Berlin as a matter of policy.

We are exposed to Stalin's strategy (which became clear in the spring of 1948) of emasculating Germany for all

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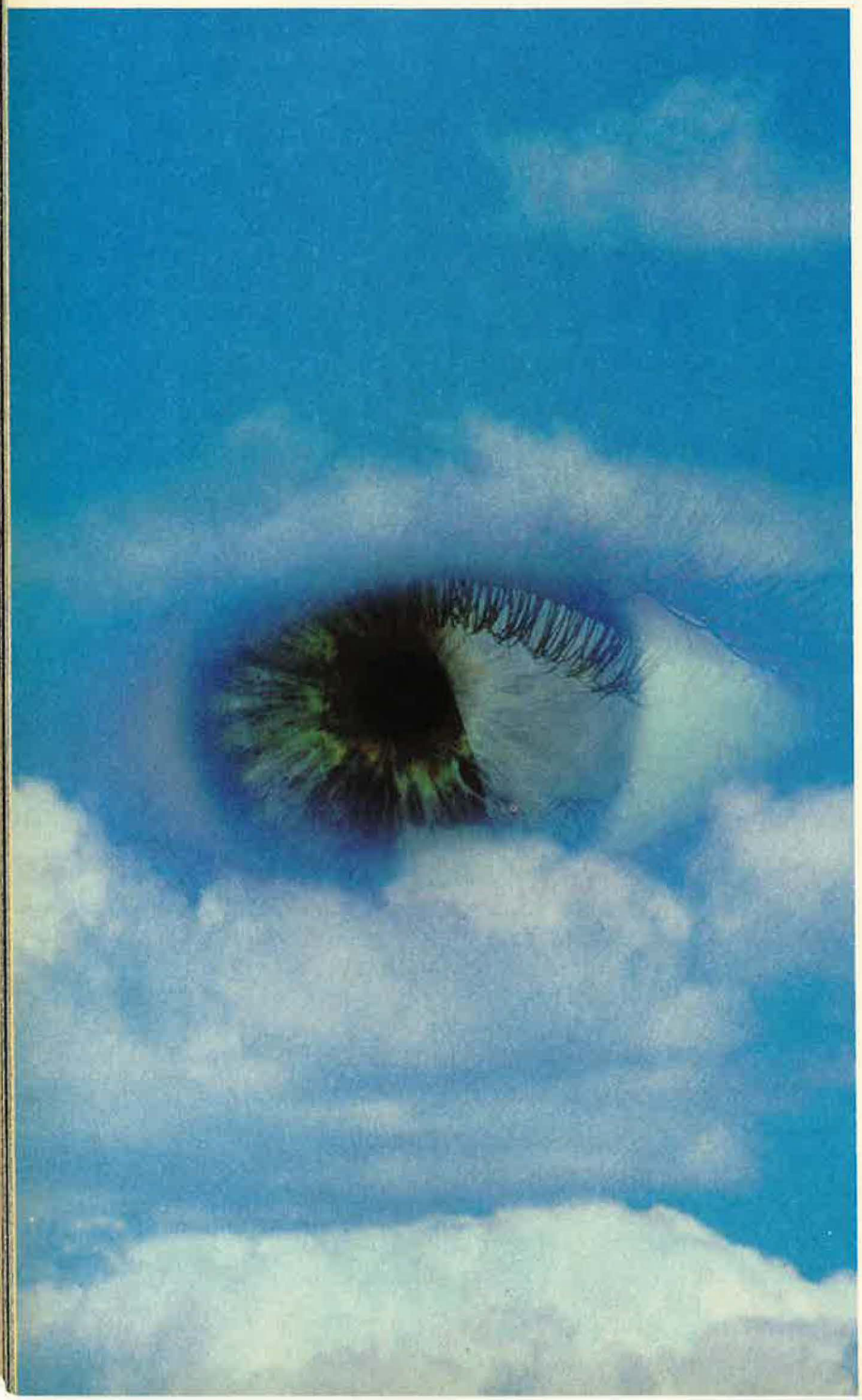

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time by driving the Allies out and consolidating the Red Army's domination over the prized capital city.

We learn that the American and British agreement to control inflation by currency reform in their sectors was too much for the Soviets to bear, for this signaled an intent to stay on their own terms. On the day currency reform was announced, the Soviets cut the electrical grid and commenced the blockade.

We discover an incredible lapse in the formulation of international law. Germany and Berlin were carved up in the war's waning days at the Yalta Conference without any mention of access to Berlin by the Allies through the surrounding Soviet zone.

Thus, the Allies were left at the start of the blockade with the three air corridors over the Soviet zone only by virtue of an oral agreement with the Soviets. Each corridor was about twenty miles wide and 10,000 feet high. These extended from Frankfurt, Hannover, and Hamburg and were serviced in West Berlin by three airdromes—Tempelhof in the American sector, Gatow in the British, and Tegel (built in about 100 days during the Airlift) in the French.

They were protected by a string of fighter bases in West Germany under the operational control of the United States Air Forces in Europe (USAFE), then commanded by Lt. Gen. Curtis LeMay. They were also backed up by USAF B-29s that were soon deployed to England at LeMay's urging. (Stalin did not know at the time that there were only two atomic weapons left in the United States inventory.)

The author gives a superb and detailed account of Airlift leadership and operations. It did not take long for the newly established USAF to bring in the world's greatest airlift commander, then-Major General Tunner. One of his men would eventually conclude that "if General Tunner were running the lion-taming act for Barnum and Bailey, the lion would put his head in Tunner's mouth." Even General LeMay resorted to the circus analogy: "It was . . . like appointing John Ringling to get the circus on the road."

Tunner believed that airlift experts run airlifts better than combat experts. He wasted no time in making this known to his USAFE bosses. He believed that, in a successful all-out airlift, an airplane must be in one of

four modes at all times: flying, being loaded, being unloaded, or being maintained. His planes flew twenty-five percent of the time, were loading or unloading thirty-five percent of the time, and were in maintenance the remaining forty percent. He also believed that a pilot should either be flying or sleeping and ground crews working or sleeping.

Tunner also believed in split-second timing to achieve both efficiency and safety. In Berlin, an airplane took off or landed every ninety seconds, flew instrument flight rules no matter the weather, and broadcast its number over landmarks (radio beacons) to establish the proper interval in the corridors. If a pilot missed his landing in Berlin for any reason, he turned around and went home. There was no time to get in the pattern for a second try.

All of this was necessary to bring in the imposing tonnage that was needed every day—about 5,600 tons of coal, food, gasoline, and machinery. The record for any single day—set on Easter Sunday 1949—was 12,941 tons carried on 1,398 flights. This represented about one round trip for every minute of the day.

The total for the entire Airlift, which ran fifteen months from June 1948 to August 1949, was 2,323,067 tons on 276,926 flights. This amounted to the greatest airlift operation in the history of the world, and it remains so today. The next largest—the United States resupply of Israel during the Yom Kippur War of 1973—did not even come close.

To accomplish this massive feat, Tunner directed a fleet of USAF C-47, C-54, and C-74 aircraft; British Dakotas, Yorks, Hastings, and Sunderlands; and civil "wet-lift" tankers (converted Lancasters, Halifaxes, and Tudors). There were also units from Australia, New Zealand, and South Africa, and US Navy seaplanes were called on to carry bulk salt since they had been treated to resist salt corrosion.

General Tunner's problems were legion—the worst weather in Germany in years (low cloud cover, fog, freezing rain, heavy turbulence, ice, severe cold), dampness that shorted out electrical systems, a shortage of instrument calibration equipment, "clutter" on the radar scopes that made traffic control in the corridors tricky at best, insufficient hangars for indoor maintenance away from the cold, scant ramp space for loading and unloading, deficient railhead capacity in West Germany, and air and ground crew stress. Thirty-six-hour work shifts were not uncommon for crews.

There were also high-rise structures near Tempelhof that made landing in bad weather a frightful experience, the challenge of building Tegel, "makeshift" crew quarters, the need for replacement training units at home, sluggish depot-level maintenance, and technical deficiencies in the command structure that governed Tunner's interface with USAFE and the US Military Governor of Berlin, Gen. Lucius D. Clay. And there were air and ground accidents and fatalities—but less than a fair share, thanks to Tunner's methods.

The Soviets played their part, too. "Owning" the airspace in the corridors above 10,000 feet, they established air-to-ground ranges in their zone and would send their fighters to shoot at targets on the ground from above 10,000 feet. In between, of course, were Tunner's airplanes. The Soviets also attempted to jam radio frequencies and trained blinding searchlights on the airlifters from the ground.

Jackson doesn't neglect the human dimension of the operation. For instance, he devotes an entire chapter to the jokes that the crews played and told.

But no tale of the Airlift would be complete without the story of the Mormon pilot from Utah, Lt. Gail Halvorsen, the champion of the German children. Jackson tells how Halvorsen—after seeing that the starving and beaten children of West Berlin did not even have the spirit to beg for food—brought them fun and laughter by dropping chocolate bars and gum on handkerchief "parachutes" from his C-54. This endeavor was later organized into a formal recurring event known as Operation "Little Vittles," and Halvorsen became known to the children as *Der Schokoladeflieger*—"The Chocolate Airman."

Eventually, the Soviets saw the futility of the blockade and gave it up, about a year after starting it. The Airlift continued for three more months to stockpile supplies. But the massive operation had saved West Berlin. The author spells out the clear legacy of the Airlift: West Berlin is free, and NATO stands guard over Western Europe.

Today, Military Airlift Command is an existing and ready force. The Berlin Airlift proved what airlifters can do. Indeed, the whole world now knows without a doubt that the

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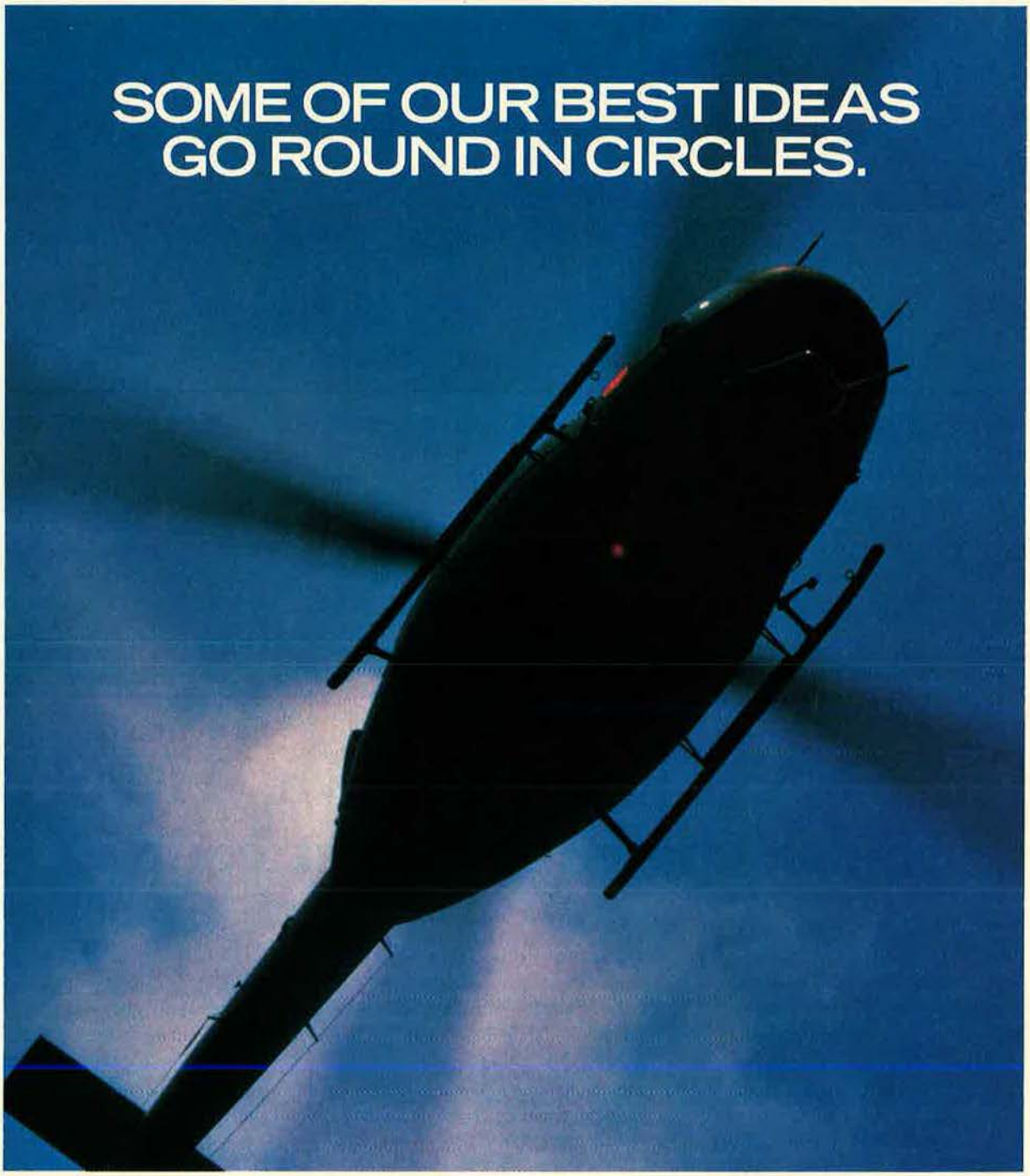

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—Reviewed by Col. John R. Brancato, USAF. Colonel Brancato is the Staff Judge Advocate of Air Force Logistics Command's Ogden Air Logistics Center at Hill AFB, Utah.

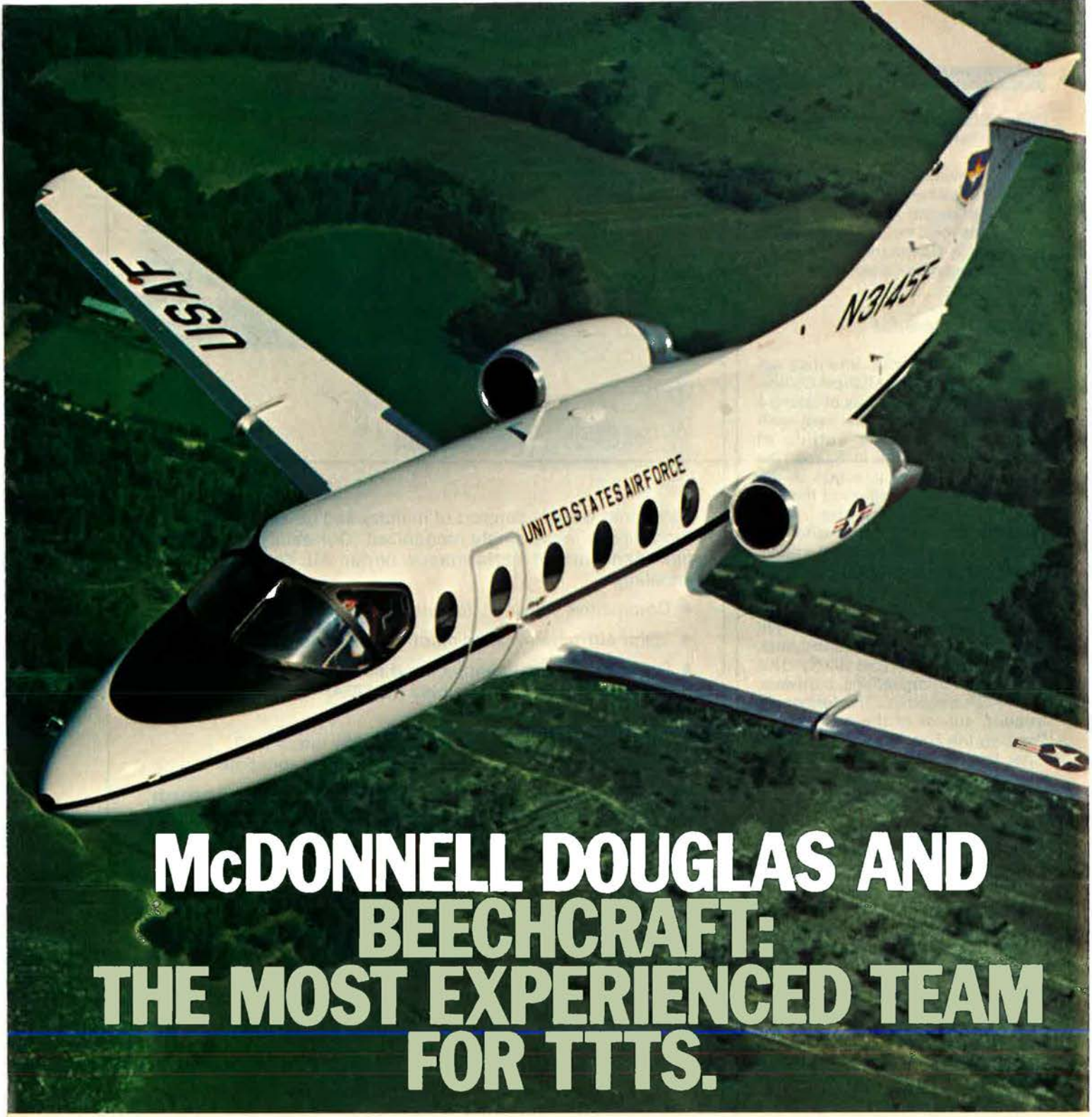
New Books in Brief

Liftoff: The Story of America's Adventure in Space, by Michael Collins. Michael Collins has a way of telling a story. Even if a reader is already well-acquainted with the outline of "America's Adventure in Space," he or she will find satisfaction in the freshness of this retelling of the history of the space age and insight through the eyes of one who was there and watched the story unfold. Space enthusiasts will especially enjoy Collins's accounts of space travel and his speculations regarding how man will eventually come to live and work beyond the earth's atmosphere, and nuts-and-bolts types will heed his discussions of operations, hardware, and NASA tragedies. The former astronaut, author of the best-selling *Carrying the Fire,* apparently has another best-seller on his hands. With illustrations. Grove Press, New York, N. Y., 1988. 352 pages. $25.

Total Force: Flying With America's Reserve and Guard, photography by George Hall (with text interviews by Jeffrey Ethell). The camera lens is fixed tightly on the various aircraft of the US reserve forces in this glossy picture book from Thomasson-Grant. Longtime aviation photographer George Hall, who has flown in more than 100 different aircraft models, mounts up and shoots the fighter/attack aircraft, airlifters and tankers, special types, and helicopters belonging to the nation's erstwhile "weekend-warriors." Jeff Ethell's complementary interviews of anonymous reservists are as effective in portraying the airmen as is Hall's photography in capturing their aircraft. The book opens with an introduction by retired Sen. Barry Goldwater and concludes with a facts section on the aircraft that includes specifications and three-view drawings. Thomasson-Grant, Inc., Charlottesville, Va., 1988. 168 pages. $39.95.

We Shall Return! edited by William M. Leary. Subtitled *MacArthur's Commanders and the Defeat of Japan,* this collection of essays by military historians surveys the overshadowed lieutenants of the man whom Stanley L. Falk calls "perhaps the most dramatic, exciting, and controversial general of World War II." Americans on the home front came to know of "MacArthur's army," "MacArthur's navy," and "MacArthur's air force," learning little of such able subordinate officers as Army Gen. Robert L. Eichelberger, who is reported to have protested to a public-relations officer: "I would rather have you slip a rattlesnake in my pocket than to have you give me any publicity." AIR FORCE Magazine readers will be especially interested in Herman Wolk's essay on George C. Kenney and Donald Goldstein's profile of Ennis C. Whitehead. With notes, maps, bibliographical essay, and index. The University Press of Kentucky, Lexington, Ky., 1988. 320 pages. $25.

—Reviewed by Hugh Winkler, Assistant Managing Editor.



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(State names refer to winner's home state at time of award.)

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1956	Thos. F. Stack (California)
1957	George D. Hardy (Maryland)
1958	Jack B. Gross (Pennsylvania)
1959	Carl J. Long (Pennsylvania)
1960	O. Donald Olson (Colorado)
1961	Robert P. Stewart (Utah)
1962	*(no presentation)*
1963	N. W. DeBenardinis (Louisiana) and Joe L. Shosid (Texas)
1964	Maxwell A. Kriendler (New York)
1965	Milton Caniff (New York)
1966	William W. Spruance (Delaware)
1967	Sam E. Keith, Jr. (Texas)
1968	Marjorie O. Hunt (Michigan)
1969	*(no presentation)*
1970	Lester C. Curl (Florida)
1971	Paul W. Gaillard (Nebraska)
1972	J. Raymond Bell (New York) and Martin H. Harris (Florida)
1973	Joe Higgins (California)
1974	Howard T. Markey (Washington, D. C.)
1975	Martin M. Ostrow (California)
1976	Victor R. Kregel (Texas)
1977	Edward A. Stearn (California)
1978	William J. Demas (New Jersey)
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1980	David C. Noerr (California)
1981	Daniel F. Callahan (Florida)
1982	Thomas W. Anthony (Maryland)
1983	Richard H. Becker (Illinois)
1984	Earl D. Clark, Jr. (Kansas)
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1986	John P. E. Kruse (New Jersey)
1987	Jack K. Westbrook (Tennessee)

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	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.)

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	Senators 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	Senator 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 SEA (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, Chairman, Joint Chiefs of Staff
1975	Hon. James R. Schlesinger, Secretary of Defense
1976	Senator Barry M. Goldwater
1977	Senator Howard W. Cannon
1978	Gen. Alexander M. Haig, Jr., USA, Supreme Allied Commander, Europe
1979	Senator John C. Stennis
1980	Gen. Richard H. Ellis, Commander in Chief, Strategic Air Command
1981	Gen. David C. Jones, Chairman, Joint Chiefs of Staff
1982	Gen. Lew Allen, Jr., USAF (Ret.), former Chief of Staff, USAF
1983	Ronald 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

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, US Secretary of Defense
1987	Hon. Edward C. Aldridge, Jr., Secretary of the Air Force

AFA's Regions, States, and Chapters

The figures on the right indicate the number of affiliated members as of June 30, 1988. Listed below the name of each Region is the name of the National Vice President for that Region.

CENTRAL EAST REGION 15,786
Charles G. Durazo

Delaware	1,608
Blue Hen	50
Delaware Galaxy	1,183
Diamond State	241
Henlopen Area	37
University	44
Wilmington	53
District of Columbia	1,891
Nation's Capital	1,891
Kentucky	758
General Russell E. Dougherty	562
Lexington	196
Maryland	3,271
*Baltimore	934
Central Maryland	371
Thomas W. Anthony	1,966
Virginia	7,952
Danville	35
Donald W. Steele, Sr., Memorial	3,414
Jack Manch	87
Langley	3,106
Leigh Wade	130
Lynchburg	86
Richmond	300
Roanoke	340
Tidewater	286
William A. Jones III	168
West Virginia	306
Chuck Yeager	306

FAR WEST REGION 40,698
David Graham

Arizona	6,680
Barry Goldwater	274
Cochise	73
Frank Luke	1,757
Green Valley	61
Phoenix Sky Harbor	1,796
Tucson	2,719
California	28,721
Antelope Valley	902
David J. Price/Beale	1,095
*Fresno	646
General B. A. Schriever Los Angeles	1,468
General Curtis E. LeMay	1,553
*General Doolittle/Los Angeles Area	3,329
General Robert F. Travis	3,232
*Golden Gate	756
High Desert	1,069
Maj. Gen. Charles I. Bennett, Jr.	921
Monterey Bay Area	356
Pasadena Area	519
Redwood Empire	444
Riverside County	1,401
Robert H. Goddard	1,701
Sacramento	3,909
San Bernardino Area	2,507
San Diego	1,348
Tennessee Ernie Ford	1,395
Ventura County	170
Guam	478
Guam-Arc Light	478
Hawaii	1,779
*Hawaii	1,753
Maui	26
Nevada	3,040
Dale O. Smith	430
Thunderbird	2,610

GREAT LAKES REGION 22,778
Walter G. Vartan

Illinois	6,013
Chicagoland-O'Hare	1,452
Greater Rockford	41
Illini	1,003
Land of Lincoln	218
Quad Cities	178
Richard E. Carver	185
Scott Memorial	2,547
West Suburban	389
Indiana	2,243
Central Indiana	434
Fort Wayne-Baer Field Area	223
Grissom Memorial	670
Gus Grissom	195
Lawrence D. Bell Museum	36
Lester W. Johnston	40
South Bend	302
Southern Indiana	193
Terre Haute-Wabash Valley	150
Michigan	4,129
Battle Creek	348
General Claire Chennault	320
Hoyt S. Vandenberg	464
Huron	741
James H. Straubel	404
Kalamazoo	203
Keweenaw	29
Lake Superior-Northland	1,086
Lloyd R. Leavitt, Jr.	95
Mid Michigan	39
Mount Clemens	335
PE-TO-SE-GA	65
Ohio	9,161
Buckeye Skypower	254
*Capt. Eddie Rickenbacker Memorial	743
Cincinnati	406
Cleveland	661
Frank P. Lahm	275
Mid-Ohio	422
Steel Valley	252
*Wright Memorial	6,148
Wisconsin	1,232
Badger State	204
Billy Mitchell	726
Madison	302

MIDWEST REGION 10,525
Donald D. Adams

Iowa	690
All-Iowa	516
Richard D. Kisling	174
Kansas	1,503
Air Capital	1,034
Contrails	52
Topeka	417
Missouri	2,473
Central Missouri	588
Harry S. Truman	588
Ozark	168
Spirit of St. Louis	1,129
Nebraska	5,859
Ak-Sar-Ben	5,537
Lincoln	322

NEW ENGLAND REGION 7,264
Joseph R. Falcone

Connecticut	1,596
Central Connecticut	156
Charles A. Lindbergh	297
First Connecticut	280
Flying Yankees	167
General Bennie L. Davis	63
General George C. Kenney	93
Igor Sikorsky	185
Northern Connecticut	283
Sergeant Charlton Heston	72
Maine	959
Eastern Maine	229
Major Charles J. Loring, Jr.	577
Southern Maine	153
Massachusetts	2,858
Boston	378
Laurence G. Hanscom	462
*Major John S. Southrey	375
Minuteman	264
Otis	205
Paul Revere	577
Pioneer Valley	112
Robert V. Pace	141
Taunton	132
*Worcester	212
New Hampshire	1,283
Amoskeag	274
Pease	1,009
Rhode Island	266
Metro Rhode Island	266
Vermont	302
Burlington	302

NORTH CENTRAL REGION 4,389
Paul G. Markgraf

Minnesota	1,212
General E. W. Rawlings	991
Richard Bong	221
North Dakota	1,943
General David C. Jones	889
Happy Hooligan	143
Red River Valley	911
South Dakota	1,234
Dacotah	256
Rushmore	978

NORTHEAST REGION 15,331
Jack Flaig

New Jersey	5,218
Admiral Charles E. Rosendahl	174
Aerospace Founders	41
Atlantic City Area	220
Garden State	24
Hangar One	169
High Point	76
*Hudson	132
John Currie Memorial	79
Mercer County	155
Middlesex	134
New Jersey Public Affairs	40
*Passaic-Bergen	362
Sal Capriglione	139
Teterboro-Bendix	85
Thomas B. McGuire, Jr.	2,642
Tri-County	57
Union Morris	426
West Jersey	214
Wings	49
New York	5,998
*Albany	297
Brooklyn "Key"	526
Chautauqua	80
Colin P. Kelly	1,057
Forrest L. Vosler	315
General Daniel "Chappie" James, Jr., Memorial	180
Genesee Valley	270
H. H. Arnold	389
Hudson Valley	160
Iron Gate	329
Lawrence D. Bell	474
Lloyd Schloen-Empire	55
Nassau-Mitchel	359
New York Air Reserve & CAP	45
Niagara Frontier	166
Plattsburgh	433
Queens	254
Suffolk County	224
Thomas Watson, Sr., Memorial	154
Westchester-Falcon	231
Pennsylvania	4,115
Altoona	70
Beaver Valley	91
Brandywine	150
Bucks County	32
Colonel Stuart E. Kane, Jr.	231
Eagle	75
Erie	113
Freedom	376
*Greater Pittsburgh	585
Jimmy Stewart	34
Joe Walker	141
Lehigh Valley	293
Lt. Col. B. D. "Buzz" Wagner	77
*Metropolitan Philadelphia	512
*Mifflin County	116
Olmsted	425
Pocono Northeast	191
Steel Valley	115
Total Force	281
York-Lancaster	207

NORTHWEST REGION 9,635
Edward J. Monaghan

Alaska	2,216
Anchorage	1,517
Fairbanks Midnight Sun	699
Idaho	1,088
Boise Valley	578
Magic Valley	96
Snake River Valley	414
Montana	830
Big Sky	731
Bozeman	99
Oregon	1,188
Eugene	301
Klamath Basin	71
*Portland	816
Washington	4,313
Central Washington	122
Greater Seattle	1,312
Inland Empire	1,011
Tacoma	1,868

ROCKY MOUNTAIN REGION 10,426
William J. Gibson

Colorado	6,420
Colorado Springs/Lance Sijan	3,479
Flatirons	220
General Robert E. Huyser	87
Long's Peak	180
Mile High	2,238
Pueblo	127
Weld County	89
Utah	3,080
Gold Card	298
Ogden	772
Rocky Mountain	370
Salt Lake	562
Ute	847
Wasatch	231
Wyoming	926
Cheyenne Cowboy	926

SOUTH CENTRAL REGION 13,821
James P. LeBlanc

Alabama	3,087
Birmingham	441
Gadsden	28
Mobile	327
Montgomery	1,920
Selma	72
Tennessee Valley	299
Arkansas	2,724
Blytheville	843
David D. Terry, Jr.	1,555
Fort Smith	102
Ouachita	45
Razorback	179
Louisiana	2,749
Alexandria	508
Ark-La-Tex	1,444
Baton Rouge	297
Greater New Orleans	500
Mississippi	3,093
Golden Triangle	961
Jackson	207
John C. Stennis	1,925
Tennessee	2,168
Chattanooga	148
Everett R. Cook	435
General Bruce K. Holloway	552
H. H. Arnold Memorial	476
Lt. Gen. Frank Maxwell Andrews	557

SOUTHEAST REGION 28,994
James E. "Red" Smith

Florida	14,395
Cape Canaveral	1,539
Central Florida	1,390
Citrus Belt	193
Eglin	2,712

Falcon	350
Florida Gulf Coast	293
Florida Highlands	316
Gainesville	172
General James R. McCarthy	291
General Nathan F. Twining	369
Gold Coast	501
Indian River	25
Jerry Waterman	1,745
John C. Meyer	301
John W. Demilly, Jr.	733
Miami	495
Morgan S. Tyler	230
Ocala	49
On Wings of Eagles	37
Panama City	1,582
Peace River	75
Southwest Florida	225
Tallahassee	257
West Palm Beach	515
Georgia	6,398
Athens	145
Atlanta	546
Carl Vinson Memorial	3,776
Chattahoochee Valley	60
Coosa Valley	58
Dobbins	824
Savannah	293
South Georgia	616
Southeast Georgia	80
North Carolina	4,104
Blue Ridge	222
Cape Fear	81
Kitty Hawk	88
Piedmont	385
Pope	1,233
Roanoke Valley	31
Scott Berkeley	1,398
Tarheel	415
Triad	251
Puerto Rico	316
San Juan	316
South Carolina	3,781
Charleston	1,348
Columbia	488
Ladewig-Shine Memorial	690
Strom Thurmond	301
Swamp Fox	954
SOUTHWEST REGION	38,597
O. R. Crawford	
New Mexico	3,881
Albuquerque	1,791
Fran Parker	1,222
Llano Estacado	868
Oklahoma	7,207
Altus	951
Central Oklahoma (Gerrity)	4,820
Enid	997
Tulsa	439
Texas	27,509
Abilene	1,233
Aggieland	179
Alamo	9,972
Austin	2,264
Concho	663
Corpus Christi	161
Dallas	1,356
Del Rio	725
Denton	170
Fort Worth	5,187
Ghost Squadron	146
Heart of the Hills	170
Houston	1,328
Lee Glasgow-Waco	201
Lubbock	985
Northeast Texas	269
Panhandle AFA	152
Paso Del Norte	238
Permian Basin	276
Wichita Falls	1,834

*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.

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
(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. Shosid
(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)

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 the 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

AFA's Expanding Network of Active Units Overseas

AFA UNIT	LOCATION
United States Air Forces in Europe (USAFE)	
Ankara	Ankara AS, Turkey
Appia	San Vito AS, Italy
Athens	Hellenikon AB, Greece
Charlemagne	Brunssum, The Netherlands
Cotswold	RAF Fairford, United Kingdom
Dolomiti	Aviano AB, Italy
Eifel	Bitburg AB, Germany
Fens	RAF Alconbury, United Kingdom
Florennes	Florennes AB, Belgium
Gateway to Freedom	Berlin, Germany
Gregory E. Miller	Incirlik AB, Turkey
Hahn AB	Hahn AB, Germany
Izmir	Izmir AS, Turkey
Lufbery-Campbell	Ramstein AB, Germany
Maj. Gen. Robert M. White	Heidelberg, Germany
Netherlands Eagle	Soesterberg AB, The Netherlands
RAF Bentwaters	RAF Bentwaters, United Kingdom
RAF Greenham Common/ Welford	RAF Greenham Common, United Kingdom
RAF Mildenhall	RAF Mildenhall, United Kingdom
RAF Upper Heyford	RAF Upper Heyford, United Kingdom
Red Raider	Torrejon AB, Spain
Sembach	Sembach, Germany
Wiesbaden	Lindsey AS, Germany
Zaragoza	Zaragoza, Spain
Zweibrücken AB Warrior	Zweibrücken AB, Germany
Pacific Air Forces (PACAF)	
Bataan Memorial	Clark AB, Philippines
Captain Joseph McConnell, Jr.	Osan AB, Korea
Keystone	Kadena AB, Japan
Manila	Manila, Philippines
Misawa	Misawa AB, Japan
Tokyo	Tokyo, Japan
Wolf Pack	Kunsan AB, Korea
Woomera	Woomera, Australia
Supreme Headquarters Allied Powers, Europe (SHAPE)	
General Lauris 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
1987–88	Lt. Gen. James M. Keck, USAF (Ret.)	George D. Hardy

Aerospace Education Foundation

DEMONSTRATING LEADERSHIP IN HIGH-TECHNOLOGY DEFENSE SYSTEMS












- DEFENSE LOGISTICS SUPPORT
- SOURCE APPROVAL
- FREE ELECTRON LASERS
- HIGH TEMPERATURE MATERIALS/COATING
- ELECTROMAGNETIC LAUNCHERS/RAILGUNS
- NUCLEAR POWER SYSTEM
- ROBOTIC HANDLING
- RADAR ABSORBENT MATERIAL
- REPAIR TECHNOLOGIES
- LOW-COST UNMANNED AIR VEHICLES
- NEUTRON AND X-RAY RADIOGRAPHY
- HIGH TEMPERATURE SUPER-CONDUCTORS
- NEUTRAL PARTICLE BEAM
- PARTS REJUVENATION
- RELIABILITY/MAINTAIN-ABILITY ANALYSES

GENERAL ATOMICS

GENERAL ATOMICS
10955 John J. Hopkins Dr., San Diego, CA 92121
(P.O. Box 85608, San Diego, CA 92138-5608)
619/455-3702

Aerospace Education Foundation Fellows

(The following is a listing of Individual Fellows who have become Fellows since the last such listing in the September 1987 issue of this magazine.)

Individual Jimmy Doolittle Fellows

(in order of affiliation)

NAME	SPONSOR
(1987)	
Brig. Gen. John W. Williams, USAF (Ret.)	William W. Spruance
K. Harold Ledford	Wright Memorial Chapter
Philomena E. Carnicelli *(in memoriam)*	Enrico M. Carnicelli
Dominick Carnicelli *(in memoriam)*	Jack R. Carnicelli
Col. and Mrs. John H. Combs	Central Florida Chapter
Lillian P. "Billie" Hanrahan	Ark-La-Tex Chapter
Gen. Monroe W. Hatch, Jr., USAF	Brig. Gen. Roger W. Smith, USAF (Ret.)
Rufus T. Amis	L. F. and R. Travis Amis
Dr. Eberhardt Rechtin	The Aerospace Corp.
Cecil C. Coffer	Ellen L. Grasso
Gene Moneymaker	Bob Hope AFA Charity Golf Tournament
Ed Dvorak	Bob Hope AFA Charity Golf Tournament
Phil Arvizo	Bob Hope AFA Charity Golf Tournament
David C. Noerr	Bob Hope AFA Charity Golf Tournament
Raymond Dobson	General David C. Jones Chapter
Maj. Gen. Donald J. Kutyna, USAF	Iron Gate Chapter
Gen. Curtis E. LeMay, USAF (Ret.)	General Curtis E. LeMay Chapter
Brig. Gen. Thomas W. Honeywill, USAF	H. H. Arnold Chapter *(in memory of Frank X. Battersby and the Hon. Joseph P. Addabbo)*
Hon. George J. Hochbrueckner	H. H. Arnold Chapter *(in memory of Frank X. Battersby and the Hon. Joseph P. Addabbo)*
Patricia R. Muncy	AFA Board of Directors
Alfred Joseph Brenner, Sr.	Suffolk County Chapter
(1988)	
Norman J. Abramson	Central Florida Chapter
Robert W. Gregory	Thomas B. McGuire, Jr., Chapter
William A. Mann, Jr.	Thomas B. McGuire, Jr., Chapter
Maj. Gen. Dale O. Smith, USAF (Ret.)	Nevada State AFA and the Thunderbird and Dale O. Smith Chapters
Maj. Gen. Cornelius Nugteren, USAF	Carl Vinson Memorial Chapter
Brig. Gen. Winston W. Kratz, USAFR *(in memoriam)*	WW II Night Fighters
Robin L. Whittle	Iron Gate Chapter
Gen. John T. Chain, Jr., USAF	Iron Gate Chapter
Brig. Gen. James A. McDivitt, USAF (Ret.)	Cape Canaveral Chapter
Clement P. Moore	Langley Chapter
Richard W. Coughenour	Iron Gate Chapter
Rosemary Pacenta	Iron Gate Chapter
Gilbert Freeman	New Jersey State AFA
John P. E. Kruse	New Jersey State AFA
Hon. H. James Saxton	New Jersey State AFA
Leonard W. Schiff	New Jersey State AFA
Leonard R. Wilf	New Jersey State AFA
Lt. Gen. Spence M. Armstrong, USAF	Washington State AFA
James A. McDonnell, Jr.	Iron Gate Chapter
Maj. Gen. Daniel F. Callahan, USAF (Ret.)	Florida State AFA
Robert Collings	Paul Revere Chapter
Lt. Col. Donald Kuhn, USAF (Ret.)	Scott Memorial and Spirit of St. Louis Chapters
Earl D. Clark	Midwest Region

Individual Ira Eaker Fellows

(in order of affiliation)

NAME	SPONSOR
(1987)	
Gen. Earl T. O'Loughlin, USAF	Wright Memorial Chapter
Maj. William Bryant Dougherty, USAF	Mrs. Henry H. Timken, Jr.
Maj. Mark E. Dougherty, USAF	Mrs. Henry H. Timken, Jr.
Alfred R. Musi	AFA Board of Directors
Carolyn King	Friends of Carolyn King
Edward A. Stearn	Bob Hope AFA Charity Golf Tournament
Jennie Alice Law Ostrander	Lt. Col. Marjorie M. Hunt, USAF (Ret.)
Col. Francis L. Jones, USAF (Ret.)	Texas State AFA
(1988)	
Col. Bruce W. Carr, USAF (Ret.)	Central Florida Chapter
Brig. Gen. John F. Dobbin, USMC (Ret.)	Central Florida Chapter
Rear Adm. Richard E. Fowler, USN (Ret.)	Central Florida Chapter
Maj. Harry T. Hanna, USAF (Ret.)	Central Florida Chapter
Fred R. Haviland, Jr.	Central Florida Chapter
Gen. Bruce K. Holloway, USAF (Ret.)	Central Florida Chapter
Lt. Cmdr. William J. Kingston, USN (Ret.)	Central Florida Chapter
Col. Robert L. Liles, USAF (Ret.)	Central Florida Chapter
Maj. James F. Low, USAF (Ret.)	Central Florida Chapter
Col. Heyward A. Paxton, Jr., USAF (Ret.)	Central Florida Chapter
Cmdr. Joseph E. Ruelet, USN (Ret.)	Central Florida Chapter
Brig. Gen. Donald K. Yost, USMC (Ret.)	Central Florida Chapter
Hon. Frank C. Carlucci	Nation's Capital Chapter
Harriett Helen Ostrander Johnson *(in memoriam)*	Lt. Col. Marjorie M. Hunt, USAF (Ret.)
Gen. Bernard P. Randolph, USAF	Charles A. Lindbergh Chapter
Gen. John T. Chain, Jr., USAF	Iron Gate Chapter
Gen. Duane H. Cassidy, USAF	Iron Gate Chapter
Hon. John P. Murtha	Nation's Capital Chapter
Hon. Joseph M. McDade	Nation's Capital Chapter
Frank S. Kula	New Jersey State AFA
Brig. Gen. Russell C. Davis, USAF	Thomas W. Anthony Chapter
CMSgt. Robert L. Ellison, USAF	Scott Memorial and Spirit of St. Louis Chapters

Individual Barry Goldwater Fellows

(in order of affiliation)

NAME	SPONSOR
(1987)	
Sen. Barry Goldwater	Air Force Association and Aerospace Education Foundation
Bill Borchert Larson	Florence Borchert Bartling
Meryll M. Frost	Arizona State AFA
Gen. James H. Doolittle, USAF (Ret.)	California State AFA
Mrs. James H. Doolittle	California State AFA
Lt. Gen. Kenneth L. Tallman, USAF (Ret.)	Brig. Gen. William W. Spruance, USAF (Ret.)
Edgar E. Ulsamer	AFA Board of Directors
(1988)	
Dorothy Welker	Iron Gate Chapter
Gen. R. E. "Dutch" Huyser, USAF (Ret.)	Scott Memorial and Spirit of St. Louis Chapters

Aerospace Education Foundation 1987–88 AFJROTC Contest Winners

Subject: "Aerospace Heroes of Today"

First-place Winner ($1,000 and distinctive plaque)

West Anchorage High School, Anchorage, Alaska
(Category: Sound/Slide)

Individual Category Winners ($500 and distinctive plaque)

Videotape: Scotch Plains-Fanwood High School, Fanwood, N. J.

Essay: Belton-Honea Path High School, Belton, S. C.

Sound/Slide: West Anchorage High School, Anchorage, Alaska

Artwork: Apollo High School, Owensboro, Ky.

AFA announces a new membership benefit for...

PERSONNEL in TRANSITION

THE AFA INTRODUCES...

...a NEW resource for employers...
...a NEW no cost alternative for Air Force personnel in transition...
...The ETS "Data Base".

A NEW ALTERNATIVE

People in search of employment are usually advised to consider outplacement counseling, working with agencies, classified ads, extensive mailings and networking. Retiring or separating military personnel are further advised to construct a professional resume that expresses their work experience in civilian terms. Personnel in transition could use all of the above but should also be certain to take advantage of the free alternative offered by AFA—the ETS Data Base and Employment Transition Service.

THE ETS DATA BASE

ETS has created a software program which is unique—it can translate military work experience into terms more understandable to civilian employers. In addition, ETS maintains a staff of military personnel specialists to insure that its clients in industry fully appreciate the unique skills and extraordinary training acquired during military service.

ETS MARKETS TO INDUSTRY

ETS does so at no cost to the job seeker and on very attractive terms to employers. The ETS marketing plan is designed to create a base of industrial clients which will have needs at all skill levels and at locations throughout the USA and overseas.

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Unit Reunions

Brady Aviation School
Students and personnel who attended or served at Brady Aviation School, Tex. (Curtis Field), will hold a reunion on October 15, 1988, at Curtis Field, Hangar 1, in Brady, Tex. **Contact:** Col. A. W. Groves, USAF (Ret.), 900 S. Bridge St., Brady, Tex. 76825. Phone: (915) 597-0330.

The Chosin Few
Korean War veterans of the Chosin Reservoir Campaign, "The Chosin Few," will hold a reunion on November 30–December 3, 1988, in Orlando, Fla. **Contact:** Paul Hirt, 1487 Chain Bridge Rd., Suite 100, McLean, Va. 22101. Phone: (703) 448-1300.

Judge Advocates Ass'n
Retired Air Force Judge Advocates will hold a reunion on September 28–October 2, 1988, at the Contemporary Hotel at the Disney World Resort in Orlando, Fla. **Contact:** Col. Tom Krauska, USAF (Ret.), 401 Candleglo, San Antonio, Tex. 78239. Phone: (512) 655-3112.

USAF Academy
Friends and associates of Ben Martin, former US Air Force Academy head football coach (1958–77), are planning a thirtieth anniversary celebration in his honor on October 7–8, 1988, in Colorado Springs, Colo. **Contact:** Col. Randy Cubero, USAF, Hq. USAFA/DFF, Colorado Springs, Colo. 80840. Phone: (719) 472-3820. AUTOVON: 259-3820.

USAF Helicopter Pilot Ass'n
Helicopter pilots who served in Air Force units will hold a reunion on October 6–8, 1988, at the El Tropicano Hotel in San Antonio, Tex. **Contact:** Jimmy M. Hamill, 212 Suncliff Dr., Universal City, Tex. 78148. Phone: (512) 658-1467.

USAFSS/ESC Ass'n
Members of the US Air Force Security Service and the Electronic Security Command Association will hold a reunion on September 23–24, 1988, in San Antonio, Tex. **Contact:** Hq. CESD/CC, Attn: USAFSS/ESC Association, San Antonio, Tex. 78243-5000.

1st Fighter Group Ass'n
The 1st Fighter Group will hold its reunion on September 15–18, 1988, at the Air Force Museum in Dayton, Ohio. Members of the 1st Tactical Fighter Wing are also welcome. **Contact:** Clifford E. Laechelin, 4914 Pepperwood Dr., Dayton, Ohio 45424.

2d Mobile Communication Group
The 2d Mobile Communication Group will hold a reunion on October 21–23, 1988. **Contact:** Bruce Dixon, 9631 Annandale Dr., San Antonio, Tex. 78239. Phone: (512) 654-6640.

3d Strategic Support Squadron
Members of the 3d Strategic Support Squadron will hold a reunion on October 13–16, 1988, at the St. Anthony Intercontinental Hotel in San Antonio, Tex. **Contact:** Charles Nolter, 6231 Rue Sophie, San Antonio, Tex. 78238. Phone: (512) 684-4616.

4th Fighter Wing
Korean War veterans of the 4th Fighter Wing will hold a reunion on September 15–18, 1988, at the Sheraton Inn in Colorado Springs, Colo. **Contact:** Col. Martin C. "Joe" Johansen, USAF (Ret.), 7040 Switchback Trail, Colorado Springs, Colo. 80919. Phone: (719) 599-9793.

18th Troop Carrier Squadron
Members of the 18th Troop Carrier Squadron (WW II) will hold a reunion on October 6–9, 1988, in San Diego, Calif. **Contact:** W. V. Harris, Homeland, Calif. 92348. Phone: (714) 926-3324.

20th Fighter Group Ass'n
The 20th Fighter Group and the 97th Service Group (Kingscliffe, England) will hold a reunion on September 22–25, 1988, in St. Louis, Mo. **Contact:** Matthew Cicero, 1903 Boscobel Ct., Rockford, Ill. 61107.

27th Fighter-Bomber Group
Members of the 27th Fighter-Bomber Group (WW II) will hold a reunion on October 6–8, 1988, at the Breckenridge Hotel in St. Louis, Mo. **Contact:** Jack Wasserman, 561 Purdue Ave., St. Louis, Mo. 63130. Phone: (314) 725-5764.

Class 40-D
Members of Class 40-D will hold a reunion on October 20–23, 1988, in San Antonio, Tex. **Contact:** C. B. Burgess, P. O. Box 34690, San Antonio, Tex. 78265-4690. Phone: (512) 655-4020.

41st Bomb Group
Members of the 41st Bomb Group, Seventh Air Force, will hold a reunion on September 22–25, 1988, at the Desert Inn in Las Vegas, Nev. **Contact:** Eugene Olsen, 2100 Meridian Park Blvd., Concord, Calif. 94520. Phone: (415) 825-8151.

Class 42-H
Members of Class 42-H (Kelly Field, Tex.) will hold a reunion on September 27–30, 1988, in Albuquerque, N. M. **Contact:** Allan F. Beck, 4905 Casa del Oso N. E., Albuquerque, N. M. 87111.

48th Fighter Squadron
Veterans of the 48th Fighter Squadron (WW II) will hold a reunion on September 18–21, 1988, at the Sacramento Hilton in Sacramento, Calif. **Contact:** Wayne Hubbard, 5024 J Parkway, Sacramento, Calif. 95823. Phone: (916) 428-2579.

51st Troop Carrier Wing
The 51st Troop Carrier Wing (WW II) will hold a reunion in Tampa, Fla., on November 4–6, 1988. **Contact:** Lewis Hodge, 8749 Beacon St., Fort Myers, Fla. 33907.

74th Tactical Recon Group
The 74th Tactical Reconnaissance Group will hold a reunion on October 20–22, 1988, at the Embassy Suites Hotel in Orlando, Fla. **Contact:** Phil Cook, 7771 Vale Dr., Whittier, Calif. 90602. Phone: (213) 693-4035.

79th Fighter Group
Members of the 79th Fighter Group, which included the 85th, 86th, and 87th Fighter Squadrons, will hold a reunion on September 30–October 2, 1988, at the Air Force Museum at Wright-Patterson AFB, Ohio. **Contact:** Edwin Newbould, 1206 S. E. 27th Terrace, Cape Coral, Fla. 33904. Phone: (813) 574-7098.

96th Bomb Group Ass'n
The 96th Bomb Group will hold its reunion in conjunction with the 8th Air Force Historical Society on October 12–18, 1988, in Des Moines, Iowa. **Contact:** Thomas L. Thomas, 1607 E. Willow Ave., Wheaton, Ill. 60187. Phone: (312) 668-0215.

107th Tactical Recon Squadron
Members of the 107th Tactical Reconnaissance Squadron (WW II) will hold a reunion on September 21–25, 1988, in San Antonio, Tex. **Contact:** Harry J. Huff II, 95 Bluet Lane, San Antonio, Tex. 78213. Phone: (512) 341-5868.

111th Tactical Recon Squadron
The 111th Tactical Reconnaissance Squadron (WW II) will hold a reunion on October 5–8, 1988, at the Hampton Inn in San Antonio, Tex. **Contact:** William H. Humble, 211 Trudell Dr., San Antonio, Tex. 78213. Phone: (512) 342-2762.

152d Observation Squadron
Members of the 152d Observation Squadron and the 152d Fighter Squadron (1939–55) will hold a reunion on November 6, 1988, at the Club 42 (FRC) in Davisville, R. I. **Contact:** Don Guilfoyle, 233 Grand View Rd., East Greenwich, R. I. 02818. Phone: (401) 884-2481.

310th Bomb Wing Ass'n
Veterans of the 310th Bomb Wing (Schilling AFB, Kan.) will hold a reunion on October 18–21, 1988, at the Melbourne Oceanfront Holiday Inn in Indialantic, Fla. **Contact:** Warren Stromberg, 391 E. Riviera Blvd., Indialantic, Fla. 32903. Phone: (305) 725-5560.

318th Troop Carrier Squadron
The 318th Troop Carrier Squadron (WW II)

This Is AFA

The Air Force Association is an independent, nonprofit, aerospace organization serving no personal, political, or commercial interests; established January 26, 1946; incorporated February 4, 1946.

OBJECTIVES: The Association provides an organization through which we as a free people may unite to address the defense responsibilities of our nation imposed by the dramatic advance of aerospace technology; to educate the members and the public at large in what that technology can contribute to the security of free people and the betterment of mankind; and to advocate military preparedness of the United States and its allies adequate to maintain the security of the United States and the free world.

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and the 343d Airdrome Squadron will hold a reunion on September 29–October 2, 1988, in Memphis, Tenn. **Contact:** Robert C. Thompson, 608 St. Andrews Way, Lompoc, Calif. 93436. Phone: (805) 733-2041.

330th Bomb Group Ass'n
The 330th Bomb Group will hold its reunion on September 29–October 1, 1988, at the Holiday Inn at Tucson IAP, Ariz. **Contact:** Don Murray, 1101 Peck Rd., Richmond, Va. 23235.

341st Fighter Squadron Ass'n
Members of the 341st Fighter Squadron, 348th Fighter Group, Fifth Air Force, will hold a reunion on September 22–25, 1988, in Austin, Tex. **Contact:** Ed McCarty, 5200 Old Manor Rd., Austin, Tex. 78723. Phone: (512) 926-3608.

359th Fighter Group
Members of the 359th Fighter Group, which included the 368th, 369th, and 370th Fighter Squadrons and associated units (WW II), will hold a reunion on October 6–9, 1988, at the South Portland Motor Inn in South Portland, Me. **Contact:** Robert M. York, P. O. Box 336, Old Orchard Beach, Me. 04064.

388th Fighter-Bomber Wing
Members of the 388th Fighter-Bomber Wing who were stationed at Clovis AFB, N. M., and Etain AB, France (1954–58), will hold a reunion on September 29–October 2, 1988, at the Holiday Inn in Fort Walton Beach, Fla. **Contact:** 388th FBW Reunion Committee, P. O. Box 1837, Fort Walton Beach, Fla. 32549.

391st Bomb Group Ass'n
Members of the 391st Bomb Group, which included the 572d, 573d, 574th, and 575th Bomb Squadrons, will hold a reunion on October 6–8, 1988, at the Embassy Suites Hotel at Tampa IAP, Fla. **Contact:** Tommy F. Tucker, 410 Sutherlin Pl., Danville, Va. 24541. Phone: (804) 797-2848.

397th Bomb Group Ass'n
Members of the 397th Bomb Group (WW II) will host the B-26 Marauder Monument final dedication ceremony on September 23, 1988, in the memorial park at Wright-Patterson AFB, Ohio. **Contact:** Nevin F. Price, P. O. Box 1786, Rockville, Md. 20850. Phone: (301) 460-4488.

488th Bomb Squadron
The 488th Bomb Squadron, 340th Bomb Group (WW II), will hold a reunion on October 5–9, 1988, at the Westpark Hotel in Rosslyn, Va. **Contact:** Robert L. Gilliam, P. O. Box 947, Warrenton, Va. 22186.

Class 39-A
I would like to hear from anyone from Class 39-A who would be interested in holding a reunion next year.
Please contact the address below.
King Parker, Jr.
1403 Via Loma
Walnut Creek, Calif. 94598

Class 54-F
I would like to hear from members of Class 54-F who would be interested in holding a reunion.
Please contact the address below.
John R. Costello
5334 Spindrift Ct.
Camarillo, Calif. 93010

63d AAFFTD
A reunion is in the planning stages for former cadets and employees who attended or served with the 63d AAFFTD School at Douglas, Ga.
Paul D. Schlundt
3149 N. Winfield Ave.
Indianapolis, Ind. 46222
or
Buddy R. Guest
429 Fairmont Dr.
DeKalb, Ill. 60115
Phone: (317) 924-1825 (Schlundt)
(815) 756-7690 (Guest)

313th Air Transport Squadron
Former members of the 313th Air Transport Squadron, 31st Air Transport Group, ETO (1943–45), are planning to hold a reunion. Please contact the address below for additional information.
Leonard E. McCrary
6746 Ridgeview Circle
Dallas, Tex. 75240

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Power Equipment ☐ Brakes ☐ Steering
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☐ Mirrors ☐ Windows ☐ Tailgate/trunk release
☐ Seats _____ driver _____ passenger _____ bench
Radio ☐ AM ☐ AM/FM Stereo
☐ AM/FM Stereo with cassette player
☐ AM/FM Stereo w/cassette & premium sound
Roof ☐ Full vinyl ☐ Other _____
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☐ Cruise control ☐ Console
☐ Defogger, rear window ☐ Glass, tinted
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And the New 'Expense Protector' Benefit

While CHAMPUS Supplement coverage was originally intended to cover the cost of medical services not provided by CHAMPUS, practitioners and service institutions may charge fees that are considerably greater than those approved for payment by CHAMPUS. And, because Supplement policies traditionally base their payments on the amount paid by CHAMPUS, the insured can be left with sizable out-of-pocket expenses. AFA's ChamPLUS® coverage includes a special feature which places a limit on these out-of-pocket expenses.

Called the 'Expense Protector' Benefit, this program limits out-of-pocket expenses for CHAMPUS covered charges in any single calendar year to $1,000 for any one insured person (or $2,000 for all insured family members combined). Once those out-of-pocket expense maximums are reached, ChamPLUS® will pay 100% of CHAMPUS covered charges for the remainder of that year.

An example of the way the 'Expense Protector' works follows. Assume you are hospitalized for 35 days, that the hospital charges you $330 per day and that this is $75 per day *more* than allowed by CHAMPUS. This would mean that you have an out-of-pocket expense of $2,625. With AFA's 'Expense Protector' benefit, your cost would be limited to $1,000. All covered costs over this amount—for the whole calendar year—would be paid by ChamPLUS®!

It's an important benefit that can mean significant savings to you and your family.

Who Is Eligible?

1. All AFA members under 65 years of age wh are currently receiving retired pay based upo their military service and who are eligible for benefits under Public Law 89-614 (CHAMPUS their spouses under age 65 and their unmarrie dependent children under age 21, or age 23 in college.

2. All eligible dependents of AFA members o active duty. Eligible dependents are spouses under age 65 and unmarried dependent chil dren under age 21 (or age 23 if in college). (There are some exceptions for older age chil dren. See "Exceptions and Limitations.")

Renewal Provision

As long as you remain eligible for CHAMPUS benefits and the Master Policy with AFA remair

AFA ChamPLUS® Benefit Schedule

Care	CHAMPUS Pays	AFA CHAMPLUS® PAYS
For Military Retirees Under Age 65 and Their Dependents		
Inpatient civilian hospital care	CHAMPUS pays 75% of allowable charges	CHAMPLUS® pays the 25% of allowable charges not paid by CHAMPUS . . . plus 100% of covered charges after out-of-pocket expenses exceed $1,000 per person (or $2,000 per family) during any single calendar year.
Inpatient military hospital care	The only charge normally made is a $7.55 per day subsistence fee, not paid by CHAMPUS.	CHAMPLUS® pays the $7.55 per day subsistence fee.
Outpatient care	CHAMPUS covers 75% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 25% of allowable charges not paid by CHAMPUS after the deductible has been satisfied . . . plus 100% of covered charges after out-of-pocket expenses exceed $1,000 per person (or $2,000 per family) during any single calendar year.
For dependents of Active Duty Military Personnel		
Inpatient civilian hospital care	CHAMPUS pays all covered services and supplies furnished by a hospital less $25 or $7.55 per day, whichever is greater.	CHAMPLUS® pays the greater of $7.55 per day or the $25 hospital charge not paid by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $7.55 per day subsistence fee, not paid by CHAMPUS.	CHAMPLUS® pays the $7.55 per day subsistence fee.
Outpatient care	CHAMPUS covers 80% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 20% of allowable charges not paid by CHAMPUS after the deductible has been satisfied . . . plus 100% of covered charges after out-of-pocket expenses exceed $1,000 per person (or $2,000 per family) during any single calendar year.

NOTE: Outpatient benefits cover emergency room treatment, doctor bills, pharmaceuticals, and other professional services. There are some reasonable limitations and exclusions for both inpatient and outpatient coverage. Please note these elsewhere in the plan description.

New 'Expense Protector' Benefit!

n force, termination of your coverage can occur nly if premiums for coverage are due and npaid, or if you are no longer an AFA member. Your certificate cannot be terminated because f the number of times you receive benefits.

Exceptions and Limitations

Coverage will not be provided for conditions for which treatment has been received during the 12-month period prior to the effective date of insurance until the expiration of 12 consecutive months of insurance coverage without further treatment. After coverage has been in force for 24 consecutive months, pre-existing conditions will be covered regardless of prior treatment. Children of active duty members over age 21 (age 23 if in college) will continue to be eligible if they have been declared incapacitated and if they are insured under CHAMPLUS® on the date so declared. Coverage for these older age children will only be provided upon a) notification to AFA and b) payment of a special premium amount.

Plan 1
For Military Retirees and Dependents

QUARTERLY PREMIUM SCHEDULE

In-Patient Benefits Only

Member's Attained Age*	Member	Spouse	Each Child
Under 50	$22.97	$ 45.12	$16.34
50-54	$34.33	$ 56.21	$16.34
55-59	$50.32	$ 60.17	$16.34
60-64	$62.98	$ 69.27	$16.34

In-Patient and Out-Patient Benefits

Under 50	$33.90	$ 61.02	$40.84
50-54	$46.59	$ 69.87	$40.84
55-59	$64.41	$ 96.11	$40.84
60-64	$77.38	$102.15	$40.84

*Note: Premium amounts increase with the member's attained age

Plan 2
For Dependents of Active Duty Personnel

ANNUAL PREMIUM SCHEDULE

In-Patient Benefits Only

	Member	Spouse	Each Child
All Ages	None	$ 9.68	$ 5.94

In-Patient and Out-Patient Benefits

All Ages	None	$38.72	$29.70

CHAMPLUS®

Coverage After Age 65

Upon attainment of age 65, the coverage of members insured under CHAMPLUS® will automatically be converted to AFA's Medicare Supplement program so that there will be no lapse in coverage. Members not wishing this automatic coverage should notify AFA prior to their attainment of age 65.

Exclusions

This plan does not cover and no payment shall be made for:

- routine physical examinations or immunizations
- domiciliary or custodial care
- dental care (except as required as a necessary adjunct to medical or surgical treatment)
- routine care of the newborn or well-baby care
- injuries or sickness resulting from declared or undeclared war or any act thereof
- injuries or sickness due to acts of intentional self-destruction or attempted suicide, while sane or insane
- treatment for prevention or cure of alcoholism or drug addiction
- eye refraction examinations
- prosthetic devices (other than artificial limbs and artificial eyes), hearing aids, orthopedic footwear, eyeglasses and contact lenses
- expenses for which benefits are or may be payable under Public Law 89-614 (CHAMPUS)

APPLICATION FOR AFA CHAMPLUS*

Group Policy GMG-FC70
Mutual of Omaha Insurance Company
Home Office: Omaha, Nebraska

Full name of Member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

Date of Birth _____ Current Age ____ Height ____ Weight ____ Soc. Sec. No. _____
Month/Day/Year

This insurance coverage may only be issued to AFA members. Please check the appropriate box below:

☐ I am currently an AFA Member.

☐ I enclose $21 for annual AFA membership dues (includes subscription ($18) to AIR FORCE Magazine).

PLAN & TYPE OF COVERAGE REQUESTED

Plan Requested (Check One)
☐ AFA CHAMPLUS* PLAN I (for military retirees & dependents)
☐ AFA CHAMPLUS* PLAN II (for dependents of active-duty personnel)

Coverage Requested (Check One)
☐ Inpatient Benefits Only
☐ Inpatient and Outpatient Benefits

Person(s) to be insured (Check One)
☐ Member Only
☐ Spouse Only
☐ Member & Spouse
☐ Member & Children
☐ Spouse & Children
☐ Member, Spouse & Children

PREMIUM CALCULATION

All premiums are based on the attained age of the AFA member applying for this coverage. Plan I premium payments are normally paid on a quarterly basis but, if desired, they may be made on either a semi-annual (multiply by 2), or annual (multiply by 4) basis.

Quarterly (annual) premium for member (age ____) $_____

Quarterly (annual) premium for spouse (based on member's age) $_____

Quarterly (annual) premium for ____ children @ $ $_____

Total premium enclosed $_____

If this application requests coverage for your spouse and/or eligible children, please complete the following information for each person for whom you are requesting coverage.

Names of Dependents to be Insured	Relationship to Member	Date of Birth (Month/Day/Year)

(To list additional dependents, please use a separate sheet.)

In applying for this coverage, I understand and agree that (a) coverage shall become effective on the last day of the calendar month during which my application together with the proper amount is mailed to AFA, (b) only hospital confinements (both inpatient and outpatient) or other CHAMPUS-approved services commencing after the effective date of insurance are covered and (c) any conditions for which I or my eligible dependents received medical treatment or advice or have taken prescribed drugs or medicine within 12 months prior to the effective date of this insurance coverage will not be covered until the expiration of 12 consecutive months of insurance coverage without medical treatment or advice or having taken prescribed drugs or medicine for such conditions. I also understand and agree that all such pre-existing conditions will be covered after this insurance has been in effect for 24 consecutive months.

Date _____, 19 ____ _____
Member's Signature

Form 6173GH App.
9-88

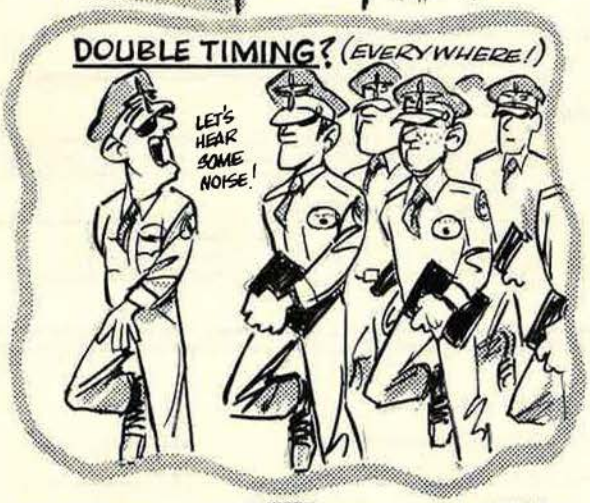
Application must be accompanied by a check or money order. Send remittance to: Air Force Association, Insurance Division, 1501 Lee Highway, Arlington, VA 22209-1198

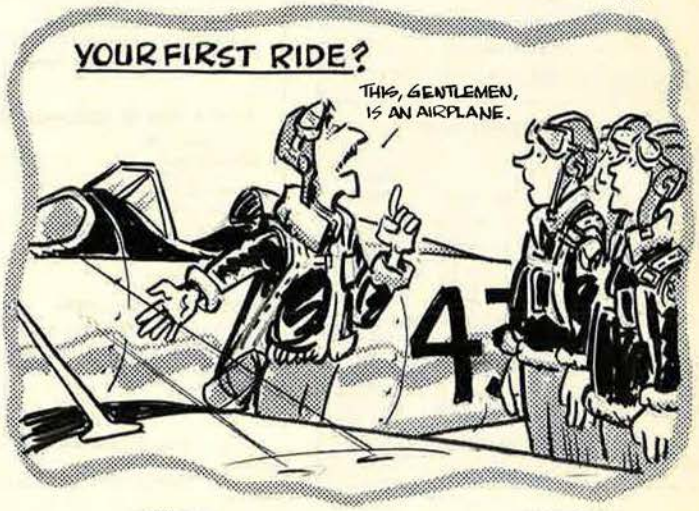
Bob Stevens'

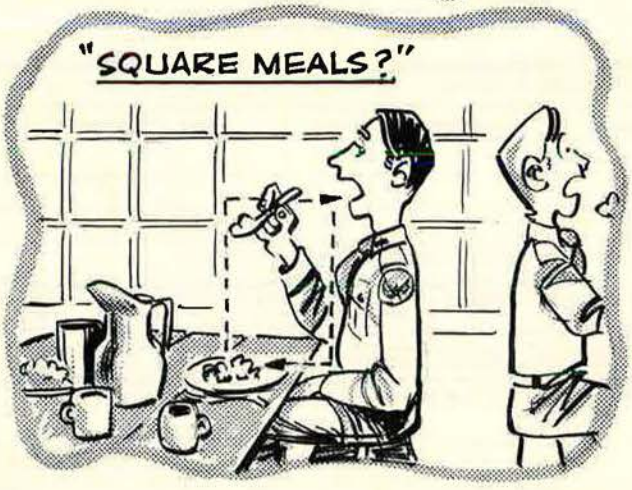
"There I was..."

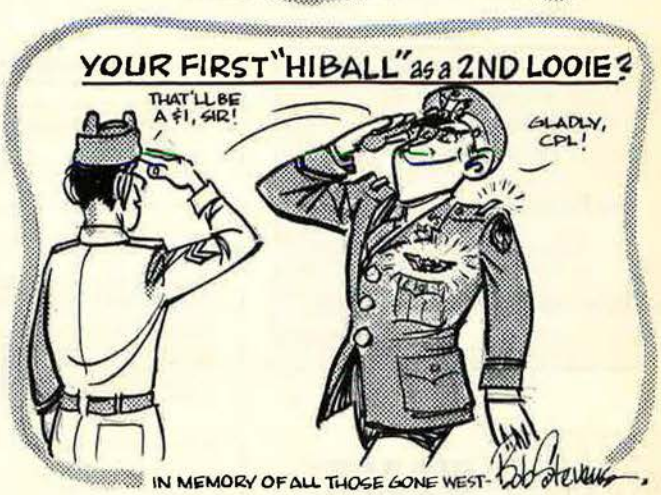
WHEN WWII HIT, THE U.S. NEEDED AIRCREWS-GOOD ONES-and WE NEEDED 'EM *FAST!* THE AAF PROJECTED AN AVIATION CADET WASH-OUT RATE OF 40-50% FOR THOSE MENTALLY and PHYSICALLY QUALIFIED. OUR CLASS (43E) WASHED CLOSE TO 47%; 4021 ENTERED IN AUG '42, and 1876 GRADUATED MAY 20, 1943. A FEW OF THE SURVIVORS MET IN PHOENIX ON OUR 45th ANNIVERSARY. WHERE, OH, WHERE DID ALL THOSE YOUNG MEN GO?

AS WE SAT AROUND COMPARING MEDICARE COVERAGES INSTEAD OF SHORT SNORTER BILLS, WE REMINISCED ABOUT CADET DAYS-









Collins Defense Communications experience in information transfer can help make C³I a reality. As specialists in communications and ECM/ECCM systems for air, sea and land battle scenarios, we know the intricacies of interconnectivity. ■ We are currently applying that expertise to our involvement in VLF/LF communications for the Navy's TACAMO relay link aboard the Navy's E-6, and for the Air Force's Airborne Command Post. ■ We are also participating in SAC's Scope Signal, MILSTAR, Project Overtake, the USN High Frequency Anti-Jam Programs, the SDI Integrated Defense Simulator, information switching systems and other major C³I programs. ■ We have the facilities in place to provide the products, systems analysis and integration, functional architecture, system partitioning, training and logistics support to meet your multi-platform/multi-service C³I needs. ■ Collins Defense Communications, Rockwell International, 350 Collins Road, N.E., MS 120-145, Cedar Rapids, Iowa 52498, U.S.A. Phone (319) 395-1600. Telex 464-435. **We Know C³I.**

FROM AIRPOWER TO SEAPOWER, WE KNOW C³I

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...where science gets down to business

Aerospace / Electronics / Automotive
General Industries / A-B Industrial Automation

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T45 TRAINING SYSTEM

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