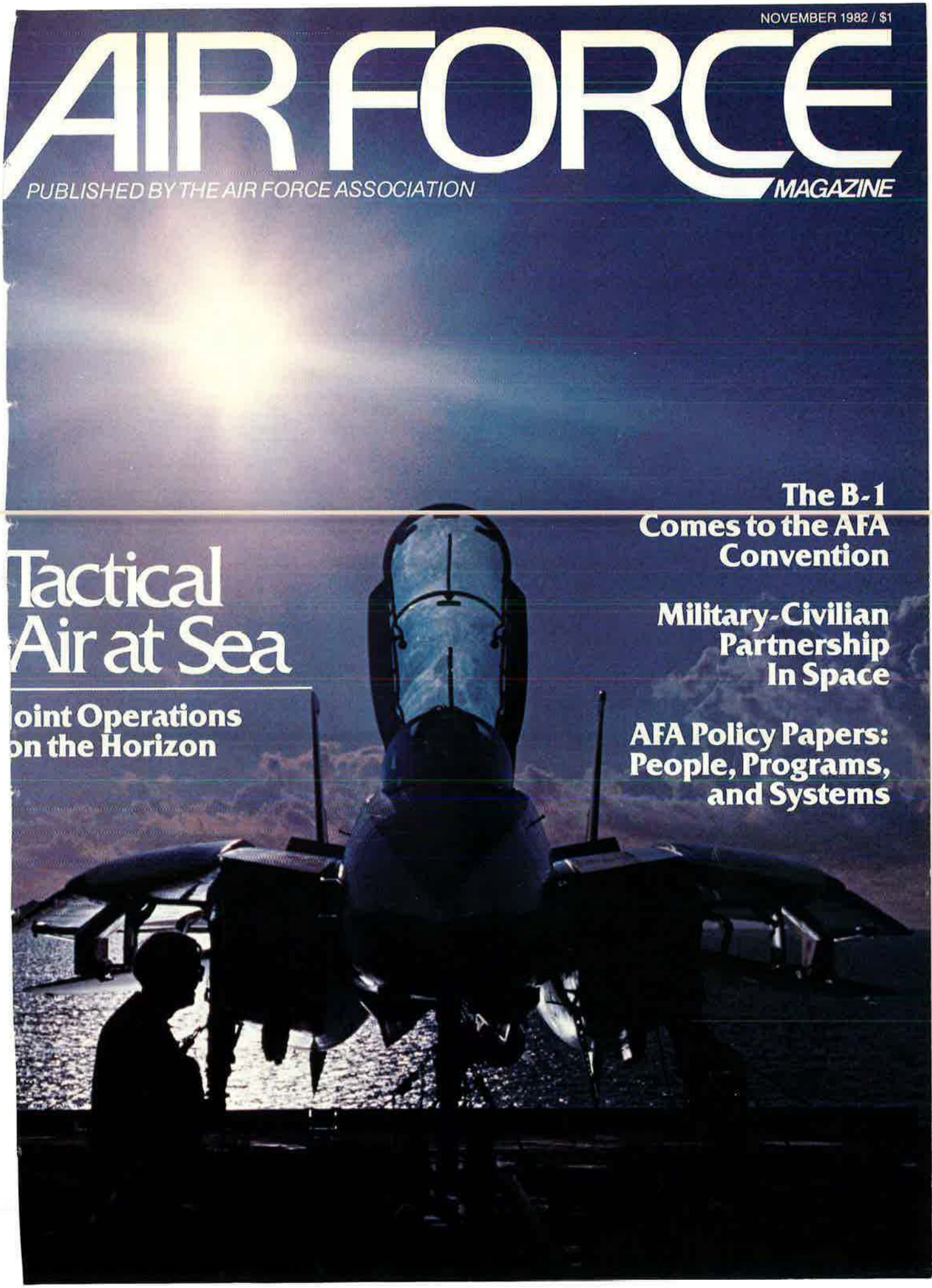
NOVEMBER 1982 / $1

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION



Tactical Air at Sea

Joint Operations on the Horizon

The B-1 Comes to the AFA Convention

Military-Civilian Partnership In Space

AFA Policy Papers: People, Programs, and Systems

CFM56

THE RIGHT ENGINE AT THE RIGHT TIME

FLYING THE KC-135R TO NEW HEIGHTS OF EFFICIENCY.

With the first flight of the CFM56-powered KC-135R, the potential of U.S. Air Force tankers has gone sky high. The high technology, high-bypass CFM56 engine system will not only give the KC-135R over 60% more takeoff thrust, it will increase the tanker's fuel offload capability by up to 150%, resulting in an average 50% increase in productivity over the current KC-135A.

The CFM56 will give the KC-135R down-to-earth benefits, too. Like a noise footprint 98% less than the KC-135A; the ability to operate from shorter fields and meet all emission requirements; plus a 25% drop in fuel consumption and lower operating and maintenance costs.

When the re-engined KC-135Rs enter service in the mid-1980's, the CFM56 will have logged more than a million hours of commercial experience. The KC-135R will be joining a winning team of CFM56-powered aircraft: re-engined DC-8s and the new 737-300s.

The Proven CFM56. Now flying the KC-135R to new heights of efficiency.

cfm international

A JOINT COMPANY OF SNECMA, FRANCE AND GENERAL ELECTRIC COMPANY, U.S.A.

SNECMA

GE

ON TARGET TO THE TARGET WITH AUTOMATIC TERRAIN-FOLLOWING RADAR

Getting pilots to the target is a Texas Instruments specialty. Take TI's Automatic Terrain-Following Radar (TFR) pod, for instance. This radar will provide F-16 and A-10 pilots with day/night low-altitude operation with adverse weather and ECM capability and is readily adaptable to the F-15E and HH-60D.

TI TFR systems are currently flying on F-111, RF-4C, A-7D/E, C-130, HH-53 and the European Tornado aircraft. In addition, TI produces sea surveillance radars for the S-3A/B, P-3C, SH-60B, HU-25A, and several international customers.

Texas Instruments is also on target in defense suppression, FLIR systems, communication/navigation, and image processing. All featuring tomorrow's technology, today.

Texas Instruments Incorporated
Radar Systems Division
P.O. Box 226015
M/S 228
Dallas, TX 75266.

TEXAS INSTRUMENTS
INCORPORATED

Symbolizing a continuing dedication to our 55-year

partnership with America's armed forces:

Pratt & Whitney, a division of United Technologies

over 4000 missiles in service with more than 10 armies on 4 continents

CROTALE

for faultless coordinated defence

12 anti-aircraft missiles
ready for launch
in a few seconds

THOMSON-CSF

DIVISION
SYSTÈMES ELECTRONIQUES

1, RUE DES MATHURINS
B.P. 10 92223 BAGNEUX CEDEX/FRANCE
TÉL (1) 657 13 65

AIR FORCE MAGAZINE
PUBLISHED BY THE AIR FORCE ASSOCIATION

AIR FORCE Magazine (ISSN 0730-6784) is published monthly by the Air Force Association, Suite 400, 1750 Pennsylvania Ave., N.W., Washington, D.C. 20006. **Phone:** (202) 637-3300. Second-class postage paid at Washington, D.C., and additional mailing offices. **Membership Rate:** $15 per year (includes $9 for one-year subscription); $36 for three-year membership (includes $24 for subscription). **Life Membership:** $200. **Subscription rate:** $15 per year; $25 per year additional for postage to foreign addresses (except Canada and Mexico, which are $8 per year additional). Regular issues $1 each. Special issues (Soviet Aerospace Almanac, USAF Almanac issue, Anniversary issue, and "Military Balance" issue) $3 each. **Change of address** requires four weeks' notice. Please include mailing label. Publisher assumes no responsibility for unsolicited material.

BPA Circulation audited by Business Publication Audit

This Month

NOVEMBER 1982 • VOLUME 65, NUMBER 11

Convention '82

ABOUT THE COVER

At dusk in the Mediterranean, an F-14A Tomcat of Carrier Air Wing 7 roosts on the aft flight deck of USS Dwight D. Eisenhower *(CVN 69). It is ready for night flight or for early morning launch. (US Navy photo by USS* Eisenhower *photographer)*

Departments

Two U.S. Air Force F-15's patrol high over Germany during a NATO maneuver. Under their wings, a full complement of Sparrow AIM-7F and Sidewinder AIM-9L missiles—a potent team for air-to-air defense, not only for NATO but throughout the free world.

The Raytheon-developed Sparrow AIM-7F serves as the primary air-to-air weapon on the F-15 and is deployed on other first-line aircraft. In more than 21,000 hours of captive flight-testing, it has achieved over 880 mean flight hours between failures.

That same high reliability is also going into the next generation of Sparrow, the AIM/RIM-7M. Now in production for both air-to-air and surface-to-air applications, AIM/RIM-7M features an advanced monopulse seeker and a digital signal processor for improved look-down, shoot-down performance and greater immunity to countermeasures.

Sidewinder AIM-9L—the free world's most advanced short-range, air-to-air missile—is operational on U.S. Air Force and Navy fighter aircraft. Raytheon, as prime industrial support

Sparrow and Sidewinder: a pair of aces for air defense

contractor, is in full production on the missile's guidance and control section. And we continue to support the Navy in the development of advanced Sidewinder concepts.

For details on Sparrow and Sidewinder, please write on your letterhead to Raytheon Company, Government Marketing, 141 Spring Street, Lexington, Massachusetts 02173.

RAYTHEON

AN EDITORIAL

Blending Seapower and Airpower

AT THE September AFA Convention, USAF Chief of Staff Gen. Charles A. Gabriel told about the prospects and reality of increased cooperation between the Air Force and the Navy that are coming to pass in using tactical airpower. He specifically mentioned "expanding our use of each other's schools, increasing the scope and frequency of joint maritime training and exercises, and developing better ways to fight together."

General Gabriel and his counterpart, Adm. James D. Watkins, the Chief of Naval Operations, are both aware that the path of cooperation will not be an easy one. "Parochial concerns" is a polite way of noting that persons in both services will not find close cooperation easy or palatable. But the leaders are committed, and any visitor to an aircraft carrier or tactical air base will learn that the people who have to do the flying and fighting are quite willing to work together.

To provide AIR FORCE Magazine readers with basic information, a "primer on carrier aviation" begins on page 60.

Elsewhere in the issue *(p. 66)*, Vice Adm. G. E. Miller, USN (Ret.), notes that both services have lagged in the past. Too often parochialism got in the way of mission accomplishment, he notes. Then he speculates on a host of possibilities for getting the most from the tactical airpower available, whether Air Force or Navy. His article is written from the perspective of a naval aviator and commander who experienced the situations he writes about, and who also saw joint service with the Air Force and who believes that tactical airpower cooperation and collaboration are essential.

Admiral Miller's comments and suggestions are certain to stir a good deal of heated commentary in return, particularly from the "parochialites," or those who feel he has the historical emphasis wrong. For instance, he stresses Navy and Marine Corps air cover over the withdrawing troops from the Chosin Reservoir trap in Korea, December 1950. At the same time, USAF fighter-bombers were involved, delivering 736 close-support sorties from November 28 to December 20, while also flying armed reconnaissance and interdiction missions to harass the advancing enemy.

But commentary is to the good. We believe the more light and discussion on the topic, the more likely something worthwhile will result. It should be more efficient use of national resources—in this case, tactical airpower—to accomplish national objectives.

A Korean War case of effective joint airpower employment was aimed at destruction of the North Korean power industry in late June 1952. This big strike used Air Force, Navy, and Marine aircraft. Land-based USAF and Marine fighter-bombers numbered 270, while 230 carrier-based planes from Task Force 77 joined in. The combined and coordinated raids on key hydroelectric plants disrupted North Korean power production. Follow-up strikes in the weeks that followed ensured continued disruption of the enemy's power capacity.

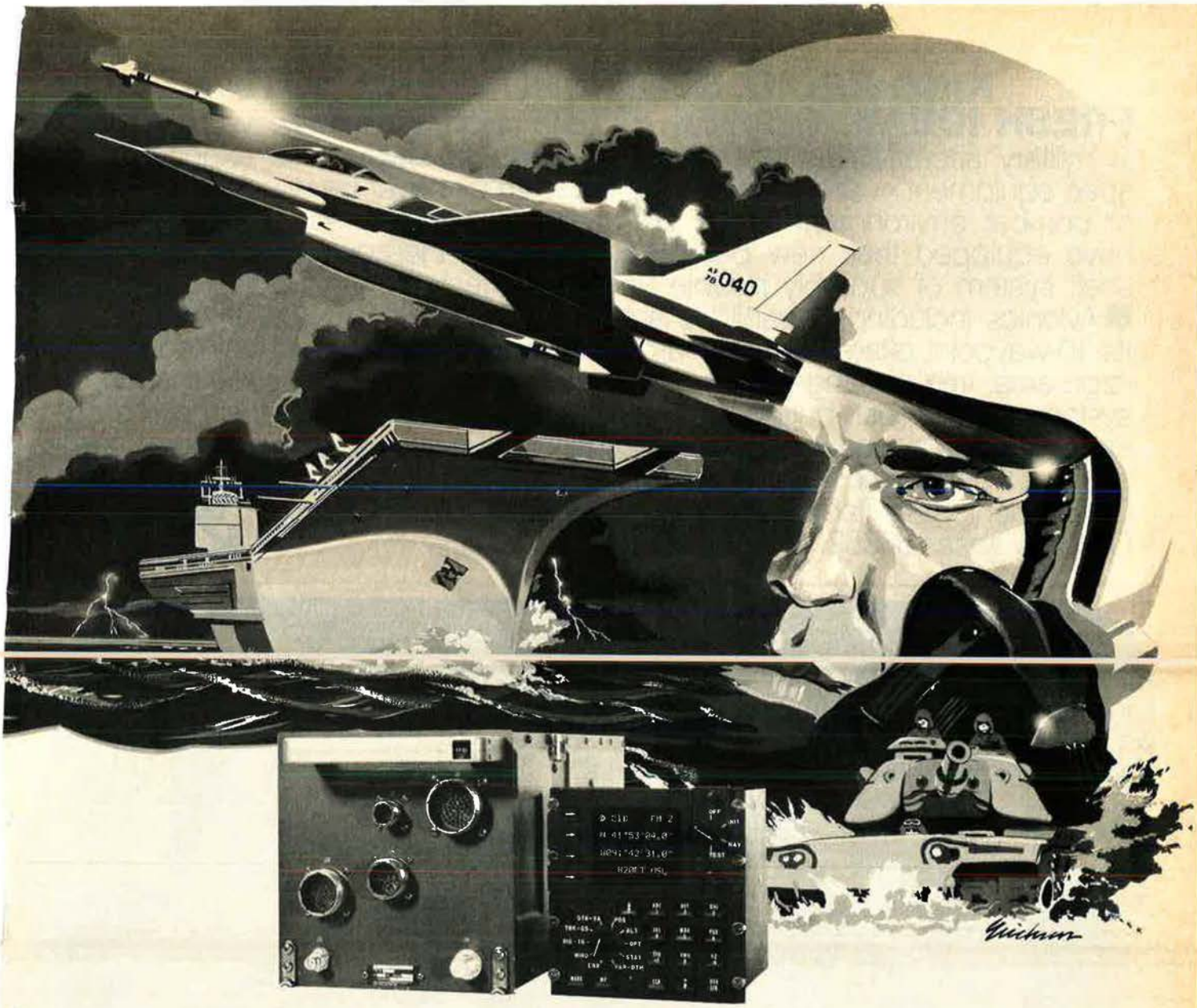
One should not think that this current cooperative thrust is a brand-new initiative. Cooperation has been tried before. Sometimes it worked and sometimes not. An excellent source for case study in this regard is the book, *Air Power in Three Wars* (WW II, Korea, Vietnam), by Gen. William W. Momyer, USAF (Ret.). General Momyer's history and analysis outline the pitfalls very clearly. Close study of his work will help the current crop of USAF and Navy leaders avoid making the mistakes of the past. Among other things, that means getting early agreement on the definition of terms, rules of engagement, and lines of authority. These have been stumbling blocks in the past. But for now, the leaders are facing the future of cooperation with confidence.

For instance, soon after the first of the year, B-52s will conduct tests of firing the Harpoon antiship missiles. Once the tests validate the match, expect to see two B-52 squadrons—one on each US coast—equipped with Harpoons, and trained to execute the antiship role on the short notice and with the professional execution that are typical of Strategic Air Command's performance.

Also, expect to see an increase in the exchange programs between Air Force and Navy, more people from one attending the schools of the other, and, in the field, more joint activity. In that regard, Navy EA-6Bs will be welcomed in joint and combined exercises in NATO's Central Region, adding to USAF's own electronic warfare capabilities there. The EA-6Bs could fly off carriers in the English Channel or the North Sea; or, to extend time on station, they will operate from forward USAF land bases. Also, look for USAF units (active, Guard, and Reserve) to mix into more operations in the Mediterranean and Indian Ocean littorals.

All of this is heartening and much to be encouraged by those who want to see airpower used effectively. For if twenty-five percent of the earth is land and seventy-five percent covered by water, all 100 percent of it is covered by air.

—F. CLIFTON BERRY, JR., EDITOR IN CHIEF



Collins GPS User Systems: The Force Enhancer

Collins Government Avionics and the Navstar Global Positioning System are powerful partners to increase U.S. and NATO military force effectiveness.

GPS increases the effectiveness of land, sea and air forces dramatically. Air Force sponsored studies and field tests using GPS show success rates for tactical air missions are enhanced up to 60%, strategic weapons by 20% and indirect artillery by 50% by improved navigation. GPS is a survivable, all-weather, 24-hour, worldwide, jam-resistant system.

It all adds up to increased force effectiveness through advanced navigation technology for all users requiring highly accurate position, velocity and time information.

Collins GPS user systems make these advantages available through affordable GPS user equipment for air, sea, subsurface and surface applications. Our common modular architecture enables low acquisition and life-cycle-support costs for GPS user operations. Our modular design is the result of our long experience in ground, sea and airborne systems.

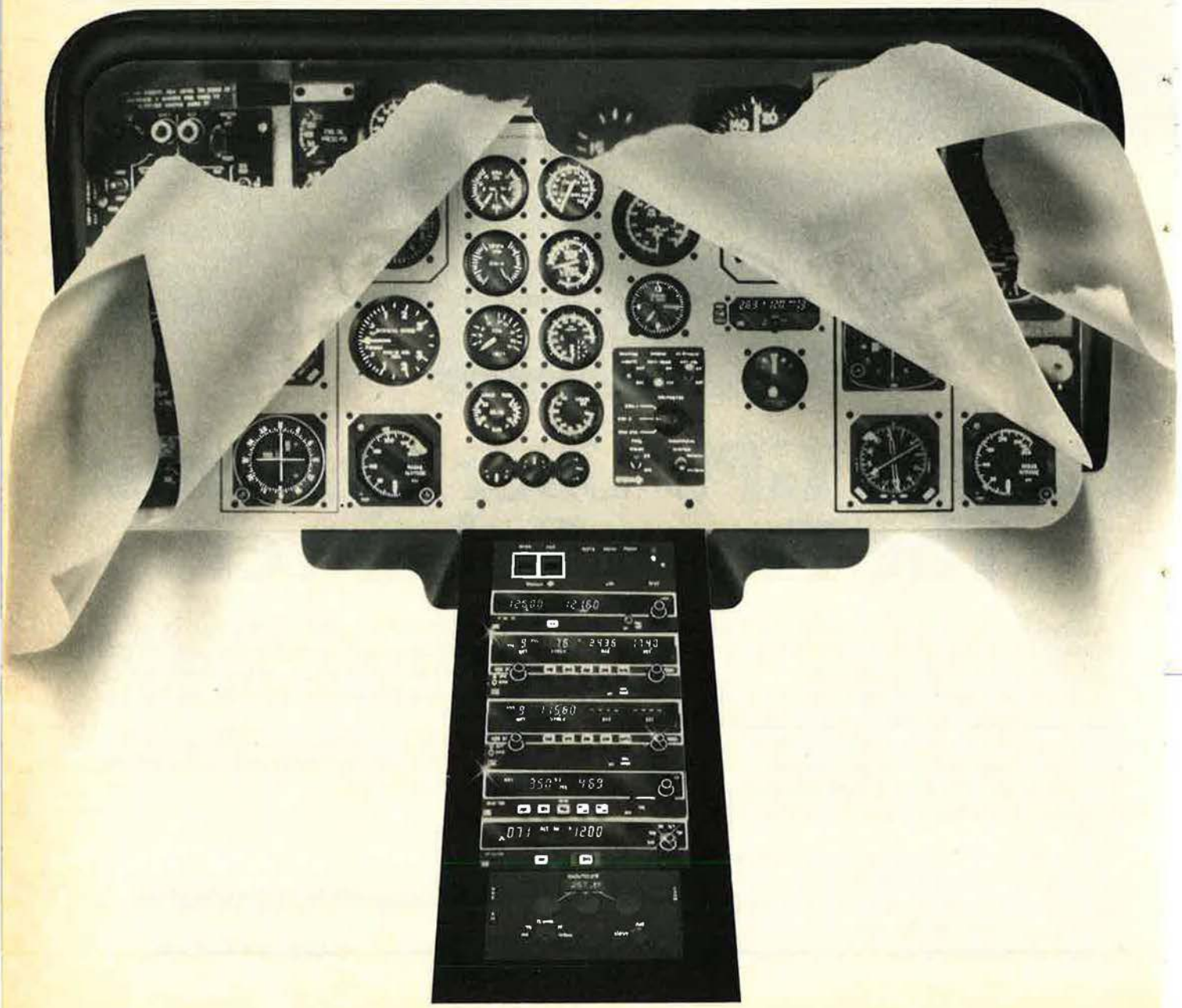
For more information, contact Collins Government Avionics Division, Rockwell International, Cedar Rapids, Iowa, 52498. (319) 395-4203.

Rockwell International

...where science gets down to business

KING RADIO. SHEDDING WORN NOTIONS FOR FRESH IDEAS. Traditionally, mil spec avionics have always been used in military aircraft. ■ But does it make sense to always use expensive mil spec equipment in aircraft that, quite frankly, may never be used in a mil spec or combat environment? ■ The U.S. Navy didn't think so. That's why they have equipped their new Bell TH-57A Training Helicopters with an off-the-shelf system of superbly reliable and cost effective King Radio equipment. ■ Avionics including capabilities such as our unique TACAN/RNAV system. Its 10-waypoint offset capability allows Navy pilots to conduct training over a large area, free of dangerous congestion. ■ And, our commercial transponder system with its push-button emergency squawk capability that simplifies operation and provides increased safety. ■ Give us your special program. We'll see that it gets some fresh ideas. Write or call Dan Rodgers, Special Programs Department, King Radio Corporation, 400 North Rogers Road, Olathe, Kansas 66062. (800) 255-6243.

KING®



AIRMAIL

Qualities of Leadership

Each reader must have had his very own set of reflections as he read that fine recounting in the September '82 issue on "The Establishment of the United States Air Force," by Herman S. Wolk *(p. 76)*—and I had mine.

The qualities of leadership have always fascinated me, and, having known so many of the names he lists for the just credits due them, it caused me to recall a mimeographed fund-appealing letter that landed on my desk shortly after I joined Litton Industries in 1963.

Litton's founder, the late Charles B. "Tex" Thornton, had sent it along with this note: "Shouldn't we support this?" It was a request from the newly formed Falcon Foundation, which was seeking financial support for prep school assistance to young aspirants for appointment to the Air Force Academy. I wrote back: "Yes, and we should name ours for the man who signed this letter, as he was really important to aerospace power as we know it today." It was done, and that's how the General Carl A. Spaatz Falcon Foundation Scholarship was born—to place leadership tied to a personality on a memorial pedestal forever.

Later, "Tex" had a serious talk with General Spaatz, convincing him to forgo his right to burial in Arlington Cemetery and to be interred instead on the grounds of the Air Force Academy—there to be a perpetual, quiet inspiration for all time. . . .

Thornton also sponsored the General Ira C. Eaker Falcon Foundation Scholarship, a personal testimony of his reverence and respect for that unusual thinker, strategist, and leader. This gave birth to the portrait display in Harmon Hall at the Academy called "The Gallery of Great Airmen," a constant reminder to the cadets of aerospace power's roots.

Both "Tex" and I were touched when Mrs. Ruth Spaatz asked us to be honorary pallbearers that day when "Tooey" came to the Academy to stay, and none of the others in that select contingent knew that it was the General's conversation with "Tex" that caused us all to be there—and why.

Just before he died on November 24, 1981, "Tex" Thornton, who planted the original seeds for that enduring "Gallery of Great Airmen," learned there would be a fiftieth Falcon Foundation fully endowed scholarship given annually—one bearing the name of Charles B. "Tex" Thornton.

Col. Barney Oldfield, USAF (Ret.)
Beverly Hills, Calif.

• *Colonel Oldfield is putting the finishing touches on a book about the history of Litton Industries, tentatively entitled* The Adventure Called Litton Industries.—THE EDITORS

Academy Attrition Rate

I read with interest Gen. T. R. Milton's article, "Why the High Dropout Rate at the Academy?" in your September 1982 issue *(p. 69)*. During my assignment on the faculty at the Academy (1976–78), I conducted a longitudinal study of Academy attrition. Some of the answers that General Milton seeks are provided by that research.

First, it has been my experience that the young people who enter the Academy are highly motivated toward a career in the Air Force. In most cases this desire does not diminish, even for the cadet who leaves. This is evidenced by the number of Academy dropouts who enter civilian universities and join ROTC units. For the most part, the cadet who leaves does so because the Academy no longer remains a feasible way for that cadet to reach commissioning. The two major reasons why the Academy no longer remains a feasible route to commissioning are the lack of adjustment to Academy life and/or academic deficiencies.

Second, and most important, the empirical evidence gathered during this research on attrition strongly indicated that attrition is driven by internal Academy policies as much as it is driven by external events. It is true that backlash to the Vietnam War and abolition of the draft were events that affected Academy attrition. However, such internal policy changes as increasing the rigor of cadet life and increasing academic standards have also had a profound effect on the Academy's attrition rate.

Third, a recent review of civilian college attrition by Pantages and Creedon (1978) states: "For every ten students who enter college in the United States, only four will graduate from that college four years later. One more will eventually graduate from that college at some point after those four years." Although the Academy's forty percent attrition rate by itself seems high, it is actually lower than that of civilian universities who suffer from a fifty percent attrition rate. On the positive side, perhaps we should be asking what the Academy is doing to produce a lower attrition rate than that of the Academy's civilian counterparts.

I would like to close by saying that I don't feel that cadets have become disenchanted with the prospect of an Air Force career. They are simply unable to distinguish the difference between an Air Force career and a cadet's life based on their experience at the Academy. The cadets who drop out are disenchanted with some aspect of the Academy, which confounds their perspective of a career in the Air Force. This confounding causes them either to change career goals or seek another commissioning source.

Bruce A. Smith
Pensacola, Fla.

In the September '82 issue, General Milton asks "Why the High Dropout Rate at the Academy?" As we were all taught a long time ago, the first step in solving a problem is to recognize that problem.

But it seems to me that General Milton has only scratched the surface, and is not yet facing the real problems. Back in 1979, a fourth-year dropout wrote an article for *Penthouse* magazine explaining why he had dropped out. The basic reason was that the recruiting prose did not match the reality of life and training at the Academy.

The differences appeared to be

more than cosmetic. Flight training was practically nonexistent and mostly at the cadets' expense. There were severe restrictions on what part of the facility the cadets could use (he said only 1,000 acres out of 18,000), and the commitment to serve after graduation was raised twice during this cadet's stay at the Academy.

Maj. Samuel Pennington,
USAF (Ret.)
Waldoboro, Me.

Cyclones Over Marienburg

I wanted to tell you how much I enjoyed Maj. Gen. Dale Smith's article in the September '82 issue, "The Target Was Marienburg" *(p. 122).* You see, I led the 94th Bomb Group over the same target on October 9, 1943.

We were the second group in the task force to hit Marienburg, and, by chance, my formation control officer, who rode in the tail gun position in my B-17, was a camera buff and took pictures. His photos made a very interesting article covering two pages in *Life* magazine, November 8, 1943.

The best photo showed the target being hit by bombs, and in the foreground is one of my squadron's B-17s named *Virgin's Delight.* A replica of this aircraft is now on display at the Air Museum at Castle AFB in Merced, Calif. (Our 94th Bomb Group Memorial Association helped open this museum.)

Col. F. H. Colby, USAF (Ret.)
Lake San Marcos, Calif.

There's invariably some picky smart-aleck character writing to outstanding publications such as AIR FORCE Magazine gleefully pointing out some insignificant error in the text of an article or story.

Well, I'll be darned if I'm going to stoop so low. No doubt hundreds of pilots and ex-crew members will let Maj. Gen. Dale O. Smith know that a B-17 did not come equipped with Pratt & Whitney engines. Therefore, I will not have to mention it.

Of course, being an old sergeant pilot, I could say something like: "Ain't that typical? The Old Man doesn't even know what kind of engines his airplane's got!" But I won't. I don't even THINK such thoughts!

I hope General Smith has a sense of humor. His story was fun to read, but I'd hate like hell to be on permanent TDY in some remote outpost, such as Philadelphia or Vernon, Tex., in the event of a recall to active duty for WW III.

Keep up the good work.

Maj. Bob Van Ausdell,
USAF (Ret.)
Santa Paula, Calif.

AIRMAIL

Re: "The Target Was Marienburg," September '82 issue:

I'm glad to hear that General Smith had a bomb group whose B-17s had Pratt & Whitney engines. I always knew that would be a winning combination.

You have a fine publication. Keep up the good work.

Gene A. Hardman
Westland, Mich.

• *For the two or three of you who haven't written us yet to point out the mistake, the B-17 was powered by Wright Cyclone R-1820 radial engines. Perhaps General Smith was thinking of the B-17 prototype Model 299, which was powered by Pratt & Whitney R-1690 single-row radials?*—THE EDITORS

The Old Geezer

We read with great interest and glee your article, "Nick Allen and the Old Geezer," in the September '82 issue *(p. 147).* We have had a copy of this picture hanging in our hallway for at least ten years. We love it!

However, I'm a little confused. In the November 2, 1974, issue of *TV Guide,* they had an article on this photo and a photo of the gentleman who posed for it. They say he was an actor, by the name of Joseph Patrick Cranshaw. We have seen him many times on television. According to your article, no one knows who posed for it. Could there be two different pictures?

I would be interested to hear your reaction to this item. Maybe you can clear up the mystery.

Mrs. Milton Stutzman
Elmhurst, Ill.

• *Yes, there could be two different pictures. In fact, we have received several versions of the "Old Geezer," including the "Toothless Cranshaw" picture to which Mrs. Stutzman refers. Perhaps the proliferation of these photos has some profound meaning regarding the psyche of the fighter pilot?*—THE EDITORS

Tarnished Model?

In the September '82 issue of AIR FORCE Magazine, Bob Stevens again applies his humor to military history *("There I Was . . . " p. 216).* Unfortunately, Mr. Stevens has tried to imply humor in a situation where anyone involved should hang their head in shame. War and death are never pleasant, but when any military person sees a civilian population as fair game, then any moral defense that would decree a "good guy" vs. a "bad guy" is removed.

The United States upholds itself as a model for democracy and as a nation that puts its trust in God. These beliefs demand that our behavior follows a moralistic code.

When our nation comes to the point of condoning the willful killing of any civilian, then we will have indeed found the enemy, and he is us.

Lowell S. Magsig, Pastor
Friends Community Church
Midway City, Calif.

Supersonic Hustler

My congratulations to Jennifer Harper on her article, "Supersonic Hustler," in the August '82 issue *(p. 62).* She helped me relive some beautiful as well as frustrating moments as a young jet mechanic stationed at Bunker Hill AFB (now Grissom AFB) in Indiana in 1961.

What an aircraft! And what an outfit—the 305th Bomb Wing! Our motto was "Can Do." And we did. From the "Bunker Hilton" alert facility to the phased inspection hangars, we ate, slept, and drank Hustler. Launching the B-58 at night was the most beautiful sight in military aviation.

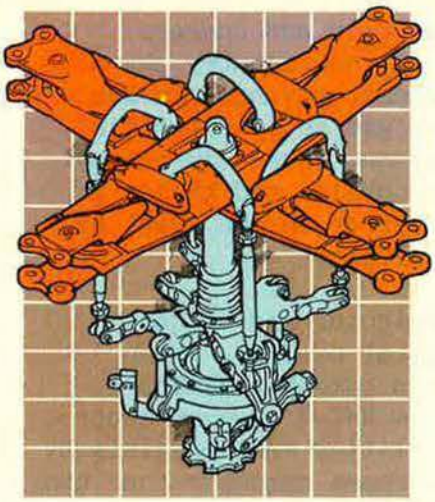
Those GE J79s hummed so sweet while taxiing to the end of the runway, and then screamed as the afterburners were activated. Blue, yellow, and orange flames pierced the darkness as she leaped into the Hoosier sky. . . .

Mrs. Harper states that maintenance was a concern. I can tell her that the word "concern" is putting it mildly. Sometimes we had almost as many factory reps from General Dynamics on the flight line as we had mechanics. As I recall, one piece of gear known as the power control linkage assembly gave crew chiefs a lot of "Excedrin Headaches." It looked like three bicycles had come together in a terrific crash, and then what was left over was squeezed into an aft compartment on the underside of the aircraft just ahead of the Gatling gun in the extreme tail of the B-58.

The aircrews had the ever-present problem of keeping the center of gravity at the right spot. One way they did this was to pump fuel from the aft to the forward fuel tanks. She flew with a 2.3 degrees nose-up attitude. So this gave the navigator plenty to do in figuring fuel consumption and speed and watching the CG.

The B-58's mission came home to

Promote an over-achiever.



In any service, over-achievers are recognized because they are the toughest. They're there when you need them — volunteers for the jobs that require endurance, performance and versatility. And Bell's UH-1N has been just that for those it has served.

Now, four-bladed, proven technology is available and ready for upgrading the UH-1N. A simple conversion makes this over-achiever even more capable: Faster. Smooth and agile. Highly efficient.

Design simplicity reduces maintenance, weight and drag. An initial transmission TBO of 2,500 hours without any intermediate inspection increases it's availability and reduces maintenance costs. Elastomeric bearings eliminate mechanical hinges, viscous dampers, and provide built-in safety. A gross weight of 11,500 lbs. means greater payload. And advanced technology composite rotorblades improve fatigue life, free blades from corrosion and provide interchangeability that will make the UH-1N even more versatile.

When you consider the cost of new aircraft today, it's wiser to promote from within. Especially when the bottom line is reduced cost of operation and an increase in performance and payload.

For more information on how to get the best from hard workers, write Ray Swindell, Director, U.S. Government Marketing, Bell Helicopter Textron Inc., Dept. 683, Box 482, Ft. Worth, Texas 76101.

Bell Helicopter TEXTRON
A Subsidiary of Textron Inc

SCIENCE/SCOPE

The radar on the F-15E Eagle dual-role fighter helps the crew attack ground targets automatically with precision. The radar produces high-resolution ground maps. The pilot first designates a target and chooses a nearby landmark as an offset aim point. Once the radar and inertial navigation system determine the aircraft has passed this location, steering cues appear on the head-up display to guide the pilot toward a precomputed weapon release point. When the aircraft reaches this point at just the right speed and direction, it releases weapons automatically. Hughes, supplier of the AN/APG-63 radar, and McDonnell Douglas co-sponsored an Advanced Fighter Capability Demonstrator program to show the F-15, with high-resolution mapping enhancements, can strike ground targets at night or in bad weather with the accuracy of a daytime attack aircraft.

A glide bomb equipped with a data link is capable of striking strategic targets from safe distances with pinpoint accuracy. The U.S. Air Force's GBU-15 weapon carries a TV imaging seeker. It is controlled by the AXQ-14 data link, which consists of electronics in the weapon, a pod mounted on the launching aircraft, and a control panel and display in the cockpit. The primary mode of operation is indirect attack, which extends standoff capability and reduces the aircraft's exposure to enemy fire. As the weapon flies, the pilot decides if he will let the electronic tracker automatically guide the weapon, or manually control it. Hughes supplies the data link under contract to the Air Force.

Despite being tested under demanding conditions, the imaging infrared Maverick missile has performed well in U.S. Air Force evaluations. This version of the Hughes air-to-ground missile produces TV-like pictures in the cockpit by sensing temperature differences across a battlefield scene. In the first launch the missile hit a tank at night. Subsequent hits were made against fast-moving and maneuvering targets, small cold targets, large targets, and targets in a high-clutter background. Missiles were launched from short and long ranges from five types of aircraft in various environments from hot and dusty to cold and snowy.

Three air defense radars that can withstand bitter arctic cold and operate faithfully in remote regions are being built for Norway so that country may augment its existing NATO system. The radars, among the most advanced in the world, are Hughes Air Defense Radar (HADR) systems. They are fully automatic and remote-controlled to provide air defense with long-range, three-dimensional information. All three HADR systems will be housed in mountains and their antennas perched atop peaks. For maintenance during winter or in the event of an attack, the antennas can be lowered into protected shelters.

The U.S. Navy's F-14 Tomcat fighter will incorporate a brighter and bigger display that will be more useful in combat. The new digital display, which replaces the original design's analog unit, incorporates a computer keyboard, display symbols, and programmable switches into the Hughes AWG-9 weapons control system. The display is essential to using the new capabilities made possible by a programmable signal processor, a high-speed, special-purpose computer that can perform millions of operations per second.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
CULVER CITY, CALIFORNIA 90230
(213) 670-1515 EXTENSION 5964

me in stark terms during October 1962 when the Soviets were caught putting missiles in Cuba. We had our more relaxed moments also—in October 1963, a Hustler from Bunker Hill AFB streaked 8,028 miles from Tokyo to London in eight hours and thirty-five minutes, at an average speed of 938 mph. Touchdown was at RAF Greenham Common, UK.

Thanks again to Mrs. Harper for giving us a look in the rearview mirror of military aviation. And thanks to AIR FORCE Magazine for running this superb article.

Tim Donovan
Fort Wayne, Ind.

The Lonely English?

I enjoyed George C. Larson's article on the designing of the P-47 Thunderbolt *(September '82 issue, p. 132).*

However, please allow me to correct one statement regarding only England being left free of Hitler after the evacuation of Dunkirk. Many of us Scots, with the Welsh and Irish, helped keep the British Isles free from Hitler.

John A. Brown
Sunnyvale, Calif.

AFCC Shuttle Backup

Your article in the June '82 issue, "Supporting the Space Shuttle: The Blue-Suit Contribution" *(p. 44),* certainly was a good wrap-up of Air Force involvement. I was, however, disappointed that there was no mention of the contributions made by the men and women of Air Force Communications Command, who provide backup communications at the launch site and navigational aids at landing sites around the world.

While I've just moved on to PACAF from AFCC, I still have a warm spot in my heart for the communicators who labor behind the scenes and who are too often unheralded and unnoticed.

Perhaps in future Space Shuttle coverage there will be an opportunity for these people to get some recognition.

Col. Peter L. Sloan, USAF
Hickam AFB, Hawaii

Picky?

Concerning the letter from Cmdr. Robert O. Dulin, Jr., in the September '82 "Airmail" section *(p. 18):* It pleases me that I have never met him. If my good luck continues, I never will meet him.

It's difficult for me to understand how any man can denigrate the efforts of a group of brave men who took part in what they considered an important mission, namely the sinking of the *Strasbourg.* Commander Dulin's closing sentence—"Incomplete and inaccurate intelligence data led to a wasted raid on a negligibly important naval target"—indicated to me that the man is a complete iconoclast—the type of man who would do research to prove that George Washington never did chop down that cherry tree.

Commander Dulin, you are "picky."

Hal Lynch
Executive Director
57th Bomb Wing Ass'n
San Antonio, Tex.

AIRMAIL

Longest Held POW

Re: The September '82 "Bulletin Board" item on Everett Alvarez, Jr., *(p. 192):* It should be noted that Army Col. Floyd J. Thompson was captured in South Vietnam on March 26, 1964, and held prisoner until February 16, 1973. Everett Alvarez, Jr., was captured in North Vietnam on August 5, 1964, and was released on February 12, 1973.

Therefore, Alvarez was the longest held Vietnam POW captured in North Vietnam, but not for the entire Vietnam conflict.

Col. Ronald J. Webb, USAF
Fort Belvoir, Va.

Fighter for a B-25

In the August '82 issue of AIR FORCE Magazine *(p. 8),* it was announced that the 500th Bomb Squadron Association has undertaken a concerted effort to locate a suitable (preferably flyable) B-25 Mitchell for *donation* to the Smithsonian's National Air and Space Museum in Washington, D. C.

As a result, we have located what may well prove to be *the* B-25, in flyable condition and in prime military configuration. However, this B-25 owner is *not* interested in donating, nor is he interested in selling, his aircraft. He is, however, willing to *swap* his B-25 for a World War II fighter—P-51, P-47, Corsair, Hellcat, etc.

Consequently, our Association's attention is now focused on finding a World War II fighter owner who would be willing to swap for the B-25. After the swap the new B-25 owner would make the donation to NASM, and reap the associated tax advantages.

The NASM has approximately 150 aircraft on display. This collection includes almost every World War II aircraft, except the B-25. Is there anyone out there who can help us get this one flyable B-25 into the NASM?

Any WW II fighter aircraft owners interested in this three-way deal, with the resultant tax-deduction advantages, please contact me for further details.

John F. Dinges
B-25 Project Officer
18536 South Hood Ave.
Homewood, Ill. 60430
Phone: (312) 798-6979

RAF Warmwell

I am working on a project for the Dorset Natural History and Archaeological Society concerning a World War II fighter station—RAF Warmwell—in the county of Dorset.

A sad state of affairs exists here in Dorset, as none of the archive departments in the county or the Museum have any details of what took place at RAF Warmwell during the war. We are attempting to remedy this situation by trying to contact people who were stationed there.

We know that the 307th Fighter Squadron and possibly the 309th Fighter Squadron of the 31st Fighter Group came to RAF Warmwell in July of 1942. Later, the 474th Fighter Group was stationed there, in 1944. This fighter group was comprised of the 428th, 429th, and 430th Fighter Squadrons and Hq. staff, etc. Other units of Army Air Forces were also at the station, but to date we have not been able to obtain any details on those units.

I would like to correspond with anyone who was at RAF Warmwell with the AAF.

Anthony Cooke
6 Streetway Lane
Cheselbourne
Dorchester
Dorset DT2 7NU
England

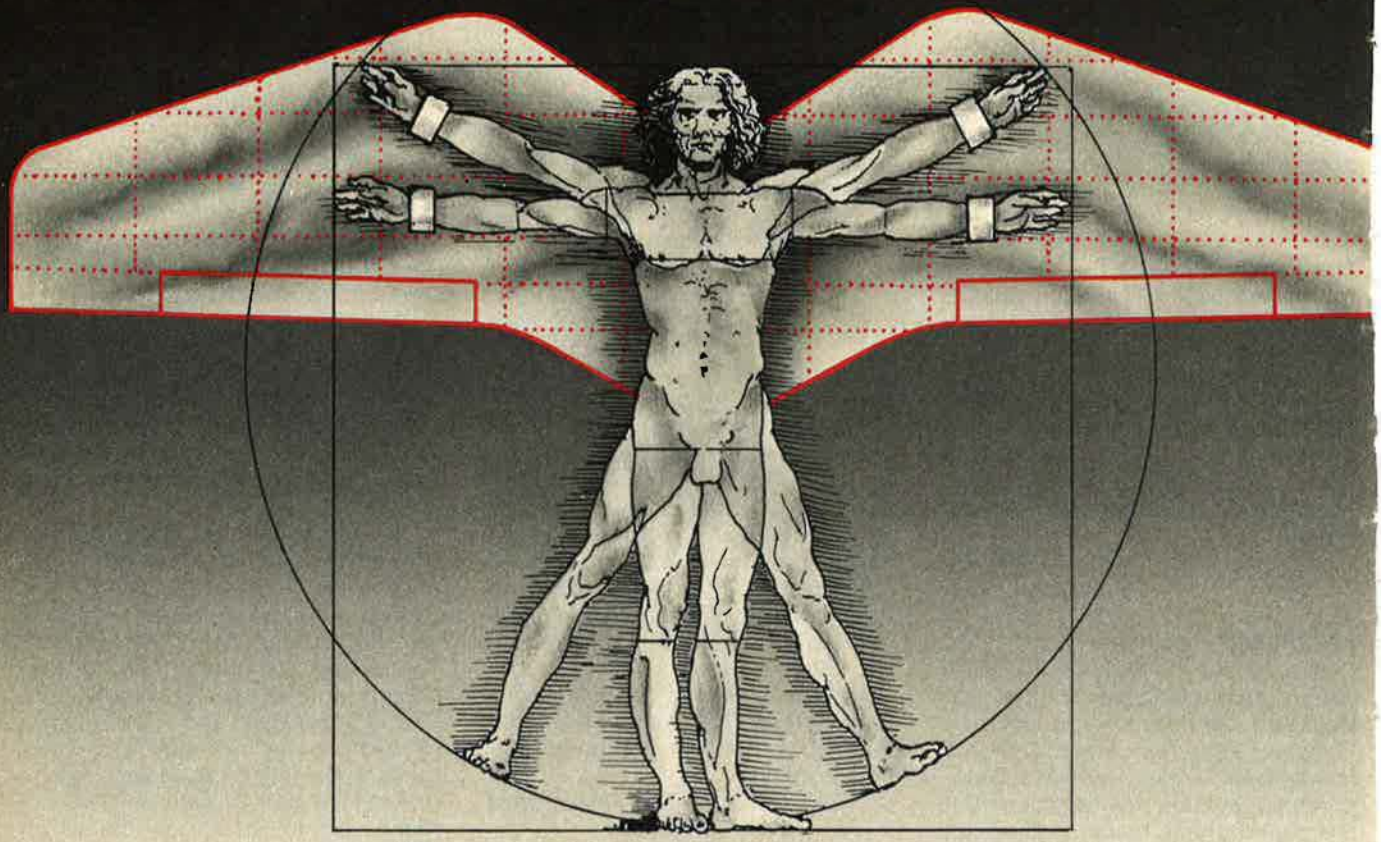
Film on B-17s

Dan Baldwin and I are writing and producing a motion picture series about the B-17 Flying Fortress. The series is geared for the television, educational, and business markets.

In the film, we propose to tell the story of the B-17 as a symbol of American foresight, technology, and resolve. We are in preproduction for Part One: "An Idea Whose Time Almost Didn't Come." This episode provides background on the development of US strategic bombing theory, and the evolution of airpower as embodied in Boeing's Model 299.

While much of Part One will utilize period films and photographs, we are hoping to locate some of the men

USAF aircraft fly with the Collins ARC-190.



So should yours.

The United States Air Force has selected the ARC-190 as the standard HF radio for the aircraft they fly–from the HH60 to the B-1B. Today, both the mil-spec ARC-190 and its commercial version, the HF-190, are available internationally.

Both HF transceivers operate with our exclusive SELSCAN adaptive communications system, which combines receiver scanning and selective calling with microprocessor control to monitor preset channels. Together with an internal link quality analysis, SELSCAN provides automatic selection of optimum channels between stations without operator intervention.

The ARC-190 and HF-190 include a digitally tuned preselector and a variety of digitally tuned antenna couplers, and both retrofit the Collins 618T, ARC-58 and ARC-105 using existing wiring. Retrofit kits are available for other applications.

The ARC-190 and HF-190 are now in full production, available immediately. So choose the standard HF radio of the USAF, and put Collins' 50 years of experience to work for you. Start by contacting your nearest Collins representative, or Collins Telecommunications Products Division, Defense Electronics Operations, Rockwell International, Cedar Rapids, Iowa 52498 USA phone 319/395-3393. TELEX 464-435.

Rockwell International

...where science gets down to business

AIRMAIL

who were involved with the early years of the Air Corps and Boeing, and especially any crew members who were involved with the YB-17s of the 2d Bomb Group at Langley.

Our goal is to present more than just the technical history of one aircraft. We wish to include the oral histories of those men in our research, and possibly film or tape their reflections for the record.

If readers are aware of anyone who was a part of this story and who would enjoy being interviewed, please let us know.

George Sewell
Baldwin-Sewell
323 Merrick St.
Shreveport, La. 71104

A Cautionary Tale

In the "Airmail" section of AIR FORCE Magazine every month, there are numerous letters from people seeking historical information or photos. In my experience, many of these people do not deserve assistance.

In recent times, I have responded to three of these people, one of whom was seeking photos of a type of Air Force fighter. Having some negatives of the plane that I no longer needed, I sent them to him. No word of thanks was received.

Within the last two months I wrote to two information seekers. One required information on a World War II fighter group, and the other needed data on a WW II general officer. Neither of these "gentlemen" bothered to acknowledge my letters, even though I had supplied the requested information.

The rudeness of people like this does considerable harm to the legitimate researchers. It is unlikely that I, or others who have had the same experience, will respond to future letters in "Airmail."

On another subject, the September '82 article "Designing the P-47 Thunderbolt" *(p. 132)* makes many references to "turbochargers" and "turbocharging." These terms tend to grate on my nerves, as neither was a WW II term. As a long-time maintenance type, I never heard them called anything but "turbosuperchargers," or simply "turbos." "Turbocharger" is a product of recent times—I never heard it until ten or fifteen years ago. Reference to any of the manuals of the day will, I believe, prove this.

Thank you for an excellent magazine!

Merle C. Olmsted
Salinas, Calif.

• *If readers send information or other materials on a loan basis to someone requesting the materials through "Airmail," and the materials are not returned as requested, please write* AIR FORCE *Magazine, to the attention of the "Airmail" editor, and we'll see if we can be of assistance in getting the property returned. Habitual offenders can be sure that their requests will never again be published.*—THE EDITORS

17th Weather Squadron

On August 28, 1982, the 17th Weather Squadron observed its fortieth anniversary. The Squadron was activated at McClellan Field, Calif., and its first operational headquarters was at Auckland, New Zealand, in November 1942. Units of the 17th were located throughout the South Pacific during World War II. The Squadron was deactivated for the first time on February 10, 1945.

The Squadron was reactivated in January 1970 at Travis AFB, Calif., and deactivated eighteen months later. The latest, and we hope more lasting, activation was again at Travis, on April 1, 1980. We now provide weather support to Military Airlift Command's Twenty-second Air Force.

We are a proud, professional organization, and we want to maintain our ties to the past as we press on to the future. To that end, we would welcome correspondence with anyone who was a member of the 17th Squadron during its previous periods of activation.

Especially valued would be photographs, memorabilia, or anecdotes concerning the Squadron and its activities. All photographs and other material will be handled carefully and returned promptly.

Historian
17th Weather Squadron
Travis AFB, Calif. 94535

357th "Dragons"

I am attempting to compile a broad squadron history of the 357th Tactical Fighter Training Squadron, also known as "The Dragons."

The unit was originally formed in November 1942 as the 357th Fighter Squadron. They initially flew P-47s, and later P-51 aircraft, in the European theater of operations.

Though it has been deactivated/reactivated a number of times over the intervening years, it has basically retained the 357th designation. The deactivations have taken a toll on whatever squadron histories previously existed.

I am keenly interested in hearing from all former squadron members of all ranks, and especially those assigned during the years 1942 through 1962. Photographs, flight logs, combat reports, newspaper articles, unit/individual orders, official documents, information concerning aircraft markings/colors, flying paraphernalia, etc., will all be greatly appreciated.

1st Lt. Roy R. Lorenz, USAF
357th TFTS/CCA
Davis-Monthan AFB, Ariz. 85707
Phone: (602) 748-5657

47th Bomb Group

A book is being prepared on the Douglas A-26 Invader in Air Force service, and a section is being devoted to the 47th Bomb Group—its aircraft and operations out of Grosseto, Italy.

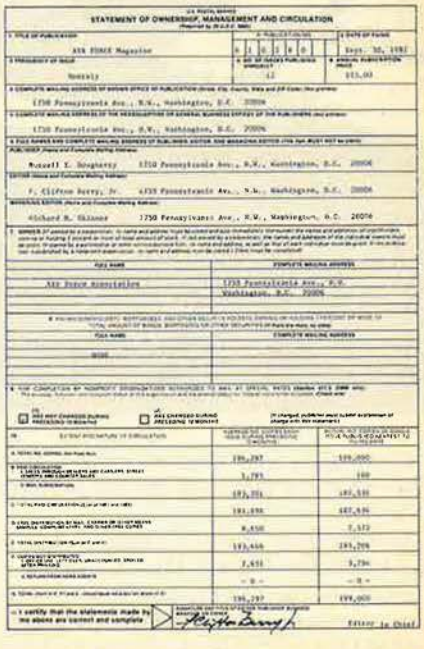
I would like to hear from any former members of the 47th who feel that they can assist me in documenting the activities of the Group while at Grosseto.

So, if you are a former member of the 47th, let me hear from you.

John Horne
15/20-22 Speed St.
Liverpool, N.S.W.
Australia 2170

Looking for . . .

In August 1944, US Army Air Forces Lieutenants Altvater and Roggencamp were shot down near the mouth of the Seine River at Deauville, France, and were taken prisoner by


STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

AIR FORCE Magazine

Air Force Association

1750 Pennsylvania Ave., N.W.
Washington, D.C. 20006

At GTE we don't treat simulation like a game because we know that some day the problems could be real.

GTE Sylvania Systems Group is a leading supplier of radar effects simulators to the U.S. Military.

Tactical Air Controllers and Tactical Weapons Controllers are, or soon will be, training on GTE designed and built systems in the U.S. Marine Corps and U.S. Air Force.

If you have a radar training problem, contact us. We think we can help because we don't treat simulation like a game.

GTE **Systems**

Sylvania Systems Group
Communication Systems Division
GTE Products Corporation
77 A Street
Needham Heights, Mass. 02194 U.S.
Area Code 617 449-2000
TELEX: 92-2497

AIRMAIL

1st Lt. Herbert Kreter of the German Army. Kreter is now a retired professor, and would like to establish contact with his one-time prisoners.

If they, or anyone who knows them, will get in touch with me, I'll be happy to supply Professor Kreter's current address in Germany.

Brig. Gen. James L. Colwell, USAFR
1501 Westbrook Ave.
Odessa, Tex. 79761

I am trying to locate two former B-17 crew members from the 390th Bomb Group's *Ain't Misbehavin'*, with the Eighth Air Force in England in 1944.

They are SSgt. James C. Blake, whose last known address was San Diego, Calif., and SSgt. Matthew Grubesich (possibly changed to Gruber), whose last known address was McKees Rocks, Pa.

We are planning a reunion. Please contact me at the address below.

James F. Bolger
Star Rte. 2, Box 406
Eustis, Fla. 32726

I served in the Air Force from 1950–71, and am looking for old friends from Korea, Okinawa, Africa, Iceland, Vietnam, etc. I've got twenty-one years of memories, and no address book!

Please contact the address below.

CMSgt. George J. Cooper, USAF (Ret.)
132 Phelps Ave.
Bergenfield, N. J. 07621
Phone: (201) 387-7024
387-7356

Collectors' Corner

I am an aviation illustrator, artist, and sculptor who collects aviation-related items that can be used as models for my artwork—helmets, uniforms, etc.

Besides art and sculpting, I also do nose art on restored aircraft, paint squadron patches, and do custom A-2 jackets. My dad served as a pilot with the Fifteenth Air Force during World War II.

Any help in obtaining items that would prove useful in my work would be most appreciated.

Nicholas P. Gamarello
173 Sherman Ave.
Jersey City, N. J. 07307

I am a member of the Connecticut Air National Guard, and work for Pratt & Whitney. For the past year I have been collecting Air Force and Air National Guard patches.

I would greatly appreciate any patches from readers, for which I would forward a patch from my unit.

SSgt. George R. Macri, ConnANG
471 Palisado Ave.
Windsor, Conn. 06095

I am seeking help in obtaining World War II vintage olive-drab (black-wool backed) rank chevrons. I need a set for the ranks of staff, technical, and master sergeant.

I am willing to pay for the chevrons, plus postage. Contact me at the address below.

MSgt. Harry Prosperi, USAF (Ret.)
1833 58th St.
Brooklyn, N. Y. 11204

IN FOCUS...

For MX: Closely Spaced Basing

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

Seventy Percent Would Ride Out Soviets' Worst Strike

Washington, D. C., Oct. 1

The Air Force, on September 15, 1982, recommended to Secretary of Defense Caspar Weinberger that closely spaced basing (CSB) be selected as the permanent basing mode for MX. The service reported that for the foreseeable future 100 MX weapons deployed in a like number of superhardened CSB shelters would provide a strategic nuclear deterrent sufficiently survivable to meet the essential requirements of US national strategy.

The Air Force's position is that initially at least MX/CSB will not require backup from either ballistic missile defense or deceptive basing. Should the Soviet threat, over the long term, grow faster than forecast by the US intelligence community, MX/CSB lends itself, however, to augmentation in the form of ballistic missile defense, deceptive basing, and collocation with ICBMs that are buried underground at depths of up to 3,000 feet.

At this writing, the Air Force has not yet made any recommendations to Secretary Weinberger about where the system is to be deployed. Four specific areas are under consideration at this time. It is not clear how many of the candidate sites will be incorporated into the Air Force's package of recommended locations that is to be submitted to OSD sometime in October.

The Defense Department, in turn, is expected to complete its review of the Air Force's recommendations—in terms of siting as well as closely spaced basing—early in November and present its formal proposals to the President at that time. Senior White House officials have informally informed pertinent elements of Congress that the President will announce his decision on how and where to deploy MX by the congressionally mandated deadline of December 1, 1982.

Initial reactions in the Executive Branch and Congress to the Air Force's MX/CSB plan reportedly have been positive. A special panel of eminent defense experts and scientists who over the past few months probed the MX issue informed Secretary Weinberger on September 14 that there were no viable alternatives to CSB, thereby strengthening further the widely held view that a decision against this basing mode is tantamount to killing the MX program and thereby abandoning the US land-based ICBM force over the long term.

The Air Force's decision to recommend MX/CSB rests on compelling findings resulting from comprehensive analyses of this basing scheme. One of the key factors is that a Soviet first strike against the system carried out under the most stressful conditions imaginable could destroy no more than twenty-five to thirty percent of these missiles. This assumption allows for steep but credible growth of relevant Soviet capabilities by the end of this decade when these weapons are to achieve full operational status. Even attacks against MX/CSB that are carried out over longer periods would leave a significant number of "survivors."

Series of attacks carried out over a ten-hour period, for instance, would leave about ten missiles intact. The likelihood of such an attack scenario, of course, is close to zero. The US National Command Authorities (NCA) would obviously not stand by idly while the Soviets kept attacking MX/CSB. Presumably a significant portion of the surviving MX missiles—as well as of the Minuteman IIIs—would be launched after a Soviet first strike. Also, the US strategic bomber forces, augmented by air-launched cruise missiles, would be attacking the Soviet ICBM fields long before the USSR's ICBMs could complete the destruction of MX in a generic sense.

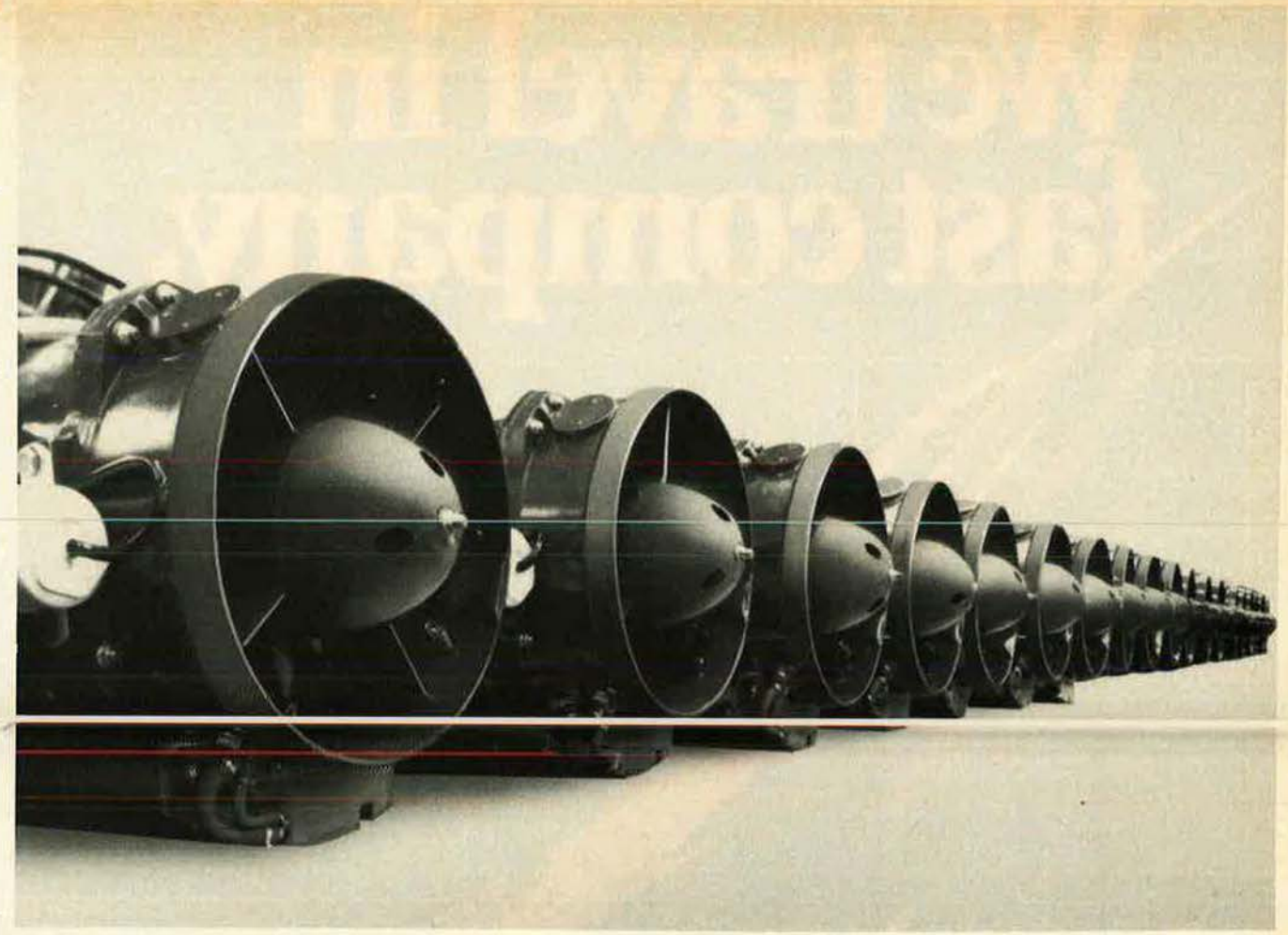
Another significant factor that was brought out by recent exhaustive studies of closely spaced basing is that this approach tends to force the Soviets toward a total, and from their point of view, disadvantageous restructuring of their ICBM force, especially that portion of the force earmarked for attacks on MX.

The Air Force studies indicated that warheads with a yield of about twenty-five megatons would increase the Soviet attack potential against MX. This means that only SS-18s—the largest Soviet ICBMs—could be used since none of their other ICBM types can accommodate such large warheads.

Secondly, of course, the SS-18s would be held to a single warhead configuration—instead of the ten MIRVed warheads that most of these missiles carry now or the sixteen or eighteen that they could deploy if not constrained by current bilateral arms-control understandings. Congressional experts suggest that the Soviets lack the capability to build large numbers of warheads with this high yield and the degree of reliability and uniformity required. Extensive testing probably would be needed to build confidence in such a capability but is prohibited by two nuclear test bans that the Soviets adhere to. One outlaws all atmospheric testing; the other precludes underground testing involving yields in excess of 150 kilotons.

The choice for the Soviets thus would be between either abrogating one or both of these bans or acceptance of a condition where their ability to threaten MX would be in question. The potential effects of MX on START, the US-Soviet Strategic Arms Reduction Talks, which are still in a preliminary and tentative state, could be beneficial. US arms-control experts point out that there now exists a unique opportunity to draw up strategic arms reduction criteria before a major new technology is deployed, rather than after the fact.

The central US objective in START is for both superpowers to reduce the total throw-weight carried by their ICBM and SLBM forces to a figure lower than the current US total. The resultant drop in the throw-weight of



THE POWER FORMATION

We've been working on cruise missile engine technology before they were even called cruise missiles. Our successful background in building engines that power RPV's, predecessors of cruise missiles, gave us a jump on cruise missile technology. We started with the early Harpoon program and now are building engines for the current ALCM and Tomahawk as well.

The J402 is a fully developed turbojet with growth potential to over 1,000 pounds of thrust. If you are looking at tactical cruise missiles, remotely piloted vehicles, or targets you take less risk with the J402 and get more hardware for your money. Our J402 lineup stands ready to perform. It's the power formation offering lower cost, proven performance, growth potential and availability. A powerful formation of reasons for choosing it!

Ideas With Power

TELEDYNE CAE

Turbine Engines

TOLEDO, OHIO 43612

We travel in fast company.

Zero to Mach 2 in six minutes.

As fast as the F-16 flies, it can't get off the ground without Turbomach's™ Titan® JFS (Jet Fuel Starter) on board. And once airborne, the F-16 relies on the Titan for in-flight restart.

Since the first Titan F-16 installation in 1975, over 1,000 of these compact, lightweight turbine power units have been delivered. And the 500 in active aircraft now flying have developed a reliability rate in excess of 99 percent.

It's this kind of proven reliability that motivated the selection of Titan's new big brother, Titan II,™ as the main engine start system in the forthcoming KC-135 re-engine program.

Titan. Reliable, lightweight and compact. The ideal choice for both today's *and* tomorrow's airborne auxiliary power needs.

The fast company we travel in proves it.

Turbomach

DIVISION OF SOLAR TURBINES INCORPORATED
4400 Ruffin Road, Dept. AF
San Diego, California 92123 • (714) 238-5754

Soviet ICBMs, especially so far as the SS-18s are concerned, would enhance further the effectiveness of MX. The US presumably would welcome development of a Soviet system similar to MX/CSB because of the stabilizing effects such a "mirror-imaging" would have in assuring mutual invulnerability and removing any incentives to strike first.

While MX/CSB has not yet won unqualified, universal approval in the scientific community, the only assumptions about Soviet responses to this system that could overwhelm it were dismissed by most elements of the intelligence community as being unrealistic. Key here was the hypothesis that the Soviets could develop maneuvering, evading, debris-resistant, and earth penetrating reentry vehicles that would not be affected by fratricidal effects.

Such RVs also would be able to work around ballistic missile defense, in the view of at least one expert on the special panel that advised Secretary Weinberger on what the Soviets might do to counter MX/CSB. Collectively, the intelligence community found no basis for the assumption that the Soviets could achieve such radical technological advances.

CSB involves placing MX missiles in superhard capsules that are spaced close together. This close spacing forces attacking weapons to arrive in lethal proximity to each other, creating "fratricide" when early arriving Soviet warheads detonate, disabling those that follow. This phenomenon limits the size and pace of an attack so that a significant number of MX would survive. Because the nuclear effects last for some time, follow-on attacks would have to wait until these effects subside. MX could be launched during this pause, however. Fratricide, therefore, puts an upper limit on the size of the force that could be brought to bear against MX/CSB.

The CSB concept proposed by the Air Force involves an array of 100 MX missiles in superhard capsules. The capsules would be hardened at 5,000 psi to ground bursts and up to 130,000 psi to airbursts, and would be spaced about 2,200 feet apart. The array of capsules would require only about fifteen square miles of land.

The Soviets appear to have four basic ways of attacking CSB. One, called a "full spike," is an attack in which all of the weapons targeted on the CSB array arrive at the same time and are detonated simultaneously. The objective of this is to destroy the entire array at the same precise time. However, the ability to achieve a full spike attack in practice is beyond the foreseeable state of technology.

Another Soviet option might be a partial spike, meaning a spike attack on only part of the CSB array, say every fourth capsule. Obviously, several waves of partial spikes would be needed to complete a full attack. The advantage of this type of attack is that the Soviet reentry vehicles would be spaced further apart and therefore may be less vulnerable to certain fratricide effects generated by previous detonations. Since a partial spike attack could only be directed at a fraction of the CSB force at one time, a high number of MX survivors could be launched in retaliation.

A third Soviet tactic might involve a "walk attack" in which the southernmost capsules are targeted first and the attack proceeds by walking from south to north, striking capsules row by row until all of the capsules have been attacked. Even within rows, however, the attacker must avoid striking adjacent capsules at the same time because of fratricide and use multiple attack waves in order to destroy an individual row. Through innovative approaches to capsule hardness and because of the potential for fuzing malfunctions, walk attacks will be difficult for the Soviets to carry out.

Lastly, it is possible to postulate a combination attack that incorporates the element of both spikes and walks, or may even employ an additional tactic such as a "pin-down." This tactic would be used if the attacker believed he could detonate a series of weapons, either at low or high altitude, that would preclude MX launch due to the resulting nuclear effects. However, the mutually reinforcing qualities of the US triad of strategic forces could negate this option. These forces can be used to disrupt the Soviets ability to employ a successful pin-down attack.

The effectiveness of these hypothetical attack tactics will depend on the height of burst of the attacking weapons. Either airbursts or surface bursts could be used. Airbursts would use overpressure, while surface bursts would rely on blast, shock, and cratering. Surface bursts will yield a higher probability of damage against individual capsules, but the increased side effects caused by such bursts will limit damage against the whole CSB array by increasing fratricide among attacking components and preventing rapid reattacks.

Obviously, for the Soviets to destroy the MX force, a systematic attack on all of the CSB capsules would have to be conducted. The attack must be conducted quickly enough to preclude launch of MX during the attack, and effective enough to preclude launch of surviving MX after the attack. Since hardened capsules drive the Soviets to use large yield weapons, they are faced with a problem: Fratricide becomes more severe if larger weapons are used.

Major nuclear effects that degrade potential Soviet attacks and ensure CSB survivability are radiation effects, airblast, fireball effects, and debris.

Radiation in the form of gamma rays, X-rays, and neutrons emanating from a detonated weapon will move rapidly toward adjacent capsules. Other weapons attacking adjacent capsules will absorb a flux of gamma rays or neutrons from the previously detonated weapon, inducing destructive heat. This prompt radiation fratricide effect makes full spike attacks ineffective, since weapons attacking adjacent capsules will invariably detonate at different times, thereby rendering many of the attacking warheads useless.

High-pressure shock waves, called airblast, are generated in the atmosphere by a nuclear explosion. The shock front tends to be of sufficient intensity to crush the reentry vehicle shell of weapons targeted at adjacent capsules. This effect makes a full spike and a fast repetition of a partial spike ineffective. Airblast also can inhibit walk attacks through destruction of incoming weapons or by driving them off course.

Another fratricidal effect is caused by the fireball, in which the radiation and energy from the weapons have been absorbed, that forms in the atmosphere near a detonation. The fireball is extremely hot and for yields of the size required to attack CSB, will rapidly engulf the area covering adjacent capsules. The interior of the fireball turns into a near vacuum. The fireball can cause catastrophic failure of the heat shield and destroy reentry vehicles, reduce overpressure on the target, or cause premature fuzing. These fireball characteristics can significantly degrade the effectiveness of airburst attacks.

Lastly, the general area under attack is clogged by debris—solid material from the ground that is kicked up into the atmosphere after a burst. As a reentry vehicle traverses the de-

bris-filled air, collisions with larger particles will destroy the weapon. Collisions with smaller sized particles will cause erosion of the reentry vehicle's nose-cone and heat shield, leading to destruction of the vehicle or degradation of its accuracy.

While there are theoretical ways of coping with these phenomena individually, none has been found that could do so across the board. Also, in many instances, the cures appear to be worse than the disease in that they create new, major opportunities for US countermeasures. It is tempting, for instance, to think of Soviet "soft-landers," meaning RVs that are slowed down by parachute or similar devices in order to detonate them simultaneously after they have landed. The accuracy of such designs probably would be degraded to a degree that terminal guidance becomes necessary. Worse yet from the attacker's point of view, such weapons would be sitting ducks for even the most rudimentary active defenses, including antiaircraft artillery.

Similarly, the minuses—from the Soviet point of view—attending such advanced technology schemes as "earth-penetrating" RVs or low-yield, highly accurate maneuvering RVs (MaRVs) seem to outweigh the pluses or, at best, lead to a wash. As a result, the Air Force was able to opt for MX/CSB with the conviction that the system will work regardless how hard the Soviets might try to negate it.

Washington Observations

★ Air Force Under Secretary E. C. Aldridge recently disclosed that the Soviets are developing a winged, aerodynamic "device" that, in a rudimentary fashion, resembles the US Space Shuttle. The Soviet system, he said, appears to be about ten years behind the technology of the Shuttle.

★ NASA's Deputy Administrator Dr. Hans Mark recently told an AFA meeting in Washington, D. C., that the Administration will not make a commitment to develop a manned space station—known to be high on NASA's wish list—for at least two years. Two other long-term NASA objectives are development of an Orbital Transfer Vehicle that can shuttle payloads, including astronauts, between low-earth and geosynchronous orbits, as well as development of nuclear reactors for spacecraft application. The latter program is to be carried out in concert with DoD and the Department of Energy, he said.

★ According to Secretary of the Navy John Lehman, the Air Force and Navy will soon announce details of an accord that stresses increased cooperation and mutual assistance of the two services. Thrust of the interservice agreement is that land-based air will be used for greater support of the Navy's battle groups (formerly called task forces) and that carrier-based airpower will be used in support of Air Force requirements, he said.

In a related comment, Secretary Lehman said that the principal lesson of the Anglo-Argentine war in the Falkland Islands was that "there is no substitute for the high technology approach." In a wry rebuff of the so-called Congressional Reform Caucus that favors quantity over quality, Secretary Lehman said that the "Department of the Navy firmly believes in the high-low mix as long as we have the 'high' part and the Soviets the 'low' part of that mix."

★ The Department of State, in a recent comprehensive assessment, concluded that "since 1975, the USSR has undertaken a major modernization of all branches of the Cuban military, transforming it from a home defense force into the best-equipped military establishment in Latin America and one possessing significant offensive capabilities."

The inventory of the Cuban Air Force, according to the State Department assessment, includes some 200 Soviet-supplied MiG jet fighters, with two squadrons of Floggers (the exact model of the second squadron recently delivered is not yet determined). The MiG-23s have the range to reach portions of the southeastern United States, most of Central America, and most Caribbean nations. But on a round-trip mission, Cuban-based aircraft would be capable of conducting only limited air engagements in Central America.

If based on Central American soil—a feasible option given the closeness of Cuban-Nicaraguan relations—Cuba's fighter aircraft could be effectively employed in either a ground-attack or air-superiority role. A similar arrangement would be possible in Grenada, once Cuban workers there complete the construction of an airfield with a 9,000-foot runway. If the MiG-23s were to stage from Nicaragua and Grenada, their combat radius would be expanded to include all of Central America, including the northern tier of South America.

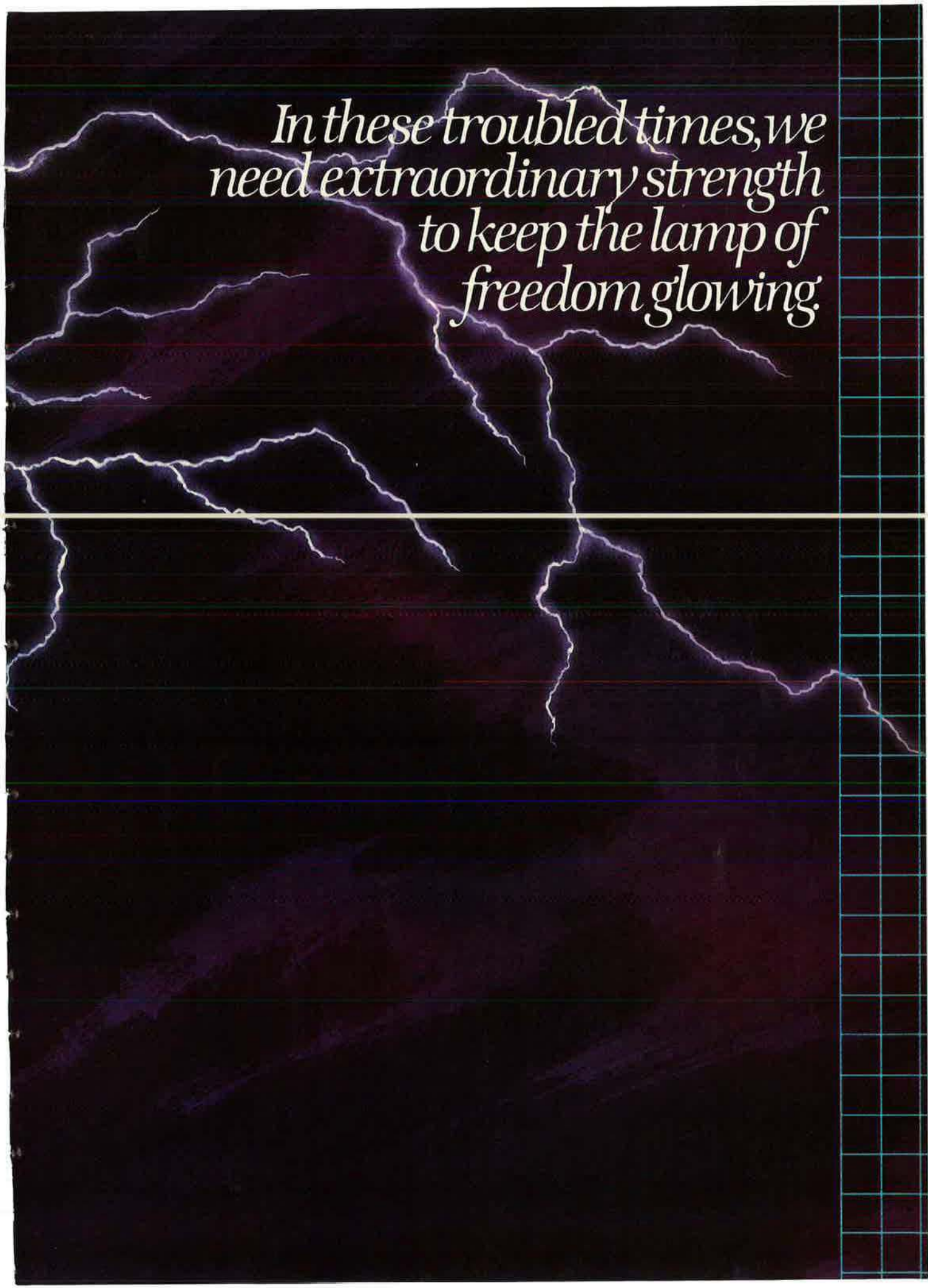
The Cuban defenses have been strengthened by the addition of mobile SA-6 launchers and related radars for air defense, SA-2 transporters, SA-2 missile canisters, new early-warning and height-finding radar stations, and electronic warfare vans. According to the State Department assessment, the USSR subsidizes Cuba to the tune of $3 billion annually and, since 1960, has turned over about $2.5 billion in military equipment to the Castro regime.

In return, the Soviets maintain in Cuba a ground forces brigade of about 2,600 men, a military advisory group of 2,000 men, and an intelligence collection facility. There also are from 6,000 to 8,000 Soviet civilian advisors in Cuba. Military deployments to Cuba consist of periodic visits by Soviet naval reconnaissance aircraft and task groups.

Located near Havana, the ground forces brigade consists of one tank and three motorized rifle battalions as well as various combat and support units. Likely missions include providing a small symbolic Soviet commitment to Castro—implying a readiness to defend Cuba—and probably providing security for Soviet personnel and key Soviet facilities, particularly for the Soviets' large intelligence-collection facility. The Soviets' intelligence-collection facility—their largest outside the USSR—monitors US military and civilian communications, according to US intelligence. Soviet intelligence-collection ships operating off the east coast of the United States regularly call at Cuba, as do hydrographic research and space support ships operating in the region.

Since 1975, Soviet Tu-95 Bear-D reconnaissance aircraft have deployed periodically to Cuba. Typically, these aircraft are deployed in pairs and stay in Cuba for several weeks at a time. The flights traditionally have been associated with US, NATO, and Soviet exercises, the transit of US ships to and from the Mediterranean, and periods of increased international tension.

The Soviets apparently sent a considerable number of pilots to augment Cuba's air defense during two periods early in 1976 and during 1978—when Cuban pilots were sent to Angola and Ethiopia. They filled in for the Cuban pilots deployed abroad and provided the Cuban Air Force with sufficient personnel to perform its primary mission of air defense of the island, according to the State Department assessment. ■


In these troubled times, we
need extraordinary strength
to keep the lamp of
freedom glowing.

COLLINS TELECOMMUNICATIONS PRODUCTS DIVISION — A worldwide supplier of tactical and strategic communications equipment for airborne, shipboard, vehicular, manpack and fixed-station applications.

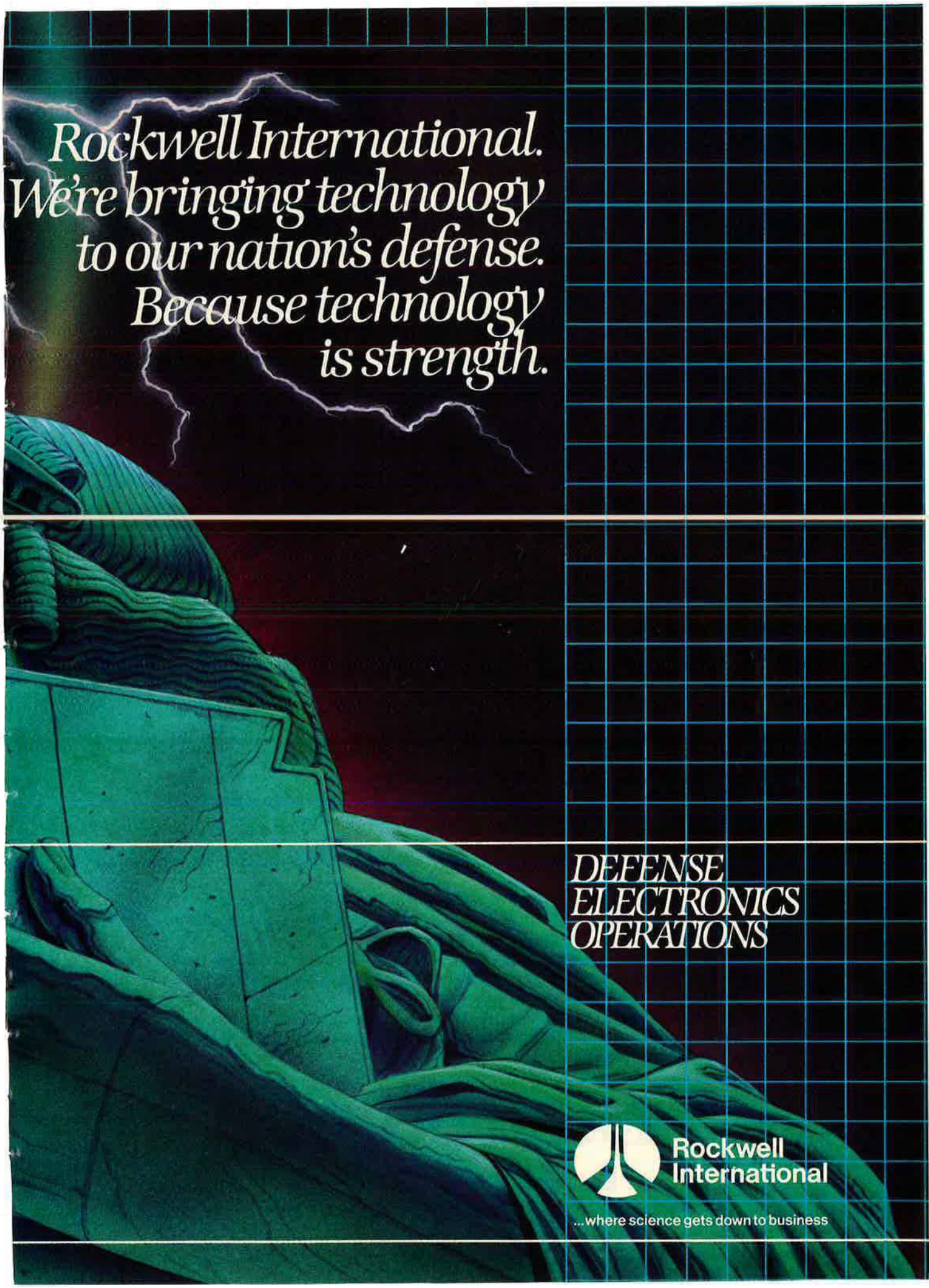
AUTONETICS STRATEGIC SYSTEMS DIVISION — The leader in ICBM guidance and control; a major presence in airborne and space electronics, with growing involvement in sensor and signal processing.

MISSILE SYSTEMS DIVISION — An established presence in the development and high-volume production of precision guided tactical weapons for anti-armor and defense suppression applications.

AUTONETICS MARINE SYSTEMS DIVISION — The leader in precision inertial navigation, with growing involvement in shipboard data multiplexing, sonar signal processing and combat systems integration.

COLLINS COMMUNICATIONS SYSTEMS DIVISION — A worldwide supplier of tactical and strategic command, control, communication and intelligence systems for spaceborne, land-based, airborne and shipboard applications.

INTERNATIONAL OPERATIONS — An extension of domestic capabilities – with subsidiary operations in Europe and Australia, providing product design, manufacturing, installation and worldwide support.


Rockwell International.
We're bringing technology
to our nation's defense.
Because technology
is strength.
DEFENSE
ELECTRONICS
OPERATIONS
Rockwell
International
...where science gets down to business

"INFORMANIA"

It's having to decide with absolute, total uncertainty.

You face a clear-cut decision.

You either optimize personnel deployment or you don't.

Which is to say you'll either succeed or you'll fail. Such decisions are critical to your mission effectiveness. And they're also your life's work.

So when you've got to sign on the line, but there's not a scrap of hard evidence to help you, momentary loss of vision is entirely normal.

That's "Informania."

The solution is information. The right information. In the right form. For the right people in the right place and time.

Burroughs can help. Because we know how to manage information. Strategically. We've put 95 years of thought and experience into it. And we offer a comprehensive solution to the problem of "Informania."

Our sophisticated computers and office automation systems can help you collect, compose, analyze, store, recall, reformulate and distribute information.

So that you will know. And act with certainty.

When "Informania" strikes, the answer is Burroughs. Write for our free brochure: Burroughs Corporation, Standard Products Group, Dept. AF-81, 7925 Jonesbranch Drive, McLean, VA 22101.

Burroughs

Building on strength

AEROSPACE WORLD
News, Views & Comments

By William P. Schlitz, SENIOR EDITOR

Washington, D. C., Oct. 4

★ From British sources come data on the weapons used to destroy Argentine aircraft during the Falklands crisis. The British claim 120 Argentine aircraft destroyed—seventy-eight in the air and forty-two on the ground or captured. Of the air-to-air victories, thirty-one were achieved by Sea Harriers, forty by surface-to-air missiles, and seven by other means. The breakdown:

Sea Harrier kills: Mirage, nineteen; A-4, five; Pucará, two; Canberra, one; C-130, one; helicopters, three.

Sea Harriers launched Sidewinder air-to-air missiles twenty-seven times to achieve twenty-four of the kills. The other seven air-to-air kills were with the 30-mm Aden gun on the Sea Harrier.

The forty surface-to-air missile kills break out this way: Sea Dart, eight; Sea Wolf, five; Sea Cat, six; Rapier, thirteen; hand-held, eight.

The "other" kills were achieved by 4.5-inch naval gun (one) and small arms or the Argentines' "own guns" (six).

Of the forty-two Argentine aircraft destroyed on the ground or captured, the British sources claim that fifteen resulted from Harrier attacks. As for utilization, they claim that the Sea Harriers flew about 2,000 combat sorties, with up to six sorties per aircraft per day and three or four sorties per pilot per day.

★ Air Force engineers are evaluating a conceptual design of a research aerospacecraft "that would provide options for future military space vehicles that might be operational after the year 2000," officials said.

The research vehicle—called MRRV, for maneuvering reentry research vehicle—would be equally at home in the atmosphere or space "and would demonstrate the technology for performance capability greatly exceeding that of the current Space Shuttle," officials declared.

The research vehicle's design was developed by North American Operations Division of Rockwell International, Los Angeles, Calif.

The triangular-shaped MRRV would measure about twenty-five feet from nose to tail and as a "lifting body" would depend on a flat underbody rather than wings to generate the lift that is needed for atmospheric flight.

The MRRV would explore aerodynamic maneuvering entry techniques and technologies needed aboard Air Force vehicles operating both in space and the earth's atmosphere. These would include advanced electronics and heat shield materials.

The MRRV could be carried into orbit within the Space Shuttle's cargo bay and launched for reentry by the Shuttle's remote manipulator arm.

In an alternate approach, MRRV and a booster rocket could be carried aloft under the wing of a B-52 and the booster could then launch the MRRV to orbit and be jettisoned.

MRRV, because of its flight characteristics, could be used to gather data in the design of sortie vehicles that could be launched to space on short notice and reenter again on demand, "a very useful capability for consideration in future military aerospace vehicles," officials noted.

Wind-tunnel testing of MRRV configurations is currently under way at Arnold Engineering Development Center, Arnold AFS, Tenn., and NASA Langley Research Center, Hampton, Va.

A miniature television camera peering over the helmet of Astronaut Joseph Allen's spacesuit will give viewers on earth a glimpse of the scene during a space walk scheduled for Orbiter Columbia *on its STS-5 mission. The first operational flight of the Space Shuttle also calls for the deployment of two communications satellites.*

★ With the threat of terrorist activity in Europe and the constant danger of sabotage, USAF is taking steps to increase the security of its combat aircraft there.

Five hangars at Spangdahlem AB in Germany are to be protected against intruders by a new type of alarm system developed by AFSC's Electronic Systems Division, Hanscom AFB, Mass. Six other European bases are to be equipped similarly.

Heart of the system is a recently developed radar sensor. Slightly larger than household fire detectors, four of the dome-shaped units are mounted inside a hangar and fill it with invisible radio waves.

"Anyone breaking into the shelter would set off an alarm the instant he moves and disturbs the radar wave pattern," commented Dr. Barry L. Allen, project manager. The alarm is sent through underground cables to

a pair of security control centers—one atop a fifty-foot-high, armor-plated observation tower, and the other at the base security center. Both have illuminated maps that would indicate intrusions.

"Using electronic sensors allows sentries to be reassigned to quick response teams sent out to investigate alarm signals. This also relieves them from the tedious hours of 'walking the perimeter' in all kinds of weather," said Capt. Bulan M. Davis, ESD deployment manager. "In addition to improving morale, this closed-sheltered system never gets careless or tired and operates at lower cost. It will never replace security personnel, but certainly will make their jobs easier."

ESD's Physical Security Systems Directorate has developed a wide range of sensors and related equipment to safeguard DoD installations.

★ A modern state-of-the-art laser communications system that has potential for use throughout the Air Force is the subject of a test and evaluation program at Scott AFB, Ill.

According to Mary Jane Aegerter, laser communications project officer with the 1842d Electronics Engineering Group, the unit has in hand atmospheric lasers and approval from the Space Defense Operations Center at Cheyenne Mountain in Colorado and Scott's environmental officer to operate and test the system's communications effectiveness under real-world conditions.

AEROSPACE WORLD

Atmospheric laser communications systems, best described as low-powered laser units that transfer information through the air in an invisible light beam, change sound (voice or digital) into electric signals and then into light signals. The laser transmitter then sends converted information by pulsing a near-infrared light ray to a laser receiver that detects the light signals and turns them back into electric signals and once again into usable voice or digital sound.

The 1842d's role in this project is to determine, test, and verify ways communications lasers can be used to support Air Force Communications Command operational requirements. The laser system the 1842d will test is lightweight, self-contained, and portable, and it offers secure line-of-sight communications with a range of up to ten miles.

Laser communications systems are being considered for use in the Air Force because of radio communications congestion problems—almost all frequency bands available for communications are filled. Laser systems aren't affected by this because they don't operate on radio frequency bands and radio signals don't interfere with laser transmissions.

★ The European Space Agency has received a major setback in its effort to break the US/USSR monopoly in space.

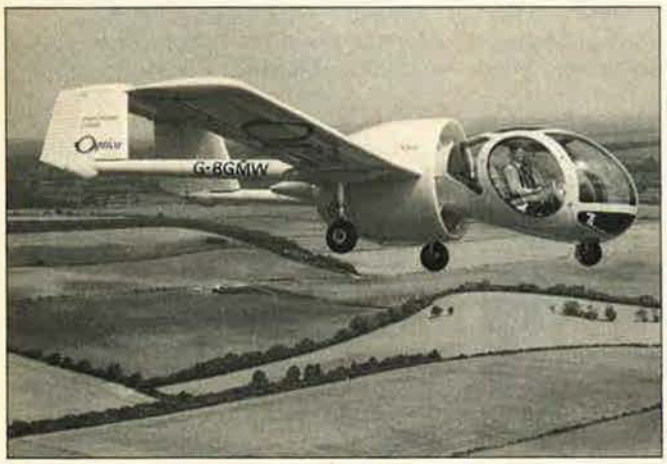
ESA's launch vehicle, Ariane, and the two satellites it was to have orbited crashed, probably into the Atlantic, soon after leaving the pad at Kourou in French Guiana. Cause of the failure seemed to be in the propulsion system, since Ariane assumed a lower trajectory than planned.

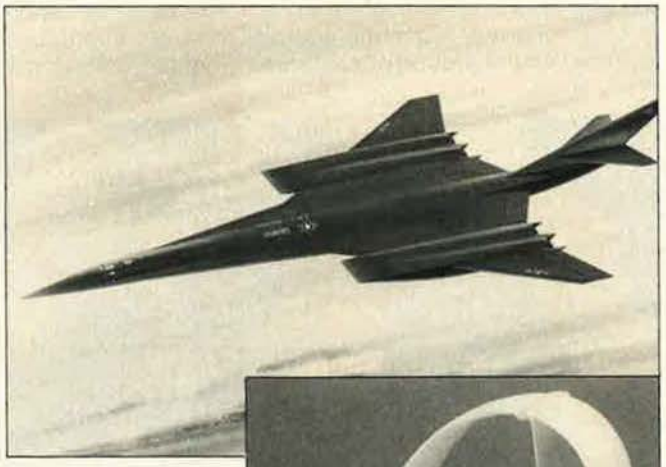
A spokesman said that the program—aimed at luring commercial customers away from the US's Space Shuttle—would "of course continue." ESA has booked some thirty-five satellite launches and holds options on thirteen more, including those of US corporations.

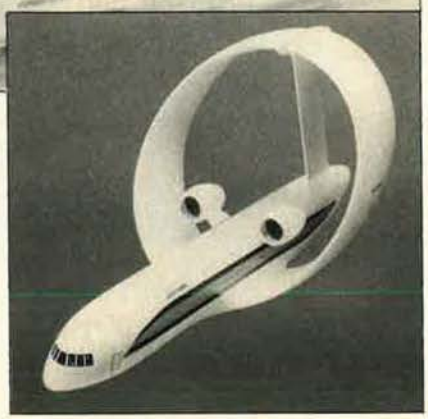
Ariane's payload consisted of a shipping communications satellite and weather-monitoring satellite. The latter was uninsured and declared a total loss.

France, which is interested in the military uses of space surveillance, has a fifty-nine percent share of the Ariane investment. Both the US and Soviet Union have declined to orbit French military satellites.

★ The FAA has issued regulations governing the operation of "ultralights," a new category of aircraft that includes hang gliders and their







Concepts in aerodynamics, above, left to right: the Optica, built by England's Edgley Aircraft Ltd., is claimed to be the world's quietest powered aircraft. An observation and low-level camera platform, the uniquely designed duct-fan aircraft has entered full production. Next, a Lockheed-California Co.'s artist conception of a liquid methane-fueled reconnaissance aircraft for the 1990s. The turboramjet aircraft would fly at a maximum altitude of 100,000 feet and cruise at Mach 5 (3,350 mph). The aircraft would be constructed of titanium with outer edges of Inconel, a heat-resistant stainless steel. Other concepts under study could be powered by hydrocarbon or liquid hydrogen. Finally, Lockheed-Georgia Co.'s fantastic Ring Wing aircraft, which the company is already featuring in preliminary wind-tunnel tests. It is considered a possibility for the post-2000 year period and would contain many advanced technologies.

TIGERSHARK. NOW FLYING.

TIGERSHARK DESIGN PERFORMANCE (CLEAN)	
Maximum speed—level flight	Mach 2 Class
Combat thrust-to-weight ratio	1.13
Acceleration: 0.9 to 1.2 Mach at 30,000 feet	29 seconds
Sea level rate of climb	54,100 feet/minute
Takeoff weight	17,260 pounds
Takeoff distance	1,500 feet
Time to climb to 40,000 feet	2.2 minutes from brake release

Tigershark. Northrop's new Mach 2 class tactical air defense fighter. More than a match for any likely opponent.

Agile. Maneuverable. Difficult to see and track. With the new 17,000 pound thrust class GE F404 engine for instant acceleration. Advanced aerodynamics. State-of-the-art radar and avionics for operations around the clock and in bad weather.

Superiority over anticipated threat: 35 percent advantage—or 2° to 3° per second—in sustained turn rate; 50 percent advantage—or 6° to 7° per second—in maximum instantaneous turn rate. This means Tigershark can gain and hold the position of maximum advantage in a dogfight—six o'clock on the tail of the opponent. (See chart below.)

Tigershark. Performance. Reliability. And affordable cost.

TURNING COMBAT
TIGERSHARK VS THREAT

TIGERSHARK
Turn radius—3,180 ft. Time to turn 180°—11.0 seconds. Turn rate—15.25°/second.
THREAT
Turn radius—5,503 ft. Time to turn 180°—16.8 seconds. Turn rate—10.6°/second.

NORTHROP
Making advanced technology work.

Northrop Corporation, 1800 Century Park East, Los Angeles, CA 90067 USA.

Before your next missile design goes too far, make sure its actuation systems go far enough.

At Garrett's AiResearch Manufacturing Company, we've earned our reputation as a leader in electromechanical actuation systems, as well as hydraulic and electric power systems. We're known for building tough, high-performance actuation systems which give you greater flexibility in designing the complete missile system.

Our leadership is also the result of unsurpassed capabilities in making trade-off studies between possible design approaches— capabilities involving an extensive use of computer programs which permits rapid response to your needs.

This expertise in complete actuation and control systems is based on advanced technology in individual components, such as electromechanical actuators which provide stiff, high-frequency response capabilities; high-speed, lightweight, turbine-driven pumps and alternators; and samarium cobalt, permanent magnet DC motors.

Furthermore, the actuation systems we pioneered on such missiles as Nike Hercules, Nike Zeus, SUBROC, and Spartan helped establish state-of-the-art technology for today. Among our current applications are MX, Pershing II, Trident, ALCM, ASW/SOW, HARM, and ALWT.

In addition, we have capabilities in electronic systems, including weapons launch controls, air data sensors and computers, solid state power conditioning systems, plus electronic cooling systems. Our experience also includes ground support, environmental, and power drive systems.

So if you're looking for qualified leaders with a solid reputation, contact Garrett's AiResearch Manufacturing Company.

Before you've gone too far.

Write: Missile Systems Sales, AiResearch Manufacturing Company, 2525 West 190th Street, Torrance, CA 90509.

GARRETT

GARRETT The Garrett Corporation
One of The Signal Companies

controversial powered counterparts.

In its move, the agency cited the growing numbers and increasing performance capabilities of these vehicles and said their continued unrestricted operation poses a threat to other air traffic.

FAA expressed particular concern about the uncontrolled use of motorized ultralights that have landing gear, movable control surfaces, and other features that give them operational capabilities similar to conventional aircraft. The ultralights have mushroomed in popularity, with an estimated 15,000 to 25,000 powered types now in operation. (The number is uncertain because of the many kits being sold.)

The powered ultras are characterized by the relatively small initial cost of purchase and economy of operation. Most can be dismantled for transport atop vehicles and easy storage. They also can be flown after limited instruction and without a pilot's license, which has become more and more expensive to earn.

The new rules require ultras exceeding certain weight and performance limits to meet FAA safety standards for airworthiness certification like regular aircraft. In addition, these aircraft operators will need a pilot's certificate.

AEROSPACE WORLD

Flying training for crews of the British, Italian, and West German Tornadoes is conducted at RAF Cottesmore. Here, three of the aircraft in their national markings in formation over the English countryside.

The agency will not require certification or registration of hang gliders weighing less than 155 pounds or powered ultras less than 254 pounds that have a fuel capacity of no more than five gallons. Motorized ultras in this category will be limited to a maximum speed of fifty-five knots with a power-off stall speed of not more than twenty-four knots.

In excluding these aircraft from certification requirements and the operators from licensing requirements, FAA said it expected the ultralight community to develop voluntary compliance programs in these areas and submit them for agency approval. "Should this approach fail to meet FAA objectives," it warned, "further regulatory action will be necessary."

In addition to the limitations on ultralight weight and performance, the new regulation also establishes right-of-way and minimum visibility requirements for safe operations. On-the-spot safety inspections by FAA personnel also are authorized.

Additional operating rules prohibit ultralight operators from engaging in any activity that jeopardizes the safety of persons or property on the ground. Flights over congested areas also are banned. All operations in certain airspace, such as airport traffic areas, control zones, terminal control

"Bridge Busters" and Missileers

The B-25 flew at precariously low altitude. The idea was to surprise the enemy and destroy one of his supply bridges.

A stand of trees suddenly appeared directly in the aircraft's path. The pilot, Maj. Robert A. Erdin, pulled up to clear the treetops and then put the aircraft into a shallow dive to resume his low-level flight.

Then he saw the bridge and, with no time for leveling off, unloaded his bombs. Another mission wasted, he thought. But to his astonishment, the bombs skipped across the river surface like stones and destroyed the bridge. Thus, the "Burma Bridge Busters," otherwise known as the 490th Bombardment Squadron, were born.

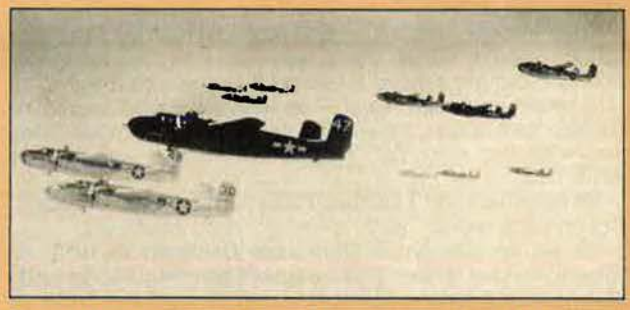
Upon discovery of this "hop" bombing technique, the 490th achieved considerable distinction in World War II's China-Burma-India theater. For example, during a one-week period, the squadron managed to demolish eight bridges, one of which reportedly provided a crossing for ninety percent of the Japanese supplies in northern Burma.

This unique wartime accomplishment earned the squadron a number of awards, including two Distinguished Unit Citations and a Presidential Unit Citation. In 1946, along with countless other units, the 490th Bombardment Squadron was deactivated.

In 1961, the 490th was reborn, this time in central Montana. While no bridge busting was involved, the crews of the 490th Strategic Missile Squadron and their fifty Minuteman missiles were assigned an essential role in the nation's policy of nuclear deterrence.

Eventually, the two groups discovered each other. The World War II veterans accepted an invitation from the missileers to meet this past summer at Great Falls, Mont., home of Malmstrom AFB and the 490th SMS.

At the reunion, there was a definite spark in the air. The missileers found the veterans' war stories sometimes humorous, sometimes poignant.



Days of yore, with B-25s conducting operations in the China-Burma-India theater.

For example, the "Bridge Busters" related the time they prematurely "unloaded" a supply of beer from a B-25, which happened to be airborne at the time. The mishap injured no one, but created havoc and damaged several structures.

Other tales reconstituted memories of lost comrades, like the B-25 that simply disappeared while flying in formation at low level and in thick fog.

During the week-long reunion, the "Bridge Busters" were taken on a tour of the missile complex and it was obvious that they and the young missileers had gained mutual respect. There was a marked improvement of the *esprit* of both groups. Members of the 490th SMS now have a better understanding of their unit's heritage and urge others considering similar get-togethers to press on.

—By 1st Lt. Bernard W. Hasson, USAF

areas, and positive controlled airspace, require prior approval.

Ultralight operations will not be permitted between sunset and sunrise. An exception to this would allow operations in uncontrolled airspace during twilight, thirty minutes before sunrise and thirty minutes after sunset, provided the vehicle carries an anticollision light. The light is defined in the rule as any flashing or stroboscopic device that is visible for at least three statute miles.

Another provision limits all ultralight vehicles to a single occupant and specifies that they may be used only for sport and recreational purposes. Commercial ultralight operations will not be permitted.

"As the FAA rule applies to powered ultralights, it is acceptable and offers the opportunity for self-regulation in such areas as minimum standards for pilots and instructors," commented Vic Powell, an Aircraft Owners and Pilots Association Senior Vice President and President of the US Hang Glider Association.

"However, the FAA has made a mistake in applying the rule to hang gliders and balloons. For example, the latter are limited to five gallons of fuel, not enough to safely conduct a flight," added Mr. Powell. "Also, in outlawing two-place powered ultralights, the FAA has overlooked the fact that two-seat machines *enhance* the safety of flight instruction. This is also clearly unnecessary government in that the US Hang Glider Association has been self-regulating under FAA sponsorship since 1972, at no cost to the public. Now the tab for inspections and other regulation will be picked up by the taxpayer," Mr. Powell added.

Rep. Stan Parris (R-Va.) plans to introduce a bill to exempt hang gliders from the FAA rule.

AEROSPACE WORLD

★ A thin giant cloud of gas and dust, thrown into the atmosphere by Mexico's El Chichon volcanic eruption in March and April, now covers much of the Northern Hemisphere.

NASA centers in Virginia and California are applying the latest electronic sensing systems in a long-range study to determine the cloud's potential effects on global weather patterns.

"Data gathered about the cloud now will provide the information base for later correlation between current weather changes and the cloud's movements and density during those weather changes," officials said.

They're Just a Couple of Pilots

He flies one of the most sophisticated jet fighters in the world.

She takes to the sky in large commercial aircraft. In her hands rests the safety of thousands of people each year. She is one of eleven women pilots employed by the company.

He flies from twelve to fifteen hours each month. She must be available to fly twenty days a month.

In their vocations as pilots they share the love of flying and married life together. They are 1st Lt. John Marshall, F-15 pilot assigned to the 94th Tactical Fighter Squadron, 1st Tactical Fighter Wing, Langley AFB, Va., and Jill Marshall, DC-9 first officer with USAir.

Their backgrounds are also similar and diverse. Both their fathers were in the Air Force, yet, unlike her husband, Mrs. Marshall did not acquire a love for flying as a youngster.

"I began to fly as a result of an advertisement I read in my college newspaper. I was vaguely interested in what flying would be like, and once I experienced it, I was hooked," she explained.

On the other hand, Lieutenant Marshall had hopes of becoming an astronaut or fighter pilot from early childhood.

"When we first met at Ohio State University in 1975, Jill already had her private pilot's license and was going for additional training. I was studying for a degree in physics under an ROTC scholarship, and would go on to flight school after graduation," he said.

Shortly after marriage, Mrs. Marshall received word that the application she had submitted for a pilot position with USAir had been accepted.

Interestingly, the Marshalls try very hard to keep "shop talk" out of their marriage. "We're very interested in what each other does," explained Lieutenant Marshall, "but the technical aspects of our careers is not what we like to share."

"It's more what we experience and how we feel about our flying that we talk about," Mrs. Marshall added. "Talking pilot language, well, that's not really communication to make our marriage strong," she clarified. "With the little time that we do have together, our marriage must come first."

The Marshalls are clearly proud of each other's accomplishments, and take equal pride in their own careers. "When I watch the F-15 in flight, I feel very proud that John is involved in this part of the Air Force," Mrs. Marshall emphasized. "However, as far as women fighter pilots go, women could certainly handle the technical part of the job. But I think that it takes a very aggressive type of individual to be a good fighter pilot. When I'm behind the controls of a DC-9, it doesn't matter if I'm a woman or a man—I am there to fly the aircraft. But when I'm not flying, well, then it certainly matters!"

The Marshalls look aft from the cockpit of an F-15 at Langley AFB, Va.

Lieutenant Marshall has been assigned to the 94th TFS for almost two years. "I was really happy to be assigned to the 94th," he commented, "The squadron's history and accomplishments are known Air Force-wide.

"To fly the Eagle is like a dream come true, and I wouldn't trade jobs with anyone. That's what makes the difficult times of being apart somewhat easier. We know that we both really enjoy what we do."

What does the future hold? "Well, we're both still pushing for improvements in our careers," the Lieutenant said. "We want to attend more college. But right now it's like standing on a mountain. Where can you go when you feel that you've accomplished all of your goals so far?

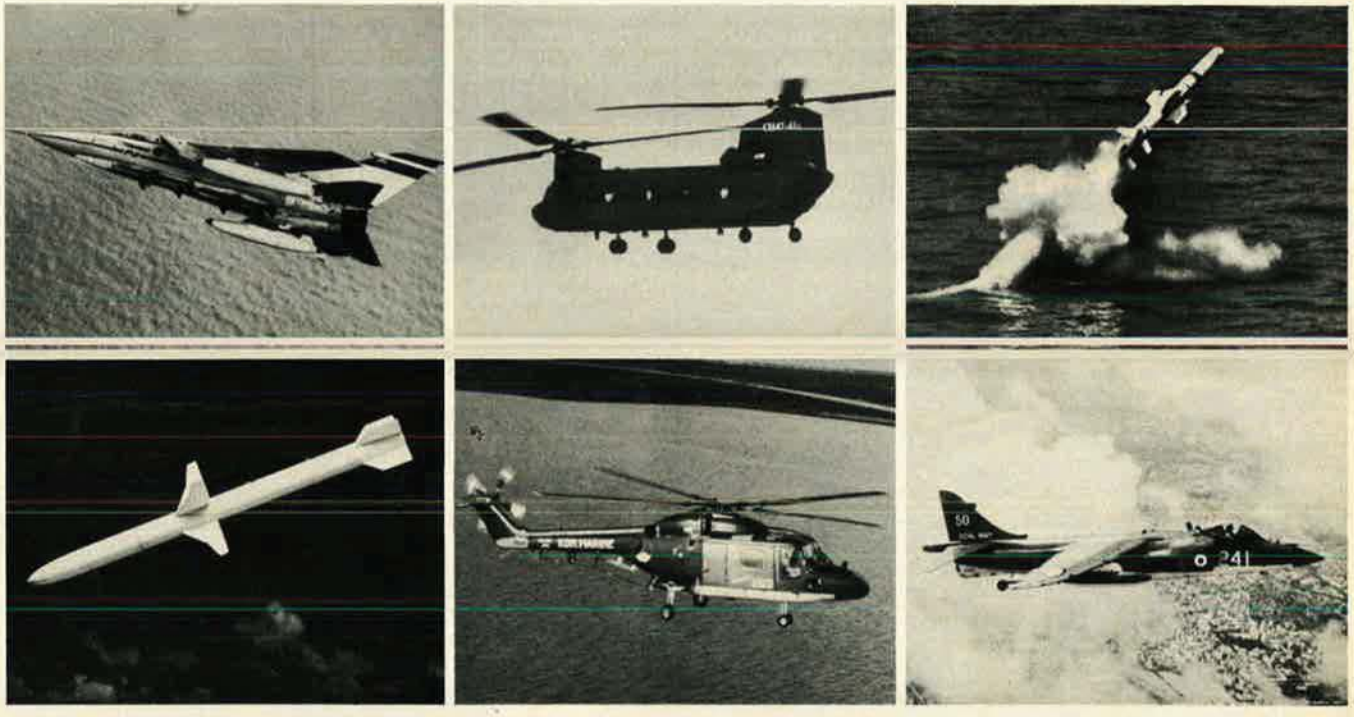
"It's true that we don't want to spend so much time apart, but we concentrate on the quality of the time that we do have together, not the quantity," he said.

"I think it all comes down to," concluded Mrs. Marshall, "You can't confuse who you are with what you do."

—By A1C Cindy Beers, USAF

LUCAS.

The largest range of aircraft and missile systems from any single source–world-wide.



Lucas Aerospace systems are supplied for over 100 different aircraft types, and for missiles such as HARM and Harpoon.

Major airlines, defence forces and operators around the globe, flying thousands of individual aircraft and millions of flying hours each year, depend on Lucas expertise, experience and the world-wide product support they provide.

Aeritalia, Aermacchi, Aerospatiale, Airbus Industrie, Bodenseewerk Gerätetechnik, Boeing, de Havilland Aircraft of Canada, Fiat, Fokker, Hughes Aircraft, Lockheed, MBB, McDonnell Douglas, Panavia, Pratt and Whitney, Siai Marchetti, Sikorsky, Texas Instruments, British Aerospace, Rolls-Royce, Westland, and many others gain the benefit of design innovation and engineering skills through close partnership with Lucas Aerospace.

The Lucas Aerospace product range includes: engine management systems; electric, pneumatic and gas-turbine starting systems; ignition and combustion systems; hot and cold thrust reversers; hydraulic, pneumatic, electrical and mechanical actuation systems; ballscrews; small gas turbines; air control valves; electrical power generation and distribution systems; auxiliary power systems; de-icing systems; transparencies; high-precision fabrications and high-performance actuation and electrical control systems for missiles.

Lucas serves the international aerospace and defence industries, combining advanced technology with high reliability, and supplying the largest range of aircraft and missile systems from any single source — world-wide.

Lucas Aerospace

A Lucas Industries Company

Lucas Aerospace Limited, Brueton House, New Road, Solihull, West Midlands, B91 3TX. Tel: 021-704 5171. Telex: 335334.
Lucas Aerospace, Lucas Industries Inc., 415 East Airport Freeway, Suite 240, Irving, Texas 75062. Tel: (214) 659 9121. Telex: 732561.
Operating Divisions in Australia, Canada, France, UK, USA and W. Germany.

THE EF-111A. ITS SIGNIFICANCE BECOMES MORE APPARENT EVERY DAY.

Potential aggressors will soon have to contend with an imposing weapon. The U.S. Air Force's newest dedicated tactical jamming aircraft—the EF-111A.

Developed by the USAF and Grumman, the EF-111A will be able to detect, identify and disrupt the electronic air defenses of enemy armor and strike forces. In support of our own air-to-ground operations, the EF-111A will loiter miles from enemy territory as a standoff jammer, or fly along with our strike forces and nullify hostile radar deep behind the lines.

Against simulated Central European air defenses—the densest in the world—the EF-111A has demonstrated its ability to counter radars. As new and more sophisticated electronics are developed the EF-111A's built-in growth potential lets it adapt to meet the threat. Thus, a full complement of EF-111A's would multiply the effectiveness of defending forces many times over and give the USAF an increased deterrent to aggression.

The EF-111A. A real answer to a real need.

Grumman Aerospace Corp., Bethpage, Long Island, N.Y. 11714.

THE PAYOFF IS PERFORMANCE.

GRUMMAN

The cloud studies are part of NASA's Aerosol Climatic Effects Program, a long-term examination of the atmospheric effects of gaseous discharges, coordinated by Dr. James Pollack of NASA's Ames Research Center, Mountain View, Calif., and Dr. M. Patrick McCormick of Langley Research Center, Hampton, Va.

To study the cloud, NASA is using satellites, U-2 aircraft, and LIDAR (Light Detection and Ranging).

The cloud is a mixture of dust and sulfuric acid. While the dust will soon settle out, the highly reflective sulfuric acid will provide spectacular sunsets for a few years. Of greater scientific concern is that the acid will absorb thermal energy from the earth, thus warming the stratosphere and, by reflecting sunlight, cooling the lower atmosphere.

Cooling attributed to volcanic clouds has had dramatic results in the past, NASA officials note. An eruption in Indonesia in 1815 is believed to have caused snowfall in New England in the summer of 1816, which became known as the year without a summer. It is not known now whether the El Chichon cloud is as potentially disruptive, NASA said.

Because of global weather patterns, the cloud will eventually cover the entire earth. To have an effect on the temperature there must be "a lot of material and it must stay around a long time because the earth's surface temperature, especially that of the oceans, has a lot of inertia," said Dr. McCormick. ■

AEROSPACE WORLD

William E. Kepner 1893–1982

Lt. Gen. William E. Kepner, USAF (Ret.), began his thirty-two-year military career with a hitch in the Marine Corps from 1909 to 1913. Following a stint with the Indiana National Guard, he then served with the US Cavalry on the Mexican Border.

In 1917, General Kepner transferred to the Infantry and saw extensive action on the Western Front, rising to battalion commander.

Between the wars, the General's interest centered on rigid airships and he became an internationally renowned balloonist (experiences he related in an article in the September 1978 issue of AIR FORCE Magazine), capping that activity as pilot and commander of the National Geographic Society/Army Air Corps Stratosphere Flight in 1934. In 1936, he also participated in Maj. Ira C. Eaker's instrument-only transcontinental flight, flying the chase plane.

During World War II, General Kepner commanded successively Eighth Fighter Command, Eighth Air Force, Ninth Air Force, and Twelfth Tactical Air Command. He flew twenty-four combat missions in fighters and bombers.

Among postwar assignments, General Kepner commanded Air Technical Training Command, and was Chief of the Atomic Energy Division at Hq. USAF.

General Kepner concluded his long career as Commander in Chief of the Alaskan Command, from which he retired in 1953.

At his death in Orlando, Fla., the AFA Charter Member was eighty-nine.

With Ira Eaker (in cockpit) for 1936's coast-to-coast flight.

INDEX TO ADVERTISERS

CAPITOL HILL

By Kathleen G. McAuliffe, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., Sept. 24

Overseas Force Cut Voted

A Senate panel voted overwhelmingly to reduce the Administration's request for US forces to be assigned to Europe in FY '83. Led by Chairman Ted Stevens (R-Alaska), the Appropriations Defense Subcommittee agreed to cap the number of troops sent to NATO countries at the 1980 level of 331,700. The request was for 350,600.

The primary reason behind the military personnel cap was to help achieve the required budget reductions of $8.7 billion in outlays. By preventing the force growth, $220 million can be saved immediately.

Sen. John Stennis (D-Miss.) stood alone in opposition to the troop cap and urged that the troop reduction, if necessary, be anywhere but in Europe. However, he was fighting a more powerful motive than budget cutting—the desire by many senators to force the allies to fund a greater share of the mutual defense burden.

The subcommittee action, subsequently agreed to by the full committee, is by no means binding since the House still must concur.

A-10 Controversy

Recent congressional action has reopened the A-10 close air support aircraft controversy. The Administration's request for twenty aircraft was denied by the Senate in the authorizing process, primarily at the instigation of Sen. Barry Goldwater (R-Ariz.), Chairman of the Armed Services Subcommittee on tactical warfare. This action was upheld in the House-Senate conference on the FY '83 Defense Authorization Bill.

However, the Administration promised the congressional delegation from New York, where A-10s are manufactured, to get the program reinstated in the appropriations bill. It was a political move—a tradeoff for support of other Administration legislation. Thus, the Senate Appropriations Committee included $357 million for the twenty aircraft in its bill to be "available only upon authorization by Congress." The House is expected to follow suit. This satisfies Sen. Alfonse D'Amato (R-N. Y.) and Rep. Joseph Addabbo (D-N. Y.) who have vital political interest in the Long Island-built A-10. About 5,000 jobs are at stake.

The aircraft will have to be approved by the House and Senate authorizing committees prior to appropriation of funds. The House is expected to approve. But the Senate Armed Services Committee probably will balk because Senator Goldwater chairs the panel with jurisdiction over the program. The Senator notified the White House that the Air Force has enough A-10s—707—and the Air Force reportedly agrees. The final decision probably will involve more political tradeoffs.

C-17 Rebounds

The McDonnell Douglas C-17 inter/intratheater outsize cargo airlifter program has taken a big step toward funding the completion of its R&D. The aircraft, authorized at a token $1 million, received the blessing of the Senate Appropriations Committee and $200 million to finish R&D. Sen. Ted Stevens was the prime sponsor of the aircraft. Senator Stevens alleged the Pentagon misread congressional intent when it essentially abandoned the C-17 early this year in favor of the C-5B.

The C-17 is by no means home free since the full Senate must concur and the House Appropriations Committee has yet to act. The C-17 has never been popular in the House. Congressional pundits predict that in the final analysis Congress will decide it cannot fund both at such high levels.

Senate Complies with Budget

After initially failing to get DoD's agreement on the level of cuts needed to comply with the budget resolution, the Senate Defense Appropriations panel steered a $201.3 billion defense bill through the full committee, keeping intact the $8.7 billion outlay reduction; $5.3 billion is to come from programs and the remainder from pay adjustments. Secretary of Defense Weinberger balked at the required cuts, allegedly saying DoD could not meet the reduction goals. But he yielded to the Senate panel when faced with the probability of operating under a lengthy continuing resolution at the lower FY '82 level, thus prohibiting any new program starts.

Declaring that there was a "new working relationship with the Pentagon" since the President instructed OMB and DoD to work out the spending cuts with the Senate panel, defense subcommittee Chairman Senator Stevens pushed the bill through the full Appropriations Committee in order that the adopted level be used as a base for the Senate's version of the interim funding measure.

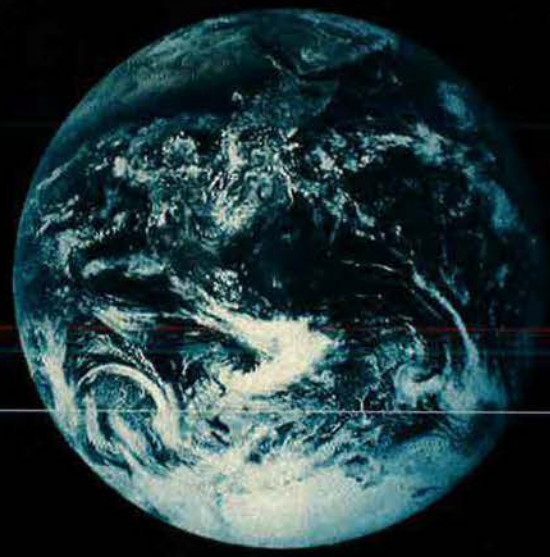
The full Senate will not debate the bill until the House completes action. This almost certainly will push the legislation into the lame duck session requested by the President.

Interim Funding

The House approved an interim funding measure, a continuing resolution, and set DoD spending at the FY '82 levels until the House Appropriations Committee completes work on the regular FY '83 bill. The interim funding level would then reflect the House reported bill and any subsequent House action. Added was a provision prohibiting funding of any new programs or activities not included in FY '82. This provision would be dropped once the committee completes work on the FY '83 bill. The House felt it should not be put in the position of funding programs on which it has not yet voted. December 15 was set as the expiration date.

The House will have to compromise with the Senate since the Senate version of the stopgap funding measure allows the Pentagon to operate at the FY '83 level approved by the Senate Appropriations Committee—$233.5 billion. Expiration is December 22.

DoD is happy with the Senate version since it would allow operation at the higher level and allow new programs to begin. If the continuing resolution ultimately adopted by both houses does not cover new starts, many programs with big outlays scheduled for FY '83 could experience delays and cost overruns. ■



Someday, somewhere down there, vital tactical communications will have to be made.

And made perfectly, not only in crisis situations, but in day-to-day communications. We, at Sperry Univac, are involved in automating those "traditional" communications disciplines--secure voice and data switching for fixed or mobile applications that utilize advanced technologies in time division matrix control and packet concepts; and message switching that ranges from a single node to worldwide interconnect.

But we are also actively involved in the development of state-of-the-art equipment ranging from terminals and fiber optics interconnects to wideband digital data links employing the latest advances in LPI and AJ.

Sperry Univac Defense Systems can offer you a unique capability in the total design, development, integration and service of your specialized voice and data communications equipment and subsystems. For more information, call our Manager, Communications Systems at 612-456-4870.

We listen. We understand.

SPERRY UNIVAC

Defense leaders agree: more airlifters able to

The C-5B will meet that need faster,

Outsized equipment is big equipment—fully assembled helicopters, infantry fighting vehicles, self-propelled artillery, tank recovery vehicles. Even tanks. It's the kind of equipment American troops will need in the first crucial hours or days of a crisis. It's the kind of equipment that can mean the difference between victory and defeat.

Today only the C-5A can handle outsized equipment. The proposed C-5B will keep those features—such as a cargo compartment and openings able to handle big equipment—that have been proved in crisis after crisis, to quote the words of a senior defense leader.

New, modern electronic systems.

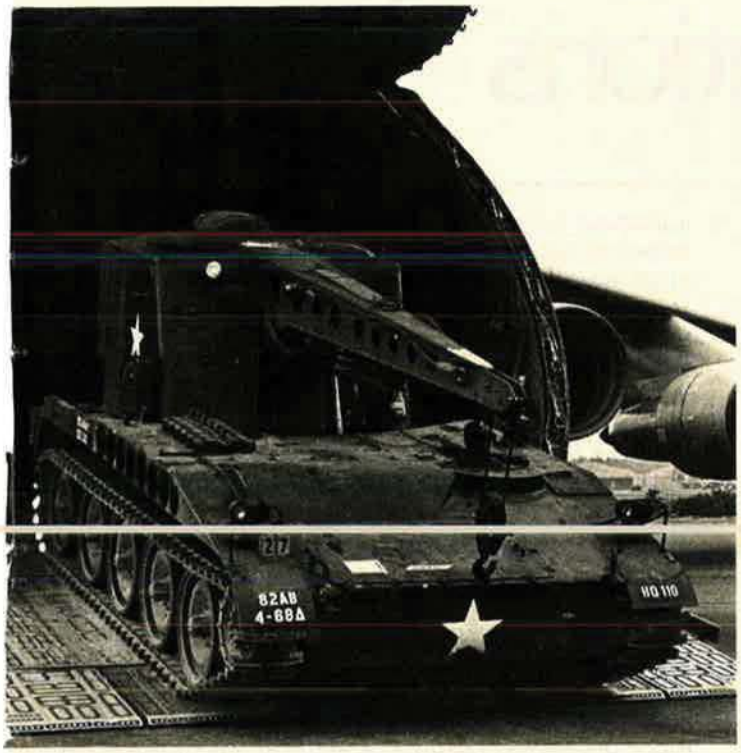
To cut maintenance costs drastically and increase effectiveness, the C-5B will have a number of new, proved electronic systems. Wherever possible, they will meet U.S. Air Force standardization guidelines.

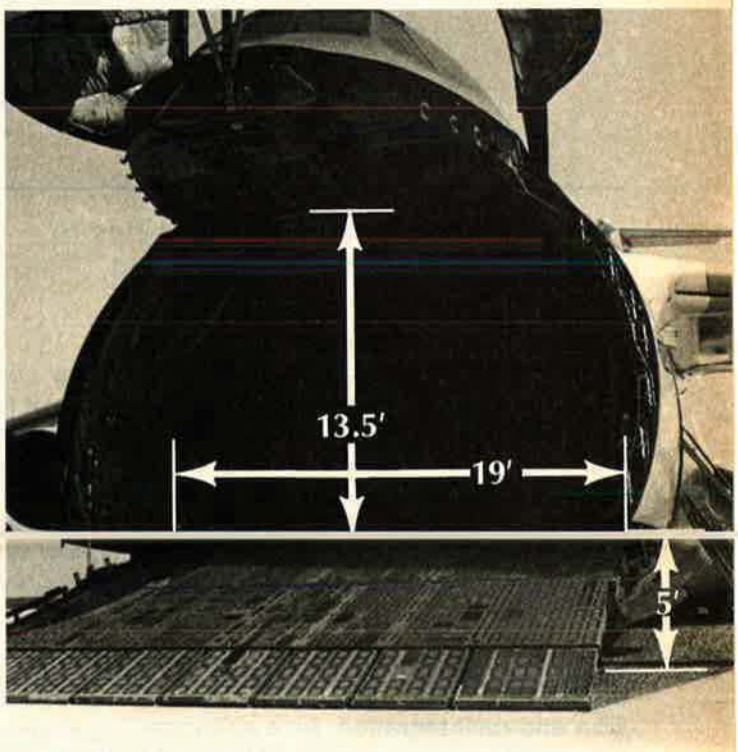
Those systems include: A simplified automatic flight control system; a lighter, more reliable color weather radar; a communications/navigation system; digital air data computer and others.

To further reduce maintenance hours, the C-5A's crosswind landing system will be eliminated. Operational experience has shown that it is not needed.

The C-5's extraordinary speed in loading and unloading is demonstrated in this photograph

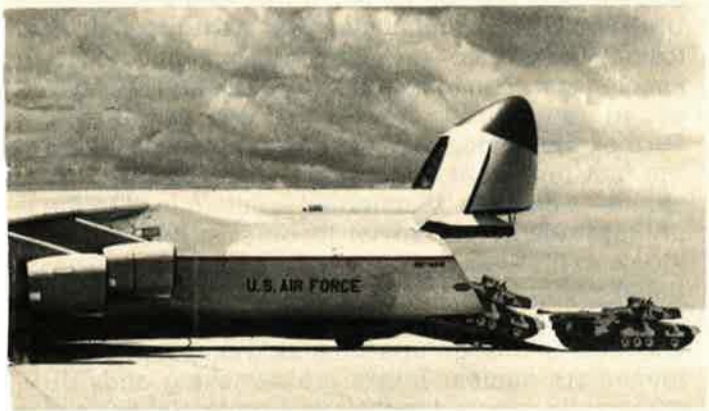
America most urgently needs handle outsized equipment.





at less cost, than any other option.

A new engine, which also is being retrofitted on the C-5A, will give the C-5B more thrust and other economies. In addition, tough, new aluminum alloys, which were not in existence when the C-5A was built, will add strength and cut corrosion on the C-5B.



that shows armored vehicles using its unique straight-through, drive-on/drive-off features.

A tried and true approach.

By keeping the crisis-proved features of the C-5A and adding modern systems wherever possible, the Air Force will gain virtually a new airlifter. It has followed this approach many times with great success. The Lockheed C-141 StarLifter has just been improved significantly, ahead of schedule and under budget. The Lockheed SR-71, world's fastest and highest flying aircraft, has been improved in many ways since it first entered service in 1966. The Boeing B-52 bomber's systems and structures have been updated throughout its long career. The F-15 fighter has undergone many improvements since it first flew in 1971.

Keep the best features, add modern ones—that's the proved way to get a greatly improved airlifter faster and at less cost than any other option. The Air Force wins, the taxpayers win.

Lockheed C-5B

The Fantasy of Simplistic Solutions

Adopted unanimously by delegates to AFA's annual National Convention, on September 13, 1982.

THE Soviet threat is real. It is not a fantasy contrived by fearmongers or arms merchants. It results from the most awesome war machine in history. The Soviet war machine is the product of a single-minded ideology spawned by force, committed to force, and brandishing force domestically and externally to perpetuate an insecure, morally hollow system of imperial power. And the war machine is growing.

Military power remains the principal instrument available to the Soviet dictatorship for extending the system's frontiers and to save it from internal dissension and disintegration. An ever-increasing share of the Soviet Union's gross national product—estimated to reach about twenty percent in this decade—is being lavished on military expansion while the standard of living of the Soviet people stagnates, and its economy flounders.

The evidence that the Soviet Union and its Warsaw Pact outmans, outguns, and, in the military sector, outproduces the United States and its allies is incontrovertible. There is a tendency to dismiss this fact with the claim that military superiority in the nuclear age is meaningless. Such a contention is a dangerous delusion and is contrary to logic and history. It disregards, to this nation's peril, the words and deeds of the Soviet leadership that spell out a doctrine geared to winning whatever type of wars the USSR gets into—be they conventional, chemical, or nuclear—and to use military superiority in a politically coercive fashion. The dismissal of the importance of the growing Soviet military power only serves those who hold that defense investments should be determined by economic conditions and scaled to social spending rather than be determined by the character and size of the threat.

Soviet military power continues to grow in all fields. In the past, this growth has not been affected by variations in the pace of the US defense effort. Since the mid-1960s, the Soviets have nearly doubled real defense spending and more than doubled military research and development. In short, when we built, they built; when we stopped, they built.

They have increased their intercontinental nuclear delivery vehicles nearly sixfold; that, coupled with improved accuracy, makes those weapons a major threat to US and allied security. The number of nuclear warheads carried by the Soviet ICBM force is now more than twice the US total, and some of the Soviet warheads are more accurate than the best in the US inventory.

They have more than tripled the number of their theater and battlefield nuclear weapons. They outproduce the US in tactical fighters by a ratio of better than two and a half to one. The Soviet Navy, in a remarkably short time, has become a huge, heavily armed, powerful fleet encompassing nuclear-powered surface ships, the world's largest submarine force, and, now, aircraft carriers. The Soviet ground forces also have significant advantages in armored vehicles, tactical defenses, and active military manpower.

The Soviet force modernization program combines the historic emphasis of producing large quantities of military equipment with comprehensive qualitative improvements. The US and its allies, therefore, cannot count on offsetting these increasing quantitative deficiencies with greater technological sophistication. The Soviet boast that the military balance has shifted in their favor "once and for all and irrevocably" is about to become a reality unless America and the free world make a sustained commitment to rebuild their defenses. The fragile advantage of the US and its allies in tactics, training, and technology must be exploited to the utmost.

Nowhere is revitalization more urgent than in nuclear deterrence capabilities. The Soviets are designing their strategic nuclear forces so they can win a nuclear war. The central factor that would keep the USSR from provoking nuclear war is the prospect of losing. Thus, there is no more commanding peacekeeping task than to develop the forces and capabilities to convince the Soviets that they cannot win. Further, the American people must not lose sight of the fact that what constitutes—or does not constitute—a credible US deterrent is determined by the perceptions of the Soviet leadership and not by ideals expressed by many American and international groups.

Americans should be concerned that domestic and international groups promoting simplistically an immediate nuclear freeze are achieving ends diametrically opposed to their own professed goals of nuclear stability and arms reduction. The rhetoric of the campaign to stop immediately the modernization

of nuclear weapons—and against their "first use"—is based on twisted arguments, and feeds the public's fear of nuclear war in order to capitalize on it. The campaign's propagandists, at home and abroad, have shifted the focus of the discussion from deterrence of all forms of war and military aggression to the horrors only of nuclear war, and are hiding the burgeoning growth in Soviet nuclear weapons behind misrepresentations of US responses to that growth.

The Air Force Association believes a nuclear freeze today is simply not in the national or the free world's best interest. It would leave us with a permanently weakened deterrent posture. It would perpetuate the very vulnerabilities and inadequacies we are making great efforts to overcome. It would decrease strategic stability and grant the Soviets, without incentive to reciprocate, their major objectives in the START (Strategic Arms Reduction Talks) and Intermediate-Range Nuclear Force negotiations. The US properly seeks a long-term, mutual, and verifiable nuclear freeze at equal and sharply reduced levels of forces.

It is important for the American people to understand clearly that no negotiations can change the fact, or disregard, that this country and the USSR—by the latter's choice—are ideological and geopolitical adversaries. We negotiate from vastly different premises of morality, political philosophy, and standards of right and wrong. Therefore, the US can no more negotiate from a position of weakness than it can deter through inferiority. There is a clear-cut need to modernize aging and increasingly vulnerable nuclear strategic systems. The nuclear freeze movement disregards the fact that the current strategic nuclear force balance is destabilizing and will, if not corrected, increase the likelihood of nuclear war. This Association believes there is a right way to achieve equal and sharply reduced levels of forces, to curb the so-called "arms race," enhance deterrence and stability, and lower the destructive potential between the superpowers. The Administration has found the right way.

The Administration's five-pronged strategic force modernization program provides fundamental leverage for equitable arms reduction; it does not move the world toward nuclear war but away from it. The MX ICBM, the B-1B, the Trident D-5 SLBM (sea-launched ballistic missile), an improved, survivable command and control system, and revitalized strategic defenses are needed not only to counter current Soviet force levels but also at the reduced levels envisioned with the US START proposal. With reduced numbers of warheads, survivability and effectiveness become even more critical than with a larger force. The nation must not forget that deterrence is a product of capability and credibility. If either is low, so is deterrence.

The combined effect of the strategic force modernization program will be that this nation's nuclear forces could survive Soviet first strikes and retaliate. Such a condition will reduce sharply Soviet temptation to use their nuclear weapons for blackmail and lift from the US National Command Authorities the terrible burden of either using the strategic nuclear forces at once or surrendering. The present hair-trigger posture that encourages Soviet nuclear adventurism is incompatible with effective deterrence.

Modernization of the strategic nuclear forces alone is not enough. In the view of this Association, strategic modernization must be coupled with other long-standing needs of our armed forces that are essential for proper balance. These include continued improvements in the readiness and staying power as well as modernization of the general-purpose forces, enhancement of the mobility and airlift capabilities, and expansion and modernization of

There is a clear-cut need to modernize aging and increasingly vulnerable nuclear strategic systems.

tactical forces. The strong common denominator of all these programs must be improved warfighting capability. This requires strengthened readiness and sustainability, intensified realistic training, refined tactics, increased flying hours, and improved pay and benefits of men and women serving in the Armed Forces. In this context, the nation must safeguard the centrally decisive element of continuity and advantage in its defense posture—well-trained and dedicated people serving in the Air Force and the other services.

The Air Force Association applauds increasing recognition of the total, joint character of national defense and concerted efforts to avoid separate and parochial approaches that waste scarce resources and do not produce the defensive strengths this nation requires. The individual services exist to provide national security through harmonious, streamlined interaction and mutual reinforcement. No service fights alone. They must plan and exercise together, just as they would fight—jointly and shoulder-to-shoulder with our allies.

The overriding requirement of our times is to retain the consensus on building a strong national defense, forged by a recognition of the mounting Soviet threat, and to maintain the momentum of the programs that are essential to this goal. The Defense budgets, as drafted by the Administration for this and subsequent years, represent an essential step toward achieving this long-term objective. They must be supported. To enhance public understanding of the importance of national defense to our nation's freedom and survival, AFA advocates a deliberate program of education in military history and science in American schools and colleges.

If we as a nation—in concert with our allies—remain steadfast in the pursuit of a prudent national security policy, we might, one day, convince the leadership of the Soviet Union to abandon imperialism, and instead seek the legitimacy that only comes from the consent of the governed. Until then, we must not forget that war comes not when the forces of freedom are strong but when they are weak. It is at these times that tyrants are tempted. We must not tempt them. ■

Toward Adequate Airpower for Tomorrow

A policy paper, adopted unanimously by delegates to AFA's annual National Convention, on September 14, 1982.

AS THE Soviet threat increases across all sectors of military power, the unique attributes of aerospace power—in conjunction with our total force capabilities—take on yet greater importance. Only aerospace power—kept at peak efficiency and readiness—offers the flexibility, speed, range, firepower, and responsiveness to provide the US with ready global access to areas threatened by the Soviets, their surrogates, or any forces hostile to the United States or its allies. At the same time, these characteristics also give the US access to areas of Soviet vulnerability and hence the means for applying countervailing force at points chosen by the United States.

Adequate airpower will enable this country to project tailored forces selectively, to shift these forces between theaters of operations or within a theater in response to quickly changing conditions, demands of the ground forces, and battlefield developments. The key to success in warfare is the ability to take initiatives, thus setting the course of battle. Maneuverability and surprise—the key to both conditions—are the natural strengths of airpower. Moreover, airpower equipped with the proper munitions can interdict Soviet forces at sea and help protect vital sea lines of communications.

. . . the Soviet Union, now more than ever, represents an awesome, sophisticated, and relentlessly growing military threat to the United States and its allies.

There is a broad and growing basis for concern that the Soviets are as aware as we are of the unique military advantages offered by aerospace power and of the importance of the underlying technology that shapes and maintains that power in the years ahead. While the US still maintains a qualitative lead in airpower and some space systems, the Soviets have acquired superiority in fielded ICBM forces. Further, in the field of tactical airpower, the Soviet Union is combining numerical superiority with across-the-board technological advances. The result is a force with increasing offensive strength, especially in terms of long-range operations essential for global force projection.

In summary, the Soviet Union, now more than ever, represents an awesome, sophisticated, and relentlessly growing military threat to the United States and its allies.

STRATEGIC NUCLEAR FORCE IMPERATIVES

At the top rung of the ladder of military requirements, the strategic nuclear forces of the United States—and the host of capabilities needed to maximize their effectiveness—stand in dire need of qualitative and quantitative improvements.

As a result of the massive Soviet investments in strategic nuclear systems, they have wrought a dramatic shift in the strategic balance. Gone is the clear-cut US superiority of the 1960s and the rough parity of the late 1970s; today, Moscow enjoys a position of some advantage. The momentum of Soviet strategic modernization programs, if not countered by a vigorous US response, presents the ominous prospect of substantial Soviet superiority in the years ahead.

Nowhere is this deficiency more pronounced than in the area of strategic command control communications and intelligence (C^3I), that, in case of conflict or crisis, should give the national leadership the real-time, fast-changing picture of what is going on, when and where, and provides the means for initiating the necessary responses.

Years of inattention and underfunding have resulted in a gravely weakened C^3I system while Soviet capabilities to attack and disrupt US strategic networks have greatly increased. C^3I must be designed to give the National Command Authorities flexible operational control at every level of conflict. Strategic force changes resulting from deployment of new systems require innovations in command and control in order that our forces realize their full potential.

Improvements and modernization are needed in ground- and space-based radars for our C^3I network to control all phases of nuclear conflict. Current deficiencies are such that C^3I systems' survival from a

first strike, let alone endurance through a prolonged nuclear conflict, is not assured. Congressional action to support the upgrading of our warning and communications network is essential. Costs for needed improvements are substantial, but not out of line with other planned strategic force modernization costs. The triad's ability to perform its mission ultimately depends on reliable and survivable command and control, thereby justifying the costs of such upgrade programs.

Specific needs center on improving the survivability and performance of many critical control networks through systems upgrades, the use of nuclear hardening techniques, higher power transmitters, redundancy and proliferation of critical C^3 nodes, and employment of new satellite and air- and ground-based systems. Key requirements include:

- The Worldwide Airborne Command Post (WWABNCP) C^3 systems must be upgraded and hardened against nuclear effects.
- The Air Force's worldwide high-frequency (HF) radio stations must be upgraded to provide improved coverage and higher power. Airborne HF radio equipment must be replaced with modern equipment.
- Existing tactical warning and attack assessment systems require extensive upgrading.
- The very-low-frequency/low-frequency (VLF/LF) systems must be modified with a new processor to improve transmission in a stressed environment. The Air Force Satellite Communications System must be deployed expeditiously in bombers, missile launch control centers, and airborne command posts, as well as a VLF/LF receiver in bombers. A low-frequency radio relay network also must be fielded.
- Over the long term, the need is for improved satellite capabilities at frequency ranges that sustain communications in a nuclear-disturbed atmosphere. The MILSTAR Satellite Communication Program must be developed and deployed to provide highly jam-resistant and survivable satellite communications for the command and control of our new strategic and tactical forces.

The most threatening aspect of the Soviet strategic buildup has been the vast improvement in their ICBM force. In contrast to US reliance on a balanced triad of strategic nuclear delivery systems, more than fifty percent of Soviet strategic delivery capability and nearly eighty percent of their available warheads are concentrated in their ICBM force. While USAF's newest missile—Minuteman III—entered the force in the early 1970s, the USSR has deployed more than 750 SS-17, SS-18, and SS-19 ICBMs since the mid-1970s, most armed with highly accurate multiple warheads. Moreover, Moscow is continuing to upgrade its arsenal and has under development a new generation of missiles nearing flight testing.

The MX program will modernize the US ICBM force, improve ICBM technology to offset the unilateral Soviet growth in counterforce capability, and ultimately provide assured credibility of US retaliatory forces. These challenges can best be met by building and deploying an MX missile, in a resilient basing mode, incorporating the best of our modern technology and responding to the imbalances in throw-weight caused by Soviet ICBM deployments. We must provide this nation with a highly accurate, capable, and responsive ICBM force.

The MX is needed to redress this significant and growing asymmetry between US and Soviet strategic forces and to restore essential equivalence in the late 1980s. The Administration's decision to deploy the MX missile recognizes the importance of retaining the unique characteristics of the land-based ICBM: quick, flexible response; high alert rate; dependable, proven command control and communications; high accuracy; and low operating cost. The increased throw-weight, accuracy, and number of warheads of the proposed MX missile will begin to close the gap between US and Soviet capabilities. This Association believes there is an urgent need to select a permanent basing mode for MX and to deploy this weapon as expeditiously as possible. Such a basing mode must enable MX to withstand a Soviet first strike and retaliate.

The MX system also will contribute to overall limitation of nuclear weapons by allowing the US to negotiate toward equitable arms reductions from a position of strength.

Deployment of MX should not detract from the need to make timely, qualitative improvements to our Minuteman force, thereby increasing overall force flexibility. Addition of the Mark 12A reentry vehicles to the entire Minuteman III force will provide improved flexibility and higher yields than the current Mark 12 reentry vehicle. An Airborne Launch Control System allowing remote retargeting of Minuteman IIIs from EC-135 aircraft is essential to increase the endurance of our aging ICBMs, and must be acquired.

The deployment of an additional fifty Minuteman IIIs in Minuteman II silos must be carried out expeditiously and represents an important stopgap measure.

The Soviets are continuing to expand and upgrade their SLBM force. An example is the new, large, multiple warhead SLBM, the SS-N-20, developed by the Soviets and now undergoing flight testing. This SLBM will be launched from the Typhoon, a new class of submarine approximately fifty percent larger than the Trident, our largest ballistic missile submarine. The Typhoon is expected to have improved range and less detectable noise levels. Development and deployment of the US Navy's Trident II (D-5) SLBM represents an important counter to the growing Soviet SLBM capabilities.

AIR-BREATHING LEG

Soviet advances in air defense, and to a lesser degree in offensive weapons, will make the current bomber force increasingly vulnerable. Soviet deployments of AWACS-type airplanes, "look-down, shoot-down" fighters, and monopulse radars—all in large numbers—will severely stress the ability of the B-52 force to penetrate the Soviet heartland and destroy critical targets by the late 1980s.

As a pivotal part of the strategic modernization program, the Air Force must procure 100 B-1B bombers, with an initial operational capability of 1986. The

bomber is the only element of the triad of strategic forces that can be launched prior to a decision to employ these weapons, permitting the crew to take action and accept responsibilities that cannot be anticipated or preprogrammed.

Weapons-carrying bombers can be launched to ensure their survivability or to signal national resolve during time of crisis—with confidence that the crews can be redirected or recalled as the situation develops. Bombers provide the only capability to engage unanticipated or mobile targets by using the crew and aircraft sensors to determine target location at time of delivery.

In maritime roles, bombers can provide an important supplement to US naval forces. They can provide collateral maritime support in long-range sea surveillance, ship attack, and minelaying. Bombers also carry a large number of diversified weapons and each bomber can cover widely separated targets. As reusable, multipurpose delivery systems, long-range combat aircraft can also deliver large nuclear or conventional payloads accurately throughout the spectrum of conflict.

A combined force of B-1 and Advanced Technology Bombers incorporating Stealth technology provides a most effective bomber modernization program for long-range combat missions (nuclear or conventional) well into the twenty-first century. Both systems are needed.

The B-1B, which relies on a combination of reduced radar observability and highly effective reprogrammable electronic countermeasures, will be fully capable of penetrating the Soviet Union well into the 1990s. This will allow designated B-52s to be employed for the cruise missile carriage mission. To keep the B-52s as a viable penetrating weapon system over the next decade and beyond would require numerous expensive modifications. As these airframes age, their operation and maintenance costs grow at an increasing rate. Therefore, the timely retirement of some of these airframes will result in a substantial cost savings. Should the B-1B's capability to penetrate decline in the face of growing Soviet defensive efforts, the B-1B will be able to function as a very effective cruise missile carrier and conventional weapon system. In view of developments in Stealth technology, the acquisition of penetrating advanced technology bombers should start in the 1990s. The B-1B would be even more important if current expectations in regard to advanced technology bombers don't materialize.

In the meantime, the ALCM and avionics modification program for the B-52 force must continue to keep these aircraft viable through the 1980s. This modification program will transform the B-52 from a pure penetration to a shoot-then-penetrate role and finally assign it to a standoff role. The ALCM, scheduled for initial operational capability on the B-52 in December 1982, will provide greater accuracy, flexible routing and targeting, and saturation of Soviet air defenses. The ALCM, deployed in conjunction with Short-Range Attack Missiles (SRAM) and gravity weapons, improves the overall capability of the air-breathing leg of the strategic triad.

There is a crucial need to augment the strategic nuclear forces with modernized theater nuclear forces (TNFs), comprised of Pershing II and ground-launched cruise missiles (GLCMs). The latter, with a range of 2,500 kilometers, will be able to strike fixed targets throughout Eastern Europe and in the Soviet Union from their sites in England, Italy, and possibly other Western European locations.

In response to the large-scale Soviet theater nuclear force buildup, notably their continuing deployments of the SS-20 mobile intermediate-range ballistic missile and the Backfire bomber, NATO agreed in December 1979 to a long-range theater nuclear modernization program involving deployment by the US Air Force of ground-launched cruise missiles in Western Europe, with an initial operational capability of December 1983. Deployment of GLCM will allow the use of dual-capable aircraft in the conventional role for a longer period before transitioning them to a nuclear role. This would allow planners to take full advantage of the inherent flexibility and capability offered by manned aircraft to strike targets of opportunity.

Deployment of Pershing II and GLCMs must not be delayed because of narrow political considerations or Soviet propaganda campaigns exploiting Western European sensitivities.

STRATEGIC DEFENSE

Our strategic defense forces must provide timely warning and attack assessment to enable the National Command Authorities and the strategic retaliatory forces to take appropriate survival and response actions and to limit damage from an enemy attack. Reliable and survivable strategic defense systems contribute to overall deterrence by reducing the prospect that the Soviet Union could carry out a successful attack. The US lacks adequate strategic defenses, because of major gaps in low-altitude and coastal surveillance coverage of potential avenues of attack. Existing detection systems cannot assure sufficient tactical warning for the NCA and appropriate military commanders to take necessary survival measures. Furthermore, even with tactical warning, the current fighter force would not be able to conduct effective, active defense against low-level penetrators, since the bulk of this force lacks a look-down, shoot-down capability against such a threat.

The current Distant Early Warning (DEW) Line was installed in the 1950s. The DEW Line can be underflown or circumvented seaward with minimal range penalty, and its radars are increasingly costly and difficult to maintain. Some seaward surveillance is provided by the Joint Surveillance System; however, this system is line-of-sight limited and also has numerous medium- and low-altitude gaps.

Over-the-Horizon Backscatter (OTH-B) radars must be deployed on both East and West coasts as well as in a south-looking site. These radars will provide coverage out to about 1,800 nautical miles.

With the bulk of the United States's air defense fighter force more than twenty years old and only marginally effective against Soviet capabilities, modernization of these fighters is one of the Air Force's

most pressing needs. Active and Air National Guard F-106 squadrons must be converted to F-15s and F-16s.

The USAF/FAA Joint Surveillance System (JSS) will provide the command and control capability required for peacetime surveillance and control, and in conjunction with the E-3A, a limited wartime capability. Since the JSS is not survivable and provides only limited radar coverage, wartime air defense surveillance and battle management is dependent on the E-3A. At least six additional E-3A Airborne Warning and Control Systems (AWACS) for North American air defense must be procured.

In order to detect the modern Multiple Independently Targetable Reentry Vehicle (MIRVed) missiles and to solve maintenance and supply support problems of an aging system, a two-part program to modernize the Ballistic Missile Early Warning System (BMEWS) must be completed expeditiously. Modifications must include replacement of the missile impact predictor computers at all three sites and upgrades to two sites' detection and tracking radars.

Also, two additional Phased-Array Submarine-Launched Ballistic Missile Warning Sites (PAVE PAWS) in the southeast and southwest United States must be built. These new PAVE PAWS sites will provide a substantial improvement in Submarine-Launched Ballistic Missile (SLBM) tactical warning capability and will allow USAF to close two old sites that are becoming increasingly costly to maintain.

SPACE OPERATIONS

The Department of Defense is becoming increasingly dependent on space-based assets to conduct effective and efficient military operations. The full integration of space operations in the employment of US terrestrial forces requires that the Air Force, as the DoD executive agent for space, meet user requirements of availability, survivability, performance, supportability, and capacity. Space operations must include the conduct of those activities necessary to protect our use of space, protect our resources from threats in and from space; and operate space systems that enhance land, sea, and air forces.

The Air Force mission in space is to conduct three types of space operations: support, force enhancement, and defense.

Space support operations must include launch and recovery activities, on-orbit support, and satellite surveillance and control.

Force enhancement must include global surveillance and communications capabilities; worldwide command and control systems; precise positioning and navigational data; and current, detailed timely meteorological data.

Space defense operations must include detecting, tracking, and identifying all objects in space; timely warning to the National Command Authorities (NCA) of hostile actions to the United States and our allies; developing the capability to deny or nullify hostile acts committed in or through aerospace; and conducting sustained operations to detect and analyze aerospace threats.

The timely creation of Space Command (SPACECOM) provides the potential for consolidation of operational space activities into a major command and provides for a stronger working relationship among space-related research, development, acquisition agencies, and the operational users.

Development of the Consolidated Space Operations Center (CSOC) is essential for future US space operations. Satellite control and Space Shuttle operations must be combined into the CSOC for management, operational, and economic efficiencies, thereby allowing the Air Force to respond to national priorities and protect national security data.

There is a crucial need to augment the strategic nuclear forces with modernized theater nuclear forces (TNFs), comprised of Pershing II and ground-launched cruise missiles (GLCMs).

Full funding of a vigorous program to enhance the survivability of our space systems is essential. Steps must be taken to improve the survivability of critical space systems, such as the Defense Support Program (DSP). Equally essential are a satellite-based relay system, the Satellite Control Satellite (SCS), and Transportable/Mobile Ground Stations (T/MGSs), in order to provide survivable satellite command and control.

The Space Shuttle is important to USAF's space operations because it performs space launch services formerly accomplished by a variety of expendable launch vehicles (ELVs). Beyond the objective of providing an economical, reliable, safe, timely, and reusable space-launch capability, the Air Force must have priority access to all elements of the Space Transportation System (STS) for tasks not possible with expendable launch vehicles and not practical with earlier manned space programs. However, in light of past technical risks and program schedules, the Air Force must provide expendable launch vehicles as a backup to the Shuttle to protect against unforeseen difficulties until the system reaches full maturity.

In addition, the Shuttle allows man to become a routine part of space operations. The new opportunities provided by the manned presence coupled with the increased payload size and weight limits should be exploited to enhance US national security.

Development of a higher-energy upper stage (HEUS) for the Space Shuttle is essential because of the growth in the payload weight requirements. The increase in payload weight results mainly from modifications to extend the lifespan of each satellite and the accommodation of on-orbit expendables to prolong the duration of each mission as well as the weight of equipment and materials that have been

added to increase the survivability of the Shuttle and its payload.

The potential and feasibility of a Shuttle-serviced, continuously manned facility deployed in low earth orbit should be explored. There are many potential missions, such as communications command and control; intelligence surveillance; on-orbit service and repair of DoD satellites; and research and development that could be performed from a space station.

The space-based laser weapons program should be carried out at a prudent pace. While space-based lasers have great potential for several applications, there are significant uncertainties which caused DoD not to commit to any operational system or prototype at this time. The vigorous risk-reduction program to address the uncertainties in order to support a system decision at a later time must be continued.

The Air Force's development and flight demonstration of this country's first nonnuclear space defense weapon, the ASAT, must be funded at full level.

TACTICAL AIRPOWER

The Air Force faces a continuous challenge in striking a proper balance between funding essential modernization of its tactical fighter forces and supporting programs designed to improve the near-term readiness and sustainability of these forces within a constrained defense budget.

US tactical air forces must be modernized to cope with the growing Soviet threat under day, night, and all weather conditions. The potential for attrition in modern warfare is dramatic; our vital, reusable aerial delivery systems must not be exposed unnecessarily—long-range, standoff weapons with all weather capability must be developed and produced. Continued improvements in the density, quantity, and complexity of the Soviet air defenses force USAF to pursue carefully selected tactical programs that will enhance the flexibility, deployability, firepower, and quick response capability of its tactical forces. Further, since the US can never match the numerically superior Soviet force on a one-for-one basis, the Air Force has to maintain an effective tactical air arm by exploiting the US technological edge and by emphasizing systems that achieve higher effectiveness through accuracy and lethality while reducing aircraft attrition through standoff capability.

The Soviets outproduce the US in tactical fighters by more than two and a half to one. Their sustained rate of investment and production translates into an increasingly sophisticated offensive force. Two-thirds of their 4,500 fighters are new "third-generation" aircraft, and they will begin introducing their fourth-generation aircraft before completion of the third-generation buy. The result is that the average age of their force is one-half that of the US tactical force.

US tactical air forces cannot offer a credible deterrent without acquiring highly capable aircraft in sufficient numbers. Quality and quantity are relative virtues in a tactical fighter. Neither approach alone can satisfy the requirements for the force. National need demands both technological improvements and adequate numbers to meet the threat. With a goal of forty tactical fighter wings in FY '85 and an average aircraft age of ten years, 250 to 270 fighters must be procured annually to offset attrition and aging.

To meet the Soviet challenge in the near term, the Air Force must continue evolutionary improvements to existing fighters and continue a balanced procurement of F-15s and F-16s. Tactical forces must be able to achieve air superiority to interdict and destroy enemy air and ground resources under all weather conditions and to provide effective close air support for friendly ground forces.

While we have an excellent air-to-ground weapon system, the A-10, there is a need today to close a gap in ground-attack capability, around-the-clock all-weather interdiction capability, and jam-resistant C^3 capability. Emphasis on a survivable, capable tactical C^3 network is essential to counter steady, steep Soviet improvements in this arena. Further, the US tactical C^3 network must be interoperable with our allies to provide better detection, location, and classification of enemy forces. The E-3A AWACS, a uniquely capable airborne command and control system of the US Air Force and allied powers, must be exploited to realize its full potential for force enhancement. LANTIRN (Low-Altitude Navigation and Targeting Infrared for Night) must be developed and deployed to aid inventory aircraft in penetrating enemy air defense at low altitude and in finding and destroying enemy targets at night in any weather.

The growth potential of the new, multipurpose versions of the F-15 and F-16, as evidenced by the manufacturers' demonstrations, provides a solid foundation for continuing force modernization. An important next step in USAF's fighter force must be the evolutionary improvement of both aircraft while continuing the focus on readiness and sustainability. Dual role derivatives of the F-15 and F-16 providing extended range and payload must be developed.

By the 1990s, these fighter designs will be twenty years old and modifications will no longer be cost-effective. Thus, to meet the threat in the '90s and beyond, the Air Force must now begin work on a new fighter. The Advanced Tactical Fighter program, coupled with associated efforts in engine technology, must be carried forward expeditiously to reach a planned IOC of 1993.

Sufficient stocks of modern, effective munitions are essential to our warfighting capability. The Air Force has a large stockpile of aging Vietnam-era munitions, characterized by gravity bombs and a general lack of precision guidance. While they remain reliable weapons, they are ill-suited to counter growing Soviet capabilities. Efforts must continue to improve the quality and size of the munitions inventory to reduce the attrition of USAF forces.

Particular emphasis on building up Air Force stocks of air-to-air missiles through procurement of AIM-9 infrared-guided missiles, and development of the Advanced Medium-Range Air-to-Air Missile (AMRAAM) to cope with Soviet force improvements, are imperative. AMRAAM will give fighters the capability to engage multiple targets and will increase aircraft survivability because of its high speed,

range, and launch-and-leave potential. Research and development efforts must be stepped up for follow-on munitions such as Medium-Range Air-to-Surface Missile (MRASM), and WASP, a small (100-pound) antiarmor missile, as well as improving the effectiveness of such guided air-to-ground weapons as the Imaging Infrared (IIR) Maverick.

Realizing the importance of realistic training for readiness, AFA fully supports the continuation and broadening of Exercise Red Flag, an invaluable, ongoing test and demonstration of tactics, doctrine, and technology—involving allied air forces—to enhance the effective response capability of the free world's tactical airpower.

AFA further supports local, state, and federal legislative and governmental action to protect military and civilian airfields and other defense facilities from encroachment by land developers and incompatible land-use programs.

ELECTRONIC COMBAT NEEDS

Electronic combat (EC) is one of the fastest developing and changing elements of air warfare. It is frequently the one element that tips the scales of victory, as has been shown in recent battles around the world. Combat commanders must be provided viable EC options to jam, exploit, deceive, or destroy combatant elements of the enemy air defense and command and control systems. A major requirement is continued, expeditious development and deployment of an integrated mix of destructive and disruptive systems to suppress enemy defenses and protect penetrating US forces.

To conduct air operations throughout a campaign and reduce the attrition of our numerically inferior forces, the enemy air defense system must be countered quickly and effectively. Each aircraft must be given the means to survive individual engagements. This must be complemented by dedicated EC assets that reduce engagement opportunities by attacking the overall air defense system. Protection capabilities must ensure that aircraft avionics and ground- and space-based weapon system control capabilities perform effectively when exposed to the enemy EC threat. Electronic support and sustaining capabilities must be available to ensure the effectiveness of our overall electronic combat effort in an extended conflict. Self-protection equipment must be upgraded. Development of airborne self-protection jammers, updated existing radar warning receivers, procurement of low smoke engines, and continued installation of new flare and chaff dispensers must receive high priority.

Protection for our aircraft electronic equipment against jamming and nuclear disturbance is vital to maintaining weapon system effectiveness. Jam-resistant radios such as HAVE QUICK must be developed to provide near-term protection for communication systems.

The F-4G Wild Weasel is a central element of USAF's EC capabilities. Through the use of the onboard avionics package, the F-4G weapon system is able to deliver antiradiation missiles and other conventional ordnance accurately and quickly. The planned updates of this avionics package, along with the acquisition of the High-Speed Antiradiation Missile (HARM) and imaging infrared (IIR) Maverick missile, are required to increase the lethality of the Wild Weasel and ensure its viability into the 1990s. The Precision Location Strike System (PLSS) must be developed to permit highly accurate location and subsequent destruction of enemy emitters and attack of other known targets. The ability to guide aircraft and standoff weapons accurately to a target, regardless of weather conditions or time of day, makes PLSS a high priority for suppression of enemy air defenses.

In the disruptive support area, the EF-111A and Compass Call aircraft are needed urgently. The EF-111A, presently in production, will electronically jam early warning, acquisition, and ground-controlled intercept radars, while Compass Call, also in production, will counter selected tactical communications. Their objective is to disrupt the air defense network by denying or degrading information collection and flow.

The Soviet Union relies heavily on electronic equipment for both its army and air force. They have made—and continue to use—major investments in radars, radios, and computers, resulting in one of the world's most formidable air defense networks.

USAF must gain air superiority in engaged areas and be effective in delaying and disrupting the momentum of a Soviet attack; this requires real-time intelligence, effective defense suppression, close air support of engaged ground forces, and electronic confusion of Soviet forces and controls. Thus, continued emphasis on research and development will provide our combat commanders with the necessary equipment to counter the threat effectively as it evolves and intensifies.

AIRLIFT NEEDS

The ability to project forces early and to keep them resupplied is essential to deterrence and critical to the outcome of conflict. Success in battle depends on the capability of placing the right forces in the right place at the right time, with the supplies to be effective. This requires the movement of critical cargo to a theater of operations and then within that theater. Airlift, sealift, and prepositioning play vital roles in the mobility equation, but only airlift, the cardinal component of today's mobility forces, can provide the timely reinforcement and supply of forward deployed forces and support rapid force projection.

Prepositioning forces increases early airlift requirements so that combat units can reach their equipment. In all contingencies, airlift provides the means for rapid deployment, and in many contingencies, airlift—with its flexibility, speed, and long range—is the only answer, either because of geographic location or the swiftness with which a threat arises. Hence, the importance of adequate and responsive airlift cannot be overstated. The global character of US interests and commitments makes it imperative that we have the capability of quickly deploying and providing initial support for combat

forces anywhere in the world. Improved Soviet offensive capability has reduced warning and mobilization time, placing a premium on bringing US power to bear rapidly.

The organic airlift capacity must be doubled over the next few years. The full potential of existing resources—seventy-seven C-5As, 269 C-141s, and eight KC-10s—must be realized as quickly as possible. The C-5A wing modification, adding some 30,000 hours to its service life as well as range and payload improvements, must continue expeditiously. The C-141 modification program has added refueling capability and a thirty percent increase in cargo space through a fuselage stretch. The capability of these existing aircraft must be maximized by increasing spare parts stocks and crews to permit higher sortie rates.

The most compelling need is for additional long-range military airlift with the capability to handle oversize and outsize cargo. The Administration, with congressional concurrence, has begun to correct this deficiency, especially in the critical area of outsize cargo.

The programmed acquisition of fifty C-5Bs and forty-four KC-10s, along with revitalization of the Civil Reserve Air Fleet (CRAF) Enhancement program, is needed to correct today's insufficient capacity and meet near-term requirements dictated by national policy.

The C-5B is a military aircraft uniquely designed for a military mission. The fifty C-5Bs requested by the Administration will add 8,000,000 ton-miles per day and provide a sixty percent increase in outsize capability.

The KC-10, a combined cargo and tanker aircraft, will provide both a new dimension in long-range aerial refueling capability and the capability of transporting large amounts of bulk and oversize supplies. Since both the C-5 and the KC-10 are already part of the USAF inventory, their training and support elements are in place.

Continuation of the CRAF Enhancement program is essential to assure growth of a program that has proved to be an integral part of our strategic airlift. A revitalized CRAF Enhancement program should exploit the current availability of domestically owned wide-body aircraft and add to wartime airlift capability at a fraction of the cost of adding to the Air Force organic inventory. The Enhancement program must go forward and the Air Force must continue to examine ways to make CRAF attractive to the airline industry.

The Administration's C-5B, KC-10, and CRAF Enhancement plans will add some 17,000,000 ton-miles per day—8,000,000 of which are specifically for outsize cargo—to the mobility force. While they provide an important and welcome step in the right direction, they will not satisfy completely the Congressionally Mandated Mobility Study's call for additional intertheater airlift capability of 25,000,000 ton-miles per day, including 10,000,000 for outsize cargo. Further, they do not alleviate serious shortfalls in intratheater airlift capability.

There is a continuing need for intratheater mobility and resupply. The C-130 is the backbone of the current force—the only airlifter with intratheater capability. Modifications must go forward, but a replacement for it and the C-141 will be needed in the 1990s. Continued R&D on the C-17 is essential to augment the C-5 and KC-10 forces and to provide the remainder of the 25,000,000 ton-miles per day capability recommended by the mobility study. The C-17 also will be needed as a supplement to intratheater forces and as a future replacement of the C-130 and C-141. For our long-term needs, the C-17's versatility as an outsize cargo carrier in the intertheater and intratheater roles and its ability to operate under austere field conditions must be realized expeditiously through adequate funding of a vigorous R&D program.

HELICOPTER REQUIREMENTS

Air Force responsibility for combat rescue and recovery and other special operations needs added assets. The Air Force decision to replace helicopters of limited payload, range, and cruise speed with a version of the UH-60, superior to any helicopter in the inventory, warrants full Defense Department and congressional support. These helicopters must be equipped with advanced sensor systems for night and all-weather operations.

AERIAL REFUELING

USAF analyses show that additional aerial refueling capability is needed for optimum bomber penetration routes to support the Single Integrated Operational Plan (SIOP). In addition, the requirement for tanker support is increasing as B-52Gs and Hs begin to carry Air-Launched Cruise Missiles (ALCMs). Compounding this is the growing requirement to refuel airlift and tactical aircraft for such contingency operations as NATO or Southwest Asia. Present aerial refueling requirements for combined SIOP and contingency missions exceed capabilities substantially. During simultaneous operations, strategic and other missions would be seriously degraded because of tanker deficiencies.

The Air Force program to reengine the KC-135 fleet with CFM56 engines, therefore, is imperative. This will add refueling capability and overcome specific operational and environmental problems. These problems include limited thrust and fuel offload capabilities, excessive fuel usage, chronic water augmentation (takeoff thrust) problems, and excessive engine noise and gaseous emissions. Recent experience with Rapid Deployment Force (RDF) operations in such scarce water areas as the Mideast shows water requirements would be a problem for KC-135s. Reengining the KC-135A with the CFM56 engine will correct these problems. Eventually the entire inventory of 640 KC-135s must be reengined.

There is a clear-cut need for two complementary tanker modernization programs: KC-135 reengining and KC-10 procurement. These two programs must be funded for sufficient quantities to help satisfy growing refueling requirements and provide a flexible tanker force to satisfy a wide range of strategic and general-purpose missions. Each aircraft is

ideally suited to a specific mission: the KC-10A to a long-range deployment of aircraft and cargo; and the KC-135R to the SIOP, mid-range deployment, or employment scenarios. A mixed force of KC-10As and KC-135Rs takes advantage of the unique capabilities of each aircraft, and each must be procured.

The KC-10 does not solve present tanker deficiencies in terms of "boom" intensive requirements in which more booms, not more fuel, are required to meet employment tactics. However, it does release KC-135s from other missions to fill this requirement. KC-10s provide a much needed long-range capability. A proper force mix of KC-10 and KC-135R aircraft is needed to enhance long- and mid-range offload and provide increased basing flexibility.

READINESS AND SUSTAINABILITY

The United States Air Force's investments in force structure and modern weapon systems must be translated into warfighting capability by near-term investments in readiness and sustainability programs. The proper mix of modern equipment and well-trained, dedicated people who have at their disposal effective repair facilities, sufficient spare parts inventories, and adequate munitions is essential. The Air Force has made the readiness and sustainability of existing forces the number-one priority for conventional forces. Readiness is the ability of forces, units, weapon systems, or equipment to accomplish their assigned mission. It is achieved through realistic operational training, maintaining the elements of the force at a high proficiency level, and ensuring that each unit is equipped with sufficient trained personnel, spare parts, and consumables. Sustainability is the ability of our forces to fight beyond the initial period of combat, and is achieved largely by having adequate stocks of spares, supplies, munitions, and fuel.

Air Force readiness and sustainability initiatives—spares, maintenance, training, personnel, munitions, and fuel—must continue to receive the highest funding priority for general-purpose forces. AFA recognizes a need to undertake efforts to increase present operational flying hours by a minimum of fifteen percent. Simultaneously, the Air Force must be provided the funds needed to expand stocks of spare parts and munitions, decrease the depot maintenance backlog, and take other steps to provide near-term combat capability.

Increased readiness and sustainability must have priority on a par with force expansion and modernization. We must remove peacetime deficiencies and enhance warfighting capability at all costs.

The Association, therefore, strongly endorses Air Force efforts to fund vitally needed logistics programs. The combat readiness and sustainability of USAF forces are tied directly to adequate funding of these programs. Over the past decade, logistics suffered at the expense of force expansion and modernization. While recognizing the need for the latter, properly balanced and integrated emphasis on each is imperative to ensure that Air Force units are ready and capable to respond to worldwide contingencies.

The wartime performance of our modern aircraft can be only as good as the munitions they carry. Our munitions posture is limited because the stockpile to support a high intensity, prolonged war is too small, and because much of our present inventory consists of older, less-efficient munitions. More modern munitions increase the efficiency of each wartime sortie, allowing destruction of more targets with decreased attrition of aircraft and aircrews.

Sufficient quantities of more modern munitions and spares must be procured. Munitions shortfalls will require more time to correct than for spares due to the limited production base available and the time required to phase in newly developed munitions.

But readiness and sustainability shortfalls cannot be corrected overnight. Special attention must be devoted to these accounts over the next few years to eliminate the existing backlog in unfulfilled requirements. Maintaining a combat-ready force will require a steady and balanced provision of significant resources over time.

AIR RESERVE FORCES

Since 1970, the Air Force has pursued a Total Force Policy, incorporating the Air National Guard and the Air Force Reserve, collectively known as the Air Reserve Forces (ARF), in wartime planning and peacetime operations, and providing them newer, more capable equipment. The ARF represents the best buy for the dollar to expand force capabilities.

The Air National Guard and the Air Force Reserve carry a large and important part of the day-to-day mission for the strategic, general purpose, and mobility forces, and maintain a continuous high state of readiness to respond in crisis situations. ARF personnel are highly experienced, proficient, professional personnel, and the Air Force and the Department of Defense rely heavily on their contribution to national security. In terms of wartime roles, they provide thirty-four percent of the tactical fighter capability; fifty-nine percent of the tactical airlift and forty-nine percent of the strategic airlift aircrew capability; twenty-one percent of the strategic aerial refueling capability; and thirty-two percent of the tactical air support job.

As the ARF contribution to the Total Force grows, the need for continuing modernization becomes increasingly important. Continued modernization of Reserve and Guard aircraft will enhance warfighting capabilities. Acquisition of first-line aircraft, with their more economical operating capabilities and advanced technology, also adds to the efficiencies of the Reserve and Guard. The equipment must be logistically and operationally interoperable with that of the active force. Operations and maintenance records demonstrate that the Reserve and Guard can maintain the weapon systems as well as the active-duty force due to the high expertise and experience level of the maintenance personnel.

RESEARCH AND DEVELOPMENT

Tomorrow's military capabilities are determined significantly by today's science and technology programs (research and development). The science and technology program, which includes manufacturing

technology and materials technology efforts to increase the productivity and vitality of the industrial base, has one primary objective: to provide a margin of excellence sufficiently broad to enable the United States to develop and field new military capabilities superior to those of potential adversaries. Not only is the development and production of military equipment fundamental for the long-term strength of the armed forces—along with such factors as the skills, training, and morale of military people—but the high visibility of these programs makes them a crucial component of deterrence.

The balance of military equipment between the Soviet Union and the US has changed markedly over the past decade and these trends—generally unfavorable to this country—can be expected to worsen in the years immediately ahead.

Soviet expenditures for RDT&E are now more than double those of the US. This country must restore and retain superiority in the technology base. A key requirement is for the US to transition technology to deployed systems faster.

While the US has maintained its lead in most of the twenty basic technologies that have the greatest potential for significantly changing military capability, the Soviets are eroding our lead in about half.

The Soviets are continuing their intensive program to acquire Western advanced technology through espionage and by exploiting inadequately controlled transfers abroad. By acquisition of Western technology and by following proven Western designs, the Soviets have reduced development risk and their R&D costs. The Soviets are currently believed to be applying Western industrial design and technology to military aircraft. The US must halt this flow of its technology to the USSR.

Soviet concentration on several unconventional technologies at a level far in excess of US programs is of grave concern. The Soviet high-energy laser program, for instance, is estimated to be five times the US level of effort and is tailored to the development of specific laser weapon systems.

High-energy lasers and particle beams are part of a new class of potential weapons called directed energy weapons. These weapons are characterized by the transmission of an intense, lethal beam of radiation at or near the speed of light to a target. The high-energy laser is a beam of light that burns through the target skin, disabling or destroying vital components. It has the potential to be a quick, long-range weapon capable of engaging a number of targets in a short time.

The particle beam weapon creates a stream of highly energetic particles to penetrate the target and its internal components. As the particles decelerate, a large fraction of the beam's kinetic energy is transferred to the target. When the beam initially enters the target, it damages electronic components. As the beam continues to dwell on the target, it ignites fuels and explosives or creates holes in the target.

Feasibility demonstrations must be conducted for both technologies.

As the Soviet threat continues to increase, the laser weapons technology must be explored fully for potential use in a self-defense system for future manned bombers and cruise missile carrier aircraft, in defensive systems against submarine-launched and intercontinental ballistic missile systems, and in antisatellite systems. Various promising laser technologies must be pursued in a balanced manner.

Similarly, particle beam technology must be explored for use in defensive systems against ballistic missiles, other types of guided missiles, aircraft, and in antisatellite systems. It is essential that the Air Force pursue dedicated laser and particle beam programs to develop the technology base and as a hedge against Soviet directed energy weapon breakthroughs.

Over the past decade and a half the thrust of the US military R&D program has changed from visionary and daring quests to new frontiers to static approaches. Maintaining technological superiority requires that the Defense Department and the Air Force stay on the cutting edge of science and engineering. Needed are the kind of outreach programs that characterized the Air Force research and development effort in the 1950s and 1960s and produced advanced ICBMs and aircraft.

There also needs to be increased concern with maximizing the return on investment in military R&D and acquisition. Several important steps need to be taken: First, R&D investment burdens should be shared more with this nation's allies through multinational codevelopment and coproduction; second, investments of productivity-improving technology must be identified.

PRODUCTIVITY

A strong defense industrial base that is capable of "surging" rapidly in time of crisis or war is of vital importance. Yet there is evidence of that base being eroded by dwindling capacity, slipping quality and productivity, severely curtailed access to critical materials, and inadequacies in technical manpower and labor force. This decline must be halted. The remedies are neither instantaneous nor total, but they must be applied quickly and forcefully.

Two related deficiencies come into play here—the nation's increasing dependence on foreign sources for critical raw materials and the dwindling stockpile of critical strategic materials that are of fundamental importance to both the defense industrial base and the national economy. This Association remains fully committed to programs that will free the nation from the shackles of "energy dependence" and the subsequent potential for foreign blackmail.

The Strategic Petroleum Reserve must be filled and nuclear powerplants authorized by the government must be completed and put on line. The national interest requires that research and development directed at finding substitutes for vital, scarce materials be accelerated and intensified. Equally critical is the need for the executive and legislative branches of government to provide reasonable access to public lands for early, comprehensive scientific evaluation and use of the potential metallurgical and energy resources they might contain. Lastly, the stockpile of critical strategic materials must be built

up and maintained at a level to ensure that vital national security needs can be met in case of crisis or war.

Revitalizing the defense industrial base will make it easier to develop and procure weapon systems and military supplies more cost-effectively and, in turn, to step up the rate at which the nation modernizes its military forces.

The Defense Department must take the lead in encouraging increased investment in productivity-enhancing equipment by the aerospace industry. The defense-related marketplace must be provided with greater stability. Multiyear contracting is an essential means to improve stability. So are steps that free operating capital for investment in productivity-enhancing technology. Further, in developing new systems, care must be taken that they are logistically supportable and affordable. The most technically advanced system, unless supported by a sound logistics base, cannot take full advantage of the technology designed into it.

When designing new systems, it is imperative that the engineering community look beyond the R&D phase. The principal means of achieving this is through initiating logistics engineering during R&D and continuing through the transition phase of the system to an air logistics center.

A problem that affects all Air Force technology programs is the shortfall of officers in the science and engineering fields, now in excess of 1,300. This problem will be compounded by anticipated increases in the need for technical officers through the next two decades. During the same period, the demand for technically educated people in the civilian sector is likely to increase even more rapidly. USAF's success in attracting and retaining needed scientists and engineers will depend on the overall ability of the nation to revitalize the technical training base.

The Air Force, in turn, must be given the means to sponsor adequate numbers of qualified people in fully funded graduate education programs and to ensure sufficient undergraduate scholarships for talented young officer prospects. Also, incentives must be provided to attract scientists and engineers to military service. These steps, in combination, will contribute to a margin of safety in the defense posture that is now tragically lacking, and dramatize to friend and foe alike America's determination to restore its military capabilities to high effectiveness and credibility.

In this, the thirty-fifth anniversary year of the United States Air Force, the more than 180,000 members of the Air Force Association recall the motto: "Pride in the Past, Faith in the Future." We pledge our unwavering support to the men and women and the cause of the Air Force, confident in our belief that USAF's glorious past is a prelude to a yet brighter future. We know the Air Force will continue to serve gallantly as a guarantor of America's freedom and world peace for generations to come. ■

Defense Manpower Issues

Heading Off a Hemorrhage of Talent

A policy paper, adopted unanimously by delegates to AFA's annual National Convention, on September 14, 1982.

"ATTRACTING and retaining the right numbers and sufficient quality of skilled and motivated people is the principal challenge for the Air Force."

This was the answer of the new Air Force Chief of Staff, Gen. Charles A. Gabriel, when he was asked during his confirmation hearing before the Senate Armed Services Committee to cite the greatest challenges to adequately staffing the Air Force in the 1980s. He went on:

"We are doing well now, but an upturn in the economy, increased airline hiring, lowered unemployment, or pay caps could return us to the brink of the retention disaster we experienced in the late 1970s. Shortages still remain in pilots, engineers, navigators, and mid-level NCOs."

He stressed that to rebuild and maintain the experience level of the Air Force, it is essential to "maintain pay comparability by providing an adequate, stable, predictable, and equitable compensation system to ensure that military pay does not again lag behind the private sector. . . . Finally, it is vital to our ability to man the Air Force in the 1980s that we ensure the stability of the retirement system. Changes should only result from a deliberate process based on valid personnel management and force structure requirements, and should 'grandfather' members currently serving and those already retired."

The Air Force Association wholeheartedly agrees with General Gabriel's assessment. Air Force man-

ning, both in numbers and quality, is at its "healthiest" level since the mid-1970s. It is meeting recruiting goals in all enlisted categories. Quality trends are favorable. Approximately ninety-three percent of this year's enlistees possessed a high school diploma. Officer recruiting requirements also are being met in almost every category—engineers and certain medical specialties being glaring exceptions.

Probably the best example of the Air Force's current success is the turnaround in pilot retention. In 1979 only twenty-six of every 100 pilots who began a career were on board at the eleven-year mark. That alarming twenty-six percent continuation rate has now rebounded to a more promising fifty-four percent. Navigator and nonrated officer retention has followed the same upward pattern. On the enlisted side, reenlistment rates are just as encouraging. After hitting bottom in FY '80, reenlistments have risen sharply. In FY '81, the Air Force saw a forty-three percent reenlistment rate for first-termers, compared to only thirty-eight percent in FY '79. These favorable trends are continuing.

Unquestionably, many factors have been instrumental in the tremendous improvements in recruiting and retention. Internal leadership efforts by the Air Force (many called for by AFA last year), adequate recruiting resources, the currently depressed economy and high unemployment rate, and resurging patriotism all played a part. But, in our view, the most important factor was improved pay. Specifically—and with AFA's most sincere thanks—we give full credit to the action of Congress and the Administration in securing the 11.7 percent and 14.3 percent pay increases in Fiscal Years '81 and '82 respectively, which restored relative military pay comparability.

Yet, in the midst of what appears to be an optimistic situation, and echoing General Gabriel's concern, we must be alert about the future. In many ways what the Air Force faces today is chillingly reminiscent of 1975, when the services were unknowingly on the brink of the worst military manpower crisis since the advent of the All-Volunteer Force.

In May 1975, after several consecutive quarters of economic downturn, unemployment reached its postwar peak of nine percent. This marked the low point in the recession, followed by a strong recovery. In 1975, at the height of the recession, a five percent cap was placed on military pay in response to concerns about the declining economy and growing federal deficits. This was followed in rapid succession by two years of pay raise reallocations and additional pay caps in 1978 and 1979 on the order of six and seven percent, respectively.

As a result, in 1979 all services failed to meet their recruiting goals, with the Air Force missing its enlisted recruiting goal for the first time in the history of the All-Volunteer Force. More importantly, all services experienced dramatic and alarming losses of experienced careerists, including pilots, navigators, and enlisted personnel in critical skills. The Air Force pilot inventory went from a 3,200 surplus in 1975 to a 1,300 deficit in 1979. In 1979 alone, 82,800 enlisted members, representing almost 600,000 man-years of experience, left the blue suit. One of every four E-8 maintenance supervisors retired or quit.

Finally alarmed, and as AFA and others raised a clarion call of concern, Congress, in an attempt to reverse this "hemorrhage of talent," passed two substantial pay raises in 1980 and 1981 to restore military pay to relative levels of comparability with the private sector. Congress was instrumental—in fact, led the

Keynote speaker, Dr. Herbert H. Reynolds, President of Baylor University, set the tone for the AFA Convention with his concluding statement that "people are not something—people are everything!" At left is AFA Board Chairman Vic Kregel.

effort—to restore comparability. This was a significant effort—but notwithstanding the resultant favorable effects of an upward surge of retention and increased recruiting successes, the Air Force is still unable completely to offset the wealth of experience that was lost. For example, it is still short 1,100 pilots, 1,000 engineers, and about 8,000 noncommissioned officer specialists in critical sortie-generating skills. It does not project "getting well" until the 1985/1986 time frame, even under the best of circumstances.

The salient point in this comparison is that there are remarkable parallels between 1975 and 1982. Both years were plagued with recession and high unemployment; in both years there was pressure to reduce defense spending and the budget deficit. A prominent target in 1975 and again today is the projected military pay increase. In 1975, and in the four years that followed, that target was bombarded repeatedly, and by September 1980, military pay lagged private sector wages by 17.6 percent. And there is, moreover, one crucial and frightening difference in this comparison. In 1975 the Air Force was drawing down from the war in Southeast Asia; it had a "bank" of skilled, combat-experienced people.

Today, it's in a buildup mode, and it doesn't have that "cushion" of experience, primarily because it hasn't had ample time to recover from the devastating losses of the late 1970s—some critical skills are still in short supply. Further, the demographers tell us that, in the years ahead, the absolute number of military-age youth will be in a downward spiral. The possibility of emergency military manpower requirements are ever-present and sobering; this Associa-

tion recognizes the need for and supports the current legislation requiring registration of our nation's youth.

From a slightly different perspective, it is also essential that no slackening in the pace of effectively manning the Air Force Reserve and Air National Guard take place. During the late 1970s, these components surged to full manning, spurred by a combination of aggressive recruiting and the ability to offer skilled blue-suiters leaving the service a meaningful "part-time" profession. Now, in a slightly ironic twist, the increased retention efforts of the active force have diminished this pool of eligible recruits for the Reserve and Guard.

At the same time, aforementioned shrinkage of the number of military-age youth—a situation expected to worsen until the early 1990s—makes nonprior-service recruiting even more challenging. Added to this is the fact that the reserve components, while fully manned by numbers, still lack sufficiency in particular skills, especially those skills not easily transferable to civilian pursuits, such as weapons loaders. With all that in mind, then, AFA urges that pay and benefits increases continue to extend to what is, truly, the Total Force Air Force.

The bottom line is that *now* is the time to maintain the momentum gained during the past two years. Otherwise we could see the beneficial recruiting and retention improvements of 1981 and 1982 erode rapidly. Further, if the economy is on the verge of recovery, a situation we fervently endorse, and as many experts, including the Congressional Budget Office, predict, the "draw" of an upswing in industrial and airline hiring, aggravated by depressed military pay, could lead to increased losses of experienced people comparable to the losses suffered in the late 1970s. Losses that were alarming then would be crippling today.

Air Force civilians are a critical part of the defense force, and make significant contributions to military readiness. Therefore, they expect and should be entitled to pay, benefits, and working conditions that are comparable to those they could attain in their profession in the private sector. Programs that impact adversely on their pay and benefits have a detrimental impact on the Air Force's ability to attract and retain the high-quality people necessary to carry out the mission.

The 1980s and '90s present challenges for manpower and personnel management. We do not want to see a repeat of the mistakes made in the early and middle 1970s, a period when the nation grew complacent and lost a tremendous amount of experience, and it cost the Air Force a tremendous amount of money to recruit and train replacements.

With the foregoing in mind, AFA highlights the following crucial issues needed to maintain the momentum gained in the last two years:

COMPENSATION

Despite the lessons of the recent past, it appears probable that there will be a pay cap on military pay. This could prove to be "penny wise and pound foolish," as it will preclude the elimination of critical shortages. There should be an independent military pay adjustment mechanism, and this mechanism should be allowed to function as intended.

AFA supports:

- Providing a full comparability raise in FY '83 and beyond.
- Should pay be artificially capped in FY '83, AFA strongly urges restoration of comparability in FY '84 to include a "catch-up" increase.
- Establishing a more stable, predictable pay adjustment mechanism tied to the Bureau of Labor Statistics Employment Cost Index (ECI), the occupational wage survey most representative of the armed forces.
- Eliminating the pay ceiling now imposed on senior Air Force military and civilian personnel.
- Retention of the pay and allowance system as the fundamental form of military compensation.
- Providing the basic allowance for subsistence as an entitlement to all single career enlisted personnel.
- Permanent authorization for enlisted flight pay.
- A permanent system of flight pay for flight nurses, similar to that now authorized for flight surgeons.
- Enacting legislation and appropriating funds to supplement a locality-based flat rate per diem system for military and civilian personnel.

AFA opposes:

- The allocation of pay increases to other than basic pay.

ADEQUATE REIMBURSEMENT FOR PERMANENT CHANGE OF STATION (PCS) MOVES

AFA supports:

- Recognizing PCS expenses as cost of doing business that must be borne by the government, not the member.
- Eliminating the differences between officer and enlisted per diem policies.
- Increasing PCS mileage allowances for members.
- Increasing mileage allowances for dependents.
- Increasing household goods weight allowances for E-7 and higher grades.
- Providing Temporary Lodging Allowance (TLA) for up to twenty days.
- Providing adequate travel reimbursements to junior enlisted members being reassigned in the continental US.

LUMP SUM SELECTIVE REENLISTMENT BONUS (SRB) PAYMENT

The present trend toward paying the Selective Reenlistment Bonus (SRB) in installments stretched over several years reduces the attractiveness of the SRB program. As the economy recovers, this extended bonus program will become a much less efficient inducement to reenlistment. A shift in this direction will weaken the program at a time when it will be needed most.

AFA supports:

- Returning to the lump sum payment of the Selective Reenlistment Bonus payment.

BONUS FOR ALL AIR FORCE ENGINEERS AND SCIENTISTS

The Air Force is presently short at least 1,000 engineers. Recruiting for the Air Force is difficult because of the national shortage in these specialties. In addition, roughly one-quarter of these officers leave at the end of their initial obligation.

AFA supports:

- Funding to pay engineering and scientific officers accession and continuation bonuses.

HAZARDOUS DUTY INCENTIVE PAY

Since 1955, the Consumer Price Index (CPI) has more than tripled while the hazardous duty incentive pay (HDIP) for officers has remained the same, $110 per month. An increase in this incentive pay is clearly warranted.

The Air Force is presently short at least 1,000 engineers. Recruiting for the Air Force is difficult because of the national shortage in these specialties.

AFA supports:

- Increasing hazardous duty incentive pay (HDIP) by fifty percent.

COMMISSARY

The commissary system is an important institutional benefit that helps to offset partially the extraordinary demands of military service.

AFA supports:

- Continuation of the commissary system.

AFA opposes:

- Efforts to contract-out commissary operations.

RECRUITERS

AFA supports:

- Adequate recruiting resources.
- An increase in special duty pay for experienced recruiters and senior supervisory personnel.
- Retaining a limited leased housing program in areas where "Special Duty Requirements" make it highly desirable for members to live near their duty stations.

COMMISSIONED OFFICER ACCESSIONS

AFA supports:

- An increase in ROTC subsistence of scholarship entitlements.
- One additional year for AFROTC cadets in technical academic disciplines that require more than four years to complete.
- Action to assure accreditation of AFROTC courses toward degree requirements at those colleges and universities that do not grant such credit.
- Seven thousand *funded* AFROTC scholarships for FY '83.
- Four hundred and fifty funded spaces for input to the Airman Education Commissioning Program in FY '83.
- Continued opportunities for qualified enlisted members to become commissioned officers.
- Continuation of the Air Force Officer Training School (OTS).

AIR FORCE JUNIOR ROTC

AFA supports:

- An increase in the number of AFJROTC units.

EDUCATIONAL INCENTIVES

AFA supports:

- The development of a new educational incentive program for the armed forces, with the following characteristics: noncontributory; for all who serve honorably; increased benefits for remaining in the service; and the option for officer and enlisted personnel with ten years of service to transfer their unused benefits to members of their families. AFA considers transferability to be an important feature of the program.

TRAINING

AFA supports:

- Continued efforts to graduate high-quality students from Air Force Technical Training Centers through improved training programs.
- Participation of ANG/USAFR members in the Defense Activity for Nontraditional Educational Service (DANTES).
- Legislation to provide for a Skilled Enlisted Reserve Training program.
- Aggressive and realistic training—such as the Red Flag exercises.
- Project Warrior.

AIR FORCE RESERVE AND AIR NATIONAL GUARD

AFA supports:

- Continuation of the Technician Program for the Air Force Reserve and Air National Guard.
- Educational and VA-type guaranteed home loan aid for Air Force Reservists and Air Guardsmen.
- Enactment of a Reserve Officer Personnel Management Act (ROPMA).
- Continuation of current military leave policies for federal employees who are also members of the Reserve Forces.
- The President's National Committee for Employer Support of the Guard and Reserve.
- An equitable military leave policy by employers that does not interfere with regular vacations for Reservists.
- A study of the feasibility of a change to the Reserve nondisability plan to allow payment of an actuarially reduced annuity before age sixty.
- Raising the ceiling of sixty creditable retirement points for Air Force Reservists and Air Guardsmen.
- Legislation that would permit receipt of immediate retirement pay to totally disabled Reservists who have otherwise qualified for Reserve retirement.
- Broader authority and more funds for enlistment and reenlistment bonuses for Air Force Reservists and Air National Guardsmen.

• Legislation to provide authorization for special pay programs for Air Force Reserve and Air National Guard physicians and dentists.

• Legislation that would totally eliminate the Social Security offset from the benefits received from the Reserve Forces Survivor Benefit Plan (RFSBP).

• Legislation that would provide aviation career incentive pay to Air Force Reserve and Air National Guard crew members on the same basis as provided their active-duty counterparts.

CIVIL AIR PATROL (CAP)

AFA supports:

• Continued federal funding of the Civil Air Patrol and an increase in CAP's capability to perform its search and rescue mission.

• Increased disability and death benefits for CAP members injured or killed on operational missions.

• The CAP Cadet Program and CAP Aerospace Education mission.

MORALE, WELFARE AND RECREATION (MWR) PROGRAM

More than ninety-three percent of Air Force members surveyed stated that discontinuance, or non-availability, of MWR programs would have a negative impact on their morale. More than eighty percent of the commanders surveyed feel that the impact would be major.

AFA supports:

• Construction of needed people support facilities from appropriated funds, such as: child-care centers, libraries, recreation centers, gymnasiums, arts and crafts centers, auto hobby shops, and youth centers.

MEDICAL/DENTAL CARE

Despite recent improvements to CHAMPUS, other benefit improvements are still necessary to ensure that the military health-care program remains an effective retention incentive and continues to compete favorably with private-sector health-care plans.

A fundamental need exists to improve the conditions of overseas service in order to attract additional experienced personnel to these duties and to encourage more members to serve longer tours, thereby reducing turbulence and PCS move requirements.

AFA supports:

• Developing a CHAMPUS dependent dental-care program for active-duty dependents.

• Establishing an individual and family out-of-pocket liability limit ("catastrophic cap") of $1,000 during each calendar year for all beneficiaries.

• Continuing CHAMPUS coverages after age sixty-five as second payer to Medicare, rather than termination at age sixty-five.

• Authorizing CHAMPUS to provide eye examinations to check for diseases and visual acuity for active-duty dependents.

RECOGNITION OF THE ROLE OF THE FAMILY

AFA believes that family attitudes play a key role in the member's job, morale, and productivity. Since two-thirds of Air Force members have families, the impact on the mission by the families is vital.

AFA supports:

• Expanding support functions and developing new programs responsive to changing needs of the Air Force family of the 1980s.

• Establishing fully funded, installation-level family support centers throughout the Air Force.

• Expanding relocation programs to address the needs of the entire family, to provide help in obtaining temporary lodging before departure and at the new station, to provide help in locating new housing, and to assist in settling at the new location.

• Improving the quality of household goods shipment.

• Improving the quality of existing military family housing units.

• Increasing the number of military family housing units.

• Appropriating funds for the construction and operation of child-care facilities.

• Employment and education programs to assist family members in locating or preparing for employment.

UNIQUE CONDITIONS OF OVERSEAS SERVICE

A fundamental need exists to improve the conditions of overseas service in order to attract additional experienced personnel to these duties and to encourage more members to serve longer tours, thereby reducing turbulence and PCS move requirements.

AFA supports:

• The improvement of overseas incentives programs, such as: environmental morale leave programs for members and families, creation of home leave provisions, higher priority for dependent travel and emergency travel payments for members and families, upgraded overseas foreign duty pay provisions, and an increase in family separation allowance.

CIVILIAN PERSONNEL

AFA supports:

• Legislation to change the tax law regarding taxes on reimbursement for relocation expenses.

• Legislation to increase the allowance for federal employees transferred in the interest of the government.

• Legislation to increase the uniform allowance for federal employees.

• Legislation to permit transportation of deceased employees, and/or his/her dependents, to home of record.

• Legislation to permit transportation of depen-

dents and personal effects when an employee dies en route to or within three months after reporting to a new duty station.

AFA opposes:

- The fifty percent cap on CPI adjustments to retired pay imposed on retirees under age sixty-two by the FY '83 Omnibus Reconciliation Act.

RETIREMENT

AFA is firmly opposed to any fundamental changes in the active force military retirement system (including earned/expected Social Security benefits). If changes are deemed necessary, they must be made (and "grandfathered") so as not to violate implicit and implied contracts made to military members.

AFA supports:

- Restoration of the "lookback" provision in computing retired pay.
- Retirees becoming active in the Air Force retiree programs of the Air Force.
- The Air Force Enlisted Men's Widows and Dependents Home Foundation and Air Force Village.
- Dental care for retired members and dependents.
- Lifetime coverage under CHAMPUS for military retirees, without regard to Social Security, Medicare, or service-connected disability treatment by the VA, and removal of current nonavailability certificate requirements.
- Removal of the dual-compensation limitations for retired officers.
- Recomputation of retired pay to reflect changing military pay structure, especially pre-1968 retirees.
- A three-year grace period for government-paid moves to the home of choice upon retirement.

AFA opposes:

- The fifty percent cap on CPI adjustments to retired pay imposed on retirees under age sixty-two by the FY '83 Omnibus Reconciliation Act.
- Any further erosion of the real purchasing power of military retiree pay, including pay caps and freeze proposals.
- Any action that penalizes retired service members working for the government, by curtailing either their retired military pay or Civil Service salary.
- Reduction in long-term retirement benefits that would occur if DoD's Uniformed Services Retirement Benefits Act becomes law.
- Any offset of military pay by Social Security benefits.
- The current so-called "Catch-62" provisions of federal law, which require retired military people who have subsequently earned retirement from Civil Service to give up applicable credit for their military retired pay and replace it with Social Security at age sixty-two.

SURVIVOR BENEFIT PROGRAM (SBP)

AFA supports:

- Legislation that would discontinue Social Security offset to SBP annuities when surviving spouses receive Social Security worker's pension based on their personal contribution.
- The return of all benefits to the widows and children of Air Force members who died while on active duty.

VETERANS

We remain concerned about the public's inclination to forget, during peacetime, the sacrifices of both those who served during the past wars and persons now serving on active duty. The problems encountered by Vietnam-era veterans, while moderating, remain a national concern. Broken promises to veterans, and neglect or disregard of their legitimate needs, are perceived by many active-duty people as major evidence of the public's low esteem for the military in general and are a factor in their assessment of the military as a career.

AFA supports:

- Continued opposition to capping the cost of living increases for disabled veterans and federal retirees.
- The opposition to the continued seven-year shrinkage of the VA's share of the federal budget.
- Continued medical treatment of veterans with nonservice-connected disabilities, and opposes postponement of construction and resources needed to treat the nonservice-connected disabled veteran.
- Greater government emphasis on training and jobs for Vietnam-era veterans.
- Extension of time restrictions on eligibility for earned veterans education benefits.
- Expansion of national cemeteries in numbers and size.
- Restoration of the $300 burial allowance to all veterans, regardless of the cause of death.
- Changing the cutoff date of the old GI Bill from December 1989 to ten years after leaving active duty.

AFA opposes:

- Any reduction to veteran's compensation, pension programs, and to the VA medical care system.
- Reductions in compensation payments for service-connected disabled veterans.
- Reduction in VA medical care facilities, hospitals, clinics, domiciliary care, or reimbursable travel funds for disabled veterans.

POW/MIA

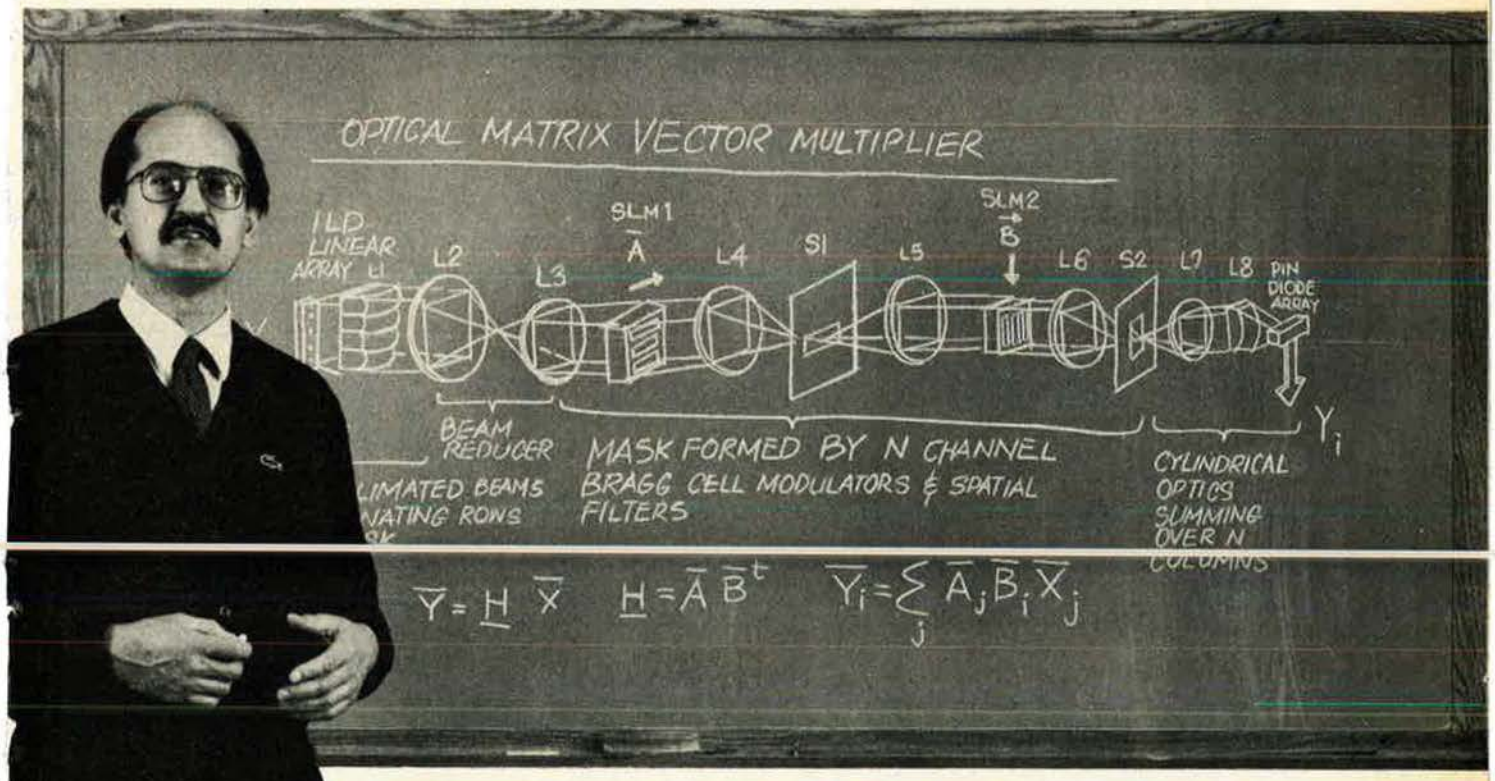
Increasing and convincing evidence indicates that some of the 2,500 Americans missing during the Vietnam War may still be alive. We strongly support the Administration's commitment that "we will proceed on the assumption that at least some Americans are still held captive by the Indochinese Communists." In the absence of proof to the contrary, we urge an increased threshold of concern and that all parties join together to establish unrelenting pressure on the Vietnamese government to act in accordance with their solemn pledge in the Paris Peace Accords. We urge that they provide a strict and accurate accounting of all the POWs and MIAs and continue that pressure until they are forthcoming and have honored their solemn promise.

AFA also supports:

- The establishment of a permanent National POW/MIA Recognition Day. ■

Optical Signal Technology on the move.

Andy Tarasevich on high speed processing to cancel sidelobe jamming.



"To make a quantum jump in radar signal processing, you must consider optical methods. Optical signal processing systems offer promising potential for needed high speed calculations since data can be processed in parallel," according to Andy Tarasevich, Senior Staff Engineer at Lockheed.

"We have a particular interest in phased array antennas, primarily because of their ability to function in hostile electromagnetic environments. To do this, a phased array must be able to adapt to a pulsed jammer in times on the order of 1 to 10 microseconds.

"To solve this problem, it is necessary to consider the transient response of the processor. Specifically, we must be able to deal with a non-stationary noise field. This calls not only for a high rate of convergence of the algorithm but an optical mask which can be updated in a few microseconds. Currently available two dimensional optical masks have frame rates of milliseconds, far too slow for this application.

"At Lockheed Electronics, proof of concept is under way to demonstrate an approach where high speed, acousto-optical, single dimension modulators are utilized to represent any matrix which is the outer product of two vectors. This optical approach appears to have distinct advantages in speed, power consumption and cost over proposed digital techniques."

In applying optical signal processing, Lockheed Electronics knows how.

Lockheed Electronics

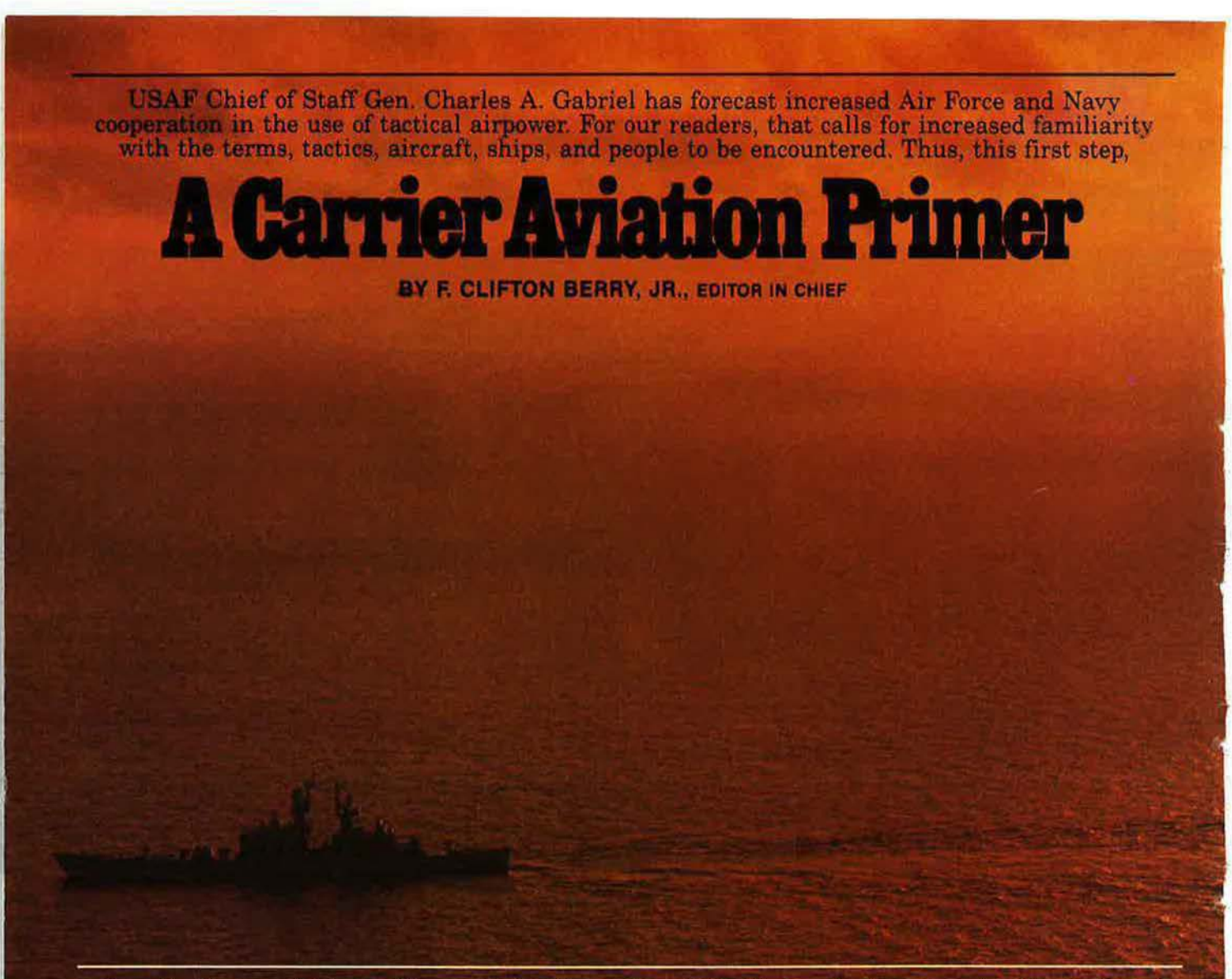
Plainfield, New Jersey 07061

Engineers interested in contributing to advanced electronic systems are invited to write Professional Employment at the address at right.

USAF Chief of Staff Gen. Charles A. Gabriel has forecast increased Air Force and Navy cooperation in the use of tactical airpower. For our readers, that calls for increased familiarity with the terms, tactics, aircraft, ships, and people to be encountered. Thus, this first step,

A Carrier Aviation Primer

BY F. CLIFTON BERRY, JR., EDITOR IN CHIEF



THE Air Force and Navy will work more closely in the months and years ahead than they ever have before in peacetime. The impulse toward closer cooperation has always been latent. From time to time it has shown results, as with the Doolittle Raiders' launch from USS *Hornet* and with the Army Air Forces' antisubmarine patrols off the US coast in World War II. But in peacetime, parochial sentiments and competition for missions and funds have often meant confrontation and controversy.

Now, however, the uniformed and civilian leadership of both the Air Force and Navy realize that the threats to national security are so ubiquitous and deep and the funds the nation can afford for defense are so constrained that it is time to find ways to work together.

Months of staff preparation and groundwork culminated at a Pentagon luncheon in mid-July. At its end, the Secretaries of Air Force and Navy (Verne Orr and John Lehman) and the uniformed chiefs (Gen. Charles A. Gabriel and Adm. James D. Watkins) "agreed to agree." Since then, their staffs have been hard at work in finding ways where cooperation is possible immediately, or soon, or later. At the same time, the staffs are putting price tags on cooperation and also identifying areas where cooperation will require changes in the rules (mission assignments, legislative directives, and the like).

Making Cooperation Work

The road to increased cooperation will not be smooth. The chiefs may direct it, and aircrews in the field and at sea may welcome it. But the many intervening layers contain a few people whose veins run with Navy or Air Force blue instead of red blood, and who can be expected to be skeptical or resistant. The leaders recognize this, and are determined to make cooperation work.

General Gabriel told the AFA Convention in September: "It will not be easy for some to shed parochial concerns. But we cannot afford separate approaches that waste scarce resources and do not give us the best warfighting capability."

In announcing the Air Force-Navy efforts, General Gabriel told the AFA audience: "We are working with the Navy on several initiatives to increase cooperation and training. We and the Navy will be expanding our use of each other's schools, increasing the scope and frequency of joint maritime training and exercises, and developing better ways to fight together."

Top Navy leaders take the same position. As an example of the need, they cite the porosity of the Greenland-Iceland-UK maritime gaps. Soviet submarines and surface com-

USS Dwight D. Eisenhower *(CVN 69) and escorts in an uncharacteristically tranquil early evening at sea. Such carriers can expect to work more with USAF in the future.*

batants flow through them now, and, in wartime, they could force the passage while NATO units tried to block them. With present US Navy and NATO resources, the gaps can be penetrated by the Soviets, permitting them to pour into the Atlantic and imperiling vital sea-lanes. The war could be lost as a result.

Navy leaders believe, however, that USAF participation could make a profound difference. If USAF E-3A airborne warning and control aircraft (AWACS) were on station and linked into the warning system, the US and Royal Navies' limited interceptor force, augmented by long-range USAF F-15s, and other USAF aircraft capable of employing antisubmarine and antiship weapons could be counted upon, then the gaps could be sealed with confidence.

Looking to the South Atlantic, General Gabriel said, "As the Falklands conflict demonstrated, airpower is a critically important part of successful maritime operations. We will be putting more emphasis on such collateral roles as sea-lane protection, aerial minelaying, and ship attack. We can learn from one another what we need to know—both on the offense and the defense." An early example of ship attack cooperation begins in January, with USAF B-52s test firing Navy Harpoon antiship missiles. In discussing the B-52's future, General Gabriel noted that most would be converted to standoff cruise missile carriers as the B-1B comes into the force. The remaining B-52s, he said, "will be used in force projection, conventional bombing, and *maritime roles.*" *(Emphasis added.)*

Carrier Aviation Primer

It is clear that US Air Force people will find themselves working directly with Navy units, or will be hearing more about such cooperation. Thus this special section of AIR FORCE Magazine: to set out for its readers some of the very basic information about US Navy carrier aviation and, at the same time, illuminate a few of the possibilities and pitfalls facing the Air Force and Navy as they edge closer together in the employment of tactical airpower.

The US Navy's aircraft carrier force is down to twelve deployable decks: ten full-range big decks, plus the smaller *Midway* and *Coral Sea*. The Navy believes that fifteen carrier battle groups with large-deck carriers are required to meet the military objectives of national strategy.

In fact, some studies calculate that twenty carrier battle groups are

LEFT: Ordnancemen of VA-94 manhandle iron bomb into position aboard an A-7E Corsair II in readiness for flight operations off USS Enterprise *(CVN 65). ABOVE: Pilots in cockpits of A-7Es of VA-22 and VA-94 are ready for launch from USS* Enterprise *(CVN 65). A-7E Corsair II is the mainstay of the Navy's light attack squadrons. Light attack aircraft side numbers are in the 300 and 400 series. The A-7E is a single-seat aircraft powered by one Allison TF41 turbofan engine. It is armed with one M61A1 20-mm multibarrel cannon in fuselage; stores stations can carry more than 15,000 pounds of weapons. The A-7Es are due for replacement by the F/A-18 Hornet aircraft in the late 1980s and early 1990s.* (AIR FORCE *Magazine photos)*

really needed, but are not fiscally or politically feasible.

The core of the battle group is the large deck CV or CVN (N for nuclear propulsion), with its embarked tactical air wing. Within the battle group or acting in direct support of it are sea-based surface-to-surface missiles, antiair warfare or antisubmarine warfare escort ships, and nuclear attack submarines, as well as the possibility of Navy and Marine V/STOL aircraft operating from auxiliary ships.

Carrier aviation evolved over the decades preceding World War II from a novelty, to a means of scouting for the battleships, to a striking force in its own right. The Pacific campaigns established the carrier battle group as the primary means of projecting power at sea.

As the jet age arrived, so did the need for larger carriers and better ways of handling faster and larger aircraft aboard them. For instance, the postwar and Korean War eras saw the introduction of the angled flight deck and steam catapults. Carriers grew in gross tonnage as well, as they evolved from single-function into multifunction warships.

The *Essex* class, commissioned at war's end, grew from 23,000 tons to 40,000 tons over their service life. The *Midway* and *Coral Sea,* commissioned in 1945 and 1947, grew from 40,000 tons to near 70,000 tons at combat load. The *Forrestal* class, commissioned beginning in 1955, have grown from 50,000 to near 80,000 tons as more functions have been assigned and more systems added.

Now, the current *Nimitz* class are being commissioned at more than 90,000 tons fully loaded. Their displacement can be expected to grow during service life, just as their predecessors have experienced.

This growth in multifunction capabilities and gross displacement raises the argument of whether the carriers have become so large as to be dinosaurs, and whether the national interest would be better served by building larger numbers of smaller carriers.

Aircraft Carriers at a Glance

Carrier	Name	Fleet	Homeport	Displacement (Tons)	Commissioned
CV 41	*Midway*	Pacific	Yokosuka	64,000	Sep. '45
CV 43	*Coral Sea*	Pacific	Alameda	64,000	Oct. '47
CV 59	*Forrestal*	Atlantic	Mayport	78,000	Oct. '55
CV 60	*Saratoga*	Atlantic	(In Yard)	78,000	Apr. '56
CV 61	*Ranger*	Pacific	North Island	78,000	Aug. '57
CV 62	*Independence*	Atlantic	Norfolk	78,000	Jan. '59
CV 63	*Kitty Hawk*	Pacific	(In Yard)	80,800	Apr. '61
CV 64	*Constellation*	Pacific	North Island	80,800	Oct. '61
CVN 65	*Enterprise*	Pacific	Alameda	89,600	Nov. '61
CV 66	*America*	Atlantic	Norfolk	80,800	Jan. '65
CV 67	*John F. Kennedy*	Atlantic	Norfolk	82,000	Sep. '68
CVN 68	*Nimitz*	Atlantic	Norfolk	91,400	May '75
CVN 69	*Dwight D. Eisenhower*	Atlantic	Norfolk	91,400	Oct. '77
CVN 70	*Carl Vinson*	Atlantic	Norfolk	91,400	Mar. '82

Source: US Navy

ABOVE: An A-6E of VA-95 with bomb load is positioned on No. 2 catapult for launch. Catapult crew members are at their stations and controls. The plane director (in yellow shirt) signals pilot to hold while crewmen perform final prelaunch checks. A-6E Intruder is the all-weather medium attack aircraft of the carrier air wings. Each air wing normally has one medium attack squadron with ten A-6E attack aircraft and four KA-6D tankers. Side numbers are in the 500 series. The Intruder is a side-by-side two-seat aircraft, capable of night, all-weather attack operations with up to 18,000 pounds of weapons. Combat range with maximum external load is almost 800 nautical miles. (AIR FORCE *Magazine photo)*

The Navy rejects this proposal. It contends that the carrier battle group built around the large deck nuclear-powered carrier is, over its service life, as cost-effective as battle groups centered about smaller carriers; that the smaller carriers have more operating overhead costs in personnel, consumables, and money while operating a smaller number of less-capable aircraft; and that the smaller carriers are more vulnerable to enemy attack than are the larger carriers, where survivability is a prime design criterion. These are among the topics that will receive more attention in the months ahead.

Control of Units

Carrier aviation units can report to two masters. They are under the administrative control of Navy air commanders on either coast; the Commander of the Naval Air Force Atlantic Fleet (COMNAVAIRLANT) or the Commander Naval Air Force Pacific Fleet (COMNAVAIRPAC). When units are ashore, administrative control flows from the Deputy Chief of Naval Operations (Air Warfare) through COMNAVAIRLANT and COMNAVAIRPAC to functional wing commanders (fighter, attack, antisubmarine, and others). When assigned to a carrier and deployed, operational control flows from the numbered fleet commander through carrier group commanders through the commanding officer of the carrier, then to the embarked carrier air wing (CVW) commander.

Ashore, the functional wing commanders provide support and training for specific types of aircraft operating from specially tailored air stations. For carrier-based types, the breakout is like this:

- Fighter wings: Oceana, Va., and Miramar, Calif.
- Light attack wings: Cecil Field, Fla., and Lemoore, Calif.
- Medium attack wings: Whidbey Island, Wash., and Oceana, Va.
- Tactical electronic wings: Whidbey Island, Wash.
- Air antisubmarine wings: Cecil Field and North Island, Calif.
- Airborne early warning wings: Norfolk, Va., and Miramar, Calif.
- Helicopter antisubmarine wings: Norfolk, Va.

At sea, operational control is exercised by carrier group commanders. They are under operational control of the numbered fleet commanders; Third and Seventh Fleets in the Pacific and Second and Sixth Fleets in the Atlantic and Mediterranean. The carrier group commanders fight the battle with a number of ships. They include one or more carriers with embarked air wings, plus such surface and subsurface combatants as cruisers, destroyers, frigates, and attack submarines, plus support ships.

Sorting Out the Air Wings

The carriers and the air wings have home ports and air stations on either US coast. (USS *Midway* is the exception, with home port at Yokosuka, Japan.) For ease in identification, the wings and squadrons have two-letter codes painted prominently on their aircraft. Codes for

Atlantic Fleet units have a first letter of A through M. Pacific Fleet unit codes begin with the letters N through Z. *(See box for listing.)*

Usually, carrier air wings are associated with specific carriers. However, this is not ironclad. Assignments of squadrons to specific wings and wings to specific carriers are changed because of overhaul periods, decommissioning and commissionings, and changes in aircraft types. Thus, while Carrier Air Wing 11 (NH) is usually associated with USS *Enterprise,* and is deployed aboard it in the Pacific now, its individual squadrons may vary from time to time.

Carrier groups are usually commanded by Rear Admirals or Commodores (O-8 or O-7), carrier air wings by Commanders (O-5), the carriers themselves by Captains, and the squadrons by Commanders. Navy tactical squadrons on aircraft carriers are smaller than USAF squadrons. Fighter squadrons usually consist of twelve aircraft and more than 200 people; attack squadrons have ten or twelve aircraft and about 200 people; tactical electronic, airborne early warning, and air antisubmarine squadrons usually have four aircraft and about 200 people.

The commanding officer of an aircraft carrier must have previously served as a squadron commander and normally as a carrier wing commander, and have a broad base of both tactical air and sea experience. He operates the ship, provides the floating air base for the carrier air wing, and also gives a home to the carrier group commander and staff.

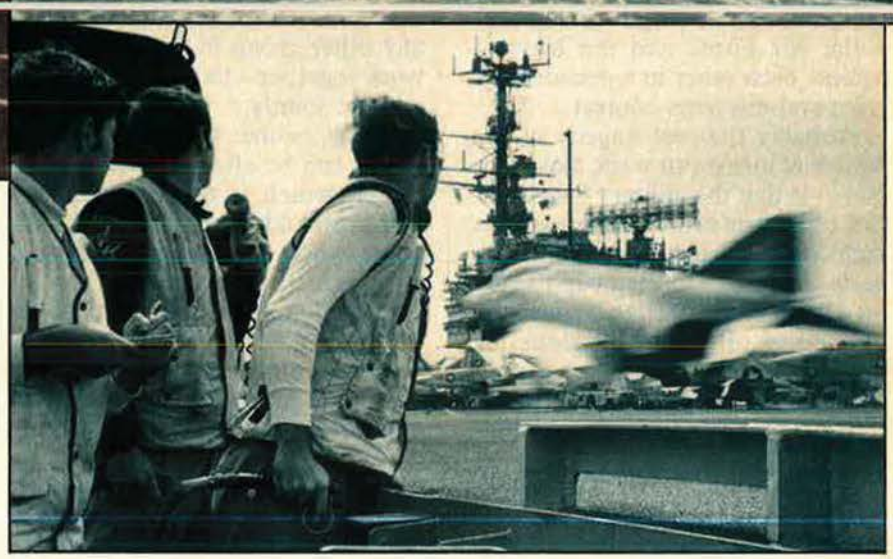
On the larger carriers such as *Enterprise* (CVN 65) or *Vinson* (CVN 70), about 6,000 men are aboard when the ship is on the high seas.

Carrier Air Wings (CVW), Their Identification Codes and Carriers

Carrier Air Wing	Code	Aircraft Carrier
1	AB	USS *John F. Kennedy* (CV 67)
2	NE	USS *Ranger* (CV 61)
3	AC	USS *Saratoga* (CV 60)*
5	NF	USS *Midway* (CV 41)
6	AE	USS *Independence* (CV 62)
7	AG	USS *Dwight D. Eisenhower* (CVN 69)
8	AJ	USS *Nimitz* (CVN 68)
9	NG	USS *Constellation* (CV 64)
11	NH	USS *Enterprise* (CVN 65)
14	NK	USS *Coral Sea* (CV 43)
15	NL	USS *Kitty Hawk* (CV 63)*
17	AA	USS *Forrestal* (CV 59)

Note: The USS *Lexington* (AVT 16) is in commission as a training carrier.
*Anticipate Reassignment.

Source: US Navy



ABOVE: F-14A Tomcat of VF-213 Black Lions in afterburner power roars off the No. 1 catapult of USS Enterprise *(CVN 65). The steam catapult accelerates aircraft from zero to 150 knots in less than 1.9 seconds. F-14A Tomcats are the main-line fighters of the carrier air wings, having replaced the F-4J in most. Fighter side numbers are in the 100 and 200 series. The Tomcat is a tandem two-seat supersonic fighter powered by two Pratt & Whitney TF30 turbofan engines with afterburner. Its armament includes one GE M61A1 Vulcan 20-mm gun, plus combinations of Sparrow, Phoenix, or Sidewinder air-to-air missiles or missiles and bombs.* (AIR FORCE *Magazine photo) UPPER RIGHT: E-2C Hawkeye with hook down is on final approach for a carrier landing. The E-2C aircraft provides airborne early warning for the carrier battle group. AEW squadrons are designated by VAW, such as VAW-117 on* Enterprise. *Hawkeye side numbers are in the 600 series. Hawkeye crew of five can be augmented for long-duration missions. Its time on station at more than 175 nautical miles from the carrier is more than four hours. LOWER RIGHT: Landing signal officer and his crew of Carrier Air Wing 7 watch an F-4 catch the wire to land aboard USS* Independence *(CV 62). In his left hand is radio microphone for talking with pilots; in his right is the trigger for red waveoff light signal. (US Navy photos)*

They are split about evenly between ship's company and air wing. Smaller carriers such as *Midway* (CV 41) and *Coral Sea* (CV 43) embark about 4,500 persons in ship's company and air wing combined.

As for aircraft, the large deck carriers normally embark ninety aircraft in this mixture: two F-14A fighter squadrons, three attack squadrons (two A-7E light and one A-6E medium), one EA-6B tactical electronic squadron, one E-2C airborne early warning squadron, one S-3A air antisubmarine squadron, and one SH-3H helicopter antisubmarine squadron. Also aboard are one or two logistic or utility aircraft such as the C-1 Trader or C-2 Greyhound.

All air base functions are provided aboard the carriers, ranging from armament and fuel for the aircraft to medical care, depot-level maintenance of aircraft and systems, food service, security, electronic warfare, air traffic control, and all the others required to project tactical airpower at sea. Visualize all the functions performed at a major Air Force base, pick them up and cram them into a large and fast armored steel ship, and you have an aircraft carrier. Just about everything but the green lawns and families can be found there. ■

The potential for USAF-Navy cooperation in tactical airpower can be significant if it works out as planned. An experienced naval aviation commander with joint service background points out . . .

The Promises and Pitfalls of USAF-Navy Cooperation

BY VICE ADM. GERALD E. MILLER, USN (RET.)

AIRMEN have made great contributions to the art of warfare, but one blemish on the record is their continuing inability to work together as a team.

In some cases, this has taken the form of factionalism and competition for resources within a single service. But at its worst it has pitted the nation's two airpower services —the Air Force and the Navy— against each other in a decades-old roles-and-missions contest.

Probably the real tragedy of the failure of airmen to work closer together is that the military loses control of its profession. Airpower has high visibility in any combat scenario, but when airmen can't agree on a type of aircraft or engine, the sharing of roles and missions, or mutual support, it creates a void that the civilian sector rushes to fill.

The civil authority assumes control once held by the military professional, which is seldom regained short of full-scale combat—a worldwide war.

There are many who contend that today's military has lost control of its profession. That may be so, to a greater or lesser degree. But for sure, one step toward helping regain that control is for airmen, more than any other group in the military, to work together—to think, plan, and operate jointly.

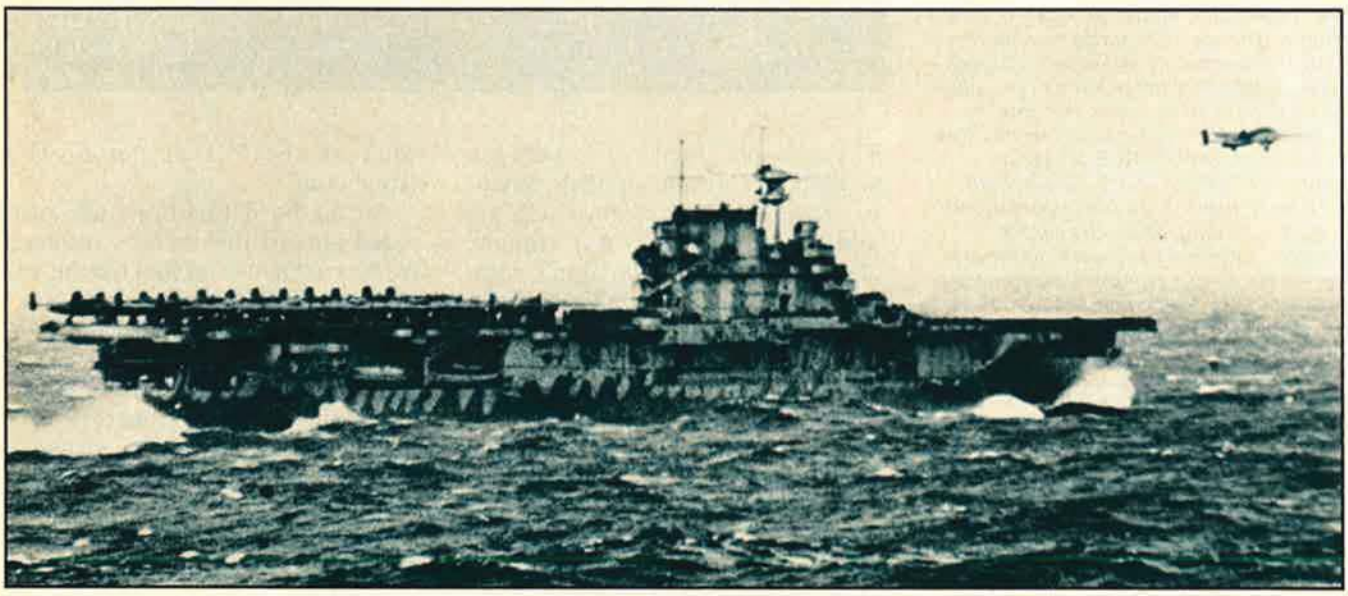
Today, neither seapower nor land power can be effective without airpower, which is the common element. Should the unlikely day ever come when we have an excess of airpower, then perhaps we can afford the luxury of arguments about the relative merits of land-based and sea-based air. Meanwhile, we would be wise to make the most of what is available—and that means working together. It means joint training, joint operations, and joint thinking.

Before considering how things *might* be, a review of how they have been may add some perspective.

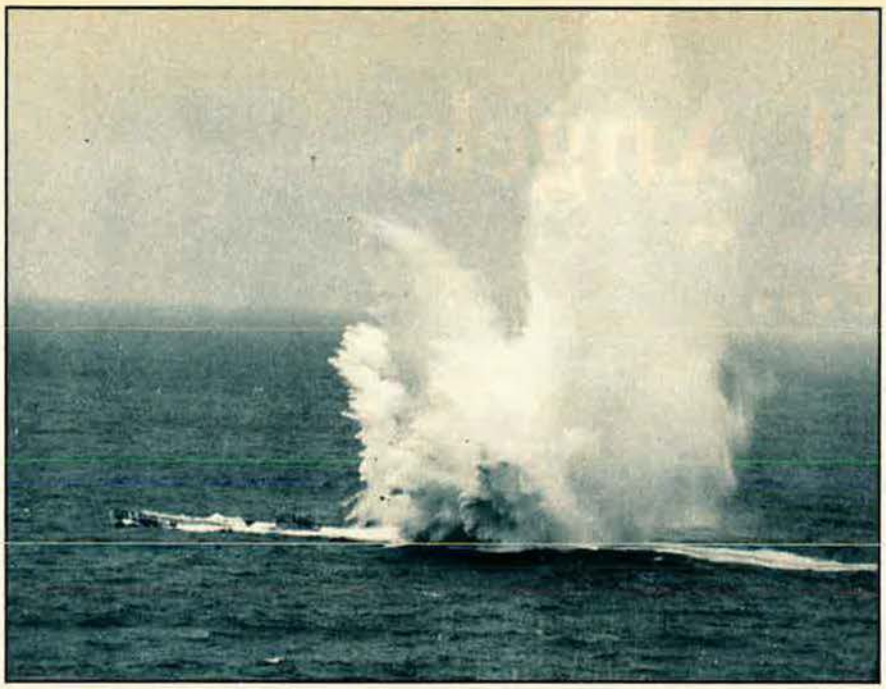
Consider History

Before and during World War II the problem of noncooperation was not so acute. The Navy was involved in the Pacific in World War II, where the Air Force was limited until the advent of the B-29 raids over Japan. The Air Force dominated the African and European theaters, where naval aviation was not significantly involved, except in the antisubmarine role. The Marines were teamed with the Navy, operating from carriers at times, and both were ashore together when circumstances dictated.

Among spectacular examples of joint service air operations were the



One of Doolittle's Raiders' B-25 bombers takes off from USS Hornet *on the morning of April 18, 1942, for the raid on Tokyo. The bomb loads were small by later standards, but the fact that the B-25s penetrated to the Japanese capital destroyed the myth of invincibility.*



Depth charge from US Army Air Forces B-24 Liberator bomber explodes next to the stern hull of a speeding German U-boat off the US east coast. Army Air Forces aircraft and crews augmented Navy efforts to turn back the submarine menace.

Doolittle raid on Japan from the USS *Hornet* and the launching of Army Air Forces tactical aircraft into North Africa from carrier decks—a one-time carrier launch for those pilots. But, in general, the services did not operate jointly because the requirement for airpower was great and the capabilities of the services were limited.

The Korean War saw little change in joint air operations as jets made their introduction into combat. In the initial stages, it was an all-Navy show. Carrier aircraft could reach the combat zone in a hurry from the Yellow Sea or the Sea of Japan. They carried significant combat payloads on their propeller-powered AD Skyraider aircraft.

Messages in the archives, particularly from the Navy, are not very complimentary about Air Force airpower during that phase of combat. The Inchon operation in September 1950 saw Navy Carrier Task Force 77 providing almost all the airpower. And the Marine Corps withdrawal from the Chosin Reservoir in December 1950 was covered almost exclusively by carrier airpower mixed with shore-based Marine F4U Corsairs.

But as the Korean campaign progressed, land bases were expanded and the Air Force introduced the F-84 and F-86 in significant numbers. By 1953, one could make a good case for removing almost all carrier aviation from the theater—saving it for something else, because the Air Force was then able to mount a tremendous number of fighter and attack sorties with relative ease.

Joint Operations in Korea

The most significant cooperation in the use of airpower by the Air Force, Navy, and Marine Corps in Korea took place during the latter months of the war. During June 1953, it became apparent that peace negotiations would succeed, and the North Korean/Chinese forces went all out to gain as much ground as possible to improve their negotiating position. Republic of Korea (ROK) forces were badly mauled under a major Communist offensive.

The Commander of the US Seventh Fleet, Vice Adm. "Jocko" Clark, sent a message to Carrier Task Force 77 that now was the time for all good airmen to come to the aid of the US's Eighth Army. He was so determined to gain the maximum from the available airpower that he volunteered to subordinate all Navy attack sorties to Air Force control. As a result, representatives—squadron commanders—from TF 77 moved into Fifth Air Force headquarters in Seoul and conducted joint planning for all attack sorties.

Early every afternoon a meeting was held, chaired by the Air Force operations directorate. At it were representatives of the Eighth Army, the Marine Air Wing, the B-29 bombing force, the A-26 night intruder elements, Air Force fighter and attack wings, and Task Force 77. Each element was empowered to commit a specific number of sorties. All sorties were coordinated to Eighth Army requirements and specific targets were assigned to each force. At the time, the Navy attack sorties numbered about 500 or more per day and were directed essentially by the Air Force through the Navy TF 77 representatives.

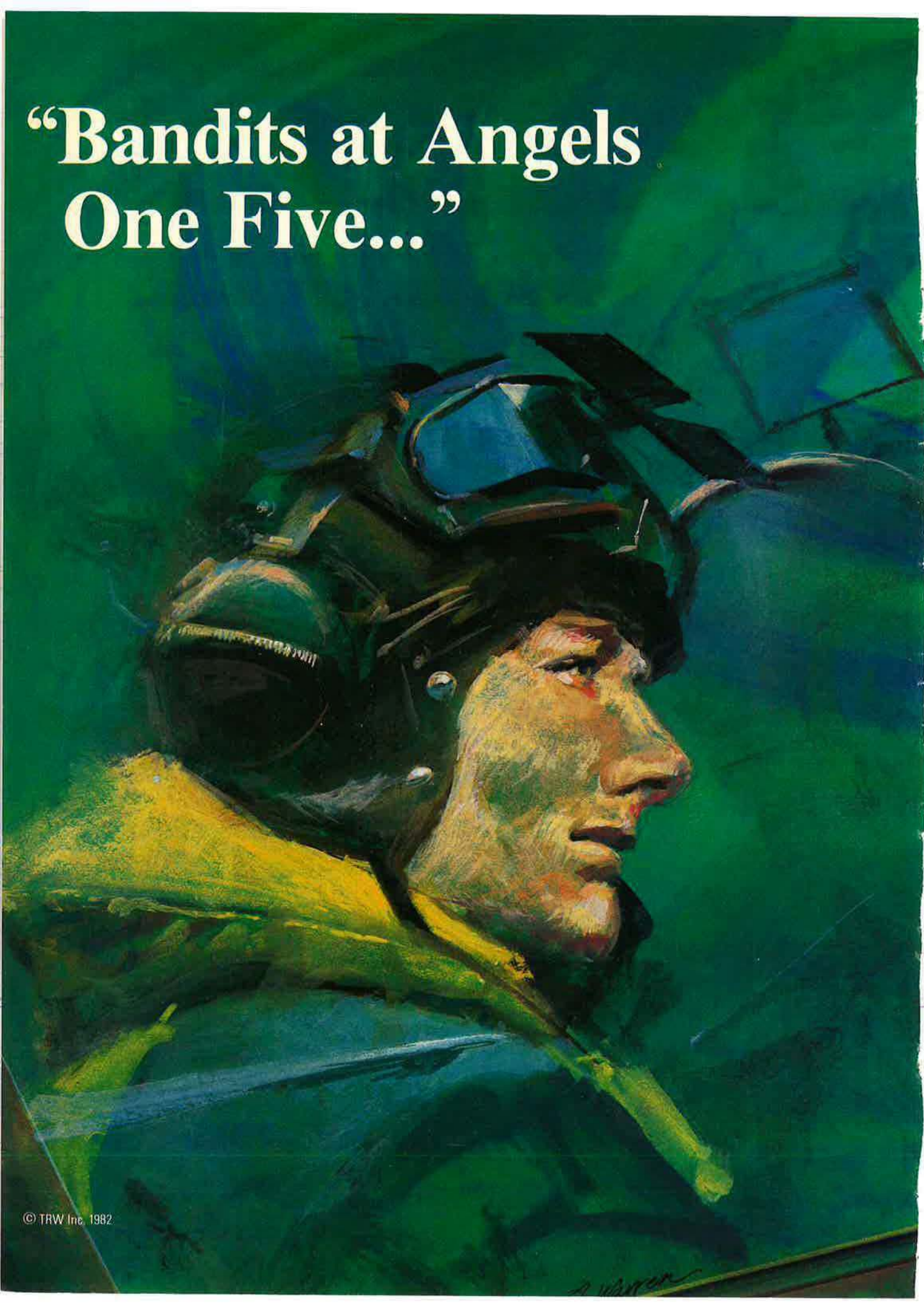
It was not "joint operations" with Navy and Air Force planes attacking the same targets at the same time, but was a significant example of how sea-based and shore-based tactical air could be coordinated.

That the coordination came about through the *in extremis* conditions faced by Eighth Army and the ROK is illustrative of how much pressure is needed to force "joint" operations into reality.

SIOP Coordination

In the years between the Korean and Vietnam Wars, vast sums financed strategic nuclear weapons and associated delivery systems. The preponderance of this money went to the Strategic Air Command, much to the consternation of Tactical Air Command and the Navy. The Navy mounted great efforts to gain a nuclear weapons delivery capability. From this came the Polaris submarine/missile program and a tactical air delivery capability from carriers. The coordination between these competing forces was not impressive, as each of the services went its own way. Annual conferences among major commands attempted to bring some order, but like most coordination conferences they were long on rhetoric and short on action.

As the nuclear arsenal reached more than 3,500 weapons, the coordination problem got out of hand. As a result, in 1960 the Joint Strategic Target Planning Staff (JSTPS)


"Bandits at Angels
One Five..."
© TRW Inc. 1982

In the terrible summer of 1940, the Battle of Britain was fought with blood, sweat, and electronics. Tears were incidental as the men and women of the RAF battled to dominate their home skies...or be swept to defeat by the Luftwaffe.

Their radars were primitive but, knowing the altitude (an "angel"—meant 1,000 feet), direction, and approximate number of "bandits," at long range, gave precious minutes of early warning. Britain's few squadrons of Hurricanes and Spitfires wasted little time patrolling. Their pilots stood ready to scramble the instant an alert was sounded. Men and machines were used so efficiently that Fighter Command's force effectiveness was multiplied many times.

Technology has come a long way since what Winston Churchill called the "wizard war." Today, digital techniques are used to sort avalanches of intelligence data so that commanders in all the services can review battlefield situation maps almost in real time. The force multiplication factor is more vital than ever, as recent events have shown.

That's why TRW is continually building its staffs of computer scientists, mathematicians, and engineers. They are developing advanced sensors, data links, high-speed computers, and complex software to provide increasingly intelligent command, control, and communications networks for the military and other government agencies. With one of the world's largest and most advanced capabilities in system development and integration, TRW is a key factor in the nation's commitment to quality in military systems. Specifically:

Tactical C^3I Systems

In 1981, TRW delivered BETA, a highly automated, tactical intelligence data fusion test bed, to the Army. A fixed-base version of this system, LOCE, is now in Europe to serve allied command and control centers. Our work on these projects has given us a solid technological base for the forthcoming Joint Tactical Fusion program.

TRW/ESL has developed a series of highly automated digital direction-finding systems that locate hostile emitters with lightning speed and pinpoint accuracy. They include the aircraft-mounted GUARDRAIL for Corps areas and higher echelons; the heliborne QUICKFIX II; and the land-mobile TRAILBLAZER, which operates close to the forward line of troops.

We are now focusing major system engineering capabilities on a key, new program: SHORADS C^2 Integration, which will solve the difficult problems of netting and controlling short-range air defense for the Army.

Avionics Systems

Since 1975, we have helped the Air Force to develop DAIS, the Digital Avionics Information System. It enables planners to analyze existing and proposed avionic systems to improve performance and reduce life-cycle costs by standardizing hardware and software. We are now involved in the next phase of digital avionics development for the Air Force, called Pave Pillar.

We have also been helping the Air Force to make fuller use of embedded computer systems. Our in-depth knowledge of integrated support techniques is enhancing Air Force systems, from navigation to electronic warfare. TRW is now prepared to develop the Area Reprogramming Capability, which will provide operational Air Force commands an automated capability to reprogram mission data in airborne electronic warfare systems.

Space Systems

As a pioneer in space surveillance command and control systems, TRW built the GEODSS deep-space surveillance system for AFESD and it is now in operational use by Strategic Air Command. Under development for the Tactical Applications Center is the Global Subsurface System for detection of seismic disturbances. We are developing software for AFESD/General Electric's over-the-horizon backscatter radar system and, for Air Force Space Division, TRW is the integration contractor on the Consolidated Space Operations Center. We are also supporting Ford Aerospace as a major subcontractor for the proposed Space Defense Operations Center.

TRW provides the Defense Communications Agency with systems engineering for the Worldwide Military Command and Control System (WWMCCS) and the Minimum Essential Emergency Communications Net. We plan to apply this background to AFESD's forthcoming WIS Integration project.

For the future we are already combining many technical disciplines to support the newly formed Air Force Space Command.

For further information, contact:
TRW Defense Systems Group,
E2/3042, Redondo Beach, CA 90278

TRW

was created. It reported to the Joint Chiefs of Staff, but was directed by the Commander in Chief, Strategic Air Command, and located at SAC headquarters at Offutt AFB, Neb., where it still functions.

Under directives from the civil authorities, the JSTPS produces the Single Integrated Operation Plan (SIOP), which in great detail brings together in a single plan (with many options) all intercontinental ballistic missiles, strategic bombers, submarine ballistic missiles, and Air Force and Navy tactical air delivery systems. The SIOP is a prime example of a true "joint" operation plan that came about through a desperate need to bring order to a massive destructive force. As the arsenal has grown to almost 10,000 weapons with many delivery systems, the value of the joint nature of the SIOP is even more pronounced.

It is of no credit to airmen that the SIOP was forced on the armed services by civil authority without much initiative from the military.

The Vietnam Case

The Vietnam campaign again brought elements of the Air Force and Navy together in the same small theater of operations. Initially, carrier airpower led the show, but as air bases were constructed the Air Force developed a tremendous capability to generate sorties. The utilization of B-52s to deliver iron bombs must have grieved the strategic bombing community, but B-52 conventional operations were most impressive in demonstrating land-based airpower.

Again in the historical pattern, coordination of air operations in Vietnam was minimal, with each service operating independently. The Navy operated from the Tonkin Gulf while Air Force tactical units were shore-based in South Vietnam and Thailand. The nature of that war, controlled in minute detail by the civil authorities in Washington, required little in the way of joint operations between the Navy and the Air Force.

There were, of course, many exchanges of intelligence and tactical information, but few real joint operations until the final phase, the Linebacker operations involving B-52s bombing the Hanoi area. Navy and Air Force tactical air was used as flak and missile suppressors and fighter cover. There *were* exceptions—for example, Navy aircraft working with Air Force forward air controllers in close air support and interdiction operations. But in general, each service went its own way in fighting its own war. Navy aircraft could not even be refueled by Air Force tankers because of equipment incompatibilities, a situation nobody worked very hard to correct.

But that is the past. Each service now possesses far more capability than in the past, and there is an overlap to accomplish certain missions of the other. Navy carriers have a viable nuclear weapons delivery capability, which can augment or in some instances replace Air Force strategic and tactical delivery. Air Force shore-based aircraft have great ranges and payload capabilities, permitting antisubmarine warfare and ocean surveillance—or minelaying—once an almost exclusive naval mission.

Navy carrier aircraft have enough range and payload to operate in many traditional shore-based theaters. For example, in exercises, such aircraft have operated in support of the Second and Fourth Allied Tactical Air Forces in Europe, launching from the North Sea, the Bay of Biscay, and the northern Mediterranean.

In one NATO exercise, four Navy A-7Es, flying from the USS *Roosevelt* in the Aegean Sea, were recovered aboard the USS *Kennedy* off Norway. At the same time, four *Kennedy* aircraft flew in the opposite direction to land aboard the *Roosevelt*. The next day, the aircraft reversed the procedure to return to their home carriers.

The demonstration was authorized by the Air Force commander controlling the air aspects of the exercise, but with the understanding that the Navy would not publicize the capability.

In short, there are many comparable and overlapping capabilities in each of the air services. Are these to be constrained in operational employment by roles-and-missions delegations of the late 1940s? Or is it possible to eliminate some of the traditional barriers to make better use of the airpower available?

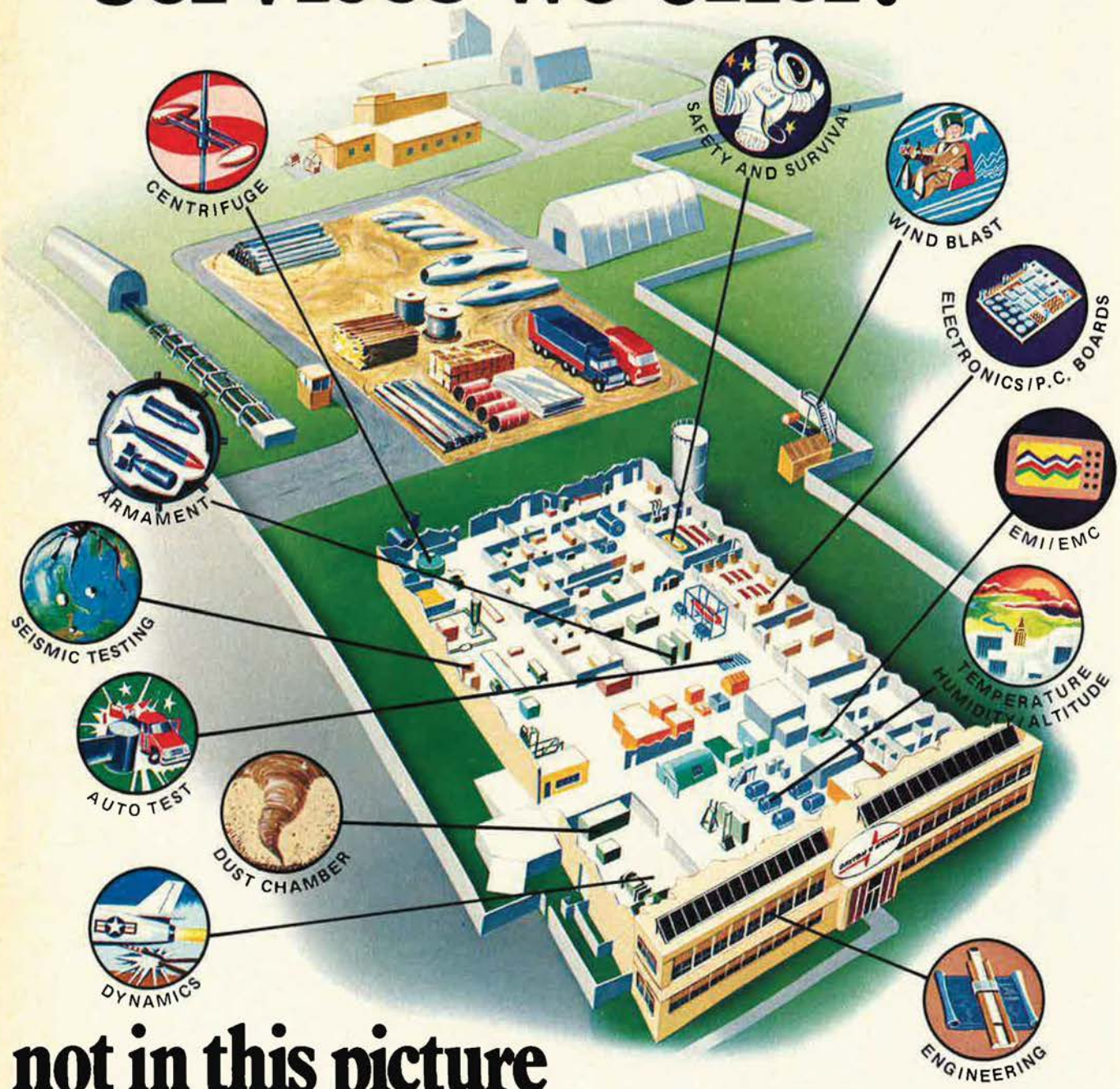
Regarding tactical air, the Navy is equipped with the superb F-14/Phoenix missile combination, probably the best interceptor in the world today against sophisticated threats like the Backfire bomber. Rather than confining it to carrier operations, why can't it operate from shore bases in Iceland or Southwest Asia?

And why not use Air Force F-15s and F-16s in defense of naval forces? A simple exercise could be conducted with those aircraft acting as combat air patrol when naval units are near land bases. Planning

F-14A Tomcats of Naval Air Forces Atlantic Fleet taxi out for training mission from Oceana NAS, Va. Oceana aircraft have for the past few years been engaged in air combat training against F-15s of USAF's Tactical Air Command over the instrumented range off the Virginia coast. (Photo by William A. Ford)


Who helps the F-111 count more?
Singer's Kearfott Division.....naturally
We help in two ways, first with an advanced microelectronic converter system that we started delivering in 1978, and through a recently awarded contract to design and produce Weapons/Navigation Computers for the F-111. These computers are designed to converse in CP2-EX and MIL-STD-1750A languages.
We're no strangers to the family of F-111 aircraft, having supplied converters and control/display panels almost from the start of the program.
Other major programs that currently count on Kearfott digital systems include the B-1 aircraft and Space Shuttle, both equipped with our multiplex interface units and data bus conversion equipment.
If you have requirements for advanced digital systems, you know you can count on Kearfott, a Division of The Singer Company.... naturally.
Kearfott
a division of The SINGER Company
THE SINGER COMPANY
KEARFOTT DIVISION
1150 MC BRIDE AVENUE
LITTLE FALLS, N.J. 07424

can you name all the services we offer?



not in this picture

...because at Dayton T. Brown, Inc. one picture only tells part of the story. We are one of the largest testing, engineering, and documentation services companies in the country. Government and industry alike have been asking Dayton T. Brown, Inc. to test their products, solve their problems, and document the results for well over 30 years. It would be difficult, if not impossible for you to find our vast knowledge and experience anywhere else.

Whether your needs call for an EMI and Environmental Test or a complete ILS program, you should be discussing it with us. The people at Dayton T. Brown, Inc. want you to know more about our extensive capabilities. By sending us your business card, or letterhead we will send you a full size, color poster reproduction of this ad along with a copy of our new, "Look Us Over" brochure.

Call or Write: Dayton T. Brown, Inc., Engineering and Test Division, Dept. 82-4, Church St., Bohemia, L.I., N.Y. 11716 Phone (516) 589-6300, Telex 96-1326, TWX (510) 228-7323

DAYTON T. BROWN INC.

S-3A Viking antisubmarine aircraft approaches for landing aboard USS Forrestal *(CV 59). Admiral Miller suggests that S-3As could control critical chokepoints from land bases, operated by USAF crews. S-3A is a four-place aircraft powered by two GE TF34 turbofan engines.*

and practicing that kind of joint operation could be preparation for a time when carrier forces may be trying to hold a beachhead in Southwest Asia and shore-based airpower is available from nearby Air Force bases. Again, why must Navy A-6E and A-7E attack aircraft be confined to hitting sea-based and peripheral land targets simply because they are Navy aircraft? They could be used, for example, in Central Europe to augment land-based airpower that is in short supply. Shouldn't airmen be exercising that role now, rather than waiting until the *in extremis* conditions of actual combat?

Excellent Capabilities

In electronic warfare, the Navy has developed excellent capabilities, of which the EA-6B jamming aircraft is a prime example. These aircraft could be used to support Air Force missions in Central Europe or elsewhere, and Air Force units could be practicing joint operations with them.

In early warning, the Navy must support USAF's E-3A AWACS. Fortunately, the Navy's E-2C Hawkeye seems to be compatible with the Air Force AWACS, and some exercises have been conducted that demonstrate the value of operating the two systems together. Shouldn't E-2Cs be practicing for a role in support of Air Force operations in the European theater?

And, in terms of antisubmarine warfare, the Air Force could add demonstrably to this tactical Navy mission. There is a move to use B-52s in an ocean surveillance role, equipping them with sonobuoys and appropriate support equipment. That capability could be utilized and integrated into a joint operation with the Navy. In a similar vein, Navy antisubmarine aircraft like the normally carrier-based S-3A could be used in a shore-based role over chokepoints, operating from Air Force bases and flown by Air Force crews.

Mine warfare, particularly that associated with naval operations, has long been an almost exclusive province of the Navy. Mines can be laid by shore-based P-3s or carrier-based aircraft, ships and submarines, and certainly by B-52s. It is noteworthy that this capability has been well recognized and that considerable progress for the inclusion of the Air Force in this mission has been made.

When evaluating Navy and Air Force airpower, one must consider flying training. An almost continual battle exists on this issue, not so much between the services as between certain key civilians and the Navy. For example, when Dr. Harold Brown was Secretary of Defense, he seemed to view the consolidation of all helicopter pilot training at Fort Rucker under the Army as one of the most significant issues on the Defense Department agenda. The Navy feared that such action was merely a nose in the tent, and that the next step would be to place all fixed wing pilot training under the Air Force.

Such perceptions, prompted by parochial roles and missions arguments, are not in the best interest of strong airpower. Many aspects of air training can and should be on a joint basis. If the services put more emphasis on joint approaches to the use of airpower, many objectives of cost savers and efficiency experts will be realized. But action should start with the military services, not by appointed officials in the Department of Defense or staff members on Capitol Hill.

If the Air Force and Navy each learn the capabilities of the other and apply them objectively, the nation's airpower can't help but be strengthened. ■

Vice Adm. Gerald E. (Jerry) Miller, USN (Ret.), enlisted in the Navy on his seventeenth birthday, serving as a sailor in both Atlantic and Pacific Fleets before entering the Naval Academy in 1938, graduating in December 1941. He served in cruisers on combat duty in the South Pacific and the Aleutians campaigns of World War II. After becoming a naval aviator, he served in the Korean War as a jet fighter squadron commander. He has been an air wing commander, commanded an ammunition ship and the attack carrier USS Franklin D. Roosevelt, *a carrier division during the Vietnam War, the US Second Fleet in the Atlantic, and the US Sixth Fleet in the Mediterranean. He also served with the JCS and with the Nuclear Target Planning Staff at Hq. SAC, Offutt AFB, Neb., and before retirement in 1974 was Deputy Director of the Joint Strategic Target Planning Staff, the agency responsible for developing the nation's strategic nuclear warfare plans. He is a member of the Board of Directors of Gulf + Western Industries, Inc., and serves other corporations in a similar capacity. He has also served as a consultant to the Office of the Secretary of Defense, the Arms Control and Disarmament Agency, the Office of Technology Assessment, and the General Accounting Office.*

NO OTHER AIRCRAFT COMES TO THE RESCUE LIKE THE BELL-BOEING TILTROTOR.

Rapid reaction: It increases the probability of success in a combat rescue. That's why the Bell-Boeing TiltRotor is unmatched at rescuing downed airmen.

The Multi-Mission TiltRotor dashes in at 300 knots. Hovers with precision and low downwash for the pickup. Then speeds directly to a medical facility. High speed and fuel-efficient cruise means the TiltRotor can fly a 1000-mile mission in less than four hours without refueling. And that saves lives by saving time.

Swiftness. Range. Helicopter-like hover. The XV-15 has demonstrated it all.

The Bell-Boeing team has the experience and technology to develop, produce and support the Multi-Mission TiltRotor for Air Force combat rescue, special operations and logistics. For more information, write to L. M. (Jack) Horner, Bell-Boeing Joint Program Office, Dept. 683-5, Box 482, Ft. Worth, Texas 76101 USA.

Bell • Boeing
THE TILTROTOR TEAM

The Bell-Boeing Team is a joint program of Bell Helicopter Textron Inc. and Boeing Helicopters.

In this thirty-fifth anniversary year of the founding of the Air Force, its fourteenth Secretary speaks out on progress and problems confronting USAF.

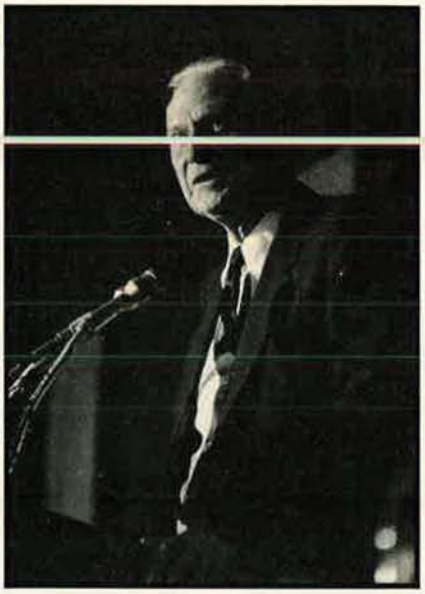
Heritage, Headaches, and Hopes

BY THE HON. VERNE ORR, SECRETARY OF THE AIR FORCE

IT IS certainly well known that this year is the thirty-fifth anniversary of the founding of the United States Air Force. It may not be as well known that I am the fourteenth Secretary of the Air Force. Now you don't have to reach for your pocket computers to divide fourteen into thirty-five and learn that the average term of a Secretary of the Air Force is exactly two and a half years. Since this is the second opportunity I have had to speak to this group, you may wonder a little, and I wonder a great deal, whether the cards will deal me an opportunity to come back and talk with you again!

In the time I have been with the Air Force, I have had the unusual opportunity of working with two outstanding Chiefs of Staff. First, of course, kindly, patient, firm, forceful Lew Allen. Can you imagine how Lew felt when he learned that the new Secretary of the Air Force was going to be a used-car salesman from Pasadena—the city of the little old ladies in tennis shoes? But now, in all honesty, we've got to admit the man upstairs has a sense of humor, because Lew Allen is now going back to Pasadena to head the Jet Propulsion Laboratory there. He will now have the opportunity to rub shoulders with my good friends, the little old ladies in tennis shoes.

Lew has been an exceptional Chief of Staff, and it was my great pleasure to come into this organization under his tutelage. He will long be remembered as a man of vision and, most recently, for establishing the Air Force Space Command, which will chart new directions for the Air Force in space.



A luncheon honoring the Secretary of the Air Force is a traditional feature of AFA National Conventions.

I am also privileged to be associated with another great Air Force leader. This time I feel a special sense of pride because I participated in the selection of Charles Gabriel as Chief of Staff. As the Vice President said at the swearing-in ceremony, America is lucky to have a man of this caliber to head its Air Force.

Heritage, Headaches, Hopes

Today I would like to give you a report on the status of the Air Force because you, the members of the Air Force Association, and, in fact, all Americans, are the stockholders, the shareholders in this service and in the nation's defense. I would like to talk to you in very simple terms about the past, the present, and the future. Put another way, where we have been, where we are, and where we are going, or—in even a third way—I would like to discuss with you the three Hs—our Heritage, our Headaches, and our Hopes. Our heritage in part, of course, determines how we handle today's headaches and, in an even greater way, how we handle today's headaches determines our hopes and our aspirations for the future. So let's talk about both the good and the bad—the successes and the problems still ahead.

As our minds drift over the heritage of our past, we go back to the days before there was an independent Air Force; days, for instance, in World War I of the Lafayette Escadrille; of such early aviators as Raoul Lufbery, Eddie Rickenbacker, Frank Luke—of the "Hat-in-the-Ring" Squadron and such aircraft as Nieuports and Spads. Then we recall the lean years of the 1930s when a fledgling air transport industry accepted the challenge of carrying the mail by air.

But we can also recollect people like Billy Mitchell, standing ten feet tall as he dreamed of an independent air force, Benny Foulois, "Pete" Quesada, and Ira Eaker—men who pioneered the uses of this new medium. Then there are the famous names of World War II and the courage of our flyers, many of whom went off with the realization that

only five percent would finish twenty-five missions—Doolittle, Chennault, and so many other names that made great history for us.

We think of that day in 1947—September 18—when the Air Force came of age. We became the newest of the independent military services, and Stuart Symington became the very first Secretary of the Air Force. Eight days later, Carl "Tooey" Spaatz became the first Chief of Staff.

Our memory next takes us over the path to Korea, the first conflict where America was content to settle for a tie and where negotiations still go on, year after year, in the demilitarized zone—a cancer on America, which has been arrested but which has not yet been removed. We think of Edwards AFB, Calif., where men have given their lives pushing the frontiers of science so that we could fly ever faster and higher—men like Chuck Yeager and Joseph McConnell.

We recall Vietnam, where America was willing to sacrifice its youth, but nothing else, on the field of battle. The irony is that as you look around the tables at the rows of ribbons on the chests of those across from you, the Vietnam ribbon, green and white with its scroll, due to the manner in which we assemble foreign decorations, is the most junior ribbon anyone wears.

When we think of the present, we come, of course, to space and the Shuttle. This is the high ground—the last frontier. Before us lies a challenge as big as space itself. However, we must not let the glories of our past lull us into a state of complacency with respect to the present. Need I remind you that the Roman Empire had a rich tradition and history, as well? Rome had its victories, and today people sit in comfortable chairs in front of comfortable fires and read about the [decline] and fall of the Roman Empire. General Gabriel and I did not sign aboard to have any part in the [decline] and fall of the United States or of its Air Force.

As we live today and dream of tomorrow, we should not only be grateful for the courage and the wisdom of those who went ahead of us, but also careful not to drop the baton they have passed to us. I don't intend to go into the threat in any great detail. It has been adequately discussed already. However, I want to point out that since I was here a year ago, the Soviets have built approximately 1,300 fighters and fighter-bombers. With attrition, that is enough to equip thirteen new wings. In the United States Air Force, we are hoping to add four wings over the next five years! They have launched 100 satellites while we have launched thirteen. They have produced 200 new ICBMs, and we currently are in a fight on the Hill to see whether we can get the money to produce any new ICBM over the next four years. They have added 400 transports, 750 helicopters, and 2,000 tanks in the past year.

Where Are We Now?

This brings me to the second point. Where are we now? What have we done with the traditions that have been left to us?

As we look at the lessons of Lebanon, in which there was approximately a ninety-to-two victory for American-built machines manned

by well-trained Israeli pilots, I hope that we have, once and for all, put aside the notion that somehow America can put its pilots up in flimsy, inexpensive, poorly kept flying machines and expect them to win. It was only a year ago that I told you that America under this Administration would never sacrifice its youth in that kind of machine, and we never will. Now I think that even the doubters have learned that our more capable machines are necessary not only to accomplish the mission but, most importantly, to protect our pilots' lives.

I want to say a word about the B-1. It was my pleasure to welcome it to Andrews AFB on Monday. A year ago I mentioned that the B-1B was the top priority in my term as Secretary, and I said it would roll out in October 1984. A year later I am pleased to tell you that, mainly through the efforts of the four major firms building it, the plane is either on schedule in each area or ahead of schedule. It is either on budget or under budget, and it will roll out in October 1984!

We sent the B-1—B-1A actually

—to Farnborough where it was by all odds the hit of the show. Yet one distinguished senator issued a press release in which he called the money expended to send it there a waste of taxpayers' funds. Now reasonable people may differ, but in my estimation, the United States did more for its image, made more friends, did more for its reputation, and did more to deter any future world war by spending the money to send the B-1 than if that amount had been allocated to one of the senator's favorite programs of artificially supporting dairy prices so that consumers pay more, while we give the products away.

. . . since I was here a year ago, the Soviets have built approximately 1,300 fighters and fighter-bombers.

The F-16 is another success story where the civilian-military partnership that I spoke about last year has worked to keep our nation strong. I am proud to say that in the past year we have signed a multiyear contract on the F-16. For once a manufacturer will know that for the next four years we plan to buy a minimum of 120 aircraft per year. As a result, he can make his production plans and buy accordingly. This effort is saving us nearly a quarter of a billion dollars. We have made similar commitments in the purchase of 30-mm ammunition, and we look forward to developing multiyear contracts for the F-15 and the KC-10.

We have selected the Next-Generation Trainer from among three excellent designs, and will soon begin production. As General Gabriel pointed out yesterday, we are working more closely with the Navy. I also want to tell you that we're working more closely with the Army. In the area of airlift, the United States cannot afford one branch of the service that builds equipment too large to fit in the planes of another branch or a branch that builds its planes too small to carry the equipment of the first branch. I'm not pointing the finger at either; I'm only saying we must work more closely together, and we are.

In September, Secretary of the Air Force Verne Orr welcomed America's newest strategic bomber, the B-1, to Andrews AFB, Md. The aircraft made a historic first East Coast appearance after what the Secretary called an "extremely successful" visit to the Farnborough International Air Show. Flanking him, in flight suits, are members of the B-1 aircrew. From left: Doug Benefield, Rockwell International test pilot; Lt. Col. Leroy Schroeder, aircraft commander; Lt. Col. Tom Alexander, offensive systems operator; and Jim Leasure, Rockwell flight test engineer. Also on hand, far right, was Gen. Robert T. Marsh, Commander of Air Force Systems Command, the organization responsible for the overall development and acquisition of the B-1. (Photo by Capt. Michael Perini, USAF)

Doing Our Best for People

But it's in people programs that we are doing our best. We're so proud of our Air Force people, of our recruiting efforts and our retention efforts. We are also proud of the women in the Air Force. More than eleven percent of the force are women—the highest percentage of any of the services—and they do a magnificent job. But in spite of these wonderful accomplishments, if you think they will be sustained when this economy turns up, then you and I are living in a fool's paradise. Our pilots will again be leaving for the airlines when the airlines start hiring, and enlisted personnel with fine skills will again be in demand by industry. We must look forward to the time when we again face a fight to keep competent people.

One of the ways you keep competent people is to pay them adequately. It took us several years, but last year we achieved pay comparability, and already this year we are starting to lose it—a four percent increase in pay with an inflation rate above seven percent is not adequate. I have been in business twenty-five years and in government nearly eleven. I think the first priority a business or government has is to pay its people a fair wage for a fair day's job. I don't think it will ever become necessary, but if it should, I would rather have 1,000 people working with me who are

well paid and satisfied than 1,100 who feel disgruntled and unhappy. We're going to fight very hard for the pay our people deserve.

Now I want to say a word about women. The truth of the matter is that in the United States, whether it's in industry, the military, or academia, we have only begun to recognize their potential. We have granted women the openings, but it remains to be seen whether they will have opportunities to climb the ladder. Let me give you an illustration from academia. You can find many, many women as assistant professors, but fewer when you get to the associate professor level, and very, very few when you get to the full professor level. And while we take credit for having more than eleven percent women in the Air Force, there are no four stars or three stars. As a matter of fact, there are only three women who are general officers out of a total of 343, which is less than one percent.

Now the reason for this imbalance is very easy to understand. It takes about twenty-three years of outstanding service to become a general officer of the United States Air Force, and twenty-three years ago, when the most recent brigadier general selectees entered, there were relatively few women as second lieutenants. But the challenge to us is to make sure that twenty years from now we are not still caught in the same predicament. We must ensure that as a year group moves from major to lieutenant colonel and lieutenant colonel to colonel, women are given the same opportunity as men.

A similar challenge faces us in addressing the disparity between rated and nonrated officers. You know, there is a saying that the mission of the Air Force is "to fly and fight, and don't you forget it." That has a salty tang, and I would like to have it up on my wall. But I also want to remind you that fifty-five percent of our officers today are not rated.

When you look at the very senior uniformed leadership—the four stars—only one out of twelve is nonrated. When you look at three stars, we have three out of thirty-five who are nonrated. The reason is that about twenty-five years ago when the current new general officers first entered commissioned service, the proportion of rated officers was far higher than it is today. Consequently, the percentage of rated officers making general is much greater than the percentage of rated officers on active duty today.

The American people get the hardware that is available, if needed, to ensure their security, the finest planes the world knows, and the most accurate missiles.

The nonrated officers are a vital part of the flying Air Force, and so it's Charlie Gabriel's responsibility and mine to see that the same promotion opportunities are there for both rated and nonrated officers alike. If we can't make sure that the fifty-five percent of our officers who are nonrated see opportunity ahead to climb up, then the best of them will be leaving us and we'll be making our selections from those who are left.

This does not mean that I foresee an Air Force that is fifty percent women general officers, nor that I see nonrated officers heading flying commands. It does mean that I have a goal that every man and woman who enters the United States Air Force can climb as high on the ladder as his or her energy, talent, and ambition permit, and no barrier of sex or race or creed will ever stand in their way—that's the goal we are fighting for!

I want to say a word about housing. It costs us about $1 million to train a fighter pilot. But after he is trained, what do we do? We send that pilot and spouse overseas, and if there is no base housing, we ask that pilot and family to live in quarters that no person in this room would live in. The same could apply to our other officer and enlisted career fields. Is it any wonder then that some of them begin to count the months until they can get out of the service? How stupid can we be to lose a $1 million pilot for the lack of a few thousand dollars spent for decent housing? This situation is something that General Gabriel and I are working hard to correct.

A Hard Look at Overhead

Finally, I want to touch on two concerns. All my life I have been a part of the automobile industry. My dad was an automobile executive and I was an automobile dealer for fifteen years. At one time I could tell you the names of most of the more than 2,000 brands of automobiles that have been built in the United States. Forty years ago, the American automobile industry dominated the world. In both civilized and semicivilized countries, people dreamed of owning an American automobile. Today the industry is in a downslide and no one knows where the bottom is. For example, the *Wall Street Journal* this morning tells us that sales are twenty-nine percent below last year's, and last year's sales were miserable!

It is not my intent nor is there time to indicate all of the problems that created this situation in the automobile business. However, one of them was that labor asked for and received too much in the way of compensation. Today labor wages in the automobile industry far surpass those in the durable goods industries. Another factor was that the companies gave in too easily to wage demands. It was easy for them to pass on the wage increases by raising the price of cars. Since there was no decrease in demand and for a long time the customer stood in line to buy a new car, the prices of cars went up and up.

Quality was also a factor. There were cars built that I saw come through that would not permit you to put a sheet of paper between the door and the post at the top, but you could put two fingers between the door and post at the bottom. Companies grew overly fat in management and their marketing research was probably not adequate either.

Why do I tell you all these things? Because today I worry that the defense industry is in a position similar to the automobile industry of

about forty years ago. Once again, labor is making strenuous demands far in excess of the cost of living. They are asking for increases between eighteen and twenty percent while the cost of living has been running around seven percent. Once again, companies are striving for so much business that their management structures may be too lean to handle the business. Once again, there is the potential for growing overhead.

I offer those of you in the industry just a warning that the Air Force is starting to take a very, very hard look at overhead, at blue and white collar wages, and at all of the things that go into the cost of a product. It is not our business to tell you how much to pay your employees. But it is our business to tell you how much the government feels it can afford to pay for your products. All of our people have been alerted, and you will find them out in the field working harder than ever to make sure that we not only get a good buy for the taxpayer, but that forty years from now we don't look around and find foreign competition replacing the US aerospace industry.

The Defense Budget

The last thing I want to touch on is the defense budget. When was the last time you read a columnist, or heard a commentator, who stated that the defense budget is too low and should be increased? Day after day, in papers and on television, the defense budget is characterized as a fat boy, standing in a corner, cowering while people take pokes at him. Let me tell you that defense is the best buy for taxpayers' dollars we have. This money provides freedom from aggression, freedom from fear, and the ability to have the kinds of social and educational programs that we all want. In addition, defense provides our nation with skilled people. We train pilots, navigators, and officers with management skills. We provide enlisted personnel who are engine overhaulers, avionics experts, and computer programmers. The American people get the hardware that is available, if needed, to ensure their security, the finest planes the world knows, and the most accurate missiles.

Many people who would cut the defense budget don't want to reduce the deficit, really. And the evidence of that is in the FY '82 Supplemental that the President recently vetoed. That bill isn't an attempt to reduce the deficit; it is an attempt to substitute some social programs for some defense programs. And what do they want to substitute for defense? Some of their tired and worn social programs at which the taxpayer has been throwing money for almost twenty-five years.

Urban renewal has absorbed hundreds of millions of dollars, yet crime is on the increase, not the decrease, and the streets are less safe than they ever were. In many cities there is a second generation and may soon be a third generation of people who have never held a job. They have never done anything but accept government handouts. With respect to low cost housing, you can go to some cities and see housing that was built for the underprivileged but within ten years has become so vandalized and so abused that it now stands empty, derelict, ready to be torn down.

Sen. John Tower put it, I think, very well when he said recently that in the last twenty years in terms of real dollars, defense has risen twelve percent, nondefense programs have risen 234 percent, and they would try to make you believe it's the defense budget that's creating the deficit. Don't believe it! Defense critics talk to you about cost overruns and program growth. We have them and we wish we didn't. But they are not unique to defense. You don't hear that in 1977, a minor amendment to the Small Business Act was expected to cost $20 million the first year and ended up costing $1.4 billion, or that the cost of the disability insurance amendment to the Social Security Act in the late 1950s, which was expected to grow to $860 million by 1980, actually cost $15 billion. Similarly, the cost of food stamps started out at $13 million and grew to $12.4 billion; school lunches rose from $602 million in 1970 to $2.3 billion in 1980; and total federal spending on health care rose from $5.5 billion in 1965 to $71 billion in 1980. And people talk about cost growth in defense programs?

Outside this building today there are protestors and they're holding up banners calling for unilateral nuclear disarmament. They don't seem to have read their history books too well. They seem to have missed the chapter about Neville Chamberlain's "peace in our time." They don't tell us about the unilateral disarmament in Rotterdam at the beginning of World War II and the blessings that fell on the naïve Dutch who thought that unilateral disarmament was the answer.

I believe we've got a solid program. Defense gives the public its money's worth. Instead of standing in the corner letting people poke at us, we ought to be before every Rotary Club, every Kiwanis Club, every Chamber of Commerce, and even before some church groups, telling people what they really get out of the defense dollar.

Last year when I stood here, I talked to you about a partnership between the Air Force and the public. Let me say, you, the public, have certainly done your part. You have given us youth, the finest in the land. We have never had such high-quality people in the Air Force. You have given us generously of your tax dollars, and we have much better budgets than we had. And more importantly, you have given our people the respect they deserve. As I have said so often, Air Force people now wear their uniform to places they wouldn't have ten years ago. And for our part, we think we've held up the bargain too. We have given you dedicated personnel with the highest morale that the Air Force has had and the most effective, efficient weapons the country has ever known. And so may I say, speaking for every man and woman in the United States Air Force, we're proud of our partnership with you for the well being and freedom of America. ■

Verne Orr is a former businessman and a political associate of President Reagan who served in the California state government and during the Presidential campaign. He holds a bachelor of arts degree from Pomona College and a master's in business administration from the Stanford graduate school of business. During World War II, Mr. Orr served in the Navy and was discharged from the Naval Reserve in 1951 as a lieutenant commander.

Seventy-five years of military airpower—and some challenges the Wright brothers never dreamed of.

From Silk Scarf to Spacecraft

BY GEN. CHARLES A. GABRIEL, CHIEF OF STAFF, USAF

IN JUST a few days, we will celebrate an important milestone in the rich history of the Air Force—our thirty-fifth anniversary as a separate service. This year also marks the seventy-fifth anniversary of military aviation.

In August of 1907, the Army Signal Corps assigned one officer, two enlisted men, and a civilian clerk to its new Aeronautical Division. In the summers of 1908 and 1909, the Wright Flyer thrilled thousands of spectators who watched at Fort Myer as Wilbur and Orville Wright flight-tested improved versions of their 1905 model. It was not until August 1909 that the Army finally accepted "Aeroplane No. 1." Three months later, the nation temporarily lost its total air strength when the plane crashed.

By comparison to the initial four-man Air Force, today we have more than 800,000—about 100,000 officers, some 475,000 enlisted personnel, and about 250,000 civilian employees—in the active force. The Air Reserve Forces add more than 240,000 highly capable men and women to the Total Force, with the Air National Guard topping 100,000 for the first time. The Air Force was born and remains a product of foresight, drive, and technology. In a few amazing decades, we have come from the silk scarf and biplane to operational spaceflight.

We appreciate the contributions your Association has made in helping the public understand the role and importance of airpower. Because of your interest and knowledge, you speak with a strong and informed voice about the important defense issues of our day. You have helped us tremendously in persuading the American people to do what is necessary to keep our nation strong. I thank you and encourage your continuing support in the dangerous and turbulent years ahead.

General Gabriel: "We are now moving in the right direction to rebuild our warfighting capability."

The Critical Edge

I do not need to belabor the threat we face. I have spent a lot of time over the past couple of years in Europe wrestling with the numbers the Soviets have lined up against us. We all know the Soviets outspend, outman, and outproduce us. I will not take up your time to recount these statistics. What I will do is tell you what we are doing to counter this threat.

We have come out of the long, dark decade of the 1970s when we, as a nation, failed to maintain our military strength. We are now moving in the right direction to rebuild our warfighting capability. Our priorities remain the same—to take care of our people, to modernize our strategic nuclear forces, to increase the readiness and staying power of our general-purpose forces, to expand our airlift capability, and to modernize and expand our tactical forces.

We don't expect to match the Soviet Union in numbers, nor do we need to. We depend on the high quality of our people and on superior training, tactics, and technology to give us the critical edge in combat. We will hold on to this edge—just as the early air pioneers did—through the dedication of our people and through our determination to exploit technological change to its fullest.

The attitude of our people in the field has never been better. Their driving motivation is their dedication to serve in the nation's defense.

We can all learn much from the courageous life of the legendary airman, Sir Douglas Bader, who died earlier this month. Although he lost his legs in a flying accident in 1931, he mastered his artificial legs, rejoined the RAF in 1939, and became an ace with twenty-two confirmed kills during the Battle of Britain. In August 1941, he was captured after his plane collided with an enemy aircraft; one of his artificial legs was

crushed in the crash. The Germans so respected Sir Douglas that they asked the RAF to airdrop a new pair of legs for him—the RAF did so, but mixed in, of course, with a bomb drop. Sir Douglas got his new legs. However, after his fourth escape attempt, the Germans decided to lock up his legs each night.

It is our highly qualified, well-trained, and motivated crews, and the people who support them, who will be the key to success or failure in combat. The bad situation our people faced in the late 1970s has been turned around, to a large extent, through improved pay and benefits, better working and living conditions, and a marked increase in public pride in the military. As President Reagan has said, "It is once again an honor to wear the uniform."

Our experienced people are staying in, and as a result our combat capability is improving. Retention rates for pilots in the six-to-eleven-year group have increased from twenty-six percent in 1979 to sixty-six percent today. And first-term reenlistment rates have increased from thirty-eight percent to fifty-eight percent. When we retain our people, we are keeping trained combat capability. When our experienced people leave, we have to recruit and train all over again. This not only costs more, it continually puts us in a training mode—never quite ready.

Support Is Essential

The combination of our experienced people staying with us and increased funding for operations and support over the past couple of years has had a good effect on the readiness and morale of our combat forces. In the late 1970s, we didn't have enough money in these accounts. Many of our bases were in a sad state of repair—roofs were leaking, buildings needed painting, runways needed patching, and flying time was not what it should have been. These "nuts-and-bolts" items had a negative effect on morale and caused us to lose training opportunities. Now our crews are flying more, training more effectively, and our stocks of munitions and spare parts are beginning to fill.

Today, our combat crews are well-supported and ready. They are expertly trained in superior tactics and they have modern, high-technology equipment.

This is a far cry from the days of Lt. Benny Foulois. As the only officer on flying duty in early 1910, he taught himself how to fly in the only plane the Army had. Foulois received instruction from the Wrights by mail, becoming the first correspondence school pilot in history. The Wrights later sent him an instructor to help with the hardest part—landing. Over the next months and years, the young air pioneers trained hard and developed the tactics to turn the airplane into an effective military weapon. They did the best they could with what they had and worked hard to show the Army and Navy how airpower could contribute to joint operations.

To ensure our nation has the most effective warfighting forces, we will plan, equip, train, and operate in close harmony with the other services and our allies. It will not be easy for some to shed parochial concerns. But we cannot afford separate approaches that waste scarce resources and do not give us the best warfighting capability.

We are working with the Navy on several initiatives to increase cooperation and training. We and the Navy will be expanding our use of each other's schools, increasing the scope and frequency of joint maritime training and exercises, and developing better ways to fight together. As the Falklands conflict demonstrated, airpower is a critically important part of successful maritime operations. We will be putting more emphasis on such collateral roles as sea-lane protection, aerial minelaying, and ship attack. We can learn from one another what we need to know—both on the offense and the defense.

Training, Mobility, Technology

For training to give us the best results, we have to train the way we would fight—in aggressive, realistic conditions. Programs like Red Flag, Maple Flag, NATO's tactical leadership program, Cope Thunder, and dissimilar air combat training ensure that all of our operational crews around the world learn to fly as a unit in conditions like we expect in combat. Large-scale mock combat exercises against threat systems that closely match Soviet equipment have become an integral part of our training in recent years. We will continue them and improve them.

In the past two years, Air Force units took part in 124 joint exercises, and we are currently participating in the Reforger '82 exercise in Europe—the largest strategic airlift deployment of troops ever. During the exercise, more than 18,000 Army troops and more than 950 tons of cargo will be airlifted from the US to Europe on C-141s and C-5s, augmented by civilian aircraft.

The best-equipped combat forces are of little value if they can't be brought to the battle in time. The C-5B and KC-10 programs, along with expansion of the Civil Reserve Air Fleet (CRAF), will greatly improve our ability to get troops and supplies to the battle.

On Easter Sunday 1949, during the Berlin Airlift, allied planes hauled 13,000 tons of supplies in *1,400* flights. Today, the C-5 could carry that many tons in just *117* flights. Despite improvements in our airlift capability, we're still short of what we need. A new aircraft, like the C-17, could add the needed long-range and intratheater lift.

While we continue to rely heavily on our people, tactics, and training to offset Soviet advantages, I am increasingly concerned about the other driving element—technology.

Gen. Charles A. Gabriel is USAF Chief of Staff. As Chief, he serves as the senior uniformed Air Force officer responsible for the organization, training, and equippage of a combined active-duty, Guard, Reserve, and civilian force of nearly 1,000,000 people. A command pilot with more than 3,800 flying hours, he flew 252 combat missions in Korea and Southeast Asia. He has served as Deputy Chief of Staff for Operations with TAC and as USAF's Deputy Chief of Staff for Operations, Plans and Readiness. His decorations include the Distinguished Service Medal and the Distinguished Flying Cross. His assignment previous to assuming his current position was as CinC of USAFE and Commander of Allied Air Forces Central Europe.

Since the early days of airpower, technological advances have been our "ace in the hole." We have to stay on the frontiers of technology and protect our advantages in equipment. We can't afford to let our critical technological advantages slip away or be stolen away into the armaments industries of the Soviet Union and its allies.

The leakage of Western technology, through legal and illegal means, has helped the Soviets close the gap. For example, our leads in radar and computers have been cut drastically through the transfer of militarily relevant technologies from the West to the East. While some steps have been taken to strengthen national and international controls on such transfers, all of us—including industry—need to do more. We have to do a better job of protecting the technologies and know-how we need to deter Soviet aggression. We cannot allow our combat capability to be threatened by Western technology in Soviet hands.

Since the early days of airpower, technological advances have been our "ace in the hole." We have to stay on the frontiers of technology and protect our advantages in equipment. We can't afford to let our critical technological advantages slip away . . .

As demonstrated in Lebanon, the quality of our equipment is excellent. However, our production is not where it should be. We would be foolish to repeat the near catastrophe the nation faced in the late 1930s, with war on the horizon.

In September 1939, the Air Corps had only 800 first-line aircraft, while Germany had more than 4,000 aircraft of better quality. The one exception was our B-17, which was better than the German bombers of that time, but we had only twenty-three on hand. We may never again have the luxury of two years or more to change the equation, as we did then.

Fortunately, we have the best tactical fighters in the world today. We are committed to a stable production program for F-15s and F-16s, and, through evolutionary improvements, we will increase their air-to-surface, night, and in-weather capabilities. For the longer term, we will continue to build toward our goal of forty-four tactical fighter wings.

The E-3A (AWACS) is another example of how technology has been applied to extend our combat capability. In times of crisis, we used to say, "Send in the Marines!" Now, AWACS is helping to fill this role. As shown in recent crises in Europe, Korea, and Southwest Asia, the AWACS increased our surveillance and warning, and demonstrated our nation's commitment and resolve. The AWACS gets to the scene quickly. It is nonlethal—it shoots electrons, not bullets—and it greatly improves the effectiveness of our fighters in battle.

Rebuilding the Strategic Forces

Our most critical technological challenge is in the rebuilding of our strategic nuclear forces—forces that have kept us from war with the Soviet Union for the past thirty-seven years. The bomber and missile legs of our strategic triad have been sadly neglected. Our youngest B-52 is twenty years old, and our ICBM forces date from the 1960s. In the past decade alone, the Soviets have deployed three new ICBMs with ten improved versions; during the same period, we deployed no new ICBMs and only one Minuteman upgrade.

The B-1B program is going well and enjoys continued congressional support. The B-1B is not the same as the original B-1 of the 1970s; it is a big jump ahead. Using Stealth technology, the B-1B will have only 1/100th of the radar cross-section of the B-52, making it tough to detect and track. The B-1B will be able to penetrate the projected Soviet air defense network through the 1990s, and will stress Soviet defenses. We need it to attack the imprecisely located and mobile targets that only a manned bomber can hit.

As our B-52s become less able to penetrate, and our new B-1Bs come on line, we will be converting most of our B-52s to standoff cruise missile carriers. The remaining B-52s will be used in force projection, conventional bombing, and maritime roles. We are also moving at the fastest reasonable pace to develop an Advanced Technology Bomber that will ensure our ability to penetrate advanced Soviet defenses in the next century.

Technology also holds the key to restoring the credibility of the ICBM leg of the triad. Our ICBM force is in danger. The Soviets have improved the accuracy of their missiles faster than we had expected, and these missiles greatly increase the vulnerability of our Minutemen and Titans. In the coming years, the Soviets could destroy about ninety percent of our ICBMs in a first strike, while using only a relatively small portion of their force. We have worked long and hard on this problem. And, after looking at a number of basing approaches for the MX, we believe we have found a solution to this destabilizing situation.

We are making our recommendation today to Secretary of Defense Caspar Weinberger on the best way to base the MX to ensure the survivability and retaliatory power of our ICBMs for many years to come. It would be inappropriate for me to discuss our recommendation until after the Secretary has had time to review it. As you know, the Administration plans to make its final decision on MX basing by December.

The brightest scientists and analysts we could find have looked at the basing concept we are recommending and have tried to find reasons why it might not work. None of these experts, not even those skeptical at first, has been able to come up with a showstopper. We believe we have a feasible basing concept that will be effective against current

General Gabriel tours the Aerospace Briefings and Displays at the Convention. This stop was at IBM's exhibit on Space C³ Systems Integration.

and projected Soviet threats. It takes advantage of America's technological capabilities—it is technology over numbers.

Unlike our current Minuteman force, MX, with survivable basing, would not be vulnerable to Soviet numbers. It will turn the tables on the Soviets. They will have to expend scarce resources on protecting their ICBMs, rather than expanding them. And they will be forced to look for technological rather than for number solutions—our game, rather than theirs.

Strength Does Not Invite War

To sum up, carrying out President Reagan's strategic modernization program, including the deployment of MX, the B-1B, and the Navy's Trident D-5, will close the window of vulnerability. We will restore the strength and credibility of our strategic forces by taking advantage of this country's technological and industrial genius.

Our President has taken a bold step to begin Strategic Arms Reductions Talks (START) with the Soviet Union. Arms control is not a substitute for modernization. At the reduced levels proposed in START, modernization of our strategic forces is all the more necessary. With these programs under way, the United States will be able to negotiate at Geneva from a position of strength, making equitable and verifiable reductions in strategic arms possible. The President's commitment to strategic modernization last fall provided the Soviets the incentive to come to the negotiating table.

I am proud of our Air Force today. It's the world's best. With your help, we're going to keep it that way. Our dedicated people and our advantages in tactics, training, and technology will continue to give us the warfighting capability we need. We will be able to deter the Soviets from war as long as they remain convinced that we have the strength *and the resolve* to use that strength.

As America has shown so many times in the past, we have the will, the ingenuity, and the resources to do what is necessary to maintain our power and, thus, preserve the peace. Strength does not invite war—weakness does. ■

AWARDS AT THE 1982 AIR FORCE ASSOCIATION NATIONAL CONVENTION

AFA AEROSPACE AWARDS

The H. H. Arnold Award (AFA's highest annual award)—To **Gen. Lew Allen, Jr.,** USAF (Ret.), for brilliant leadership throughout four years as Chief of Staff, USAF, and for enduring contributions to the nation's defense posture through improvements in combat readiness of the entire Air Force and increased effectiveness of aerospace weapon systems and sensors essential to national security.

The David C. Schilling Award ("The most outstanding contribution in the field of Flight")—To the **24th Strategic Reconnaissance Squadron,** Eielson AFB, Alaska, for superb professionalism, superior airmanship, and high technical competence that advanced this nation's understanding of the international strategic balance through the collection of significant reconnaissance data vital to US strategic deterrence. *(Accepted by Lt. Col. Edgar Paul, Jr., Commander.)*

The Theodore von Kármán Award ("The most outstanding contribution in the field of Science and Engineering")—To **Aeronautical Systems Division,** Wright-Patterson AFB, Ohio, for exceptional management of nearly 200 key Air Force programs representing almost twenty percent of the total Air Force budget, thus attesting to the professionalism of the 8,000 people who develop, test, and procure all Air Force aircraft, simulators, and related subsystems vital to America's defense. *(Accepted by Lt. Gen. Thomas H. McMullen, Commander.)*

The Gill Robb Wilson Award ("The most outstanding contribution in the field of Arts and Letters")—To **Cable News Network,** Atlanta, Ga., for providing millions of Americans outstanding around-the-clock analysis and in-depth coverage of the news, particularly national security issues, thereby presenting a clearer picture of the world, America's place in it, and the threats we and our allies face. *(Accepted by Larry LaMotte, Washington Bureau Chief.)*

The Hoyt S. Vandenberg Award ("The most outstanding contribution in the field of Aerospace Education")—To **James H. Straubel,** for contributions to aerospace education in the US and abroad as a stimulus, catalyst, and innovator during more than three decades both as Executive Director of the Air Force Association and of the Aerospace Education Foundation and for his 1982 book, *Crusade for Airpower: The Story of the Air Force Association.*

The Thomas P. Gerrity Award ("The most outstanding contribution in the field of Systems and Logistics")—To **Col. Karl G. Berroth, Jr.,** for leadership and imaginative management as Deputy Commander for Maintenance, 81st Tactical Fighter Wing, USAFE, one of the largest and most complex tactical fighter wings in the Air Force.

AFA's highest tribute—the H. H. Arnold Award—is presented by Association President John G. Brosky to Gen. Lew Allen, Jr., USAF (Ret.), during ceremonies at the National Convention.

Veterans Administration Employee of the Year—To **Michael D. Tomsey,** Washington, D. C., for compassionate and beneficial service to veterans as exemplified by his unique efforts as a counseling psychologist for the hearing impaired.

The Juanita Redmond Award for Nursing—To **Capt. Susan A. Brokish,** Pease AFB, N. H., for excellence in improving nursing care as Emergency Room Charge Nurse at the Pease AFB Hospital.

The General Edwin W. Rawlings Award for Energy Conservation—To **Capt. Roy D. McMaster,** ASD/DEI, Wright-Patterson AFB, Ohio, and **Mary L. MacDonald,** Management Assistant, TAC/DEMU, Langley AFB, Va., for achievements in energy conservation within the Air Force.

Stuart Reichart Award for Lawyers—To **Lt. Col. Fredolin W. Kuhn,** Staff Judge Advocate, Norton AFB, Calif., for achievements in the field of law within the Air Force.

Lt. Gen. Paul W. Myers Award for Physicians—To **Maj. Terrence J. O'Neil,** Staff Nephrologist, USAF Regional Medical Center, for upgrading nephrology services at Clark AB, R. P., and for promoting USAF's positive image.

COMBAT CREW AWARDS

The General Curtis E. LeMay Strategic Aircrew Award—To **Crew E-09,** 441st Bomb Squadron, 320th Bomb Wing, Mather AFB, Calif., as SAC's best overall aircrew. *(Accepted by Capt. James J. Demetrio, Aircraft Commander.)*

The General Thomas S. Power Strategic Combat Missile Crew Award—To **Crew S-199,** 374th Strategic Missile Squadron, 308th Strategic Missile Wing, Little Rock AFB, Ark., as SAC's best overall combat missile crew. *(Accepted by Capt. James A. Sands, Missile Combat Crew Commander.)*

The Lieutenant General William H. Tunner Aircrew Award—To the **75th Military Airlift Squadron,** 60th Military Airlift Wing, Travis AFB, Calif., as MAC's best overall aircrew. *(Accepted by Capt. Milton M. Brewer, Aircraft Commander.)*

The Lieutenant General Claire Lee Chennault Award—To **Lt. Col. Wayne L. Schultz,** Commander, 120th Tactical Fighter Squadron, Colorado ANG, Buckley ANGB, Colo., designated the outstanding aerial warfare tactician.

AFA CITATIONS OF HONOR

1st Lt. Joseph DeVenuto, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, for exceptional ability and leadership as Project Engineer of a unique space-based radar providing a viable space surveillance option for a major USAF mission requirement.

Directorate, Intelligence Reserve Forces, Fort Belvoir, Va., for superior achievement in making the Total Force policy an operational reality within the US intelligence community, thereby strengthening our national defense posture. *(Accepted by Col. John Oberst, Commander.)*

Col. Donald W. Henderson, Assistant Deputy Commander for Space Defense Systems, Los Angeles, Calif., for superb management in formulating a master plan for defending US space systems, thereby contributing in a major way to national security in the years ahead.

Capt. Delloyd Jacobson and C-5 crew, 3d MAS/DOV, Dover AFB, Del., for demonstrating the rapid, global reach of US strategic airlift by transporting eight F-5 aircraft aboard a C-5 nonstop from the US to Jordan, involving innovative aerial refueling with KC-10 aircraft.

Maj. Gen. Doyle E. Larson, Commander, ESC, San Antonio, Tex., for focusing national attention on all aspects of electronic warfare as well as developing and honing vital electronic combat doctrine and capabilities, thereby enhancing the wartime survivability of US command control and communications systems.

Joe Lineberger, Deputy for Air Force Review Boards (SAF/MIP), Hq. USAF, Washington, D. C., for compassionate and effective management, implementing the intent of Congress, that has ensured responsible, thorough, and equitable consideration of those with perceived injustices.

Capt. James G. Parks, 3282d Technical Training Squadron, Air Force Military Training Center, Lackland AFB, Tex., for major contributions to training in the field of security. His innovative approach to training military working dogs not only saved $2 million but led to a vastly improved program.

CMSgt. Charles H. Pettit, Jr., Senior Enlisted Advisor, 343d Composite Wing, Eielson AFB, Alaska, for outstanding performance as a wing SEA within Alaskan Air Command. His leadership and counsel epitomize the best attributes of the noncommissioned officer corps.

MSgt. Henry B. Saunders V, 507th Tactical Air Control Wing, Shaw AFB, S. C., for drive and expertise in developing a simulated battlefield environment, CAMO FLAG, thereby enhancing Ninth Air Force and wing training.

Martin L. Skutnik III, Lorton, Va., for bravery at risk of his life in rescuing from the icy Potomac River the victim of a jetliner crash.

Maj. Gerald J. Stiles, 562d Tactical Training Squadron, 37th TFW, George AFB, Calif., for initiative and technical competence in enhancing F-4G Wild Weasel training.

SSgt. Michael K. Unruh, 9th Organizational Maintenance Squadron, Beale AFB, Calif., for superior performance, maturity, and professionalism as a SAC U-2R crew chief.

Col. Richard Uppstrom, Director, Air Force Museum, Wright-Patterson AFB, Ohio, for imaginative management of an array of programs that has enhanced public education and Air Force prestige.

64th Aggressor Squadron, Nellis AFB, Nev., for advancing through unique air-to-air fighter training the combat readiness and proficiency of US and allied fighter forces. *(Accepted by Col. Russell A. Everts, Commander.)*

509th Bombardment Wing, Pease AFB, N. H., for continuous excellence in standards within SAC for FB-111A and KC-135 operational readiness and mission effectiveness. *(Accepted by Col. Trevor A. Hammond, Commander.)*

552d Airborne Warning and Control Wing, Tinker AFB, Okla., for superior airmanship in operating around-the-clock surveillance missions with E-3A Sentry aircraft. *(Accepted by Col. Jerry D. Holmes, Commander.)*

James H. Straubel, right, is presented the Hoyt S. Vandenberg Award in recognition of his more than three decades of leadership of AFA as Executive Director, during which he helped establish the Aerospace Education Foundation.

2052d Communications Squadron, Keesler AFB, Miss., for excellence in mission support of an important Air Force training facility and in maintaining vital communications systems. *(Accepted by Lt. Col. Carroll T. Eddie, Jr., Commander.)*

Thomas P. O'Mahony, Electronic Systems Division, Hanscom AFB, Mass., for leadership in the acquisition of the COBRA JUDY seaborne radar system on time and within budget. AFA honors him as Air Force Civilian of the Year.

Maj. Thomas E. Baril, Hq. AFLC/MPCR, Wright-Patterson AFB, Ohio, for leadership in initiatives while Chief, Military Personnel Assignments, Directorate of Military Personnel, DCS/M&P, Hq. AFLC. AFA honors him as Air Force Personnel Manager of the Year.

AFA MANAGEMENT AWARDS FOR LOGISTICS

AFA Executive Management Award—To **Col. Robert P. McCoy,** for performance as Director of Maintenance, Sacramento ALC, McClellan AFB, Calif., in depot-level maintenance for all aircraft and interservice ground electronic systems supporting worldwide DoD requirements.

AFA Middle Management Award—To **Maj. Gary G. Henry,** for numerous management innovations while Chief, Transportation Operations Division, Directorate of Distribution, Sacramento AFC, McClellan AFB, Calif.

AFA Junior Management Award—To **Capt. David W. Minto,** Andrews AFB, Md., for leadership in flight-test projects, including showing the compatibility of C-5 with KC-10 aerial refueling, while he was assigned to the System Management Division, Directorate of Materiel Management, San Antonio ALC, Kelly AFB, Tex.

AFA MANAGEMENT AWARDS FOR SYSTEMS

AFA Distinguished Award for Management—To **Brig. Gen. Joseph D. Mirth,** USAF (Ret.), Redondo Beach, Calif., for outstanding service as Deputy for Space Launch and Control Systems and Program Manager for the Space Transportation System, Space Division, Los Angeles AFS, Calif.

AFA Meritorious Award for Program Management—To **Col. James W. Reynolds,** for support of the Navstar Global Positioning System Joint Program Office while Program Director for Deputy for Space Navigation Systems, Space Division, Los Angeles AFS, Calif.

AFA Meritorious Award for Support Management—To **Col. Kenneth S. Smiley, Jr.,** for accomplishments as Director of Civil Engineering, ESD, Hanscom AFB, Mass.

AIR NATIONAL GUARD AND AIR FORCE RESERVE AWARDS

The Earl T. Ricks Memorial Award—To **Capt. Greg Engelbreit** and **1st Lt. Fred Wilson,** 124th Tactical Reconnaissance Squadron, Boise Air Terminal, Idaho, for successfully recovering from a RF-4C night in-flight emergency that included aircraft damage and bodily injury.

The Air National Guard Outstanding Unit Award for 1982—To the **134th Air Refueling Group,** McGhee-Tyson Airport, Tenn. *(Accepted by Col. Thomas P. Webb, Commander.)*

The Air Force Reserve Outstanding Unit Award for 1982—To the **403d Rescue and Weather Reconnaissance Wing,** Selfridge ANGB, Mich. *(Accepted by Col. Richard L. Hall, Commander.)*

The President's Award for the Air Force Reserve—To the **315th Military Airlift Wing (Associate),** Charleston AFB, S. C., for the outstanding AFRES flight crew of the year. *(Accepted by Lt. Col. John P. Beason, Aircraft Commander.)*

SPECIAL CITATION

Kirtland AFB, N. M., for outstanding support of the Air Force Recruiter Assistance Program. *(Accepted by Col. Richard W. Thompson, Director of Base Personnel.)*

A battle-tested RPV, dual-role fighter entries, electronics, and more at AFA's annual briefings and displays.

1.3 Acres of Aerospace Update

BY JOHN T. CORRELL, SENIOR EDITOR

As Israel Aircraft Industries briefs the Scout mini-RPV, an actual unit hangs overhead. The Scout, used in the fighting in Lebanon, drew great attention in the exhibit hall.

LAST summer's headlines from the Falklands and the Middle East were apparently much on the minds of visitors to this September's aerospace development briefings and displays at the AFA National Convention. Systems employed in the fighting—especially a mini-RPV shown by Israel Aircraft Industries, Ltd.—generated particular interest.

The Rockwell B-1 bomber was in the spotlight, too. Fresh from the Farnborough Air Show in England, it stopped over at nearby Andrews AFB, Md., where special buses took AFA convention registrants to see it up close. The McDonnell Douglas KC-10 airlifter-tanker, which accompanied the B-1 on its way home from Europe, was also on hand at Andrews. Both systems were briefed in the exhibit halls, where Rockwell spokesmen said that the B-1B program was running a few weeks ahead of schedule and a little under cost.

More than 7,000 people poured through the three exhibit halls, which covered nearly an acre and a third of floor space at the Sheraton Washington Hotel on September 14–16. Eighty-eight companies or company divisions were represented, fifty-nine of them conducting briefings along with their displays.

The AFA convention is the foremost aerospace event in the United States, and the exhibits are always well-attended by senior military and civilian staffers from the Pentagon and other Washington agencies, as well as by AFA convention registrants. Capitol Hill and the news media are represented, too.

Contrary to the claims of demonstrators who seem to have become annual fixtures on the streets outside the convention, the program is not an "arms bazaar." The briefings and displays are informative, offering updates on a full range of systems. Participating companies provide knowledgeable personnel to field questions, but this is basically not a sales show.

While everything from space systems to general aviation was on the schedule, the prevailing tone in the exhibit halls this year was international, tactical, and electronic. Increasingly, the world of aerospace users and suppliers is spanning national boundaries, and the driving technology is electronics.

Battlefield RPV

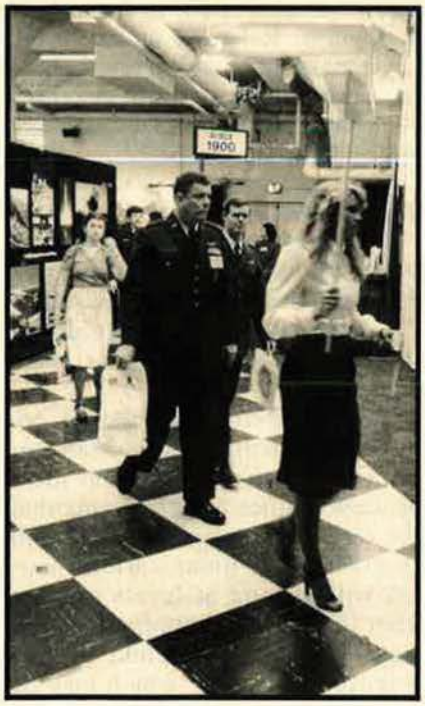
The single item drawing most attention on the exhibit floor was the multirole Scout mini-RPV, which was used with telling effect in the Lebanon campaign. Israel Aircraft Industries showed an actual unit, not a model, this one configured for battlefield reconnaissance with a TV camera for real-time intelligence. A panoramic camera for high-resolution photography can be installed, but was not on the unit shown.

The briefers held up a magazine

clipping on Israel's "killer electronic weaponry," featuring a diagram with a Scout-like RPV arousing Syrian radars in the Bekaa Valley and "fingerprinting" their signals so the Israelis would know which frequencies to jam. The spokesmen at the booth declined to confirm or deny the report they were pointing out, and would not say whether the Scout had flown such missions. Nor would they talk beyond the TV version of the Scout except to agree that their RPV could certainly accommodate an electronic payload.

The Scout is catapult-launched and can stay up for about seven hours before its ground operator flies it into a net for landing. It can be ready to go again in fifteen minutes. The television camera can be stabilized on a target if more than a fleeting look is desired, and even the third-generation pictures from Lebanon being shown on monitors at the IAI exhibit were quite good. The ground display unit provides coordinates, which the briefers said were accurate to within three feet, and gives slant range and other data. The requirement so far has been for black-and-white transmission only, but color is possible. At present, the main limit on the Scout's effective range is line of sight—the curvature of the earth getting in the way of transmissions—but it can operate in excess of sixty miles out, depending on conditions. The cruising altitude, presently up to 12,000 feet, the briefers said, could be increased with longer wings, or a second RPV could relay the signal if the situation called for that.

The seat of the F-16C/D cockpit was seldom empty at the General Dynamics display. Blue-suiters and others lined up to try the features that should make the new cockpit a hit with pilots.



Visitors to the morning briefings signed up in advance and were escorted in small groups through their schedules.

Down the aisle, British Aerospace was drawing interest in how its systems, especially the Harrier jump jet and the mobile Rapier air defense missile system, had done in the Falklands conflict. In air-to-air combat, the Sea Harriers brought down thirty-one Argentine aircraft—twenty-four with Sidewinder missiles and seven with 30-mm Aden guns—while no Harriers were lost to Argentine aerial attack. The Rapier accounted for thirteen of the forty SAM kills against Argentine aircraft.

The AIM-9L Sidewinder, successful in the Lebanon conflict as well as in the Falklands, was further briefed by Raytheon and Ford Aerospace, both of whom produce this heat-seeking close-range missile that has been a proven weapon in many versions over many years. Additional perspective on Rapier was given by Norden Systems of United Technologies, which will build up to 200 Rapier missiles for the US Air Force to use in the United Kingdom for air base defense.

Dual-Role Fighters

But all talk was not of the summer wars, even in the case of systems that had been in them. While the F-15 Eagle and the F-16 Fighting Falcon performed extremely well for the Israelis in Lebanon, emphasis at the McDonnell Douglas and General Dynamics booths was on the future. They were briefing the E models of their respective aircraft, which are prime contenders to meet the Air Force's dual-role fighter requirement.

USAF is well pleased with the various models of the F-15 and F-16 that it already has in service or under contract, but plans to acquire up to 400 additional aircraft to augment F-111s and replace F-4s in a dual air-to-air and deep interdiction role. At present, it's uncertain whether this program will be a split procurement or a winner-take-all competition, but it is clear that the Air Force has the two finest fighters in the world to choose between.

McDonnell Douglas says its F-15

already has everything the Air Force is looking for in a dual-role fighter. A Strike Eagle prototype, which has been flying for two years now, is packed with even more enhancements than the E-model bird being offered for consideration by the Air Force. The presentation at the exhibit stressed the low development risk and early availability to the fleet of the F-15E, as well as the F-15's impressive record.

The General Dynamics F-16XL, which first flew July 3, enters the dual-role derby as the F-16E. It is an advanced version of the Fighting Falcon with better avionics and a much larger wing of "cranked arrow" design, which reduces drag and adds to fuel efficiency. This aircraft offers up to forty-five percent more radius on internal fuel with twice the payload of the F-16A. And the F-16's record is impressive, too.

There was frequently a line of visitors waiting their turns to climb into the advanced cockpit for the F-16C/D at the General Dynamics exhibit. Among the features intended to make things easier for the pilot are a head-up display with a wide angle field of view and two interchangeable screens at convenient level for displaying radar/EO, stores management, and other data. This version of the F-16 will have upgraded radar, and the Air Force is to begin receiving it in 1984.

Fairchild Industries had some white-knuckle film footage of its flying cannon, the A-10 attack aircraft, in action. A one-second burst from its General Electric GAU-8A Gatling gun is enough to punch through Soviet tank armor, and Fairchild says the A-10 can lose an engine, part of a wing, and half a tail—and still fly. The company was also showing its Next-Generation Trainer, recently chosen by the Air Force to replace the T-37. At the Garrett exhibit, the briefing was on the TFE76 engine that will power the Fairchild trainer.

And all over the hall, exhibitors were talking about their products that go on or work with the F-15, F-16, and A-10 first-line tactical aircraft. Notable among these were AMRAAM and LANTIRN.

The Advanced Medium-Range Air-to-Air Missile (AMRAAM) is now in full-scale development by Hughes, which says it should begin entering the inventory in 1986 to replace the AIM-7 Sparrow. This will be a "launch-and-leave" weapon, much less dependent on the fire-control system of the aircraft that fires it than is Sparrow. It will enable a single fighter to take on as many as eight hostiles. When AMRAAM is launched within its active radar range, it finishes the trackdown job on the target by itself, leaving the pilot free to break away and begin the next engagement. The F-15 and the Navy's F-14 will be able to carry up to eight AMRAAMs, while the F-16 and Navy F-18 can take up to six.

Martin Marietta briefed the Low-Altitude Navigation and Targeting Infrared for Night (LANTIRN) system, which will enable single-seat A-10s and F-16s to go in low, in darkness, and under the weather—a capability the Air Force urgently needs. The exhibit was a multimedia simulation of a low-altitude attack seen through a head-up display. LANTIRN production is planned for 1985–87, and the company says compatability is not limited to the F-16 and the A-10.

Elsewhere in weaponry exhibits, Boeing briefed its AGM-86B Air-Launched Cruise Missile (ALCM), designed for use on B-52 and B-1 bombers. Full-rate production of forty ALCMs a month was projected for later this year. General Dynamics described its cruise missile programs, including the Medium-Range Air-to-Surface Missile (MRASM), a conventional variant of Tomahawk, which the Air Force could use to attack runways from standoff distances. Rockwell showed a scale model of the GBU-15 guided weapon system currently in production. Brunswick's presentation was on the Low-Altitude Dispenser (LAD), a standoff weapon with submunitions for use against armor, for defense suppression, or for airfield disruption. Released at low level, LAD makes a climbing turn behind the launch aircraft until reaching dispensing altitude and target heading.

The exhibit hall had a marked international tone this year, in terms of both the displays and the people attending. Here, a group of German officers gets a briefing on the B-1 bomber.

Silicon and Signals

It was a rare exhibitor who did not stress the electronic properties of the products shown—in avionics, C³I, target acquisition, guidance system, data processing, or some other aspect.

The E-Systems presentation, entitled "Electronic Battle Management," said that federal and independent studies are projecting that the electronic warfare/command control and communications market will expand at levels ranging from fifteen to twenty-five percent annually through 1986, and that any defense budget cuts which may be forthcoming should not have significant impact on that market.

The electronic battle manage-

Aerospace Industry Roll of Honor

Companies Represented at the 1982 Aerospace Development Briefings and Displays

Aerojet-General Corp.
Propulsion, Electronics, Ordnance Technology from Aerojet

Aérospatiale, Inc.
Manufacturing Capabilities in Fixed-Wing Aircraft, Helicopters, Rockets, and Ballistic Missiles

Avco Systems Div.
Strategic and Tactical Systems for the '80s and Beyond

Bell System
Telecommunications Systems for Greater Mission Effectiveness

Bendix Corp.
Capabilities and Features of Selected Advanced Aerospace Technology

Boeing Co.
Overview of Boeing's Work on Air Force Strategic Systems

British Aerospace
Rapier, ASRAAM, V/STOL, and the Hawk Trainer

Brunswick Defense
Low-Altitude Dispenser System (LAD)

Canadair Ltd.
Challenger, the Utility Jets

Computer Sciences Corp.
Computer Technology in Aerospace and Defense

Control Data Corp.
Solution-Oriented Computer Systems for the '80s and Beyond

E-Systems, Inc.
Command Control Communications and Intelligence (C^3I) in Today's Air Force

Eaton Corp., AIL Div.
Electronic Systems for the '80s

Fairchild Industries, Inc.
Fairchild Industries Current Aerospace Activities Update

Ford Aerospace & Communications Corp.
Tactical Missile, Electro-Optical, and Operations Support Systems

Garrett Corp.
Next-Generation Trainer Engine—TFE76

Gates Learjet Corp.
Learjet: Continuous Effort to Remain at the Forefront of Aerospace Technology

General Dynamics
USAF's F-16 Fighting Falcon

General Electric Co., Aerospace Group
Air-to-Air and Air-to-Ground Gun Sight Systems

Gould Inc., Defense Systems Group
Complete Defense Systems for the US and the Free World From Gould Government Systems

GTE, Strategic Systems Div.
MX C^3 Update

Gulfstream American Corp.
Multimission Aircraft for USAF Requirements

Honeywell, Aerospace & Defense Group
Millimeter Wave Guidance and Targeting

Hughes Aircraft Co.
AMRAAM Missile System

IBM Corp.
IBM: Total Systems Responsibility

Israel Aircraft Industries, Ltd.
RPVs in Action/Kfirs for the Aggressor Squadron

Itek Corp., Itek Optical Systems
Modern Reconnaissance

ITT Gilfillan
Tactical Radar Systems for the 1990s

Lear Siegler, Inc.
Tactical and Strategic Avionics and Controls—Integrated Flight Management Systems

Lockheed Corp.
The Case for the C-5 and Space Shuttle—The Job Ahead

Loral Electronic Systems
Radar Warning Receivers, Target Surveillance, Acquisition Technology

Martin Marietta Aerospace
Denver Aerospace
MX Missile Engineering and Launch Facility Development
Orlando Aerospace
LANTIRN Navigation and Targeting System; T-16 Airframe and the ADATS

MBB Messerschmitt-Bölkow-Blohm, Dynamics Div.
Air-Launched Weapon Systems

McDonnell Douglas Corp.
Douglas Aircraft Co.
USAF KC-10 Extender
McDonnell Aircraft Co.
F-15 Eagle
McDonnell Douglas Astronautics Co.
Cruise Missiles for the USAF

Northrop Corp.
Aircraft Div.
F-5G Tigershark
Electronics Group
New Developments in Electronic Systems & Equipment

Raytheon Co.
Advanced Tactical Air-to-Air Missile Systems—Sparrow & Sidewinder

Rockwell International
Autonetics Strategic Systems Div.
MX Guidance Control System
Missile Systems Div.
Tactical Technology at Work—GBU-15 Guided Weapon
North American Aircraft Operations
B-1 Aircraft Program
North American Space Operations
DoD Navstar GPS Satellite Program and the Space Shuttle Program

Rolls-Royce Ltd.
Pegasus Engine

Sanders, Federal System Group
The Evolution of Electronic Warfare

Sierra Research Corp.
Advanced Radar and Stationkeeping Systems

The Singer Co.
Kearfott Div.
State-of-the-Art Navigation
Link Flight Simulation Div.
US Air Force Simulation Update

Teledyne CAE
Turbine Engine Power: Today, Tomorrow

Texas Instruments Inc.
HARM, Paveway III, and Advanced Terrain-Following Radar

TRW Electronics & Defense
Defense Systems Group
MX and its Deterrent Role
Space and Technology Group
Technology Bridge to Advanced Military Communications Satellites

United Technologies Corp.
Norden Systems/Chemical Systems
Advanced Avionics/Propulsion/Data Systems for the Air Force
Pratt & Whitney Aircraft, Government Products Div.
High Technology Engine Products for Strategic, Tactical, and Utility Aircraft
Sikorsky Aircraft
HH-60D Night Hawk Helicopter

Visitors to the 1982 Aerospace Development Briefings and Displays had many opportunities to gather information on the exhibits.

Westinghouse Electric Corp.
Emerging Defense Systems and Technology for the USAF

Williams International
Small Cruise Missile Turbofan

The following companies displayed but did not hold briefings

Aeritalia Societa Aerospaziale Italiana
The G-222, a Light Tactical Transport

AGA Corp.
Infrared Imaging Equipment

Aviation Week & Space Technology
"BUDGETRACK"—Defense Budget Data-Base Retrieval System

Beech Aircraft Corp.
Air Force MQM-107 Training Target and Other Beech Aircraft

Bell Helicopter Textron, Inc.
Helicopter and V/STOL Developments Applicable to Current and Future Air Force Missions

Davis Agency Inc.
Special Worldwide Travel Arrangements

EDO Corp.
High Technology Aircraft and Helicopter Ejection Release Racks for Heavy and Lightweight External Stores

General Electric Co., Aircraft Engine Group
CFM56 and CF34 High Bypass Turbofan Engines

Grumman Aerospace Corp.
EF-111 Production and STARS Development Programs for the Air Force

Industrial Acoustics Co.
"Aerotronic" Air-Cooled, Electronically Monitored, Noise-Controlled Jet Engine Test Facilities

Jane's
Jane's Yearbooks and a List of New Jane's Publications

King Radio Corp.
Off-the-Shelf Avionics Systems for the Military

Litton Systems Inc.
Data Systems Div.
Modular Control Element (MCE)
Guidance & Control Systems Div.
Inertial Guidance Systems and Ring Laser Gyro Technology

Lucas Aerospace Ltd.
System and Equipment Suppliers to the World Aerospace and Defense Industries

Magnavox Government and Industrial Electronics Co.
Electronic Systems for Communications, Position Location, and Navigation

M.A.N. Truck and Bus Corp.
Manufacturer of the 10-Ton Truck which Carries the GLCM Launcher

Marconi Avionics Ltd.
LANTIRN HUD, AFCS Fly-by-Wire, Fly-by-Light SCADC

McDonnell Douglas Electronics Co.
Avionics/Electronics Training Systems

Northrop Corp.
Ventura Div.
BQM-76C Aerial Target

Olympus Corp. of America
Fiberscopes, Borescopes, and Accessories

Pace Inc.
Portable Equipment for Non-Destructive Repair of Printed Circuit Boards

Panavia Aircraft GmbH
Tornado, the European All-Weather Strike Attack Aircraft

Rockwell International
Collins Government Avionics Div.
Collins Range of Avionics Systems and Equipment for the Air Force
Rocketdyne
Rocketdyne's Roles in Propulsion and Advanced Technology for the Air Force

Rolm Corp.
Mil-Spec Processor Products Including 16- and 32-Bit Computers and a 365 Megabit Winchester Disk

Stanley-Vidmar
Modular Storage Drawer Cabinets for Air Force Applications

Thomson-CSF, Inc.
Short Range Air Defense (SHORAD) Systems/SICA and Crotale Missile Systems

U. E. Systems, Inc.
New Developments in Ultrasonic Instruments

Vega Precision Labs, A Compudyne Co.
System Components for Command and Control of RPVs and Target Drones

Examining a model of the Next-Generation Trainer are Air Force Chief of Staff Gen. Charles A. Gabriel, Vice Chief Gen. Jerome F. O'Malley, outgoing Chairman of the Board Vic Kregel, and outgoing AFA President John G. Brosky.

ment loop, as E-Systems abstracts it, runs from data-collecting sensors to processing points where the data is analyzed, then to fusion centers for correlation, exploitation, and targeting, and on to the decision-makers who use electronic and other assets to carry out the necessary actions. The glue that holds the loop together is communications.

More than a dozen exhibits had central themes of electronics, EW, and C^3. TRW described the maturation of communications satellites over the past two decades and looked ahead to MILSTAR, which will provide both strategic and tactical C^3 links. Sanders outlined the evolution of electronic warfare from its primitive beginnings to today's sophisticated systems. Itek briefed techniques of modern reconnaissance for real-time surveillance of the battlefield at deep penetration distances. Loral's presentation covered target acquisition, display/control, surveillance, and self-protection. At the ITT exhibit, a chatty robot receptionist welcomed visitors to a full-size command and control module.

Raytheon displayed several of its key strategic sensors: PAVE PAWS, the dual-faced phased-array radar for detection of SLBM attack; Over-the-Horizon Backscatter (OTH-B) radar for long-range bomber attack warning; and Cobra Judy, a phased-array radar carried aboard a ship to monitor foreign ballistic missile tests.

In the area of electronic countermeasures and counter C^3—the neutralization or destruction of the enemy's electronic assets—exhibits included material on Grumman's EF-111A "Electronic Fox" jamming aircraft, which is capable of blinding hostile radars out to a range of about 125 nautical miles, and the Precision Location Strike System (PLSS), which Lockheed is developing to pinpoint the whereabouts of enemy emitters so weapons can be directed onto them.

Both Texas Instruments and Ford Aerospace had information on the High-speed Anti-Radiation Missile (HARM) that F-4G Wild Weasel aircraft will employ against hostile SAM and early warning radars. E-Systems displayed its E-130 RPV, which can home in on enemy C^3 systems for a variety of electronic missions.

In still other areas of electronics, Singer had an update on simulation in the Air Force and an animated cartoon that traced the art of navigation from the days of the stars and dead reckoning to the Joint Tactical Information Distribution System (JTIDS). Navigation on a yet larger scale, the Navstar Global Positioning System, was briefed by Rockwell. Navstar will eventually be a constellation of satellites, covering the globe with navigational signals so users can precisely determine their own locations anywhere on earth.

MX, Space, and Aircraft

GTE's exhibit on C^3 for MX, along with an explanation of the closely spaced basing concept, was one of several presentations featuring MX. One company spokesman reported even more interest than last year in MX on the part of visitors to his booth. One reason may have been that in his speech to the AFA convention just hours after the exhibit halls opened on September 14, Air Force Chief of Staff Gen. Charles A. Gabriel said that the Air Force was making its recommendation to the Secretary of Defense that day on the best way to base MX *(see*

p. 80). That recommendation has since been disclosed as closely spaced basing (CSB). First flight of the MX missile is scheduled for January 1983, and Martin Marietta gave a summary of the flight test program at its exhibit.

Numerous companies were describing their space systems, thus striking a chord with the AFA Space Symposium at the convention *(see report, p. 102).* The Space Shuttle was a major theme for both Lockheed and Rockwell. The Air Force is keenly interested in the Shuttle, and is DoD executive agent for military Shuttle application. Plans call for eventual transition of virtually all national security spacecraft from their current expendable launch vehicles to the Shuttle.

Northrop was showing a film, "Day of the Tigershark," about its privately developed F-5G export fighter. Tigershark performed flawlessly in its first flight in August, Northrop says, reaching a speed of Mach 1.04 and climbing to 40,000 feet. The company reports substantial interest on the part of several foreign governments in the Tigershark—but no big order for aircraft yet.

Lockheed's presentation on its C-5 airlifter included a point-by-point comparison with the Boeing 747, recapping the company's position in the airlift acquisition controversy that was recently resolved in favor of the C-5. Douglas Aircraft's briefing was on the KC-10 tanker/airlifter mentioned previously, but there was material on the C-17 advanced military transport, too. The C-17 is presently in what the Pentagon calls a "low-level development program," with initial operational capability projected for 1989 or 1990.

An Air Force officer gets a close look at the MILSTAR program, the next step in military communications satellites.

Air Force Under Secretary Edward C. Aldridge (second from right) and party at the British Aerospace booth, where an actual Rapier air defense unit was shown. USAF is acquiring Rapier for defense of its air bases in Britian.

Still other aircraft exhibits featured the British Aerospace Hawk, the Gates Learjet 35A, Canadair's Challenger, Gulfstream American's Gulfstream III, Sikorsky's HH-60 Night Hawk helicopter, Grumman's X-29A advanced technology demonstrator with its forward-swept wing, Bell Helicopter's XV-15 TiltRotor research aircraft program, Aérospatiale's Epsilon French Air Force trainer, and the trinational Panavia Tornado (Aeritalia, British Aerospace, and Messerschmitt-Bölkow-Blohm).

Three foreign companies were exhibiting at the AFA convention for the first time this year. Messerschmitt-Bölkow-Blohm showed its Korman air-to-ship missile and the CWS Container Weapon System, which can dispense subammunition of various kinds from its ejection tubes. Aeritalia, also new to the show, provided information on its G-222 light tactical transport, a candidate for the European Distribution System. Thomson-CSF displayed its Crotale ground-to-air missile and its mobile air defense systems.

Internationalism and Interdependence

Interdependence, both international and domestic, has become a fact of life in the world of defense, but touring the exhibit halls one was struck again with the extent of it, not only in exports and imports, but also in subcontracting, in coproduction, and in interoperability efforts. As for the US aerospace industry, the visitor was reminded that while competition for defense acquisitions is spirited—sometimes very much so—there are plenty of cooperative ventures, too.

With many companies presenting material on half a dozen or more of their products, several hundred different systems were being briefed or displayed during the three exhibit days. It was not possible for a single individual to take it all in.

Most visitors were stocking up on the brochures and other printed material passed out at almost every booth. A secondary advantage of attending the annual briefings and displays is the opportunity to collect current literature on nearly all programs that the aerospace industry has under way. ■

They range in age from twenty-one to forty-two and hail from such diverse communities as Brooklyn, N. Y., and Lockhart, Tex. They have worn blue suits for as little as three years to well over twenty-four. Regardless of length of service, though, they all have been chosen to join a select fraternity. Here are this year's Outstanding Airmen . . .

The Air Force's Diligent Dozen

BY WILLIAM P. SCHLITZ, SENIOR EDITOR

THE process that in its final phase determines who will be selected as the year's Outstanding Airmen begins at the air base level. From the hundreds of these nominations, the major commands and agencies, plus the Air Reserve and Air Guard, culled out all but one or two each.

Then, a central selection board convened at the Air Force Military Personnel Center at Randolph AFB, Tex., had the hard task of designating 1982's Twelve Outstanding Airmen from the seventy-eight top-notch candidates submitted.

Selection criteria are based on individual on-duty and off-duty involvement and achievement during the previous twelve months. Criteria include job knowledge and leadership that resulted in "significantly increased mission effectiveness; self-improvement; leadership in social, cultural, or religious activities; government or civilian awards; and demonstrated ability as an articulate and positive Air Force spokesperson."

THE OUTSTANDING AIRMEN FOR 1982

MSgt. Ronald J. Auspelmyer
91st Strategic Missile Wing (SAC)
Minot AFB, N. D.

SSgt. Brian A. Bell
2163d Communications Squadron (AFCC)
Peterson AFB, Colo.

SMSgt. Charles R. Brown
Hq. Thirteenth Air Force (PACAF)
Clark AB, Republic of the Philippines

SSgt. Dennis A. Eibe
Hq. Air Force Manpower and Personnel Center (AFMPC)
Randolph AFB, Tex.

MSgt. Robert E. Flanagan
Hq. Air Force Technical Applications Center (AFTAC)
Patrick AFB, Fla.

MSgt. Richard L. Hall
16th Special Operations Squadron (TAC)
Hurlburt Field, Fla.

SSgt. Michael S. Jaques
71st Aerospace Rescue and Recovery Squadron (MAC)
Elmendorf AFB, Alaska

MSgt. Bobby K. Jordan
Hq. Strategic Air Command Security Police (SAC)
Standardization Evaluation Division
Offutt AFB, Neb.

SMSgt. David W. Lepori
Air Force Systems Command NCO Academy and Leadership School (AFSC)
Kirtland AFB, N. M.

MSgt. James E. McAuley
6912th Electronic Security Group (ESC)
Tempelhof Central Airport
West Berlin, Germany

TSgt. Cynthia G. Mendonca
Air Force Global Weather Central (MAC)
Offutt AFB, Neb.

Sgt. Gary J. Turner
3636th Combat Crew Training Wing (ATC)
Fairchild AFB, Wash.

ABOVE: MSgt. Ronald J. Auspelmyer and wife, Charlene, prepare their house for painting. NCOIC of maintenance scheduling with the 91st Strategic Missile Wing, Minot AFB, N. D., Sergeant Auspelmyer is active in his church and in the base's Big Brother/Big Sister program and has received many citations for civic services. (He holds a BA in business management.) (USAF photo by Fred Jones)

Thus, the Twelve Outstanding Airmen for 1982 were selected and came to Washington as guests of AFA during the National Convention in September. This year marked the twenty-seventh anniversary of the program.

Besides the glittering annual Airmen's Banquet, the twelve were honored at a luncheon hosted by the Chief Master Sergeant of the Air Force and attended an Air Force anniversary concert at Constitution Hall.

Following are photos of the Outstanding Airmen and notes about their achievements and activities. ■

LEFT: SSgt. Brian A. Bell, now a Reserve liaison NCO with the 1816th Reserve Advisory Squadron at Westchester County Municipal Airport in New York, was nominated as an Outstanding Airman while serving as a communications security accounting clerk with the 2163d Communications Squadron, Peterson AFB, Colo. Here he gives some wood-carving tips to a youngster at the muscular dystrophy camp in Larkspur, Colo. Sergeant Bell is active in fund-raising for the MD Association throughout the year. He was selected for promotion to staff sergeant through the Stripes for Exceptional Performers program. (USAF photo by SSgt. Fernando Serna)

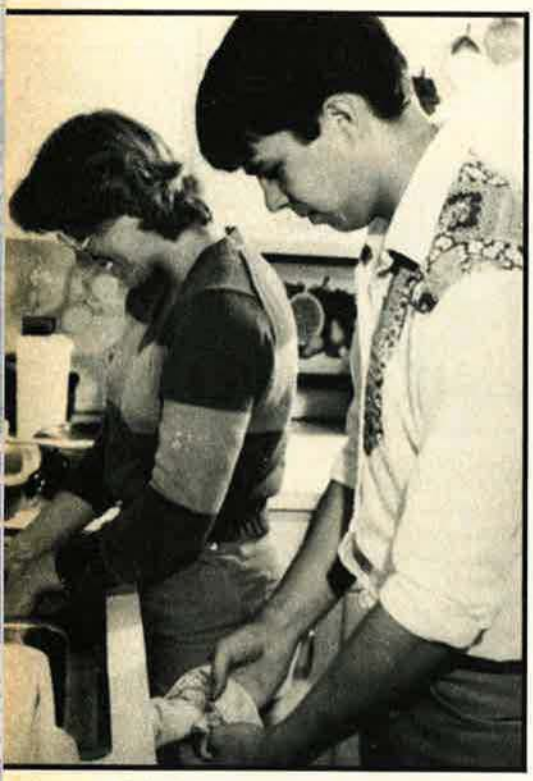
RIGHT: SMSgt. Charles R. Brown is NCOIC of the Operations Plans Directorate of the Thirteenth Air Force Combat Operations Staff, Clark AB. R.P. Sergeant Brown, during his Air Force career, has served five tours of duty in Thailand, where he was officially recognized by a province governor for his civic contributions. He is presently involved with local orphanage and senior citizen home projects. Here, Sergeant Brown relaxes at home with youngest daughter Shari and wife Gaysorn.

ABOVE: MSgt. Richard L. Hall is the NCOIC of the Illuminator Operator Section of the 16th Special Operations Squadron at Hurlburt Field, Fla. He's earned more than sixty hours of credit toward a bachelor's in business administration. Sergeant Hall participated in the planning of the attempted rescue of American hostages in Iran, and is the recipient of squadron and wing awards for averting a major aircraft accident. Of 5,600 flying hours logged, 1,331 are under combat conditions. Off duty, Sergeant Hall is active in the Cub Scouts and PTA and is a little league baseball coach. Here, with son Chad and wife Jean.

LEFT: MSgt. Robert E. Flanagan is Chief, Special Actions and Promotion Section, Consolidated Base Personnel Office, Hq. Air Force Technical Applications Center, Patrick AFB, Fla. Off duty, he is active in his church and the base Youth Booster's Club. Sergeant Flanagan and his wife Connie have two sons, Robert E., Jr., and Shawn.

RIGHT: SSgt. Dennis A. "Bucko" Eibe is Chief, Promotions and Special Programs, Air Force Manpower and Personnel Center orderly room at Randolph AFB, Tex. He's earned a BS in special education and is working toward a master's in business administration. Off duty, Sergeant Eibe is active with Special Olympics and Boy Scouts and participates in unit tennis, softball, badminton, and volleyball. Here he strolls with fiancee Cathy Bradshaw along San Antonio's famed River Walk. (USAF photo by O. J. Sanchez)

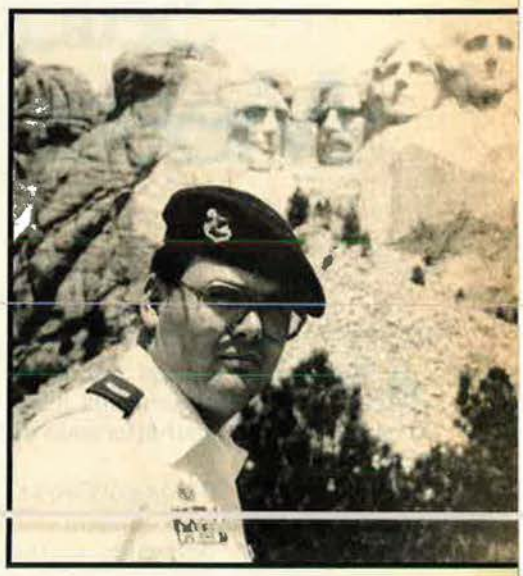
ABOVE: SMSgt. David W. Lepori is chief of the Instruction Division at AFSC's NCO Academy and Leadership School at Kirtland AFB, N. M. His academic qualifications include a BA in business administration and an MA in human relations. At home leafing through the family photo album are, from left, son Jeffrey, Sergeant Lepori, daughter Kimberly, and wife Cathy.



ABOVE: SSgt. Michael S. Jaques is a pararescue specialist assigned to the 71st Aerospace Rescue and Recovery Squadron, Elmendorf AFB, Alaska. He is working toward a Community College of the Air Force associate's degree in applied science. An outstanding graduate of his Arctic survival training class, he later was credited with saving two lives, for a total of six, in −60°F. weather. He's shown here at home with wife Mary Jo.

LEFT: Sgt. Gary J. Turner is a public-affairs specialist with the 3636th Combat Crew Training Wing, which supervises the Air Force's Survival School at Fairchild AFB, Wash. Sergeant Turner has written more than 100 survival-related articles published in numerous military and civilian periodicals and hosts a weekly five-minute interview show on survival techniques on a local radio station. Sergeant Turner is a Lions Club member and works with the Spokane Wheelchair Basketball Team. He and his wife Marlene have one son, Traye. Pictured here, Sergeant Turner begins restoration of an antique stove. (USAF photo by Fred Jones)

ABOVE: TSgt. Cynthia G. Mendonca is a tropical weather forecaster assigned to the Forecasting Services Division, Air Force Global Weather Central at Offutt AFB, Neb. She holds a BA in geography. Off duty, Sergeant Mendonca is involved in a number of civic activities—among them, contributions to Children's Village, USA, a center for abused children; World Vision Agency, a worldwide relief agency; Aid to Foster Children; and projects benefiting victims of muscular dystrophy. Here she is shown posting contributions to the March of Dimes.



ABOVE: MSgt. Bobby K. Jordan is stationed at Offutt AFB, Neb., with the Hq. SAC Security Police Wing Security Evaluation Section. He holds a BA in history and political science and an MA in public administration. While serving at Ellsworth AFB, S. D., he established the base's first hostage negotiation team and also helped train the Rapid City police department in hostage negotiations and tactical team skills. Sergeant Jordan has two children, John and Christine. Here, he's at Mount Rushmore. (USAF photo by Fred Jones)

LEFT: MSgt. James E. McAuley is chief of electronic systems and programs for the 6912th Electronic Security Group at Tempelhof Central Airport in Germany. His academic qualifications include a BA (cum laude) in sociology and psychology and an MA. The Sergeant works as a part-time disc jockey for the American Forces Network in Berlin. Here, center, he supervises staff members. (USAF photo by Thomas Farr)

One event that has become integral to AFA's National Convention and each year has grown in popularity with attending delegates is the . . .

Salute to Congress: Meeting the Lawmakers

BY ESTHER CURTIS, AFA LEGISLATIVE ASSISTANT

AFA's ninth annual Salute to Congress reception took place on a sunny September afternoon on Capitol Hill.

More than 550 congressional guests, high-ranking Pentagon officials, and AFA delegates to the National Convention filled the Rayburn Building Banquet Rooms on Tuesday, September 14, to exchange views and greetings.

AFA thanks the Angel Flight and ROTC cadets who acted as escorts for our distinguished guests. Special thanks go to Betty Nelson, Wanni Spence, Jean Isaacs, Carol Nuetzel, Jancy Bell, Jeanne Buffalino, Pamela Beatty, Barbara Barnes, John Smith, and Detective George Dotson of the Capitol Hill Police who gave us help and support during the Salute to Congress reception.

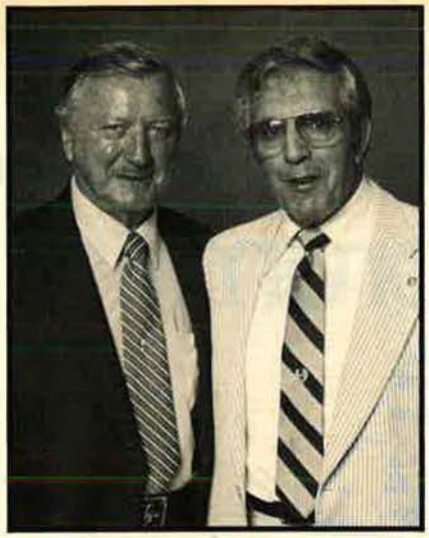
We look forward to seeing you next year at the same time, to celebrate the tenth AFA Salute to Congress on Capitol Hill. ■

Sen. Dennis DeConcini (D-Ariz.) (second from right), receives a warm welcome from fellow Arizonans (from left) Arizona State AFA President John Byrne, Bill Chandler, and Tom Henderson, Arizona State President-elect.

Meeting for a group picture are (from right) Congressman Richard C. White (D-Tex.); Gen. Charles A. Gabriel, Air Force Chief of Staff; Angel Flight "Little General" Angela Clark; and Texas delegate Frank Gallagher.

David L. Blankenship, AFA President-elect, and Mrs. Blankenship are joined by Sen. Don Nickles (R-Okla.).

Congressman George Brown (D-Calif.) is greeted by San Bernardino Chapter President-elect Herb Stone (left) and Nat Trembath, outgoing Chapter President.



Sen. James Abdnor (R-S. D.) is greeted by Jan Laitos (left), newly elected Vice President for AFA's North Central Region.

New York State AFA National Director Bill Rapp (left) and New York state delegate Bob Root join two of their state's distinguished members of Congress, Sen. Alfonse D'Amato (R-N. Y.) and (far right) Congressman Raymond J. McGrath (R-N. Y.).

The state of Washington was well represented by (from right) Mike Winslow, newly elected Under-40 National Director; Ed Hixson, delegate from Washington State; Sen. Henry M. Jackson (D-Wash.); National Director Margaret Reed; and Sherm Wilkins, newly elected National Secretary.

Congressman Melvin Price (D-Ill.), Chairman of the House Armed Services Committee, is greeted by Illinois AFA Vice President Jerry McCabe.

Georgia delegate Mary Norwood meets with Sen. Mack Mattingly (R-Ga.).

House Majority Leader James C. Wright (D-Tex.) (left) engages in lively conversation with AFA Board Chairman Vic Kregel, as AFA's outgoing President and newly elected Chairman of the Board John G. Brosky joins them.

AFA sponsors three blue-suit advisory councils: the Enlisted Council, the Senior Enlisted Advisors, and the Junior Officer Advisory Council. These groups met during AFA's National Convention in September to discuss concerns facing the Air Force today and focused on issues certain to affect tomorrow's Air Force.

The Councils: Forum for Change

BY CAPT. MICHAEL B. PERINI, USAF, CONTRIBUTING EDITOR

THE Air Force Association operates a very special brain trust. This think tank is made up of officers and enlisted people—some of the top performers in the Air Force today. The unique group can generate support and influence policy at the highest levels of AFA and the Air Staff.

"We consider their advice very helpful in formulating positions that AFA must take in ensuring that the US Air Force is the world's best," said Judge John G. Brosky, immediate past AFA President and current Chairman of the Board.

"In addition, this annual gathering of talent is important to AFA because we learn what the grassroots concerns of the blue-suiters are," he emphasized.

More than seventy men and women, both junior officers and enlisted appointed as delegates from USAF locations around the world, form the AFA-sponsored advisory network: the Enlisted Council, the Senior Enlisted Advisors (SEA), and the Junior Officer Advisory Council (JOAC).

The council delegates had prepared themselves to discuss the concerns of those they represent and to exchange ideas with AFA and Air Force leaders. Their rendezvous in Washington was in conjunction with September's AFA National Convention.

While the AFA business sessions were proceeding, the council delegates were enthusiastically putting finishing touches on drafts of papers and proposals they felt would benefit AFA and the Air Force in the years ahead.

The Senior Enlisted Advisors, led by Chairman CMSAF Arthur "Bud" Andrews, discussed a variety of issues and concerns facing the enlisted force, including per-diem equity, the retirement program, and projected enlisted force levels for the mid-1980s. It was the sixth annual meeting of the AFA-sponsored council.

All three councils faced a rigorous schedule of meetings, briefings, and tours, including a visit to Andrews AFB, Md., for a close look at the B-1 *(see also p. 123).*

AFA's senior leadership in turn looked to the councils to voice their concerns and offer suggestions and recommendations on how the Association could best support the more than 500,000 junior officers and enlisted persons currently on active duty.

AFA's Executive Director, Russell E. Dougherty, addressed the councils and asked them to assist AFA in keeping the American people aware of the seriousness of the threat to the nation's security: "Council members need to explain to the public at every available opportunity what aerospace power is and why we need an Air Force."

Maj. Gen. Kenneth L. Peek, Jr., Director of Personnel Plans, gave the Conference keynote address. Like the many speakers who followed him, he stressed the need to ensure that Air Force people are taken care of and reminded his audience that there are still those who are eager to cut defense spending, which may mean "people-related" cutbacks. He also reminded conference members of their responsibility to articulate their views and

those of the blue-suit people they represent as to what is going on in the Air Force today. During the conference sessions that followed, the delegates did just that.

Conference Sessions

The SEA and JOAC groups are composed of one representative from each major command and separate operating agency. The nucleus of the Enlisted Council is made up of the previous year's Outstanding Airmen. Earlier groups have focused on projects of Air Force-wide significance, including: identifying career irritants and problems; developing a slide briefing describing Air Force life for the public; compiling a list of ideas and programs to be used by the Human Resources Development Directorate; drafting pamphlets to be used in support of recruiting, retention, financial management, and the role of today's enlisted people; cataloging proven management ideas; and developing a guide for young officers.

This year's session was equally productive. In fact, during the past twelve months, preliminary work had been in progress on new initiatives that resulted by week's end in substantial results.

The Enlisted Council, last year's twelve Outstanding Airmen plus selected representatives from various major commands, focused on enlisted leadership expectations. Under the direction of its Chairman, CMSgt. Kenneth A. Black, Commandant of SAC's NCO Academy, the Enlisted Council finished its report examining leadership pertaining to the positions of supervisor, first sergeant, and senior enlisted advisor.

After developing the topic at the first council meeting last February in Washington, the Council solicited input from all ranks, surveyed work centers, Commander's Calls, and Professional Military Education classes. As they compiled their report, the enlisted advisors reached several conclusions. "The enlisted force has definite expectations of its supervisors, first sergeants, and senior enlisted advisors," Chief Black said.

"The broad segment of today's enlisted force expects to continue honesty, integrity, loyalty, and leadership by example as necessary criteria in filling these three key positions during the years ahead," he explained.

The Junior Officer Advisory Council prepared the draft of a paper outlining the ideals and responsibilities of officers and leaders. Here working on the JOAC document are, from left, Capt. Pete Rensema, Alaskan Air Command; 1st Lt. Alane Andreozzi, Aerospace Defense Center; Capt. Ronald Oberbillig, Air Force Accounting and Finance Center; and Capt. Robert Schwartz, Pacific Air Forces.

The Senior Enlisted Advisors, led by CMSAF Arthur "Bud" Andrews, discussed a variety of issues and concerns to the enlisted force. Among topics discussed: Uniform changes, per-diem equity, out-of-pocket expenses for PCS moves, CHAMPUS, and the retirement program.

The senior NCOs also looked at enlisted-force levels in the mid-1980s and expressed concern about the quality and lack of recruitable people who will be available. The SEAs decided to survey the enlisted force to identify the most immediate issues—what will be needed to retain on active duty those already in uniform. Their results will be presented to AFA and the Air Staff in order that work can be started now to keep shortfalls at the lowest possible level.

The SEAs were also encouraged to interview suitable chief master sergeants to fill the position of Commandant of the Air Force Senior NCO Academy at Gunter AFS, Ala. The prestigious position, which had been open only to field-grade officers, will now be filled by qualified chief master sergeants *(see October '82 "Bulletin Board").*

The Junior Officer Advisory Council spent long work sessions completing the draft for a paper, which may be published later under the title "Leadership." Discussions led by Chairman Capt. Marcia Tamblyn, 1943d Communications Squadron, Pope AFB, N. C., centered on the professional aspects of leadership, and the JOAC members naturally drew heavily on their own experiences. "Officership doesn't end when you go home," said Captain Tamblyn. "It's a twenty-four-hour responsibility."

"We want to open a dialogue, not dictate to others," said Capt. Dale C. Hill, delegate from TAC and the JOAC Vice Chairman.

The JOAC paper discusses the ideals, responsibilities, and commitment of officers and leaders. The paper also states: "The Oath of Commission is indeed one of the

AFA Enlisted Council members listen to Chairman CMSgt. Kenneth A. Black, center, review input received from throughout USAF on the topic of enlisted leadership expectations. The Council is preparing a report to AFA on leadership as it pertains to the positions of supervisor, first sergeant, and senior enlisted advisor.

most sacred obligations any officer will ever undertake."

The JOAC document encourages each officer to renew his or her commitment to the Air Force. Furthermore, the JOAC believes that the single most important characteristic of professionalism is integrity—"The cornerstone on which is built the trust so essential to command," in the words of the JOAC paper.

Professional Update

A series of briefing and question-and-answer sessions was held by key Air Force and AFA leaders during the Professional Update Seminar of the combined conference. Speakers included Gen. Charles A. Gabriel, USAF Chief of Staff; Lt. Gen. John T. Chain, Jr., Deputy Chief of Staff for Plans and Operations; Lt. Gen. Andrew P. Iosue, Deputy Chief of Staff for Manpower and Personnel; Brig. Gen. Richard F. Abel, Air Force Director of Public Affairs; Brig. Gen. Clifford H. Rees, Jr., Deputy Director of Legislative Liaison; and Ben Catlin, AFA Special Assistant for Defense Personnel Matters.

The Issues

Major points covered in the seminar and discussed further in conference sessions included:

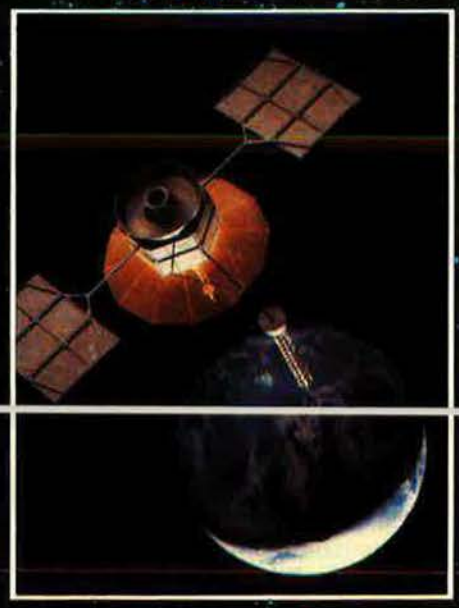
- The Soviet threat is real and growing. Major advances have been made in the US Air Force's force modernization program to counter the threat. The effort must continue, however, in order for the nation to stay on the frontiers of technology. Air Force people play a vital role in the relationship with the civilian community surrounding a base. What aerospace power is and why we need an Air Force should be articulated at every available opportunity.

Lt. Gen. Jimmy Doolittle, USAF (Ret.), AFA's first national president, made a special appearance to welcome the more than seventy delegates from USAF locations worldwide. AFA Executive Director Russell E. Dougherty, left, also welcomed conference members.

- A renewed sense of patriotism is growing throughout the country. Recruiting and retention rates are at an all-time high. Though major gains have been made in the areas of military pay and compensation, work must continue to seek pay comparability with the civilian community, or else the nation must accept a smaller force with inadequate capability.
- Air Force civilians are an integral part of the defense force. They, in turn, expect and should be entitled to pay, benefits, and working conditions comparable to those in the private sector.
- The Air Force family plays a key role in a member's job, morale, and productivity. The changing needs of the Air Force family should continue to be recognized with new programs being developed to assist them. Action has been taken by the Air Staff to improve living and working conditions, particularly overseas. Increases in the military construction program during the past year and funding for quality-of-life and workplace improvements will be a principal concern in the future.
- The Air Force has made excellent strides in seeing that women can enter many different career fields. It is now the challenge of Air Force leaders to see that they are recognized with promotions.
- Nonrated officers are a vital part of the flying Air Force. The Air Staff's responsibility is to see that opportunities for advancement are there for rated and nonrated officers alike.

To the delegates participating in this year's conference, the trip to Washington was extremely beneficial. But, as the convention came to an end, one conference member voiced a word of caution: "Our work isn't finished. We have a responsibility to continue to serve as a vital forum to the top—a hotline on the personnel and readiness issues that will affect the Air Force in the decade ahead. We must keep the momentum." ■

MILSTAR



TRW is ready to meet the tough requirements of the new military communications satellite system, MILSTAR.

We have built more than 50 milsatcoms, including the highly successful Defense Satellite Communications System (DSCS II) and the most recent Fleet Satellite Communications System (FLTSATCOM).

As the backbone of U.S. military wideband communications for the past decade, the DSCS II system provides worldwide coverage for routine traffic as well as steerable spot-beams for small, individual areas. It also links all elements of the Worldwide Military Command and Control System (WWMCCS).

FLTSATCOM is the most complex military communications satellite in use. Shared by the Navy and Air Force, it provides high-priority, DoD communications for ships, submarines, aircraft, and ground units around the world. Since 1978, the four operational satellites have accumulated 140 spacecraft-months of flawless, on-orbit performance.

TRW is also building the sophisticated Tracking and Data Relay Satellite System (TDRSS), the first unit of which will be launched in early 1983. These 5,000-pound satellites will be used to transmit data between Earth-orbiting spacecraft, Earth-based users, and the large, highly automated TDRSS ground station at White Sands, New Mexico.

As the major supplier of milsatcom systems for DoD, we have assembled a team of professionals with unmatched experience to meet the MILSTAR challenge.

TRW

Space & Technology Group

Senior Administration officials and military leaders met during the Association's National Convention in September to analyze America's space policy, its effect on national security, and the growing Soviet challenge in . . .

SPACE: The Fourth Dimension

BY EDGAR ULSAMER, SENIOR EDITOR (POLICY & TECHNOLOGY)

SOVIET doctrine holds that "the space medium is a vital fourth dimension to those of air, land, and sea. As such, space is viewed by the Soviets as a 'no holds barred' environment, and they consider 'spacepower' essential to ultimate victory and the subsequent political success of the USSR," Air Force Under Secretary Edward C. Aldridge, Jr., told AFA's Symposium. The meeting, titled "Space: Military Challenges and Opportunities," took place on September 16, the closing day of the AFA National Convention.

In the same vein, Sen. Harrison H. (Jack) Schmitt (R-N. M.), a former astronaut and Chairman of the Senate's Science, Technology and Space Subcommittee, told the AFA meeting that "throughout the last decade, the Soviet Union has pursued an aggressive space program that is purely military in nature. They have outpaced the United States in the number of launches per year as well as the types of activities pursued."

To meet the Soviet challenge in space, he said, the US must act in three areas: The foundations of the national effort in science and technology must be "redeveloped and expanded." Current deficiencies stem from the fact that "scientists, engineers, technicians, as well as engineering and manufacturing capabilities, are well undercapitalized, underemphasized, and, for the most part, inadequate to the demands. . . ."

Second, "a national policy and commitment to going into space and staying there with a permanent presence must be adopted both for our national security needs and to explore this unique environment of space for the well-being of our citizens," as well as all mankind.

Lastly, Senator Schmitt urged that the goal of a permanent manned presence should be incorporated in the nation's space policy, "and the first step must be taken very soon."

On the one hand, America's future opportunities in space are limited only by this nation's willingness to make essential investments; on the other, the loss of US leadership in related science and technology would enable the Soviets to "capture the high ground of space," according to Senator Schmitt. The pressing need now is "shaking up the bureaucracy in government that has, up until now, failed to see the challenge and all the benefits that space offers this nation and mankind," he added.

Dr. Keyworth stressed that the President's new space policy maintains a balance between military and nonmilitary programs and in no way signals the "militarization of space."

A "Bad Rap"

In highlighting the new national space policy announced by President Reagan this summer, the White House Science Advisor, Dr. George A. Keyworth II, the keynote speaker of the program, rejected claims that it entailed "militarization of space. This is simply not true; the balance remains essentially what it has been—about a fifty-fifty split between military and nonmilitary. This US balance is significantly different from that of the Soviet Union, whose space program is about ninety percent military."

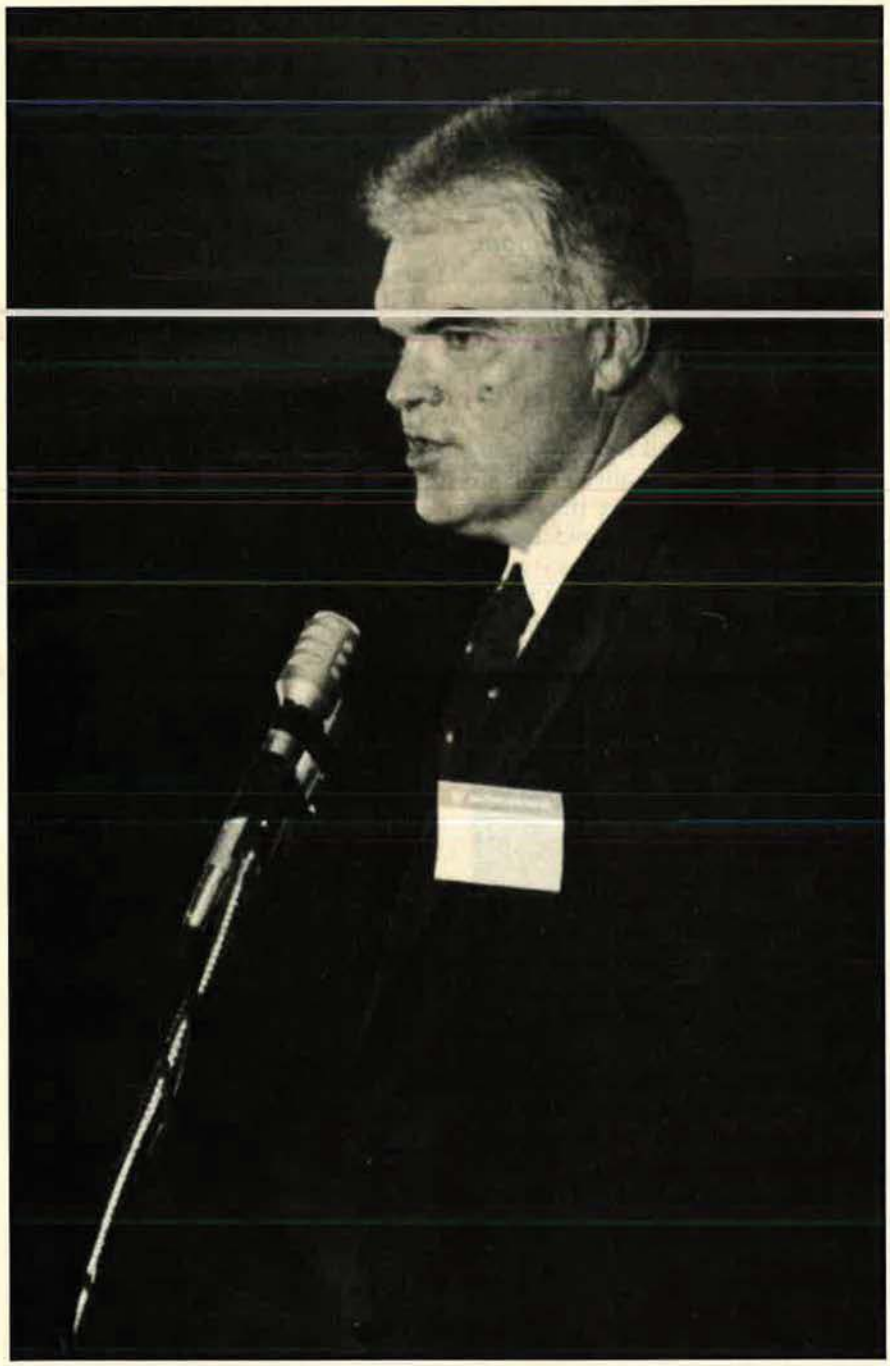
NASA's Deputy Administrator, Dr. Hans Mark, told the Symposium that at a recent United Nations-sponsored international meeting on space policy the United States was unilaterally accused of being culpable for the alleged militarization of space, even though the Soviet Union is the world's only power that has developed and deployed space weapons. Dr. Mark said the Department of State instructed the US delegates to this "Unispace" meeting not to campaign against this misconception.

Secretary Aldridge delved fur-

ther into the issue, asserting that "we seem to be taking a 'bad rap' in the US while the actual Soviet space programs, which are the forcing functions of any space competition, seem to escape the world's focus. . . . The [Soviets]—masterful hypocrites that they are—lead a worldwide propaganda campaign to ban weapons in space, and they are the only ones in history who have ever placed such systems in orbit."

Soviet space doctrine, he pointed out, produced, "among other things, orbital bombardment systems, deployed antisatellite systems, space-based radars, and permanent space stations—all systems which are uniquely Russian since no other nation has yet matched such deployments. These are in addition to the formidable array of intelligence, surveillance, communications, and other support systems which the Soviets launch in great numbers."

The Air Force Manual on Military Space Doctrine, by contrast, reflects a process that "is reversed. That is, we in the Air Force go to great pains in our manual to show how our space doctrine is guided by and consistent with national and defense policy, executive guidance, international law, legal constraints, and assigned Air Force missions and responsibilities. . . . The United States is not a player in the space weapons arena. We have never placed a weapon in orbit and have no approved programs to deploy any weapon in orbit," Dr. Mark concluded.



Despite the fact that the Soviet Union is the only country to develop and deploy space weapons, Dr. Mark observed that the US is declared culpable for the "militarization of space."

Going Operational in Space

Gen. James V. Hartinger, Commander of the Air Force's new Space Command, announced that this organization already assumed responsibility for two operational satellite systems, the Satellite Early Warning System (SEWS) Defense Program and the Defense Meteorological Satellite Program (DMSP). Space Command's broad objective, he said, is to "provide a focus for centralized planning, consolidated requirements, and an operational advocate and honest broker for USAF space systems. We will provide the operational pull to go along with the technology push which has been the dominant factor in the space world since its inception," he continued.

General Hartinger announced that "as the largest producer and consumer of operational space intelligence, we will promote a new look by the intelligence community on the space threat. We feel that operational space intelligence should take its place as an area with at least the same emphasis as missile, air, ground, and naval intelligence. I talked to [the Director of Central Intelligence William J. Casey] . . . and he shares my concerns and indicated that a National Intelligence Estimate on space will have high priority. Should the Space Command become a unified command, we will play an even greater role advocating a joint space intelligence analysis activity with participation by the CIA, DIA, NSA, and the services."

Another area of emphasis, General Hartinger told the AFA meeting, centers on incorporating space assets in JCS exercises. One such exercise has already taken place, when "we exercised the space

warning systems, tested the newly developed Space Activity Conferences, and gave decision-makers the opportunity to recommend appropriate responses to attacks on our space assets and to evaluate options for reconstituting lost US space capabilities."

Survivability of space assets is another key concern of Space Command, he said, adding that "the lack of budgetary support for survivability enhancement provides an excellent case study of how an operational requirement can languish." There is, he stressed, "a spectrum of survivability enhancements one could employ because all four nodes are vulnerable—the launch site; the tracking, telemetry, and control facilities; the C^3 network; and the satellite itself. Of course, our survivability requirements have to be driven by an assessment of our orbital strategy and force structure needs. We must look at proliferation or sparing as well as launch and on-orbit reconstitution."

The bottom line, General Hartinger said, "is that the establishment of Space Command means that the Air Force is going operational in space. We think we have the right time, we think we have the right place, we think we have the right people, and we are excited about it. Space Command is a big step toward a space program that will meet the President's policy goal of strengthening national security."

Imagination Only Limit

Lt. Gen. Richard C. Henry, Commander of AFSC's Space Division, who also now serves as Space Command's Vice Commander, told the AFA meeting that "space is not a mission; it is a place. It is a theater of operations. It is now time that we treat it as theater of operations."

The military mission in space, he explained, is to deliver from "on high to our operational forces, the electronic bit stream—a written message, an oral conversation, a picture or a navigation signal wherever they need it, whenever they need it, and with total certainty."

In the hardware arena, General Henry called for a "renaissance in rocket propulsion. We have done wondrous work, as evidenced by the rocket engines on the Space Shuttle. But much more needs to be done. Think of the strides we have made in fuel efficiency, thrust-to-weight ratio, and reliability in the turbojet engine—and we can fathom the opportunities yet ahead of us in rocket engines. They are the secret to routine, on-call, and rapid access to space. Survivability is a key word today. We believe that in most situations, the best counter to physical attack is escape and evasion or maneuver. Small rocket engines make that possible."

NASA's Associate Administrator for Manned Space Flight, Lt. Gen. James A. Abrahamson, provided a detailed status report on the Space Transportation System, especially its key component, the Shuttle, at the AFA meeting.

Manned capabilities, General Abrahamson said, "will be broadened to include such reliable, low-cost orbital systems as manned space stations, high-energy upper stages, and teleoperator vehicles that will permit manned operations in geosynchronous orbit. And beyond that, the ultimate dream—human settlement of the solar system and the exploitation of its vast, untapped resources.

"Our future in space," he added, "in terms of scientific, economic, and national security needs, is limited only by our imagination. I am confident that the civilian-military partnership we are forging will lead to a newer, better, and more secure existence for all inhabitants of this planet."

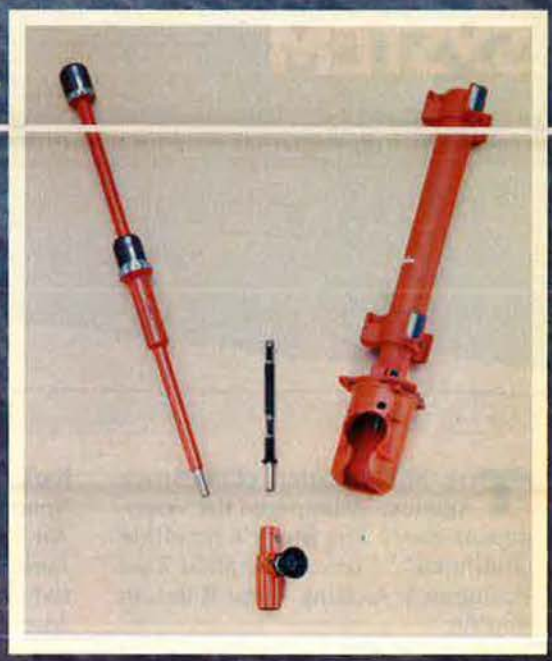
The long-term look ahead taken by AFA's Space Symposium provided a fitting finale to the 1982 National Convention commemorating the thirty-fifth anniversary of the United States Air Force. ■

The Soviets' view of space as a "no-holds-barred environment" vital to their ultimate military and political victory was discussed by Under Secretary Aldridge.

Gen. James V. Hartinger envisions the newly established Space Command as a first step toward President Reagan's objective of a space program that will enhance national security.

Lt. Gen. Richard C. Henry, Commander of AFSC's Space Division, stressed that the time has come to view space as a new theater of operations, requiring new technology and new doctrines.

Wild SZR2 muzzle boresight. Unmatched "first hit" accuracy.



In the field you know that accuracy, speed and reliability are paramount in getting the upper hand. Wild's new SZR2 muzzle boresight — which meets MIL-810C — gives you all three and more.

In field tests, the SZR2 has delivered "first hit" accuracy far beyond any other competing device. And while the military advantages are obvious, consider the logistical benefits. Reduced ammunition expenditure permits more effective fire power with the same number of rounds. As a result, material costs are cut sharply and resupply concerns are eased.

What's more, the SZR2 is engineered for flexibility and reliability in the field. For example, it's the only boresight to use the same optical head for caliber bars of 5.5 to 155 mm. So it costs less to purchase and maintain.

The adjustable reticle mount provides another advantage. The optical head and caliber bar can be realigned in the field by the weapon crew. So the SZR2 stays where you need it.

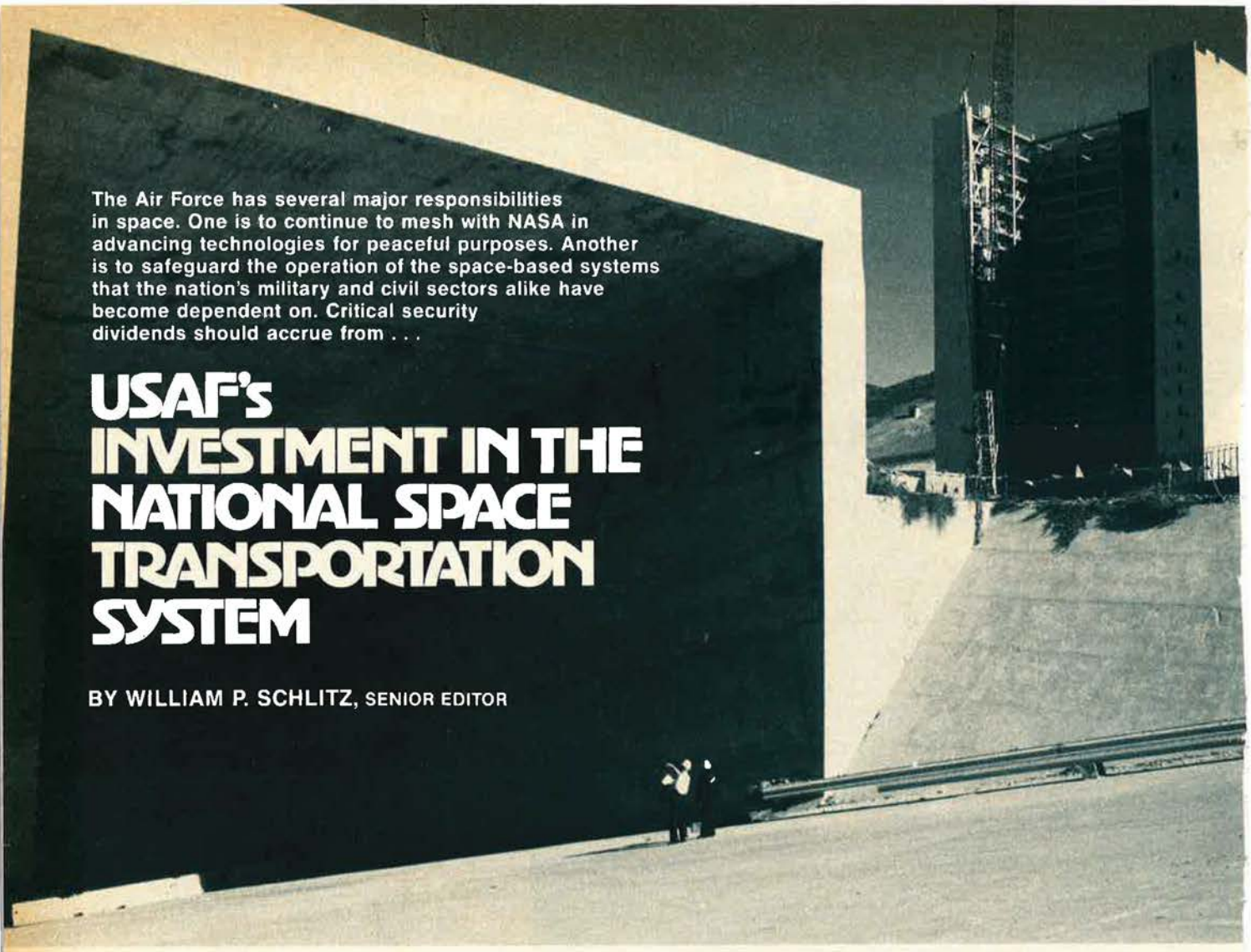
Caliber bars are made to specifications and are available with extensions for flash suppressors. A variety of reticle patterns is also available. And an optional lens permits reticle illumination by flashlight for night boresighting.

So set your sights on unmatched "first hit" accuracy, speed and reliability with the Wild SZR2 muzzle boresight.

For full details, call toll free **800-645-9190.**

WILD HEERBRUGG

Wild Heerbrugg Instruments, Inc.
P.O. Drawer P, Farmingdale, NY 11735
800-645-9190 • In NY State 516-293-7400



The Air Force has several major responsibilities in space. One is to continue to mesh with NASA in advancing technologies for peaceful purposes. Another is to safeguard the operation of the space-based systems that the nation's military and civil sectors alike have become dependent on. Critical security dividends should accrue from . . .

USAF's INVESTMENT IN THE NATIONAL SPACE TRANSPORTATION SYSTEM

BY WILLIAM P. SCHLITZ, SENIOR EDITOR

At Vandenberg AFB in California, a giant launch pad flame duct, one of three designed to conduct Shuttle's exhaust away from launch complex during liftoff. The 275-foot-high mobile service tower is in the background. The first Shuttle launch from Vandenberg is scheduled for 1985.

"THE 'Militarization' of the Space Agency," trumpeted the Washington *Post*. The story's headline continued: "Critics Complain That Pentagon Is Getting 'Free Ride' on Shuttle."

This was indicative of the kind of criticism leveled at the Department of Defense and NASA last spring when it became apparent that the Space Shuttle was approaching operational reality.

Quoting from the story, by Washington *Post* staff reporter Thomas O'Toole:

"One sign that the space agency is being 'militarized' is the number of Air Force personnel now on active duty at NASA. There are 8 Air Force officers assigned to NASA headquarters in Washington, 60 to the Kennedy Space Center at Cape Canaveral, and 66, plus 22 Air Force civilian employees, at the Johnson Space Center in Houston.

"NASA's top management has taken on a distinctive 'blue-suit look.' Head of the new Office of Space Transportation Systems is Air Force Maj. Gen. [now Lt. Gen.] James A. Abrahamson. His executive assistant is Air Force Lt. Col. Joseph Rougeau. The head of external relations is retired Air Force general Frank Simokaitis. NASA deputy administrator is Dr. Hans Mark, a former Secretary of the Air Force."

While the *Post's* story may be accused of a certain editorial bias, the article failed to note that NASA has been *chartered* to have a distinctive "blue-suit look."

Considering what the nation has at stake in space, small wonder that defense-oriented blue-suiters are prominent in the ranks of the space agency.

In terms of Space Shuttle operations, it can be stated unreservedly that NASA would be hard-pressed to function effectively without the considerable help rendered by the Air Force full-time "detailees" assigned to NASA and the people and resources allocated for specific Shuttle missions *(see p. 44 of the June '82 issue, "Supporting the Space Shuttle: The Blue-Suit Contribution").*

In turn, Shuttle-involved blue-suiters undoubtedly would agree that the Air Force is entirely dependent on NASA for operation of the Space Shuttle. After all, NASA *owns* the Shuttle.

In fact, NASA and the Air Force, acting as executive agent for the Department of Defense, are partners in operating the Shuttle, the core piece of hardware in what more formally is labeled "the national Space Transportation System" (STS).

Origins of the Partnership

This unique relationship of the US's civil and military sectors predates considerably the creation of NASA. It was in 1915 that the National Advisory Committee for Aeronautics was empaneled. The Committee was made up of military as well as civilian members entrusted with working together to advance US aeronautical technology in the interests of both sectors.

The 1958 Act of Congress that created NASA simply continued that precedent, although it established the Air Force as sole executive agent for DoD in providing support and overseeing military space activities involved in national defense.

"The partnership of NASA and the Air Force has been forged out of necessity," commented General Abrahamson, who is one of a number of blue-suit "detailees" serving full-time with NASA. "The civil and military areas of the nation's space program must mesh where possible. We can't afford two programs," General Abrahamson said. "With major investments by both organizations, the foundation of our efforts must be cost-effectiveness.

"The NASA/Air Force partnership has been fruitful from the beginning. And it has been synergistic, with the military sector helping to advance civil objectives and vice versa," said General Abrahamson. "Air Force people have been integrated at all levels throughout the partnership, including the upper echelons in the policy formulation role."

Not an inconsequential Air Force investment in the nation's space program in general and the national Space Transportation System in particular has been the "detailing" of top-level blue-suiters full-time to NASA through the years. One outstanding example: Gen. Samuel C. Phillips, Program Manager of the NASA Apollo lunar landing team.

"But the partnership has not been all one-way," commented General Abrahamson. "For example, NASA has contributed a substantial segment of the design development for Vandenberg AFB in California where a second Shuttle launch complex is being constructed."

NASA teams have also been trouble-shooting problem areas at Vandenberg, based on their experience in developing the initial Shuttle launch facilities at Kennedy Space Center in Florida.

As an example of working together to achieve results neither organization could accomplish independently, NASA and the Air Force are pioneering the use of superhigh radio frequencies.

The first Commander of USAF's newly established Space Command is Gen. James Hartinger. Here he chats with his Vice Commander, Lt. Gen. Richard C. Henry, who also wears a second hat as Commander of Space Division. General Hartinger will continue to command North American Aerospace Defense Command and ADC. (An interview with General Henry appeared in the June '82 issue of this magazine.)

On the hardware level, DoD representatives assigned to offices at various industrial plants oversee as an adjunct to their own affairs the quality control of items produced for the STS, and for other NASA programs as well.

In the cost-effectiveness role, the two organizations have been able to avoid or delay more than $230 million in near-term budget expenditures, according to General Abrahamson. One such saving: Originally Vandenberg was to have its own booster parachute refurbishment facility. It was determined that this work could be accomplished just as satisfactorily at the already existing Kennedy Space Center facility.

An unsung story is the contribution made by Air Force people assigned to NASA's space centers to the formulation of logistics concepts and plans for the procurement and stocking of millions of essential Shuttle system spare parts.

The familiarity between NASA and Air Force leaders—far from breeding contempt—further improves the interface between the space agency and, through USAF, the defense community.

To assure this close liaison, high-level blue-suiters assigned to the space program conduct biweekly meetings to review problem areas. Because of this important exchange of information in a continuing manner, problems can be dealt with on a real-time basis.

NASA also benefits from the advice and counsel of senior DoD managers. The influence these officials wield on Capitol Hill is of no small consequence and can be considered essential in a political sense.

One formal instrument for this cooperative venture is the Aeronautics and Astronautics Coordinating Board, co-chaired by NASA's Dr. Hans Mark and Dr. Richard D. DeLauer, Under Secretary of Defense for Research and Engineering. Among other things, this body coordinates testimony of key officials

before congressional committees. "With resounding support for the STS from the current Administration, NASA and the defense community are more solidly locked in than ever before," commented Dr. Mark.

"The fear that members of Congress and others have that NASA is being militarized is unfounded," continued Dr. Mark. "In fact, the relationship between NASA and the Air Force is very healthy, with arguing, debating, and simply *talking* to each other on all levels. As for a Defense Department 'free ride,' when NASA cut the Space Shuttle deal with the Air Force in 1972, it obligated itself to about three-fourths of outlays to the Air Force's one-quarter. The ratio has remained the same, with the Air Force providing about twenty-five percent of the total outlay. Considering the nature of the initial commitment and the recent economic climate, it is a real achievement that we have been able to maintain a stable relationship for such a long time," said Dr. Mark

On the operational side, "a lot of progress has been made by NASA and the Air Force in the last four years," commented Dr. Mark. "With the Space Shuttle missions so far successful we now have a lot of flight data under our belts. So in the engineering sense the Shuttle is fully operational. We are now striving to get a handle on more accurately predicting operating costs and more accurately determining turnaround rates."

USAF's Missions in Space

The Air Force has several major responsibilities in space. One is to continue to mesh with NASA in advancing technologies for peaceful purposes. "As we move further into the operational phase of the national STS, it is becoming a key element in the formulation of national space policy, with NASA and the Air Force on the threshold of a far-sighted leap into new technology and beyond to new methods of doing things in space," said General Abrahamson.

A second responsibility involves national security, with the US becoming increasingly dependent on space-based systems for everything from communications to navigation. This dependency is widespread in both the military and civil sectors. Thus, the Air Force is charged with safeguarding these systems—and the nation—against potential adversaries in space, which now has become the "high ground" that must not be lost.

National security, then, was among the key factors in the decision to equip Vandenberg for Shuttle launches. This will give the Air Force, acting for DoD, launch-and-control capability for Shuttle missions orbiting classified payloads.

Air Force officials make it clear, however, that there is no intention or requirement to put weapons aboard the Shuttle. One major objective, though, is the improved survivability of space-based systems.

With the establishment of Vandenberg as a second Shuttle launch center, the nation will have achieved a major goal: the security provided by the "redundancy" of the second center. ("Redundancy" is an objective found frequently in the Air Force's space program.)

When the launch complex at Vandenberg becomes operational, DoD officials will breathe easier. There has been the possibility—no matter how remote—of the loss of the single Shuttle launch capability at Kennedy Space Center through natural disaster or hostile act.

Vandenberg Launch Site

Vandenberg AFB in California has had a long history of military space-related activities, with more than 1,500 unmanned launches having taken place from the promontory on the southern California coast.

During the late 1950s, missile testing began at Vandenberg in earnest, initiating the base as test site for the nation's ICBM arsenal. Air Force combat missile crews are still trained there.

Currently, work on strategic systems is continuing, with Martin Marietta Aerospace developing facilities for the assembly and test of the new MX missile, with test launches scheduled from next year through mid-decade.

The planned Shuttle pad at Vandenberg, Space Launch Complex 6 (or "Slick Six"), was built originally in the 1960s for the Air Force Manned Orbiting Laboratory, a project canceled in 1969 because of the money crunch.

Because of its background and existing facilities, Vandenberg was the logical choice when it was selected in 1972 as the west coast launch site for the national Space Transportation System. Once operational—with the first Shuttle launch from there now scheduled for 1985—Vandenberg will make possible scientific exploratory and DoD-related Shuttle missions requiring high-inclination or polar orbits.

These types of missions are impractical from Kennedy Space Center because of weight restraints and potential hazards to safety, trajecting as they would over North America and its populated areas. NASA and Air Force planners envision a moderate growth rate to at least ten Shuttle launches per year from Vandenberg as the program matures, depending on mission requirements.

According to officials, about seventy percent of Shuttle ground support and procedures is being adapted from those developed at Kennedy Space Center, with USAF's 6555th Aerospace Test Group there acting in a technical liaison role.

As planned, none of the four (or hoped-for five) planned Orbiters will be "stationed" at either Vandenberg or Kennedy. All will be capable of launch from either site. Again, this provides redundancy of operation. In any event, if not landing at Vandenberg, the Orbiters will arrive there in the now-familiar "piggyback" style aboard a 747 transport.

Under the supervision of the Air Force's Space Division, construction at Vandenberg includes lengthening the runway from 8,000 to 15,000 feet; modifying Complex 6 buildings and facilities; developing payload preparation rooms; and constructing Orbiter maintenance and checkout facilities, among other things.

One huge edifice under active consideration for which there is no counterpart at KSC is a giant weather shelter to protect the Shuttle on its launch pad from the strong winds prevalent in the area. Architectural and engineering companies are being surveyed for one that could handle a project of that size. The estimated cost: about $40 million.

The total Air Force outlay to pre-

Aerial view of the massive construction being undertaken at Vandenberg to provide a second national Space Transportation System launch site. About seventy percent of ground support and procedures is being adapted from those developed for Shuttle launches from KSC in Florida.

pare Vandenberg as the west coast launch site for the national Space Transportation System is an estimated $2.5 billion, although inflation and underestimated costs—not unusual in projects of this magnitude—could nudge the final price tag upward.

On launch, the Shuttle's solid rocket boosters will be jettisoned and parachuted into the Pacific about 150 miles from Vandenberg. They are to be recovered and towed to Port Hueneme, about ninety miles south of the base.

Because of topography, Shuttle processing has been divided north and south on the base. Orbiter checkout and maintenance is to be performed at the base's northern Shuttle complex, adjacent to the runway. In the southern area is the launch pad and associated facilities. The expendable external tanks will arrive there by NASA ocean-going barge from the manufacturer in Louisiana via the Panama Canal.

According to officials, launch preparations at Vandenberg are to differ sharply from those at KSC, with boosters and fuel tank being joined vertically on the pad. The Orbiter is to be towed horizontally over the fourteen miles that separate the north and south complexes. Then it will be raised vertically to be joined to the other elements. The payload will then be inserted into the cargo bay.

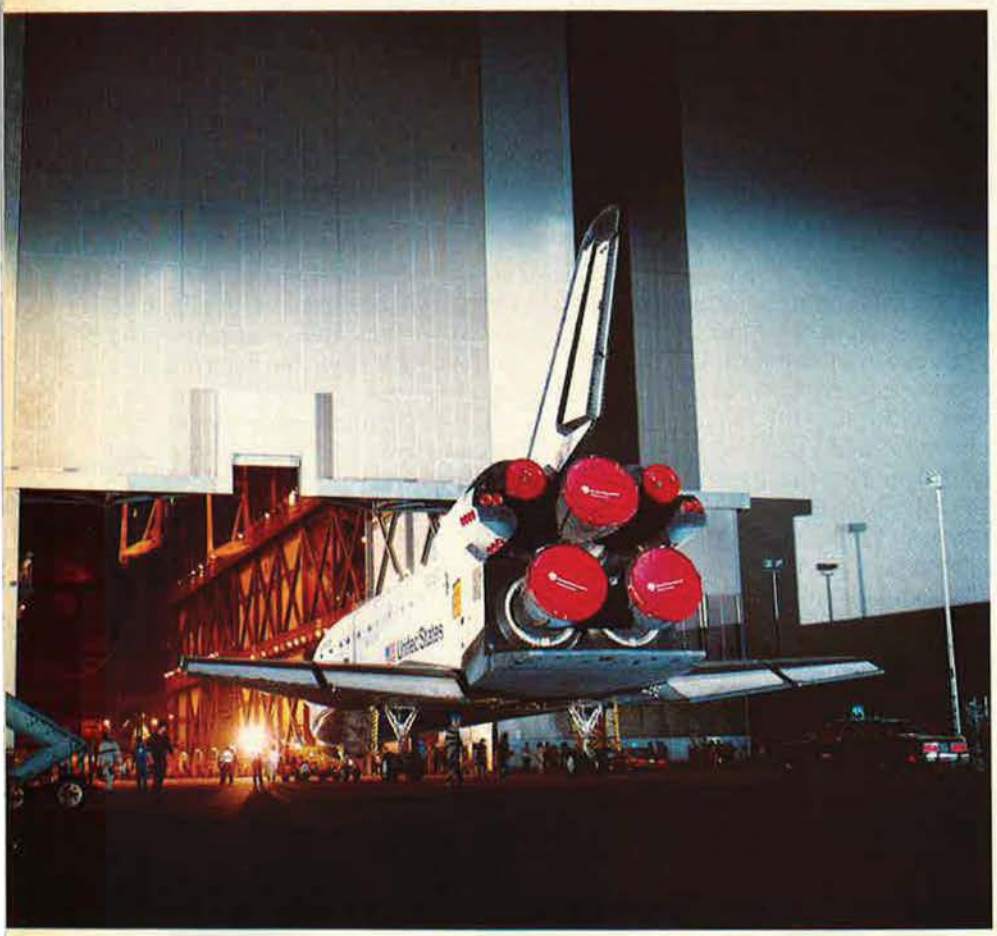
The payloads are to arrive at Vandenberg from whatever sources and be prepared and inspected for launch in the Payload Preparation Room near the launch pad and moved to the Orbiter via Mobile Payload Changeout Room.

But the preparation of facilities at Vandenberg to provide USAF with Shuttle launch-and-control capability is but one aspect of the program. Others are training the people and developing essential associated hardware.

Space Support Group

The Manned Space Flight Support Group (MSFSG) was set up at

Above, a southerly view from Orbiter Columbia *reveals a small portion of the vehicle's aft section and the fifty-foot-long, Canadian-built remote manipulator system arm. The Mediterranean Sea is at the right foreground and other areas of the Mideast can be identified. Below,* Columbia *enters the Vertical Assembly Building at KSC for mating with solid rocket boosters and external tank. At Vandenberg these components will be joined vertically on the launch pad.*



NASA's Johnson Space Center in Houston, Tex., in June 1979. It reports directly to Space Division, and blue-suiters and Air Force civilian employees assigned to it have the mission, in a nutshell, of learning how to launch and control Space Shuttle flights.

They'll be key personnel when Shuttles with classified military payloads in their cargo bays start lifting off the pad at Vandenberg in October 1985. Their areas of study have been broken down into three categories within the MSFSG's Directorate of Flight Support and Training: flight planning, flight readiness, and flight control.

In the first, the "detailees" are becoming familiar with all facets of a Shuttle flight—including designing the entire launch trajectory, orbital operations, and Orbiter reentry and landing. This entails such nuts-and-bolts essentials as how much fuel, water, electrical power, and support equipment will be required to conduct a particular Shuttle mission that could span a few days or last weeks.

NASA professionals have also pitched in to acquaint Air Force counterparts with the second area of expertise—flight readiness. Eventually, these blue-suiters will be assigned as astronaut flight controllers at the Consolidated Space Operations Center (CSOC) being built at Peterson AFB near Colorado Springs, Colo. Among other things, they'll be tasked with the mission-specific training of Shuttle flight crews composed of astronaut pilots and mission specialists. (The plan is for all mission specialists to receive some flying training or "stick time" in the rear seat of a trainer at JSC. This is to give them at least a chance at bringing an Orbiter home should the mission commander and pilot both become incapacitated. Other touches of astronaut training will include exposure to G forces.)

The third essential activity—flight control—is preparing blue-suiters to monitor, analyze, and, if required, correct failures in the scores of subsystems aboard the Shuttle. They are specializing in ground data systems; guidance, navigation, and control; propulsion systems; operations command; auxiliary power; communications;

thermal systems; flight computers; and Shuttle element interfaces.

The MSFSG, in addition, advises Space Division's office charged with acquiring the wherewithal of mission control—equipment and facilities. The Group, uniquely situated at JSC, provides liaison with NASA officials helping to meet DoD's needs in terms of command and control, security, payload integration, and facilities.

In addition to the MSFSG staff, other Air Force, Army, Navy, and Marine Corps people are assigned as detailees to NASA as astronauts, astronaut trainees, and in other specialties in preparation for Vandenberg Shuttle launches.

In another aspect of the "redundancy" theme, by the late 1980s the Air Force's Consolidated Space Operations Center will provide DoD with its own mission operations control center that will be a functional duplicate of NASA's "Mission Control" at the Johnson Space Center in Houston. The cost to USAF in CSOC construction: about $100 million.

Thus, there will be a backup launch control center should either be put out of operation by enemy action or natural catastrophe. The CSOC will combine two major Air Force responsibilities: DoD satellite control as well as directing DoD Shuttle operations.

Again, redundancy. DoD satellite control is currently conducted via the seven worldwide remote tracking stations linked with the Satellite Test Center at Sunnyvale AFS, Calif. The computer hardware and system architecture at Sunnyvale are being modernized to better handle the increased volume of space traffic expected into the next century. The CSOC and Sunnyvale will complement each other in the control of satellites, officials said.

The working relationship between the CSOC and Vandenberg will be similar to that of Johnson Space Center and KSC. Upon liftoff from Vandenberg, control of all mission functions, including satellite orbital placement, will pass to CSOC.

Peterson AFB was chosen as site of CSOC for a number of reasons: its proximity to the Space Defense Operations Center of NORAD's Aerospace Defense Command at Cheyenne Mountain; the Aerospace Data Facility at Buckley ANGB in Denver; supporting contractors in the area; and the area's academic assets. SPADOC will enable CSOC to link into the existing space surveillance and warning structures.

The 6555th Test Group and the IUS

The 6555th Aerospace Test Group at Cape Canaveral AFS and KSC in Florida is a much more dynamic organization than its straightforward moniker would imply. In effect, representing Space Division, it provides technological liaison between KSC and the ongoing activities at Vandenberg—and a lot more besides.

This official pronouncement sums it up: "In addition to launching missiles from the Cape, the 6555th Aerospace Test Group's role in space launch systems has been expanded to include the assessment of Space Shuttle development, test, and operations activities at KSC in support of DoD payloads, and the transfer of technical lessons learned to Space Division for incorporation into the design of Vandenberg AFB Space Shuttle facilities." That's a tall order.

During the four test launches of the Shuttle from KSC, the 6555th was the lead Air Force organization working with NASA in the ground-operations phase. This included all ground processing directly associated with the launches, Orbiter refurbishment following the mission, and solid rocket booster retrieval and refurbishment.

The Group was instrumental in gathering data for a DoD assessment of Shuttle capabilities and limitations—items that would be essential to know for the coming Vandenberg launches. These included a determination of launch site adequacy, ground processing timelines, and—a major factor in DoD terms—overall system security.

Another objective in working with NASA technicians was to acquire experience in both Shuttle hardware and computer software systems and procedures. To this end, Group team members held posts in the nuts-and-bolts side of the Shuttle operation at KSC: the Orbiter Processing Facility, Vehicle Assembly Building, Launch Control Center, and Launch Pad 39A. Another essential factor—safety—was not overlooked, with a number of Air Force specialists serving in training and familiarization at KSC.

With training concluded, these blue-suiters will be the nucleus of the Air Force Shuttle operations team at Vandenberg.

But that's not all. The Test Group has borne Air Force responsibility for the development of two essential types of hardware related to the Shuttle. Under Air Force funding, the Inertial Upper Stage (IUS) will be an integral part of the national Space Transportation System. USAF has invested about $700 million developing the IUS.

The IUS is a solid-fueled system to boost both civil and military payloads from the Shuttle's low earth orbit to higher orbits. From the outset, the IUS was designed for high reliability through redundancy of electronic systems. The IUS also will be capable of launching spacecraft into interplanetary trajectories.

The first such system—IUS-1—was rolled out at Boeing Aerospace Co.'s plant in Washington State just this past summer. IUS-1 is scheduled to boost NASA's first Tracking and Data Relay Satellite System (TDRSS) into geosynchronous orbit soon after the new year. The IUS will be carried into orbit aboard Orbiter *Challenger,* launched from KSC.

"You can almost consider the IUS a spacecraft," said Col. Frank J. Redd, Assistant Deputy Commander for Launch and Control Systems Acquisition. "It switches automatically from one system to another if a fault is detected. The parts are the most reliable ever developed for unmanned space application." At least one backup system exists for each of IUS's critical systems—from its electric power buses to its antennas.

To demonstrate the thoroughness of the 6555th's Test Group's preparations, IUS-1 joins an identical nonflight vehicle—called a pathfinder—already serving as a stand-in during launch-site activation and checkout at KSC. The real IUS will undergo final testing before being joined with its TDRSS payload.

The IUS will also act as the upper

stage aboard the new launch vehicle, USAF's Titan 34D, the second major STS hardware program sponsored by the Air Force and shepherded through development by the 6555th Test Group. The last of the Titan series, the 34D will provide supplementary—and redundant—launch capability until the national STS is in full operation. But as an indication of Air Force and NASA's current faith in the Shuttle, funds are to be deleted from future Air Force budgets for continued Titan 34D production. In any event, first launch of the 34D is scheduled for later this year, and the latest Titan derivative is expected to be in use through 1985.

The Public Affairs Issue

Well before the event—that is, the launch of a classified DoD payload aboard the fourth Shuttle flight—a potential problem area was recognized and steps taken to defuze it.

In the normal course of events, Air Force Public Affairs personnel are gatherers of facts and conveyors of information. Rarely are they involved in formulating high-level policy. With the advent of DoD payloads aboard the Shuttle, they did just that.

Since its inception, NASA has always allowed open and unrestricted public access—within reason—to the information it was developing. In fact, under its charter as a research and development organization to exploit space technology for human benefit, the space agency was obligated to do so. Thus, there was potential for a clash in joint space activities with DoD, with the latter's responsibility for national security.

The problem was how best to keep the public informed while protecting national interests and security.

A team led by Air Force Public Affairs Director Brig. Gen. Richard F. Abel hammered out such a policy with its NASA counterparts, leading to an "excellent accommodation," reports General Abel.

There will be a Memorandum of Understanding setting basic guidelines and a specific plan for each Shuttle mission carrying DoD payloads. "Each such mission will have its own characteristics involving political, policy, and safety aspects that must be addressed," commented General Abel. "We'll prepare a security plan some two months before a specific mission is scheduled for launch."

In another security matter, NASA is directly responsible for the security clearances of its astronauts and mission specialists. The Air Force will assign its own payload specialists to Shuttle missions involving classified payloads.

For its part, the Air Force is financing security modifications at both the Johnson and Kennedy Space Centers and at Goddard Space Flight Center in Maryland, hub of NASA communications. "The objective," commented General Abel, "is to apply an umbrella security approach to protect the integrity of DoD missions." This extensive modification program, financed by USAF, carries a multimillion dollar price tag.

The Future Is Now

"It so happens," said Brig. Gen. (Maj. Gen. selectee) Bernard P. Randolph, "that this year marks the twenty-fifth anniversary of space exploration. If you reverse the last two digits of the year you get 1928, which happened to be the twenty-fifth anniversary of powered flight. In 1928 aviation was still in its infancy, as we believe the Space Age is today.

"But we've come far and fast already," said General Randolph, Air Force Director of Space Systems and Command Control and Communications, "and exciting things are already on the drawing boards. Previously, costly expendable satellites were used for both military and civilian on-orbit missions. Now, the Shuttle can provide relatively economic and routine two-way access to space."

Additionally, "perhaps right around the corner is a spacecraft that could take off conventionally from a runway and achieve orbit," General Randolph said.

"Although not yet approved, NASA is planning and working toward a manned space platform that, like the Shuttle, can serve both civil and military needs," General Abrahamson said. "Several design concepts have been put forward but at this point the primary emphasis is on missions—what it could do that satellites and the Shuttle can't. NASA has released a series of mission analysis studies to potential contractors who are now coming up with their own creative thoughts on missions, such as materials processing and the creation of new medicines," General Abrahamson added.

With the Shuttle proven, NASA officials are studying several classes of "Shuttle-derived vehicles" as next-generation space cargo carriers based on STS technology. One, the SRB-X, would use various combinations of the Shuttle's Solid Rocket Booster for expendable, unmanned launches into low earth orbit, but with recoverable major elements.

One such combination would be able to achieve geosynchronous orbit, unlike the Shuttle. The derived vehicles could provide commercial economies in that they wouldn't have to haul the equivalent of full Shuttle payloads.

Contracts for studies on several of these concepts have already been awarded.

There also are technology advances expected from the European and NASA jointly sponsored Space Laboratory, being readied for flights aboard the Shuttle.

The Air Force got its organizational ducks in a row in September with the establishment of the new Space Command, headquartered at Peterson AFB in Colorado. "With space having grown up all around us," said Brig. Gen. John H. Storrie, Director of Space at Hq. USAF, "an umbrella organization was needed to manage more effectively the diverse resources that are currently the responsibility of a number of Air Force organizations such as AFSC, SAC, and Space Division." Over the near term, the new command is to be developed into a unified command.

Commanded by Gen. James V. Hartinger, who is also Chief of the Aerospace Defense Center, Space Command will consolidate Air Force operational space activities and provide a link between space-related research and development and operational users, among other things. General Hartinger's deputy is Lt. Gen. Richard C. Henry, currently also Commander, Space Division. ■

"Ears, Right!"

YES, E·A·R™ division cabot corporation
7911 zionsville road • indianapolis, indiana 46268
I want to set my ears right. Send me free samples of E-A-R Plugs.

Name_____

Address_____

City_____ State_____ Zip_____

Description for ordering from military stock:
NSN 6515-00-137-6345
PLUGS, EAR, HEARING PROTECTION,
UNIVERSAL SIZE, YELLOW, 400's.

☐ Active ☐ Guard
☐ Reserve ☐ Other

With E-A-R hearing protection.

These unique earplugs fit almost any size ear canal. They've been so successful in attenuating noise that they've become *the* standard for industrial hearing protection. Perfect for reducing noise on submarines, trucks, helicopters, armored vehicles, airplanes, etc.

Clip the coupon and send for free samples. E-A-R® foam ear plugs are available through Military Procurement under National Stock Number 6515-00 137 6345.

E·A·R™ division cabot corporation

7911 zionsville road • indianapolis, indiana 46268
telephone (317) 872-1111 twx: 810-341-3412

Domestic stresses and uncertainty regarding Philippine relations with the US after Marcos have cast a new light on the status of US bases there. In approaching the problem of defending the Pacific we must . . .

Keep Our Options Open

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

Twenty-one years ago Douglas MacArthur went back to the Philippines for one last visit. If he had been the Messiah, there could scarcely have been more commotion. One million Filipinos squeezed into Manila's Luneta Park to catch a glimpse of the man in the famous scrambled-egg khaki cap as he reviewed a seemingly endless parade.

That night there was a dinner at Malacañang, the presidential palace. In the tropical setting of that splendid mansion on the banks of the Pasig River, MacArthur rose to speak after the Philippine president had had his oratorical fling. The old man, standing there in the candlelight, began softly in that marvelous actor's voice, "As I stand here tonight, the ghosts of friends of former years pass before my eyes."

He then proceeded to name the heroes of the Philippines, pausing ever so slightly when he got to Arthur MacArthur, his father. It was a masterful performance, and MacArthur left on that note. He could have had anything that night, just for the asking, whether a new base agreement or the presidency of the Philippines. Well, those days, along with Douglas MacArthur, are a part of history. The present is a different proposition.

The visit of President Ferdinand Marcos to the United States in September came at a time when Lebanon had riveted Washington's attention. And if that were not enough of a distraction, while Marcos was in town our longtime NATO pillar, Helmut Schmidt, began to topple. It was all symbolic of the way Pacific Ocean concerns have been displaced to a dusty pigeonhole in the years since Vietnam. Nonetheless, the Marcos visit did focus some attention, if only briefly, on the Philippines and our interests there.

Since it is now generally accepted that the earth is round, the bases on Luzon just north of Manila—Clark and Subic—have taken on a new importance in recent years, along with Soviet preemption of Cam Ranh Bay. Clark AB, which began as Fort Stotsenberg during the American venture into colonialism, is hardly justifiable on the basis of Philippine defense.

The only credible threat to the Philippines these days is an internal one, spurred on by economic distress. Added to that is the general ungovernability of a nation made up of more than 7,000 islands, ninety-some languages, a permanently dissident Moslem minority, and an ethnic predilection toward violence.

There are, in short, serious difficulties in the Philippines, and while they have nothing to do with the justification of American bases there, they might have a lot to do with the future of those bases. It all depends on where the Republic of the Philippines is headed after President Marcos, who is, like the rest of us, mortal. Succession to dictatorship is always a question, and while President Marcos denies his seventeen-year rule has been a dictatorship, it bears a strong resemblance to one. Whatever it is, in all fairness, it was needed; the Philippines were headed down the chute when he took over. What comes after Marcos, then, is a question the planners must take into account in plotting the long-term importance of the Philippine bases.

To get back to the round-world thesis, Clark offers an alternate staging point to the Mideast if Europe and the Mediterranean are closed to us. Judging from our experience in the Yom Kippur War, this is by no means unlikely in the event the United States has ever again to ride to Israel's rescue. The trouble with Clark, however, lies in the increasing divergence of United States and Philippine views toward the Mideast. Clark may not be any more usable in support of a Mideast contingency than, say, the bases in Spain, and for identical reasons.

Not that there is any hurry about it, but it may be time to start looking around just in case future Philippine terms are too tough to accept. The Pacific is a vast ocean, as those who have flown around it very well know, and picking places on a map can be deceptive. It is hard to beat the Philippines for a southwestern Pacific location, all things, including the enormous investment, considered, but there are alternatives.

The Marianas, for instance, are on course to the Persian Gulf. Guam has a fine air base, and the territory is ours. With tanker support, transports and fighters could wave to the Philippines as they went by. Perhaps Tinian in the same island chain is a possibility. Kadena AB on Okinawa is operating under Japanese restrictions nowadays, a far cry from the time when Okinawa was a US bastion, but there is no reason to believe there is any threat to our tenancy.

We don't often think of Australia, but there remains a strong bond. Darwin, then, might be a possibility.

SEATO is dead, buried, and largely forgotten, all of which is too bad considering the gloomy state of affairs in the world at large. For while SEATO never really amounted to much—and the putative SEATO enemy, Red China, is now everybody's pal—that John Foster Dulles creation did provide a basis for military cooperation, along with some useful real estate. That, however, is looking back, a waste of time in the planning business.

The Pacific has been out of the news in recent years and thus, presumably, largely out of mind in the Pentagon. In that building, current fires are the ones you put out. But the United States has at least as much interest and certainly as much at stake in the Pacific as in Europe. There is the same adversary there, the same competing interests.

The Philippine bases are thus extremely important, but they are not irreplaceable. The Air Force of the 1980s has far longer legs than the one twenty years ago. Both sides should remember this the next time Clark AB comes up for negotiation. ■

AIRMAN'S BOOKSHELF

Into the Abyss

Forged in Fire, by DeWitt S. Copp. Doubleday & Co., New York, N. Y., 1982. 528 pages, with photographs and index. $19.95.

World War II was the most cataclysmic event of this century. For those directly involved, the war provided high adventure and pathos, a time of crowning achievement and abject failure.

DeWitt S. Copp has attempted to meld the best of all approaches in this story of the strategic air war over Europe from 1940 to 1945. His new book, *Forged in Fire,* is essentially three intertwined themes. First, a broad survey of the strategic bombing effort in the European theater; second, the drama of the quest for American airpower and the recognition of airpower as an independent military force; and third, and most importantly, the book is a biographical look at the men who developed American airpower and took it into the abyss of total war.

When Germany invaded Poland in September 1939, airpower was the newest and poorest relation of the American military establishment. American airmen had spent the prewar years hammering out a doctrine of strategic bombardment despite limited interest by the nonflying Army, hostility from the Navy, and dissension among the flyers themselves. These American disciples of Douhet and Mitchell believed the destruction of an enemy's industrial web by strategic bombing would destroy that enemy's will and ability to wage war. Each believed such a bombing campaign would be decisive.

In theory, such strategic airpower should force any enemy to capitulate and avoid the bloodbath of surface combat. The theory, however, could only be proven in the cauldron of total war.

The story of the strategic bombing campaign in the European theater was one of frustration, experiment and change, diversion, and many failures. Overall, however, it is the story of constantly increasing pressure on the enemy and eventual thundering success. Frustration came in the form of agonizingly slow deliveries of aircraft and trained crews and the political pressure to use these meager forces piecemeal. Plans changed often, as new attempts were made to identify the critical points of the German war economy.

Bombing advocates were outraged when their resources were diverted to nonstrategic objectives by those who did not understand the potential decisiveness of strategic bombing. In the long run, though, the pressure of strategic bombing steadily increased to devastating proportions.

The author has done an exceptional job putting these diverse themes together. His anecdotal style, slightly reminiscent of the late Cornelius Ryan, weaves a highly detailed tapestry depicting the men who directed the bombing campaign. We see Ira Eaker in England struggling to build his forces, to train his crews, to find the best tactics, and to keep the strategic forces concentrated on strategic targets. We read Eaker's messages to "Hap" Arnold in Washington pleading for and demanding a speedup in the delivery of planes and crews. Meanwhile, Arnold struggled with competing global priorities, an often hostile Army and Navy, and a mercurial President.

These men, and such others as "Tooey" Spaatz, Frank Andrews, Curtis LeMay, "Monk" Hunter, Laurence Kuter, and "Possum" Hansell, had much at stake. First, of course, was the war itself, a life-and-death struggle against a clearly defined evil. Professionally, each believed that airpower and the long-cherished dream of an independent Air Force was on trial. Finally, on a personal level, these men were responsible for the bombing doctrine that would put young American men in harm's way.

Forged in Fire captures this personal drama but never loses sight of the larger drama of the war itself. Nor does Copp overlook the British in this story. The reader sees the American airmen struggling to maintain the concept of daylight precision bombing while "Bomber" Harris and Churchill argue for night area bombing.

Forged in Fire should have both wide appeal and historical value. Historians will find Copp's research thorough and his interpretations well founded. Military officers will appreciate the difficulties and frustrations encountered by the central characters.

Forged in Fire is the second volume by the author concerning the history of US airpower, the first being *A Few Great Captains.* Together, these volumes form a continuous historical account. One can only hope that a third volume taking the story through the independence of the Air Force will be forthcoming.

—Reviewed by Lt. Col. Dennis M. Drew, Air Command and Staff College.

Birds of Prey

The Eagles' War—The Saga of the Eagle Squadron Pilots 1940–1945, by Vern Haugland. Jason Aronson, Inc., New York, N. Y., 1982. 234 pages with appendices, index, and photographs. $17.95.

"Restlessness, frustration, and love of flying seemed to be the main reasons for going to England. Or maybe it was a reach for personal glory, perhaps to show others just who the hell we were."

The "we" were the young American pilots who joined the RAF prior to the bombing of Pearl Harbor and the subsequent American entry into World War II.

This book's predecessor, *The Eagle Squadrons (reviewed in the December '79 issue of* AIR FORCE *Magazine),* told the story of Eagle Squadron recruitment, training, and activities in the RAF from 1940 to 1942. In *The Eagles' War,* author Haugland continues the tale to include the absorption of the three Eagle Squadrons into the USAAF and their contri-

butions that helped lead to the Allied victory in Europe.

The first part of the book, entitled "RAF," contains brief biographies of many of the young Americans. Haugland's treatment of the numerous shifts in location by the three squadrons is sometimes confusing and disrupts the flow of an otherwise smooth narrative.

The remainder of the first section contains some fascinating firsthand accounts of the air battles. Pilot remembrances are vivid and provide interesting, suspenseful reading. One problem confronting the young pilots was learning to handle aircraft much larger and more complex than those to which they were accustomed. As evidenced by the numbers of accidents and aborted missions, the Eagles's "baptism by Hurricane and Spitfire" was anything but smooth.

By the time of America's involvement in the hostilities, the pilots of Squadrons 71, 121, and 133, the Eagle Squadrons, had completed on-the-job training and had developed into highly capable aerial warriors.

The USAAF then decided that the Eagles should be formed into a new unit of the Eighth Air Force, the 4th Fighter Group. Gen. Carl "Tooey" Spaatz, chief of the US air forces in Great Britain, recognized the experience the Eagles had acquired and wanted to transfer Eagle flight commanders to new American units bound for England. Squadron Leader Chesley "Pete" Peterson did not agree, and threatened to keep the Eagles in the RAF if Spaatz's plan was implemented. A compromise was finally arrived at whereby pilots and squadron commanders would be transferred out of the 4th Fighter Group individually or in small groups, rather than en masse.

This proved to be very effective in making the most of the Eagles's combat experience. The new American units benefited from the leadership pool, and the 4th Fighter Group went on to become the top-scoring American fighter unit in World War II, claiming 1,016 enemy aircraft.

The remainder of Part II, entitled "USAAF," contains firsthand accounts of combat, with many of the pilots crediting the P-51 Mustang for turning the tide of the air war. The Mustang's fuel capacity and combat capabilities at both high and low altitudes allowed deep penetration of enemy territory.

One of the most fascinating anecdotes concerns the internment of several Eagle pilots in neutral Portugal. During their limbo in Lisbon, the Americans became friendly with several German pilots, as camaraderie transcended national loyalties. The Germans informed their new friends that the ship the Americans had been ordered to board for England was to be bombed by the Luftwaffe. The Americans heeded this warning and refused to board. The ship *was* attacked, and the Americans were subsequently court-martialed but received only light sentences.

The Eagles' War is history spoken by those who lived it and captures the emotions and excitement of the period.

—Reviewed by Edward J. McBride, Jr., Editorial Assistant.

New Books in Brief

East European Military Establishments: The Warsaw Pact Northern Tier, by A. Ross Johnson, Robert W. Dean, and Alexander Alexiev. Recent Western military thinking has postulated a Warsaw Pact move against NATO using forces in place with little or no prior reinforcement, and thus no warning. If this scenario is credible, Western military thinkers would do well to study this comprehensive examination of the military establishments of the three Warsaw Pact Northern Tier states—East Germany, Poland, and Czechoslovakia. The book does not focus on the respective national military establishments as military forces—rather, it analyzes their functions and roles as institutions within each nation and within the Warsaw Pact. The authors' various conclusions as to the effectiveness, utility, etc., of each national military force are sometimes self-evident—and sometimes surprising and frightening. With charts, glossary, appendices, notes, and index. Crane, Russak & Co., Inc., New York, N. Y., 1982. 200 pages. $19.50.

Great Battles on the Eastern Front, by Col. T. N. Dupuy, USA (Ret.), and Paul Martell. This highly detailed book attempts to give the Western reader an idea of the vast scale of war on the Eastern Front between the Wehrmacht and the Red Army in 1941–45—a war fought with more weapons, more men, and over more area than any other war in history. The authors contend that the German forces more than outclassed the opposing Soviets, and but for a few strategic blunders by Hitler—and the Soviet advantages of weather, a larger manpower pool, and space—might have defeated the Soviets. The superb performance of the German military was not lost on the Soviets, the authors point out, as evidenced by their postwar military literature and the Soviet campaign into Manchuria in 1945. With maps, tables, and appendices. The Bobbs-Merrill Co., Inc., New York, N. Y., 1982. 294 pages. $14.95.

The History of Dive Bombing, by Peter C. Smith. Though the era of dive bombing may have passed with the advent of sophisticated electronics, dive bombing was at one time the most precise, if dangerous, form of aerial bombardment. The author covers the history of dive bombing through firsthand accounts by and interviews with the men who created, pioneered, and practiced this form of aerial warfare. While not a comprehensive history, this book partly fills a gap in the air combat literature. With illustrations, notes, bibliography, and index. Nautical & Aviation Publishing Co., Annapolis, Md., 1981. 253 pages. $17.95.

Practice for Air Force Placement Tests, by E. P. Steinberg. This is a revised and updated edition of one of the Arco series of military placement test tutor handbooks, designed to help the aspiring airman prepare for the Armed Services Vocational Aptitude Battery, the entry and placement test required by the Air Force. The handbook includes three sample tests and study chapters covering mathematics, word knowledge, reading comprehension, automotive knowledge, and electronics. This book would make an excellent gift for youngsters planning on an Air Force career. Arco Publishing, Inc., New York, N. Y., 1982. 266 pages. $6, paper.

When Tigers Fight, by Dick Wilson. A theater of World War II often glossed over or ignored in accounts of the war, the Sino-Japanese War that began in 1937 pitted the two giants of Asia in savage combat, exceeded perhaps only by the fierce fighting on the Eastern Front in Europe. The struggle was a mismatch from the beginning—one nation modern, technological, and militaristic; the other steeped in past cultural glory, huge in population, and straining under revolutionary struggles. From the Marco Polo Bridge incident in 1937 to the Japanese surrender in 1945, author Wilson has produced a well-researched and fast-paced account of a war whose effects are felt throughout the world to this day. With illustrations, notes, and index. The Viking Press, New York, N. Y., 1982. 269 pages. $16.95.

—Reviewed by Hugh Winkler, Ass't Managing Editor.

THE BULLETIN BOARD

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

Benefits for Former Military Spouses Passed

"I'm very proud of this legislation. To me it's a tangible recognition of the importance of the military spouse to the quality of the member's service. The military spouse also serves—we always say that, but this law backs up our words with action."

This was Rep. Patricia Schroeder's (D-Colo.) summation when she was asked by AIR FORCE Magazine to encapsulate her feelings about the recent passage of the "ex-spouse benefits bill," actually passed as an amendment to the DoD FY '83 Authorization Bill, that mainly reflected her efforts.

Many, many military people and retirees do not share Representative Schroeder's euphoria about this legislation. But it now is the law of the land—effective February 1, 1983. Thus, it is of interest to examine what it does—and does not—do. *(See related item, January '82 "Bulletin Board".)*

In brief, what it does is to overturn the McCarty Supreme Court decision and allows state courts, in ruling on divorce proceedings, to consider military retirement benefits as marital property. What it doesn't do, as some have feared, is award automatic entitlement of retired pay to ex-spouses—although, as opponents have pointed out, the effect might be the same.

Important features include:

- States may treat military retired pay in divorce cases the same way other pensions are addressed by state domestic relations law.
- Courts must certify that any disposition ensures the rights of the service member as guaranteed by the Soldiers and Sailors Civil Relief Act—*e.g.*, if a member is unavailable because of military duty, due notification must be made to him/her of pending action.
- Courts with jurisdiction to divide up retired pay must be those of the member's state of residence other than those of the state of military assignment, the member's legal domicile, or a state consented to by the service member.
- Reopening of prior divorce settlements is not allowed, but modification of post-McCarty decrees is.
- An ex-spouse may garnishee a portion of the member's retired pay to satisfy a court award of property other than retired pay, *e.g.*, from sale of home or stocks.
- Members may voluntarily assign SBP to ex-spouses under the legislation, but courts may not direct such action.
- Continued military health, commissary, and exchange benefits for all unremarried former spouses whose divorces become effective after the date of the bill's authorization if she/he was married to the service member during twenty years of active-duty service (and, in the case of health benefits, is not covered by an employment health plan).

Protection for the service member includes: The total amount of retired pay made available to satisfy valid court orders cannot exceed fifty percent; ex-spouses gain no "right, title, or interest" in retired pay that can be sold; and the courts cannot direct a service member to retire at a certain time in order to create a retired pay resource.

Rumblings from military people, especially careerists and retirees, are just beginning to build in reaction to this legislation which, in an unusual move, was offered and passed as an amendment from the floor during debate on the Authorization Bill, thus precluding further hearings. It's a sure bet that military and retiree constituents displeased with this action will be making strong overtures to their congressional representatives to take another look at this in next year's Congress.

Doggone Good Team

"Doolie," a military working dog assigned to Eglin AFB, Fla., recently sniffed his way to first place honors at the US Canine Association Championships, held at Patrick AFB, Fla. Both military and civilian dogs competed.

His handler, SSgt. Jack E. Rush *(see photo)*, formed the other half of the team that produced 100 percent accuracy in finding seven different types of explosives during the contest. Doolie breezed through the three major preliminary contests—Patrol (basic obedience), Agility, and Criminal Apprehension—on his way to victory in the final Bomb Detection Evaluation.

Considered to be just entering his prime as a "bomb sniffer," the six-

The winning team of SSgt. Jack Rush, of Eglin AFB's 3201st Security Police Squadron, and bomb-sniffing "Doolie." See item. (USAF photo by 2d Lt. Charles West)

Newly Designated Uniformed-Services Medical Facilities

Hospitals
- Wyman Park Health Systems, Baltimore, Md.
- Brighton Marine Public Health Center, Boston, Mass.
- Hospital of St. John, Nassau Bay, Tex.
- Seattle Public Health Hospital, Seattle, Wash.
- Bayley Seton Hospital, Staten Island, N. Y.

Outpatient Clinics
- Lutheran Medical Center, Cleveland, Ohio
- St. Mary's Hospital, Galveston, Tex.
- St. Joseph Ambulatory Care Center, Houston, Tex.
- Family Practice Center, Port Arthur, Tex.
- Coastal Health Services, Portland, Me.

For additional information, contact the health benefits advisor at one of these facilities.

year-old Doolie has been a military working dog for five years. Sergeant Rush has been with him for the past year, during which time the pair was called to Clearwater, Fla., to ensure on-site clearance of explosives before a visit by Vice President George Bush.

Doolie and Sergeant Rush perform as a true team, and no one else can take the dog out while they are assigned together. As an old saying in the Air Force Security Police field goes, "a dog's feelings travel up and down the leash." The official Air Force regulation on the employment of dogs, AFR 125-5, puts it another way: "People react to what they think the stimulus means. Military working dogs simply react to the stimulus and let their handlers decide what they mean."

Obviously, as this competition proved, Doolie and Sergeant Rush make a "doggone good team!"

CHAMPUS Users Get Alternatives

Ten cities across the country *(see box)* now offer an alternative to military members, their families, and retirees who might otherwise have to use CHAMPUS for nonemergency, inpatient health care.

This has been effected by the government's designation of former US Public Health Service Hospitals or Clinics (earlier turned back to private sector management as part of the Administration's budget paring) as Uniformed Services Medical Facilities (USMF). Even though these USMF sites are now under nonfederal sponsorship, DoD officials have declared that using the facilities is the same as using military hospitals or clinics.

Under this direct-care system, the only cost to the user will be $6.30 per day for inpatient care. There is no charge for outpatient care. The service of assignment of the member, retiree, or dependent, will be billed for the remainder of the cost.

These former USPH facilities are located in areas with a heavy concentration of potential CHAMPUS users. DoD health officials said beneficiaries must normally use one of the facilities if they live within a forty-mile radius of it.

Santa Time Again

This is the busy time for Santa's helpers, and the personnel at MAC's Detachment 2, 11th Air Weather Squadron, Eielson AFB, Alaska, are gearing up for their annual volunteer stint.

Since 1954, Santa's Mailbag Program, sponsored by the Squadron, has brought good cheer to thousands of children all over the world who have received a letter from Santa, complete with North Pole postmark. How does it work? Children write a letter to Santa Claus and relatives or friends answer the letter as if it were from the old gentleman himself. Then, the Santa reply is sent, inside a stamped envelope addressed to the child, to the Detachment, zip 99702. The answers are returned with Santa artwork on the envelope and, of course, the eagerly awaited North Pole postmark.

Once in a while, letters are received direct from children, and when this happens, the blue-suit "elves" do their own reply. Also, sometimes answers are received without the stamp, which means the off-duty volunteers must solicit funds from friends and other base members. No government funding or time is involved in the effort.

Those who want to get the Santa reply for a child are reminded to include the self-addressed, stamped envelope, and the prepared return letter. It's recommended to mail before December 1, so that letters will have the best chance of being returned before Christmas.

Flight of the Bumblebee

The Bumblebee is back, and the 22d Tactical Fighter Squadron, Bitburg AB, Germany, has it.

The Squadron Commander, Lt. Col. Robert J. Casey, USAF, brought the Bumblebee back during his recent

acceptance-of-command ceremony. "Since World War II, through some ten changes of aircraft, the 22d TFS has worn the Walt Disney-designed bumblebee shoulder patch," he said. Noting that four years ago, when the squadron started flying F-15s, it changed to an *Adler* (the German word for eagle) patch, he went on to announce that, in honor of all former members of the 22d TFS and its proud tradition, it was time to welcome back the bumblebee.

The 22d counted twenty-eight pilots killed in World War II, several missing in action, and achieved 346 combat missions and 2,325 sorties over France and Germany. Among its members during its history were Edwin "Buzz" Aldrin and the late Edward White, both of whom subsequently became astronauts.

Although different from the *Adler* as a symbol—and the *Adler* will still be worn as a pin on a crew member's name patch, symbolizing the full mission-ready status—Colonel Casey declared the bumblebee no less formidable. "The bee represents an obsession with an idea, and this squadron's strong record of achievements is proof that that idea is greatness," he said.

Air Force Dominates Chess/ Skeet Championships

The Air Force Chess Team, paced by Sgt. Timothy G. Brown, George AFB, Calif., recently overpowered the other services to take top honors in the twenty-third annual Armed Forces Chess Championship Tournament, held in Washington, D. C. *(see photo).*

The blue-suiters amassed forty-eight and a half points, well ahead of second-place Army with thirty points. Additionally, in individual competitions, the Air Force walked away with first, second, and third places, out of a field of eighteen.

Sergeant Brown, also the highest scorer in last year's tournament, took first place, with ten wins and two ties, for eleven points in twelve games. An event newcomer, A1C Emory Tate, Jr., of RAF Chicksands, UK, took second individual honors, with ten and a half points, and third place was captured by 2d Lt. Russel H. Garber, Hanscom AFB, Mass., with nine and a half points. Ironically, Lieutenant Garber won the competition in 1976 as an Army enlisted man. The Air Force has produced the individual champion in fourteen of the twenty-three tournaments; of the twenty-one years of

The winning Air Force chess team is shown with the Thomas Emery Silver Trophy at awards ceremony following the twenty-third annual Armed Forces Chess Championship Tournament held at the American Legion's Hall of Flags in Washington, D. C. From left are project officer Darrel A. Sandman, Randolph AFB, Tex.; SSgt. Robert B. Martin, Elmendorf AFB, Alaska; Sgt. Glenn Bady, Kleine Bogel AB, Belgium; 2d Lt. Russel H. Garber, Hanscom AFB, Mass.; Sgt. Timothy G. Brown, George AFB, Calif.; A1C Emory Tate, Jr., RAF Chicksands, UK; 2d Lt. Paul J. Woldowski, Offutt AFB, Neb.; Maj. Gen. Keith D. McCartney, USAF Director of Manpower and Organization; and Allen Kaufman, Executive Director of the American Chess Foundation. See item. (Photo courtesy American Legion News Service)

THE BULLETIN BOARD

team competition, the Air Force holds the most wins with nine.

Meanwhile, in Savannah, Ga., the US Air Force Skeet Team won three team firsts and went on to dominate the competition at the World Skeet Shooting Championships, with members winning several individual events.

Team members were Col. Don Karges, Cameron Station, Alexandria, Va.; Maj. Bubber Youngblood, Fort Bragg, N. C.; Maj. Gary Kwist, Nellis AFB, Nev.; MSgt. Mike Brazzell, Eglin AFB, Fla.; and MSgt. Dan Woods, Norton AFB, Calif.

Short Bursts

Military retirees in Alabama will benefit from recent state legislation nearly doubling—to $8,000—the amount of **military retired pay that may be exempted from state income tax.** In 1985, the exemption climbs to $10,000.

In support of Project Warrior, local commanders are urged to designate **one week a year as Air Force Anniversary Week,** to highlight military heritage and local achievements. Bases can set any week except Armed Forces Week and are encouraged to consider a tie-in with the Air Force's birthday on September 18.

VA has set up **a second specialized research center,** in Palo Alto, Calif., aimed at a better understanding of schizophrenia, a mental illness which accounts for more than seventeen percent of VA hospitalizations. The first such center, in the Bronx, began operations last year, and officials are pleased with the progress being made there.

MSgt. Charley W. Bright, Jr., NCOIC, combat arms training and maintenance, USAFA, has been named the first winner of the Air Force's **new Combat Arms Training and Maintenance Manager Award.** A companion award for the top technician was captured by **SSgt. Jack N. Loomis,** Hahn AB, Germany.

The Army and Air Force Exchange Service has laid on **a one dollar service charge for the formerly free layaway program.** Officials cite as reasons for the change the precedent of civilian stores asking a nominal fee, many of which charge two dollars; the expected savings to AAFES of some $17 million now being paid for paperwork costs; and the ability to do a better job for the patron with this small fee.

DoD has reminded official travelers that **discount air rates should be used** whenever possible, even if reservations have to be made before actual orders are issued, in order to qualify for Supersavers and such. A spot survey shows that, in one month alone, three out of every four Air Force travelers were able to snag a discount fare.

In 1980, a presidential election year, only twenty-five percent of American civilian residents overseas voted. DoD, because of its smoothly functioning existing absentee voting procedures for military and federal employees, has been given the added task of **encouraging overseas civilians to vote** in larger numbers. It has teamed up with a nonpartisan group—Association of American Residents Overseas—to try to combat the difficulties in disseminating voter registration to the more than 2,500,000 nongovernmental-connected Americans abroad.

Air Force Secretary Verne Orr has again extended authority to **Air Force air traffic controllers** deployed in support of FAA facilities to **exceed the sixty day accrued leave cutoff.** A sizable number of blue-suit controllers are still filling in as the FAA moves to build up its strike-depleted controller force. Many cannot take leave because of tight manning at the civilian sites. This new extension will keep them from losing any leave time through FY '83.

Senior Staff Changes

RETIREMENTS: B/G Charles E. **Bishop;** L/G Charles C. **Blanton;** M/G Guy L. **Hecker,** Jr.; B/G Charles B. **Jiggetts;** M/G Stanley C. **Kolodny;** B/G Sarah P. **Wells.**

CHANGES: B/G Duncan W. Campbell, from Cmdr., Tac. Comm. Div., & DCS/Staff Comm.-Elec., Hq. TAC, Langley AFB, Va., to Vice Cmdr., Hq. AFCC, Scott AFB, Ill., replacing retired B/G Charles B. Jiggetts . . . **B/G Richard D. Hansen,** from Command Surgeon, Hq. TAC, Langley AFB, Va., to Surgeon, Hq. USAFE, & Dep. Command Surgeon, USEUCOM, Ramstein AB, Germany, replacing L/G Max B. Bralliar.

B/G Robert I. McCann, from Cmdr., 836th AD, TAC, Davis-Monthan AFB, Ariz., to Vice Cmdr., 9th AF, TAC, Shaw AFB, S. C., replacing retiring B/G Charles E. Bishop . . . **B/G James P. McCarthy,** from Special Ass't for MX Matters, DCS/RD&A, Hq. USAF, Washington, D. C. to Dir., Leg. Liaison, OSAF, Washington, D. C., replacing retired M/G Guy L. Hecker, Jr.

SENIOR ENLISTED ADVISOR CHANGE: CMSgt. Edwin J. Remmert, to SEA, Hq. AFAFC, Lowry AFB, Colo., replacing CMSgt. Donald E. Lindemann. ■

INDUSTRIAL ASSOCIATES OF THE AIR FORCE ASSOCIATION

"PARTNERS IN AEROSPACE POWER"

Listed below are the Industrial Associates of the Air Force Association. Through this affiliation, these companies support the objectives of AFA as they relate to the responsible use of aerospace technology for the betterment of society, and the maintenance of adequate aerospace power as a requisite of national security and international amity.

Aeritalia, S.p.A.
Aero Energy Systems, Inc.
Aerojet ElectroSystems Co.
Aerojet-General Corp.
Aerojet Liquid Rocket Co.
Aerojet Ordnance Co.
Aerojet Strategic Propulsion Co.
Aerospace Corp.
Aerospatiale, Inc.
AGA Corp.
Aircraft Porous Media, Inc.
Allegheny International, Inc.
American Electronic Laboratories, Inc.
American Telephone & Telegraph Co.
Amex Systems, Inc.
Analytic Services Inc. (ANSER)
Anheuser-Busch, Inc.
Applied Technology, Div. of Itek Corp.
Arco Engineering Co.
Aris Engineering Corp.
Aster Engineering Corp.
Astronautics Corp. of America
AT&T Long Lines Department
Avco Corp.
Battelle Memorial Institute
BDM Corp., The
Beech Aircraft Corp.
Bell Aerospace Textron
Bell Helicopter Textron
Bell & Howell Co.
Bendix Corp.
Benham Group, The
Boeing Co.
British Aerospace, Inc.
British Aerospace Dynamics Group
Brunswick Corp., Defense Div.
Brush Wellman, Inc.
Budd Co., The
Burroughs Corp.
CAI, A Division of Recon/Optical, Inc.
Calspan Corp., Advanced Technology Center
Canadair, Inc.
Canadian Marconi Co.
Cessna Aircraft Co.
Chamberlain Manufacturing Corp.
Clearprint Paper Co., Inc.
Colt Industries, Inc.
Computer Sciences Corp.
Conrac Corp.
Control Data Corp.
Cubic Corp.
Data General Corp.
Decisions and Designs, Inc.
Dynalectron Corp.
Eastman Kodak Co.
Eaton Associates, Inc.
Eaton Corp., AIL Div.
ECI Div., E-Systems, Inc.
EDO Corp., Government Systems Div.
Educational Computer Corp.
E. I. du Pont de Nemours & Co.
Emerson Electric Co.
E-Systems, Inc.
Ex-Cell-O Corp., Aerospace Div.
Fairchild Industries, Inc.
Fairchild Weston Systems, Inc.
Falcon Jet Corp.
Ford Aerospace & Communications Corp.
Frasca Int'l, Inc.
Frick-Gallagher Manufacturing Co.
Garrett Corp., The
Gates Learjet Corp.
General Dynamics Corp.
General Dynamics, Electronics Div.
General Dynamics, Fort Worth Div.
General Electric Co.
GE Aircraft Engine Group
GMC, Delco Electronics Div.
GMC, Detroit Diesel Allison Div.
Goodyear Aerospace Corp.
Gould Inc., Government Systems Group
Grumman Aerospace Corp.
Grumman Data Systems Corp.
GTE Products Corp., Sylvania Systems Group
Gulfstream American Corp.
Harris Corp.
Hayes International Corp.
Hazeltine Corp.
Hercules Aerospace Div.
HITCO
Honeycomb Co. of America, Inc.
Honeywell, Inc., Aerospace & Defense Group
Howell Instruments, Inc.
Hughes Aircraft Co.
Hughes Helicopters
HR Textron, Inc.
IBCOL Technical Services
IBM Corp., Federal Systems Div.
IBM National Accounts Div.
Industrial Acoustics Co.
Intermetrics, Inc.
Interstate Electronics Corp.
Israel Aircraft Industries Int'l, Inc.
Itek Optical Systems, a Division of Itek Corp.
ITT Defense Communications Div.
ITT Defense-Space Group
ITT Federal Electric Corp.
Jane's Publishing
Kelsey-Hayes Co.
Kentron International
King Radio Corp.
Lear Siegler, Inc.
Lewis Engineering Co., Inc.
Litton Aero Products Div.
Litton-Amecom
Litton Data Systems
Litton Industries
Litton Industries Guidance & Control Systems Div.
Lockheed Corp.
Lockheed Aircraft Service Co.
Lockheed California Co.
Lockheed Electronics Co.
Lockheed Georgia Co.
Lockheed Missiles & Space Co.
Logicon, Inc.
Loral Corp.
Lucas Industries Inc.
Magnavox Government & Industrial Electronics Co.
M.A.N. Truck & Bus Corp.
Marconi Avionics, Inc.
Marquardt Co., The
Martin Marietta Aerospace
Martin Marietta, Denver Co.
Martin Marietta, Orlando Co.
MBB
McDonnell Douglas Corp.
Midland-Ross Corp./Grimes Div.
MITRE Corp., The
Moog, Inc.
Motorola, Inc., Government Electronics Div.
NORDAM
Northrop Corp.
OEA, Inc.
O. Miller Associates
Oshkosh Truck Corp.
Pan Am World Services, Inc., Aerospace Services Div.
Planning Research Corp.
Products Research & Chemical Corp.
Rand Corp.
Raytheon Co.
RCA, Government Systems Div.
Rediffusion Simulation, Inc.
Republic Electronics, Inc.
Rockwell Int'l Corp.
Rockwell Int'l Defense Electronics Operations
Rockwell Int'l North American Aircraft Operations
Rockwell Int'l North American Space Operations
Rockwell Int'l Rocketdyne Div.
Rohr Industries, Inc.
Rolls-Royce, Inc.
ROLM Corp., Mil-Spec Computers Div.
Rosemount Inc.
Sanders Associates, Inc.
Satellite Business Systems
Science Applications, Inc.
Sierra Research Corp.
Silicone Rubber Specialties, Inc.
Singer Co., The
Space Applications Corp.
Space Communications Co.
Space Ordnance Systems
Sperry Corp.
Standard Manufacturing Co., Inc.
Sundstrand Corp.
Sverdrup Corp.
Syscon Co.
System Development Corp.
Talley Industries, Inc.
Teledyne CAE
Teledyne, Inc.
Teledyne Ryan Aeronautical
Texas Instruments Inc.
Thiokol Corp.
Thomson-CSF, Inc.
Tracor, Inc.
TRW Space & Technology Group
U.E. Systems, Inc.
United Technologies Corp.
UTC, Chemical Systems Div.
UTC, Hamilton Standard Div.
UTC, Norden Systems, Inc.
UTC, Pratt & Whitney Aircraft Group
UTC, Research Center
UTC, Sikorsky Aircraft Div.
Vought Corp.
Western Electric Co., Inc.
Western Gear Corp.
Western Union Telegraph Co., Government Systems Div.
Westinghouse Electric Corp.
Wild Heerbrugg Instruments, Inc.
Williams International
Wyman-Gordon Co.
Xerox Corp.

AFA Intercom

On its way back from a successful visit to the Farnborough Air Show in Britain, the B-1 stopped off at Andrews AFB, Md., where it was toured by AFA officers, directors, Convention delegates, and conferees. See item. (Photo by William A. Ford)

A Special Visitor Comes to the AFA National Convention

The B-1 came to AFA's 1982 National Convention—or at least as close as it could get.

America's newest bomber landed at Andrews AFB, Md., outside Washington, D. C., on September 13, the first day of the Convention. For the three remaining Convention days, the B-1's early mornings were reserved exclusively for visits by AFA national officers, directors, delegates, and conferees. The KC-10A Extender tanker/cargo aircraft was also on display at Andrews AFB. Both the B-1 and the KC-10 were just home from an extremely successful visit to the Farnborough Air Show in Britain.

The Convention, held at the Sheraton Washington Hotel, had a double milestone theme: the diamond anniversary of military aviation in the US, and the thirty-fifth anniversary of the US Air Force as an independent service.

A stirring musical tribute, celebrating seventy-five years of military flight, was presented at the Air Force Dinner Dance on Wednesday evening of Convention week. Jim Hartz, television news personality and co-host of the public television program *Over Easy,* narrated. Honored at the Dinner Dance was retired Gen. Lew Allen, Jr., immediate past Air Force Chief of Staff and recipient of AFA's 1982 H. H. Arnold Award. *—By John Correll*

Thirty-Sixth Annual National Convention: The Best One Yet

This year's AFA National Convention had new events, new awards, expanded delegate programs, and a new symposium.

Membership Awards

Following meetings of AFA's Executive Committee and National Board of Directors, on Sunday evening the Membership Awards Reception for Delegates was held in the Sheraton Washington Hotel's Cotillion Ballroom. AFA President John G. Brosky and Membership Committee Chairman Dave Blankenship presented awards during the evening to six AFA Regions, twenty-three State Organizations, and 131 Chapters. All of these units had exceeded their membership goals for the previous year *(see box, p. 128).*

Thanks to the outstanding efforts of these units, and to excellent on-base membership drives, AFA more than realized its total national new-member goal for the past year.

AFA's thirty-sixth National Convention celebrated both the thirty-fifth anniversary of the founding of the Air Force and the seventy-fifth anniversary of military aviation.

Opening Ceremonies

The Convention's Opening Ceremonies on Monday morning featured a keynote address by Dr. Herbert H. Reynolds, President of Baylor University in Waco, Tex. The theme of his address, matching that of AFA's 1982 Membership Campaign, was "People *Do* Make a Difference." He noted that people "can, will, and *do* make a significant difference in human affairs."

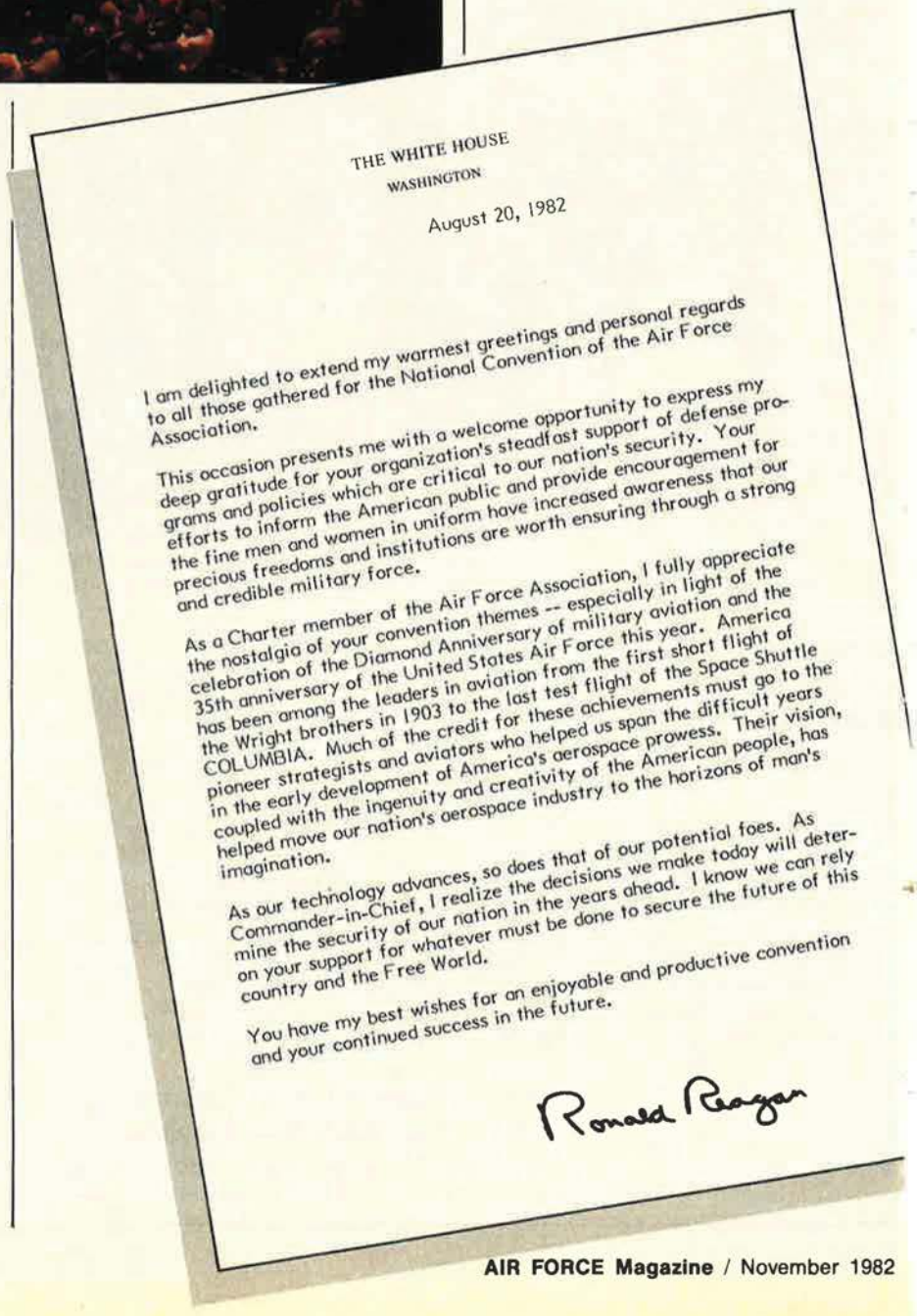
Quoting Alexis de Tocqueville, Dr. Reynolds reminded the audience that Americans are more prone to form such voluntary associations as AFA than are any other people. He went on to emphasize the necessity for all of us to have hope for the future and to be willing to continue the struggle for "long periods of time without tangible rewards or recognition." Dr. Reynolds concluded with the reminder that "people are not something—people are everything!"

The invocation was given by AFA's National Chaplain, Rev. Henry J. "Hank" Meade of Needham, Mass., and included a memorial tribute to aviation and AFA leaders who died during the last year *(see box, p. 125).*

National President John G. Brosky, assisted by AFA Chairman of the Board Victor R. Kregel and several senior Air Force officials, presented awards to fifty-nine individuals and units of AFA and the Air Force *(see pp. 126–127).* Past AFA Man of the Year honorees and this year's Exceptional Service Award and Medal of Merit winners were all asked to stand and be recognized.

The presentation of several new awards took place during the award ceremonies *(see also p. 84).* The first new award, sponsored by the men and women of the Air Force medical service and named for Lt. Gen. Paul W. Myers, immediate past Surgeon General of the Air Force, honors an outstanding Air Force physician. The first recipient of this new award was Maj. Terrence J. O'Neil.

The second, the Stuart M. Riechart Award, was sponsored by Mr. Riechart and is to be awarded annually to an outstanding Air Force lawyer. The first



THE WHITE HOUSE
WASHINGTON

August 20, 1982

I am delighted to extend my warmest greetings and personal regards to all those gathered for the National Convention of the Air Force Association.

This occasion presents me with a welcome opportunity to express my deep gratitude for your organization's steadfast support of defense programs and policies which are critical to our nation's security. Your efforts to inform the American public and provide encouragement for the fine men and women in uniform have increased awareness that our precious freedoms and institutions are worth ensuring through a strong and credible military force.

As a Charter member of the Air Force Association, I fully appreciate the nostalgia of your convention themes -- especially in light of the celebration of the Diamond Anniversary of military aviation and the 35th anniversary of the United States Air Force this year. America has been among the leaders in aviation from the first short flight of the Wright brothers in 1903 to the last test flight of the Space Shuttle COLUMBIA. Much of the credit for these achievements must go to the pioneer strategists and aviators who helped us span the difficult years in the early development of America's aerospace prowess. Their vision, coupled with the ingenuity and creativity of the American people, has helped move our nation's aerospace industry to the horizons of man's imagination.

As our technology advances, so does that of our potential foes. As Commander-in-Chief, I realize the decisions we make today will determine the security of our nation in the years ahead. I know we can rely on your support for whatever must be done to secure the future of this country and the Free World.

You have my best wishes for an enjoyable and productive convention and your continued success in the future.

Ronald Reagan

winner of the Riechart Award was Lt. Col. Fredolin W. Kuhn.

Finally, a group of four awards, named for Arthur C. Storz, Sr., and sponsored by his son, Arthur C. Storz, Jr., are to be presented annually to the AFA region, state, chapter, and individual compiling the best record of new member recruiting and meeting other criteria promulgated by the Membership Committee. The first winners of these awards were AFA's Southwest Region, Nebraska State AFA, the H. H. Arnold Memorial Chapter, and Arthur L. Littman.

Business Sessions

Three hundred forty-five official delegates representing forty-three states, the largest Convention delegation ever, unanimously adopted AFA's 1982–83 Statement of Policy *(see p. 42)*, and two major position papers: "Force Modernization and R&D" *(see p. 44)*, and "Defense Manpower Issues" *(see p. 53)*. These documents set the direction for AFA support and action for the year ahead.

Delegates amended AFA's National Constitution and By-Laws to include the immediate past Air Force Chairman of the Joint Chiefs of Staff as a member of the National Board of Directors, and to clarify those sections explaining the two-thirds rule as it applies to the election of National Directors.

Delegates also amended the Convention Rules and Procedures to clarify application of the two-thirds rule. The change is to round down to the nearest whole number in cases where application of the two-thirds rule would result in a whole number plus a fraction.

Named in Memorial Tribute

These are the names of the USAF and AFA leaders and supporters and aviation pioneers who died during the last year: Joseph A. **Abbott;** Dean **Anholt;** Sir Douglas **Bader;** Joseph **Barr;** Russell S. **Bernhard;** Richard **Beverage;** Col. Frederick F. **Brent,** USAF (Ret.); Brig. Gen. C. Pratt **Brown,** USAF (Ret.); Edith E. **Caffrey;** Maj. Gen. Charles G. **Chandler,** USAF (Ret.); CMSgt. Albert J. **Connors,** USAF (Ret.); Lt. Gen. Idwal **Edwards,** USAF (Ret.); MSgt. Michael John **Ennis,** Jr., USAF (Ret.); Elton C. **Fay;** Col. Clark **Fetterman,** USAF (Ret.); Maj. Gen. Billy **Forsman,** USAF; Allen J. **Freytag;** Capt. Allan W. **Gist,** USAF; Brig. Gen. Lloyd E. **Griffis,** USAF (Ret.); Courtlandt S. **Gross;** Brig. Gen. John S. **Gulledge,** USAF (Ret.); Francis M. **Harris;** Brig. Gen. Jack **Hilger,** USAF (Ret.); Brig. Gen. Boyd **Hubbard,** Jr., USAF (Ret.); Brig. Gen. Irby B. **Jarvis,** Jr., USAF (Ret.); Lt. Gen. William E. **Kepner,** USAF (Ret.); Brig. Gen. Arnold N. **Krogstad,** USAF (Ret.); Beirne **Lay,** Jr.; Maj. Gen. William C. **Lewis,** Jr., USAF (Ret.); Lt. Col. Arthur F. **Lohrey,** USAF (Ret.); Lt. Col. Loren G. **McCollom,** USAF (Ret.); Robert V. **Pace;** the Hon. Alexander **Pirnie;** Kenneth C. **Puterbaugh;** Lt. Gen. Edwin **Reyno,** CD (Ret.); Charles J. **Russhon;** Lt. Col. James L. **Smith,** USAF (Ret.); Maj. Gen. Delmar T. **Spivey,** USAF (Ret.); Jane E. **Spruance;** Maj. Gen. Robert C. **Thompson,** USAF (Ret.); Charles B. **Thornton;** Gen. Nathan F. **Twining,** USAF (Ret.); Karl **Warren;** Jackson T. **Willis;** Brig. Gen. Robert F. C. **Winger,** USAF (Ret.); and the Thunderbird pilots—Maj. Norman L. **Lowry** III, Capt. Willie **Mays,** Capt. Mark **Melancon,** and Capt. Joseph **Peterson.**

Election of Officers

New National Officers were elected by the delegates during the business sessions. They are: President, David L. Blankenship; Chairman of the Board, John G. Brosky; Secretary, Sherman W. Wilkins; and Treasurer, George H. Chabbott.

AFA National President David L. Blankenship is an aerospace industry

Maryland State AFA President Thomas W. Anthony was named AFA's Man of the Year for 1982. The award is the highest honor that AFA bestows on an AFA leader. Mr. Anthony, left, received the Man of the Year plaque from AFA National President John G. Brosky.

The Chicagoland-O'Hare Chapter in Illinois received AFA's Donald W. Steele, Sr., Memorial Award as the AFA Unit of the Year. Here, Chapter President Walter Vartan, left, accepts the award plaque, which was presented by AFA National President John G. Brosky.

Air Force Association's 1982 Activity Awards

UNIT RECIPIENTS

Donald W. Steele, Sr., Memorial Award
AFA Unit of the Year

Chicagoland-O'Hare Chapter, Illinois

Outstanding State Organization

California State Organization

Outstanding Chapters

Frank Luke Chapter, Arizona (401–900 members)
Lake Region Chapter, Florida (151–400 members)
Flatirons Chapter, Colorado (20–150 members)

Exceptional Service Awards

Alamo Chapter, Texas (Aerospace Education)
Ak-Sar-Ben Chapter, Nebraska (Best Single Program)
Richmond Chapter, Virginia (Communications)
San Bernardino Area Chapter, California (Community Relations)
Charles A. Lindbergh Chapter, Connecticut (Overall Programming)

executive. He was commissioned in USAF and served four years as a pilot with assignments in TAC, SAC, and ATC. A graduate of the University of Tulsa, Mr. Blankenship is active in the Tulsa community, having served on the Board of Directors of the Oklahoma Chamber of Commerce; the Board of Directors of the National Conference of Christians and Jews; the Advisory Board of the Tulsa Urban League's Business Development Center; the Tulsa Public School System's Vocational Advisory Council; and the Executive Board of the Indian Nations Council of Boy Scouts of America.

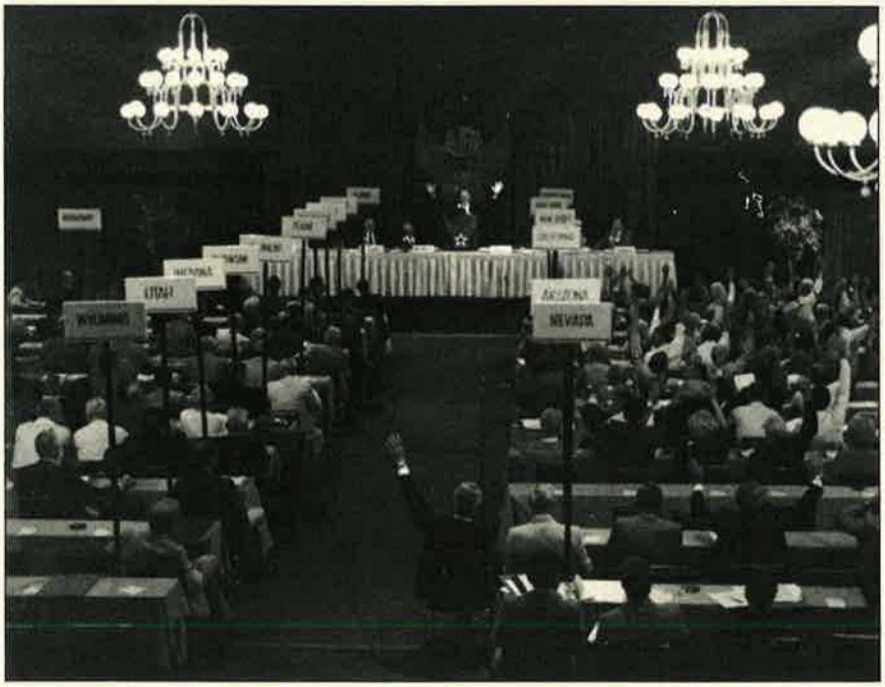
In 1967, he was selected as one of the Outstanding Young Men of America. Mr. Blankenship has served AFA as a member of the Organizational Advisory Council, as a State and Chapter President, and as a member of the Board of Directors. He is an AFA Life Member.

Chairman of the Board John G. Brosky serves on the Superior Court of Pennsylvania, and is a former Judge on the Allegheny County, Pa., Common Pleas Court. He retired from the Air Force with the rank of brigadier general, and is a retired major general of the Pennsylvania Air National Guard. He served as an artillery captain in the South Pacific during World War II. After the war, he joined the Pennsylvania Air National Guard and was assigned to the 171st Military Airlift Wing in Pittsburgh, eventually serving as Assistant Adjutant General for Air, an office he held on his retirement.

He is a graduate of the University of Pittsburgh and its law school, and is an Outstanding Letterman of Distinction at the university. A former writer, he has also been active in many national and local civic organizations. Mr. Brosky has served AFA as National President, National Director, National Vice President (Northeast Region), State President, Chapter President, Chapter Vice President, and Chapter Secretary. He is a member of the Aerospace Education Foundation Board of Trustees, and is a Jimmy Doolittle Fellow. Judge Brosky founded AFA's Air Force Mothers Chapter of Pittsburgh, Pa. He is an AFA Life Member.

AFA National Secretary Sherman W. Wilkins is a retired aerospace industry executive. He is an alumnus of the University of Connecticut and George Washington University, and a graduate of the Army Command and Staff College and the Air War College. His active-duty Air Force career spanned some twenty-seven years, and he retired in 1968 with the rank of colonel. Mr. Wilkins has served AFA as Chapter President and as National Vice President (Northwest Region). He is a member of the Board of Directors, a Trustee of the Aerospace Education Foundation, a Jimmy Doolittle Fellow, and an AFA Life Member.

National Treasurer George H. Chabbott, of Dover, Del., is a management consultant and real estate counselor, President of Commercial Consulting, Ltd., and Vice President of Emerson Commercial Industrial Real Estate Division. He served in the Air Force for twenty-three years, retiring as a colonel. He flew fifty combat missions in B-26s



This year's Convention had the largest delegation ever, with more than 340 delegates in attendance.

Air Force Association's 1982 Activity Awards

INDIVIDUAL RECIPIENTS

AFA Man of the Year

Thomas W. Anthony, Maryland

Presidential Citations

Richard H. Becker, Illinois
Amos L. Chalif, New Jersey
William J. Demas, New Jersey
Jon R. Donnelly, Virginia
Hugh L. Enyart, Illinois
John P. Flynn, Texas
John P. E. Kruse, New Jersey
Arthur L. Littman, California
Frank M. Lugo, Alabama
Walter Vartan, Illinois

Exceptional Service Awards

Haynes Baumgardner, Texas
William J. Becker, Nevada
Jackie L. Bunn, California
Robert L. Carr, Pennsylvania
Ernest J. Collette, Jr., North Dakota
Carey Deckard, Texas
Leland P. Derrick, California
[illegible]
William J. Gibson, Utah
Betty Hazeleaf, California
Robert F. Hazeleaf, California
Thomas W. Henderson, Arizona
John R. Kagel, Indiana
Alwyn T. Lloyd, Washington
[illegible]
Lloyd G. Nelson, New Jersey
B. J. Scott Norwood, California
Neil J. November, Virginia
Maj. Gen. Dalton S. Oliver, USAF, Louisiana
Douglas L. Pangborn, Oklahoma
Lyle O. Remde, Nebraska
William T. Reynolds, Maryland
William L. Ryon, Jr., Maryland
Martha Schiff, New Jersey
Marvin G. Spallina, Oklahoma
Ray S. Villareal, California
Charles E. Walker, Utah
Ronald N. Wallis, Oklahoma
George R. Weinbrenner, Texas

Medals of Merit

James Anderson, South Dakota
Mary J. Bakaitis, Pennsylvania
Rex M. Ball, Oklahoma
CMSgt. Kenneth Black, USAF, Louisiana
Rollin C. Broughton, Alabama
Carrol D. Buford, California
CMSgt. Herbert L. Buttner, USAF, Virginia
John P. Byrne, Arizona
Alma Cannon, Pennsylvania
Don A. Casteel, Texas
John Casteel, Nebraska
Robert S. Cauch, Michigan
Raymond E. Choquette, Connecticut
Kevin Clary, Illinois
Harry L. Cleveland, Utah
Col. Maralin K. Coffinger, USAF, California
Col. Hartwell F. Coke, VaANG, Virginia
Frank M. Coorsen, Maryland
Zinaida Dakiniewicz, California
Richard G. DeLong, Indiana
Roy Denney, California
Merritt E. Derr, Pennsylvania
Edward Dvorak, California
Frank W. Elliott, Illinois
Joseph L. Falvey, Indiana
Gilbert R. Freeman, New Jersey
Ivan R. Frey, Virginia
Mary E. Frey, Delaware
Meryll M. Frost, Arizona
Dorothy I. Gang, Florida
Maj. Gen. Francis R. Gerard, USAF, New Jersey
Billy Gould, Pennsylvania
CMSgt. Paul F. Greenwood, USAF, Texas
Lawrence R. Gryskiewicz, Florida
Ramsey B. Gunter, Texas
Robert S. Hancock, Oklahoma
[illegible]
Percy Haugen, California
David Hendrix, California
Harold H. Hester, Delaware
Alton G. Hudson, Connecticut
Robert Hull, California
Harvey H. Inouye, Colorado
[illegible]
John F. Kasper, Texas
Donald L. Krekelberg, Alabama
Giles D. Leonard, Utah
Arthur MacFadden, Tennessee
Maj. Gen. Leo Marquez, USAF, Utah
George Mattson, New Jersey
Robert A. McClellan, Nevada
Arley McQueen, Jr., Maine
Ronald W. Mick, Texas
Maj. James A. Miller, USAF, Pennsylvania
Capt. Gordon L. Minner, USAF, Delaware
M. N. "Bud" Morss, California
Barry B. Newstadt, Delaware
Leroy W. Niehaus, Pennsylvania
Harold B. Owens, Texas
Edward S. Papelian, Michigan
Edwin I. Power, Jr., California
William J. Reslie, California
Richard Rico, California
Kyle Robeson, Illinois
R. E. Runice, New Jersey
E. M. Russell, Virginia
Nuel Sanders, Utah
Joseph F. Sinsabaugh, New York
CMSgt. Jerel L. Smith, USAF, Texas
Juan B. Sotomayor, Nevada
Francis D. Spalding, Ohio
John E. Stavast, Texas
Stanley E. Stepnitz, Maryland
James M. Still, Jr., New Jersey
John E. Strickland, Delaware
Maj. Thomas E. Symonds, USAF, Nevada
Marcia Tamblyn, North Carolina
J. R. Temple, Virginia
Brig. Gen. Ray Thompson, USAF, Maryland
George Thurber, California
Nat Trembath, California
CMSgt. George R. Tucker, USAF, California
Maj. Duane E. Turnbull, USAF, Pennsylvania
John W. Walton, Nebraska
Edwin L. Ware, Ohio
Brig. Gen. Claudius E. Watts III, USAF, Illinois
Nevina M. Whitaker, Maryland
Charles E. White, Texas

Special Citations

Charles F. Bock, Virginia
Art Culver, California
F. Thomas Hissem, Indiana
Inland Action Inc., California
Richard D. Kisling, Maryland
Beverly R. Kriese, Wisconsin
[illegible]
Carl Phillips, Arizona
Kenneth A. Rowe, Virginia
J. Deane Sterrett, Pennsylvania
Thomas B. McGuire, Jr., Memorial Committee (New Jersey)
Alton W. Cross, Jr.
William J. Demas
William C. Gray
1st Lt. Patricia C. Hatem, USAF
Michael Kittis
Earl L. Lacomb
Lt. Col. Edward M. Leete, USAF
George Mattson
Barry B. Newstadt
Clinton L. Pagano
SSgt. William Rowe, USAF
Robert J. Stankovitch
Col. Larry D. Wright, USAF

Commander's Award

Air Force Association

American Spirit Award

John G. Brosky, Pennsylvania

Storz Awards

AFA Southwest Region
Nebraska State AFA
H. H. Arnold Memorial Chapter
Arthur L. Littman

in Korea, and flew another 100 missions as a forward air controller during the Vietnam War.

A graduate of Utah State University, Mr. Chabbott attended senior-level finance courses at the Columbia School of Bank Administration and Management and at the National Commercial Lending School at the University of Oklahoma. He has served AFA as a National Director, National Vice President (Central East Region), and State President. This will be his second term as National Treasurer. Mr. Chabbott is an AFA Life Member.

National Vice Presidents

Twelve National Vice Presidents were also elected at the Convention. Five are serving as National Vice President for the first time. They are: R. L. Devoucoux, New England Region; Thomas J. Hanlon, Northeast Region; Jan Laitos, North Central Region; Joseph Turner, Southwest Region; and Karen M. Kyritz, Rocky Mountain Region.

Seven National Vice Presidents were reelected. They are: H. B. Henderson, Central East Region; Lee C. Lingelbach, Southeast Region; Frank M. Lugo, South Central Region; Edward J. Monaghan, Northwest Region; Lyle O. Remde, Midwest Region; Edward A. Stearn, Far West Region; and Howard C. Strand, Great Lakes Region.

Directors

Seven new Directors were elected to the Board of Directors. They are: Thomas O. Bigger, Tullahoma, Tenn.; Richard C. Doom, Canyon Country, Calif.; Joseph R. Falcone, Rockville, Conn.; J. Gilbert Nettleton, Jr., Washington, D. C.; Ellis T. Nottingham, Jr., Arlington, Va.; J. Deane Sterrett, Beaver Falls, Pa.; and James H. Taylor, Farmington, Utah.

1982 AFA Membership Achievement Awards

Each year, specific membership objectives for new members are established for AFA Regions, State Organizations, and Chapters. The units listed below achieved these objectives as of July 31 (two months prior to the September 30 close of the chapter year) and were recognized as pacesetters during the September 1982 National Convention. The names of additional units achieving their membership objective by the September 30 date will be published in the December issue of AIR FORCE Magazine.

REGIONS	VICE PRESIDENT
Far West	Edward A. Stearn
Midwest	Lyle O. Remde
New England	Joseph R. Falcone
North Central	Ernest J. Collette, Jr.
South Central	Frank M. Lugo
Southeast	Lee C. Lingelbach

STATE WINNERS	PRESIDENTS
Arizona	John P. Byrne
Arkansas	Charles E. Hoffman
California	Richard C. Doom
Connecticut	Frank J. Wallace
Delaware	John E. Strickland
Georgia	Edward I. Wexler
Indiana	Richard Ortman
Louisiana	Thomas L. Keal
Maine	Arley McQueen, Jr.
Maryland	Thomas W. Anthony
Massachusetts	Zaven Kaprielan
Michigan	Jeryl L. Martlatt
Mississippi	Don Wylie
Nebraska	Edward A. Crouchley
Nevada	James L. Murphy
New Jersey	John P. E. Kruse
New Mexico	Ken Huey, Jr.
North Dakota	Maurice M. Rothkopf
Oklahoma	Aaron C. Burleson
South Carolina	William B. Gemmill
South Dakota	Duane L. Corning
Tennessee	Arthur MacFadden
Utah	Charles E. Walker

CHAPTER WINNERS	PRESIDENTS
Abilene (Texas)	Ronald W. Mick
Admiral Charles E. Rosendahl (New Jersey)	Ronald Montgomery
Aggieland (Texas)	John O. Teague
Airport Number One (Pennsylvania)	Lee W. Niehaus
Ak-Sar-Ben (Nebraska)	Donald D. Adams
Alamo (Texas)	Dan D. Fulgham
Albuquerque (New Mexico)	Valin R. Woodward
Altus (Oklahoma)	Thomas S. Pyle II
Andrews Area (Maryland)	William L. Ryon, Jr.
Arc Light (Guam)	Lee P. Webber
Ark-La-Tex (Louisiana)	Ed Conley
Athens (Georgia)	Robert P. Crow
Atlantic City (New Jersey)	Leonard Schiff
Austin (Texas)	John Stavast
Badger State (Wisconsin)	Kenneth J. Sawyer
Baltimore (Maryland)	Rick Gibbs
Beaver Valley (Pennsylvania)	Richard Ellinwood
Birmingham (Alabama)	Addison O. Logan
Blue Ridge (North Carolina)	John E. Hostettler, Jr.
Blytheville (Arizona)	John B. McNulty
Carl Vinson Memorial (Georgia)	Wilbur H. Keck
Charles A. Lindbergh (Connecticut)	Alton G. Hudson
Charleston (South Carolina)	John L. Mack, Jr.
Central Missouri (Missouri)	Paul E. Rodriquez
Central Oklahoma (Oklahoma)	Rex M. Ball
Chattahoochee Valley (Georgia)	W. W. Harrington
Chattanooga (Tennessee)	John W. Glass III
Chautauqua (New York)	Elden B. Hollobaugh
Cheyenne (Wyoming)	R. S. Rowland
Chicagoland-O'Hare (Illinois)	Walter Vartan
Chicopee (Massachusetts)	Andrew W. Trushaw, Jr.
Cleveland (Ohio)	John Boeman
Color Country (Utah)	Boyd H. Edwards
Concho (Texas)	R. F. Durso
Concrete Mixers (North Dakota)	John W. Zeller
Coosa Valley (Georgia)	Howard M. Smith
Dacotah (South Dakota)	Joe Kaliszewski
Dallas (Texas)	Bernard J. Bogoslofski
David J. Price/Beale (California)	Tony Bevacqua
Delaware Galaxy (Delaware)	Alfred J. Gillis
Del Rio (Texas)	James A. Hester
Denton (Texas)	William D. Wiser, Jr.
Enid (Oklahoma)	Terry Little
Eugene (Oregon)	Phil Saxton
Fairbanks Midnight Sun (Alaska)	Raymond I. Karns
Ft. Wayne-Baer Field Area (Indiana)	F. Thomas Hissem
Fran Parker (New Mexico)	Eddie Olsen
Frank Luke (Arizona)	Fred Lustig
Gainesville (Florida)	Dorothy I. Gang
Garden State (New Jersey)	Helen Aiellas
General Curtis E. LeMay (California)	Ray S. Villareal
General D. "Chappie" James, Jr., Memorial (New York)	Dorothy Wadsley
General George C. Kenney (Connecticut)	Kenneth L. Weber
General Robert E. Huyser (Colorado)	James C. Hall
General Robert F. Travis (California)	Robert F. Hazeleaf
General Russell E. Dougherty (Kentucky)	Elmo C. Burgess
Gold Card (Utah)	Harry L. Cleveland
Golden Triangle (Mississippi)	James E. Evans
Greater Camden (New Jersey)	Robert F. Hahn
Greater Pittsburgh (Pennsylvania)	Lee S. Smith
Grissom Memorial (Indiana)	Thomas F. Hayes
Gus Grissom (Indiana)	Charles F. Holleman
H. H. Arnold (New York)	Irwin Hansen
H. H. Arnold Memorial (Tennessee)	Lee V. Gossick
Hangar One (New Jersey)	Thomas F. Lynch
Head of the Lakes (Minnesota)	Edward A. Orman
Heart of the Hills (Texas)	Edward J. Fox
High Point (New Jersey)	Donald Roos
Homestead (Florida)	William Susser *(Contact)*
Hudson (New Jersey)	Joseph J. Bendetto
Hudson Valley (New York)	John F. Homin
Huron (Michigan)	William Stone
Jack Manch (Virginia)	Daniel F. Kowats
James H. Straubel (Michigan)	E. S. Papelian
Jax (Florida)	Ed Teigeler
Joe Walker (Pennsylvania)	Mary J. Bakaitis
John C. Meyer (Florida)	Donald E. Matthews
Kitty Hawk (North Carolina)	E. H. North, Jr.
Lake Region (Florida)	Morgan S. Tyler, Jr.
Lake Superior Northland (Michigan)	R. Thomas Peters, Jr.
Las Vegas (Nevada)	William J. Becker
Laurence G. Hanscom (Massachusetts)	John F. White
Lester W. Johnson (Indiana)	Max Patterson
Lincoln (Nebraska)	David D. Tews
Llano Estacado (New Mexico)	Owen Huffaker
Long's Peak (Colorado)	John H. Huisjen
Lynchburg (Virginia)	James L. Ford
Mercer County (New Jersey)	Sidney S. Rimberg
Middlesex (New Jersey)	Walter P. Nelson
Mifflin County (Pennsylvania)	Earl B. Hamler, Jr.
Minot (North Dakota)	George Christensen
Mobile (Alabama)	Frank A. Brown
New Jersey Public Affairs (New Jersey)	N. A. Manocchio, Jr.
Northern Connecticut (Connecticut)	Raymond E. Choquette
Ogden (Utah)	Mortimer T. Gilbert
Panama City (Florida)	Loren D. Evenson
Passaic-Bergen (New Jersey)	Gilbert Freeman
Pease (New Hampshire)	Robert N. McChesney
Pope (North Carolina)	James R. Warner
Razorback (Arizona)	Aaron Dickerson
Red River Valley (North Dakota)	Todd C. Hogan
Redwood Empire (California)	M. N. Morss
Richmond (Virginia)	Neil J. November
Riverside County (California)	L. P. Derrick
Robert H. Goddard (California)	Carrol D. Buford
Rocky Mountain (Utah)	Ann Hewitt
Rushmore (South Dakota)	Jim England
Sacramento (California)	Jim Carpenter
Sal Capriglione (New Jersey)	Joseph M. Capriglione
Salt Lake (Utah)	Ted H. Olsen
San Bernardino (California)	Nat Trembath
Savannah (Georgia)	Larry O. Oliver
Silver and Gold (Colorado)	Don R. Nichels
Snake River Valley (Indiana)	Chester A. Walborn
Spudland (Maine)	Alban E. Cyr, Sr.
Steel Valley (Ohio)	Paul D. Monroe
Steel Valley (Pennsylvania)	Mary Ann Lash
Tacoma (Washington)	Joseph E. Tucker
Tallahassee (Florida)	Charles E. Hopkins
Taunton (Massachusetts)	Allan A. LaCombe
Teterboro-Bendix (New Jersey)	Jack Carnicelli
Thomas B. McGuire, Jr. (New Jersey)	George Mattson
Tri-County (New Jersey)	R. Charles Black
Tucson (Arizona)	Tom Henderson
Tulsa (Oklahoma)	C. J. McBride
Union Morris (New Jersey)	Thomas S. Thomas III
Ute (Utah)	Giles D. Leonard
War Eagle (Alabama)	Peter L. Henderson
Wasatch (Utah)	George W. Jenson
West Suburban (Illinois)	Lee Cordell
Wichita Falls (Texas)	Art Beyer

Eleven Board members were returned for an additional term. They are: Robert L. Carr, Pittsburgh, Pa.; Hoadley Dean, Rapid City, S. D.; Jon R. Donnelly, Richmond, Va.; E. F. Faust, San Antonio, Tex.; Alexander C. Field, Jr., Marco Island, Fla.; James P. Grazioso, West New York, N. J.; Francis L. Jones, Wichita Falls, Tex.; William V. McBride, San Antonio, Tex.; William C. Rapp, Buffalo, N. Y.; Margaret A. Reed, Seattle, Wash.; and Liston T. Taylor, Lompoc, Calif.

In addition, four Under-40 Directors joined the Board for the coming year. Serving for the second consecutive year are Gregg L. Cunningham, State College, Pa.; John L. Mack, Jr., Mount Pleasant, S. C.; and David J. Smith, Springfield, Va. The new Under-40 Director is Michael Winslow, Yakima, Wash.

Other members of the National Board of Directors are the permanent National Directors, the National Officers, the National Vice Presidents, the immediate past Air Force Chairman of the Joint Chiefs of Staff, the immediate past Air Force Chief of Staff, the immediate past Chief Master Sergeant of the Air Force, the National Chaplain, the National Commander of the Arnold Air Society, the Chairman of AFA's Junior Officer Advisory Council, the Chairman of AFA's Enlisted Council, and the AFA Executive Director.

A list of the new National Officers, National Vice Presidents, and National Directors appears in "This Is AFA" on p. 130.

Acknowledgments

William N. Webb, National Vice President for the Southwest Region, served as Convention Sergeant at Arms. AFA Executive Committee member Martin H. Harris served as Parliamentarian. Credentials Committee members were Lee Lingelbach, National Vice President for the Southeast Region, Chairman; Tillie Metzger, Pennsylvania State AFA President; and Chuck Walker, Utah State AFA President. The Inspectors of Election were Bryan Murphy, immediate past President of the Fort Worth Chapter, Chairman; Lee Terrell, Florida State AFA President; and Ed Monaghan, Na-

tional Vice President for the Northwest Region.

With deep gratitude, AFA acknowledges the invaluable volunteer contributions to the success of the 1982 Convention by the following individuals: Jayne Belanger, Cecil Brendle, Ronald Carbon, Dave Dingley, Evie Dunn, Meredith Eicker, Phil Loebach, Chuck and Mary Lucas, Irene Robertson, and Kerry Spears.

AFA wants to express its appreciation to all leaders, delegates, and spouses who attended the Convention and whose dedication and consistent, diligent efforts contributed to the success of the 1982 Convention. Your ongoing, year-round efforts in the field ensure the viability of our Air Force Association. Your willingness to expend your personal time—and yes, your personal finances as well—in support of this Association and its goals is the strength and promise of AFA. To all our members—our deepest, heartfelt thanks.

The 1983 National Convention will be held at the Sheraton Washington Hotel in Washington, D. C., on September 11–15. See you there!

—By Dave C. Noerr

Aerospace Education Foundation Luncheon Held During Convention

More than 500 people attended the annual Aerospace Education Foundation Luncheon on Monday of Convention week. The luncheon honors supporters of the Foundation, and is the occasion for the presentation of AFA's highest aerospace education award, the Hoyt S. Vandenberg Award, and several Citations of Honor. Also, the winning entry of the annual Foundation-sponsored Air Force Junior ROTC contest is exhibited, and the winning unit is recognized.

Several special groups are also recognized at the luncheon: AFA's Enlisted and Junior Officer Advisory Councils, AFJROTC Instructors, the Executive Boards of Arnold Air Society and Angel Flight, and Tuskegee Airmen, Inc.

Foundation President Dr. Don Garrison served as master of ceremonies for the luncheon. Dr. Garrison welcomed a very special guest to the luncheon—Foundation trustee and first AFA National President Jimmy Doolittle. General Doolittle presented corporate and individual Jimmy Doolittle and Ira Eaker Fellows during the ceremonies.

Other special guests at the luncheon included Mrs. Ruth Eaker; Gen. Jerome F. O'Malley, Air Force Vice Chief of Staff; Lt. Gen. Andrew P. Iosue, DCS/Manpower and Personnel; Maj. Gen. Leigh Wade, USAF (Ret.), the only living pilot from the round-the-world flight in 1924; famed test pilot Scott Crossfield; Lt. Gen. Charles G. Cleveland, Air University Commander; Ms. Sharon Schonhaut, representing Secretary of Education Terrel H. Bell; Brig. Gen. Ted Rees, Deputy Director of Air Force Legislative Liaison; AFA Board Chairman Vic Kregel; AFA National President John G. Brosky; congressional staffers; and others.

AFA President John G. Brosky awarded four AFA Citations of Honor at the luncheon to individuals and organizations for their accomplishments in training and education. They are: Capt. James G. Parks, for his contributions to security training; Maj. Gerald J. Stiles, for enhancing F-4G Wild Weasel training; the 64th Aggressor Squadron, for advancing air-to-air fighter training; and to the 2052d Communications Squadron, for excellent mission support of an important Air Force training facility. *(See also p. 84.)*

President Brosky then presented the Hoyt S. Vandenberg Award, AFA's highest aerospace education award, to former AFA Executive Director James H. Straubel. His citation read in part: "For outstanding contributions to aerospace education in the United States and abroad as a stimulus, catalyst, and innovator . . . and for his 1982 book, *Crusade for Airpower: The Story of the Air Force Association*."

Next event on the program was the presentation of the Foundation's corporate and individual Jimmy Doolittle Educational and Ira Eaker Historical Fellows *(see accompanying box)*.

To date, there are sixteen corporate and 270 individual Jimmy Doolittle Fellows, while the newly created Ira Eaker Fellow program has one corporate and thirty-five individual Fellows.

Proceeds from the Doolittle Fellow program are used to apply aerospace technology to the advancement of education by making available Air Force courses to the civilian educational community. Resources from the Eaker Fellow program allow the Foundation

Aerospace Education Foundation Fellowships

(Presented at September 13 Luncheon)

Corporate Jimmy Doolittle Fellows	**Recipient**
General Electric Foundation	Clifford LaPlante, GE Aircraft Engine Group
Hughes Aircraft Co.	John L. Winkel, Senior Vice President of Marketing
Individual Jimmy Doolittle Fellows	**Sponsor**
Gen. Charles A. Gabriel, USAF *(Presented at Chief's Luncheon)*	Brig. Gen. William W. Spruance, USAF (Ret.)
Mrs. Anna Chennault	Northrop Corp.
Mrs. Alice "Skip" Brown	Gen. Ed Rawlings, USAF (Ret.)
Congressman Melvin Price	Air Force Ball of Mid-America
Personnel of Military Airlift Command	Air Force Ball of Mid-America
Personnel of Air Force Communications Command	Air Force Ball of Mid-America
Personnel of Scott AFB, Ill.	Air Force Ball of Mid-America
Mr. G. Duncan Bauman	Air Force Ball of Mid-America
Air Force Ball of Mid-America *(Accepted by Hugh L. Enyart)*	Air Force Ball of Mid-America
Ambassador Marquita M. Maytag	Self
CMSgt. Bernard R. Joyce, USAF (Ret.)	MSgt. Kathryn K. Joyce, USAF (Ret.)
Mr. Norman C. "Dutch" Heilman	Wright Memorial Chapter
Michael J. Nisos	Brig. Gen. William W. Spruance, USAF (Ret.)
Individual Ira Eaker Fellows	**Sponsor**
President Ronald Reagan *(Accepted by Gen. Jerome F. O'Malley, USAF)*	Ms. Frances Jo Curtis
MSgt. Kathryn K. Joyce, USAF (Ret.)	CMSgt. Bernard R. Joyce, USAF (Ret.)
USAF Air Demonstration Squadron	Air Force Ball of Mid-America
Defense Mapping Agency	Air Force Ball of Mid-America
Geralee S. Dougherty *(In memoriam) (Accepted by her son, Capt. Bryant Dougherty)*	Russ and Barbara Dougherty, and her children

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 free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principle of freedom and equal rights for all mankind.

PRESIDENT
David L. Blankenship
Tulsa, Okla.

BOARD CHAIRMAN
John G. Brosky
Pittsburgh, Pa.

SECRETARY
Sherman W. Wilkins
Bellevue, Wash.

TREASURER
George H. Chabbott
Dover, Del.

NATIONAL VICE PRESIDENTS

Information regarding AFA activity within a particular state may be obtained from the Vice President of the Region in which the state is located.

R. L. Devoucoux
270 McKinley Rd.
Portsmouth, N. H. 03801
(603) 436-5593
New England Region
Maine, New Hampshire, Massachusetts, Vermont, Connecticut, Rhode Island

Thomas J. Hanlon
5100 Willowbrook
Clarence, N. Y. 14031
(716) 741-3732
Northeast Region
New York, New Jersey, Pennsylvania

H. B. Henderson
10 Cove Dr.
Seaford, Va. 23696
(804) 898-4432
Central East Region
Maryland, Delaware, District of Columbia, Virginia, West Virginia, Kentucky

Karen M. Kyritz
17105 E. Bethany Cir.
Aurora, Colo. 80013
(303) 690-2920
Rocky Mountain Region
Colorado, Wyoming, Utah

Jan Laitos
2919 Country Club Dr.
Rapid City, S. D. 57701
(605) 343-0729
North Central Region
Minnesota, North Dakota, South Dakota

Lee C. Lingelbach
P. O. Box 1086
Warner Robins, Ga. 31099
(912) 922-7615
Southeast Region
North Carolina, South Carolina, Georgia, Florida, Puerto Rico

Frank M. Lugo
5 S. Springbank Rd.
Mobile, Ala. 36608
(205) 344-4414
South Central Region
Tennessee, Arkansas, Louisiana, Mississippi, Alabama

Edward J. Monaghan
2401 Telequana Dr.
Anchorage, Alaska 99503
(907) 243-6132
Northwest Region
Montana, Washington, Idaho, Oregon, Alaska

Lyle O. Remde
4911 S. 25th St.
Omaha, Neb. 68107
(402) 731-4747
Midwest Region
Nebraska, Iowa, Missouri, Kansas

Edward A. Stearn
15 Cardinal Lane
Redlands, Calif. 92373
(714) 793-5077
Far West Region
California, Nevada, Arizona, Hawaii, Guam

Howard C. Strand
15515 A Drive North
Marshall, Mich. 49068
(616) 781-7483
Great Lakes Region
Michigan, Wisconsin, Illinois, Ohio, Indiana

Joseph Turner
2705 Ross St.
Clovis, N. M. 88101
(505) 762-5519
Southwest Region
Oklahoma, Texas, New Mexico

NATIONAL DIRECTORS

John R. Alison
Arlington, Va.

Lew Allen Jr.
Pasadena, Calif.

Joseph E. Assaf
Hyde Park, Mass.

William R. Berkeley
Redlands, Calif.

Thomas O. Bigger
Tullahoma, Tenn.

Daniel F. Callahan
Cocoa Beach, Fla.

Robert L. Carr
Pittsburgh, Pa.

Earl D. Clark, Jr.
Kansas City, Kan.

Gregg L. Cunningham
State College, Pa.

Edward P. Curtis
Rochester, N. Y.

Hoadley Dean
Rapid City, S. D.

Jon R. Donnelly
Richmond, Va.

James H. Doolittle
Monterey, Calif.

Richard C. Doom
Canyon Country, Calif.

George M. Douglas
Denver, Colo.

Joseph R. Falcone
Rockville, Conn.

E. F. Faust
San Antonio, Tex.

Alexander C. Field, Jr.
Marco Island, Fla.

Joe Foss
Scottsdale, Ariz.

James Grazioso
West New York, N. J.

Jack B. Gross
Hershey, Pa.

George D. Hardy
Hyattsville, Md.

Alexander E. Harris
Little Rock, Ark.

Martin H. Harris
Winter Park, Fla.

Gerald V. Hasler
Albany, N. Y.

John P. Henebry
Chicago, Ill.

Robert S. Johnson
Clover, S. C.

David C. Jones
Arlington, Va.

Francis L. Jones
Wichita Falls, Tex.

Sam E. Keith, Jr.
Fort Worth, Tex.

Arthur F. Kelly
Los Angeles, Calif.

Victor R. Kregel
Dallas, Tex.

Thomas G. Lanphier, Jr.
San Diego, Calif.

Jess Larson
Washington, D. C.

Curtis E. LeMay
Newport Beach, Calif.

Carl J. Long
Pittsburgh, Pa.

John L. Mack, Jr.
Mt. Pleasant, S. C.

Nathan H. Mazer
Roy, Utah

William V. McBride
San Antonio, Tex.

J. P. McConnell
Bethesda, Md.

James M. McCoy
Bellevue, Neb.

J. B. Montgomery
Los Angeles, Calif.

Edward T. Nedder
Hyde Park, Mass.

J. Gilbert Nettleton, Jr.
Washington, D. C.

Ellis T. Nottingham, Jr.
Arlington, Va.

Martin M. Ostrow
Los Angeles, Calif.

Jack C. Price
Clearfield, Utah

William C. Rapp
Buffalo, N. Y.

Margaret A. Reed
Seattle, Wash.

Julian B. Rosenthal
Sun City, Ariz.

John D. Ryan
San Antonio, Tex.

Peter J. Schenk
Jericho, Vt.

Joe L. Shosid
Fort Worth, Tex.

C. R. Smith
Washington, D. C.

David J. Smith
Springfield, Va.

William W. Spruance
Marathon, Fla.

Thos. F. Stack
San Mateo, Calif.

J. Deane Sterrett
Beaver Falls, Pa.

James H. Straubel
Fairfax Station, Va.

Harold C. Stuart
Tulsa, Okla.

James H. Taylor
Farmington, Utah

Liston T. Taylor
Lompoc, Calif.

James M. Trail
Boise, Idaho

A. A. West
Newport News, Va.

Michael Winslow
Yakima, Wash.

Russell E. Dougherty
(ex officio)
Executive Director
Air Force Association
Washington, D. C.

Rev. Henry J. Meade
(ex officio)
National Chaplain
Needham, Mass.

CMSgt. James Binnicker
(ex officio)
Chairman, Enlisted Council
Randolph AFB, Tex.

Robert Gass
(ex officio)
National Commander
Arnold Air Society
Irvine, Calif.

Gen. Jerome F. O'Malley, USAF Vice Chief of Staff, thanks Ms. Frances Jo Curtis for her sponsorship of an Ira C. Eaker Fellowship for President Reagan. General O'Malley accepted the Fellowship on behalf of the President. See item.

to make available dynamic and extensive aerospace educational and historical training materials and programs to the nation's youth, community leaders, opinion-makers, and government officials. This program is designed to perpetuate knowledge of the rich military and civil aerospace history of the nation.

The final major event of the luncheon was the presentation of the winning entry in the Foundation's annual AFJROTC contest. This year's contest called for a presentation on aerospace history.

The overall winner was the AFJROTC unit at Patchogue-Medford High School, Medford, N. Y. The unit produced a color sound/slide presentation on the history of their AFJROTC unit. Representatives from the high school were special guests at the AFA Convention, and included: Lt. Col. Ramon L. Echevarria, USAF (Ret.), the aerospace education instructor for the unit; TSgt. James Cowan, USAF (Ret.), his assistant; and Cadet Maj. Joseph Potuzak, who was primarily responsible for the entry. The winning plaque and $1,500 prize were presented to Colonel Echevarria by General Doolittle.

AFA Intercom

AFA President-elect and Membership Chairman Dave Blankenship, left, and AFA President John G. Brosky present a Membership Achievement Award to New Jersey State AFA President John P. E. Kruse at the Convention.

In a related matter, Foundation Board Chairman Sen. Barry Goldwater (R-Ariz.) was unanimously reelected by the Foundation's Board of Trustees during their annual meeting. Also reelected unanimously were: Dr. Don C. Garrison, President of the Tri-County Technical College in Pendleton, S. C., as Foundation President; Emlyn I. Griffith, member of the New York State Board of Regents, as Secretary; and George D. Hardy, former AFA National President and Foundation Board Chairman, as Treasurer.

—By Michael J. Nisos

Some Well-Earned Credit for Four Crackerjack Crews

AFA took particular pleasure in presenting four new awards this year, honoring the people who form the cutting edge of aerospace power—the aircrews of USAF's strategic, tactical, and mobility forces. Selection of the first recipients for the crew awards was made by the Air Force. *(See also p. 84.)*

The awards and winners are:

- *The General Curtis E. LeMay Strategic Aircrew Award,* designating the best overall aircrew in SAC. Crew E-09, 320th Bomb Wing, Mather AFB, Calif. Capt. James J. Demetrio, aircraft commander; Capt. Glen N. Pontiff, copilot; Capt. Davis S. M. Glasebrook, copilot; 1st Lt. Joseph A. Worthington, copilot; Capt. Jon A. Fischer, radar navigator; 1st Lt. Richard J. Sorenson, navigator; Capt. Theodore A. Zwicker, electronic warfare officer; and TSgt. John T. Degeare, aerial gunner.

  Won title of best B-52 crew in SAC at annual bombing and navigation competition, finishing first among thirty-four handpicked crews representing seventeen bomb wings. Contributed significantly to 320th Wing's capture of the Russell E. Dougherty Trophy for most accurate SRAM launches, and the James E. Bartsch Trophy for best ECM activity. One hundred percent scores on all ORI testing.

- *The General Thomas S. Power Strategic Combat Missile Crew Award,* designating the best overall combat missile crew in SAC. Crew S-199, 308th Strategic Missile Wing, Little Rock AFB, Ark. Capt. James A. Sands, commander; Capt. David D. Rathgeber, deputy commander; TSgt. John D. Ferguson, missile systems analyst technician; and SSgt. Stephen K. Fortier, missile facilities technician.

  Won "Best Missile Combat Crew in SAC" title at annual missile combat competition. Led wing to honors for best missile operations and best Titan II operations in command. Entire crew achieved "Highly Qualified" job proficiency ratings on stanboard/evaluation. During one alert, they abated an oxidizer reagent leak and resolved this potentially volatile situation quickly.

- *The Lieutenant General William H. Tunner Aircrew Award,* designating the best overall aircrew in MAC. Capt. Milton M. Brewer, aircraft commander, and crew, 60th Military Airlift Wing, Travis AFB, Calif. Maj. Richard A. Batsford,

first pilot; Capt. Robert C. Johnson, copilot; Maj. Kendall J. Wright, navigator; MSgt. Gary L. Villeneuve, flight engineer; TSgt. Mark D. Warren, flight engineer; SSgt. Daniel H. Guthrie, flight engineer; SSgt. Phillip E. Peterman, flight engineer; TSgt. Eugene R. Clairborne, loadmaster; TSgt. Ralph D. Jones, loadmaster; SSgt. William H. Marshall III, loadmaster; and SSgt. Michael A. See, loadmaster.

On June 7, 1982, No. 3 engine of their C-5A blew on takeoff, and fire was soon spreading from it. It was too much to handle in flight, and adding to the problems of landing was debris from the engine scattered on the runway. With smoke covering the underside of the aircraft, and hot metal falling to the ground, they got the seventy-three passengers—including a hysterical mother with baby—safely away, finished engine shutdown, and completed necessary checklists before essential crew members themselves exited.

● *The Lieutenant General Claire Lee Chennault Award,* designating the outstanding aerial warfare tactician. Lt. Col. Wayne L. Schultz, 120th Tactical Fighter Squadron, Colorado ANG.

Winner of TAC's Top Gun championship, leader of his wing's teams in Gunsmoke 81 fighter gunnery competition and joint Maple Flag 8 exercises. Formulated fighter pilot's "bible" that A-7D colleagues use to hone their skills. Since he assumed command, the squadron has been tops in ORI and stan/eval ratings, its pilots getting the highest threat-knowledge scores in Twelfth Air Force history.

—By Eric Clydesdale

Unit Reunions

Ordre Pour Le Mérite
The Ordre Pour Le Mérite (Aerospace Honor Society) annual muster will be held December 3–5, 1982, at Vandenberg AFB, Calif. **Contact:** Col. Robert L. Griffin, USAF (Ret.), 4367 California Blvd., Santa Maria, Calif. 93455.

23d Bomb Sqdn.
Members of the 23d Bomb Squadron will hold a reunion on December 4–8, 1982, in San Antonio, Tex., in conjunction with the Pearl Harbor Survivors Association. **Contact:** Lee Benbrooks, 509 E. Chartres St., Anaheim, Calif. 92805.

Beale AFB/Beale Heritage Ass'n
Beale AFB and the Beale Heritage Association are asking all veterans who served at this base, including when it was Camp Beale Army Base, to write the Retiree Affairs Office for the purpose of planning a reunion.

Please send name, rank, name of organization assigned while at Beale, and home address to the address below.

CWO David S. Roginson, USA (Ret.)
Director of Retiree Affairs Office
Beale AFB, Calif. 95903

Class 42-H
Parks Air College, Enid AAB, Foster Field, Victoria, Tex.—let's get that great gang reacquainted. Perhaps a reunion to relive those memorable years!

Please contact the address below.

Lt. Col. John P. Ford, USAF (Ret.)
Forest Dunes
Covert, Mich. 49043
Phone: (616) 764-1751

Class 43-F
The fortieth anniversary reunion is being planned for the Stockton Army Air Corps Pilot Class 43-F, to be held on June 21–23, 1983, in Stockton, Calif. Our instructors and the base personnel are also welcome.

Please contact the address below.

Henry H. Day
1640 N. W. Arthur Circle
Corvallis, Ore. 97330
Phone: (503) 752-7451

48th Troop Carrier Sqdn.
I would like to hear from all former members of all ranks (WW II) of the 48th Troop Carrier Squadron for the purpose of planning a 1983 reunion.

Please contact the address below.

Maj. Damron C. Owen, USAF (Ret.)
4616 Tuckaseegee Rd.
Charlotte, N. C. 28208

152d Tac Control Group
The New York Air National Guard, 152d Tactical Control Group, Roslyn ANG Station, N. Y., will hold its thirty-fifth anniversary ball on March 25, 1983.

Former members of this unit should contact the address below as soon as possible.

SMSgt. Ronald F. Persico, NYANG
Hq. 152d Tactical Control Group
Roslyn ANG Station, N. Y. 11576

454th Bomb Group
I am trying to locate the men who served with the 454th Bomb Group, Fifteenth Air Force, for a possible reunion, and to organize a 454th Bomb Group Association.

Please contact the address below.

Chris McDougal
3921 67th St.
Urbandale, Iowa 50322

All members under age 65 now eligible to apply

NEW, RECORD BENEFIT

CURRENT BENEFIT TABLES

Including Substantial Benefit Increases for Policyholders Under Age 65
(effective May 31, 1982)

Member's Attained Age	STANDARD Premium: $10 per month Basic Benefit*		HIGH OPTION Premium: $15 per month Basic Benefit*		HIGH OPTION PLUS PLAN Premium: $20 per month Basic Benefit*	
	Former Coverage	New Coverage	Former Coverage	New Coverage	Former Coverage	New Coverage
20-24	$85,000	**$100,000**	$127,500	**$150,000**	$170,000	**$200,000**
25-29	85,000	**95,000**	127,500	**142,500**	170,000	**190,000**
30-34	65,000	**70,000**	97,500	**105,000**	130,000	**140,000**
35-39	50,000	**55,000**	75,000	**82,500**	100,000	**110,000**
40-44	35,000	**37,500**	52,500	**56,250**	70,000	**75,000**
45-49	20,000	**22,500**	30,000	**33,750**	40,000	**45,000**
50-54	12,500	**15,000**	18,750	**22,500**	25,000	**30,000**
55-59	10,000	**11,000**	15,000	**16,500**	20,000	**22,000**
60-64	7,500	**8,000**	11,250	**12,000**	15,000	**16,000**
65-69	4,000	**4,000**	6,000	**6,000**	8,000	**8,000**
70-74	2,500	**2,500**	3,750	**3,750**	5,000	**5,000**

AVIATION DEATH BENEFIT* (for pilots and crew members)

Non-war related: Ages 20-34—Payment of ½ the scheduled benefit. (Applies to Standard, High Option and High Option Plus Plans)
Ages 35-74—Payment of the full scheduled benefit. (Applies to Standard, High Option and High Option Plus Plans)

War related:	$15,000	$22,500	$30,000
EXTRA ACCIDENTAL DEATH BENEFIT**	$12,500	$15,000	$17,500

***AVIATION DEATH BENEFIT:** The coverage provided under the Aviation Death Benefit is paid for death which is caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage. Furthermore, the non-war related benefit will be paid in all cases where the death does not result from war or act of war, whether declared or undeclared.

****EXTRA ACCIDENTAL DEATH BENEFIT:** In the event of an accidental death occurring within 13 weeks of the accident, these AFA plans pay an additional lump sum benefit as shown in the tables, except as noted under AVIATION DEATH BENEFIT above.

OTHER IMPORTANT BENEFITS

COVERAGE YOU CAN KEEP. Provided you apply for coverage under age 65 (See "ELIGIBILITY") your insurance may be retained at the same low group rates to age 75.
FULL TIME, WORLD WIDE PROTECTION. The policy contains no war clause, hazardous duty restriction, combat zone waiting period or geographical limitation.
DISABILITY WAIVER OF PREMIUM. If you become totally disabled at any time prior to age 60 for at least a 9-month period, your coverage will be continued in force without further payment of premiums as long as you remain disabled.
FULL CHOICE OF SETTLEMENT OPTIONS. All standard forms of settlement options, as well as special options agreed to by the insured and United of Omaha, are available to insured members.
CONVENIENT PAYMENT PLANS. Premium payments may be made by monthly government allotment (payable to Air Force Association), or direct to AFA in quarterly, annual or semi-annual installments.
DIVIDEND POLICY. AFA's primary policy is to provide maximum coverage at the lowest possible cost. Consistent with this policy, AFA has provided year-end dividends in all but three years (during the Vietnam War) since the program was initiated in 1961, and basic coverage has been increased on seven separate occasions.

ADDITIONAL INFORMATION

Effective Date of Your Coverage. All certificates are dated and take effect on the last day of the month in which your application for coverage is approved, and coverage runs concurrently with AFA membership. AFA Group Life Insurance is written in conformity with the insurance regulations of the State of Minnesota. The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minnesota as trustees of the Air Force Association Group Insurance Trust.

EXCEPTIONS: There are a few logical exceptions to this coverage. They are:

Group Life Insurance: Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane will not be effective until your coverage has been in force for 12 months.

The Accidental Death Benefit and Aviation Death Benefit shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or (4) During any period a member's coverage is being continued under the waiver of premium provision, or (5) From an aviation accident, either military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

ELIGIBILITY

All members of the Air Force Association are eligible to apply for this coverage provided they are under age 65 at the time application for coverage is made.

*Because of certain restrictions on the issuance of group insurance coverage, applications for coverage under the group program cannot be accepted from non-active duty personnel residing in New York.

OPTIONAL FAMILY COVERAGE
PREMIUM: $2.50 per month

Member's Attained Age	Life Insurance Coverage for Spouse	Life Insurance Coverage for each child*
20-39	$20,000.00	$4,000.00
40-44	15,000.00	4,000.00
45-49	10,000.00	4,000.00
50-54	7,000.00	4,000.00
55-59	5,000.00	4,000.00
60-64	3,000.00	4,000.00
65-69	2,000.00	4,000.00
70-75	1,000.00	4,000.00

*Children under six months are provided with $250 coverage once they are 15 days old and discharged from the hospital.
Upon attaining age 21, and upon submission of satisfactory evidence of insurability, insured dependent children may replace this $4,000 group coverage (in most states) with a $10,000 permanent individual life insurance policy with guaranteed purchase options.

Please Retain This Medical Bureau Prenotification For Your Records

Information regarding your insurability will be treated as confidential. United Benefit Life Insurance Company may, however, make a brief report thereon to the Medical Information Bureau, a nonprofit membership organization of life insurance companies, which operates an information exchange on behalf of its members. If you apply to another bureau member company for life or health insurance coverage, or a claim for benefits is submitted to such a company, the Bureau, upon request, will supply such company with the information in its file.

Upon receipt of a request from you, the Bureau will arrange disclosure of any information it may have in your file. (Medical information will be disclosed only to your attending physician.) If you question the accuracy of information in the Bureau's file, you may contact the Bureau and seek a correction in accordance with the procedures set forth in the federal Fair Credit Reporting Act. The address of the Bureau's information office is P.O. Box 105, Essex Station, Boston, Mass. 02112. Phone (617) 426-3660.

United Benefit Life Insurance Company may also release information in its file to other life insurance companies to whom you may apply for life or health insurance, or to whom a claim for benefits may be submitted.

IOW AVAILABLE (30% Dividend—1981)

APPLICATION FOR
AFA GROUP LIFE INSURANCE

United of Omaha

Group Policy GLG-2625
United Benefit Life 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 (Mo. Day Yr.)	Height	Weight	Social Security Number

This insurance is available only to AFA members

☐ I enclose $15 for annual AFA membership dues (includes subscription ($9) to AIR FORCE Magazine).

☐ I am an AFA member.

Name and relationship of primary beneficiary

Name and relationship of contingent beneficiary

Please indicate below the Mode of Payment and the Plan you elect:

Mode of Payment	Standard Plan		High Option Plan		High Option PLUS Plan	
	Member Only	Member And Dependents	Member Only	Member And Dependents	Member Only	Member And Dependents
Monthly government allotment (only for military personnel). I enclose 2 month's premium to cover the necessary period for my allotment (payable to Air Force Association) to be established.	☐ $ 10.00	☐ $ 12.50	☐ $ 15.00	☐ $ 17.50	☐ $ 20.00	☐ $ 22.50
Quarterly. I enclose amount checked.	☐ $ 30.00	☐ $ 37.50	☐ $ 45.00	☐ $ 52.50	☐ $ 60.00	☐ $ 67.50
Semi-Annually. I enclose amount checked.	☐ $ 60.00	☐ $ 75.00	☐ $ 90.00	☐ $105.00	☐ $120.00	☐ $135.00
Annually. I enclose amount checked.	☐ $120.00	☐ $150.00	☐ $180.00	☐ $210.00	☐ $240.00	☐ $270.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth Mo. Day Yr.	Height	Weight

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanatorium, asylum or similar institution in the past 5 years? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes ☐ No ☐

If YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid.

I hereby authorize any licensed physician, medical practitioner, hospital, clinic or other medical or medically related facility, insurance company, the Medical Information Bureau or other organization, institution or person, that has any records or knowledge of me or my health, to give to the United Benefit Life Insurance Company any such information. A photographic copy of this authorization shall be as valid as the original. I hereby acknowledge that I have a copy of the Medical Information Bureau's prenotification information.

Date _____, 19 ____ _____
Member's Signature

FORM 3767GL App REV. 10-79

Application must be accompanied by a check or money order. Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Avenue, NW, Washington, D.C. 20006

11/82

Bob Stevens'

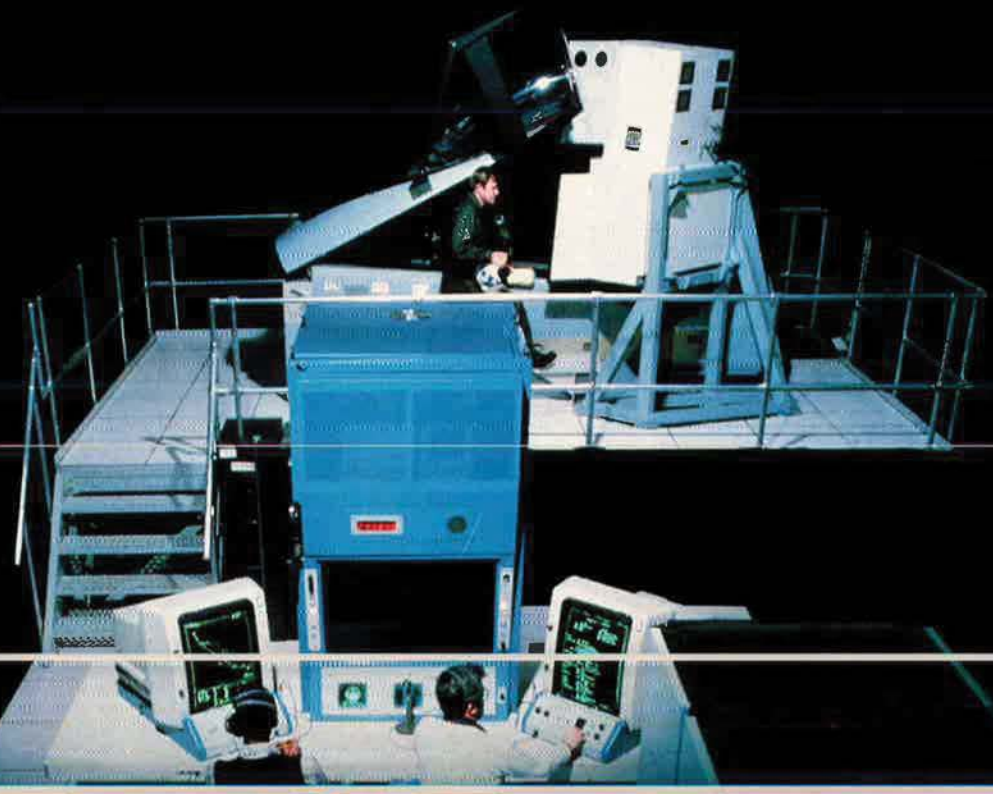
"There I was..."

HERE'S A CLASSIC. THESE SENTIMENTS, EXPRESSED BY THE 2ND IN COMMAND OF A DOUGLAS RACER ROARING ALONG AT 180 MPH, ARE STILL VALID TODAY. THIS POEM HAS APPEARED IN VARIOUS FORMS and IN COUNTLESS PUBLICATIONS; WE LIKED THIS ONE —

THE CO-PILOT

I'm the Co-pilot, I sit on the right,
It's up to me to be quick and bright.
I never talk back, for I have regrets,
I have to remember what the Captain forgets.
I make up the flight plan and study the weather,
Pull up the gear and stand by to feather,
Make out the forms and do the reporting,
and fly the old crate while the Captain is courting.
I take the readings and adjust the power,
Put on the heaters when we're in a shower,
I give him his bearings on the darkest of nights,
And do all the bookwork without any lights.
I call for my Captain and buy him a Coke,
And I always laugh at his corniest joke,
And once in a while, when his landings are rusty,
I always come through with "By gosh, but it's gusty!"
So all in all, I'm a general stooge
As I sit on the right of the man I call "Scrooge";
I suppose you think that is past understanding,
But maybe some day he'll give me a landing.

A training system that flies wing-to-wing with the F/A-18...



because Sperry knows how to listen.

Communicating with the onboard avionics of the highly computerized F/A-18 Hornet required data rates which overpowered conventional input/output systems.

That was until Sperry developed the first operational flight trainer able to match the sophistication of this "fly-by-wire" tactical aircraft. Our solution was a unique systems architecture—a new programming approach capable of greater speed and capacity, and of relieving the host computer of many input/output processing tasks.

Realism—coupled with instructional and growth flexibility—is the key element in training effectiveness. Computer-generated imagery displays panoramas ranging from carrier decks to airfields. A computer-linked G-suit/G-seat and a buffet system reproduce the physical dynamics and physiological cues of the full supersonic and subsonic flight environments.

We listened to the needs of fleet instructor pilots when we designed the instructor station. So even for new instructors, our system is easy to operate and offers flexibility in structuring and evaluating the training exercise. And the system is designed to keep pace with changing training requirements and aircraft developments. As aircraft features and objectives change, the simulation programs can be upgraded accordingly.

For more information on what we're doing—and can do—in the broad field of simulation and training, talk to us...we listen.

Write to Sperry Division Headquarters, Systems Management Marketing, Great Neck, N.Y. 11020.

SPERRY

SPERRY IS A DIVISION OF SPERRY CORPORATION

The #1 fighter "Ready Room" in the U.S. Air Force.

It's the cockpit of an F-15 Eagle, the fighter which established the highest readiness rate of all USAF combat fighters during 1981—regardless of age or capability.

The Eagle readiness rate was higher than older, less capable planes such as the F-4 and A-7. Higher also than the newer fighters, including the F-16.

The F-15 had the lowest loss rate as well—a safety record even better than the former best and current second place plane, the F-4 Phantom.

America's tactical, air defense and rapid deployment missions demand aircraft we can depend on. Airplanes ready with the range, radar, and armament to find and defeat hostile forces by day or night, in good weather or bad.

That's the Eagle. Ready and able to fight and win.

F-15 Eagle

MCDONNELL DOUGLAS