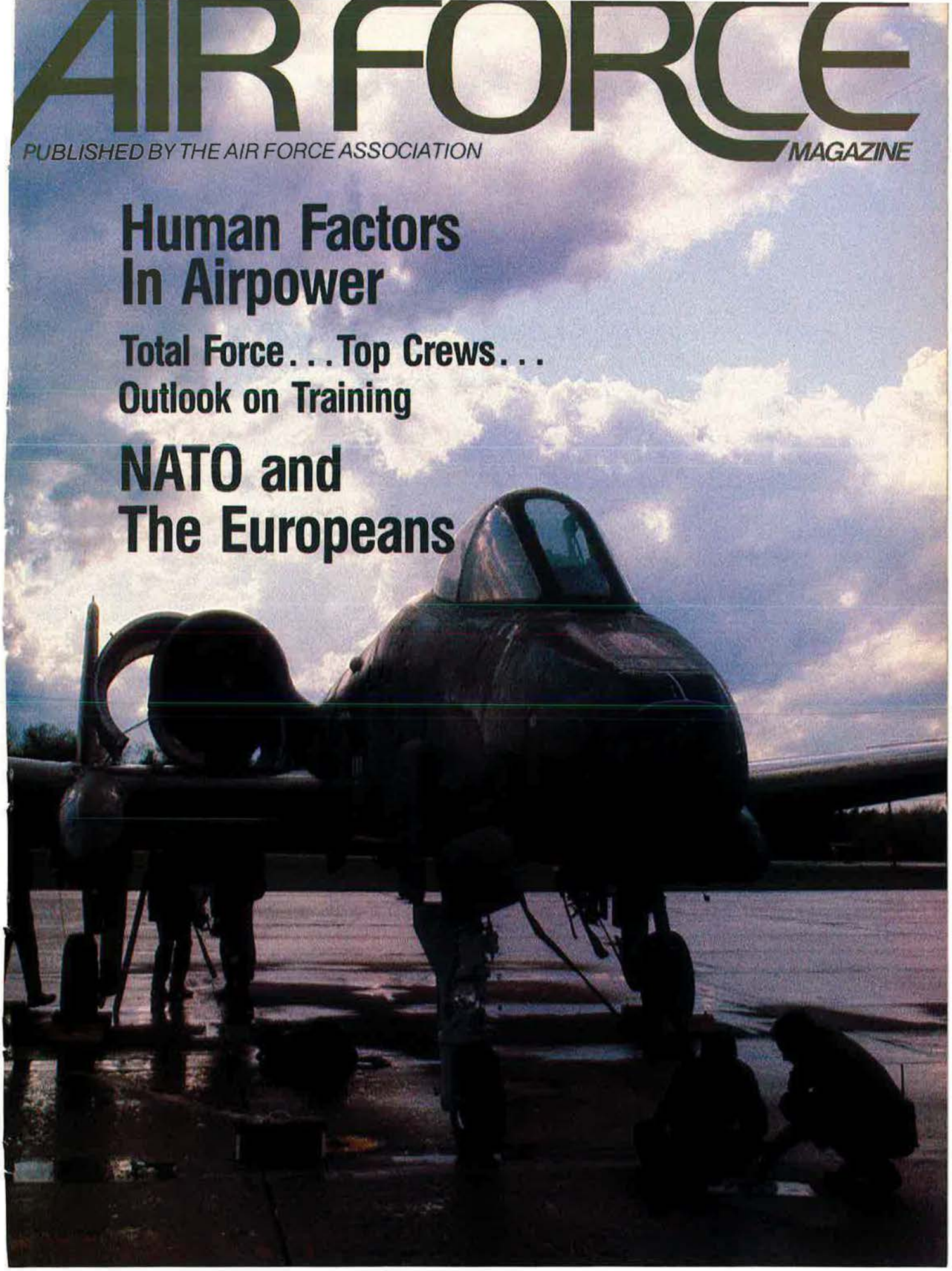
AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

Human Factors In Airpower

Total Force. . . Top Crews. . . Outlook on Training

NATO and The Europeans



It can complete any lon
altitude. An

For its strategic, conventional and cruise-missile missions, the Rockwell International B-1B Long-Range Combat Aircraft is superbly qualified to do the job. Its range, payload and penetration capabilities make it the most survivable strategic aircraft in the world.

Its General Electric F101 engines are a key reason.

A perfect match of aircraft, engine and mission

Designed specifically for the B-1, GE F101 engines provide the right mix of thrust, handling, durability and reliability needed to enhance mission success. Not only for terrain-following penetrations as low as 200 feet, but also for high-speed, high-altitude standoffs.

A tough engine for tough missions

Twelve years of improvements and technology spin-offs are rooted in every F101. So the Air Force will have a mature engine before it ever enters service.

F101 core components are identical to those of the F110, which will make fighters like the F-16XL more operable and more durable.

Examples? A demonstrated 3,000-hour hot section life before the first production engine is shipped. That's the equivalent o ten years of in-service operatio simplified exhaust nozzle to red engine weight. Bleed pipes in a neutral configuration to allow engine assemblies to be installe any engine position. And turbin inlet temperatures that provide maximum performance, reliabi and durability.

Low operating costs, too

One reason: design and pa commonality with other GE eng in the F101 family. Another reas exceptionally low fuel consump for such a high-performance eng

ange combat mission at any or good reasons.

another reason: on-condition ntenance procedures that imize maintenance actions and p costs low.

perience kes the difference

As the core engine for the B, the F101 shares technology components with a family of engines that are setting stan- ds for a host of different aircraft. F404 on the F/A-18 attack ter. The CFM56 on the KC-135R ker and commercial jetliners like new-generation DC-8s and the w 737-300. And, in flight testing, F110 on the F-16 and F-14 nters.

The F101, in short, is not only proving its mettle powering the B-1B, it's also benefiting every day from the experience gained from other engines in the family.

Engines that set new standards

The GE philosophy is simple: develop military engines that surpass previous standards and exceed customer requirements.

That's what the F101 is doing for the B-1B. And what other GE engines — like the F404, T700, CFM56 and F110 — are doing for aircraft as diverse as the F/A-18, the Black Hawk, the KC-135R and (in flight testing) the F-16 and F-14.

For lots of good reasons.

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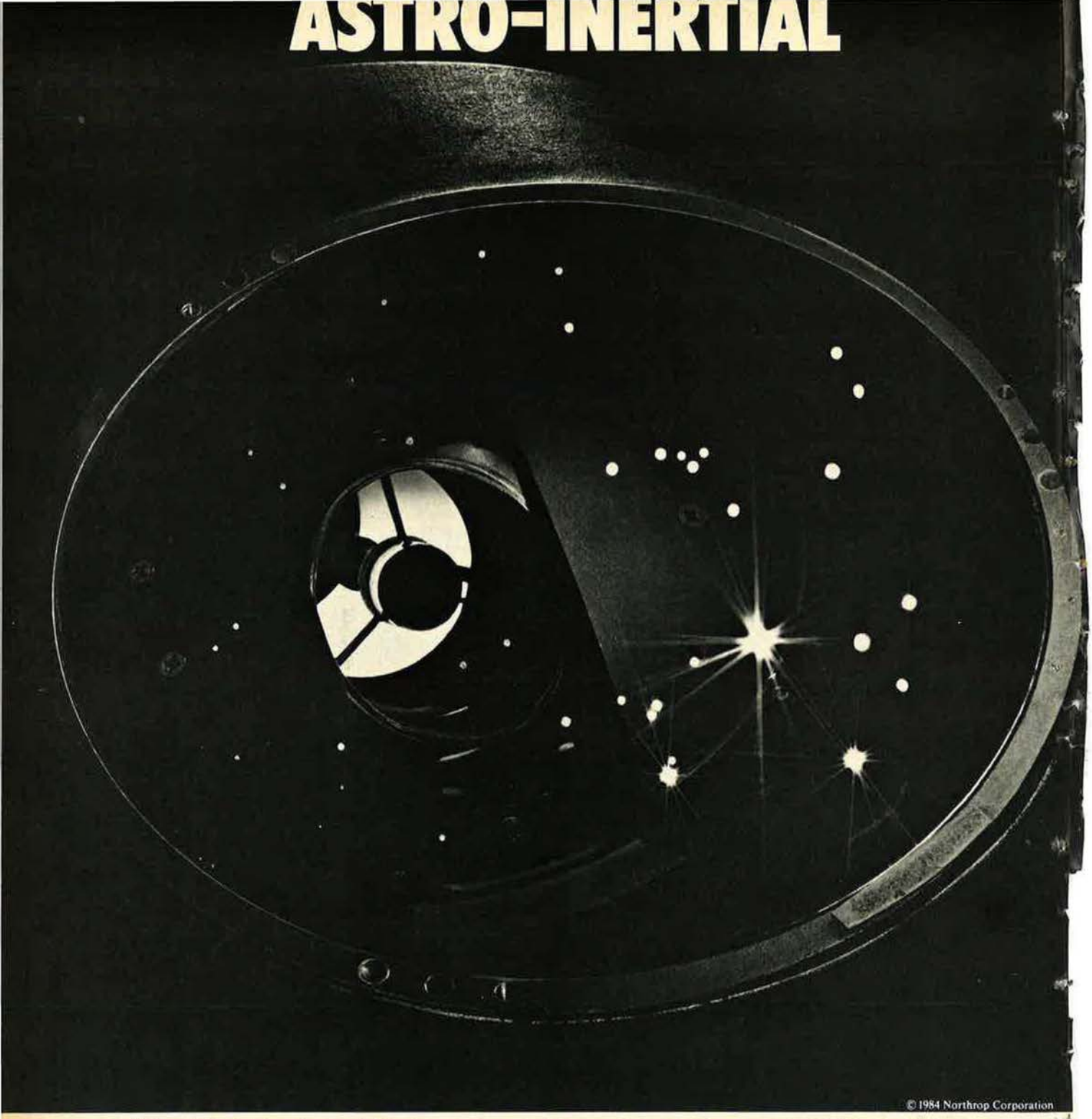
ASTRO-INERTIAL



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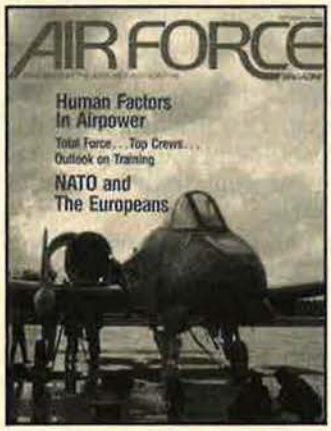

About the cover: An A-10 undergoes maintenance on the flight line. A special section on "Human Factors in Airpower" begins on p. 56 of this issue. (Photo by William A. Ford)

Departments

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AN EDITORIAL

Hay for the Yaks?

THE theme of this year's AFA National Convention is "Global Access Through Aerospace," commemorating the sixtieth anniversary of the first round-the-world flight and developments in the global reach of aerospace power since that pioneering event in 1924. It is a series of accomplishments that began with early aviators in open-cockpit biplanes, but which now encompasses the circumnavigation of the earth and moon by astronauts in space vehicles.

Reflecting on these matters is more than an exercise in nostalgia; it is a strategic imperative. Global access—for any purpose or mission, independent of any prepared environment, and unrestricted by the natural barriers or limitations of land or sea—is a unique characteristic and a fundamental advantage of aerospace technology. That may seem a rather obvious point to make, but acceptance of it came slowly, and even today, its strategic significance is not always appreciated fully.

Although the 1924 round-the-world flight demonstrated the global dimension of aviation, another twenty years would elapse before the natural long-range features of airpower became established in doctrine. A War Department regulation of 1935 recognized that airpower might have some role beyond immediate support of the land battle, but not until 1943, with the publication of Army Field Manual 100-200, did the air arm finally break out of its limited mission as auxiliary to the land forces. And in 1944, Gen. H. H. Arnold began preparation for a postwar Air Force that would be responsive to global as well as battlefield requirements. Time has proved the validity of Arnold's vision.

As the need emerged for power projection and flexibility in the exercise of national power, so did the need for versatile platforms that could go anywhere and do anything required to implement a global strategy. Yet a tendency persists to think of aerospace power in an artificially confined context. Some envisage only nuclear weapons delivery; others would limit it to narrow supporting roles.

Some years ago, I was accused by a close military associate of advocating a long-range combat aircraft of such conventional versatility that, in his words, it could "deliver hay to the yaks in Katmandu." We do not know on which day or to what remote corner of the world it may be suddenly in our nation's strategic interest to put a platform carrying sensors, weapons, or even, if it is in our national interest, "hay for the yaks in Katmandu." Only aerospace platforms with rapid global access are capable of doing these things quickly and surely.

In recent years, it has become fashionable to deride the long-range combat aircraft—the manned bomber—as an anachronism. That provincial point of view not only derogates the substantial value of a modern, reusable bomber in nuclear-delivery missions, but also it ignores or minimizes its unique, long-range versatility in strategic, nonnuclear roles.

The world power that underestimates the importance of flexibility and versatility in global access is sure to find itself imperiled, perhaps in ways not easily foreseen, by more prescient adversaries. Short of actual conflict—or through a quick, dramatic illustration of overwhelming combat capability—such a nation may be coerced, intimidated, or forced to accommodation by an aggressor in a position to project power meaningfully. We have only to reflect on France's rapid capitulation in 1940.

The nation that best masters aerospace technology—and can demonstrate that mastery to command, defend, and control global access—has the upper hand in deterring actions that threaten its security and interests, and thus is the one best able to assert its global power effectively without actually using it at all.

—RUSSELL E. DOUGHERTY, EDITOR IN CHIEF AND PUBLISHER

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MIL-STD-1553 front-panel module allows direct interface with aircraft digital bus systems.

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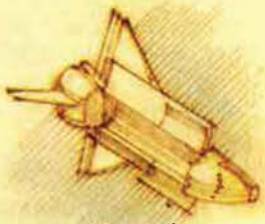
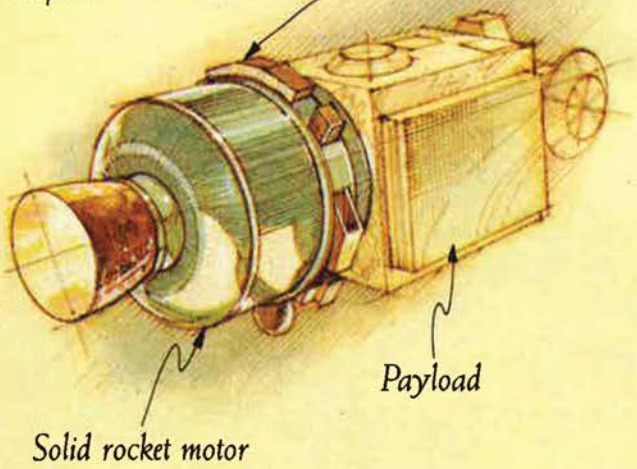
The next step: a space station that means business.

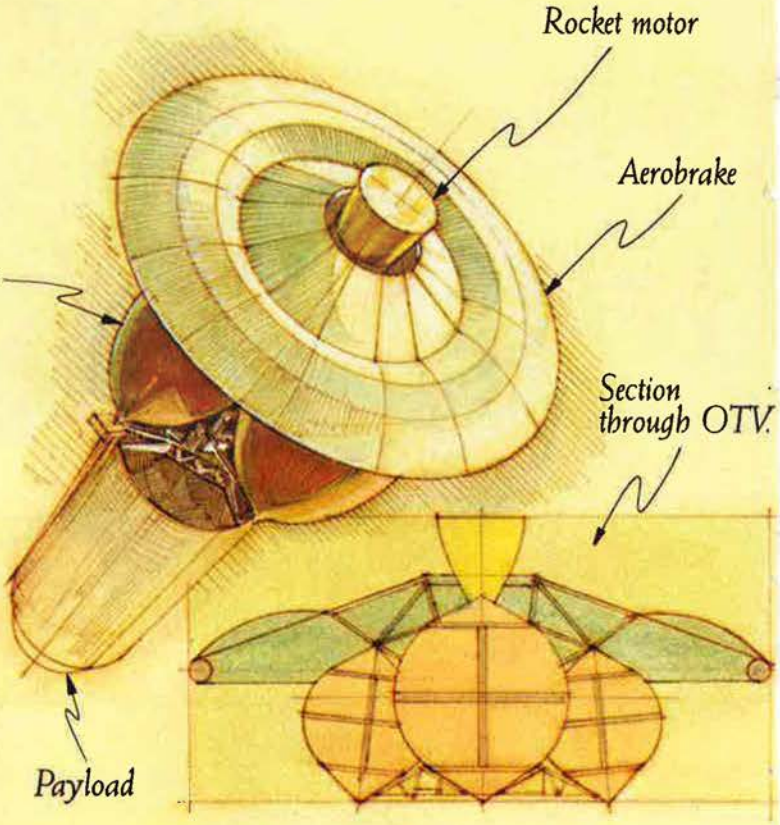
NASA has targeted the 1990s for deployment of a permanently manned space station. Martin Marietta is aiming to help NASA meet its date with advanced development of systems and spacecraft. As the permanently manned space station becomes a reality, it will open a new era of opportunity for government, science and private enterprise.





Transfer Orbit Stage (TOS)

The TOS will boost spacecraft and payloads from the Shuttle's low Earth orbit to geosynchronous transfer orbit.



Orbital Transfer Vehicle (OTV)

The mission of this reusable vehicle is to boost spacecraft to high orbits, including the geosynchronous band. The OTV will fly 20 to 30 missions before refurbishment.

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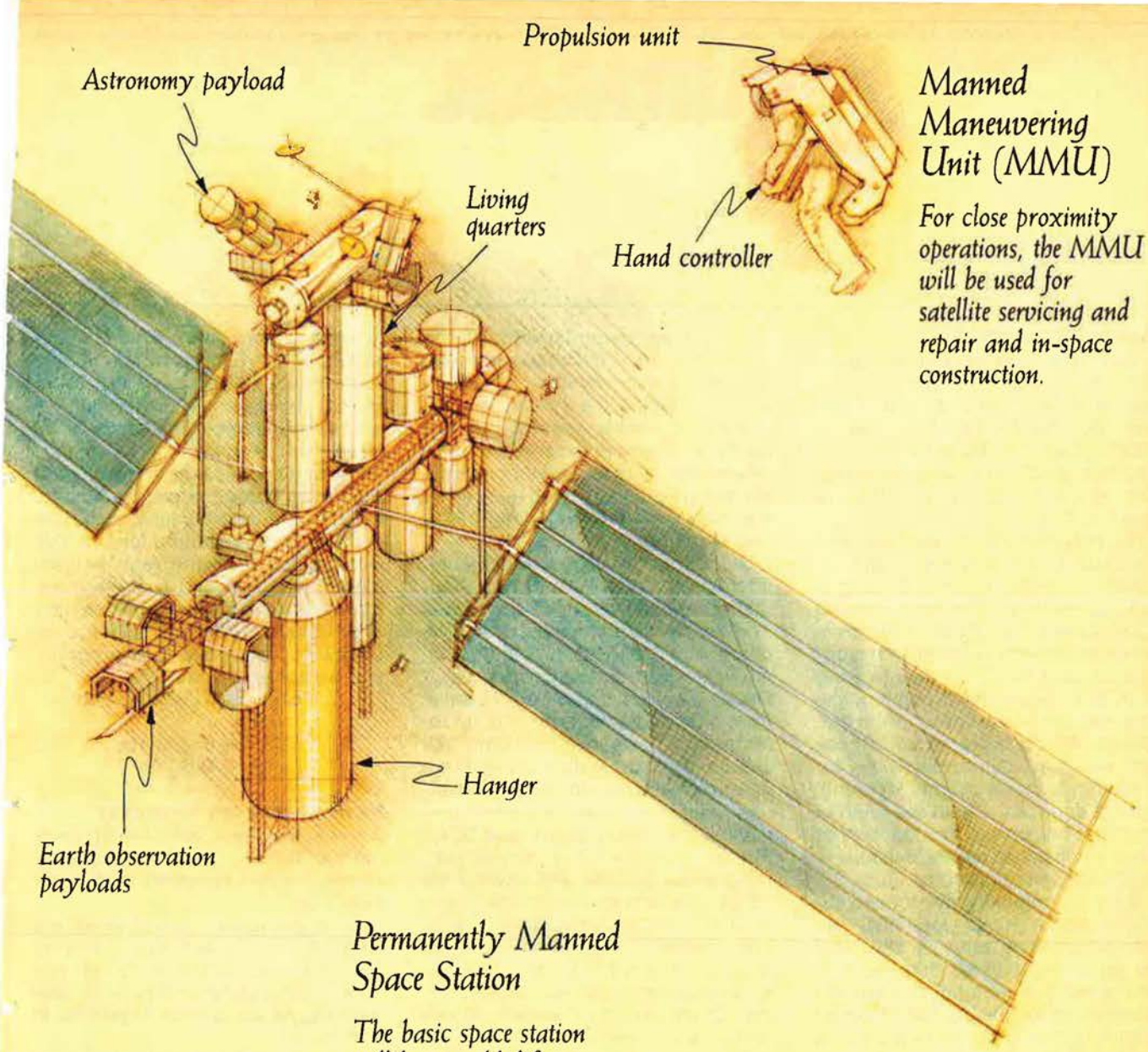

Manned Maneuvering Unit (MMU)

For close proximity operations, the MMU will be used for satellite servicing and repair and in-space construction.

Permanently Manned Space Station

The basic space station will be assembled from hardware and modules carried in the cargo bay of the Space Shuttle on successive flights. Subsequent flights will ferry crews and supplies, and deploy independently orbiting platforms.

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AIRMAIL

Warming Up to JTIDS

Your otherwise excellent edition highlighting the Electronic Air Force was flawed somewhat by your statement that the Air Force is "cool to JTIDS." *(See "Fast Track for C³I," July '84 issue, p. 42.)* On closer examination, you will find that just the opposite is true.

We in the Air Force have been and continue to be leaders in the research, development, and fielding of high-data-rate distributive communications links like JTIDS. Your comments apparently referred to misgivings we have for JTIDS data to solve all of our critical voice communications near, over, and beyond the battlefield. We do disagree with those who would substitute data links for voice links under highly dynamic combat engagements in the teeth of jammers, because JTIDS has neither the jam-resistance nor the capacity to handle those critical voice links.

But you completely overlooked our enthusiastic advocacy for JTIDS data links where they serve us best—for the rapid exchange of high-volume data among command and control centers and for the control of the air defense battle in the rear area where data exchanges are more efficient than voice communications and where JTIDS jam-resistance is adequate. We are currently fielding the Class I JTIDS terminals in all our E-3A AWACS and ground control and reporting centers. This will significantly expand our capacity for transferring air track data in a jamming environment, a capability we have long sought. Moreover, we fully intend to procure Class II JTIDS terminals for the E-3As, our ground C² centers, and our F-15 fighters in Europe for NATO air defense. The same Class II terminals are being procured by NATO for our early warning system in Europe and by the UK for its air defense Tornados as well as by the US Army for its air defense components.

JTIDS will be interoperable with the Navy because the Navy JTIDS terminals will have a mode compatible with the Air Force's JTIDS waveform.

So, on balance, I believe you will find that we strongly support the JTIDS program in its broadest context and, from a user standpoint, look forward to fielding the system in roles where it is clearly needed. Unfortunately, your article focused on areas where high antijam voice communications are critical, a need that can be met only with the Enhanced JTIDS System (EJS).

Since your article also touched on interoperability, a word or two about that often misunderstood concept is in order. The biggest enemy of interoperability is not being able to communicate at all, or, said another way, if enemy jammers prevent both parties from communicating, there is no interoperability. Yet, we frequently see solutions offered in the name of interoperability that would result in the situation just described—no communications. Tac air missions take USAF fighters into the most intense jamming threat at, over, and beyond the FEBA. That scenario demands a high level of jam-resistance. If we are to interoperate with other forces in this scenario, those forces, too, must be equipped with a robust, antijam radio. Otherwise, no communications and no interoperability.

The Air Force solution to this high antijam voice need is the EJS. Many studies over the past four years validated the level of jam-resistance required to operate where tac air missions must—in close proximity to ground- and air-based jammers. Our advocacy for EJS is based on this stark reality, not—as your article inferred—because we are chasing a unique requirement, oblivious of interoperability goals.

Fortunately, because of the diligent work of Air Force Systems Command, the Air Staff, and ourselves, we have defined the architecture for EJS that will provide both the high antijam margin required and a mode interoperable with both Air Force and Navy JTIDS Class II terminals. OSD has recently approved the EJS program, and we are on our way.

Brig. Gen. John M. Loh,
USAF
DCS/Requirements, Hq. TAC
Langley AFB, Va.

Remembering the Keystones

I was delighted with Jon R. Donnelly's article, "Last of the Keystones," which appeared in the July 1984 issue.

As a youngster born into an old Army Air Corps family and having lived at Langley in the 1930s, I may be able to shed some light on what may have happened to other Keystones of that period.

In 1935, my father was a technical sergeant and "line chief" of the old 49th Bomb Squadron, 2d Bomb Group, at Langley. He retired in the late 1940s as a colonel.

In about 1936–37, approximately ten Keystones from the 2d Bomb Group were stripped of engines, instruments, etc., and towed to the lighter-than-air section of the post. There they were parked in a row in the area of the old, well-known Balloon Hangar that previously—until they departed Langley Field in 1935—had been occupied by the 19th Airship Company.

Many of the youngsters—myself included—would play around and in these old aircraft, much to the chagrin of many fathers as well as the Air Corps. Finally, as I recall, we were totally restricted from this type of fun!

At that time, the aircraft were being prepared to be "barged" to Plum Tree Island, which was then the bombing

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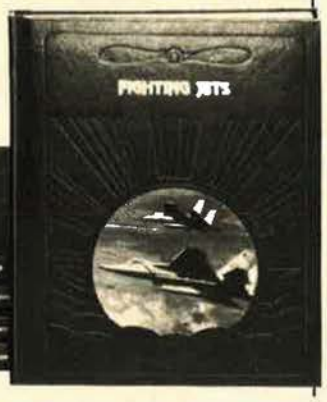

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AIRMAIL

and gunnery range for pursuit and bombardment units at Langley. I believe that was done. (I still have an eight-day Waltham clock that was mounted with four screws in the instrument panel of one of those aircraft. The stem protrudes from the bottom of the clock.)

Many years have passed, and I understand that Plum Tree is now a bird and game refuge. Wouldn't it be interesting if, somewhere out there, there are still the remains of those old bombers?

W. E. Simons
Swannanoa, N. C.

I just received my July 1984 issue of AIR FORCE Magazine and especially enjoyed Jon Donnelly's article, "Last of the Keystones." I've wondered for years what that danged twin-engine biplane was!

In early 1938, my parents took me—at age four and a half—to an Open House at nearby Barksdale Field. There were at least two Keystones on static display that day. I still have some home movies (in color!) of me sitting on the tail of Keystone KF 21. The fuselage was a mottled green, both wings and the vertical and horizontal stabilizers were yellow, and the rudder was red and white stripes.

That was the first airplane I was ever "on," and I've been on them ever since, flying for the Air Force, the Louisiana Air Guard, and the airlines. (By the way, Barksdale was "new" then, and the white buildings with red tile roofs looked stark surrounded only by small bushes and no trees!)

Conrad H. McEachern
Dallas, Tex.

Spirit and Surge

I enjoy reading your magazine. I was shocked to read the article "Spirit and Surge" in the July 1984 issue of your magazine. I couldn't believe my eyes! Those were the planes and people I had worked with when I was in the Air Force.

I was one of the crew chiefs Major Eschmann wrote about. I was the primary crew chief on F-4E 67-288. The picture at the bottom of page 96 shows the aircraft that I was responsible for on the night that the picture was taken. Then-Lieutenant Eschmann took the pictures that night because of the painted-up centerline tank on our plane. Sgt. Howard Brown and I always painted our center tanks with flags and sayings that were not so nice about Jane Fonda. If you look closely, you can see a Maltese cross on the front part of the centerline tank that we had painted.

At that time, Major Eschmann was a lieutenant. He was well liked because he never pushed us around or tried to impress us. He always seemed concerned about us and about what we were doing.

The article made me remember many details about our experiences. I thank you for publishing the article and Major Eschmann for writing about something in which I had a part. It is something I will never forget.

Bob Strickland
Madisonville, Tenn.

Cheers for DMES

Three cheers to the folks at the Air Force Logistics Management Center (AFLMC) for bringing on-line what promises to be the answer to a logistician's stubby-pencil nightmare—contingency load planning. *(See "More Load to the Lift," July '84 issue, p. 74.)*

As a SAC logistician assigned to US Central Command Air Forces, the air component of the United States Central Command, I've had an opportunity to participate in various contingency operations. During the last one, MAC planners used the DMES to rapidly and effectively load-plan the redeployment effort. As a customer, I can well attest to the system's flexibility and usefulness under demanding and austere conditions.

Again, another great job by AIR FORCE Magazine and the dedicated pros at AFLMC, several of whom I've worked with in the past.

Lt. Col. George Moyer, USAF
Shaw AFB, S. C.

Another Quiet Victory

In the article "The Quiet Victory" in the July 1984 issue of AIR FORCE Magazine, Herman S. Wolk presents an account of how World War II aircraft procurement was phased out. However, there is another aspect of the wind-down of World War II that is also worthy of note—the story of how demographics were handled. Like the procurement story, it contradicts the common belief that the government never does anything right.

After the last German defenses had collapsed and the war against Japan seemed to be entering its final phase, the government started to wonder about what would happen to the thousands of people who had moved to the West Coast to take jobs in aircraft factories there. The government asked factory managements how long they could continue to meet their current payrolls if government funds were cut off without notice.

Aircraft assembly was a labor-intensive industry—no doubt considerably more labor-intensive than it is today—and the manufacturers' estimates were in the neighborhood of seven or ten days. Spurred on by the prospect of thousands of people becoming jobless all at the same time in locations obviously incapable of absorbing the labor pool thus suddenly created, the government initiated talks with management that culminated in the issuance of a notice, inserted in each worker's pay envelope, with a message substantially as follows:

"Although the War is not yet over, the Government has decided to take a calculated risk by embarking on a program of phased cutbacks of aircraft production. The management has been conferring with the Government to determine how this cutback should be carried out. Layoffs will be governed by the principle, 'Last hired, first laid off,' and every employee has been assigned a number indicating his placement in the layoff sequence.

"Your number appears below. If it is low, the management suggests that you start making plans to seek other employment."

A great many of the assembly workers were making more money than they had ever made before, and hence they wanted to keep working on aircraft production as long as they could. The exodus of surplus workers was more or less proportionate to the cutbacks that took place, thereby avoiding the overnight creation of local labor surpluses.

At the same time, efforts were made to diversify plant output, thus building a factor of flexibility into the cutback process. For example, Grumman Aircraft got into the business of making aluminum canoes. Retooling was not too big a problem because the same basic material—aluminum alloy—was already at hand in plentiful supply, and some of the same processes used for building airframes—cutting, shaping, and riveting—could be continued.

I don't know whether the Grumman management considered the canoe-making option merely a temporary device to control the rate of workforce cutbacks or whether it foresaw the postwar demand for recreation equipment, but, as it turned out, canoe production proved to be economically viable and is still in operation today.

Frank Holan
Westminster, Vt.

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Engineers: Join the leader. Call now for information 213-452-6892. An equal opportunity employer.

Production models of the infrared-guided Maverick missile are being delivered on schedule. The new AGM-65D air-to-surface weapon significantly increases the U.S. Air Force's attack capabilities by letting crews engage a wide variety of targets during nighttime and conditions of reduced visibility. Initial production of the first 1,100 missiles follows a rigorous flight test program during which the missile demonstrated its effectiveness against moving tanks, a hangarette, radar vans, a patrol boat, and a simulated fuel dump. Eleven of 20 direct hits were made at night. The Hughes Aircraft Company missiles were tested in all kinds of weather and terrain, including the cold and snow of winter at Ft. Drum in New York and the forests and high humidity at Eglin Air Force Base in Florida.

A head-up display (HUD) that provides a wide field of view can be retrofitted on fighter aircraft to give pilots critical sensor and steering information, even in low-altitude flights at night and under poor visibility conditions. The display saves pilots from looking down into the cockpit to read instruments because information such as airspeed, heading, and target data is superimposed on a diffraction optics combiner mounted at the pilot's eye level. Compared with conventional, mirrored glass displays, the HUD has a wider field of view, is more transparent, has brighter symbology, and reduces glare and sunballs. Hughes pioneered the technology used in its display, which incorporates diffraction optics made through a process involving holographic techniques and lasers. The Hughes HUD is in production for Sweden's JAS-39 and is undergoing evaluation for several U.S. aircraft.

In the last 20 years, over $611 million in savings have been negotiated by Hughes and the Department of Defense as a result of engineering proposals for cutting costs of military systems. Since the inception of the Value Engineering program, Hughes has had 675 proposals accepted in 50 programs. The changes stemmed from advanced technology that was not available at the time the original contracts were signed. They resulted in substantial improvements in quality, reliability, producibility, and life-cycle costs. Savings amounted to 3% of Hughes' sales during the period, with the U.S. government's share amounting to nearly $500 million. The Value Engineering program is designed to encourage employees to look at the functions of a product and develop alternatives that cost less, perform better, and improve reliability.

Significant improvements in infrared simulation technology loom with the development of a device that converts complex visible scenes into infrared images. The device would at first be used for testing missile seekers and other military systems. It converts visible images into infrared by means of a modified silicon liquid-crystal light valve. The Hughes device is being developed to be fully compatible with standard video rates and computer-image generation systems.

A laser is used to weld certain components of the AMRAAM missile to lower costs and to provide improved performance where low heat distortion is required. The missile's precision RF (radio frequency) seeker antenna is made lightweight and low in cost by laser-welding aluminum foils together. The missile fins are made of laser-welded corrugations and skins to provide strong lightweight surfaces for steering in flight. Hughes designed and developed the Advanced Medium-Range Air-to-Air Missile for the U.S. Air Force and Navy. This laser welding process was developed by Hughes on an Air Force manufacturing technology program. AMRAAM is manufactured in Tucson, Arizona.

For more information write to: P.O. Box 11205, Marina del Rey, CA 90295

AIRMAIL

Access for IR&D

The "Airmail" column in the July 1984 issue of AIR FORCE Magazine carried a letter on page 11, "The Independent Infusion," that left an incorrect impression. The letter indicated that the Air Force has no mechanism for providing classified data to contractors working in independent research and development (IR&D) when the contractor can demonstrate a valid "need to know" but has no funded contract in the area.

The mechanism for providing contractors access to classified information is the Air Force Potential Contractor Program (AFPCP), which was established under provision of DODI 5100.36 and AFR 80-11. This program gives contractors who presently have no Air Force contracts the ability to obtain requirements information that will aid them in competing for future Air Force contracts. Contractors with ongoing contracts also may use the program to obtain information that will allow them to expand into new technology areas. The receipt of government documents or information through AFPCP in no way obligates a contractor to the government.

The Air Force contact points for the AFPCP are the Air Force Information for Industry Offices (AFIFIO) located in Alexandria, Va., (202) 274-9305; Pasadena, Calif., (213) 792-3192; and Wright-Patterson AFB, Ohio, (513) 258-4259. All contractors with a valid "need to know" should feel free to register with AFIFIO.

Lt. Gregory J. Black, USAF
Andrews AFB, Md.

Care for the Rotorheads!

Unfortunately, it would appear that certain "fixed-wingers" in your organization have stuck it to us poor "fling-wingers" again. On page 61 of your July 1984 issue is a picture with a caption reading, "An OV-10 pilot switches his HAVE QUICK radio to a jam-resistant mode before takeoff."

There are a couple of errors in this statement. The aircraft pictured is a CH-53C belonging to the 601st Tactical Air Support Squadron. The pilot belongs to the 601st TASS and not to one of the sister OV-10 units. (The tip-off is that his helmet is equipped with a boom mike, not an oxygen mask/mike.) The chopper is not ready for takeoff since the engines have not started (there are no indications on the engine instruments). The pilot is not ready for takeoff since his seat belt and shoulder harness are not fastened.

Congratulations on an excellent publication, but please have a care for us current and ex-rotorheads!

Maj. Mark D. Gunn, USAF
Wright-Patterson AFB, Ohio

Your caption writer may have been misled by the pilot's shoulder patch in the photo on page 61 of the July 1984 issue.

Although the pilot is wearing a patch of the 601st Tactical Control Wing, he is not one of the wing's OV-10 pilots. Instead, he is a CH-53 pilot of the 601st Tactical Air Support Squadron. Your photo shows the pilot in the right seat of the Sikorsky BUFF, not in the front seat of a Bronco.

Having flown both aircraft while stationed at Sembach AB, I can tell you that there is a big difference between the two.

Capt. David K. Daley, USAF
Belleville, Ill.

• *Apparently, the caption information we received along with the photograph was in error. The radio in the aircraft is a HAVE QUICK set, but the aircraft is indeed a CH-53C. We have not been able to verify the unit designations supplied by our readers (nor did our caption give any); however, we have no doubt that our sharp-eyed readers are correct!*—THE EDITORS.

Corrections Corner

I fear that a rather significant error slipped into your item that began on page 32 of the July 1984 "Aerospace World" column on the USS *Iowa*.

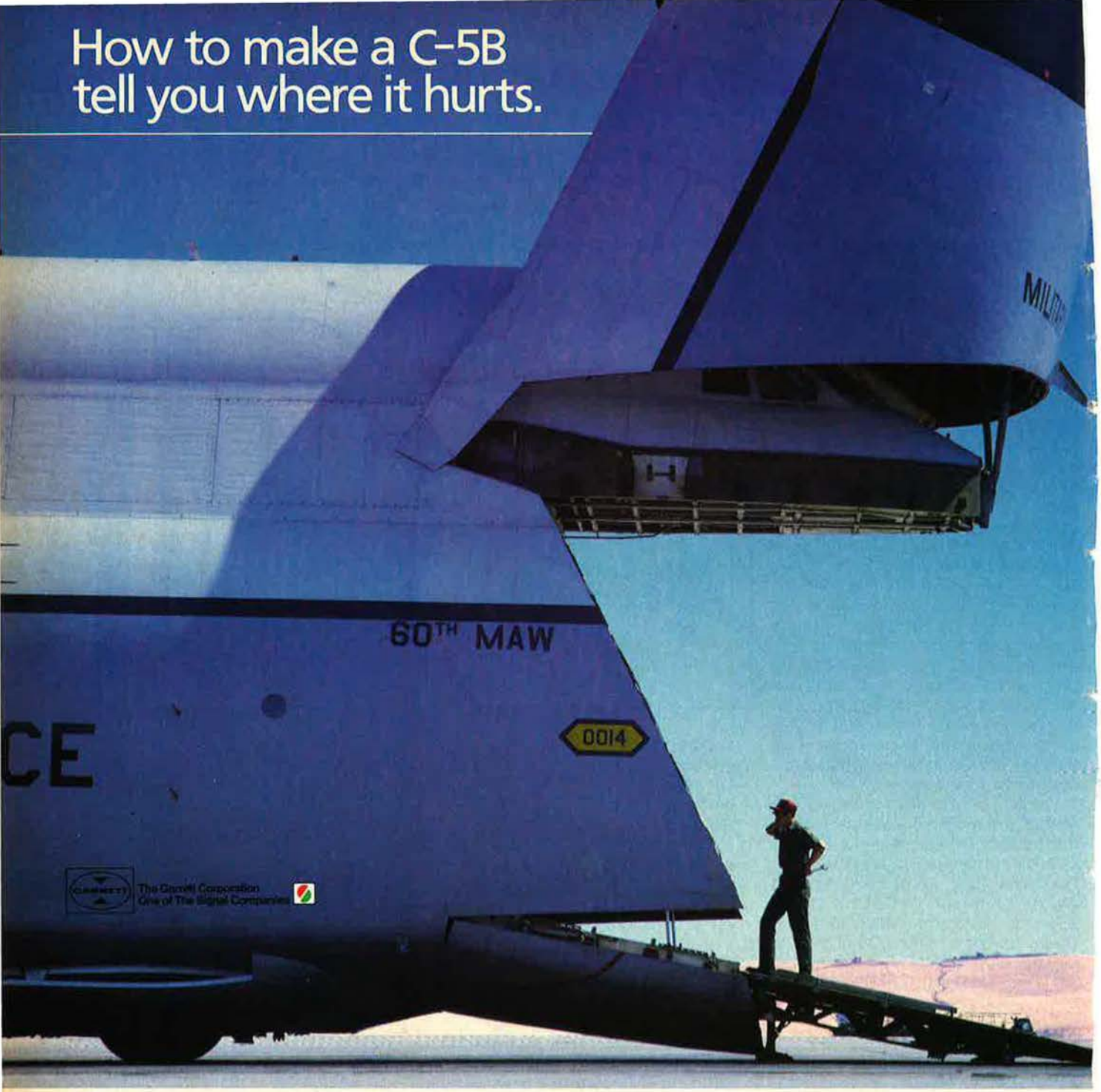
Your article states that "four quadruple cannister launchers for sixteen Harpoon missiles for antiair and antimissile defense" will equip the *Iowa*. While Harpoon is an excellent weapon, no current or planned cruise missile can effectively serve as an antiair or antimissile weapon. The Harpoon is intended for use against surface targets. For antiair/antimissile operations, the *Iowa* will carry a variety of weapons, including the Standard Mk 2 series missiles and the Phalanx close-in air defense weapon system.

Thank you for allowing me to correct this small "gremlin" in an otherwise excellent issue!

Capt. Steven E. Daskal, USAFR
Annandale, Va.

• *Reader Daskal is correct.*—THE EDITORS.

How to make a C-5B tell you where it hurts.



Transient faults from interfacing avionics or weapons systems are not always evident on the ground. That's why you should specify the Garrett Standard Central Air Data Computer (SCADC) in your retrofit program. Or in new designs.

SCADC is already in production for the Grumman C-2A and the Lockheed C-5B. Where it will permanently record its own intermittent faults, or input faults from interface systems. Before they become catastrophic.

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What's more, the Garrett SCADC is designed for growth, easily adding new systems inputs.

SCADC can be retrofitted to over 25 types of fighter, attack and transport aircraft. Extending their life. Or adding capability to new aircraft designs.

So when the time comes to specify a SCADC, remember the only one that can't forget.

For information, contact: SCADC Sales Manager, AiResearch Manufacturing Company, 2525 West 190th Street, Torrance, CA 90509. (213) 512-1025.

GARRETT

AIRMAIL

Your checklist of major electronics projects in "What's Happening in Electronics at ESD" in the July 1984 issue of AIR FORCE Magazine mistakenly shows Logicon Inc. as the Sentinel Bright contractor *(p. 66)*.

Engineering Research Associates (ERA) is the present contractor on this program. We are particularly proud of this $9 million contract award since, as a small business, we won this program in a competitive procurement.

Paul Arnone
President, Engineering
Research Associates
Vienna, Va.

• *Reader Arnone is correct. According to Electronic Systems Division, Logicon Inc. did some preliminary work on Sentinel Bright; however, Engineering Research Associates is the present contractor on the program.*—THE EDITORS.

Double Duty!

While reading the July 1984 issue of your magazine, I came upon an interesting photograph *(p. 36)*. It shows an Air Force general in his new ceremonial uniform officiating at the swearing-in ceremony of four Naval Academy graduates who had accepted commissions in the Air Force.

I found it quite appropriate that the new Air Force ceremonial uniform, which makes Air Force officers appear as though they are in the Navy, was used to commission Naval Academy graduates into the Air Force! Perhaps the genius who designed these uniforms had just such a ceremony in mind!

I suggest immediate promotion for the individual who had the foresight to predict these intriguing situations.

David C. Garretson
Belleville, Ill.

The Equation

The letter in "Airmail" in the July 1984 issue from Capt. Bruce E. Lewis, Jr., USAF, really hit the nail on the head, particularly in his last two paragraphs *(p. 6)*. I have seldom seen anything stated quite so nicely as his declaration that "the equation of doubts vs. loyalty is still weighted to the loyalty side, but the equation is approaching equilibrium in my personal calculations."

I am also within a year of retiring from government service. Captain Lewis's letter hit home as one from *all* who have served our country. Along with the Captain, I hope that the unknown "They" are not hard-of-hearing.

R. M. Bascom
San Jose, Calif.

History Repeats

John T. Correll's article "From Worst to First" in the June 1984 issue offers an important point—sometimes the psychological advantages of linking individual identity with specific hardware outweigh all the supposed advantages of consolidated maintenance and support in the mistaken notion of improving economy and efficiency. TAC is to be congratulated for learning this vital lesson and for implementing needed changes. However, it is really yet another example of history repeating itself.

There is a fascinating section in R. V. Jones's semiautobiographical *The Wizard War* that deals specifically with the advantages of squadron-level rather than consolidated maintenance of fighter aircraft. At first, during the Battle of Britain, the RAF did have squadron-level maintenance but abandoned it later in the war for centralized maintenance. Commanders learned at the time of the V-1 crisis, however, that the older method had the very advantages that TAC has now recognized: improved sortie rates, increased reliability, and improved morale and *esprit de corps*.

Jones concluded, "The enthusiasm engendered by the direct interest of the ground crew in any particular aircraft and pilot somehow drew substantially more work out of them when an emergency arose. Since this is rarely quantifiable, it is not usually taken into account by any plan to improve administrative efficiency."

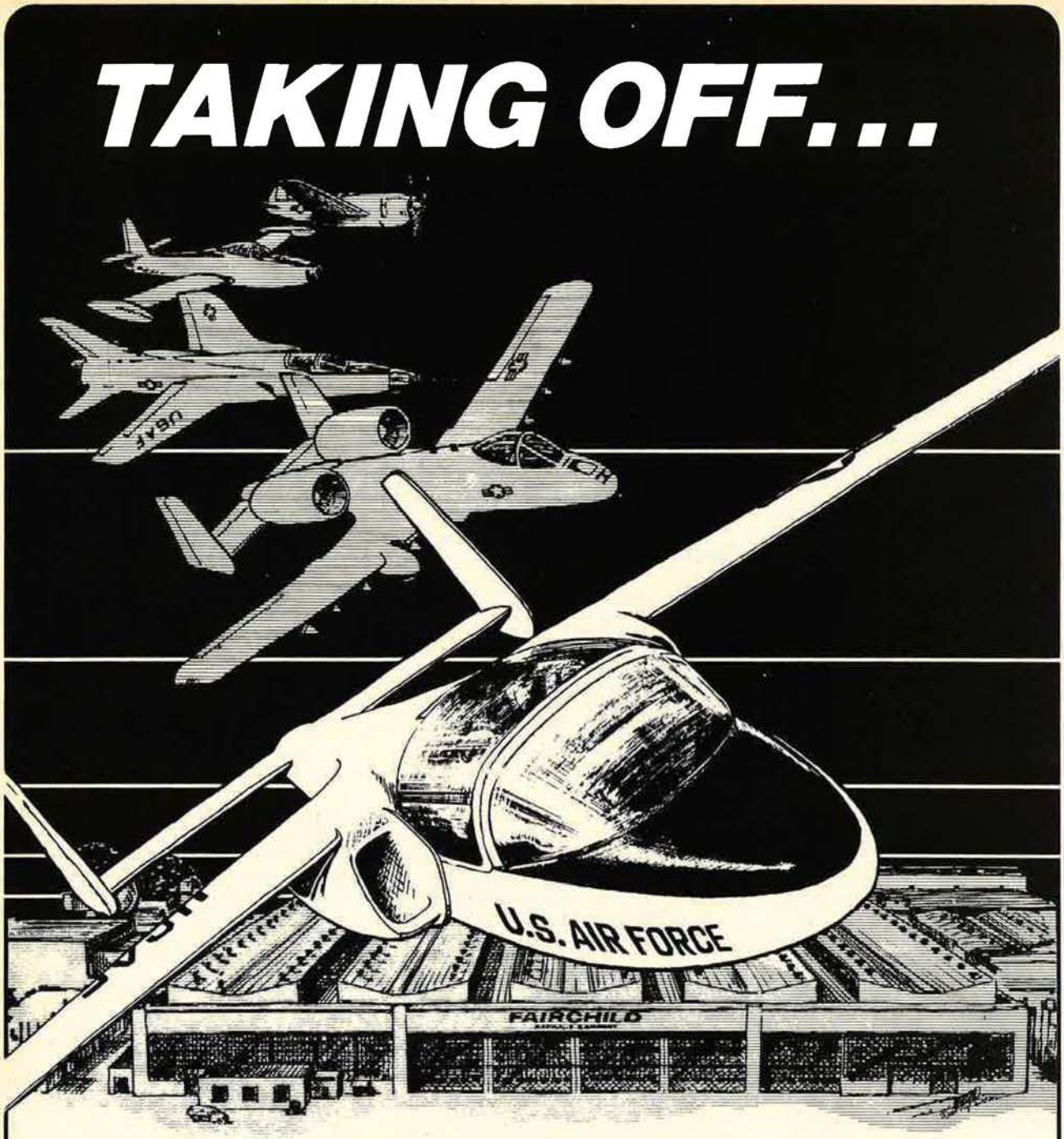
Has it *really* taken forty years to relearn this lesson? And, having learned it, will we at some future time abandon it yet again in favor of the illusory "advantages" of centralization and consolidation?

Richard P. Hallion
Edwards AFB, Calif.

The Bear Facts

At the risk of nitpicking a fine magazine (circulated monthly by retired and reserve light-blue-suiters here in the office), I must call attention to an error of about eleven years. On page 34 of your June 1984 issue, you say that the first Bear intercept by a Harrier occurred during Teamwork '84.

TAKING OFF...



...to join the family of quality aircraft built by Fairchild Republic Company.

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REPUBLIC COMPANY

Top to bottom: P-47, F-84, F-105, A-10, T-46A

AIRMAIL

As a reminder of my days as CO of VMA-513 (the Marine Corps's first AV-8A squadron) in the early 1970s, I still have a dusty photograph that belies your statement. My photo shows our US Navy exchange pilot, Lt. Cmdr. (now Cmdr.) W. S. Orr (no relation), flying an AV-8A on the wing of a Bear. It was taken from another AV-8A by, I believe, Capt. T. W. Griggs.

During our support of the Navy's Interim Sea Control Ship trials, there were numerous Bear overflights and intercepts. Specifically, overflights occurred in June and July 1973 on an Atlantic crossing to Portugal and, as I remember, earlier in 1973 farther north in the Atlantic. Both cruises were aboard USS *Guam*.

I enjoy your magazine. Keep showing Marine airplanes, and I may subscribe.

Col. James W. Orr,
USMC (Ret.)
Sterling, Va.

The Flawed Pastoral Letter

It has been more than a year since the National Conference of Catholic Bishops published their pastoral letter on "war and peace." The document badly mixes truth with error. The experienced military professional who reads the pastoral letter can readily see how flawed it is, but much of the public is seeing it differently.

In his June 1984 editorial, "Capability × Will = Deterrence," General Dougherty accurately pointed out the erroneous basis of the bishops' letter on "war and peace." But his message is not getting to the thousands of people who are developing antinuclear and antimilitary biases based upon the cleverly composed letter on "war and peace."

We need more experienced people, such as General Dougherty, and AIR FORCE Magazine to point out objectively that the bishops' letter on "war and peace" contains doctrine that is misleading, dangerous, and unacceptable to the public support required to maintain the security of the United States.

Col. Robert L. Bobbett,
USAF (Ret.)
Las Vegas, Nev.

Lucky Lady III

On January 18, 1957, three B-52B bombers landed at Castle AFB, Calif., after having completed a nonstop around-the-world flight. One of these aircraft was *Lucky Lady III*, bearing serial number 53-394.

We are attempting to locate several clear in-flight photos taken during that mission in which -394 can be identified by tail number. Efforts to locate such photos through USAF sources have been fruitless, but perhaps a reader might have such material that they could loan to us to copy.

Charles G. Worman
Chief, Research Division
Air Force Museum
Wright-Patterson AFB, Ohio 45433

Positions Open

Two Reservists in the grades of technical sergeant or master sergeant, AFSC 66170, logistics plans technician, are needed immediately to perform logistics planning for an air base survivability capability demonstration called Salty Demo. The demonstration will take place at Spangdahlem AB, Germany, in the spring of 1985.

Interested individuals should contact the address below or phone (301) 981-3388 or AUTOVON 858-3388.

SMSgt. Michael Lutsky, USAF
Hq. AFSC/MPB
Andrews AFB, Md. 20334

Convair L-13A

The Yankee Air Force is an organization in Ypsilanti, Mich., that has been organized exclusively for the purpose of obtaining, restoring, and preserving historical and vintage aircraft and related components for historical and educational purposes.

The Northeast Division of the Yankee Air Force is currently restoring a USAAF Convair L-13A liaison aircraft. We do know that this aircraft was a Stinson design and that 300 were built by Convair in the 1946–47 era. However, we have no knowledge of the service record of the aircraft after it left the Convair factory in San Diego, Calif.

We would appreciate hearing from readers who might have had experience with the aircraft or who have any knowledge of the aircraft. Any information forwarded to us would be sincerely appreciated.

Otto K. Mueller
95 Franklin St.
Cedar Grove, N. J. 07009

Air Force Songs

I am the author/publisher of the book, *The Wild Blue Yonder: Songs of the Air Force*, which contains 661 songs from World War I through the Vietnam War. By overwhelming de-

"I KNOW THAT YOU BELIEVE YOU UNDERSTAND WHAT YOU THINK I SAID BUT I'M NOT SURE YOU REALIZE THAT WHAT YOU HEARD IS NOT WHAT I MEANT."

The problem with language is English.

The source of most errors in the field of systems and software engineering today is the way in which system requirements and design specifications are written. With a combination of pencil and paper, English, a few graphs and some math, the engineers who develop the specifications are, many times, the only ones who know what they're talking about. And the problem is the ambiguity of the English language.

That's why Teledyne Brown Engineering developed IORL®, The Input/Output Requirements Language. IORL is a system requirements and design language that allows the engineer to communicate specifications and designs in a precise, unambiguous manner. While other design languages have made compromises in the English language, IORL has made none. It is comprised of graphical engineering symbols, mathematical expressions, Latin, and the Greek alphabet, all known quantities to systems engineers. The ambiguity of English never comes into play.

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The dramatic cost reductions, accurac and confidence factors that can be achieved through the use of TAGS and the IORL language hold the promise of revolutionizing the field of systems and software development.

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AIRMAIL

mand, I now plan to publish Volume II, "The Stag Bar Edition," which will include an update on Volume I. I have more than 200 songs for Volume II, but would appreciate contributions of songs of Air Force origin to augment the collection. I am particularly interested in post-Vietnam songs and songs about missile units.

All letters will be acknowledged, and, if the songs are printed, your contribution will be credited in the book.

I am grateful for the many contributors to Volume I. More than 4,000 copies have been distributed, and fewer than 1,000 copies remain.

Please contact me at the address below.

C. W. "Bill" Getz
P. O. Box 3323
San Mateo, Calif. 94403
Phone: (415) 342-4411

337th TFS

The 337th Tactical Fighter Squadron is seeking historical background information on the squadron.

We have the skeletal outline of the squadron's history and are looking for a more complete history on personnel, deployments, anecdotes, memorabilia, etc. Any pictures or personal correspondence would be greatly appreciated.

Please contact the address below.

1st Lt. Mark Clements, USAF
337th TFS
Seymour Johnson AFB,
N. C. 27531

Crashes in Kent

I am carrying out research into the history of aviation in Kent, part of which involves US Eighth Air Force crashes in the area and Ninth Air Force squadrons stationed in Kent. I am especially interested in anything on these subjects connected with RAF Manston and with such Advanced Landing Grounds as Great Chart, Kingsnorth, Woodchurch, High Halden, Staplehurst, Lashenden, or Headcorn.

Although there were no bomber units of Eighth Air Force based in Kent, many B-17s, B-24s, P-51s, and P-47s crashed or ditched within the county—more than forty at RAF Manston alone. Other aircraft ditched off the coast, and the crews were rescued by launch or other means.

I would be most interested to hear from anyone who has reminiscences, photographs, maps, or other such items that would enable me to complete my research. All material will be carefully treated, returned promptly, and will be acknowledged if used in subsequent publication. (I am particularly anxious to make contact with former members of Detachment A, 16th Mobile Reclamation and Repair Unit, which was based at RAF Manston from 1943 to 1945.)

David G. Collyer
25, Pilot's Ave.
Deal, Kent CT14 9HQ
England

440th TCG

I am tracing the history of Operation Market Garden, which started on September 17, 1944, in Holland, and am looking for material on the 82d Airborne Division and Ninth Troop Carrier Command. Both units were involved in this operation, which resulted in the liberation of Nijmegen.

In particular, I am looking for reports and other stories about the 440th Troop Carrier Group, which dropped the 376th Parachute Field Artillery Battalion over drop zone "N" at Groesbeek, Holland, on the first day of Operation Market Garden.

I am also interested in hearing from any former members of any other troop carrier units involved in this operation.

Please contact me at the address below.

Jan Bos
De Gildekamp 23-08
6545 KP Nijmegen
Holland

452d Bomb Group

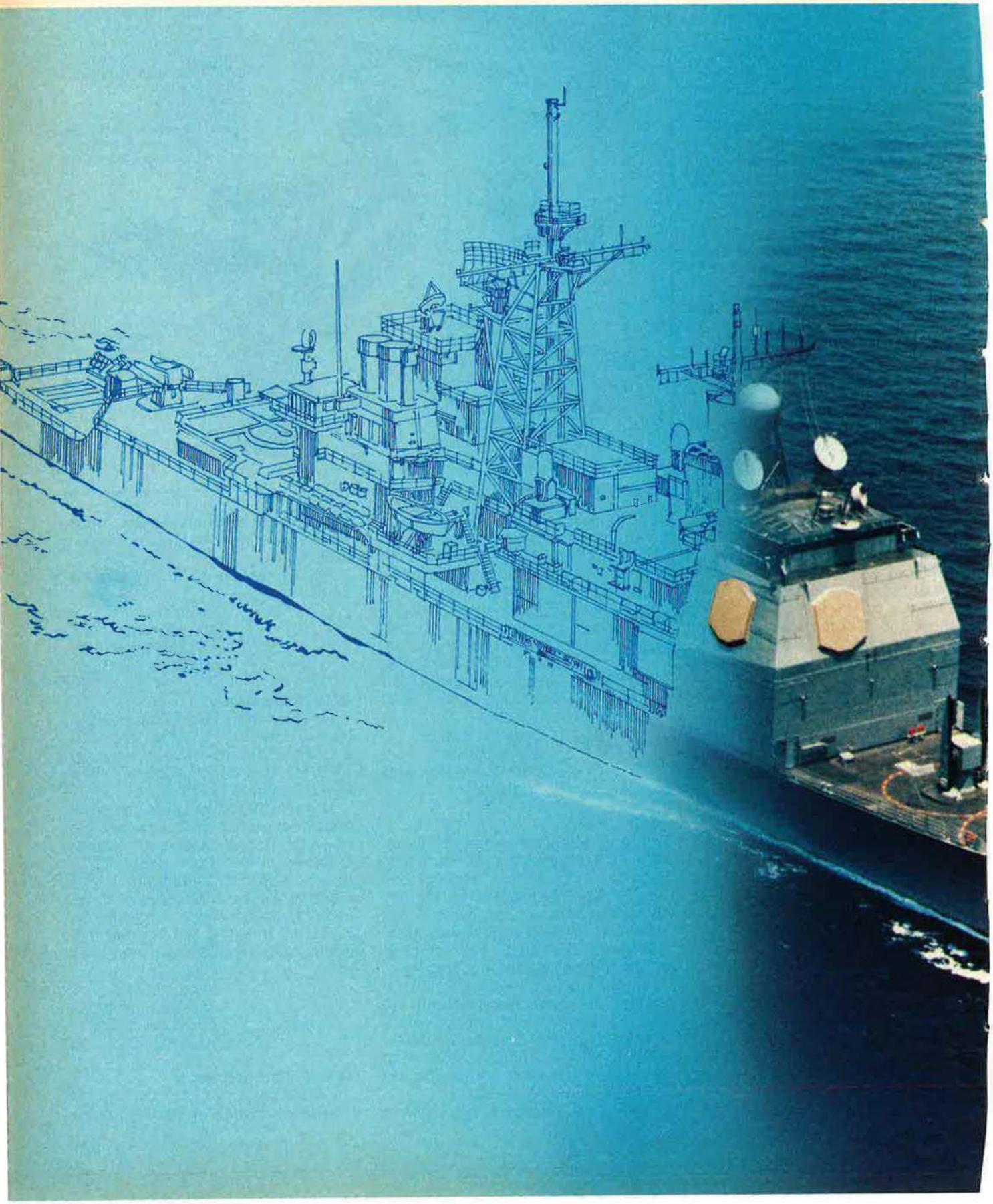
I am preparing a book on the Douglas B-26 Invader in USAF service, with a substantial portion of it being devoted to the activities of the 452d Bomb Group in Korea.

To make this coverage as complete and as honest as possible, I would like to ask for the assistance of any former members of the 728th, 729th, 730th, and 731st Bomb Squadrons. If you feel that you can assist me in documenting the activities of these units in Korea, be it with a recollection or a photograph, I would like to hear from you.

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

44th Fighter Squadron

I would enjoy hearing from anyone who served in the 44th Fighter Squad-



The AEGIS Team built a tight ship by running a tight ship

RCA as Prime Contractor to the Navy Met the Challenge of Managing a Total Ship Combat System Design Process to Produce the TICONDEROGA Class Cruisers. To meet the battle group needs of the future, the AEGIS program confronted a formidable challenge . . . create a total shipboard combat system capable of countering a potential enemy's most sophisticated threats of the 1990's. As prime contractor to the Navy, RCA met this challenge with new technologies and innovative management techniques. From blueprint through production, the system combat design methodology consisted of a step-by-step incremental design-build-test-integrate approach that has led to the successful at-sea performance of the first AEGIS guided missile cruiser USS TICONDEROGA.

AEGIS was developed as a total ship combat system, rather than the traditional approach to integrate a series of weapon and electronic subsystems into a ship. Each function of the combat system — detection, control, engagement, as well as support equipment — was developed under an integrated design review and testing process.

On January 22, 1983 TICONDEROGA was commissioned on time and on budget. Time from commissioning to first deployment was cut from 2 years to just 9 months . . . a savings of time and millions of dollars.

On July 4, 1984 USS YORKTOWN joined the fleet with an even better on time, on budget performance record. Plans for completion of 11 more AEGIS class cruisers by 1988 are on schedule.

RCA's unique combat system engineering capabilities are being applied to future ship classes. Against intense competition, RCA was selected to develop the combat system for the Arleigh Burke class, DDG 51 destroyers.

A system for the 90's became a reality in the 80's by running a tight ship. To meet your challenge for the next century, we welcome you to learn more about RCA's technology.

For more information contact: Director of Marketing, Moorestown, New Jersey 08057, (609) 778-7431.

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AIRMAIL

ron at any time from its inception in 1941 to the present.

In particular, I am looking for information on the following World War II pilots: Wallace "Little" Jennings, Douglas V. Currey, Carl Hay, Bob Krohn, C. B. Head, Jr., Lucian B. Shuler, and Robert "Red" Fox. Also, I'd like to hear from anyone with any information on Maj. Maurice E. Seaver, Jr., who downed a MiG-17 on May 13, 1967.

Please contact me at the address below.

Jack Cook
6638 Fairway Ave., S. E.
Salem, Ore. 97306

Earhart Flight

The date of January 11, 1985, marks the fiftieth anniversary of Amelia Earhart's solo flight from Wheeler Field in Hawaii to Oakland, Calif.

I am the project officer for organizing an appropriate ceremony to commemorate the occasion here in Hawaii. I would like to hear from readers who can help us reconstruct the story of that flight as accurately as possible.

Please contact the address below.

Ronald L. Barker
662 Curtis Loop
Wahiawa, Hawaii 96786

95th Bomb Group

The 95th Bomb Group (H) Association wishes to hear from any former members of the unit. We are writing an anthology of the group and need your help.

Also, if you are not a member of the Association, we'd like to enroll you as a member. Please let us hear from you.

Leonard W. Herman
P. O. Box 313
Benson Manor, Suite 109
Jenkintown, Pa. 19046

"Colonel" Bill Brooks

I am researching American involvement in the Honduran-Nicaraguan border dispute of 1937 and need to know any information about the activities of a "Colonel" Bill Brooks who supplied aircraft to the Honduran forces.

Please contact me with any information at the address below.

Michael E. Unsworth
History Bibliographer
Michigan State University Libraries
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Crown Seven

I am searching for information on a certain F-105F, the *Crown Seven*. A painting of this plane appeared on the cover of AIR FORCE Magazine in April of 1974.

I know of three of the men who flew the *Crown Seven*. Majs. John Revak and Stan Goldstein were assigned to the 44th Tactical Fighter Squadron at Korat AB, Thailand. Capt. Don Carson also flew the *Crown Seven*.

If anyone has any information on these men or this aircraft, please contact me at the address below.

J. D. Murphy
501 Chambliss St.
Prattville, Ala. 36067

Wilmington Warriors

The recently organized Wilmington Warrior Association is seeking to contact personnel who served with the 2d Ferrying Group, Ferrying Division, Air Transport Command, New Castle AAB, Wilmington, Del., during World War II.

The Association publishes an "In Flight" bulletin twice a year and holds a yearly national reunion. The second annual reunion will be held on October 12–13, 1984, in Colorado Springs, Colo.

Individuals desiring additional information regarding the Wilmington Warrior Association should contact the address shown below.

Wilmington Warrior Ass'n
3819 N. Tazewell St.
Arlington, Va. 22207

Vietnam Vets

I am presently engaged in compiling information and data for a book I am writing on the activities of the US Air Force during the Southeast Asian conflict. I would therefore be most pleased to correspond with anyone who would be prepared to share their personal experiences, anecdotes, photos, etc., from that theater.

Obviously, any material secured would be carefully handled and returned, if requested, after copying, with full credit given.

Dennis W. Pritchard
Bryn Teg, Bangor Rd.
Caernarfon
Gwynedd LL55 1LR
Wales, UK

Atlas Crews

I'm trying to get any firsthand information I can on Atlas ICBM combat crew duty. As part of Project Warrior, I want to write an article on the Atlas system for our base newspaper.

Anyone who served in an operational Atlas unit, particularly the 564th Strategic Missile Squadron at Francis E. Warren AFB, Wyo., and who is interested in sharing their experiences can contact me at the address below.

2d Lt. Daniel Keder, USAF
564th SMS
Malmstrom AFB, Mont. 59402
AUTOVON: 632-2967

It Really Works!

It really works!

After forty years, I inquired about interest in a reunion for former members of the 454th Bomb Group, which was stationed in Italy with B-24s during 1944–45. Thanks to my letter printed in AIR FORCE Magazine, response was outstanding.

We moved to firm up a reunion. An organizational meeting in Fort Lauderdale made plans for our *first* reunion in Colorado Springs, Colo., next October 4–7.

With more than 400 respondents from around the country, only one thing is missing: response from my own fifty-mission crew! They are: William H. Sherman, Rollie M. Schuder, Jr., Harold Lane, Emmett McCullough, Joseph H. Gatrell, Russell E. Jones, Vincent E. Hudson, Verlin T. Burnett, Raymond B. Ramquist, and Phillipe Coudert.

Please forward any info on the whereabouts of these men to the address below.

Maj. Alphonse P. Riccardi, USAF (Ret.)
8637 Bridle Path Ct.
Davie, Fla. 33328

Where Are You?

I am attempting to locate the members of my old B-24 crew from World War II. We flew together in the Pacific out of Morotai with the Thirteenth Air Force.

We know that three of our former crew are deceased. The four who are missing are John Hasselbach, Donald E. Shaw, Charles E. Anderson, and Fred Z. Content.

We other four members have recently been in touch. In fact, three of us got together at the 307th Bomb Group reunion in Orlando, Fla., on May 4–6. There will be another reunion in Milwaukee, Wis., in May of 1986.

If anyone can help me find any of the above missing four, I would greatly appreciate it. Please contact me at the address below.

Malcolm A. Willard
1247 Brighton Rd.
Tonawanda, N. Y. 14150
Phone: (716) 834-8951

American Fighter Aces

As explained in the Editors' response to Mr. Fiedler's letter on page 9 of the July 1984 "Airmail" section, AIR FORCE Magazine has, for reasons of space (among others), limited its listing of aces in the annual May USAF Almanac to only those aces from the Air Force and its predecessor organizations. In that response, we recommended Raymond Toliver's and Trevor Constable's book *Fighter Aces* for those who wished to learn more about American fighter aces.

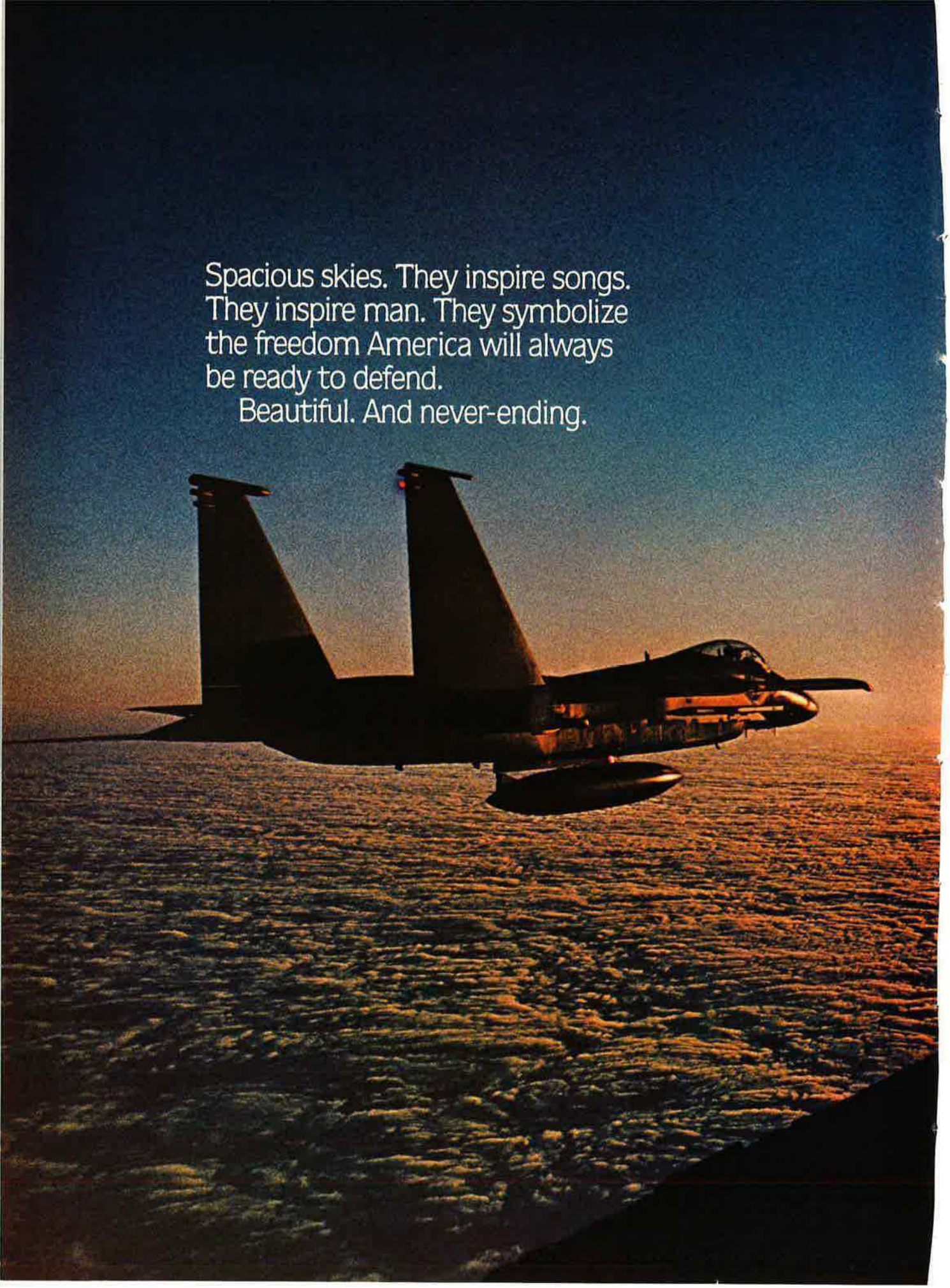
We have subsequently received a note from Mr. Toliver reminding us that his book is available from Aero Publishers in an updated version. Also, Mr. Toliver sent along his listing of the top American aces of all time. Here, as a "keeper" for all you unquenchable aces enthusiasts, is Mr. Toliver's list.

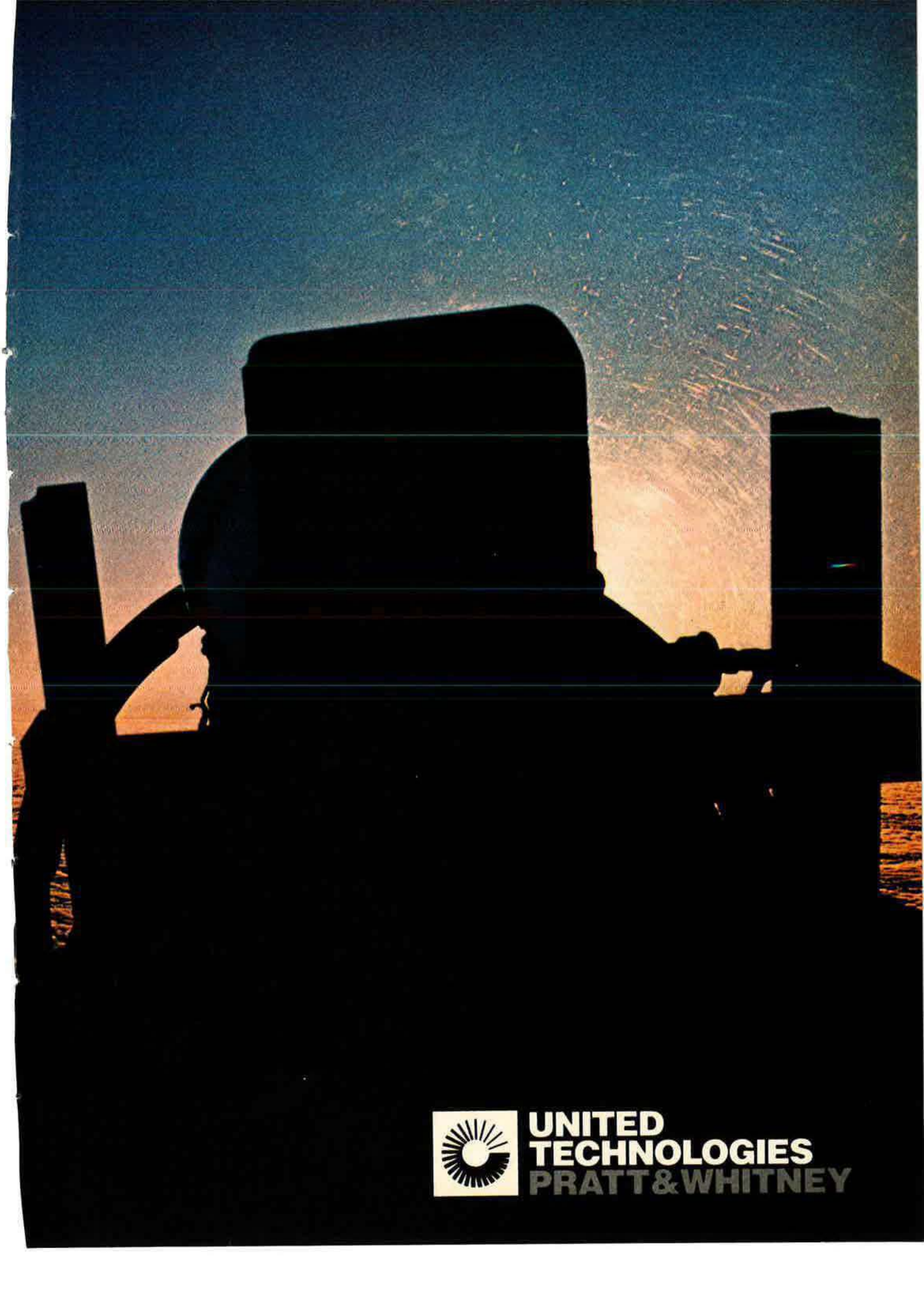
NAME	VICTORIES
Bong, Richard T.	40.00
McGuire, Thomas B.	38.00
Gabreski, Francis S. (WW II and Korea)	34.50
McCampbell, David (US Navy)	34.00
Johnson, Robert S.	27.00
McDonald, Chas. H.	27.00
Preddy, George E.	26.83
Foss, Joseph H. (US Marine Corps)	26.00
Rickenbacker, Edward (AEF)	26.00
Meyer, John C. (WW II and Korea)	26.00
Boyington, Gregory (US Marine Corps)	25.50
Hanson, Robert M. (US Marine Corps)	25.00
Wade, Lance (RAF)	25.00
Mahurin, Walker M. (WW II and Korea)	24.25
Harris, Cecil E. (US Navy)	24.00
Rosevear, S. C. (Royal Flying Corps)	23.00
Valencia, Eugene A. (US Navy)	23.00
Wetmore, Ray S.	22.59
Schilling, David C.	22.50
Johnson, Gerald R.	22.00
Kearby, Neel E.	22.00
Lambert, William C. (Royal Flying Corps)	22.00
Robbins, Jay T.	22.00
Christensen, Fred J.	22.00
Davis, George A. (WW II and Korea)	21.00
Voll, John J.	21.00
Walsh, Kenneth A. (US Marine Corps)	21.00
Whisner, William T. (WW II and Korea)	21.00
Eagleston, Glenn T. (WW II and Korea)	20.50
Aldrich, Donald M. (US Marine Corps)	20.00
Gillette, Frederick (Royal Flying Corps)	20.00
Lynch, Thomas J.	20.00
Malone, John J. (Royal Navy)	20.00
Westbrook, Robert	20.00

Also with reference to the topic of aces, Barrett Tillman, Executive Secretary of the American Fighter Aces Association of Mesa, Ariz., has sent us a note recommending two other listings of aces. One compilation lists all aerial victories credited to Navy tactical aviators in World War II; the other does the same for Marine Corps pilots. These compilations were made by Dr. Frank J. Olynyk of 207 Chelmsford Dr., Aurora, Ohio 44202. Mr. Tillman reports that AFAA "regards Dr. Olynyk's studies as near-definitive, as they are far more detailed than any official documents. He is [also] working on similar studies for the various numbered air forces. . . ."

Mr. Tillman, noting the July 1984 issue "Valor" column, p. 120 (wherein author John Frisbee profiled William Leverette's downing of seven enemy aircraft on a single mission), also offered these other "single-mission" aces (in addition to William Leverette and William Shomo): Navy Cmdr. David McCampbell, nine victories on October 24, 1944; Navy Lt. Stanley W. Vejtasa, seven victories on October 26, 1942; Marine Lt. James E. Swett, seven victories on April 7, 1943; and Navy Ens. Alfred Lerch, seven victories on April 16, 1945. Mr. Tillman reports that another fifteen Americans are credited with shooting down six enemy aircraft on a single mission or during a single day. Another eighty or so have been credited with five victories in a single day.

Our sincere thanks to Mr. Toliver, Mr. Tillman, and the many other aces enthusiasts who have written.—*THE EDITORS.*


Spacious skies. They inspire songs.
They inspire man. They symbolize
the freedom America will always
be ready to defend.
Beautiful. And never-ending.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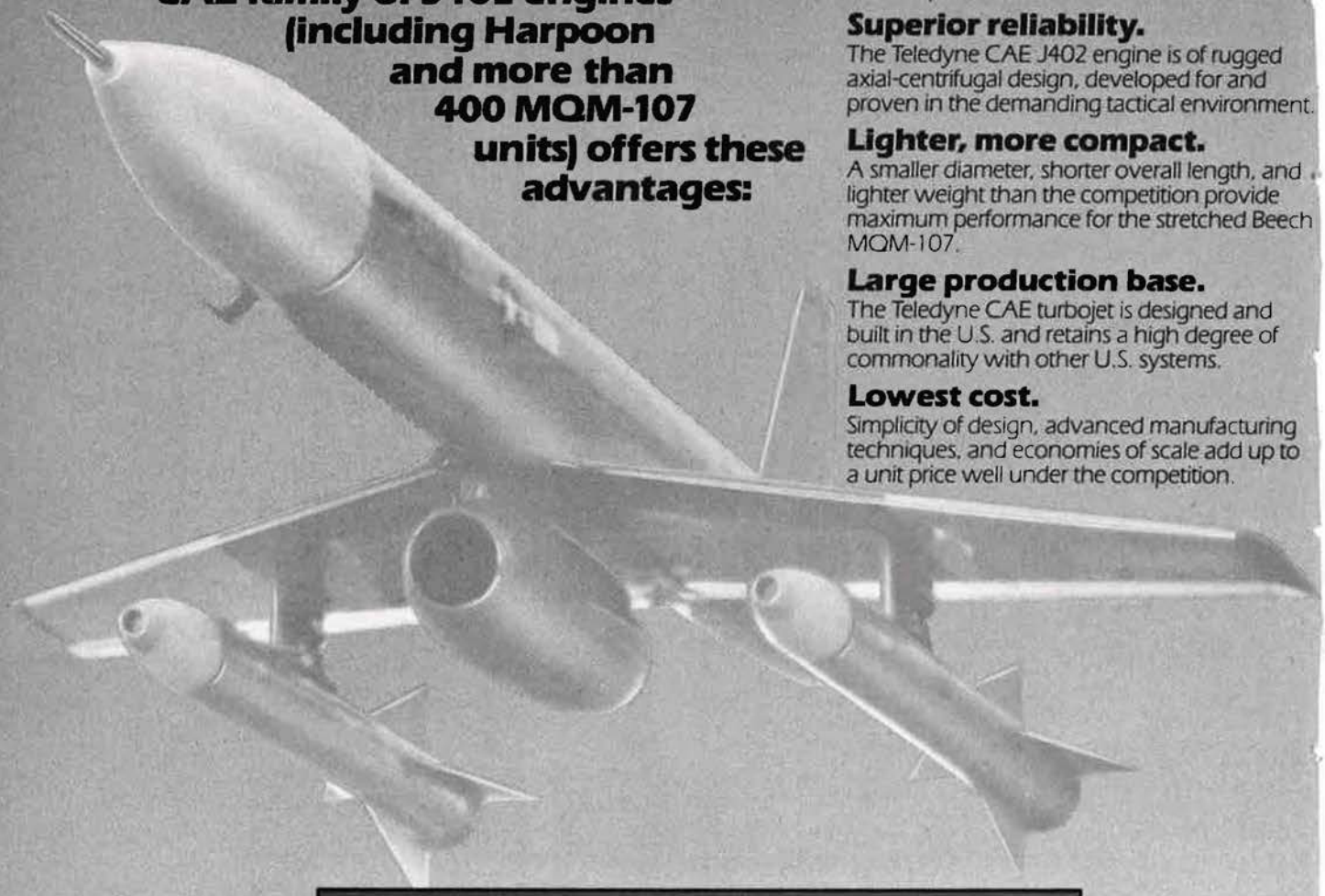

Up-rated, ready for production.

Teledyne CAE has up-rated its proven J402 turbojet to 725 lbs. thrust to meet growth MQM-107 requirements—and it's available now to meet the Army / Air Force delivery schedules.

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Higher pressure ratio and turbine temperature of the cycle result in lower specific fuel consumption and higher altitude capability than the competition.

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The Teledyne CAE J402 engine is of rugged axial-centrifugal design, developed for and proven in the demanding tactical environment.

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A smaller diameter, shorter overall length, and lighter weight than the competition provide maximum performance for the stretched Beech MQM-107.

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The Teledyne CAE turbojet is designed and built in the U.S. and retains a high degree of commonality with other U.S. systems.

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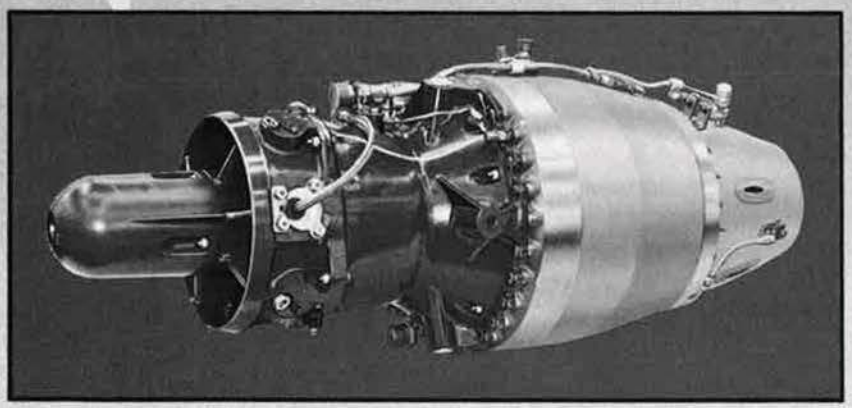
Simplicity of design, advanced manufacturing techniques, and economies of scale add up to a unit price well under the competition.



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Penetrating the Sea Sanctuary

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

Soviet space stations and aircraft are using advanced-technology synthetic aperture radar to detect and track submerged submarines.

Washington, D. C., Aug. 7

The US intelligence community is in agreement that the Soviet Union has, for at least a year, been carrying out highly significant experiments in detecting and tracking submerged submarines by using advanced side-looking synthetic aperture radars (SARs) aboard its Sal manned space station as well as on various types of aircraft. Soviet *Delta* SSBNs operating off the USSR's Pacific coast at modest depths in relatively shallow waters are being detected and tracked by nonacoustical means by both the Salyut's advanced-technology synthetic aperture radar as well as by up to about a dozen different types of specialized ASW aircraft, also equipped with SAR systems.

Two of the aircraft types participating in the high-tech experiments are the Il-20 Coot-A electronic intelligence (ELINT) aircraft and the Il-38 ASW system. Underlying these cat-and-mouse games between overhead sensors and submerged quarries are remarkable advances in Soviet SAR technology that capitalize on the well-established capability of synthetic aperture radars to detect various surface "signatures" caused by submerged moving bodies or water currents moving over submerged structures. Soviet scientists have been remarkably frank in discussing these phenomenologies.

Writing in *Izvestia* on July 29, 1981, B. Nelepo, a member of the Ukrainian Academy of Sciences, stated, for instance, that "it is now becoming clear that, because of satellites, we can know not only the surface patterns of phenomena in the ocean, but also the volumetric, deep picture. Internal waves occur very extensively in the ocean. Their manifestations at the surface can be registered from aboard satellites, and it is possible to judge what is occurring in the upper layer of several hundred meters, which is most important for us." Congress and US intelligence found Academician Nelepo's assertion sufficiently intriguing to commission a thorough study of the associated phenomenologies.

While the status of US SAR technologies appears to lag behind those of the USSR, especially in maritime and ASW applications, several years ago a nonmilitary system aboard NASA's SEASAT satellite was able to map the ocean bottom off Woods Hole, Mass., with extreme precision. The satellite was able to "read" the surface signatures generated by ocean currents flowing over the submerged topography with startling accuracy.

Soviet interest in exploiting space-based sensors for naval warfare applications is, of course, of long standing and has resulted in the deployment of two operational systems, the nuclear-powered RORSAT (radar ocean reconnaissance satellite) that detects and tracks surface vessels, apparently mainly by identifying the wakes of various classes of naval ships, and the complementary EORSAT (ELINT ocean reconnaissance satellite). The US still has no military radar satellite and has not even defined a conceptual approach to such a program.

While the US intelligence community finds that Soviet experiments with space-based and airborne submarine-tracking devices are remarkably successful and constitute an awesome technological achievement, there is no indication that the Soviet Union is actually on the verge of deploying an operational system. Such a capability may be a decade away. There is little doubt, however, that the Soviets are mounting intense efforts to solve the ASW problem. Some US naval experts are convinced, for instance, that the burgeoning Soviet SSBN fleet is meant mainly to combat US SSBNs, augmenting the increasingly capable fleet of SSNs (attack submarines).

Three new SSN classes, all technological derivatives of the superfast, deep-diving *Alfa* boats, have been spotted by US intelligence. They have been code-named the *Uniform, Mike,* and *Sierra* classes. There is other evidence that suggests that the determined Soviet effort to keep the US from testing an ASAT space interceptor is closely tied to the Kremlin's desire to protect its space-based ASW assets from US countermeasures.

In the view of some analysts, there is circumstantial evidence that the brutal attack by Soviet fighters on the KAL 007 airliner last fall may have resulted from the unfounded fear that the aircraft was eavesdropping on the Soviet submarine-detection experiments.

Toward a Renaissance in Aeronautics

According to a high-powered White House panel comprising some of the country's foremost technical experts in government and industry, aeronautical technology stands on the threshold of a renaissance that, by the year 2000, could lead to a doubling in the productivity of commercial and military airlifters and, on the military side, to hypersonic flight.

Known as the Aeronautical Policy Review Committee of the White House Office of Science and Technology Policy, the nineteen-member panel convened by Presidential Science Advisor Dr. George A. Keyworth II is concerned that US preeminence in aeronautics might erode unless the national effort in basic research can be beefed up significantly. Equally pressing is the need for the Defense Department and NASA to resurrect the development and testing of experimental aircraft as a means of strengthening the technology base and "rekindling national interest in aeronautics."

The government, the committee suggested, should "reestablish a vig-

orous, stable flight and systems research program to include the development and testing of advanced experimental aircraft on either a coordinated or jointly conducted basis."

The committee bemoaned a lack of boldness in the US approach to aeronautics, evidenced by the absence of "truly long-term, beyond the next-generation systems [and] high-risk research and test" programs. Rather, the committee complained, "research directed toward programs aimed at incremental improvements and those closely linked to an identified weapon system have evolved."

Rejecting the notion that aeronautics is static and on a technological plateau, the panel—whose Pentagon members include DARPA Director Dr. Robert Cooper and Assistant Secretary of the Air Force for Research, Development and Logistics Thomas E. Cooper—found that "all currently operational aircraft could be technologically superseded by the end of the century. . . . Major technological opportunities are available not only to the US but to potential military adversaries and industrial competitors as well." The panel recommended boosts in research and test efforts as well as "raising of the IR&D [independent research and development] ceiling, further progress toward relaxation of antitrust laws, and more effective tax incentives for private sector R&D and investment for productivity."

The committee underscored the increasing importance of systems integration, which could play a potentially "dominant role in the development of advanced technology aircraft." All types of new aircraft are becoming more complex, and advances in the traditional aeronautical disciplines won't ensure a superior product by themselves. But neither the Defense Department nor NASA, the committee believes, pays enough attention to this new "discipline" of systems integration.

In scanning the range of emerging technologies that could become tripwires for significant advances, the panel came up with a "vision" for the year 2000 of designs that could achieve "quantum improvements in capabilities, performance, cost, and efficiency." This vision consists of:

- Subsonic and supersonic Stealth technology for significantly reduced detection range against enemy radars and other sensors that will revolutionize aircraft and missile design.
- STOL and VTOL aircraft for operation from short or damaged runways, air capability on small ships, and increased operations at commercial and military airports and heliports.
- All-composite military and civil aircraft with a forty percent reduction in aircraft weight and lower cost of ownership.
- "All-electric" aircraft with fully integrated active controls and associated fault-tolerant systems—possibly fiber optic—to permit relaxed stability margins, lower weight, and improved vehicle efficiency.
- High-speed turboprops and other advanced propulsion systems, including counterrotating propellers, with twenty to thirty percent fuel savings for both military and commercial transports and patrol aircraft.
- Ceramic engine components with a minimum cooling requirement, reduced dependence on strategic materials, thirty percent increase in thrust for cruise missiles, and a five to fifteen percent reduction in fuel consumption.
- Laminar-flow control for fuel savings of fifteen to thirty percent, significantly increasing the range and endurance of civil and military aircraft.
- Advanced-concept fixed- and rotary-wing aircraft that offer new capabilities along with significant improvements in range, payload, and productivity.
- Transatmospheric vehicles for new military mission concepts.
- Manned and unmanned hypersonic vehicles for more effective interceptors, reconnaissance aircraft, and missiles for fleet air defense and other military missions.

In discussing with this writer the prospects for high-speed flight, DARPA's Dr. Cooper and other panel members asserted that there are three potential "drivers" for supersonic, hypersonic, and transatmospheric flight. The first in a chronological sense—and technologically least risky—involves the introduction in the not too distant future of very smart, long-range, standoff missiles that will operate in the Mach 2 to Mach 6 range. Associated R&D efforts are deficient but will be strengthened beginning with the FY '86 Defense Department budget proposal and possibly with subsequent NASA support.

Another potential incentive for pursuing high-speed flight vehicles that the committee discussed with "some vigor" centers on the advisability of resurrecting government-funded prototype development of either supersonic or hypersonic aircraft to exploit the economic potential of the West Pacific Basin. This area, characterized by vast distances, seems slated for enormous economic growth. Some forecasts, deemed convincing by the White House panel, see the Western Pacific economic community overtaking the combined economic power of North America and Europe before the turn of the century. Such an explosive growth in that area, the committee believes, might support civilian supersonic or hypersonic transports sometime after the year 2000.

Lastly, some of the panel members hold the view that the time may be ripe to look at hypersonic flight in an even more ambitious context—that of developing vehicles that could function as alternatives or follow-ons to the Space Shuttle. The technological underpinnings for such TAVs (transatmospheric vehicles) that could take either military or commercial payloads into low earth orbits are "beginning to emerge," according to Dr. Cooper.

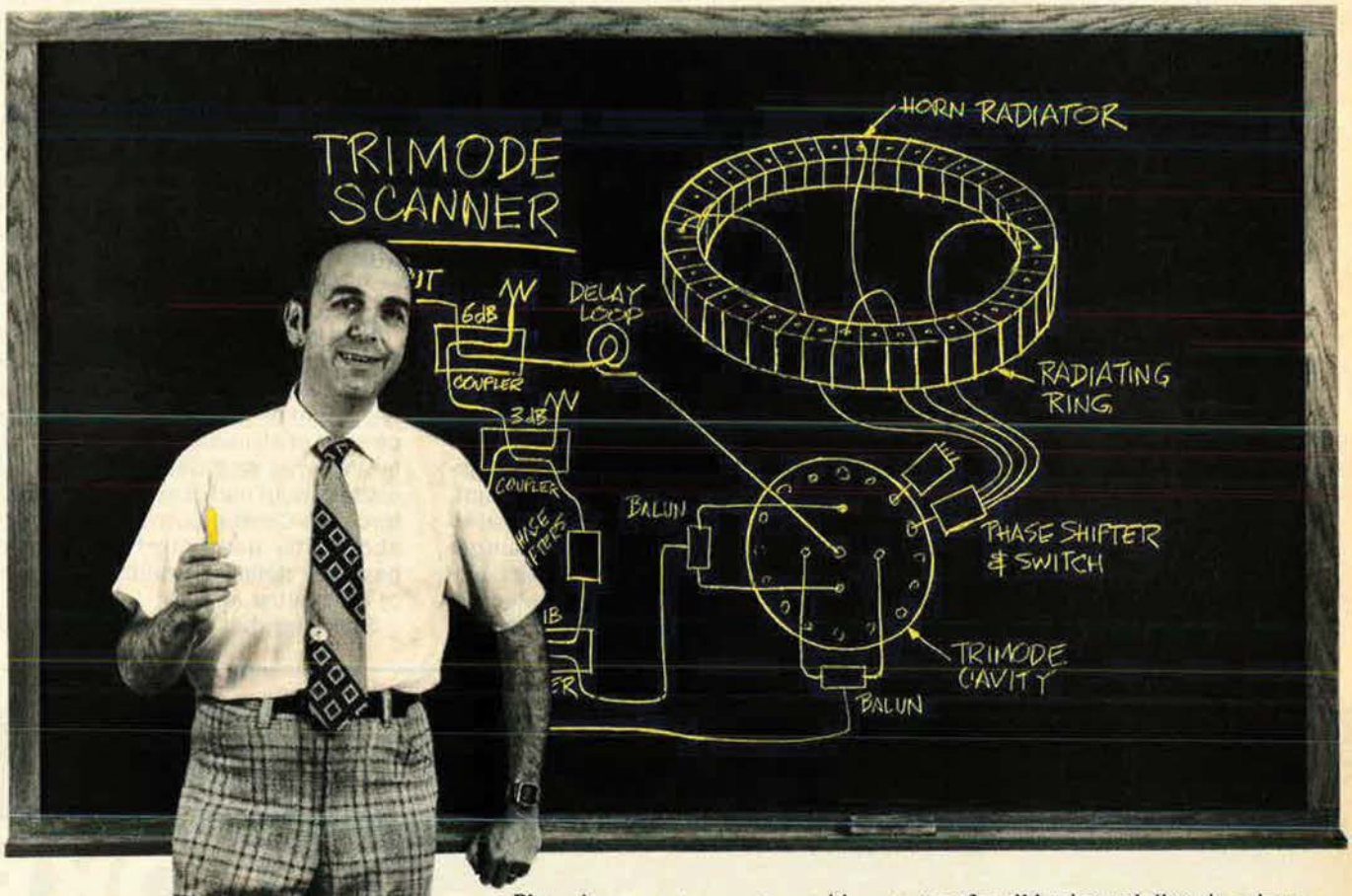
Two recent advances might help toward the eventual development of TAVs. One involves gains in such materials as carbon/carbon composites that have extreme thermal resistance, and the other is centered on advanced computational capabilities that allow more thorough assessments of turbulent boundary layers involving high thermal flux. Both are essential for future TAV programs. The DARPA Director suggested, therefore, that "it appears that there is at least a technological opportunity to make a major push in the research endeavors that would underpin TAV."

Preliminary TAV concepts, he added, pivot on air-breathing systems, "some kind of a modified Scramjet that would operate in a number of different flight regimes, ranging from subsonic to supersonic all the way up to Mach 25." Such a vehicle, he said, might be thirty to forty percent larger than an SR-71 and capable of delivering a "sizable" human or other payload into earth orbit, "to descend at any place on the globe, loiter for a short period, perhaps fifteen to thirty minutes, then [climb back into space] and return [to its base or other airfield] for a total mission time of perhaps as much as an hour and a half." Potential missions for a TAV extend from reconnaissance and rescue to putting communications devices at critical sites as well as into space.

The Air Force is examining the mili-

Radar Technology on the move.

Dave Lerner on a new approach to omnidirectional coverage.



Phased-array antennas to provide coverage for all horizontal directions have presented designers with some difficult problems. But now a circular phased array incorporating the Trimode Scanner, invented at Lockheed Electronics, has solved those problems. Dave Lerner, Lockheed consulting scientist, explains: "Linear phased arrays individually cover only a limited horizontal angle. Four such arrays frequently are needed to provide 360-degree coverage. Linear arrays also have another significant disadvantage. The shape of the radiation beam changes as it is scanned. This change in shape causes errors in systems that use linear antennas to determine the horizontal direction of a signal source.

"Circular arrays provide 360-degree coverage with only a single antenna. While the array complexity is generally comparable to four linear arrays, the radiation beam shape is constant as the antenna is scanned. This enables horizontal angles to be measured accurately with the antenna.

"Circular antennas, however, have posed design problems in connecting the RF signal between the array and a single transmitter and receiver. It is necessary to control both phase and amplitude distribution at the array as the beam is scanned. The Trimode Scanner, named for the three electromagnetic modes in the microwave cavity, does exactly that. It moves the amplitude distribution around the array as the beam direction is scanned."

The result? Another Lockheed advance in radar technology. One that is simple, free of moving parts, and, as Dave Lerner says, greatly increases the efficiency and reliability of the circular array system. Lockheed Electronics, Plainfield, New Jersey 07061.

Engineers interested in contributing to advanced electronic systems are invited to write Employment Manager at LEC, Plainfield, New Jersey 07061.

Lockheed Electronics

Leadership in Technology

tary potential of TAVs and will probably decide later this year whether or not significant funding should be provided for such a project.

IN FOCUS...

US-German Air Defense Accord

After lengthy wrangling over costs and burden-sharing, the US and West Germany agreed jointly to beef up the air defenses of Central Europe. The agreement, signed by Secretary of Defense Caspar Weinberger and the German Federal Republic's Minister of Defense Manfred Woerner in July, represents, according to the latter, "a milestone in the political, military, and economic relationship" between the two countries that will increase air defense capabilities in Central Europe by almost fifty percent.

Under the agreement, Germany will obtain twenty-eight Patriot fire units from the US. Half of these will be bought outright from Raytheon Corp. through US foreign military sales procedures. In response to German concerns over the Patriot's cost growth, the Defense Department promised to seek congressional authority to forgo about $350 million in sunk R&D costs and other charges. For its part, Germany will man and support twelve US Army Patriot fire units over a ten-year period and contribute $50 million toward shoring up NATO air defenses.

In addition, Germany pledged to purchase, man, and support a total of ninety-five European-made Roland short-range air defense systems, twenty-seven of which will be used to defend three US air bases in Germany. The remaining sixty-eight Rolands will be fielded by the late 1980s to defend several German bases, some of which could be used by US forces during a conflict. The agreement requires approval by the US Congress and the West German parliament before it can go into effect.

Patriot was developed by the US Army as a replacement for the aging Nike-Hercules and HAWK theater air defense missiles. The fielded system consists of a radar set, an engagement control station, a powerplant, and up to eight remotely located launchers. The Patriot's single phased-array radar furnishes airspace surveillance, target detection and tracking, and support of missile guidance. The system can function at various altitudes and resist severe electronic countermeasures.

Roland is a European-designed, all-weather, short-range system adapted for use by the US Army. Roland fits on a single vehicle and combines radar guidance with a backup optical capability. A single fire unit can engage and destroy up to ten aircraft in a matter of minutes.

Following the signing of the agreement, the German official told congressional and press representatives that recent US "threats of troop withdrawals" from Europe in retribution for allegedly inadequate contributions to NATO by its European members were "inappropriate, conflict with our common objectives, and would be the wrong signal to send to the Soviet Union."

Citing a host of statistics—including the assertion that the European NATO nations provide more than ninety percent of all line forces and eighty percent of all combat aircraft—Minister Woerner said Germany alone furnishes about half of all of NATO's land forces in Central Europe, along with about fifty percent of all ground-based air defenses and thirty percent of all combat aircraft.

Stressing that there was "no room

for either German or European neutralism," the German Defense Minister said, "Germany has no future outside of NATO. . . . This pro-NATO orientation is not just government policy but the attitude of the vast majority of the German people." He expressed regret that the media were playing up the anti-Americanism and anti-NATO harangues of small but vocal minorities, thus creating a misleading picture abroad.

Underscoring Germany's commitment to the deployment of US ground-launched cruise missiles and Pershing IIs on her territory as part of the so-called dual-track (deploy and negotiate) decision as long as the USSR refuses to scrap its SS-20 intermediate-range ballistic missile force, he stressed that "the basic mission of the SS-20 is to dictate the political fate of Europe, to dominate it, and to decouple it from the US." He added that the Soviet Union must be made aware of the fact that "it completely miscalculated the effects of this relentless massing of arms and provocation" of the NATO allies.

Reasserting Germany's strong interest in advanced standoff capabilities—known in Europe as the Weinberger emerging technologies initiative—because of their potential for raising the nuclear threshold, Minister Woerner reiterated his country's basic defense strategy: "Our position is that the first priority must be to fight the [Warsaw Pact's] first echelon forces. The second priority is to fight the war on the ground, which means a counteroffensive. The third priority is to fight the second echelon forces at the chokepoints."

These objectives dictate a forward defense approach predicated on "effective, cohesive defense close to the border." The geographic facts of life in West Germany provide neither the space nor the time to "sacrifice territory" because at some points the width of the country is in the 200–250 kilometer range. After that, he stressed, "the Soviets are on the Rhine."

Pronouncing the state of NATO as sound in terms of military strength as well as political cohesion and determination, the German official came down foursquare in favor of the Reagan Administration's Strategic Defense Initiative (SDI). With the Soviets working on strategic defenses, SDI is imperative since a unilateral Soviet "advantage in this area could not be accepted," he said. The effect of "these developments on . . . deterrence on a global scale and in Europe can be assessed only when the technical and economic feasibility and military effectiveness of strategic defense systems have been determined. . . . We are grateful that the US is consulting with us on [SDI] and is including Europe" in terms of potential defensive coverage.

While the German Defense Minister took a basically tough stance concerning the West's defensive posture vis-à-vis the USSR, he was cautious with regard to offensive capabilities: "We should not seek [military] superiority over the USSR. It would be counterproductive to put the Soviet Union back into the ranks of second-class powers." In the same vein, a forward defense posture in Europe keyed to "far-ranging offensive forward operations is neither possible nor necessary," he asserted.

Soviet Military Spending Increased

Recently released preliminary findings of a Defense Intelligence Agency (DIA) study indicate that Soviet military program costs for 1983, when measured in US dollars, "may have increased faster than at any time since 1976." The DIA study—somewhat at odds with assertions by CIA officials on Capitol Hill that Soviet de-

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GENERAL ELECTRIC

fense spending, although high, had flattened—concluded that "the increased rate of growth last year follows an upturn that began in 1982, after several years of high but somewhat stable military procurement costs."

The Pentagon intelligence branch based its assessment of accelerated growth on a study of cost patterns, gauged in dollars, of some 170 major Soviet weapon systems for which "confidence in the production numbers is generally high." Included in this preliminary estimate, which accounts for about half of the total Soviet hardware spending, are expenditures for aircraft, land arms, naval ships, and missiles.

These spending boosts, along with other measurable aspects of what the USSR invests in military hardware, suggest that total Soviet procurement increased somewhere between five and ten percent during 1983, compared with the previous year. The 1982 spending level was pegged at $235 billion by the DIA. This figure reflects what it would cost to design, produce, and operate the Soviet weapons in this country, using US prices and wages. It is noteworthy that this estimate for 1982 does not include such factors as spending on civil defense, civil space programs, internal security troops, and military pensions.

The DIA found that significant increases for a number of major weapon systems contributed to the pronounced upturn in 1983, which happened to be the first production year for many of these programs. For example, 1983 was the initial year of production of the lead ship of a new aircraft carrier class and a new cruise-missile submarine class, both of which are projected to enter the force near the end of the decade.

In the case of the SS-X-24, a new solid-rocket ICBM comparable in size to the MX Peacekeeper, the DIA reported that production had begun shortly before 1983 and "the output rates are building up toward eventual full production." Incidentally, the SS-X-24, one of several new Soviet solid-propellant ICBMs, recently broke its string of successful test flights. An SS-X-24 apparently veered off course during a test shot in mid-June and had to be destroyed. Test failures of this type are commonplace during the early development of new ICBM designs.

The DIA study allowed for the fact that the introduction of new, complex, and expensive weapon systems can increase total procurement costs even if actual production quantities of a weapon class decline. In the case of a large number of production programs, costs held steady in 1983 compared to the previous year. In a few instances, major weapon systems encountered modest production cuts, according to the DIA estimate. The acquisition of new and follow-on systems, however, more than made up for the production cuts of older systems. The 1983 growth in military procurement presages further significant spending boosts, especially in the form of expanding production of new, costly systems.

In addition, the Soviet research and development program continues to grow and is likely to result in the introduction of more new and expensive

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IN FOCUS...

weaponry. Also, military production facilities are being expanded and modernized, thereby creating a pattern of activities that suggests that "the USSR is prepared to field several costly new weapons during the rest of the 1980s, [which] will continue to push Soviet procurement costs upward."

The DIA study listed a number of weapon systems whose production costs shot up by more than $250 million in 1983. These included the MiG-31 Foxhound interceptor, the MiG-29 Fulcrum air-superiority fighter, the Su-25 Frogfoot ground-attack aircraft, two new attack submarine classes, and improved ICBMs. Boosts below that level but above $100 million were recorded in the case of the cruise-missile-launching Bear-H bomber, the Su-27 Flanker air-superiority fighter, the SA-10 surface-to-air missile, and a new-model medium tank, among others.

Production costs of the SS-X-24 and the new, smaller, mobile-based SS-X-25 ICBM grew by less than $100 million because of the early nature of these programs, according to the DIA study. Overall, procurement costs in new naval programs went up by about $1 billion, or twenty percent, in 1983, compared to 1982. Aircraft and missile procurement costs also went up by about $1 billion each, but only represented a percentage growth of ten percent, according to the DIA estimate.

Postmortem on the Falkland Islands

A high-powered US Navy study of the lessons taught by the conflict between Argentina and Britain over the Falklands two years ago concluded that both the Royal Navy's and Royal Air Force's V/STOL Harriers "were surprisingly reliable and versatile" during the battle, destroying at least twenty Argentine aircraft, with sixteen of the kills by US-produced Sidewinder missiles.

The Navy's study team, chaired by the Assistant Secretary of the Navy for Research, Engineering and Systems, Melvyn R. Paisley, found, however, that "the performance of both types [RN and RAF] of Harriers in air-to-ground action was less impressive. Together they delivered fewer than 200 general-purpose bombs, including only four laser-guided bombs, and had little effect on the outcome of the land battle."

The twenty-eight Sea Harriers deployed to the South Atlantic during the conflict flew more than 1,200 sorties in forty-four days and maintained an availability of almost ninety percent. Fewer than one percent of planned missions was scrubbed because of aircraft unserviceability. The Navy's study found that the radar and attack weapon-control systems in the Sea Harriers proved to be reliable and versatile but limited in range and capability. The British aircraft were also handicapped because of the lack of adequate radar-controlled cuing and vectoring for intercepts as well as their intrinsically limited time on station and air-to-air ordnance loads, the US Navy report concluded.

Two other circumstances favored the Sea Harriers, on the other hand: "In many engagements, [they] were attacking aircraft which were operating at the extreme limits of their range and could not afford to maneuver if they were to return home safely. [Also,] fortunately for the British, the Argentine aircraft actually attempted to attack the Sea Harriers [only] on the first day of the battle."

The US Navy's assessment was somewhat critical of the performance of the Vulcan strategic bombers during the Falklands conflict, claiming that the five strike missions flown from Ascension Island had "virtually no impact" on the two assigned target complexes, the Port Stanley airfield and the Argentine surveillance radars.

Three single-plane sorties, with each Vulcan carrying twenty-one 1,000-pound bombs, attacked the airfield, and two single-plane sorties with antiradar missiles attacked Argentine radar installations. Each of these sorties required multiple in-flight refuelings. "Both the airfield and surveillance radar installation remained operating until the last day of the war," according to the Navy study.

The performance of the C-130 Hercules, however, drew rave reviews by the Navy analysis: "The venerable Hercules provided the backbone for both the UK and Argentina during the conflict. For the British, they were operated as aerial refuelers, were refueled themselves, and were used to airdrop critical supplies at sea and ashore. Right up to the final day of the war, Argentine Hercules transports flew critical resupply missions from the mainland, usually under threat of Harrier attack. Argentine bombers were air-refueled by Hercules tankers to extend their operating range." ■

CAPITOL HILL

By Kathleen G. McAuliffe, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., July 27

Democratic Defense Plans

The Democratic platform has a nuclear freeze as the cornerstone of its defense policy. The platform commits the party to a strong national defense and what is referred to as a "more realistic assessment of the threat." While the document spells out the party's plans in the arms-control arena and programs for cancellation, the Democrats do not say what weapon programs will be supported.

On the first day of a Democratic Administration, a mutual moratorium would be initiated on all underground nuclear and ASAT testing, on testing and deployment of all space weapons and any strategic ballistic missile now under development, and on deployment of nuclear-tipped, sea-launched cruise missiles.

Following implementation of a freeze, a Democratic Administration would resubmit the SALT II, Threshold Test Ban, and Peaceful Nuclear Explosions Treaties to the Senate for ratification and negotiate a Comprehensive Test Ban Treaty; merge talks on reduction of strategic and intermediate-range nuclear systems; reaffirm US commitment to the ABM Treaty and pursue a ban on space weapons; negotiate an ASAT Treaty; end MX and B-1B production; and ban production of chemical weapons.

The platform stresses modernization of conventional forces, but no specifics are provided. Adequate funding levels for training, spares, fuel, and munitions are also supported, but "adequate funding" is not defined. The plank recognizes the importance of the skilled military professional and supports adequate pay and benefits. Draft registration in peacetime would be abolished.

Defense Deadlock

House and Senate conferees remain deadlocked over the FY '85 defense authorization because of differences on MX. The Senate earlier broke a stalemate over defense levels by offering to reduce by $2 billion its original plan to seek $299 billion in FY '85. The House had voted to limit defense to a total of $292 billion.

Senate conferees expected some concessions in return for the reduction, namely fewer restrictions on MX production and ASAT testing and a removal of the House ban on introduction of troops in Central America. All issues reportedly are resolved, with the exception of MX. Senate conferees find unacceptable a House demand for a bicameral affirmative vote next spring to allow MX production to begin. The Senate prefers to allow production to proceed unless both houses vote to disapprove it. A vote of disapproval is perceived as politically more difficult to achieve and, according to the Senate plan, would be subject to a Presidential veto. House and Senate intransigence dims hopes for approval of a compromise defense package before Congress recesses for the GOP National Convention and could make MX a big election issue.

Readiness Defended

Secretary of Defense Caspar Weinberger decried the findings of a congressional staff report on military readiness as misinterpreted data potentially dangerous to national security. He said the report undermines deterrence by fostering false impressions of US capability and resolve.

The report was the work of House Appropriations Committee staff investigating the status of military readiness in 1982. It concluded that combat operations could not be sustained, despite increased defense spending, because of inadequate supplies, personnel, and equipment. A good portion of the additional equipment and munitions bought with defense increases in 1981 and 1982 was, however, not yet in the inventory because of long lead times for production. The conclusions reached in the report distort 1984 realities.

The Defense Secretary and Joint Chiefs Chairman Gen. John Vessey, USA, reaffirmed that by "every commonsense measure" the US armed forces are "considerably more capable" than they were four years ago.

USAF experienced dramatic increases in capability in the last four years, including the ability to fly 62,000 more sorties with better aircraft, and more spares, munitions, fuel, and better-trained pilots.

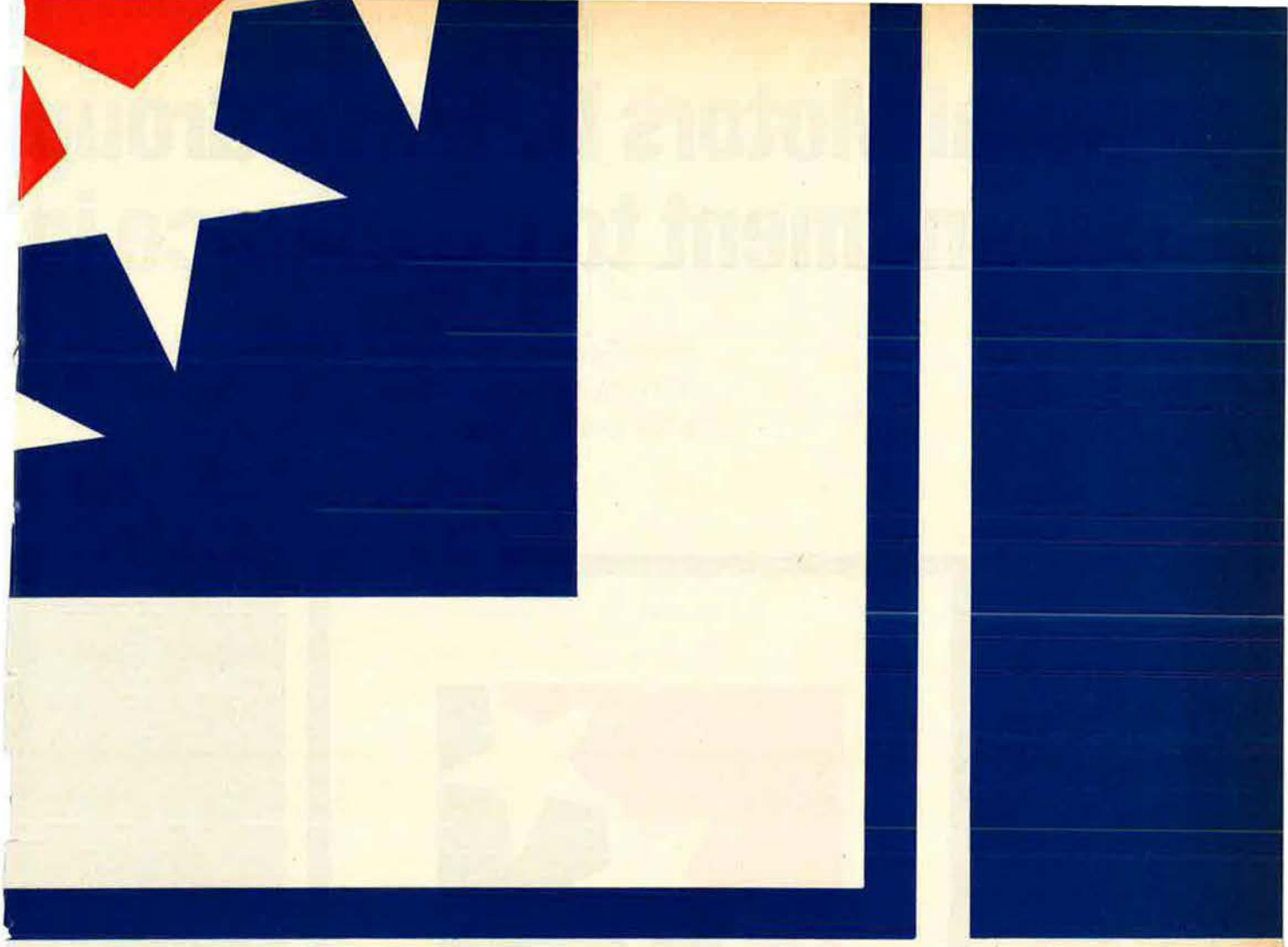
Ironically, the House Appropriations Committee recommended reductions of $20.3 billion in the FY '83 defense budget. Congressional budget cuts wreaked havoc with program schedules and costs and made unachievable Pentagon plans to reach the Department's readiness and sustainability goals in 1988–89.

Arms-Control Report

The numerous arms-control restrictions included in House and Senate versions of the FY '85 defense authorization overshadowed an uncontested provision requiring full disclosure of the Soviet record on compliance with arms accords. Both houses approved the sunshine-type amendment directing the Administration to submit to Congress a report by the General Advisory Committee on Arms Control, a panel of the Arms Control and Disarmament Agency (ACDA), detailing Soviet arms-control compliance over the last twenty-five years. The report, unanimously approved by the twelve-member panel, was completed last November.

Sen. James A. McClure (R-Idaho) and Rep. James A. Courter (R-N. J.), sponsors of the full disclosure amendment, believe that a clear knowledge of the history of Soviet treaty violations would help Congress in deciding the fate of critical strategic nuclear systems now being hamstrung by arms-control restraints and would help "preserve the integrity of the arms-control negotiating process. . . ."

The President, at congressional direction, submitted last January a report of seven Soviet violations of various arms-control treaties. Administration officials later told Congress that more violations existed. Release of the comprehensive ACDA report is cause for concern by some in the Administration who fear it could rekindle a perception in an election year that the Administration is not sincere about negotiating with the Soviets. ■



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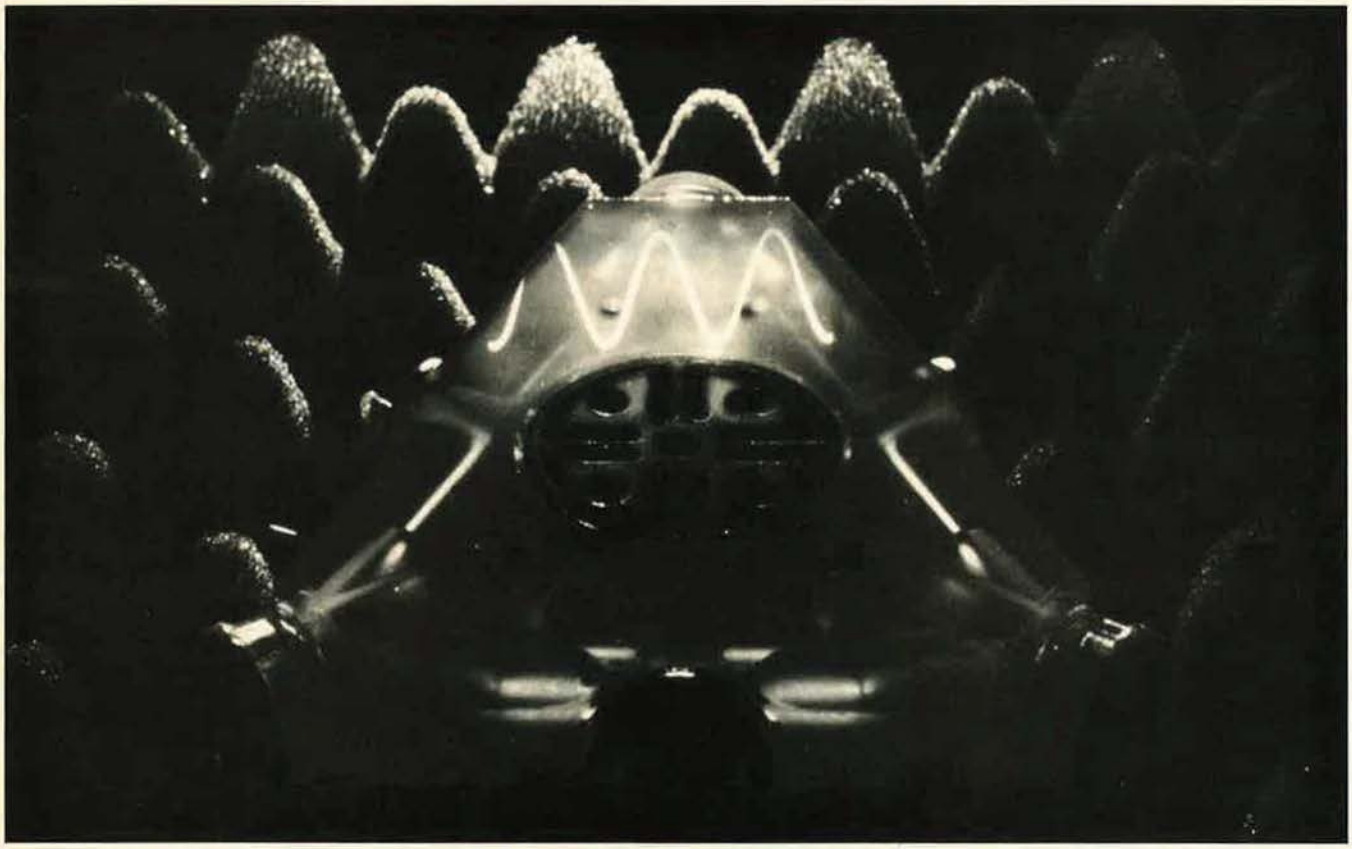

Because laser beams are its only "moving parts," this Honeywell ring-laser gyroscope can perform in inertial reference, guidance, and navigation systems with greater reliability than conventional gimballed systems. The gyroscope measures the frequency difference between two contrarotating laser beams, which are circulated in the triangular cavity through the use of mirrors. The resonant frequency of a contained beam is a function of optical-path length. When the gyro is at rest, the beams have identical frequencies. When the gyro is subjected to an angular turning rate around an axis perpendicular to the plane of the beams, one beam has greater optical-path length than the other. Thus, the two frequencies change and the differential is directly proportional to the angular turning rate.

Washington, D. C., Aug. 7

★ USAF's fleet of AWACS aircraft has been completed with the delivery of the last in the planned buy of thirty-four.

The 552d AWAC Division at Tinker AFB, Okla., operates thirty-three E-3As from there and from various worldwide locations. One aircraft is at Boeing Aerospace Co.'s plant in Seattle, Wash., as a flying testbed for continuous improvements to the $4.5 billion AWACS program.

AWACS has steadily improved over the years. Among the improvements are upgraded radar computer software to allow the E-3A to track surface vessels, additional radios and radar consoles, and an airborne computer with twice the capacity of the original.

Originally designed to fly sixty-five hours a month, the division's E-3As are currently flying about 100 hours a month with less maintenance and higher reliability than at the lower flying rate.

Of eighteen NE-3As being purchased for NATO, thirteen have been delivered.

★ The NATO Airborne Early Warning Force (NAEWF) conducted its first-ever change of command at NATO Air Base Geilenkirchen in the Federal Republic of Germany in late June. USAF Maj. Gen. Leighton R. Palmerton retired after more than thirty-four years of service and relinquished command of NAEWF to German Air Force Brig. Gen. (Maj. Gen. selectee) Klaus Rimmek.

General Palmerton has commanded the thirteen-nation force since its inception in January 1980. General Rimmek, who had served as the force's NE-3A component commander, was replaced by Brig. Gen. Hugh L. Cox III, USAF.

Command of both units is rotated between the United States and Germany.

★ The fourth launch of an experimental Army missile in the central Pacific

this summer moved the US a step closer to a nonnuclear defense against enemy strategic ballistic missiles.

The Army's optically guided Homing Overlay Experiment (HOE) vehicle successfully intercepted a dummy ICBM warhead fired from Vandenberg AFB, Calif., toward Kwajalein Missile Range in the Marshall Islands.

The intercept was the first for the US and, so far as is known, for the world, according to Defense Department officials.

The HOE program was designed to validate the optical homing technology needed to develop a near-term, nonnuclear capability to destroy an attacker's strategic nuclear missiles outside the atmosphere.

This was the fourth HOE flight. The three prior flights, while satisfying ninety percent of program data requirements, also revealed various hardware and software anomalies that prevented intercepts.

Use of this experimental technology could provide one element in a layered defense to assure the high level of ballistic missile defense effectiveness envisioned in the Strategic Defense Initiative, DoD officials explained.

As the ICBM reentry vehicle approached Kwajalein, booster rockets lifted the HOE missile from Meck Island in the atoll complex. After separation above the atmosphere, onboard guidance equipment directed the HOE to an intercept course with the approaching target.

The HOE's longwave infrared sensor and guidance computer locked onto the target against the cold background of space. Longwave infrared sensors can detect heat emissions in space equivalent to those of a single human body at a distance of more than 1,000 miles.

Just seconds before impact, the HOE unfurled a metal "net" shaped like the frame of an umbrella. The ribs of the net are studded with weights that, on impact, can destroy an ICBM warhead. Destruction of the target was confirmed by ground radars and optical sensors and a specially instrumented, intercept-assessment aircraft.

The HOE is managed by the Army's Ballistic Missile Defense Systems Command in Huntsville, Ala.

★ Lockheed-Georgia Co., Marietta, Ga., recently flew its High Technology Test Bed (HTTB) aircraft, a modified L-100-20 Hercules commercial cargo transport, for the first time.

"We need an airborne test vehicle to be able to evaluate advanced and

Lockheed-Georgia Co.'s High Technology Test Bed aircraft recently made its first flight. The modified L-100-20 Hercules commercial cargo transport will be used to evaluate advanced and emerging airlift technologies. See item.

This artist's sketch shows the design of a Northrop/Dornier advanced fighter that West Germany is considering developing as part of the European Fighter Aircraft (EFA) program.

maturing airlift technologies," commented Armand Rosende, Jr., manager of the company's engineering flight test department. "Specific areas we want to look at are STOL [short takeoff and landing] and improved electronics and avionics.

"HTTB is an ideal tool for that research because we can combine technology integration with technology demonstration," Mr. Rosende explained.

"Other companies and several government agencies also have things they want to test on an airborne platform. And we will make some uncommitted time available to several universities as well," he added.

To the casual observer, only the instrumentation booms and unusual black paint scheme mark the HTTB. Made of composite material, the instrumentation booms extend forward from each wingtip.

But the Lockheed Airborne Data System, or LADS, installed permanently in the HTTB airframe is a major modification, company officials said.

LADS is a highly reliable data-gathering, analysis, and display system that allows engineers on board the aircraft to run tests and to check data in real time.

Following the baseline flights, HTTB is to go into a two-month modification layup. It should resume flying in early fall, fitted out with part of its new STOL hardware.

Ten aerospace firms are currently supporting the HTTB program: Hamilton Standard, Menasco, Garrett, Allison Gas Turbine Operations, Bendix, Collins, Honeywell, Litton, Northrop, and Texas Instruments. Others have actively expressed interest.

★ Returning to the arena it pioneered in the 1950s, Lockheed-California Co., Burbank, Calif., will use its own funds to develop airborne early warning and control (AEW&C) versions of its P-3 Orion antisubmarine patrol aircraft and C-130 Hercules military transport.

Featuring a saucer-shaped rotodome mounted atop the fuselage to house the antenna for General Electric's APS 138 radar, either aircraft could patrol, detect, and track enemy air and surface traffic while acting as a command center for friendly forces.

Lockheed Vice President and AEW&C Program Manager Burt O'Laughlin noted that the proposals combine proven airframes with a proven radar system to provide an affordable solution to land-based AEW requirements.

"Either Lockheed aircraft would have a radius of action and time on station comparable to the Boeing E-3A, but at less than half the price," the company executive explained. "Fuel costs and consumption would also be significantly lower for the two efficient Lockheed turboprop aircraft," he added.

According to Mr. O'Laughlin, another twenty percent improvement in time on station and radius of action could be realized with an alternative proposal to upgrade the Hercules or Orion engines from the Allison T-56-14 to the T-56A-427 model.

Currently, the company is embarked on a project to create a flying system demonstrator using a former Australian P-3B Orion that has been

Young, Dedicated, and Gaining Experience

Everybody talks about them. The Pentagon controls them, Congress pays them, and the press speculates about them.

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But who are they?

First off, they are "hes," although there are more "shes" wearing Air Force blue today than ever before—11.3 percent of the service's 560,000 people in 1984, up from 3.8 percent a decade ago. And those "shes" are in more jobs than before, with only ten percent of the officer positions in the Air Force closed by law to women and only five enlisted specialties off limits to women.

By and large, these average Air Force people are married. More than half of Air Force spouses work outside the home. Also, 24,350 members are married to other military members (4.35 percent).

These typical Air Force people are spending more time in one place than they did ten years ago. The average tour length is actually up 108 percent, for an average time on station of four years. They are moving fifty-four percent less frequently than they did in 1974.

They are also extending their overseas tours—serving twenty-five percent longer than is required on three-year accompanied tours, and even spending an extra eight months on generally unaccompanied tours of eighteen months.

If our average people are among the Air Force's 106,707 officers, their average age is thirty-two, and they are senior captains. They have 1.8 dependents and a bachelor's degree with some credits toward a master's.

If they are among the 489,159 enlisted people, they are staff sergeants, are twenty-eight years old, and have 2.4 dependents. They are high-school graduates and have earned some credits toward a college degree.

Air Force retention figures are up, and Air Force people are now staying in the service longer. The average time in service is now fifteen years for the officer corps and eight years for the enlisted force—a fifty percent increase over 1979.

However, Air Force officers are retiring slightly sooner than they used to. The average retirement age is now 45.8 years, with twenty-four years of service—about six months earlier than a decade ago. The enlisted force is retiring slightly later than ten years ago, with an average retirement age now of forty-two years and an average service career of twenty-three years.

Although our average service people make more money today than did their predecessors, their actual purchasing power has dropped by twelve percent since 1972. The average pay (base pay and allowances for subsistence and quarters) on January 1, 1972, was $7,336 for enlisted people and $16,144 for officers. In constant 1972 dollars, the enlisted force averaged only $6,908 and officers only $14,787 on January 1, 1984. In addition, our average Air Force people now receive 8.7 percent less than the private sector pays employees in comparable jobs.

Rounding out our "average" force are the Air National Guard and Air Force Reserve folks.

Of the 12,571 ANG officers, 5.9 percent are women. Of the 88,618 enlisted people, 10.9 percent are women. The officers' average age is 38.3 years, they average 15.7 years of service, and most of them are married. Enlisted ANG members average 33.9 years of age and 11.4 years of service. Sixty-eight percent are married.

In the Air Force Reserve, there are 67,972 selected reserves assigned either to units or mobilization augmentee positions. The average Reserve officer is 38.9 years old, married, has 2.2 dependents, and has a bachelor's degree. The average Reserve enlisted person is 33.3 years old, married, has 1.8 dependents, and has a high-school diploma.

Ninety-one percent of Reserve officers have served on active duty, and 12.6 percent are women. Almost seventy-eight percent of the enlisted Reserve force have served on active duty, and 22.2 percent are women.

So that's the average—a force that's young, dedicated to a career in the service, and gaining experience.

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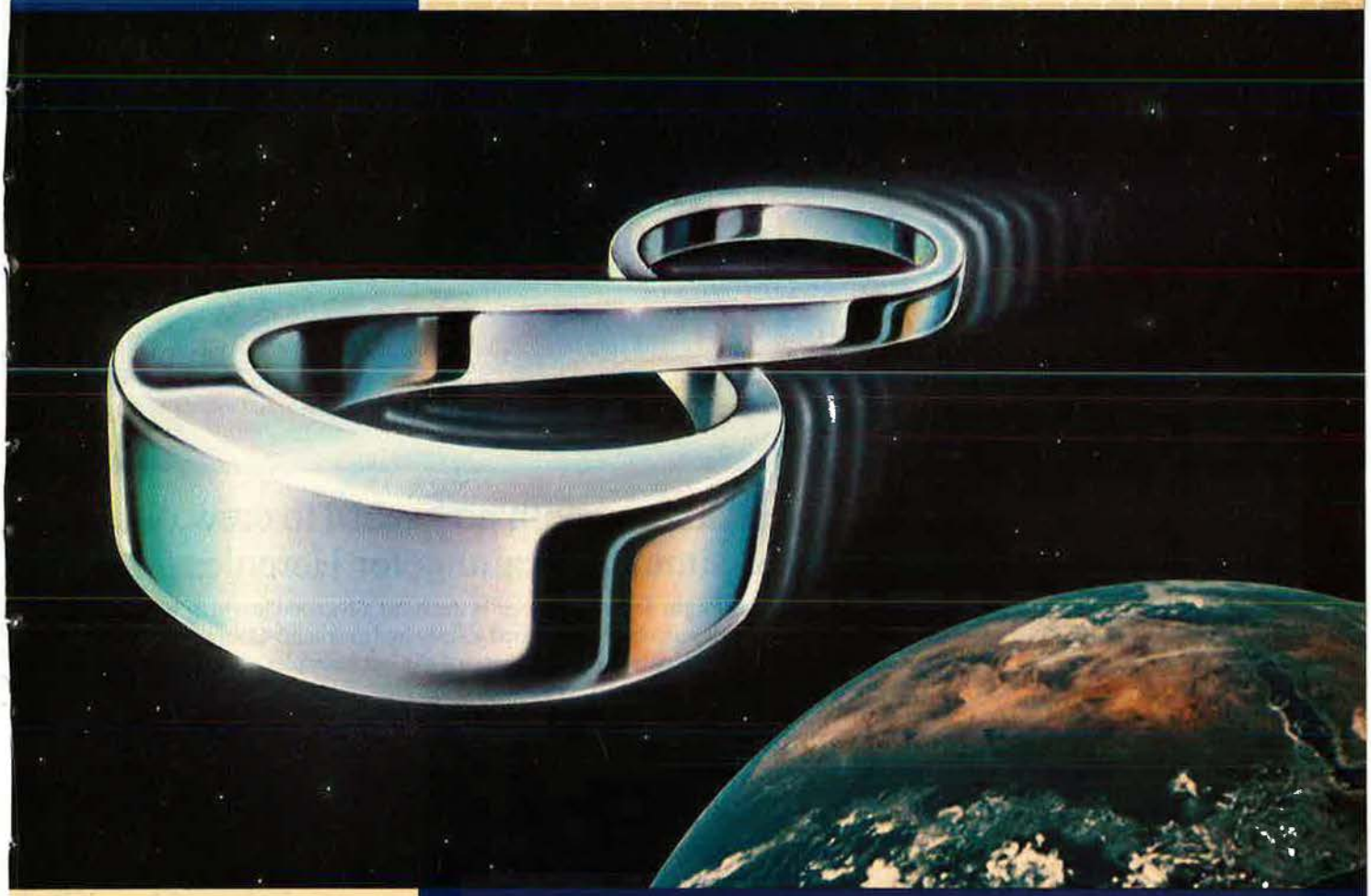

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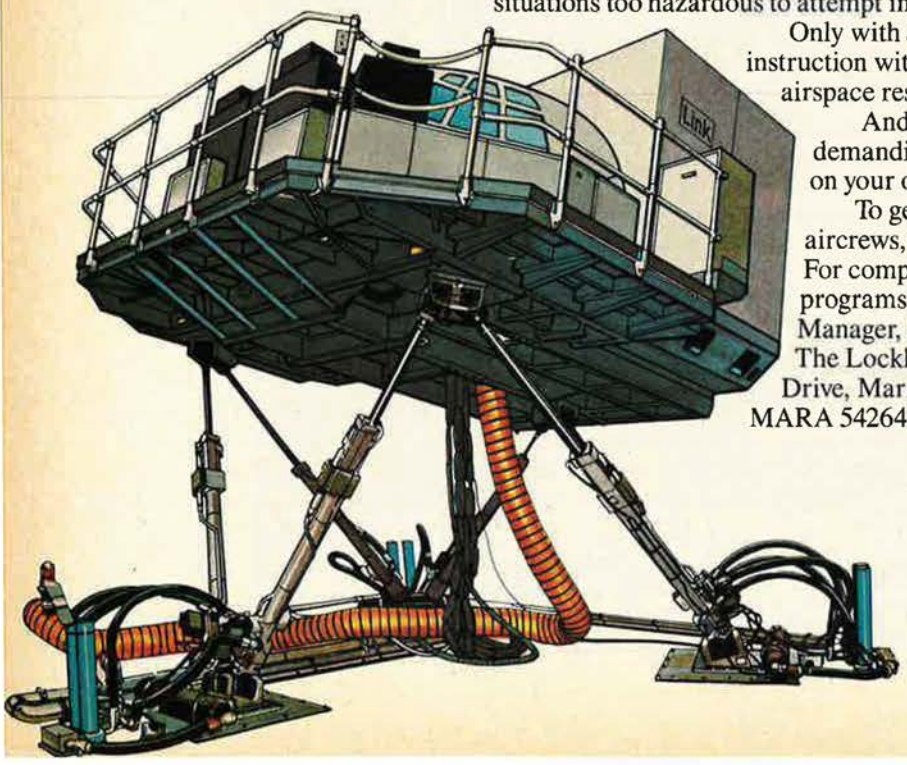

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Lockheed-Georgia

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FLIGHT SIMULATION DIVISION
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equipped with a rotodome. Throughout the remainder of the year, the aircraft will be used to prove aerodynamic qualities. Next year, the specialized radar and avionics will be added to validate overall operational claims for the system.

AEROSPACE WORLD

Potential customers for the AEW&C P-3 include Australia, Canada, Japan, and the US Navy.

Besides the California-based company, Lockheed-Georgia—as manufacturer of the C-130—is also involved in the venture. By making the package

Featuring a saucer-shaped rotodome designed to house the antenna for a General Electric APS 138 radar, this specially modified P-3 Orion has begun test flights at Lockheed-California Co.'s flight-test center in Palmdale, Calif. See item.

AIR FORCE Magazine welcomes its newest Contributing Editor, Capt. Napoleon B. Byars, USAF. Captain Byars joined the staff in August under USAF's Education With Industry (EWI) program.

Born in Charlotte, N. C., Captain Byars was commissioned through the ROTC program at the University of North Carolina at Chapel Hill, where he majored in journalism. He also holds a master's in communication.

An eight-year USAF veteran and a career public affairs officer, Captain Byars recently completed ROTC instructor duty. He replaces Capt. Patricia R. Rogers, USAF, who is currently assigned to the Pentagon.

Panavia Tornado aircraft with (from foreground) West German, Italian, and British markings fly in formation over Europe. Advent of the Tornados in the air forces of all three NATO nations gives them greater punch, particularly in the interdiction role.

AEROSPACE WORLD

Air Force to Validate Shale Fuel

F-111s and transient aircraft at Mountain Home AFB, Idaho, will begin filling up later this year with JP-4 fuel derived from oil shale rock. F-16s and other aircraft at Hill AFB, Utah, will follow suit early in 1985.

Use of shale JP-4 fuel marks the beginning of a two- to four-year Air Force operational validation effort managed by Air Force Logistics Command.

Operational validation follows extensive work by Aeronautical Systems Division (ASD) to develop and test shale JP-4 as an alternative fuel source. Shale-derived fuel is, at present, slightly more costly than conventional fuel, according to Charles L. Delaney, shale oil fuels program manager in ASD's Aero Propulsion Laboratory. However, since estimates of US oil reserves trapped in shale rock are as high as one trillion barrels, the Air Force has undertaken the program with the long-range goal of ensuring an acceptable supply of JP-4 in the event of a petroleum shortage. Deriving oil from US shale also provides an excellent opportunity for the United States to lessen its dependence on foreign crude.

The program began in 1979 and has included the operation of an F-111 engine—the TF30—with shale-derived JP-4 in the laboratory's sea-level engine test stand for the equivalent of almost 1,000 flight hours. Inspection of the engine revealed no adverse effects from the use of the shale fuel.

Under an Air Force contract, Pratt & Whitney of West Palm Beach, Fla., performed similar tests using an F100, the powerplant for the F-16 and F-15. Also ground-tested were three engines used in Army helicopters of the type based at Mountain Home AFB, main fuel pumps for the F100 engine, and such auxiliary power equipment as start carts for the F-111 and the jet fuel starter for the F-16.

No bad effects were reported from use of shale fuel on any of the engines, pumps, or other equipment tested. This success paved the way for a short series of flight tests encompassing eight sorties using F-16s and sixteen sorties in an F-111. The flight tests revealed no significant performance differences between the shale fuel and conventional petroleum fuels.

The San Antonio Air Logistics Center at Kelly AFB, Tex., will implement the operational validation phase of the program at Mountain Home and Hill AFBs.

—BY MIKE WALLACE

available on both airframes, compatibility can be offered to a wider variety of operators, Lockheed officials explained.

In addition to the primary mission, the aircraft could be deployed for coastal surveillance, maritime support, search and rescue, interdiction of smuggling traffic, and fisheries patrol, a spokesman from the Lockheed Company noted.

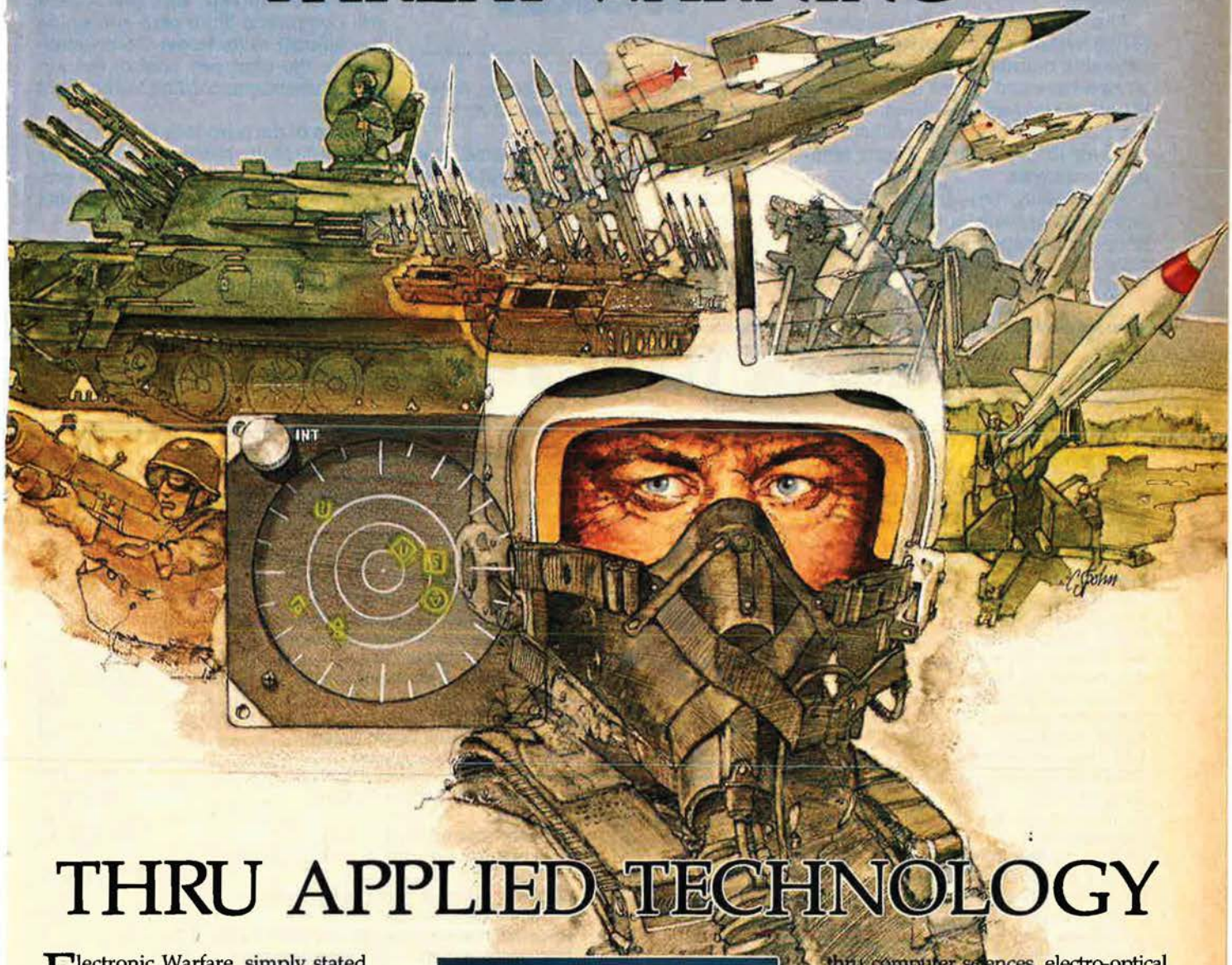
Lockheed was instrumental in original AEW developments in the late 1940s and 1950s with versions of its P-2V Neptune patrol aircraft and the Constellation transport.

It was a model of the Constellation, or "Connie," that, in 1956, became the first aircraft to be equipped with a radome.

USAF's first F-16C took flight following delivery at General Dynamics Corp.'s Fort Worth, Tex., plant last July. Unlike earlier variants, which can carry only short-range, heat-seeking Sidewinders, the F-16Cs are wired for radar-guided advanced medium-range air-to-air missiles and thus will be more potent in the air-superiority mode.

THE SPECTRUM OF

THREAT WARNING



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★ McDonnell Aircraft Co. is developing an on-board fighter aircraft system that, in effect, will plan air-to-air missions and air-to-surface attack missions.

The Tactical Flight Management (TFM) system will calculate the most desirable course and speed to avoid air defenses and to take advantage of terrain for low-altitude flying. The aircraft is to be flown automatically according to the Tactical Flight Management's plan.

Additionally, the system is being designed to provide gun-pointing and snap-shoot capability during a dogfight.

Dr. William J. Murphy, the company's TFM program manager, notes that the system is the first of its kind for use in combat.

Sponsored by the Air Force, the TFM system research concept development should be completed by September, when blue-suit pilots will test the system in the company's flight simulators.

In operation, the TFM system will link a fighter's mission computer to the aircraft's flight and engine control systems. Pilots will enter target position, time of arrival, and location of antiaircraft threats, and the system will compute a flight plan and guide the aircraft to its target. As an alternative, the pilot can control the aircraft manually according to the flight plan.

"One of the purposes of the system is to reduce the pilot's work load," Dr. Murphy explained. "Another is to provide the best mission plan for pilot survivability."

The TFM system could be operational on an aircraft in three to five years, Dr. Murphy added.

AEROSPACE WORLD

INDEX TO ADVERTISERS

★ Qualified noncommissioned officers are needed to fill vacancies in professional military education instructor slots around the world.

NCOs are being sought for assignments at bases in Japan, the Philippines, Alaska, England, and Germany, as well as at twenty-three CONUS bases.

The instructors are needed at the Senior NCO Academy, the Leadership and Management Development Center, NCO academies and leadership schools, and for the NCO Preparatory Course.

Application procedures are outlined in Air Force Regulation 39-11. Base personnel office customer service centers have additional information.

★ Beginning in September, the FAA is slated to undertake a broad safety inspection of business and private aircraft operations.

The twelve- to eighteen-month audit aims at increasing the safety of general aviation. The need for this study is apparent, considering an expected forty percent growth by 1995 in the number of business and private aircraft. The US active general-aviation fleet now numbers 210,000 aircraft, ranging from single-engine private aircraft to sophisticated business jets.

In announcing the action, Secretary of Transportation Elizabeth Hanford Dole noted that the review will include those commercial operators with one or two aircraft that contract with travel clubs and companies conducting group flights. About 230 of these operators own older DC-8s and 707s that are being phased out of US fleets at the end of the year in order to comply with federal noise regulations.

"I have directed that maintenance surveillance of all these aircraft be intensified to assure that their airworthiness is in no way compromised during their final months of service," the Transportation Secretary explained.

During the audit, she added, "Our inspectors will also look at flight schools, repair stations, mechanics, and on-demand air taxis—all part of the general-aviation community."

In addition to the safety audit, Secretary Dole said that "we are considering a proposal requiring shoulder harnesses for small aircraft. We are reviewing information available on survivable crashes, the potential for voluntary compliance, and additional costs to the public. We are working with general-aviation pilots and manufacturers on this issue."

New techniques for pilot training may also provide an added margin of safety, Secretary Dole said. "Since a large number of general-aviation accidents are due to 'pilot error,' new or additional methods of training might equip pilots to handle life-threatening situations more successfully."

★ A $30 million contract for improving communications inside the Air Force's Cheyenne Mountain Complex near Colorado Springs, Colo., was announced by AFSC's Electronic Systems Division at Hanscom AFB, Mass.

GTE's Communication Systems Division, Needham Heights, Mass., has been designated to design, install, and test the improved system.

"As part of the modernization, we'll develop a new switching system," explained Col. David A. Levesque, the program manager. "It is a key step in standardizing communications."

The data flow produced by radars and satellites that feed the warning and intelligence complex is expected to grow in the years ahead. This upgrade will make provision for additional communications links.

★ Hughes Helicopters, Inc., Culver City, Calif., is evaluating a version of the AH-64 Apache attack helicopter to extend the reach of naval firepower and surveillance to beyond the horizon.

The new version would be configured for full-time shipboard operation.

The Apache is armed with missiles, folding-fin rockets, and an automatic cannon and can be equipped with an array of antiship and air-to-air missiles for use in day or night.

In one scenario, the Apache could be positioned at the edge of a task force—up to 150 miles away—to search for, identify, and destroy enemy surface ships.

In a combat situation, the Apache would climb to use its radar, attack, and then descend below the horizon and out of view of enemy radar.

During amphibious support and coastal patrol operations, the AH-64 could provide dedicated air cover to the amphibious ready group commander as the landing forces deployed.

The aircraft would establish an orbit above landing-force ships and engage surface vessels, fast patrol boats, swift boats, hovercraft, or air threats. It could also attack coastal emplacements.

The AH-64 also could work independently to provide armed escort and close fire support for Navy SEAL and other operations. ■

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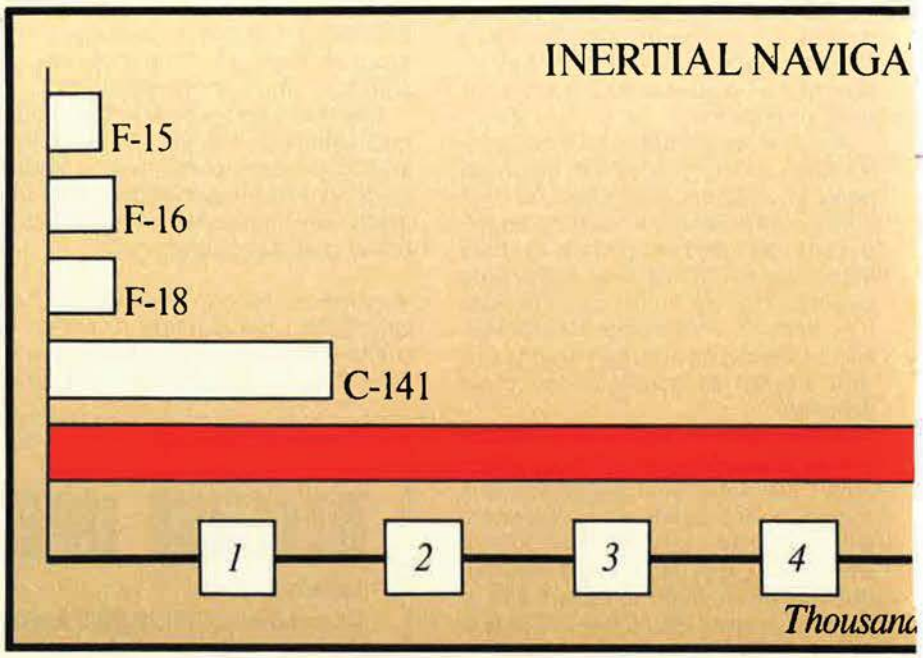

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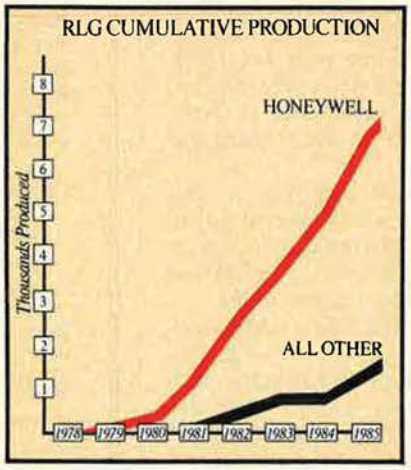

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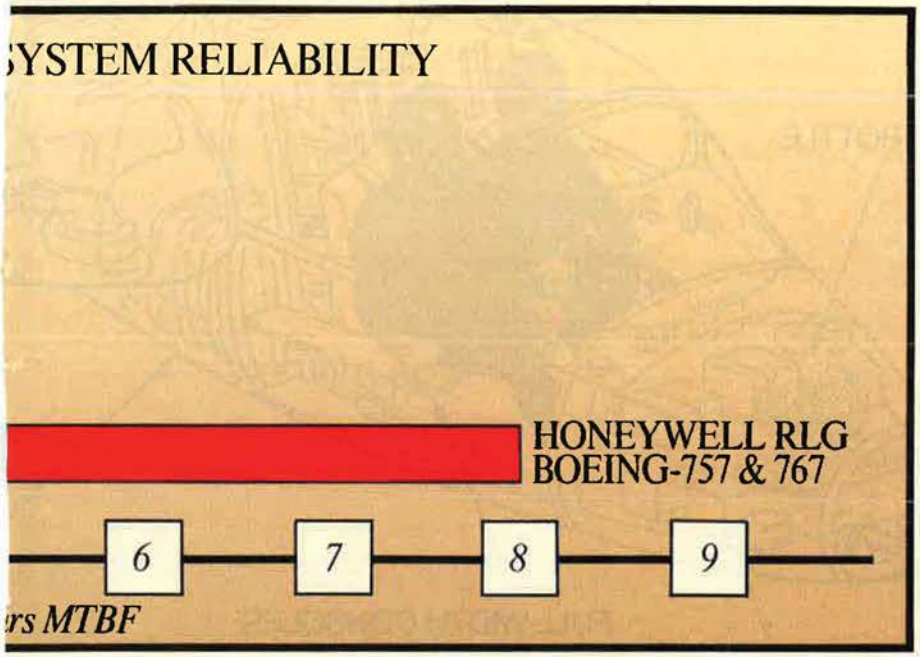

Boeing 757, 767, and the Airbus A310, as well as many business jets. They will soon enter service on Boeing's new 737-300.

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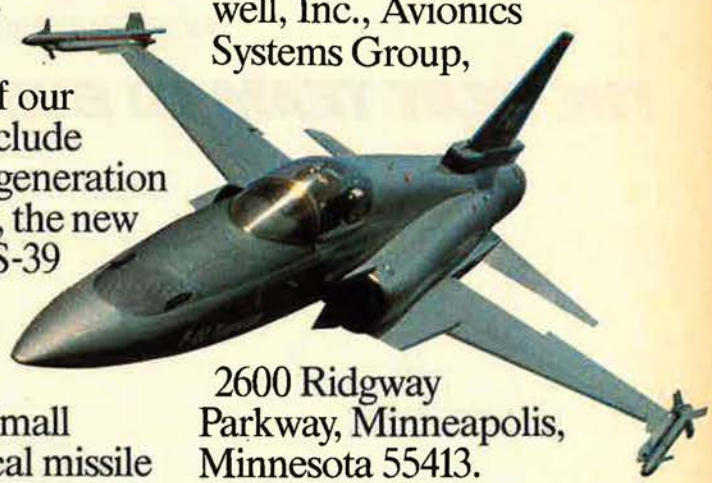

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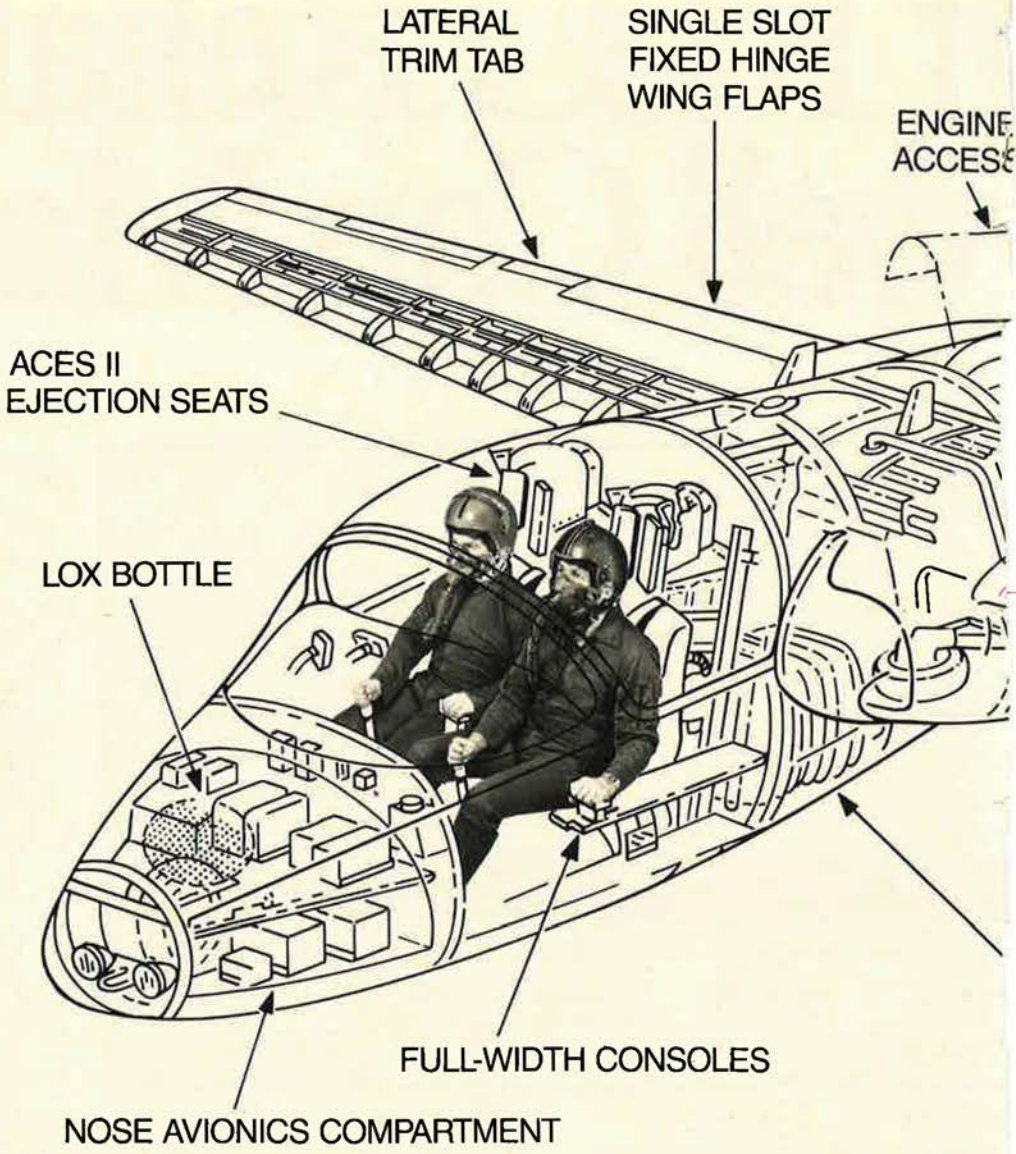

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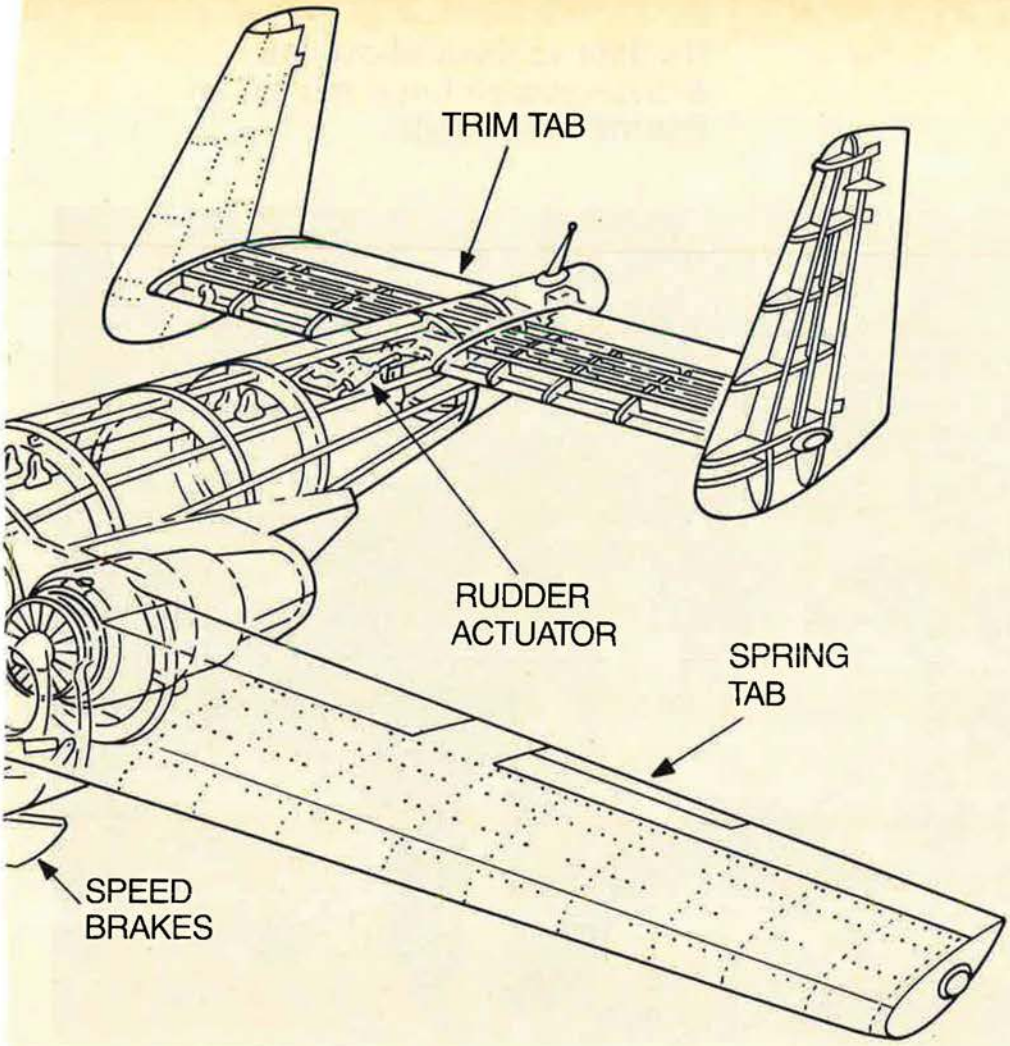
Our other teammate is Logicon, a leader in using computer technology to create training systems that are flexible yet easy to use. Examples include Navy and Air Force automated flight training systems,



OWAGE COMPARTMENT

It's time to think about the active-reserve force mix as an international issue.

Total Force in a Global Context

BY THE HON. TIDAL W. McCOY
ASSISTANT SECRETARY OF THE AIR FORCE (MANPOWER, RESERVE AFFAIRS AND INSTALLATIONS)

NEXT year, we will mark the fortieth anniversary of the end of the greatest conflict in world history. This spring, we observed the fortieth anniversary of D-Day—the greatest amphibious assault in the history of warfare and the beginning of the end of Nazi Germany. Such celebrations help to focus the attention of all who have some responsibility for the national defense.

It is sometimes difficult to remember what a massive change United States military forces underwent in the years of World War II. William Manchester, in his book *The Glory and the Dream,* presents a striking baseline:

In 1932, " . . . the US had the sixteenth largest army in the world, putting it behind, among others, Czechoslovakia, Turkey, Spain, Romania, and Poland. When every $17.85-a-month private had suited up, there were 132,069 Americans in uniform. . . . [M]ost of [then-Army Chief of Staff Gen. Douglas] MacArthur's men were committed to desk work, patrolling the Mexican border, and protecting US possessions overseas. The Chief of Staff was left with 30,000 troops—fewer than the force which King George [III] sent to tame the rebellious American colonists in 1776."

At Omaha Beach, more American troops (34,000) went ashore on D-Day than General MacArthur had had available for immediate use some twelve years earlier. At the end of World War II, there were 12,000,000 Americans in uniform.

In the growth that marked that period, America's Guard and Reserve Forces played a huge role. They have continued that role today—an almost equally critical period—as the United States has faced the largest military arms buildup by a potential adversary in history. In the 1970s, Soviet defense spending increased by forty percent while US defense spending did not even keep up with inflation. US defense expenditures decreased to five percent of national output from approximately eleven percent in the 1950s and nine percent in the 1960s; Soviet military expenditures increased from twelve to fourteen percent of national output. Without belaboring an issue that has been widely reported, this period of change made rebuilding America's defenses the most critical problem faced in the new decade, and that meant greater reliance on reserve forces.

Global capabilities are demonstrated annually during the Reforger exercises, which deploy active and reserve forces to the European theater. At left, US troops patrol in a European forest while an A-10, below, provides air support.

The Militia Tradition

"One thread that runs through the military history of England is a demand for low-cost protection," John K. Mahon says in his *History of the Militia and the National Guard.* "Owners of land bore those costs for the most part, but the lowest strata of society paid their share if they were impressed into service for extensive overseas duty. In England, the complaints of the landholders over the costs of the militia on the one hand and the pressures exerted by the Crown to make them pay those costs on the other hand shaped military policy. Demand for low-cost military security reappeared in the North American colonies."

The demand for low-cost military security never died in America, except during some periods of war. After each such period, however, America quickly demobilized as many forces as possible and returned to "business as usual." To some degree, that demand is at the heart of the current debate concerning missions and equipment for the Guard and Reserve.

Simply stated, the argument goes like this: Active forces cost too much; the same level of defense can be provided on a part-time basis and at lesser cost; we need to adopt this or that program to bring about this desirable effect. In short, we want what the early settlers wanted: low-cost protection.

Before we address some of the arguments in detail, a general point must be fixed firmly in mind. The extent and nature of military forces reflect the purposes to which those forces might be used. The responsibility of the Department of Defense is to identify the obligations taken on by the United States that might require military force, and to structure forces capable of carrying out those responsibilities. The analysis begins with national commitments, objectives, threats, and policy requirements. These are translated, ultimately, into doctrine, force levels, weapon systems, etc. Thus, the first parameter that planners must acknowledge is the commitment that our forces fulfill. A "solution" that undermines the ability to carry out those responsibilities is fatally flawed, irrespective of any other advantages it might possess, including cost.

United States military forces must prepare for war efficiently in order to prevent war from happening. At the same time, those forces must be effective enough to fight and win, should it become necessary. This fundamental dichotomy of purpose is a major influence on the formulation of the military forces.

Cheaper—Sometimes

Reserve forces *are* cheaper, in some instances, than active forces. They are cheaper in at least two ways. First, the cost of retirement compensation for reserve forces is less than for active forces, because reserve

personnel retire at a later period in life. This article is not the place to argue the current retirement system. But it is important to remember that the retirement system is a management tool, designed to accomplish specific purposes in the composition of our military forces, and to recognize the special nature of military service. Some potential savings associated with reserve activities arise from the necessity of having a fair and equitable retirement system for the active force.

The second—and key—factor in determining whether reserve units could perform a given mission at a lower cost is activity rates. If an activity rate during peacetime is at a high pace requiring heavy daily training demands and is manpower-intensive, this unit mission is usually not assigned to the reserve forces. The concept of the citizen-soldier is that he be given a military mission that is not peacetime-intensive but one that is a definite wartime requirement, even though in today's Air Force some citizen-soldiers perform active Air Force peacetime missions. Thus, in most instances, the citizen-soldier trains to a more specific function than that required of his full-time military counterpart. This specific training results in fewer training hours and, as a result, the reserve units' costs are lower.

Acknowledging generally that the reserve forces are economically performing missions with lower activity rates than their active counterparts does not address the critical issue. The critical issue is: How do we determine when we have reached the optimum force balance between the active and reserve components? This question can best be examined by looking at some operational factors that must be considered by our military programmers when they are tasked to prepare their plans for congressional review.

Programming the Force

The composition of our military forces is not developed by accident or in response to congressional pressures. Our task in the Department of Defense is to look at the threat posed to this nation by potential adversaries and to develop a military force structure designed to counter that threat. Among numerous factors that must be weighed when making force-mix decisions, three factors require close examination here: readiness, deployment timing, and forward deployment.

In most cases, the readiness of a unit is a question of resources and time. Almost any unit can be brought to high readiness if given enough of both. In most cases where a unit is less than fully ready, it is because of either a general shortage of resources or a conscious decision not to provide enough personnel and equipment—on the assumption that the unit can be brought to full readiness after a decision to mobilize, but before the unit is scheduled to deploy. In any case, DoD policy is that units that are scheduled to fight first are the first to be brought to full readiness, regardless of component.

Of the four elements of readiness (equipment, supplies, personnel, and training), training is the only one for which the reserve components have an inherent disadvantage. A reserve unit, by its nature, cannot train full-time in peacetime, and, in many cases, training facilities (such as firing ranges and maneuver areas) are too distant for a weekend trip. If a unit's wartime mission is so immediate that it requires training beyond the time

An A-10 weapons loading crew shows its skill on the flight line. Thunderbolt IIs are based in England but operate from forward positions in Germany, providing a quick response capability against enemy armored forces.

available to a reserve unit, it should not normally be in a reserve component. It must also be realized, however, that the combination of experienced personnel and modern training techniques can overcome some of the disadvantage of limited training time. This is especially true when the necessary skills are transferable from the private sector, *e.g.*, doctors and pilots, or are individual skills rather than team skills.

The second major factor is the deployment schedule. A reserve unit generally takes longer than an active unit to assemble for deployment once a decision to mobilize has been made. The extent to which this is true depends on several factors, such as geographical dispersion of unit personnel and whether the unit is collocated with its equipment. In addition, there is sometimes a need for training prior to deployment, which consumes time as well. Therefore, a unit placed in the reserves must be able to match its deployment capability to its deployment requirement. Availability of strategic lift must be factored into this analysis. Obviously, this is also true for active units, but assembly time is not as large a problem in that case. It should also be noted that there are many selected reserve units scheduled to deploy very early—earlier than some active units.

Forward Deployment

The third factor to be considered is forward deploy-

ment. A unique factor in the military's current threat analysis lies with the substantial conventional force structure of potential aggressors poised on the borders of our allies. The sheer size and the capability of these forces require us to join our allies in combining our force structure with theirs to offer a deterrent force to a common aggressor. Our airlift and sealift capability are not sized to allow us the historic luxury of time to respond to a conventional attack against our allies.

Currently, we are working with our allies to standardize weapons and fuels to make broader use of these common resources. Further efforts to explore means to preposition equipment and supplies that could be used by mobilized NATO reserves could provide an exceptional increase in allied capability and decrease our mobility timing requirements substantially. (More about this issue later.) At present, nearly thirty percent of active-duty military personnel are stationed overseas in foreign countries, in US trust territories, in the states of Alaska and Hawaii, or aboard ships. There is extremely limited potential for reserves to fill any of this requirement because of the limitations on duty time.

A notable exception is the filling of the tactical airlift and close air support requirement in Panama by rotating Guard and Reserve personnel to the assignment every two weeks. While this is a successful program, it does involve a fairly large number of Guard and Reserve units, which means that only a few such deployment requirements can be met in this way.

A by-product of our forward-deployed forces is the requirement to maintain active-duty forces in CONUS to support personnel rotation to and from overseas units. While no unit exists only for this purpose, there is a necessity to provide a rotation base to preclude overly lengthy and frequent overseas assignments. Some of this requirement can be met with the CONUS-based auxiliary and support forces, but it is also necessary to maintain a broader base of combat skills for overseas rotation. Therefore, the impact on the rotation base must be carefully considered when converting a unit from the active to the reserve component.

There are other factors to consider in force-mix decisions, such as the impact on recruiting and retention. Moreover, the value of the active forces in assisting the training of the reserve components must be weighed. Without delving into these issues, it is safe to say that they combine with the considerations discussed above to make proper force-mix decision-making a complex task.

Reliance on Reserves

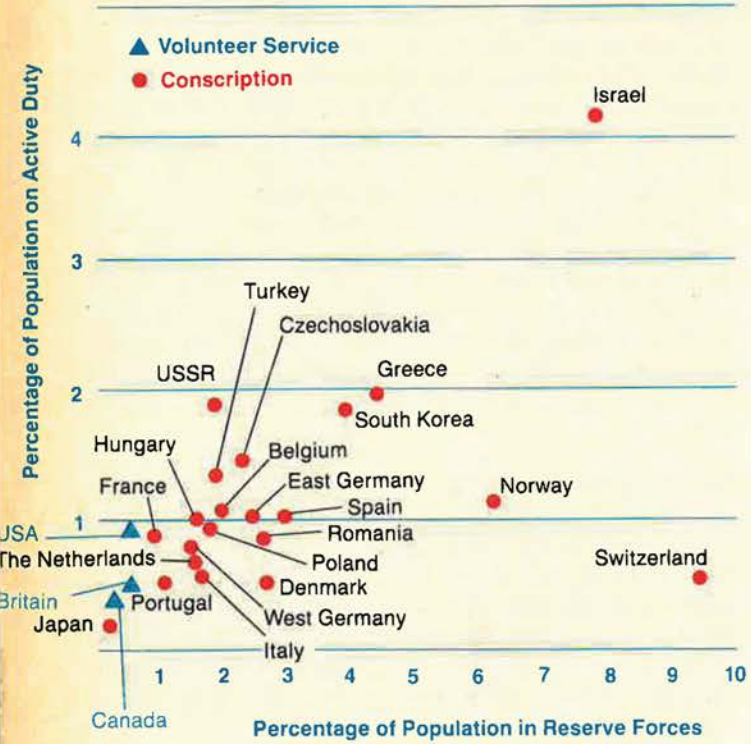
In these critical times, thoughtful Americans are embarked on a fundamental rethinking of military matters. Such thinking has always been reported in military academic journals and attracted attention on Capitol Hill; what is new is that the subject has become a national debate, with reports routinely appearing in news media that did not previously evince much interest in military matters.

As a part of the national debate, attention has been focused on American military doctrine and strategy, on weapon systems, on methods of procurement, on allocation of resources, and on the organization of the national defense establishment. Given their long and distinguished history, it was inevitable that attention would also be focused on America's Guard and Reserve forces. How to mix active and reserve forces has been studied on numerous occasions, in response to numerous requests, by a variety of Air Force groups.

In the midst of this national debate on military matters, we must break through our traditional ways of thinking and be willing to reexamine our basic assumptions. Let me present one example, in limited detail, of the type of rethinking that is required. Since World War II, United States forces have been present in Europe to deter Soviet expansionism. We have been there as a partner with our European allies. Throughout those years, there have been some disagreements among the NATO allies as to the level of participation by different countries. Many countries have found themselves constrained—or have perceived themselves to be constrained—in their spending for and their support of our common defense effort.

Similarly, we have debated in the United States how best to fulfill our commitments to NATO. From time to time, proposals have been made to reduce the number of American troops in Europe, or to reduce American dependents in Europe, or to transfer a greater share of the defense load to our allies, or some combination of the above. Each year, we demonstrate our capability to *re*turn our *for*ces to *Ger*many in the Reforger opera-

Relative Reliance on Reserves



Source: 1983–84 Military Balance, International Institute for Strategic Studies, 1983

tions. One of the constraints on programming the force that was discussed earlier was the requirement to lift our forces, both active and reserve, to Europe.

When studying this issue, one is struck by these statistics: The United States has nine-tenths of one percent of its total population in active service, which is higher than that of Britain, Canada, Denmark, Germany, Italy, the Netherlands, Portugal, or Japan. As a percentage of population, these other countries place far more reliance on their reserve forces than does the United States. The accompanying chart shows the relative reliance by the United States and other countries on reserve forces. The United States, in my view, needs to increase the total number of our forces, both active and reserve. But, more important, perhaps the solution to the conventional force balance in Europe lies in *greater reliance by NATO on additional European brigades that are "cadre-manned" by European reserve personnel with arms and equipment supplied by the United States and European nations.*

Franklin Roosevelt called upon America to be the "Great Arsenal of Democracy"; perhaps it is time to look at that idea again.

Euro-Neutral Examples

Experience suggests that our European allies may perceive themselves as unable to increase their spending on military matters and may feel they cannot provide greater reserve forces. While those countries are certainly in the best position to determine what is in their own national interest, it might be instructive to examine the curious case of the Euro-neutrals.

Look, for example, at four European neutral countries—Austria, Sweden, Switzerland, and Finland. Their active-plus-mobilization forces (excluding paramilitary forces) as a percentage of population are, respectively, 12.8%, 9.6%, 10.2%, and 15.4%. If we focus on four selected NATO countries (Belgium, Denmark, the Netherlands, and Norway) and we perform the same analysis, the respective figures are 2.5%, 1.8%, 1.9%, and 4.9%. In short, these neutral countries have forces, available for rapid mobilization, averaging some twelve percent of the population. The NATO countries average somewhat less than three percent. No NATO country approaches the Euro-neutral figure. The best performer, Greece (with six percent), fails by half.

The second striking comparison is in the percentage of gross national product devoted to those military forces. For the four neutral nations, the averages are 1.2%, 3.2%, 1.9%, and 1.5%. For the NATO countries the figures are 3.3%, 2.4%, 3.4%, and 2.9%. In short, *more* participation is generated by *less* expenditure in the Euro-neutral countries.

Now, there are clearly differences that do not emerge in this kind of analysis. Comparative evaluation of capabilities, weapon systems, tactics, doctrine, etc., would identify both deficiencies and strengths that should be factored into the equation. Nonetheless, it is equally clear that if the NATO nations were able to generate reserve forces at only half the rate of the Euro-neutrals, the total numbers would be impressive. Properly equipped and trained, such reserves would constitute a great resource, should conflict arise in Europe.

Consider the following reasons why our European allies and the European neutrals may be able to make even better use of reserve forces. The first has already been alluded to: Such forces are practically contiguous to the area in which they might be used, with all the assorted savings and efficiencies that arise from proximity.

Second, most of these countries do not have worldwide responsibilities, such as those exercised by the United States. Accordingly, they may procure mission-specific, geographically limited, defense-only weapon systems. By mission-specific, I mean relatively simple (and thus cheaper) systems designed to perform one mission. By contrast, the United States must procure weapon systems that, in some instances, have both strategic and tactical roles, or are designed for a multiplicity of roles. By geographically limited, I mean systems designed to operate in one location taking into consideration the prevailing topography, weather, etc., where the weapons will be used. By contrast, the United States must be prepared for efforts around the world, which dictates more complex and more expensive systems. By defense-only, I mean that the weapon systems can be less complicated than those required for force-projection or deep-attack missions.

Complicating Factors

Greater reliance by European nations on reserve

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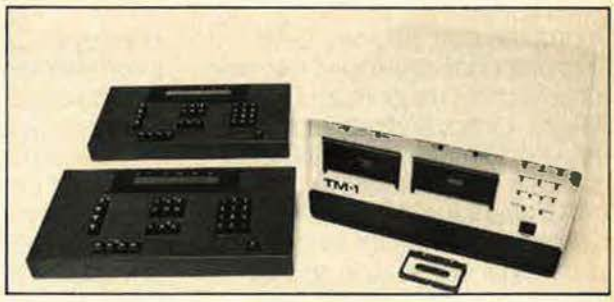

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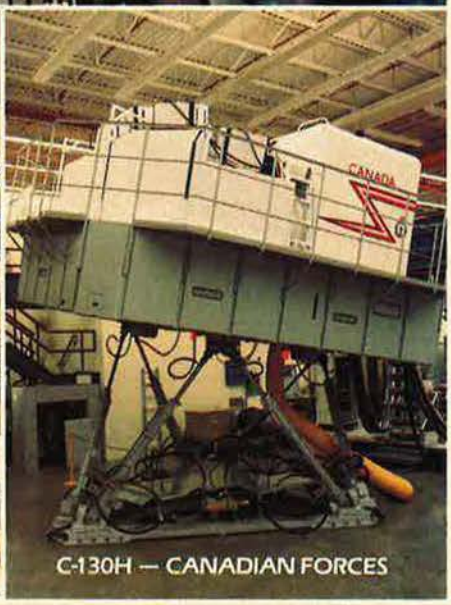

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forces would not be without problems. There are at least two problems associated with any such proposal. The first would be that such a proposal might be perceived by our European allies as somehow diminishing our commitment to European defense. While such a reaction is understandable, it is *not* the basis of the proposal. It simply recognizes the realities of the situation we face in European defense.

The second problem is in interoperability in NATO. Those who have followed this issue are aware of the difficulties that already exist in increasing standardization among the various NATO forces. Rather than being a barrier to this proposal, this might provide another tool for *increasing* standardization. Additionally, greater production of weapon systems by European countries would produce some economies of scale in production that would strengthen both the individual nations and the Alliance. Other savings associated with weapons procurement have already been alluded to.

There is nothing new about calling for greater participation by European countries in their own defense. A long line of authorities has addressed this issue over the years. Some of the argument has been based on strategic grounds, some on economic grounds. The proposal in this article is not intended to add to the finger-pointing, and I hope it is not used for that purpose. My purpose is simply to focus on the facts that confront European and American planners.

The Duke of Wellington thought the greatest attribute of a commander was his ability to know what was on "the other side of the hill." In Central Europe today, the other side of the hill is filled with lethal, mobile weapon systems manned by a trained and deadly enemy.

Faced with this fact, our analysis must include all possible ways to combine the efforts of all participants in the most effective and efficient way. Greater use by our NATO allies of reserve forces is one way to increase conventional deterrence and greatly complicate the job of Soviet and Pact planners.

Nontraditional Approaches

I referred earlier to the process through which national objectives are translated into military forces. Military forces may be evaluated only in the context of the national objectives that they are created to accomplish. The defense of the United States is inextricably bound up in the defense of Europe. Therefore, Air Reserve Forces members are intimately involved with all areas where they might be called to serve. Clearly, NATO is such an area.

I also referred earlier to the necessity to break through our traditional ways of thinking. The historical background of the mixture of active and reserve forces which has been presented emphasizes that Total Force is neither a new idea *nor an idea limited to a single country.*

Dr. Mahon made clear the extent of this fact in American history: "There has never been a moment in the history of the United States when responsible leaders assumed that the professional military forces, existing in peacetime, would be able to wage war unassisted."

The time has come to think of Total Force in a larger context—in the context of the major alliance that has, for thirty-nine years, kept the peace in Europe and permitted the economic growth European countries have experienced.

Just as reliance on reserve forces is, for some purposes, cheaper for the United States, such a program, aggressively pursued and adequately funded, could greatly strengthen European countries at limited expenditures. Such a program could create a "North Atlantic Total Force," whose contributions could be enormous to the security of all NATO members.

Citizen-Soldiers at Crécy

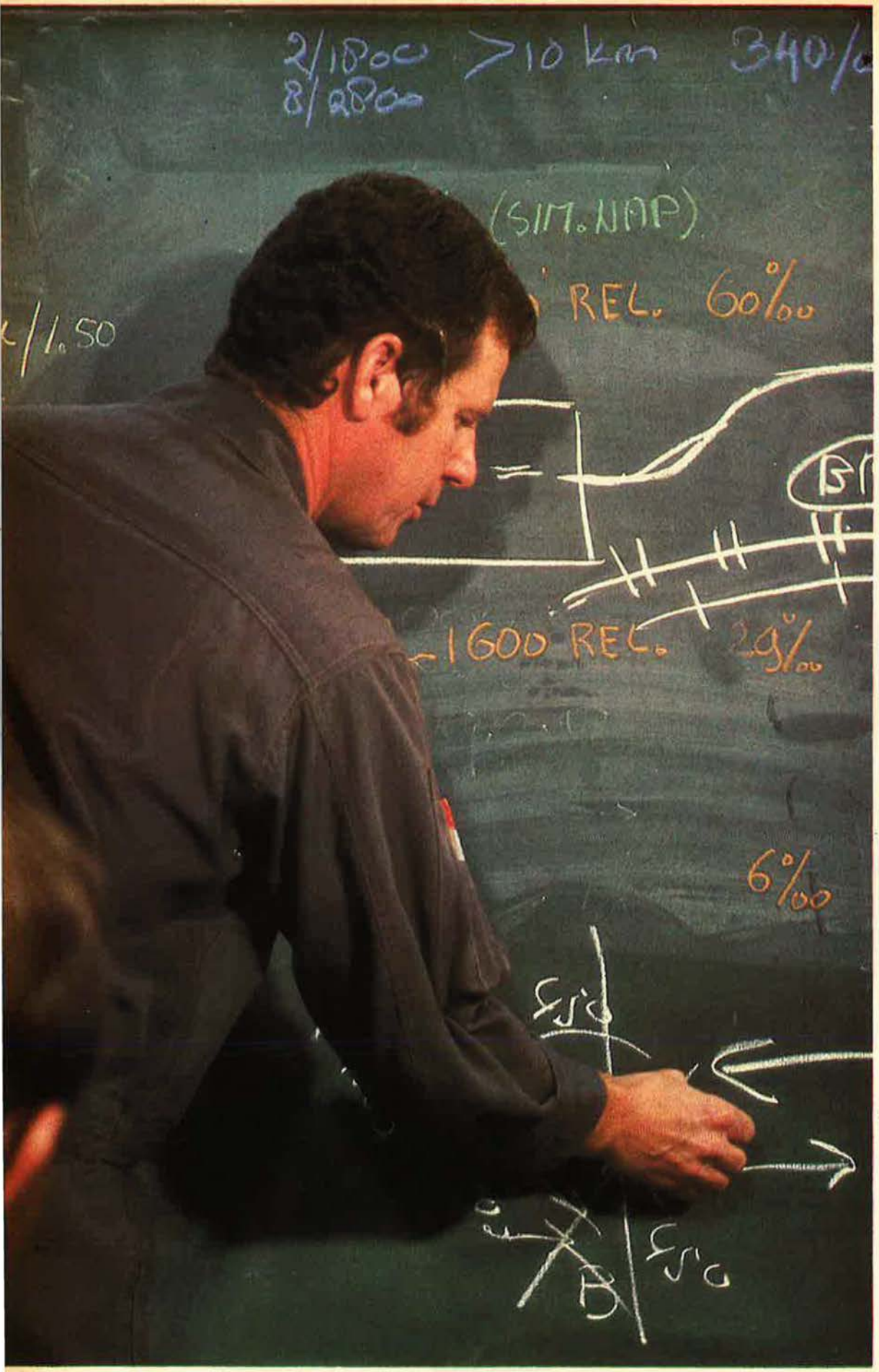
On August 26, 1346, an English force under the Earl of Derby met a French force at Crécy. The English force was outnumbered two to one. Military history fans know the result. When the battle ended at midnight, the French had lost more than 1,500 lords and knights and an estimated 10,000 other troops. According to one authority, the French suffered more casualties than the English had troops. The English had lost two knights, one squire, forty men at arms and archers, and a "few dozen" other troops. The difference lay in technology, specifically the longbow, which the English had developed to a high art and which the French scorned. As the French tried to advance, they were met by swarms of arrows fired by technologically superior longbows. The range of those weapons—their "standoff" capability in twentieth century parlance—commanded the battlefield. The striking power of the arrows—the "throw-weight," if you will, of the Hundred Years War—was so great that arrows pierced both armor and wearer. The French forces suffered a great disaster.

Because we cannot match our adversaries person for person, we rely today on technology to give us a competitive edge. But there is a second lesson, separate from technology, to be drawn from Crécy. The archers who destroyed the French that day were commoners, called (or forced) to military service. Crécy demonstrated that citizen-soldiers could face and defeat their "betters"—a result which increased reliance on them by kings and countries for the subsequent 600 years.

We will probably never find the perfect solution to the puzzle of mixing regular and reserve forces for the common defense. But each administration, and each generation, will continue to work the problem, recognizing that in the solution is our protection as a free people.

What we *can* count on throughout that process is the willingness of free men and women to rally to arms, for the reasons recognized by the great eighteenth century English jurist Sir William Blackstone: "In Free states . . . no man should take up arms but with a view to defend his country and its laws; he puts not off the citizen when he enters the camp; but it is because he is a citizen, and would wish to continue so, that he makes himself for a while a soldier." ■

Tidal W. McCoy is Assistant Secretary of the Air Force for Manpower, Reserve Affairs and Installations. A graduate of West Point, he served as a field artillery officer in command and staff assignments in the US, Europe, and Vietnam. He has held several high-level positions in DoD, including service as Deputy Assistant to the Secretary of Defense and as Director of Policy Research in the Office of the Under Secretary of Defense for Policy. Prior to assuming his present position, Mr. McCoy was Assistant for National Security Affairs for Sen. Jake Garn of Utah.



Classroom instruction is one method whereby Air Training Command "shows the way." ATC is the free world's largest training system.

Training is the first step toward readiness, and it all begins in ATC.

The Schoolhouse Is Going Strong

BY LT. GEN. GLEN W. MARTIN, USAF (RET.)

AT THE Soviet flying training base at Chernigov two years ago, a Soviet Air Force maintenance officer made a revealing statement.

Lt. A. Lakatosh said that aircraft technicians were not allowed to service the MiG-21 anti-icing systems although regulations required it as standard procedure. A further examination of anti-icing alcohol distribution records raised an interesting question: Why was the amount of ethyl alcohol expended during cloudless summer months enough to melt an iceberg?

As it turned out, the mysterious disappearance of the anti-icing fluid was traced to two prevalent activities. First, obviously, it was warming people instead of airplanes and, second, it was an active barter material for other creature comforts.

That breakdown in discipline in the Soviet Air Force supports the idea that the Soviets are not eight (or ten or even twelve) feet tall. In any case, that breach of training and integrity is in sharp contrast to the American saga of the Spotted Horse Café.

Two years ago, almost to the same month, while the Soviet Air Force training squadron was experimenting in exotic drinking, a detachment of eighty brand-new graduates of the Air Force Basic Military Training School moved out. They were en route by bus from Lackland AFB, Tex., to Sheppard AFB, Tex., for technical training.

When the buses reached Hamilton, Tex., about fifty miles west of Waco, they could go no farther because of an unexpected blizzard. The entire detachment sought shelter in the Spotted Horse Café.

During the delay of more than twenty-four hours imposed by Mother Nature, some remarkable actions were taken by those young airmen with less than two months of service. On their own initiative, they regulated their activities in shifts, appointed "dormitory guards," and, because of the bar in the café, posted "bar guards" as a precaution against unauthorized consumption of alcohol.

To me that is a heartwarming story that reflects several important facts about the Air Training Command of the United States Air Force.

Basic and Beyond

In the first place, six weeks of basic training is not very long—except to those young citizens in the Air Force who are undergoing the training. A longer or even more rigorous period of basic training is favored by some. There are two mitigating considerations, however. One is that, with the exception of the security police, pararescue forces, and combat controllers, the object of Air Force basic training is not to develop commando, ground assault, or airborne troops.

There are, however, additional programs for special purposes that are exceedingly demanding. One is the training, in concert with the Army, for air base ground defense. Another is an array of courses in survival, escape, and evasion. Still another, brought on by the growth of worldwide terrorism, is a course in antiterrorism. At Department of Defense direction, the Air Force, with Rand Corp. participation, has developed a comprehensive program that will require a variety of ATC training efforts in that field.

As a second consideration, the emphasis on military training in Air Training Command is carried beyond basic. For example, in all of the five major training centers of ATC, the regimen and restriction of privileges common to basic training are continued for two weeks after basic training. That, in itself, is an effective increase of thirty-three percent in basic training. After that, there is a phased increase in the latitude of individual activity and privilege—if earned. Throughout ATC, from day one, there is a strong emphasis on incentive and reward.

As Gen. Andrew P. Iosue, the Commander of ATC, says: "The Air Training Command is committed to recruiting the best people in America and giving them the best training for our Air Force. We have an educational process second to none; ATC is the free world's largest training system. Virtually every member of the Air Force must pass through the command at some time. We feel that we have a tremendous opportunity to influence today's Air Force as well as the Air Force of the future. That's why we have selected the motto: *Show the Way.*"

Incentive for Excellence

It is clearly evident at all levels in ATC that a major policy has "trickled down"—develop a quality force by quality training. The American citizens throughout the organization, whether command, staff, instructors, or students, are motivated by the pursuit of excellence—high incentives for maintaining high standards.

That thrust in motivation is not new in Air Force training, but it is bigger and better. A few years before World War II, there were hardly more than 2,000 officers in the entire Army Air Corps. Instructor duty was a challenge, but brought sought-after rewards. During that period, Brig. Gen. Frank "Beau" Lackland was the commander of the Advanced Flying Training School at Kelly. Today Lackland AFB, adjoining Kelly, is truly the Gateway to the Air Force every year for 60,000 or more highly intelligent and alert young Americans.

The motivating process starts with the Air Force Recruiting Service in ATC—where a duty assignment, again, is a challenge with high incentives.

With the motto "Aim High," an example is set in the selection process for assignment. As examples, all officers in the Recruiting Service are college graduates, and nearly ninety-nine percent of the airmen are high-school graduates. It is the largest all-volunteer command in the Air Force and the only all-volunteer recruiting service among the armed forces.

As to the new Air Force recruits, thirty-two are accepted from each 100 applicants on the average. There is an active awareness in ATC that these desirable standards may be vulnerable in the future. In the main, the same factors that affect successful recruiting also have an impact on satisfactory retention rates of trained and experienced people already in the Air Force.

Influences on Recruiting

Probably the four most potent influences on recruitment are the condition of the economy, the opulence or austerity of the national budget, the public attitude toward the military, and demography.

By the way of brief explanation, when the good times roll, the attraction of high pay in the civilian economy is strong and there is greater competition between the recruiter and industry.

A multitude of concerns, political as well as economic, plays on the federal budget constantly. Today, for example, there is growing alarm about the budget deficit. But in an election year, the Administration and Congress are loath to raise direct taxes or cut spending in various social areas. At such a time, the defense budget customarily becomes more controversial.

Public attitude is a bellwether, not only in recruiting but in morale and motivation and, hence, retention. For example, the recent Grenada landings were a plus, and that was reflected in enlistments.

Students receive instruction in the operation and maintenance of a powerplant. "Hands-on" experience is an integral part of ATC's technical training. (USAF photo by Walt Weible)

On the other hand, the Vietnam War was a monstrous minus. For the record, however, it should be said that, although Vietnam was an agonizing defeat, it was not a military defeat. The enemy was forced to the peace table after "the eleven days in December." That period, straddling Christmas of 1972, saw a massive, coordinated attack by joint air operations. It was decisive. As a rueful aside, it should be said also that it could have been done years earlier, thereby alleviating much of the Vietnam syndrome.

Demographically, it is forecast that there will be a significant decline in eighteen-year-olds eligible for military service by 1992.

In sum, the people in ATC recognize those variables and consider them to create a major challenge for the future. They're working the problem.

Art of Motivation

Motivation becomes almost an art during basic training.

The 3507th Airman Classification Squadron spends four to five hours with each new airman. Those counseling interviews are conducted both individually and in group sessions. Unlimited additional hours are spent as needed for assistance with personal problems or in the transition to military life.

In the Squadron's motto, "Doorway to Opportunity," the key word is "Opportunity." People all over the world perceive opportunity as being related closely to freedom, which is probably the most highly prized condition to be achieved. Not long ago, Sidney Maree, a naturalized American citizen from Africa and an Olympic runner, put it well. He said that he regarded his newly won citizenship in the United States as being a gift of freedom, dignity, and opportunity.

Going on to technical training is an opportunity. Gen. William V. McBride, former Commander of Air Training Command, has pointed out that Air Force training has a far greater impact on US life than recognized. The thousands of Air Force people returning to civilian life each year take with them more than professional and technical skills. They have also acquired an understanding of leadership, personal responsibility, and self-discipline. Those "graduates" can "show the way" in their neighborhoods.

National Asset

Speaking of opportunity and impact of Air Force training on the public, ATC is the Department of Defense's Executive Agent for the Defense Language Institute at Lackland. The impact of DLI training is worldwide. As examples, there are students from fifty-seven nations there now, and they will go on to technical training and other schools. There are always foreign students in flying training as well. It would be interesting to know how many future leaders among the nations of the world have attended those courses.

Student and instructor prepare for a training flight in ATC's primary undergraduate pilot trainer, the T-37. (USAF photo by MSgt. Buster Kellum)

At the training centers in Air Training Command, there are almost 4,000 courses taught, covering every activity needed by a modern, combat-ready air force. Virtually all of those courses are accredited toward a college degree through the Community College of the Air Force, administered by ATC. About ninety-two percent of the skills taught in the courses, according to the Department of Labor, are useful also in civilian commerce and industry. That is a fact long known in flying training as well as in technical training. The airline industry would be having a much tougher time without the government-trained resource of pilots and mechanics.

Although in that light it becomes clear that ATC is a major national asset, it is a mixed blessing. The pull of higher wages in the private sector is tangible. As someone remarked, you can't set the table with patriotism. But the fact is that you can, although it may not be quite as bountiful.

The young people in today's Air Force are thinking of the future, not only their own but also that of the country and the world. Two centuries have passed since George Washington's deeds and words made an imprint on history. His words of wisdom have been time-tested. One of his views was: "If we desire to avoid insult we must be ready to repel it; if we desire to secure peace . . . it must be known that we are at all times *ready* for war." (Italics supplied.)

That was not an exhortation to bellicosity; it was an appeal for readiness. And let us note that the world's peoples are still in a savage environment. Improvement, slow at best, is impeded by two driving human characteristics—fanatical prejudice and greed. Accordingly, the most important goal for national security is still to sustain a high degree of modern, professional readiness.

Path to Readiness

Training, as the main path to readiness, starts in ATC. It continues throughout service in every career field.

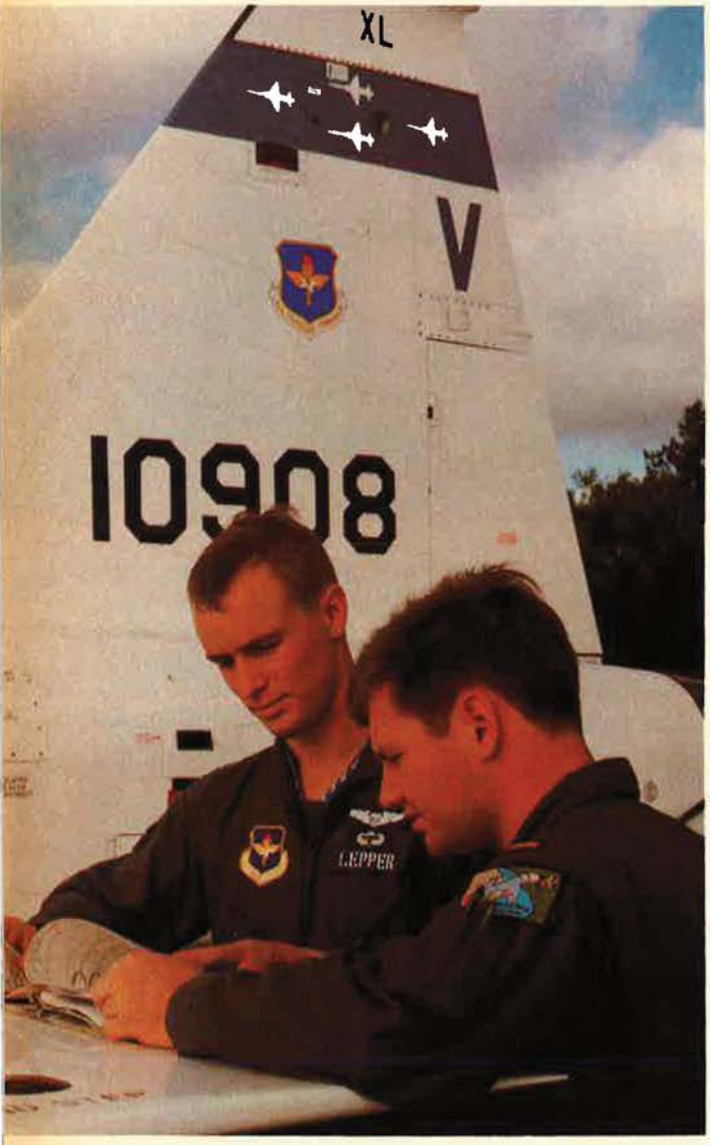
As an F-15 squadron commander on Okinawa told his people recently: "A part of Air Force life that makes a continuing record of success difficult is that many people who took part in a unit's successes must eventually move on to other

assignments. With that goes experience. . . . A portion of each day, then, is spent as a team teaching and often relearning old lessons."

Training and teamwork seem to be a successful formula. That unit, the 67th Tactical Fighter Squadron, recently won the Hughes Trophy. *(For more on the Hughes Trophy, see "Hot Wing," p. 126.)*

Continuous training occurs in all commands. The Strategic Air Command is notorious for rigorous and realistic training. The no-notice Operational Readiness Inspection was devised in SAC. That type of inspection, now Air Force-wide, led to a little joke about the two biggest lies ever told. It seems that a transport aircraft landed at a SAC base without the advance notice of the usual flight plan. The Inspector General, accompanied by an inspection team of fifty-five, deplaned. He said to the wing commander, who had arrived to meet him, "We're here to help you!" The wing commander responded, "We're glad to have you!"

The constant operational training in the Military Airlift Command, in some ways, is the most realistic of all because the complete mission of moving people and cargo can be carried out without any simulation.



The tail of a 47th Flying Training Wing T-38 looms behind instructor pilot 1st Lt. Michael J. Lepper, left, and student pilot 2d Lt. Jeffrey L. Davis. Visible at the top of the wing is the 47th FTW's brand, "XL." (Photo by Capt. Claude Morse, USAF)

The main operational training program of the Tactical Air Command is the world-renowned Red Flag program. It has been developed to furnish as realistic a combat environment as possible. Other commands and services also participate.

But it all starts in ATC.

The leading edge of the Air Force mission is to fly and fight. That motto, incidentally, came from the coat of arms of a tactical fighter wing in Southeast Asia during the Vietnam War. Note that missiles and spacecraft also fly—not just aircraft.

Appeal of the Mission

The appeal of the Air Force mission was illustrated in the late 1940s at an annual convention of the Air Force Association. Gen. Hoyt S. Vandenberg, the Chief of Staff, took the occasion to present Gen. H. H. "Hap" Arnold's wings to Bernard Baruch for his conspicuous contribution to national security.

Years later, after Mr. Baruch had died, his son Bernard "Barney" Baruch, Jr., returned the wings to the Air Force. They are now at the Air Force Academy with General Arnold's other memorabilia. Barney, who was a captain in the US Naval Reserve, remarked at the time that there are two kinds of people in the Air Force—those who fly and those who like to be around those who do.

As long as so many outstanding young Americans feel that way, the Air Force can be counted on to carry out its mission.

That conclusion was borne out by some thought-provoking conversations with the commander, his staff, instructors, and students of the 47th Flying Training Wing at Laughlin AFB, Tex. It was apparent immediately that things were happening on that base. First, there were many people-oriented activities.

The liberal use of mottoes, slogans, and even a wing brand deserves special mention. The brand is "XL." In English, of course, it says "excel." In Roman numerals it says "forty" and was devised for the fortieth anniversary of the wing. That's the first Latin *double-entendre* I've encountered. As Madison Avenue knows well, slogans are an effective way of communicating. But the objective is more than selling. It is motivation in furtherance of a proud tradition. It is heritage.

Another feature of the base activity was steady emphasis on military behavior—and it showed.

Third, everybody was working hard. Fifty- to sixty-hour work weeks are common. One result is that 400 training sorties are flown and maintained per day. That approaches, in terms of air base uti-

lization, the takeoff and landing activity at the nation's tenth busiest commercial airport. The ATC training activity averages more than 2,200 sorties each day—more than a half million annually.

Common Denominators

One of the main events on my schedule was the opportunity to talk with a few groups of flying instructors and students. Although there was a substantial diversity of backgrounds, there were a few interesting common denominators among the reasons given for joining the Air Force. The challenge of flight and of the mission were emphasized by most. The nature and adventure of Air Force life were also cited frequently as reasons for engaging in flight training. A significant number—including one young woman—stated that they regarded their current assignments as step ping-stones to space operations. The "right stuff" was evident. To nurture the right stuff, it was gratifying to learn that total flying training time is edging up in spite of budget restrictions.

As we have seen, there is high interest in space operations in the flying training units. There is also that interest, perhaps even more advanced, in the technical training units.

At Lowry AFB, Colo., among its technical training courses vital to Air Force operations, there is also direct support for space operations.

There are many functions related to current space operations that need training and also retraining support. Space surveillance, weather, navigation, communications, early warning, and satellite control are examples. There is also support for Shuttle flights. The operation and maintenance of all associated radars and computers used in those functions must also be taught.

All in all, more than 300 separate "modules" of functional training have been identified and are being constructed for a complex but flexible curriculum. As the scope of space operations expands in the future, the principal Air Force activity to be supported is the recently activated Space Command near Colorado Springs. The Operations Center will be the focal point for exploration of the new frontier.

The Air Force people in training for these exotic roles are not all volunteers, but they are intrigued and enthusiastic.

Less Exotic Courses

Also at Lowry there are many not-so-exotic but equally important courses. The food service and dietetic training is one of many examples. The students are imbued with the idea of doing it right and being proud of it.

Again, it was a privilege at Lowry for me to talk with commanders, staff, instructors, and students. The results of strong leadership and clear communication were apparent at every turn throughout the vast Technical Training Center.

Capts. Sharon Oshin, left, and Al Chapman, right, and 2d Lt. Wayne Lo inspect a Space Shuttle model at Lowry Technical Training Center, Lowry AFB, Colo. Along with its technical training courses, Lowry TTC also provides direct support for space operations.

It is evident that both technical training and flying training have come a long way in adapting technology to teaching methods. That bears out a view expressed by Lt. Gen. Sam Maddux, Jr., USAF (Ret.), another former ATC Commander. He said recently: "The system has changed so radically in the past fourteen years that the students [have to be] sharper and high-tech minded." There are now many computer-based training programs.

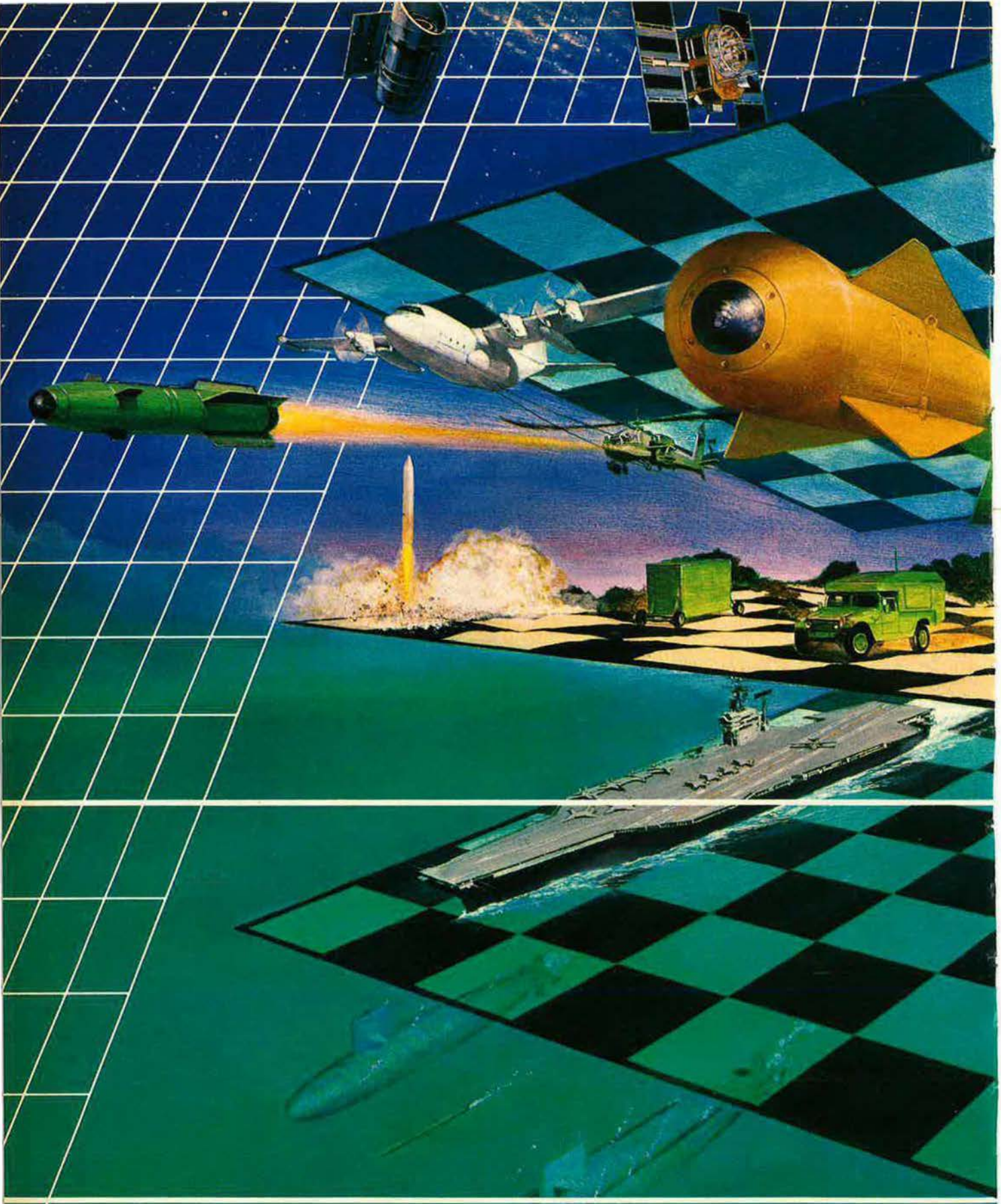
There are some skeptics, not so much of the method, but of the extent it may be used in teaching. In flying training there is an expressed need for "eyeball" contact between instructors and students. In technical training there is emphasis on "hands-on" experience as being important. These factors are being included in the evaluation of computerized courses. There are similar views regarding the amount of training that should be given in simulators. All agree that simulation is valuable and is here to stay. The only question is one of degree, and the answer will be evolving under watchful attention for a long time.

When considering the Air Training Command overall, one is struck by the sheer magnitude of the operation. It is the fifth largest command in the Air Force, and the mission is fundamental to national security. With its 85,000 assigned people, the tremendous scope of activity, the size of the budget, and plant value, it's impossible not to consider the question of management.

A recent *Air Force Policy Letter* cited a book by two management consultants, Thomas Peters and Robert Waterman, Jr. In their study of many American companies, the authors distilled the common denominators of management techniques that set apart the "excellent" companies. In large measure, success in communicating with and motivating people makes the difference. The title of the book is *In Search of Excellence*. Air Training Command qualifies and does, indeed, "Show the Way."

So, compatriots, you can be proud of the schoolhouse. It's going strong. ■

Prior to his retirement in 1973, Lt. Gen. Glen W. Martin served as Vice Commander in Chief of Strategic Air Command, Offutt AFB, Neb. A graduate of Purdue University, he served with Eighth Air Force in England and later with Twentieth Air Force on Tinian during World War II. He served as an executive officer under the first Secretary of the Air Force, Stuart Symington, in 1948. Currently, General Martin writes a weekly column for the San Antonio Express News.



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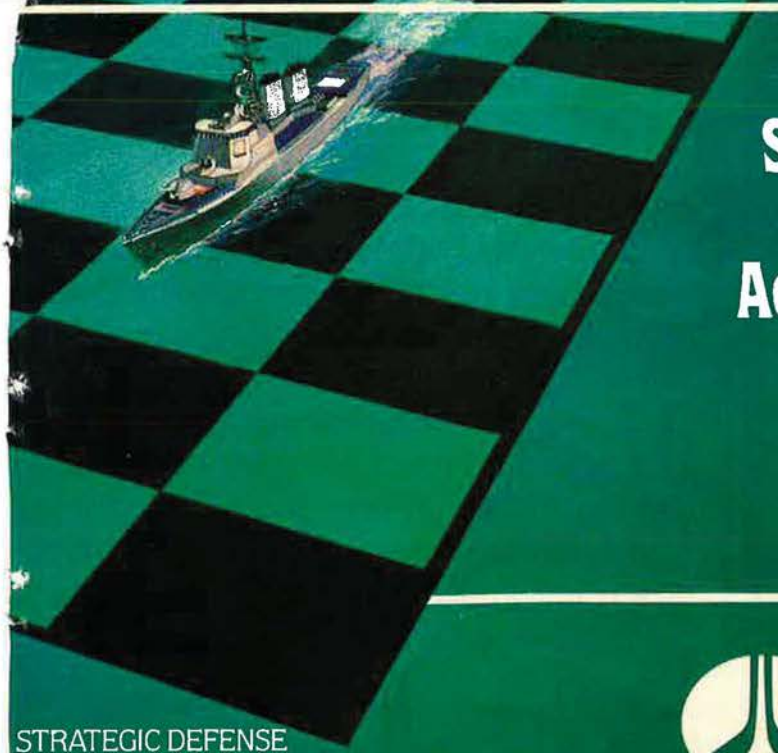

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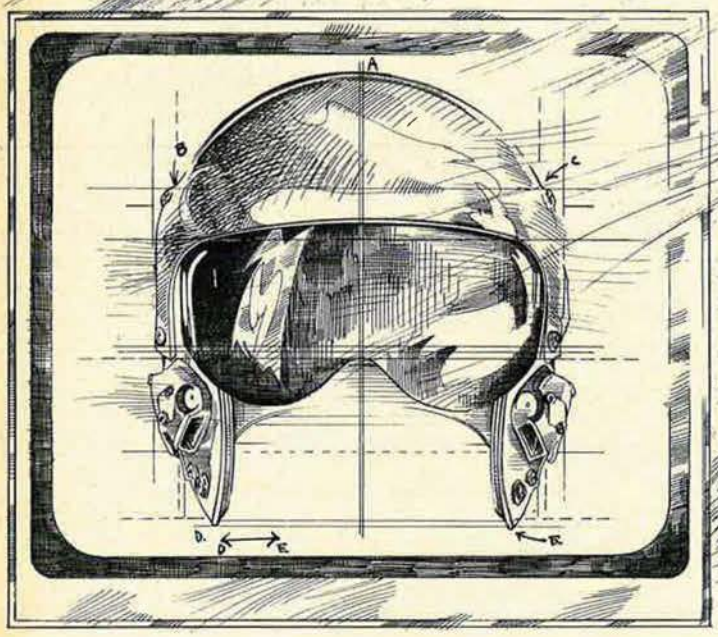

Case in point: The development of a helmet equipped with fiberoptic display for use in combat mission training simulation. This helmet readies pilots for combat in on-the-ground training modules, so that without having to go through flight preparations and unnecessary fuel, pilots are able to sharpen their combat skills.

Through the use of video teleconferencing between the Human Resources Laboratory Headquarters at Brooks Air Force Base in Texas and Williams Air Force Base in Arizona, both the budgetary and the manpower costs of developing this sophisticated training apparatus were better managed.

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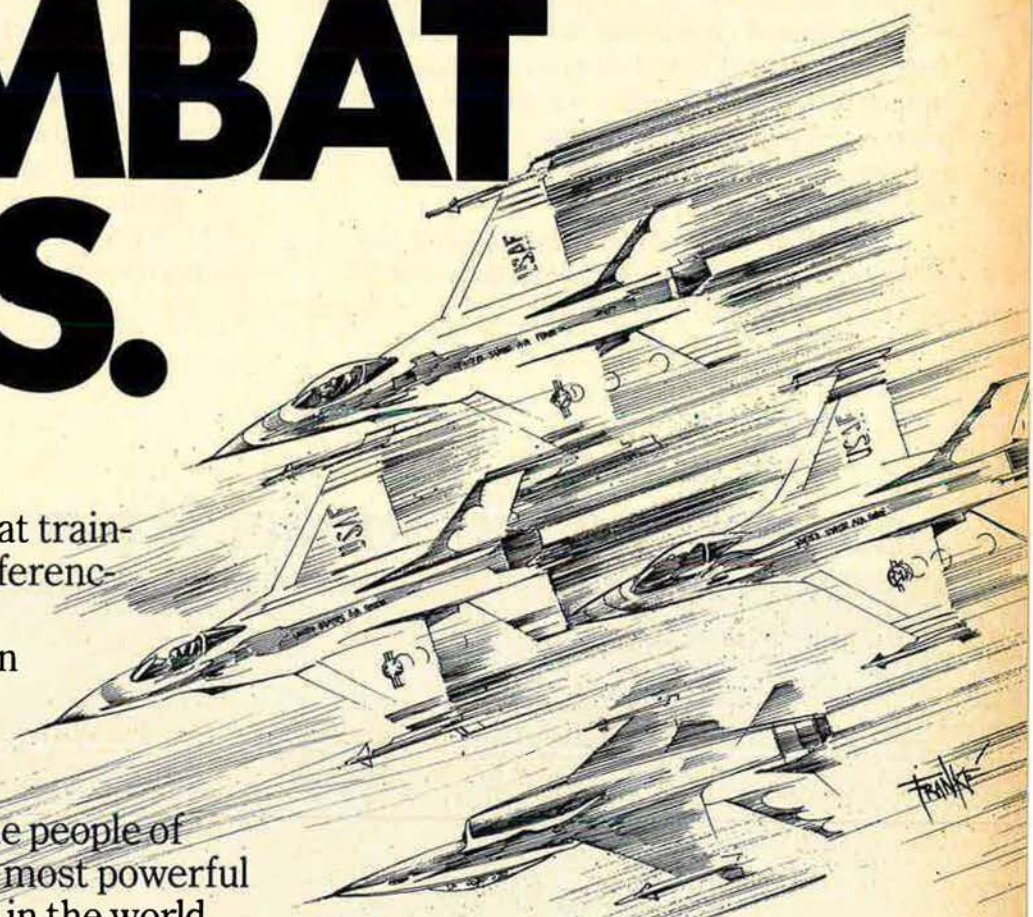

development of the combat training helmet. Video teleconferencing was able to speed the flow of critical information between private contractors and both Air Force Bases.

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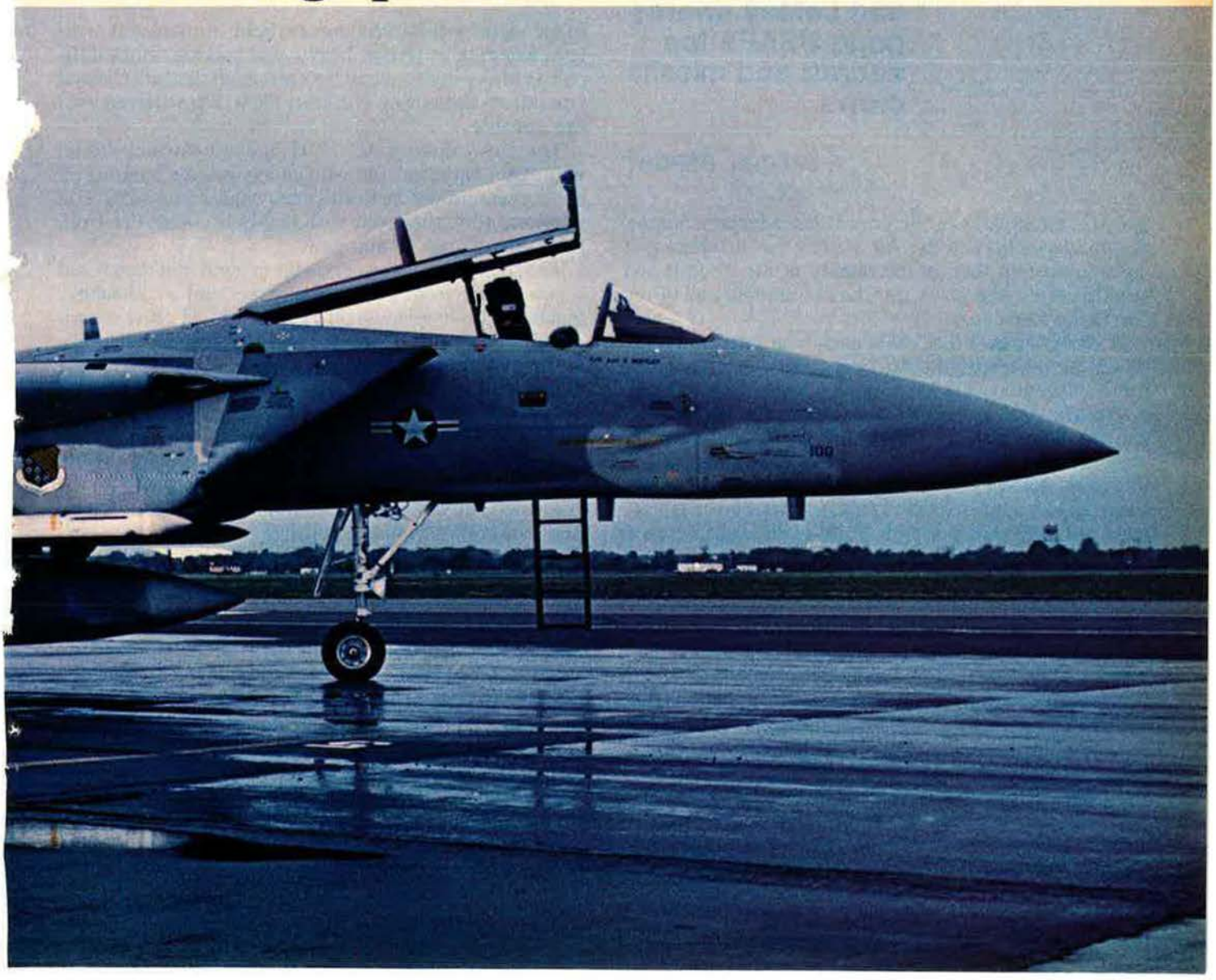


The Blue Ribbon Crews

The Tunner, Chennault, Power, and LeMay awards go to USAF's top aircraft and missile crews.

A SPECIAL REPORT

IT ALL culminates in the crews. Excellence is important everywhere in the Air Force—but nowhere is it more important than in the quality of the aircraft and missile crews who carry out the operational end of the Air Force's business.

In recognition of this, AFA each year honors the top crews, as chosen by the Air Force, with awards named for four legendary USAF leaders. The Lt. Gen. William H. Tunner Aircrew Award goes to MAC's best overall aircrew. The Lt. Gen. Claire Lee Chennault Award is presented to the outstanding aerial warfare tactician. The Gen. Thomas S. Power Strategic Combat Missile Crew Award is presented to SAC's best combat missile crew. And the Gen. Curtis E. LeMay Strategic Aircrew Award is for the best aircrew in SAC.

The nomination and selection process is extensive, so the awards to be presented at the AFA Convention in September reflect achievements in 1983.

The Lt. Gen. William H. Tunner Aircrew Award

It had been a long flight from Hurlburt, and the fire-control system and the 105-mm howitzer were giving trouble. But there was a small war on that morning of October 25, 1983, so Maj. Clement W. Twiford and his AC-130H gunship crew went straight to work.

It was the first day of the combined-arms assault against Cuban and Marxist troops on Grenada. The bloody coup threatened American and Grenadan lives, and, if it succeeded, it might enable the Soviets and Cubans to establish another military foothold in the Caribbean. Among the forces taking part in the mission were airlifters and gunships of the Military Airlift Command.

An early order of business was to drop US paratroopers, and an MC-130 was attempting to do just that in the vicinity of Port Salines Airfield. Antiaircraft artillery, accurate as well as heavy, was making things difficult as Major Twiford and his crew from the 16th Special Operations Squadron, Hurlburt Field, Fla., arrived with the gunship.

The slow-moving AC-130H doesn't normally duel with AAA batteries, but with enemy rounds bursting all about them, Major Twiford's crew engaged four ZU-23-2 guns and took them out with highly accurate fire from their 20-mm and 40-mm guns.

The Army Rangers were on the ground, but they faced a new threat from a pair of mortars and a .50-caliber machine-gun emplacement. The AC-130H crew unlimbered its heavy artillery, the 105-mm howitzer. The sophisticated fire-control system was out of whack, so the crew shot the big gun manually, pulling a lanyard upon the pilot's command to fire. They knocked out the machine-gun nest before the 105 stopped working altogether, and then continued to plug away with the 20-mm and the 40-mm. The first C-130 to set down on the contested runway became an immediate target, but superior shooting from the gunship suppressed the resistance.

Troops that go up against gunships learn caution quickly. The AC-130H crew realized that it was attracting action mostly from its six o'clock position, meaning that the Marxists were holding their fire until they could shoot at the gunship from behind. In response, the crew established the enemy positions by observing the direction of fire at other aircraft. They continued to pound the enemy until ammunition was depleted and fuel was running low. Major Twiford took them out of the battle area and headed for Roosevelt Roads, Puerto Rico. When the weary airmen were finally ordered to stand down, they had put in a thirty-hour crew day that included almost seventeen hours in the air.

The crew included two other pilots, Maj. Thomas W. Waylett and 1st Lt. Michael P. Phelan. Navigators were Capt. Bryan A. Lasyone and 2d Lt. Robb W. Schmitt. Fire control officer and electronic warfare officer were Lt. Col. Richard P. Dougherty and 1st Lt. Samuel F. Neal, respectively. CMSgt. Donald L. Beardsley and MSgt. Michael J. Hosenbackez were the flight engineers. Illuminator operators were MSgt. Warren S. Allen, Jr., and SSgt. William L. Jennings. Sensor operators were TSgts. Jerry L. Andersen and Albert G. Sexton III. The crew's airborne gunners were MSgt. Ronald E. Broyles, TSgt. Richard K. Smith, SSgts. James G. Habas and Herbert L. Thompson, Jr., and Sgt. George G. Celis.

Tunner Award-winning AC-130 crew, from left (kneeling): Beardsley, Sexton, Jennings, Hosenbackez, Celis, Dougherty, Habas. Top row: Twiford, Waylett, Phelan, Andersen, Broyles, Lasyone, Neal, and Allen. Missing were 2d Lt. Robb Schmitt, TSgt. Richard Smith, and SSgt. Herb Thompson.

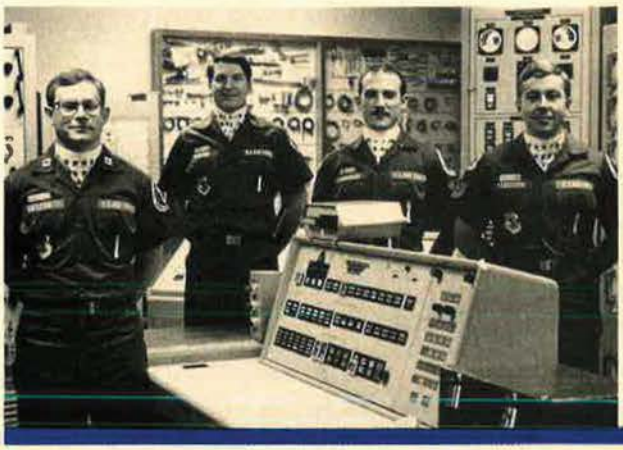
The Lt. Gen. Claire Lee Chennault Award

They call Bitburg "fighter pilot heaven," and when the seldom-modest fraternity of fighter jocks says that one of their own is "an absolutely standout fighter pilot" and an "expert, innovative tactician," it stands to reason that the man must be impressive. Capt. Michael Bebo certainly is that, and has been for some time.

He was a distinguished graduate of UPT (undergraduate pilot training), a superlative pilot in both TAC and PACAF, and one of the youngest pilots to attend the USAF Fighter Weapons School F-15 instructor course. At present, he is Chief of Weapons and Tactics for the 525th Tactical Fighter Squadron, Bitburg AB, Germany, where he has established what his bosses call "a nonstop record of accomplishments and contributions."

For starters, he was named top F-15 pilot in Seventeenth Air Force for 1983. He was chosen as one of USAFE's two F-15 demonstration pilots and throughout the summer of 1983 put the Eagle through its paces to the acclaim of huge audiences all over Europe. He played a central role in his squadron's deployments to Italy, Denmark, and the United States. Captain Bebo, although junior to many of the pilots involved, was chosen to lead three of the twelve four-ship flights in the transatlantic deployments. When he attended Squadron Officer School, he was a standout there as well. He was commended personally by the SOS commandant for leadership, maturity, and demonstrated insight.

Captain Bebo's ability in the application of tactical know-how was shown in his work on tactics for F-15s participating in a major 1983 NATO exercise that involved seven different types of aircraft representing six NATO nations. He demonstrated more of the same in orchestrating effective four-ship F-15 tactics for forces exercising in Dissimilar Air Combat Training (DACT) against USAFE aggressor F-5s, German F-104s and F-4s, and British FGR-2s.



The 381st Strategic Missile Wing's Power Award-winning missile crew, from left: Capt. David K. Shiller, 1st Lt. William D. Hinton, TSgt. John D. Ferguson, and SSgt. Albert J. Abbondanza.

Captain Bebo is a member of the elite European Tactics Analysis Team, which produces reports for use by some 350 units worldwide.

When a short-notice opportunity—it was there, but only weeks remained to get ready for it—for prime training at Nellis AFB, Nev., arose, Mike Bebo was the man the 36th Tactical Fighter Wing turned to and told, "Get it done!" He did.

Now that they mention it, he does sound like an absolutely standout fighter pilot and an expert, innovative tactician.

The Gen. Thomas S. Power Strategic Combat Missile Crew Award

For the second year in a row, a Titan II crew from the "McConnell Machine"—the 381st Strategic Missile Wing at McConnell AFB, Kan.—has been named best in SAC. Crew S-099, however, compiled such a superb record that even their competition would have trouble arguing that the honors should go anywhere else.

One of the events that separates The Very Best from The Merely Outstanding is the SAC Missile Combat Competition, and S-099 won that with back-to-back scores of 289 out of a possible 300 points. That was twenty-five points ahead of the runner-up and among the highest scores achieved in the sixteen-year history of the competition. A bonus was that S-099 led a team that won the Blanchard Trophy, signifying the best missile wing in SAC, for the 381st.

Capt. David K. Shiller is commander of the crew, and 1st Lt. William D. Hinton is deputy commander. The enlisted members are TSgt. John D. Ferguson, missile systems analyst technician, and SSgt. Albert J. Abbondanza, missile facility technician.

They excel, not only as a team but also individually. Among them, they have accumulated thirty-five "highly qualified" ratings on standardization evaluations. Sergeant Ferguson has eleven, Sergeant Abbondanza nine, Lieutenant Hinton eight, and Captain Shiller seven. Captain Shiller leads the wing in Emergency War Order testing with thirty-five consecutive perfect scores.

LeMay Award-winning crew atop B-52, from left: Capt. Tim Miller, Capt. Rob Garza, 1st Lt. Kevin Umstaedter, Capt. Tom Dyer, Sgt. Chris Brady, and Capt. Bob Little. Not shown is the other copilot, Capt. Dwight Klenke.

S-099 is one of the few crews whose members have all earned the Eighth Air Force Crew Member Excellence Award.

Captain Shiller wrote and revised the scripts used by the wing's training division. Inspectors praised the scripts as the best they have ever seen. Lieutenant Hinton has been chosen for instructor duties within the wing. Sergeant Ferguson, an honor graduate at the SAC NCO Academy, is responsible for Standardization Evaluation Division records, about 400 of them, which the inspectors find "flawless." He was a member of crew S-199, which won the Power Award in 1982. Sergeant Abbondanza, a Commandant's Award winner at the NCO Leadership School, has written and administered lesson plans on basic concepts and increased evaluator proficiency.

An indication of the crew's coolness under stress was seen when commercial power at the missile complex went out and the backup diesel engine began pumping out heavy fumes. The crew shut down the diesel, expertly evacuated eight maintenance personnel, found the problem, and restored power—all rapidly and in a most professional manner.

When distinguished visitors come to McConnell, guess which missile crew is chosen at least its fair share of the time to help welcome them and demonstrate the missile procedures trainer?

The Gen. Curtis E. LeMay Strategic Aircrew Award

It hasn't been mentioned as a possible modification for the B-52, but crew E-05 of the 28th Bomb Wing, Ellsworth AFB, S. D., could use a trophy room aboard their bomber. They certainly have enough presentation hardware to show off.

Their wing commander terms their performance in the 1983 SAC Bombing and Navigation Competition—they won the event and took five first-place trophies—an "unprecedented success." In addition to that, E-05 has been named the Fifteenth Air Force Crew of the Year, and was the first line crew at Ellsworth to be trained on the Offensive Avionics System (OAS) conversion.

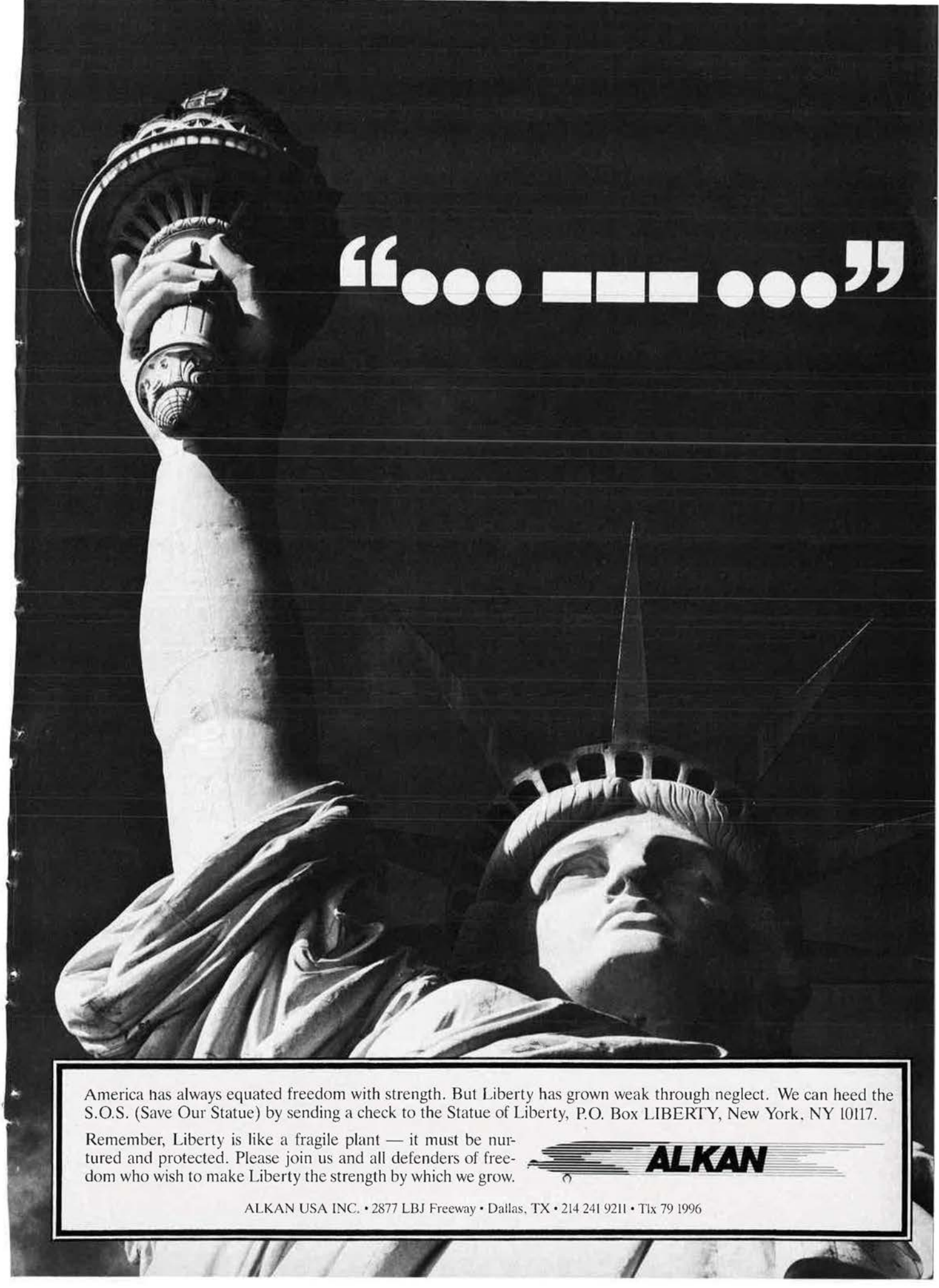
E-05 was also one of the first crews to fly Quick Force '83. This is a mission designed specifically to test the ability of the aircraft and the aircrew to penetrate enemy defenses in a nonnuclear environment. And E-05 was the first crew in the unit to drop dummy bombs from external pylons. It was quite a year.

The members of E-05 are as follows: Capt. Robert C. Little, aircraft commander; Capt. Dwight A. Klenke, copilot; 1st Lt. Timothy S. Miller, copilot; Capt. Thomas D. Dyer, radar navigator; 1st Lt. Robert K. Umstaedter, navigator; Capt. Roberto Garza, electronic warfare officer; and Sgt. Christopher M. Brady, aerial gunner.

Here's what E-05 brought home from the bombing and navigation competition.

- The Best B-52 Crew Award for compiling the highest percentage of total possible points in the competition for all scored activity. E-05 beat out twenty-six other determined crews.
- The Curtis E. LeMay Bombing Trophy for the most points in both high- and low-level bombing. Thirty-one crews competed in this category, and the Ellsworth wing commander attributes the success of E-05 to the crew's expert and innovative employment of the OAS.
- The William J. Crumm Memorial Trophy for best combined scores in high-altitude bombing.
- The Mathis Trophy for best scores in combined high- and low-altitude bombing.
- The Gen. John D. Ryan Trophy for best combined bombing scores and release-time control. More than good bombing was required to finish ahead of the twelve other crews in this category. E-05's average deviation from scheduled weapon delivery times was twenty-seven hundredths of a second.

By winning five first-place trophies, E-05 helped Fifteenth Air Force win the Doolittle Trophy. During the year, the crew also maintained a 100 percent completion rate on command-directed training events and received the highest possible ratings on standardization/evaluation activity and Emergency War Order testing. ■



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The ANG and AFRES award winners are world-class airmen.

The Best In Reserve

A SPECIAL REPORT

ABOVE: A 315th Military Airlift Wing (Associate) C-141 in Grenada. The 315th, headquartered at Charleston AFB, S. C., captured this year's AFRES Outstanding Unit Award. LEFT: Ricks Award winner Capt. Richard S. Cain of the South Carolina ANG.

In recognition of exceptional performance by the Air National Guard and the Air Force Reserve, AFA presents four special awards at its National Convention in Washington, D. C., each September. They are: the Ricks Memorial Award for outstanding airmanship in the Air Guard; the ANG Outstanding Unit award; the Air Force Reserve Outstanding Unit award; and the President's Award, which goes to the top AFRES flight crew.

The Ricks Award

Capt. Richard S. Cain of the 169th Tactical Fighter Group, McEntire ANGB, S. C., had already exercised his options. He had flown his F-16A to flameout, and now he would have only one shot at landing it safely.

It was September 13, 1983, and Scott Cain was a student upgrade pilot at Luke AFB, Ariz. At the time, he had but twenty-five hours as an F-16A student pilot.

The problem appeared when Captain Cain pulled out of a low-angle strafing pass and discovered that he was unable to reduce from full military power. Unknown to him, the throttle linkage between the cockpit and the engine had disconnected. Captain Cain climbed to a higher altitude, declared an in-flight emergency, and turned back toward Luke. He had enough fuel left to fly for fifteen minutes at full military power.

While Captain Cain tried various procedures to get some response out of his throttle, the Supervisor of Flying at Luke queried the engineering staff of General Dynamics, manufacturer of the F-16, in Fort Worth, Tex. The cause of the malfunction could not be determined, and nobody had a good solution.

Under the circumstances, Captain Cain would not have been faulted had he chosen to use his remaining fuel to reach an unpopulated area and there punch out of the crippled aircraft. Instead, he chose to ride his fuel load down to empty, flame out the engine, and take his chances on landing without power.

The approach angle and glide path would have to be right the first time. A single miscalculation would lead to disaster.

Captain Cain flamed out at 18,000 feet, made one descending turn to arrive over Luke at 10,000 feet, flew a pattern that could serve as a diagram for the manual, and then greased the F-16A in for a perfect landing.

ANG Outstanding Unit

From its aircrews to its band, the 136th Tactical Airlift Wing had an outstanding year, demonstrating its excellence in deployments, inspections, and exercises. The unit began the year right with an overall rating of "Excellent," three findings of noteworthy management action, and twelve laudatory findings during operational readiness and management effectiveness inspections conducted by the Military Airlift Command in February.

It ended the year right, too. In December, the wing's 531st Air Force Band was evaluated as "Outstanding" and was recognized unofficially as the premier band in the Air National Guard.

Twenty-one people from the wing participated in Exercise Team Spirit '83 in March, providing tactical airlift support. In April, the wing co-hosted Sentry Cowboy II, one of the largest ANG composite force exercises of the year. That ran for two weeks and featured realistic training in a simulated combat situation. ANG officials pronounced it "most cost-effective and worthwhile." In June, 101 wing members participated in Red Flag at Nellis AFB, Nev. This training in mountain and desert environments was "accomplished exceptionally well."

Three of the wing's C-130s and seventy of its people took part in Operation Cold Fire, September 9–24, in support of Reforger '83. The transfer of hundreds of personnel and tons of cargo was a great success, with no accidents or injuries during the long workdays and many flying hours logged. Not a single sortie was missed as a result of maintenance problems.

Further training and support were accomplished by the wing in a series of deployments throughout the year: the 136th Civil Engineering Flight to Eglin AFB, Fla., in March; the 136th Communications Flight to George AFB, Calif., in April; the 181st Weather Flight to Camp Ripley, Minn., in May and June; the 136th Mobile Aerial Port Squadron to Travis AFB, Calif., in June and to Torrejon, Spain, in August and September; the 531st Air Force Band to Hanscom AFB, Mass., in June and July; and the 136th Tactical Hospital to Elmendorf AFB, Alaska, in July.

AFRES Outstanding Unit

A single award is hardly big enough to accommodate all that the 315th Military Airlift Wing (Associate) did, so it's not surprising that these airmen won both the AFRES Outstanding Unit award for 1983 and the President's Award for top aircrew. The 315th was at the forefront of almost every strategic airlift operation undertaken by MAC—flying the first and third C-141s into Grenada, the first two aircraft into Beirut after the massacre of the US Marines there, and the only Reserve-manned aircraft into Chad during the relief operations there.

This superb Reserve wing is headquartered at Charleston AFB, S. C., along with its host unit, the 437th Military Airlift Wing, but it has geographically separated elements in North Carolina, Florida, and elsewhere in South Carolina.

A 315th MAW (Associate) C-141, with the markings of the Wing's host unit, the 437th MAW, on the ramp in Grenada. A 315th C-141 crew won the President's Award as top AFRES flight crew.

A loadmaster from the wing, a crew member on that first C-141 into Grenada, was selected to represent his colleagues when President Reagan passed out accolades at the White House for the rescue operation. Enemy bullets were still flying when these airlifters evacuated the first students and civilians to safety. Between October 25 and November 23, the wing flew sixteen Grenada missions and also took on more regular work for MAC so active-duty aircrews could be available for Grenada tasking.

In August, two 315th crews were among the first military cargo carriers into Chad with equipment for government troops fighting Libyan and insurgent forces. The exploits of the 315th crew that was first into

Beirut are described below, that mission having won the President's Award.

Even if its role in these crises was disregarded, the 315th's list of achievements would still be fantastic. It includes:

Two complete phased aircraft inspections per month on Unit Training Assemblies (the only Associate unit to manage this); more than 400 personnel sent to seven locations to provide line maintenance for MAC transient aircraft; augmentation of aerial ports all over the world, including takeover of the McGuire AFB, N. J., aerial port during that wing's ORI; ninety-eight percent of the wing force trained in cardiopulmonary resuscitation; flying 1,572 missions, 531 of them productive airlift missions for MAC and the others for training; adding 15,547 hours to the wing's cumulative record of more than 175,000 hours of accident-free flight; an "Excellent" rating on the ORI; and more flying than any other three-squadron Reserve wing.

Maintenance troops of the 315th/437th were judged best propulsion branch in MAC, best organizational maintenance squadron in MAC, and best avionics squadron in MAC—and then won the CINCMAC trophy for best maintenance in MAC. A 315th team won the maintenance trophy for best C-141 unit at the Volant Rodeo competition. In November, a 315th crew broke a Charleston AFB record with its two-hundredth consecutive on-time departure. The wing's departure reliability rate for the year was 96.4 percent.

And more: an OJT effectiveness rate of 100 percent, participation in a long list of exercises, training goals not only met but exceeded, and average manning of 104.0 percent and retention rates of ninety-one percent for both first-termers and career airmen.

That doesn't exhaust the list of accomplishments, but it's enough to illustrate why Hq. Air Force Reserve says that this wing represents the "epitome of professionalism in a professional force."

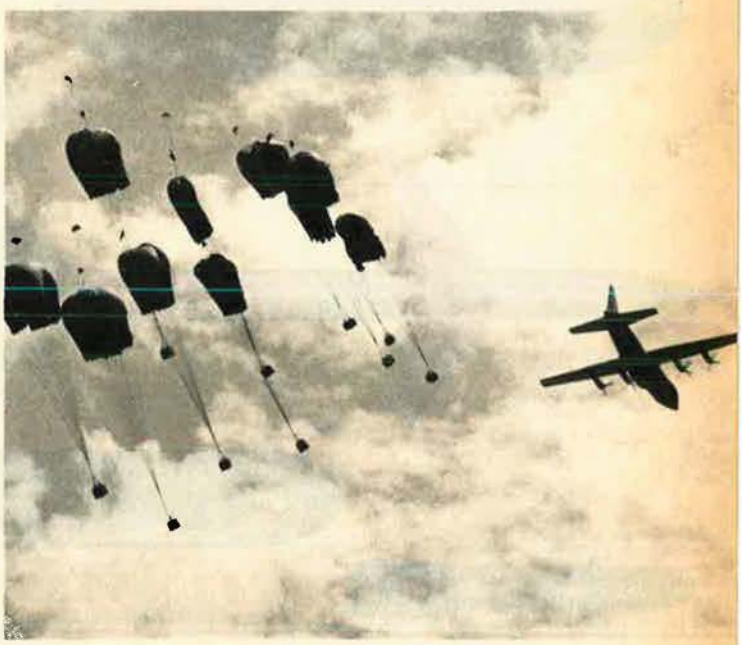
The President's Award

The Rhein-Main command post told Capt. John M. Bookas that he and his C-141 crew were to stand by for a top-priority mission to an undisclosed location. It wasn't difficult to guess where they were going, though.

The world was recoiling to the news out of Lebanon, where the casualty reports of the numbers of dead and injured from the bombing of the US Marine compound in Beirut were being updated hourly. Captain Bookas and his crew were from the 315th Military Airlift Wing (Associate), four days into a routine MAC mission in Europe. Their routine ended on October 23 when they flew out of Germany, configured for aeromedical evacuation and carrying a medical team in back. They would get their destination orders in flight.

Under the circumstances, flight planning was no more routine than the mission. Fuel requirements, for example, were calculated using three different route scenarios. Finally, word came to proceed to Beirut. Captain Bookas raised two Red Cross C-9s, just out of Beirut, on the radio to get more information on the situation in what might be hostile airspace. Thus updated, the pilots and navigators came up with an approach plan that included an extended overwater downwind leg at low level, a lights-out configuration, and a last-minute change of runway to minimize hostile fire from the surrounding hills.

The C-141 touched down in Beirut with supplies and the medical team just thirteen hours after the explosion at the compound. The smell of burning powder was still in the air. The crew was met by Marines who warned that no one should deplane without a flak jacket. The flight engineers began refueling operations immediately, but three times were interrupted by sniper fire. The crew had to repair a ruptured brake line themselves, since no maintenance assistance was available.



Cargo is air-dropped from a 136th Tactical Airlift Wing C-130. The Texas Air National Guard unit, based at Dallas NAS, was selected as this year's ANG Outstanding Unit.

Patients began arriving from the American University Hospital and from Navy ships offshore. Thirteen critically wounded Marines were brought aboard in litters, and the crew buttoned up to go. They made a blacked-out takeoff from Beirut.

Their route back to Germany took them over the Italian and Swiss Alps, which, at their cruising altitude, required extra terrain avoidance. A special diplomatic clearance was arranged so they could overfly Swiss airspace. Twenty-one hours after liftoff from Rhein-Main—and 4.7 hours out of Beirut—the C-141 was back on the ground at Rhein-Main and the Marines were on their way to the hospital.

Their part of the crisis over, the C-141 crewmen resumed their previous routine mission, performed every bit of it, made every takeoff and delivery on time, and were only a few hours behind schedule when they arrived home to Charleston on the day they were due back under the original plan.

Members of the crew were as follows: Capt. John M. Bookas, aircraft commander; Lt. Brian J. Mickel, copilot; Maj. Laurens M. Pitts, navigator; Capt. Spencer P. Bell, flight examiner navigator; MSgt. Robert S. Brock, flight examiner flight engineer; SSgt. Van S. Effler, flight engineer; SSgt. Charles D. Brooks, Jr., flight engineer; MSgt. Clarence G. Hartis, instructor loadmaster; and TSgt. James F. Bowersox III, loadmaster. ■

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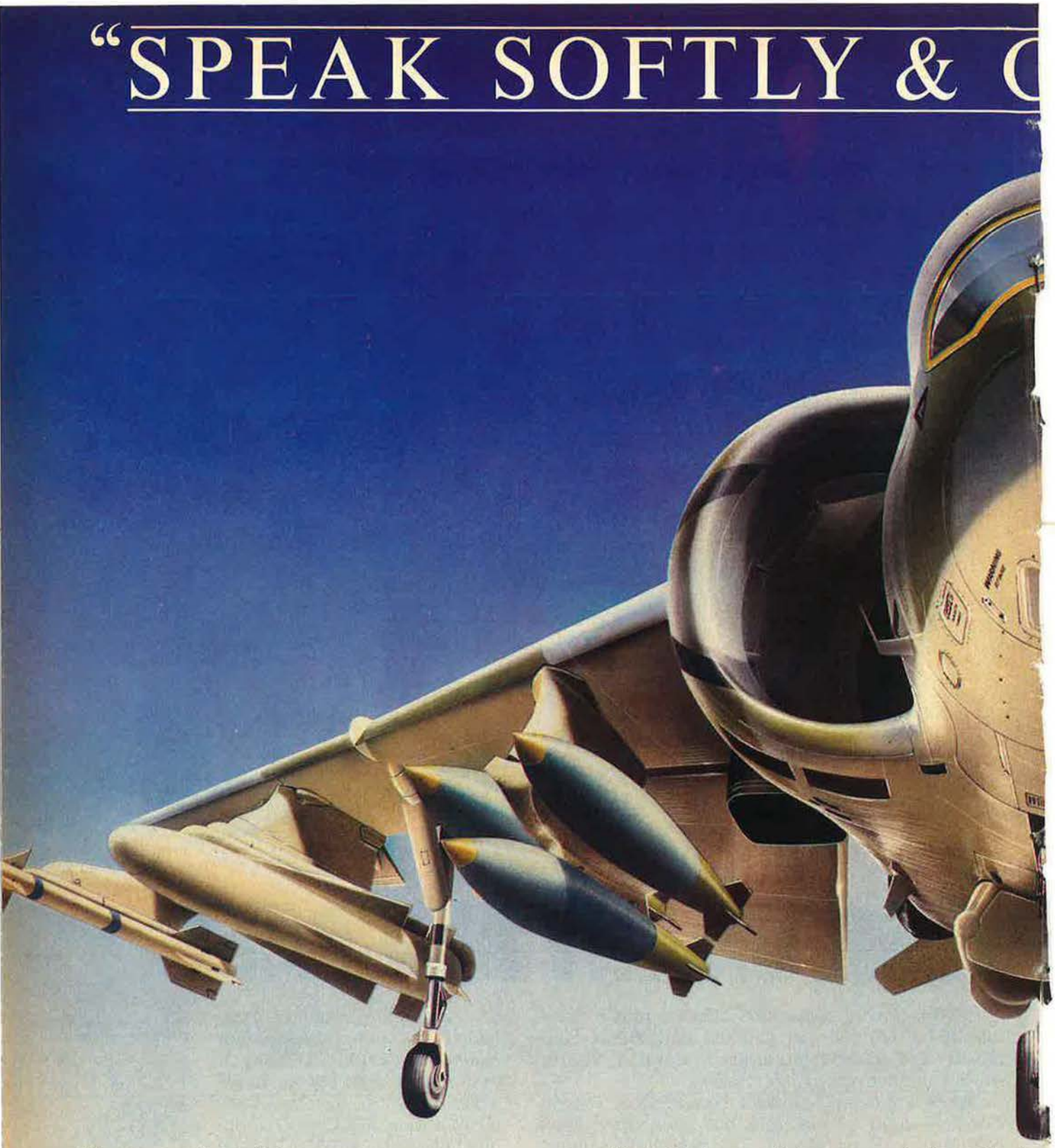

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Air Force Reserve crews fly C-141 StarLifter (foreground) and C-130 Hercules over the Cascade Range in Washington state.

Today's Reserve force has a big part in everyday operations.

Evolution to Partnership

BY MAJ. GEN. SLOAN R. GILL, USAF
CHIEF OF THE AIR FORCE RESERVE AND COMMANDER, HQ. AFRES

In 1956, when I first began my association with the Air Force Reserve, the term "Reserve" pretty well summed it up—we were indeed a force to be held in reserve only. Perhaps one of the biggest changes in the last twenty-eight years, and certainly one of the most significant, is the fact that the Air Force Reserve has now evolved from being a Reserve Force for use only in mobilization to an adjunct force having a big part of the everyday operations of today's Air Force. Through an evolutionary process, the Air Force Reserve has been absorbed into the corporate Air Force decision-making and mission-planning process, and we're now proud partners with the Air National Guard and the active Air Force in helping defend our nation.

Because of our increased involvement in the day-to-day operation of the Air Force, one thing has changed—the term "weekend warriors." This term no longer applies, because at any given time we're flying approximately one-third of the global airlift missions—including those to such far-flung locations as Japan, Iceland, and Germany. We also have as many as 500 support people training at Military Airlift Command bases worldwide, working alongside their active-duty counterparts. Every day, everywhere, Reservists are performing their duties. It's a long way from the days of flying around the flagpole on weekends.

How We Got Here

Perhaps some perspective on how we got where we are would be appropriate. During a major portion of our nation's history, our military posture has consisted of a small standing force, augmented, when necessary, by the citizenry. Rooted in that philosophy of the Founding Fathers, "that a standing army endangered liberty," this view of military force held that the militia was the least threatening as well as the most economical form of military power. However, the Cold War period following World War II created a new national attitude—that a large, readily available force is essential to counter external threats. Since highly sophisticated warfare, including nuclear weapons, and increased training times precluded a rapid military expansion from the civilian population, it became necessary for the first time in our history to fund a large, standing peacetime force.

Our Reserve Forces were not well suited to this new strategy of massive retaliation. We played a follow-on role, equipped for the most part with obsolete equipment and only partly prepared for any specific mission. But, as you are well aware, the military is not exempt from the old adage that "the only sure thing is change."

During the latter part of the Vietnam conflict, a combination of factors interacted to cause some changes in the Air Force. Flexible response became our military strategy. Détente had significantly reduced the "high threat" of the Cold War, and the rising disenchantment with the war in Southeast Asia had produced a vocal antimilitary attitude in some sectors of our popula-

tion. As a result, the 1971 military Selective Service Act placed ceilings on the size of the active force, and, of equal significance, the law limited the President's means of expanding the military *solely* to the mobilization of the Reserve Forces.

There were three other factors interacting with these societal changes that enhanced the Reserve Forces. First, the post-Vietnam reductions of both equipment and personnel allowed for their release to the Reserve Forces. Secondly, the All-Volunteer Force resulted in programs designed to enlist more prior-service individuals in the various Reserve Forces. And finally, budget reductions increased the attractiveness of the less expensive Reserve components.

Treated as Equals

This has all led to today's stated policy that a Total Force outlook will be applied in all aspects of planning, programming, manning, equipping, and employing the Air Force Reserve. In other words, we are to be treated as equals to the active force in all arenas. Within these guidelines, we're then tasked to provide combat units, combat support units, and qualified personnel for active duty in the Air Force, and to perform those peacetime missions that are compatible with our training and mobilization requirements.

We do this in several ways. Probably the most visible is our unit program where we equip a unit just like its active-duty counterpart. Today we have more than 56,000 people assigned in fifty-six such units, and they have missions related directly to or in support of our main mission of *flying aircraft*. We currently have some 430 aircraft assigned, ranging from the C-130 transport aircraft to the Air Force's newest fighter—the F-16. These units—whether flying airlift, tanker, or fighter aircraft—are all alike in one sense: They are run by Reservists and are primarily concerned with training and operational readiness. Reserve units have the same high standards and requirements as those of the active force and are tested frequently by active Air Force inspection teams.

As an adjunct to our unit structure, we also have what we call our *Associate* program, where we share the maintenance and flying requirements with the active-duty unit members on *their* aircraft. Reservists assigned to these organizations provide about half the crews for the C-5, C-9, and C-141 fleets, as well as about forty percent of the maintenance of these aircraft. In addition, we now supply half the crews for the Air Force's newest cargo/tanker aircraft—the KC-10. This arrangement establishes a very beneficial resource extension for an active wing during peacetime, as well as giving it an immediate surge capability during contingencies.

Like the active force, not all our units are directly related to flying. We currently have some 155 mission support units, such as civil engineering, aerial port, tactical hospital, and communication flights. Like our flying units, these units furnish essential services to the active force.

Still another way we support the Air Force is through our individual Reserve program—which gives Reservists the opportunity to participate as individuals rather than as members of an organized unit. This program allows Reservists, called "mobilization augmentees," to train in a broad spectrum of career specializations. These men and women are assigned to active-duty units for training rather than to all-Reserve units and can be found in nearly every career area and at nearly every base—a real tribute to the program's effectiveness. More than 12,000 Reservists are currently assigned to this program.

To meet other Air Force mission requirements, the Air Force Reserve can call on a force of more than 362,000 members who are placed into three basic categories: the Ready Reserve, the Standby Reserve, and the Retired Reserve. The Ready Reserve is, as the name implies, those members who agree, or are obligated, to report for active duty when called. This group includes those men and women who make up the unit and individual programs. They have the highest priority in terms of personnel, training, and equipment for reasons that should be obvious. The other categories include those members who have retired or completed their basic military commitment and are no longer required to participate in any formal training programs, but who would be available in times of national emergency.

A Proud Record

Our mission is to prepare and train those members in the unit program for active duty in a time of national emergency and as national security may require. We must be responsive to situations covering the entire spectrum of warfare—from a mere threat to general war. We are very proud of our record and of our successes. We feel that the transfer of modern equipment, along with our ability to recruit and retain quality personnel, has allowed the Air Force to assign us challenging and demanding missions—missions that help us maintain our readiness. Today, we stand on the threshold of expanding in both mission and size.

You may be familiar with the debate going on in Congress about using the various military Reserve Forces as one way of helping keep down the defense budget. Congress is also realizing that the Reserve components have a great deal of experience and therefore is looking at adding more missions. Is the Air Force Reserve ready to accept these challenges? Let me answer, at least in part, by reviewing the basic criteria the Air Force uses for determining if a specific mission is suitable for the Reserve.

First and perhaps most important, a validated wartime surge requirement must be established for the mission. Since the mission of the Air Force Reserve is to provide trained units and qualified personnel for active duty in times of emergency, this becomes the ultimate test. Thus, the fighter, tanker, and airlift missions can all be considered prime mission areas for our forces because there is a definite surge requirement during wartime. On the other hand, the strategic bomber mission would not be considered appropriate since the peacetime/wartime utilization rates are the same.

The second challenge is not as easy to meet. Generally, a Reserve unit will cost less than a similar active-duty unit. A fully equipped Reserve unit that is ready for deployment requires the same aircraft and equipment as its active force coun-

terpart, so there's no savings from this source. However, as you might imagine, the lower operating costs and lower personnel costs can make a substantial difference in the total operating costs of a unit. For example, the Congressional Research Service recently compared the costs of an active and Reserve fighter squadron and found that the Reserve unit costs between thirty-two to thirty-nine percent less than the active squadron.

Of course, the magnitude of the savings depends on the type of unit being considered. Generally speaking, those requiring a higher peacetime operating tempo exhibit higher costs and lower savings. This, of course, relates directly to the peacetime-vs.-wartime intensity criteria. As noted earlier, the Air Force Reserve is significantly involved in the tactical and strategic airlift missions because they both require a high surge capability in wartime—a capability we can provide.

And finally, as an adjunct to being ready to absorb these extra required missions, our aircrews are able to combine training missions with real-world missions required by the Military Airlift Command. Thus, both sides benefit—the Air Force gains valuable assistance in accomplishing day-to-day requirements and the Air Force Reserve is able to maintain its crew capabilities without having to man aircraft and units on a full-time basis.

All of these criteria are used when the Air Force is determining proper roles and missions for the Reserve Forces, and we're quite proud of the results. It is, in our opinion, Total Force policy at its best.

Effective Total Force

I'm very happy to say that current events indicate the wisdom of that policy. Not only have Air Force Reserve units gained valuable training and proficiency from increased involvement with the active Air Force, the active Air Force has benefited as well.

Without a Total Force policy, several mission areas would have faced greatly reduced support.

Today's Air Force Reserve flies peacetime missions as a by-product of training, providing day-to-day support for the Air Force. These peacetime missions include performing passenger and cargo airlift, aerial refueling and spraying, search and rescue, airborne fire fighting, weather reconnaissance missions, and civil engineering and aerial port support. This past year our search and rescue crews saved eighty-one lives. They were also on hand to support all of the Space Shuttle launches. Our aeromedical evacuation crews airlifted more than 41,000 patients. Our hurricane reconnaissance missions in the Gulf of Mexico and Caribbean accounted for seventy percent of the total hours flown monitoring these storms in 1983.

Despite the wide range of support missions we handle, I'm frequently asked: "If mobilized, will your people go?" My answer is an emphatic "Yes!" We can point to last fall's actions in Grenada and Lebanon for our best answer to this question. Although they were not given the sites of the operations or the expected duration, every member who was contacted volunteered for immediate duty. Our Reserve crews flew twenty strategic and four tactical airlift missions as well as eleven tanker sorties, totaling 329 total flying hours in the combined effort in Grenada. In fact, it was a Reserve crew that flew the first American citizens out of Grenada back to the United States. In Lebanon, our strategic airlift Reserve crews flew six missions in support of the US Marines after the destruction of their Beirut headquarters.

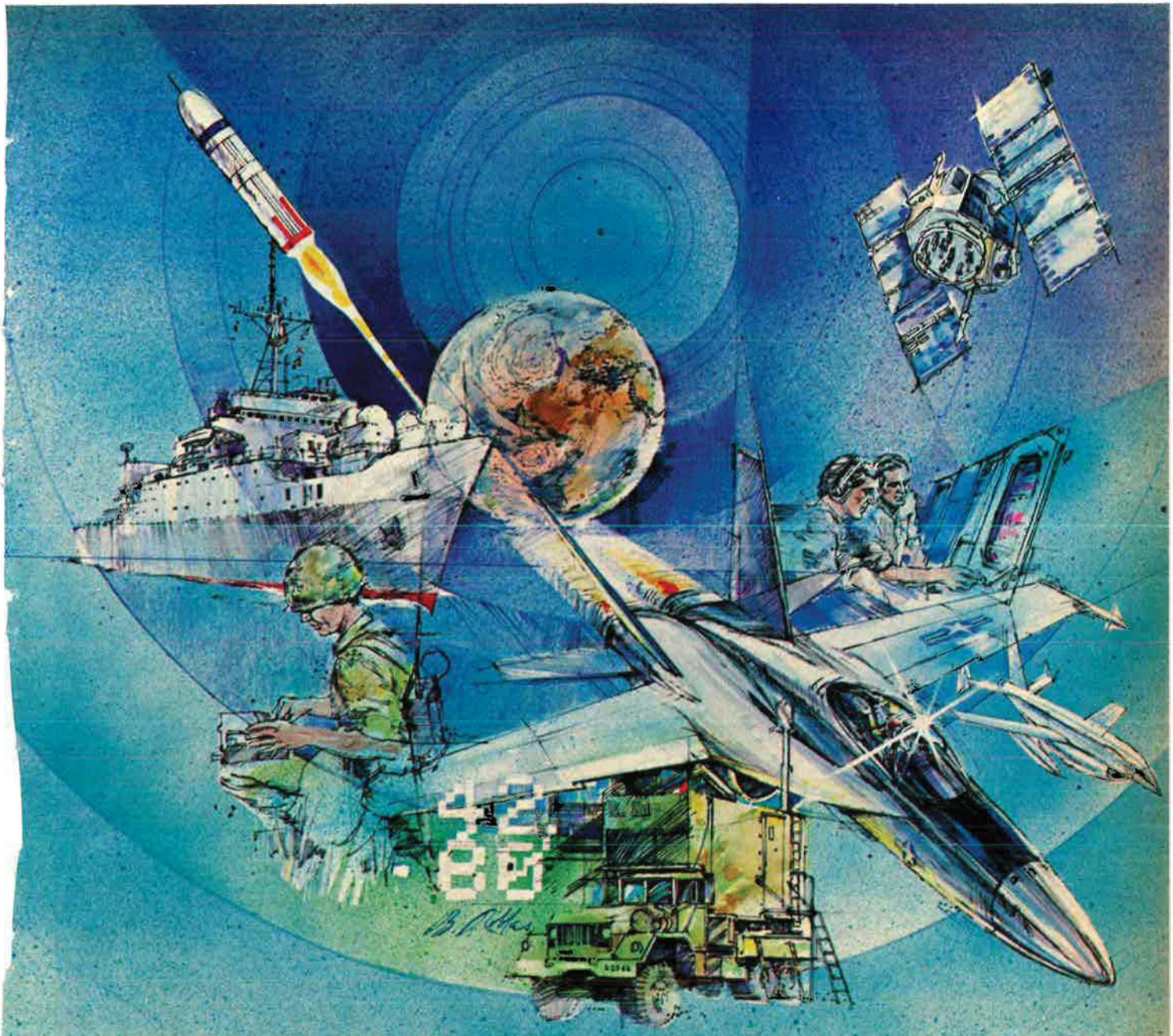
Because of the effectiveness of Total Force and the modernization of the Air Force Reserve, many of our units are so well integrated with their active force counterparts that there's little chance an effective wartime mission could ever be performed without them.

This is particularly true in the critical strategic airlift categories where, as I mentioned earlier, we supply half of the C-141 and C-5A aircrews and forty percent of the maintenance people. These figures will change somewhat in the years to come since the Air Force announced earlier this year that it will be assigning C-5A Galaxies and C-141 StarLifters to the Air Force Reserve in a unit-equipped role—meaning we will "own" these cargo aircraft for the first time. We are very excited about this new dimension to our airlift mission and feel confident that we will be able to do very well in this role. It is obvious, then, that we in the Air Force Reserve have challenging missions, the same aircraft that the active force flies, and top-notch people.

You may be surprised to learn that a key to our success is beyond all of this and, in fact, lies in the encouragement and support our Reservists get from their employers. Quite frankly, we rate these along with support from the family as the key factors in our ability to keep these important people. If Reservists know they have the support of their bosses and they don't need to worry about their jobs, then we find they do a much better job for us. In turn, the employers get highly trained and motivated employees—those who not only demonstrate excellent job proficiency but also their dedication to our great nation.

Our people do a tremendous job in meeting the challenging and demanding tasks that face them as citizen-airmen. For more than 200 years, a cross section of our free society has guaranteed the common defense of the United States by serving in the National Guard and Reserve Forces. By capitalizing on the extensive professional knowledge and experience of the citizens of this country, we are able to carry out the important missions assigned to us. We appreciate the support of the Air Force Association and pledge our commitment to continue to provide a strong defense for America at the most reasonable possible cost. ■

Maj. Gen. Sloan R. Gill is Chief of the Air Force Reserve at Hq. USAF and Commander, Hq. AFRES, Robins AFB, Ga. A graduate of the Georgia Institute of Technology, he was commissioned as a second lieutenant through AFROTC in 1952. After completing flying training, he flew in various assignments with Military Air Transport Service. General Gill entered Reserve status in 1956, joining the 700th Troop Carrier Squadron at Dobbins AFB, Ga. Subsequently, he served as Deputy Commander of Dobbins AFB, Base Commander of the Chicago-O'Hare Air Reserve Facility, and Commander of Fourth Air Force before assuming his present command in November 1982.



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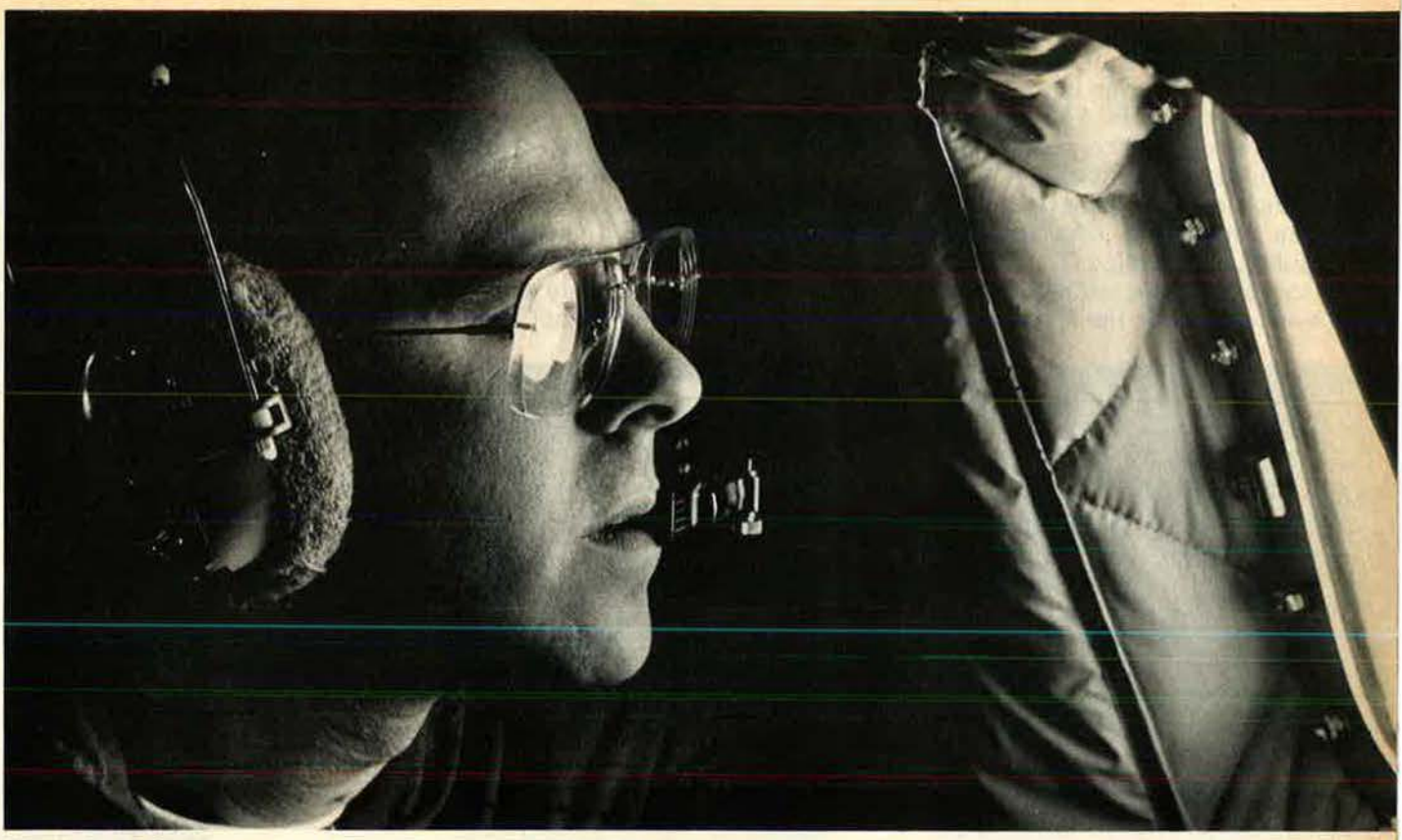


Wisconsin Air Guardsman 1st Lt. David B. Sjostrom, KC-135E navigator with the 128th Air Refueling Group, took part in last spring's Coronet Giant deployment to Germany. (Photo courtesy of the Milwaukee Sentinel*)*

The "best back-up air force in the world" is getting bigger and better.

Soul of The Guard

BY MAJ. GEN. JOHN B. CONAWAY, USAF
DIRECTOR, AIR NATIONAL GUARD

THIS month's theme for AIR FORCE Magazine, "Human Factors in Airpower," is as vast as the entire Air Force. I want to concentrate my comments on the soul, brains, muscle, and heart factors of the Air National Guard.

The soul or core of any organization has to be its people and the missions it performs. Our Air Guard men and women are today the most stable, cohesive, experienced force I have ever been privileged to work with on a daily basis. They know their jobs and do them well—very well.

That force is growing. By the end of Fiscal Year 1984, we expect to have 104,000 Guard members on duty. When Fiscal Year 1985 is over, another 4,000 are programmed to be added to our organization. Why? Because the Department of Defense and the Air Force know the ANG can do the job, and they have asked us to do more.

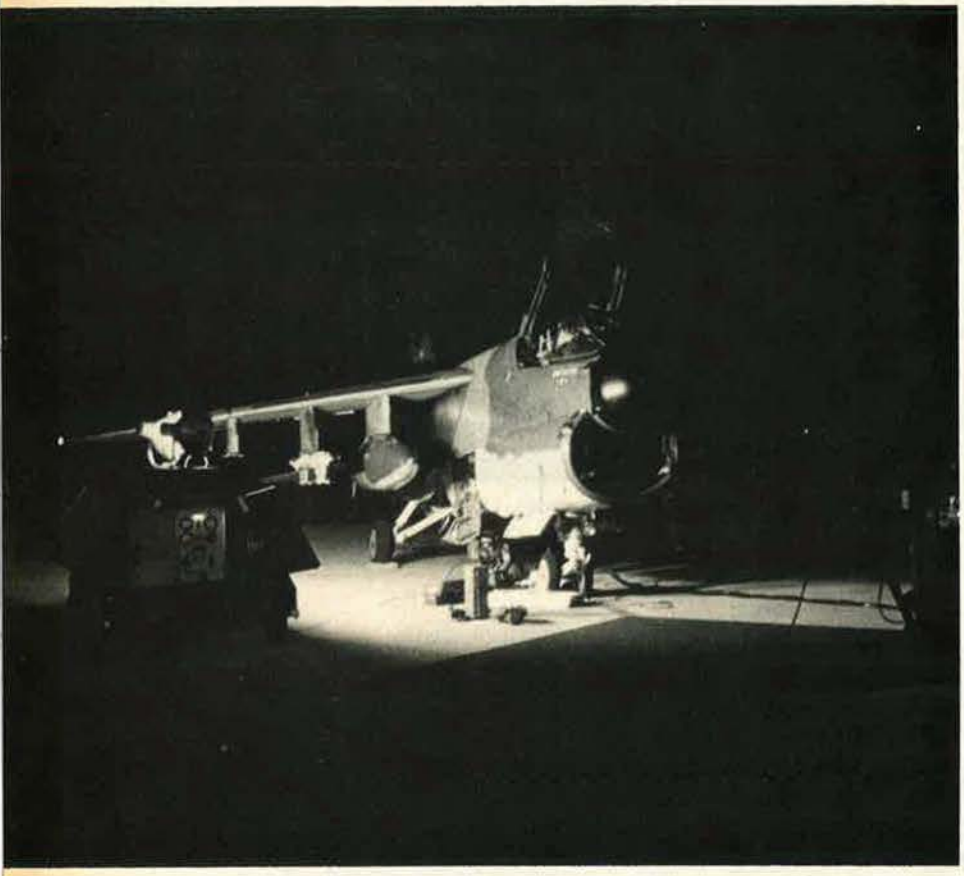
Expanding Missions

As a result, our missions are being expanded and our forces are being improved. Within the next two years, the Air Guard will gain its first F-15s, and our first C-141s and C-5s will allow us to be part of the strategic airlift program for the first time in more than a decade.

At the same time, many of our Guard units will gain even greater capabilities as we add F-16s and F-4s to existing authorizations. Ad-

ditionally, new C-130Hs will replace older tactical aircraft, and our tanker fleet will be even more mission-capable as reengined KC-135Es allow our aircrews to perform more effectively and efficiently.

Each of these changes requires men and women who are smart, skillful, and talented. The ANG has those people now and will have even more of them in the future.



LEFT: A lonely night on the flight line for maintenance people of the South Carolina ANG 169th Tac Fighter Group. RIGHT: Milwaukee Sentinel photo shows Wisconsin ANG crew member during preflight inspection before leaving RAF Mildenhall, UK.

Brains are not a unit's median IQ. Brains in a unit are educated, trained people who put their education to work for the unit. There are Air Guard people right now in nearly every Air Force formal training program offered. Many of them will be selected as honor graduates.

It may surprise some people to learn that the ANG also operates formal schools at several locations. These schools provide technical and professional training to members of the Army and Air National Guard, active-duty Air Force personnel, members of the Air Force Reserve, and some foreign nationals in the military assistance program. Four of the most important are the advanced flying schools that provide training for tactical fighter aircrews.

I am indebted to my predecessors who had the vision to see that future training of Guard aircrews would depend on the ANG's doing a lot of the work. Two of the oldest schools are conducted by the 162d Tactical Fighter Group in Tucson, Ariz., for A-7s, and the 184th TFG at McConnell AFB, Kan., for F-4s. The two newest training schools are run by the 142d Fighter Interceptor Group, Kingsley Field, Ore., for our air defense crews, and the 124th Tactical Reconnaissance Group, Boise, Idaho, which trains RF-4 aircrews.

Another important and unique training program is conducted by the 139th Tactical Airlift Group, St. Joseph, Mo. Their Advanced Airlift Tactics Training Center is designed to train MAC-gained C-130 aircrews in survival tactics and techniques derived from Red Flag learning experiences.

But improving the aircrews without improving the aircraft is not enough. The Air National Guard is improving both.

Improving the Aircraft

Last year, we opened the ANG Fighter Weapons Office, a joint Guard and Air Force Reserve venture collocated with the 162d TFG in Tucson. The purpose of the office is to have a single manager for evaluation of improvements to our aircraft and the weapon systems on the aircraft. Our idea is to examine and modify our aircraft and systems so they will improve the performance of our crews and their ability to meet—and overcome—any threat. The Fighter Weapons Office works closely with the Air Force Fighter Weapons Center at Nellis AFB, Nev.

This year, the Guard instituted another weapons office associated with the 124th TRG's reconnaissance training school. The goal of this program is to develop tactics and weapon systems to provide our RF-4 crews with a defensive capability. We want to remove "unarmed" from between the "alone" and the "unafraid" in the recce motto.

Each day, the ANG provides its muscle and capabilities in exercises, deployments, and real-world missions in support of the USAF—but not only with crews and airplanes. We also have communica-

tions specialists, civil engineers, security police, food-service people, photographers, maintenance experts, logisticians, and numerous other career fields representing the Guard at almost any intersection of latitude and longitude you can point to.

This year will set a record for Air Guard support to the Department of Defense and various services. In fact, we will have more people and units participating in overseas deployments than the ANG has ever had in a nonmobilized status. Our units take pride in being a part of the Total Force and enjoy using their muscle in worthy achievements.

Inevitably, any discussion of the human factors of the Air Guard must finally focus on the heart of the organization—its people. They have the drive, the initiative, and the courage that allow the unit, section, or office to succeed. I cannot speak too highly of today's Guardsman and woman. AFA will recognize some of them at its National Convention with special awards for achievement.

Capt. Richard S. Cain from the 169th TFG, South Carolina ANG, will receive the Earl T. Ricks Memorial Trophy for his superior airmanship. During an F-16 training mission in Arizona, the throttle linkage between the cockpit and engine disconnected while the aircraft was flying at full military power. Captain Cain chose to bring the aircraft back safely to Luke AFB, and, after the engine flamed out, made a successful powerless landing at the base.

The winner of the ANG Outstanding Unit Award is the 136th Tactical Airlift Wing, Texas ANG, Dallas, Tex. The unit was rated very highly during an Operational Readiness Inspection (ORI) and Management Effectiveness Inspection (MEI) by Military Airlift Command, and participated in exercises from Korea to Europe and throughout the United States. In addition to all that, the 136th TAW was able to plan, coordinate, and co-host one of the largest composite-force training exercises in the Guard—Sentry Cowboy II.

The Chief Red Award

This year, the Air National Guard is deeply honored that AFA has instituted a new award—the Chief Master Sergeant Dick Red Award for ANG Aerospace Maintenance. Chief Red was a maintenance superintendent with the 189th Air Refueling Group, Arkansas ANG, Little Rock AFB, and had an exceptional career in the Guard. He served for forty years and was mobilized with his unit to serve in three wars. Chief Red was a respected, dedicated citizen-airman, and I am proud to have this award named in his honor.

CMSgt. Gene A. Killilea, a maintenance superintendent with the 121st Tactical Fighter Wing, Rickenbacker ANG Base, Ohio, is the first recipient of the Chief Red Award. Chief Killilea has had a superb career, serving not only his country but also giving of himself to his family and community. His nomination read in part: "His brand of leadership coupled with his personal pride, dedication, enthusiasm, and professionalism make him a superior candidate for the Chief Red Maintenance Award." I agree and am equally gratified that the Air National Guard fosters individuals who will carry on for these gentlemen.

I believe the human factors in airpower are to be found in each individual Air Guard man and woman. They are the ones with the talent, drive, and spirit that make our organization the best back-up Air Force in the world. Together, they are nearly 104,000 strong—the soul, brains, muscle, and heart of today's Air National Guard. It is a privilege to serve with them as part of the Total Air Force. ■

Maj. Gen. John B. Conaway has been Director of the Air National Guard since April 1981. Commissioned in 1956, he attended undergraduate pilot training and then flew F-102 fighter-interceptors in Air Defense Command. He has also flown SA-16s and RB-57s in various Guard assignments. He was called to active duty in 1968 and served in Alaska, Panama, Japan, and Korea. Upon deactivation in 1969, he returned to the Kentucky Air Guard as operations officer and in 1972 was named KyANG Air Commander. He was recalled to active duty as Deputy Director of the ANG in 1977.

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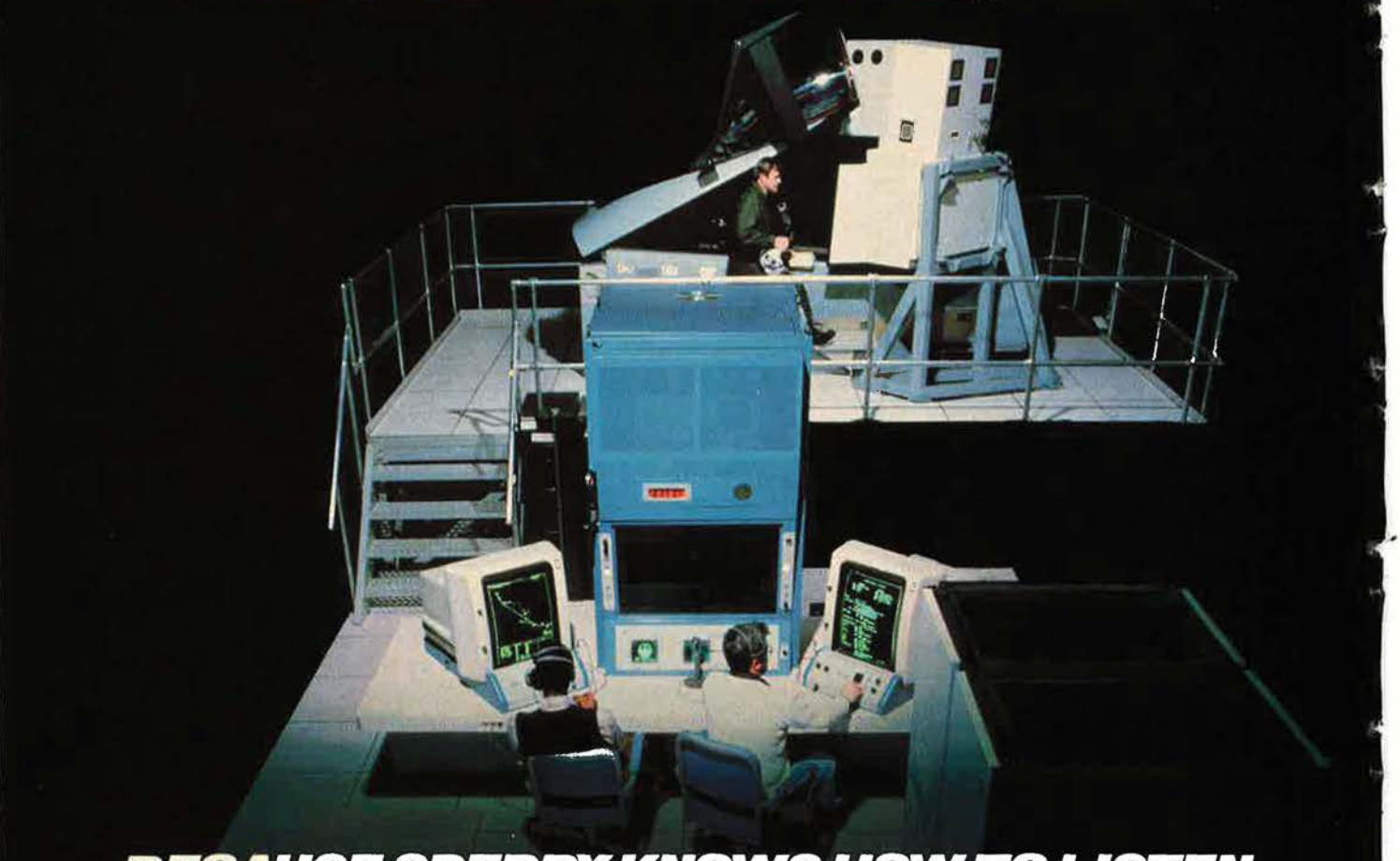

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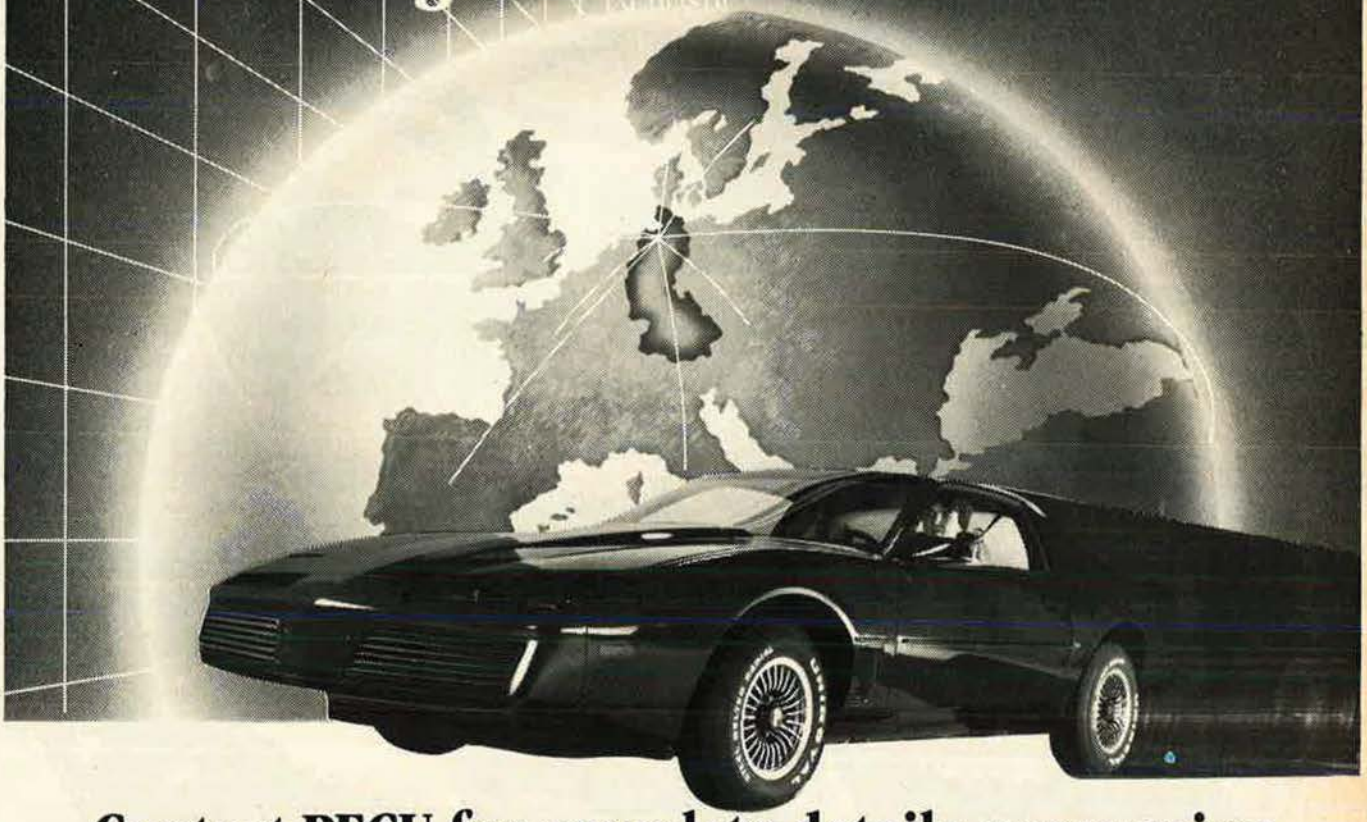

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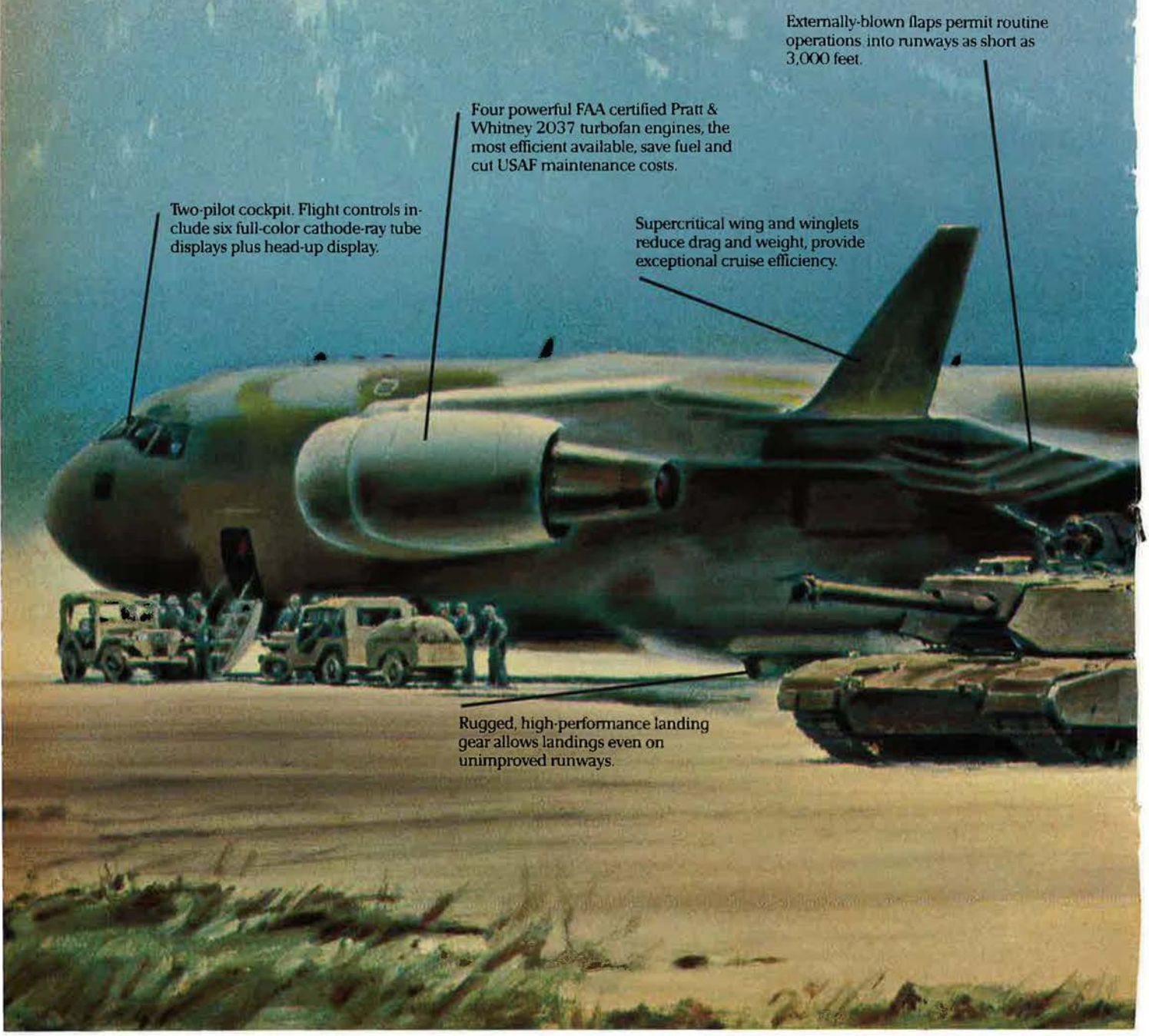

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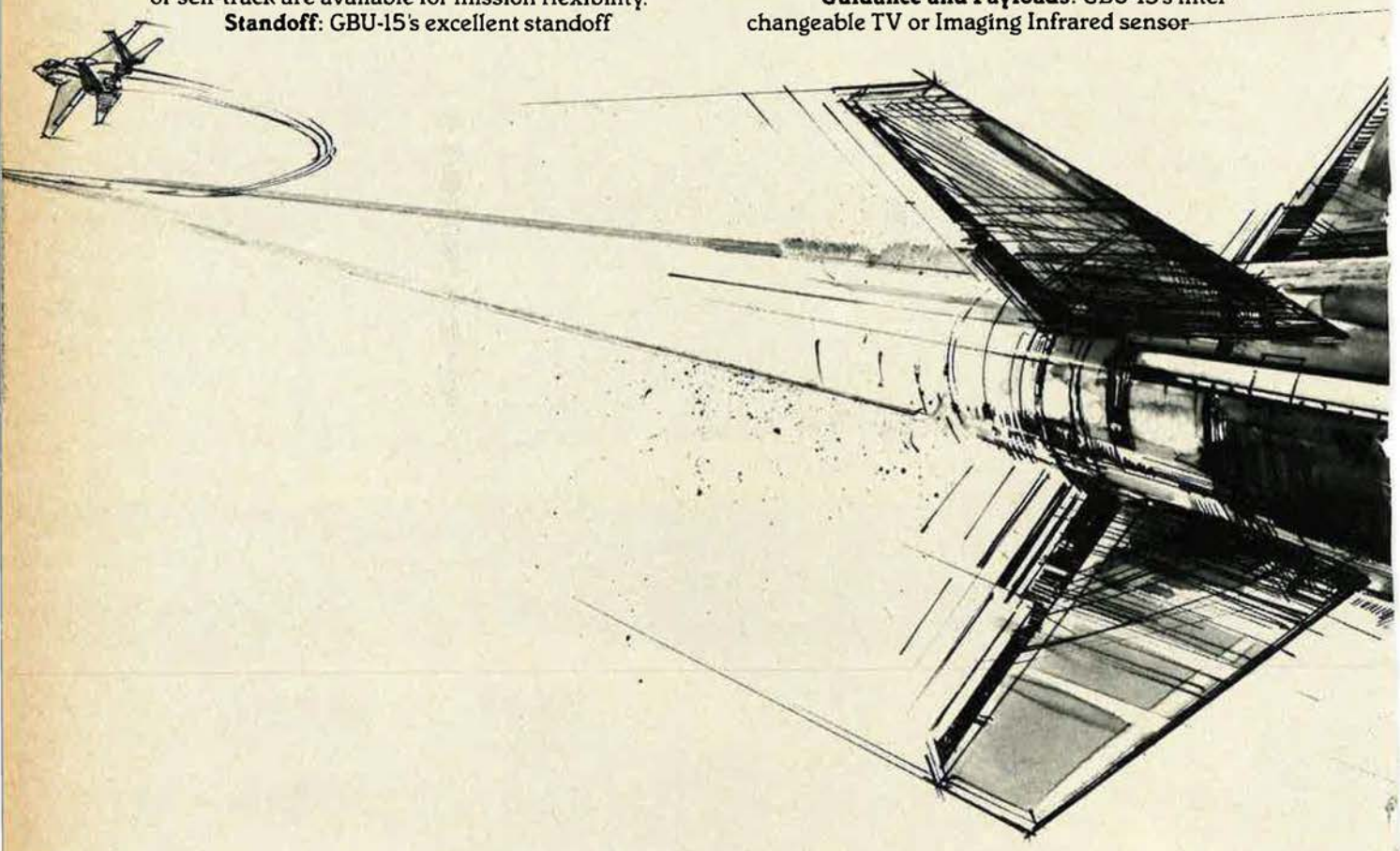

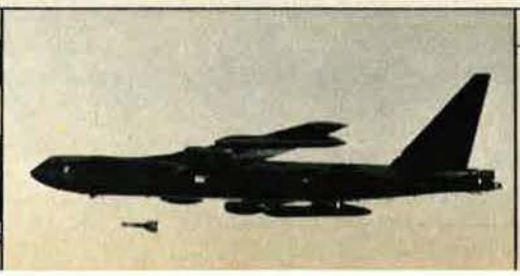

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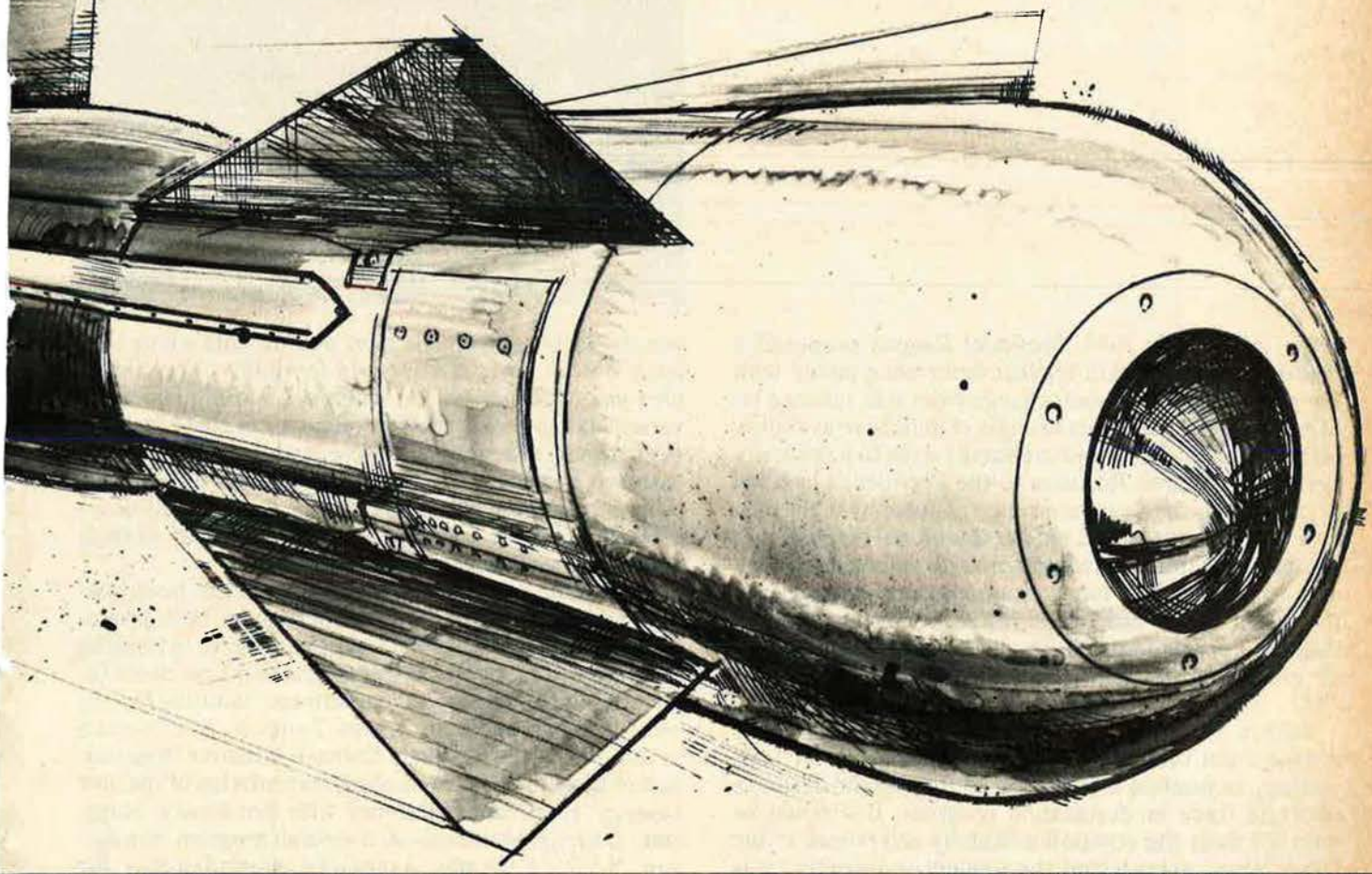

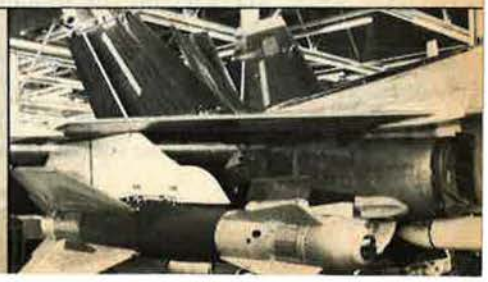

If a system is to be deployed, it must work—and be perceived as working—as advertised.

Charting a Course for SDI

BY EDGAR ULSAMER
SENIOR EDITOR (POLICY & TECHNOLOGY)

On March 23, 1983, President Reagan proposed a drastic shift in US nuclear deterrence policy with the primary aim a gradual change from sole reliance on offensive strategic forces to a mix of defensive as well as offensive capabilities and eventually even to a primarily defensive posture. Reaction to the President's epochal break with the nuclear deterrence philosophy of the past four decades was mixed among traditional defense supporters and, not surprisingly, hostile among hard-core defense critics. The latter group chose to misinterpret the intent of the proposed change in course as thinly disguised escalation of the nuclear arms race and *coup de grâce* for the ABM (antiballistic missile) treaty of 1972.

Within the defense community, initial concerns ranged from the specter of a high-tech Maginot Line strategy to implied repudiation of the Administration's strategic force modernization program. If it could be inferred from the somewhat sketchy references in the "Star Wars" speech that the immediate objective was creation of a "leakproof" defense, the notion follows naturally and inescapably that there would be no further need for continuation of the strategic force modernization. Widely overlooked by the interpreters of the President's remarks about the merits of a defensive strategy was the fact that its realization was not only a long time away but, in part, of uncertain feasibility. The central idea was to establish the technical feasibilities of the various components that in combination could justify a shift toward a largely defensive strategy. The fact that assorted causists—some motivated more by ideology than a clear understanding of the laws of physics—claimed credit for the new look at US nuclear strategy added to the initial skepticism.

In the interim, much of the confusion has been clarified and some of the strident rhetoric by both proponents and opponents bridled. A central factor in bringing SDI (the strategic defense initiative, the proper name for the "Star Wars" concept) to a firm and enduring footing was the appointment of Lt. Gen. James A. Abrahamson as director of the Strategic Defense Initiative organization to head up the technical implementation of the new strategy. In a recent interview with Air Force Magazine, General Abrahamson, a veteran program manager and NASA's former Associate Administrator for manned spaceflight, stressed that SDI does not seek to eliminate the tried and true concept of deterrence, which remains this country's "fundamental policy." What SDI "really means is that we are entering a new era of deterrence," he said, adding that, under the Presi-

LEFT: Lt. Gen. James A. Abrahamson, a veteran USAF and NASA program manager, heads the new SDI organization, reporting directly to Defense Secretary Caspar Weinberger. RIGHT: Artist's concept by Lockheed shows how future space-based directed-energy weapons might perform multiple "kills" of hostile ballistic missiles.

dent's approach, deterrence would consist of "two components, one defensive and the other offensive."

As SDI becomes more effective, the defensive component will be carrying a correspondingly greater share of the deterrence function. Concomitantly, the military value of the offensive component will decline and thereby provide impetus to reduce weapons of this type, he said. This progression is what the "President had in mind when he said that we can make nuclear missiles obsolete," General Abrahamson suggested. The fact that strategic deterrence based on offensive capabilities has served the world relatively effectively for the past thirty-nine years does not mean that the US must remain wedded to the *status quo* forever. He added: "In an increasingly complicated world—ten or twenty years from now—holding cocked guns at each other's heads should not be all the security we want. We would never think of sending a soldier into battle without the ability to defend himself; yet we leave our cities unprotected. So [SDI] is not just a shift in strategy, but a moral imperative."

For the next few years, he stressed, SDI will remain a research program, pure and simple. But assuming an eventual go-ahead decision, it is probable that its operational components will come into being in an incremental, gradual fashion. There will be ample opportunity to decide the technical feasibility and economic affordability of individual component systems as well as to assess their effects on strategic stability. In the context of arms control and increased stability, surveillance systems—a key component of SDI—appear well-suited for reducing the level of strategic risks and bolstering the case for arms control. Another component of SDI—midcourse and terminal defenses—might be candidates for early, limited deployment without affecting the ABM treaty. General Abrahamson said the Administration favored such a "one-system-at-a-time" approach that leads to a gradual increase in capability and at the same time makes it possible to scale down future rounds in strategic force modernization while scaling up the overall SDI effectiveness.

The New SDI Management Organization

The key to the future of defense-oriented deterrence may well be the makeup and scope of the SDI organization that must bring about this reorientation. The two watchwords that guide General Abrahamson in setting up the SDI organization are "centralized planning" juxtaposed with "decentralized execution." This translates into "a reasonably small organization of about eighty to

ninety people [charged with providing] management leadership as opposed to detailed program management." The principal task of this organization will be setting up and coordinating what he terms "competitive technology opportunities" for the "real centers of excellence in all areas of SDI throughout the services" and elsewhere in government. Included here are the Army's Ballistic Missile Defense Systems Command, the Air Force Systems Command's Space Division, the Defense Nuclear Agency, and the national laboratories of the Department of Energy, the SDI Director said. In the case of the Navy, the SDI organization plans to tap such R&D facilities as the Naval Research Office and the Naval Research Laboratory, especially so far as directed-energy (DE) weapons research is concerned.

The SDI organization will work with the services and other agencies through "centralized points of contact at the headquarters level" rather than directly. All liaison with the Air Force, for instance, will be conducted through Maj. Gen. Donald L. Lamberson, Assistant Deputy Chief of Staff for Research, Development and Acquisition, while Maj. Gen. Elvin R. Heiberg III, head of the Ballistic Missile Defense program, will be the contact with the US Army. The Joint Chiefs of Staff will approve all requirements and strategies related to SDI. This presupposes that the JCS be kept current on all technical options. Close liaison will be maintained, therefore, with the Joint Staff, as well as with the policy elements of the Defense Department, the White House National Security Council, the Department of State, and the US Arms Control and Disarmament Agency. The SDI Director reports directly to the Secretary of Defense and clears all major budget and programmatic decisions through that channel.

Internally, the SDI organization is built around the key program tasks. There are five management leadership teams, each one in charge of one of the major program elements, General Abrahamson explained. These elements are surveillance, acquisition, and tracking; directed-energy weapons; kinetic-energy weapons; systems analysis and battle management; and support programs. In addition, the SDI organization includes a systems concept and architecture group to ensure that all individual efforts are integrated and that all relevant information is made available to the government agencies concerned with SDI, according to General Abrahamson. Over the next five years, SDI's funding requirements are pegged at about $26 billion. More than half of this amount is required for the interrelated areas of surveillance, acquisition, pointing and tracking, battle management, and command and control.

Goals and Concepts

The immediate goal of the Strategic Defense Initiative is to conduct research on technologies required to intercept ballistic missiles after they have been launched to prevent them from hitting their targets. Over the long term, SDI is to look for the means to defend military targets as well as civilian populations, both in the US and in allied countries. Three distinct "echelons" of ballistic missile defense are implied by the SDI mission. Obviously central—and probably most "doable" in a technical and operational sense—is defense against a counterforce attack. Such a defense need not be totally "leakproof" to be militarily effective. If such a defense is perceived by the attacker as denying him his military objectives, the utility of a preemptive nuclear strike is thwarted and strategic stability strengthened. If the attacker is forced to expend the lion's share of his ballistic missile arsenal to destroy a handful of the other side's ICBM silos, even a latter-day Attila the Hun will presumably be deterred.

The second echelon of defense—protection of industrial, transportation, and other types of targets required to sustain warfighting efforts—poses a somewhat tougher problem. Under these conditions, the defenses need to be denser and more leakproof. In the last instance, protection of the civilian population, the task of the defense becomes herculean, and the defense must be essentially leakproof since only a few weapons getting through would equate to millions of casualties. The purpose of the initial phase of the SDI program is to establish whether—and how soon—these various levels of defensive capabilities can be attained.

The flight of any ballistic missile can be divided into four generically distinct phases. In turn, the defense needs distinct technical and operational capabilities to deal with each of these flight phases. The first phase involves the ascent of the weapon through the atmosphere into space. The rocket engines of the missile's first and second stages burn brightly at this time and generate unambiguous "signatures" that the defender can read clearly and easily. In the second or post-boost phase, the "bus" separates from the main engines, and the multiple reentry vehicles (RVs), along with any penetration aids, are deployed. In the third, or midcourse, phase, the multiple warheads and penetration aids travel on ballistic trajectories through space, several hundred miles above the earth's surface. In the terminal phase, the warheads and penetration aids reenter the earth's atmosphere.

From the defender's point of view, the boost phase of ballistic missiles provides the best opportunity for intercepts, according to General Abrahamson. For one, neither the penetration aids nor the individual warheads have been deployed and the defense can thus go after truly lucrative targets. Also, there is reasonable time available for detecting, tracking, and intercepting the target. Large Soviet ICBMs and SLBMs burn relatively slowly—the boost burn of the SS-18, for instance, lasts about five minutes. The fastest-burning ballistic missile is MX, with a burn time of about 150 seconds.

Presumably, the Soviets will attempt to move toward faster-burning designs once SDI becomes a factor in the strategic equation, but there is no evidence that the burn time can be cut to a point where there is no adequate "window" for intercepts by the defense during a ballistic missile's boost phase, according to the SDI Director.

There have been claims that, to complicate intercepts, the Soviets could develop advanced "fast-burn" boosters that would finish their "burn" while still within the outer reaches of the atmosphere. Defense Department analyses of the associated technological challenges suggest that the Soviets could not deploy significant numbers of such boosters until some time after the turn of the century. Also, fast-burn boosters exact an exorbitant price in terms of reduced missile throw-weight. Defense

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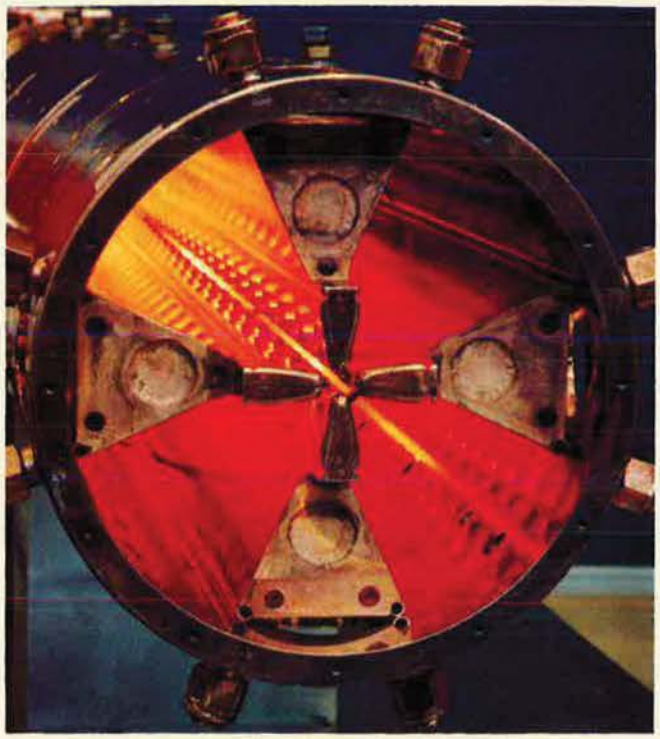
Department experts believe that payload reduction would average between seventy and ninety percent, compared to an equivalent standard missile. It can be argued, therefore, that such a forced offloading of warheads and penetration aids is equivalent to a seventy to ninety percent effective boost-phase defense when measured against current Soviet ballistic missiles. Such a drawdown would obviously ease the task of defensive systems that target enemy missiles in the midcourse and terminal regimes.

Prerequisite for any effective boost-phase intercept scheme is speed, preferably the speed of light. SDI, therefore, concentrates on directed-energy weapons, such as neutral particle beam and high-energy laser designs, according to General Abrahamson. The SDI program will split relevant R&D efforts into near-term and long-term categories and carry out some of this



Free-electron lasers are among the short-wavelength directed-energy weapons under study by SDI. The system shown is operated by the Los Alamos National Laboratory.

work on a concurrent, parallel basis. At this time, he stressed, it is not yet clear whether chemical or short-wavelength lasers are more suitable for the SDI application. Short-wave, "pulsed systems appear to have pluses insofar as their lethality mechanisms are concerned, but that may well be offset by the efficiencies that could result from innovative continuous-wave systems [employing such concepts as phased arrays of mirrors]," he pointed out.

Also yet to be resolved is the question of whether the power source of directed-energy weapons of this type should be operated on the ground or in space. The basic engineering and operational tradeoffs between self-contained designs in orbit and antiballistic missile defense (ABM) lasers that beam their energy from power generators on the ground to mirrors in space that then, in turn, reflect that energy against the target will be a key task of the SDI program, its Director pointed out. There is no doubt that the power requirements—not just the huge amounts of power, but the power conditioning needed by directed-energy weapons—represent a major development challenge.

A third area that will need intensive research and analysis revolves around the relative advantages and disadvantages of various laser types and the size of mirrors they require. Long-wave, chemically powered lasers depend on larger mirrors than do short-wave designs, typified by excimer and free-electron lasers. Getting large mirror arrays into space poses a logistics problem. Such large structures also tend to be more susceptible to hostile countermeasures than do smaller ones. But the issue may not be as cut-and-dried as the experts first assumed, according to General Abrahamson: "A large mirror may make it possible to achieve substantially greater range with reasonable power levels [compared to the smaller mirrors associated with short-wave systems], thereby offering defense in depth. For the moment, we are still up against some circular tradeoffs that we won't be able to resolve until more research has been conducted."

The so-called X-ray laser, a concept that envisages channeling the X-ray radiation of a nuclear detonation against distant targets, is probably SDI's most ambitious, long-term technology challenge. The status of this concept is shrouded by tight security classification, and the concept itself is probably uncertain technically. General Abrahamson acknowledged that his SDI organization was taking over the Defense Department's tri-service SP-100 program, whose purpose is development of nuclear power sources for directed-energy weapon systems, along with other advanced energy sources.

The basic goal of SDI's directed-energy technology program is to bring forward the most promising concepts for boost and post-boost phase intercepts to support major development decisions by the early 1990s. To achieve that goal, he said, "we plan to demonstrate the feasibility of the leading beam generator concepts by the mid-1980s and their scalability to weapon performance levels late in this decade or early in the next. In beam control, we will demonstrate by the end of the decade a capability to control wave-front errors, maintain beam alignment within the system, compensate for atmospheric effects, and provide the components necessary to transmit and control the high-intensity beams."

He went on to explain that, in the area of large optics, "we plan by the 1990s to demonstrate several approaches for providing the large-diameter ground- and space-based optics required for most directed-energy concepts and all surveillance systems employing optical and electro-optical sensors." In the crucial area of acquiring and tracking targets and then pointing DE weapons against them, the SDI program calls for tests in space of the ability to point with the required degree of accuracy after targets have been identified and tracked. Finally, he said, "we are considering integrated technology experiments to show that we can integrate the weapon subsystems with adequate efficiency." These demonstrations are essential to determine "whether we are ready to move into the more complex system level demonstrations required in SDI's technology validation phase."

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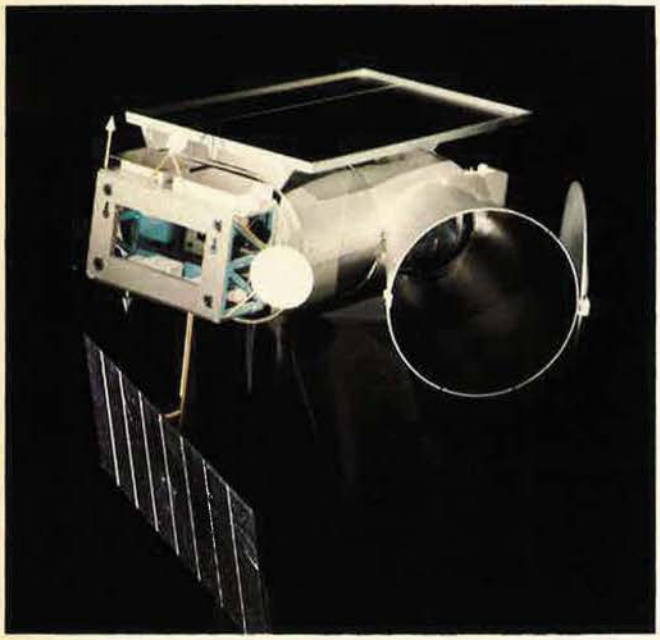
The Post-Boost and Midcourse Phases

During the second and third segments of ballistic missile trajectories—when the "bus" dispatches the individual reentry vehicles toward their targets and deploys whatever penetration aids have been programmed for the flight, which then travel through space several hundred miles up—both directed-energy and kinetic-energy weapons can theoretically be brought to bear against them. Kinetic-energy weapons include interceptor missiles and hypervelocity gun systems. Their primary roles include midcourse engagement of reentry vehicles that have eluded intercepts during the boost and post-boost phases and of post-boost vehicles that have not dispensed all of their RVs. Kinetic-energy weapons also might be used against surviving RVs when they reenter the atmosphere during the terminal phase of their trajectory as well as for defense of space platforms against threats that are not vulnerable to DE weapons.



This artist's conception shows what a space-based directed-energy weapon system might look like. The telescope-baffle assembly, thermal radiator, and solar array are in the foreground. Specific decisions on whether such systems should be ground-based and operated in conjunction with mirrors in space or function autonomously in space have yet to be made.

Other potential applications of kinetic-energy weapons could include intercepts of short-range SLBMs during their boost phase as well as of other ballistic missiles during various flight phases following the launch of kinetic-energy weapons from space platforms. This type of weapon will rely on high-velocity kill mechanisms. The technological underpinning of these weapons that the SDI program needs to provide includes fire control along with basic guidance and control as well as specialized warheads, fuzing, and guided projectiles and associated launch mechanisms.

Some of the kinetic-weapons concepts under consideration for eventual SDI roles are "very attractive," according to General Abrahamson, and include several types of rail guns that, operated from the ground, have produced velocities in excess of Mach 20. The SDI Director called special attention to the recent intercept of an ICBM RV at an altitude above 100 miles over the Marshall Islands Kwajalein Missile Range following a flight of almost 4,200 miles from Vandenberg AFB, Calif. Both missiles involved in this test were Minuteman I ICBMs launched by AFSC's Ballistic Missile Office. The interceptor lofted by the Minuteman I was the Army's optically guided Homing Overlay Experiment (HOE) vehicle.

As the ICBM RV approached Kwajalein atoll, the HOE missile was launched from Meck Island within the Kwajalein complex. Once lofted above the atmosphere by the Minuteman I, the HOE interceptor separated from the launch vehicle, and its on-board guidance system directed it to make a "divert" maneuver onto an intercept course with the approaching target. While the target was still far above the atmosphere, the HOE interceptor's long-wave infrared sensor and guidance computer achieved a lock-on. Long-wave infrared (LWIR) sensors can detect heat emissions against the supercold background of space as minuscule as those generated by a human being over distances beyond a thousand miles. While closing in on the target at a combined speed well in excess of 20,000 feet per second, the HOE interceptor unfurled a metal "net" with a radius of about fifteen feet. Shaped like the frame of an umbrella, the net's ribs are studded with weights that hit the onrushing warhead with destructive impact. Destruction of the target was confirmed by ground-based radars and optical sensors as well as by a specially instrumented intercept-assessment aircraft.

The HOE program is to be merged into the SDI effort under the name of ERIS, for Exoatmospheric Reentry-vehicle Intercept Subsystem. The HOE intercept, described by the Army as a "first" by any nation, was predicated on the LWIR sensor of the experimental missile detecting the RV over a distance of several hundred miles and the on-board computer then guiding the weapon on a precise intercept course. The Army has been working on HOE for about six years, with the objective of determining the basic feasibility of the optical homing technology needed to develop a near-term, nonnuclear interceptor that can destroy an attacker's nuclear missiles outside the atmosphere late in the midcourse phase of their trajectory.

Of the four HOE tests that occurred between May 28, 1983, and June 10, 1984, only the last one succeeded in hitting and destroying the target, but all were considered successful in terms of the tasks the Army assigned to this test program. The first three flights satisfied more than ninety percent of the program's data requirements, even though minor glitches caused the weapon to miss the target, according to Army spokesmen. From the SDI perspective, the HOE program represents a significant, early step toward an operational midcourse interceptor. Most of the HOE components—except for the sensor and computer—were not optimized but jury-rigged from existing parts.

The choice of the Minuteman I missile, for instance, resulted from availability; a much smaller launcher would have been much better suited to the task. There are questions also about the effectiveness of HOE's kill mechanism—the net—compared to nonnuclear explosives. The net, or any other kinetic system, requires direct impact but poses no fuzing problem. A high-

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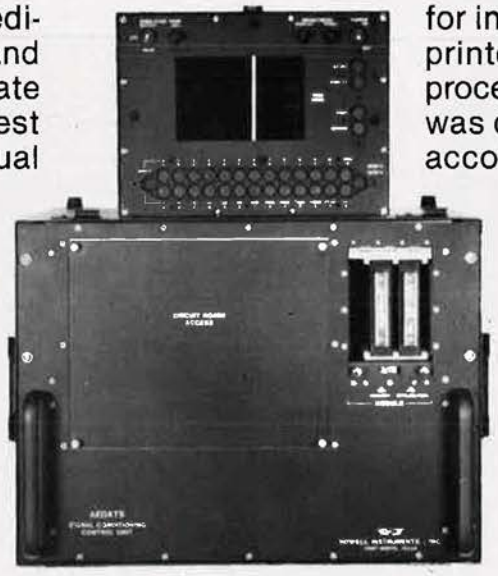

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explosive warhead, on the other hand, could pack greater lethality, but requires perfect timing in terms of detonation because of the extremely high closing speeds.

The Army expects to complete review of the data from the four HOE flights and to finish concept definition of an actual weapon system by the end of this year. Advanced development of such a system, a component of SDI, might then start next year and lead ultimately to engineering development later on.

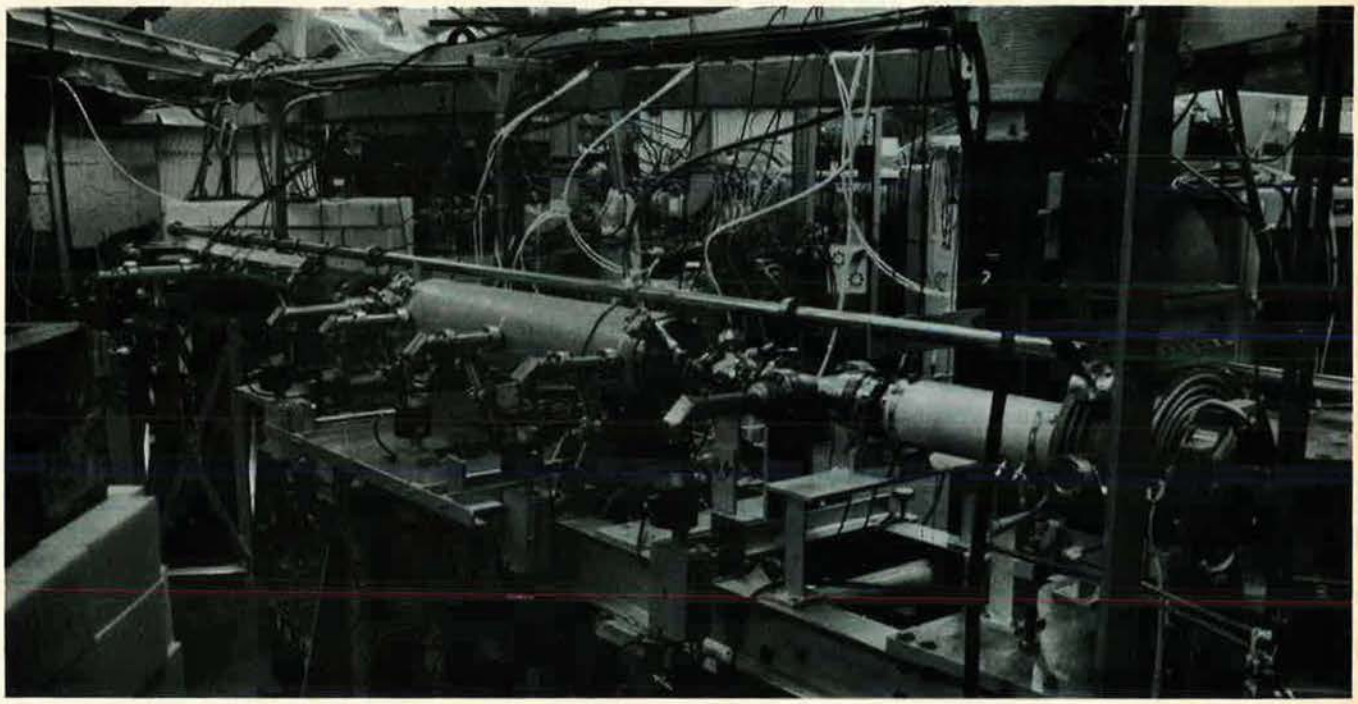
Terminal Defenses

Intercepting warheads in the terminal phase of a ballistic missile attack is tough. As General Abrahamson pointed out, the time to act is brief, and differentiating between warheads and decoys poses an "awesome but not impossible task." The solution of the differentiation problem above the atmosphere may lie in such multi-spectral sensor systems as imaging lasers linked with radar and infrared systems. Such an approach, he explained, would negate most of the attacker's electronic warfare spoofing, but tends to create major data transfer and processing tasks for SDI.

The differentiation problem would go away to a large extent if the defense can occur at low altitudes, significantly below 50,000 feet. The reason is that lightweight decoys descending through the atmosphere either burn up or behave markedly differently from the heavily shielded and intrinsically heavy RVs. Building decoys that are almost as heavy as the RVs themselves to thwart this "atmospheric sorting" process obviously makes little sense since it would eat up too much throw-weight.

But the attacker has a relatively inexpensive and simple way of keeping the defender from waiting until atmospheric sorting has weeded out his penetration aids and countermeasures. It is called salvage fuzing and means that the RV is made to detonate before an approaching interceptor can destroy the nuclear warhead. The SDI approach, therefore, is to intercept at altitudes sufficiently high so that the overpressures reaching the ground from even large Soviet warheads won't exceed a few psi (pounds per square inch). Otherwise, the SDI defenses could be destroyed by a single RV. Present plans are to confine terminal defense to high endoatmospheric systems that intercept at altitudes above 50,000 feet.

As in the case of the other component systems of SDI, terminal defenses won't have to function by themselves but will work together with the other elements in an overlapping fashion. The so-called Future Security Strategy Study, one of two analyses commissioned by the Administration to define SDI, dealt in detail with the cumulative factor associated with multitiered ballistic missile defense systems. The conclusion was that even a "modest level of effectiveness—for example, a kill probability of 0.5 for each layer of a four-layer defense—yields an overall 'leakage' rate of only about six percent for an attack size that does not exceed the total intercept capacity of the various layers."



Neutral particle beam generators appear to have long-term potential for SDI applications. The Los Alamos National Laboratory is testing such a generator called RFQ, for Radio Frequency Quadrupole.

As the study pointed out, "such a leakage rate is, of course, sufficient to create catastrophic damage in an attack of, say, 5,000 reentry vehicles aimed at cities. It would mean 300 RVs arriving at targets—sufficient to destroy a very large part of our urban structure and population." The picture changes drastically, however, in the case of an attack on military targets where such a "leakage rate would be totally inadequate for the offense. The more specific the attack objectives and the higher the confidence required by the offense, the greater the leverage exacted by the defense."

Applying this theory to a specific scenario—that of an attack by 5,000 warheads against the previously mentioned four-layer defense—the Future Security Strategy Study found that "if the defense required a high-confidence penetration against a specific target, it would

need to fire at least thirty RVs [against each] since the defense firing doctrine is unknown to the attacker." It follows that a massive ballistic missile raid—that in the absence of strategic defenses could destroy a vast military target system—would be totally inadequate for the assured destruction of counterforce targets if confronted with a layered defense system of the SDI type.

The Defense Department-sponsored analysis also found that the effectiveness of layered ballistic missile defenses increases dramatically in the case of limited attacks on restricted target systems where the aggressor seeks decisive strategic advantages yet tries to prevent escalation to higher levels of conflict. Layered defenses appear capable of thwarting such an attack for a variety of reasons, according to the study. Among them are unacceptable force drawdown, the uncertainty of the outcome of such an attack, and the requirement to use force to a degree wholly inconsistent with the goal of limiting the level of violence.

Battle Management, C³, and SATKA

While there is at least theoretical evidence that reasonably effective kill mechanisms for the various layers of a ballistic missile defense system can be brought into being over time, serious questions remain about SDI's battle management, especially with regard to architecture, software structure, and the tremendous data-processing problem, according to General Abrahamson. The SDI organization is using an "accelerated procurement concept" involving a number of parallel studies by different segments of industry to mobilize the best talents to tackle the battle-management challenge in the fashion of a "horse race," he said. These individual studies, each in a range from $10 to $12 million, will be based on "very simplified requests for proposals that give industry a great deal of freedom in isolating the key tradeoffs, in establishing alternate architecture concepts, and in encouraging creativity," he stressed.

As a special White House Panel known as the (Dr. James) Fletcher Defensive Technologies Study group has pointed out, in the past, "technology in computer hardware and software and signal processing was incapable of supporting battle management for a multilayered defense. Today, the rapid advancement of these technologies is believed to permit realization of the complex command and control systems needed." General Abrahamson added that "we continue to make such tremendous progress in electronics, especially in microprocessors and chips, that this problem becomes easier every year." As a result, he said, the Defense Department plans to build the system's battle management (BM) and C³ component architecture in a "transparent" fashion so "that we can incorporate future improvements [including faster circuits] without having to disrupt all of our software concepts."

A major challenge is to ensure that the battle management/C³ system can continue to function in an intense nuclear environment. The program, therefore, will explore gallium arsenide and other technologies that resist EMP (electromagnetic pulse) and other nuclear effects, according to the SDI Director. In addition to resisting nuclear effects, SDI's battle management/C³ component system must also be able to continue to work in the face of direct attack as well as under a host of electronic and other countermeasures. Because of the complexity of the tasks assigned to battle management and C³, these two interrelated missions—and the associated technologies—are the subject of intensive systems analyses. The purpose, according to General Abrahamson, is to come up with ways and means that "allow eventual implementation of a highly responsive, ultrareliable, survivable, endurable, and cost-effective BM/C³ system for a low-leakage defense system." The systems analysis project will probe all facets of the SDI program, with emphasis on threat and mission analyses as well as on concept formulation and technology assessment.

Much is expected from SDI's BM/C³ component. If, as General Abrahamson points out, a multitiered defense "were deployed, it would require positive control of its operations. We have to assure that we can turn the system on when it is needed and . . . that it is safe when it is not needed. Just as importantly, the system must not be regarded as a 'paper tiger' by the Soviets if it is to serve as an effective deterrent to nuclear war. Therefore, its credibility must be based on a demonstrated capability to manage surveillance, tracking, and intercept actions over the multiple tiers of this complex system."

That results in a pretty tall order, he concedes. The information-processing task associated with assimilating and combining a torrent of data from large numbers of sensors—in order to perform near-real-time target discrimination and designation, "birth-to-death" tracking, and reliable kill assessments—places unprecedented demands on software development. The first order of business is to come up with the best approaches and tools for creating the advanced processors and software as well as the responsive communications networks that provide high reliability and fault tolerance. Because evaluation and demonstration of SDI's BM/C³ component—and of the total system—will largely depend on simulation, development of realistic modeling and simulation techniques is urgent and crucial, he emphasized.

One of SDI's first tangible efforts in the BM/C³ area centers on the so-called Boost Phase Detection and Tracking System, previously known as the Advanced Warning System. The latter was first thought of as two individual start-up efforts that were to be follow-on programs to the aging Defense Support Program (DSP, also known as the Early Warning Satellites), he explained. But, he added, "we concluded that there is sufficient commonality in the technical challenge that we are driving at here and that our [SDI's] problem is the toughest one. So we have [folded] these follow-on programs into SDI." A dual responsibility goes with the transfer of the Boost Phase Detection and Tracking System to SDI: "Not only do we have to develop the technology for ourselves, but we must also ensure that these follow-on systems meet" the requirements of other users.

In the sense of SDI, BM/C³ systems are inextricably tied to surveillance, acquisition, tracking, and kill assessment (SATKA) that range from sensing of information that triggers defense engagement to battle management and assessment of the status of forces before and during the engagement. Undergirding the SDI design philosophy is that "surveillance and acquisition should be autonomous in each phase of the engagement, but

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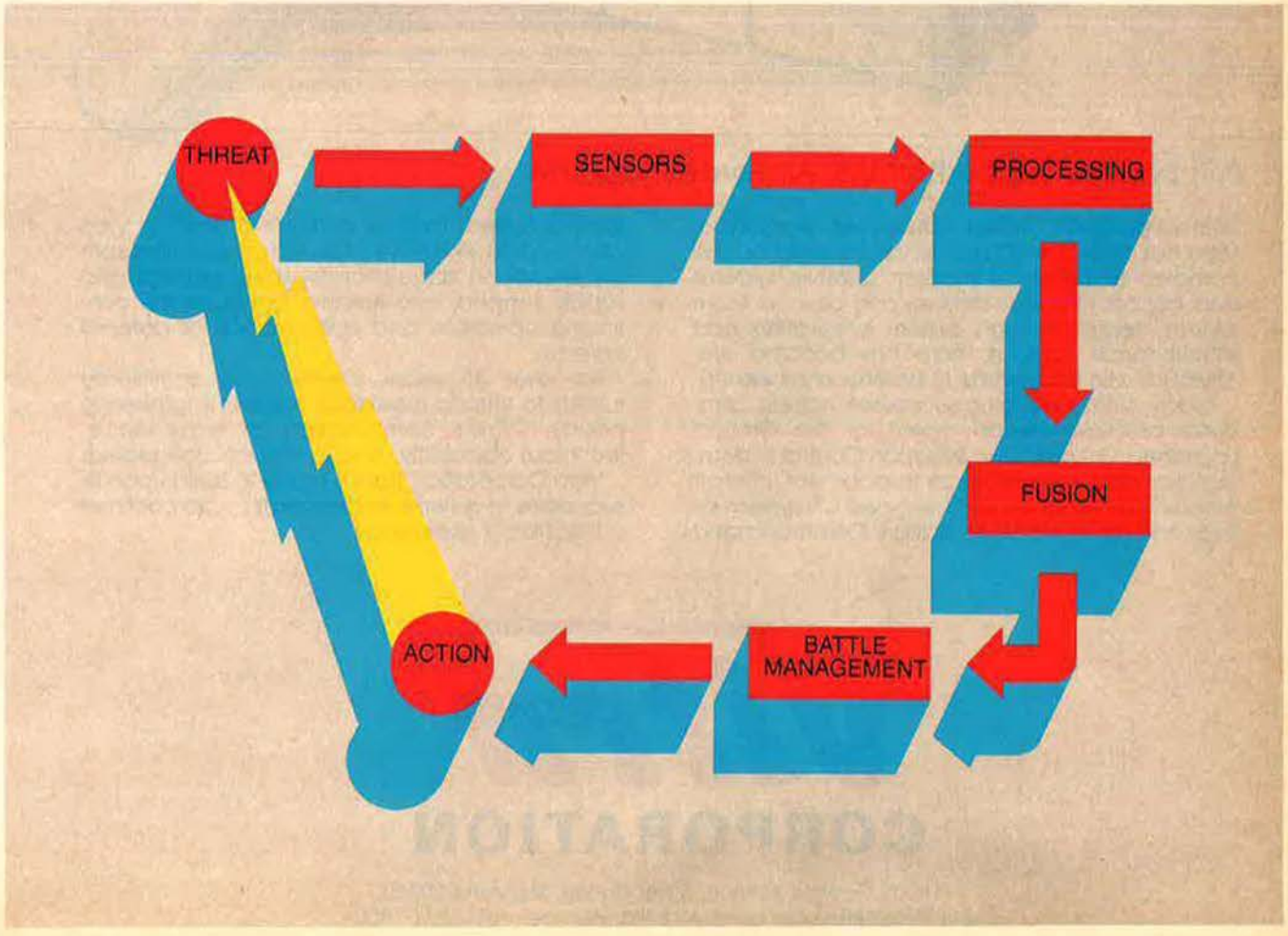

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that tracking and kill assessment should be consultative through battle management," according to General Abrahamson. The reasoning behind this approach is that detection "misses" must not be permitted to occur across the system to hold leakage to a minimum.

Concomitantly, SATKA is to develop and demonstrate the capabilities needed to detect, track, and discriminate objects in all phases of ballistic missile trajectories. Among the key technologies to be investigated are optical imaging using lasers rather than radar beams and advanced concepts of cooled infrared sensors and near-real-time data processing. Imaging radar technologies will also be pursued. Another central objective is research on optical, infrared, and radar signatures of reentry vehicles and penetration aids.

Initially, four demonstration efforts—one of them centered on the boost-phase detection and tracking system—are planned, including the tracking and discrimination of attacking objects in midcourse using advanced LWIR sensors. In addition, the Army's Airborne Optical System (AOS) development program is to demonstrate the feasibility of identifying and tracking objects reentering the atmosphere from space by means of airborne infrared sensors. Imaging and tracking by ground-based radars will continue to be demonstrated and refined by the Army's terminal and midcourse defense programs.

As such advanced technologies as radar and optical imaging mature, they will be added to the SATKA demonstration effort so that, eventually, sufficient technical information is on hand to determine whether or not layered defensive systems can be provided with the quintessential battle management, C^3, and SATKA capabilities, the SDI Director pointed out.

Survivability and Countermeasures

Along with battle management, the ability to solve the survivability and countermeasures challenge represents one of the most difficult tasks facing the SDI program, according to General Abrahamson. In an organizational sense, these areas are under the purview of the SDI "support programs." The ability of a layered, complex ballistic missile defense system to survive in the face of dedicated attack and to continue to function effectively is yet to be established and demonstrated. As General Abrahamson put it, "Relevant research [must be carried out in an open-ended fashion] because if there is an easy way of spoofing, destroying, or reducing the effectiveness of the system, you would have a real problem." The outlook is not unrelievedly bleak, in his view: "Space is a battlefield in depth, and, since we are dealing with a system [consisting of various layers and] constellations, there are both operational and technical options" for countering evolving survivability and countermeasures threats to SDI.

He acknowledged that space systems at present are excessively vulnerable, but suggested that, in the case of SDI's space-based components, it should be possible to alleviate the problem considerably: "The reason for this vulnerability is that [in the past] we concentrated on [satellite] performance [at a time when we were handicapped] in terms of launch weight and volume. That is why it is so important that we make full use of the Shuttle and maybe, later on, of a larger launch vehicle."

As far as SDI is concerned, he saw no need for a backup of the Shuttle by ELVs (expendable launch vehicles) or such long-term concepts as TAVs (transatmospheric vehicles), because "in wartime the system has to be up there and working. The [system's orbital] spares have to be in place" since there are no realistic means for reconstituting space-based SDI components during a nuclear conflict. Eventually it might become essential, however, to develop a very large boost capability—meaning a vehicle similar to Saturn V, the mainstay of the Apollo program, or a Shuttle-derived large, multiple booster design—to be able to place large payloads into orbit economically.

Linking spacecraft survivability to economical launch capability, General Abrahamson stressed that the ability to build space systems unconstrained in terms of weight and volume by their launch vehicles appears to be a pivotal factor in solving their vulnerability problems. So far as countermeasures are concerned, SDI presumably will have to engage in the same kind of continual electronic warfare "cat and mouse game" as military aviation has had to for decades, the SDI Director predicted.

Another important task assigned SDI's support programs centers on scientifically gauging for each weapon concept under consideration the "minimum energy that would be required under various engagement scenarios to kill unhardened, retrofit hardened, and responsively hardened Soviet systems." This information will have a large effect on SDI's design approaches and concept selections. Improved space logistics, especially economic and sophisticated orbital transfer vehicle capabilities that SDI is likely to require, will also be pursued by the support programs. He added that "we will also evaluate the technical feasibility and cost-effectiveness of using extraterrestrial materials for certain SDI applications."

Solving the strategic air-breathing threat—meaning bombers, cruise missiles, and related "stealthy" systems operating in the atmosphere rather than in space—is "not in my charter at this time," General Abrahamson pointed out. The ballistic missile threat, he explained, has always been the most destabilizing, dangerous, and hardest to solve: "I am sure that the [SDI] technologies will offer some collateral advantages that can assist in coping with the air-breathing threat. If that is the case, we will apply them. There are other studies that are going to examine [this type of SDI spinoff in concert with] aggressive independent efforts to solve the air-breathing threat." General Abrahamson said that SDI will not assess the various functions that operational systems eventually might perform in a "roles-and-missions context" vis-à-vis the individual services.

The central decision on whether or not national security and strategic stability will be increased or decreased by fielding a given comprehensive strategic defense is clearly many years away. In the interim, SDI's paramount task is to keep that decision from going the wrong way: If a system is eventually deployed, it must work—and be perceived by the Soviets as working—as advertised. The consequences of fielding defenses that appear to work but in actuality won't work and won't deter could be tragic, especially if they cause steep reductions in offensive capability without offsetting gains on the defensive side. ■

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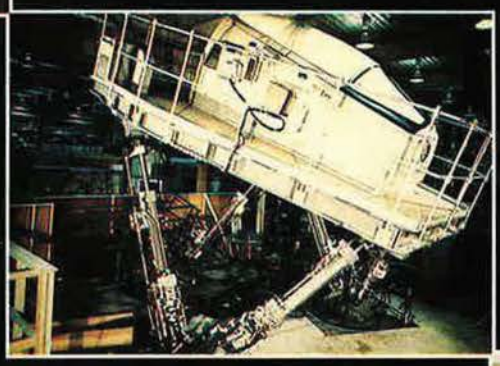

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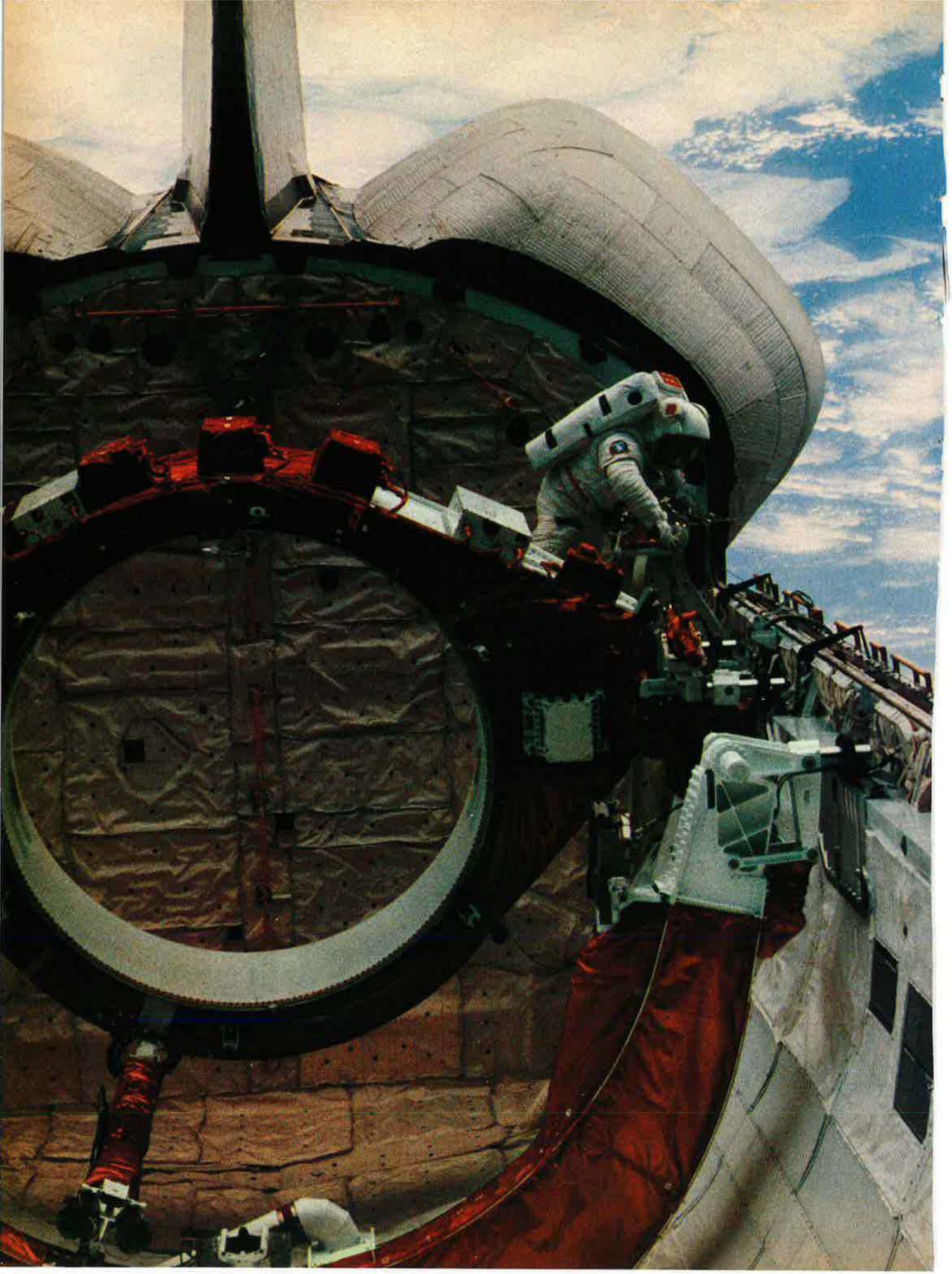

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At Kadena, they do it right.

HOT WING

BY LT. COL. CHARLES G. TUCKER, USAF

"IF YOU don't take care of your people, you can't fly and fight," read the plaque that hung outside the office of Maj. Gen. Thomas G. McInerney, the former 313th Air Division Commander at Kadena AB, Okinawa, Japan.

Those words have not been forgotten. Air Force people at Kadena are taken care of, and they have proved repeatedly that their ability to fly and fight is second to none.

The people of Kadena's 18th Tac-

One important training activity at Kadena is the 18th Wing's "combat turn" and sortie surge exercises. The object is to refuel, rearm, and relaunch aircraft within thirty minutes—procedures particularly useful during exercises that approximate combat conditions.

tical Fighter Wing have compiled a record of success that provides ample evidence of their capabilities. They achieved an unprecedented "first" by winning the Hughes Trophy, presented annually to the Air Force's best air-superiority fighter squadron, three years running.

In 1981, the trophy went to the wing's 12th Tactical Fighter Squadron, in 1982 to their 18th TFS, and in 1983, the wing's other F-15 squadron, the 67th TFS, took the award.

In 1982, the wing demonstrated its ability with the longest nonstop flight ever for single-seat aircraft when six Kadena F-15s flew 7,000 miles to Tyndall AFB, Fla., in fifteen hours for the William Tell air-to-air competition.

Accompanying the F-15s was a Strategic Air Command KC-10A Extender tanker/cargo aircraft that also carried the wing's fifty-eight-person support force. This enabled the crew chiefs who launched their aircraft to recover them—half a world away.

And after all that, the wing's team took the lion's share of the honors in the competition—the top gun trophy, top weapons battle management team, best weapons control team, top F-15, and overall winner.

The F-15, RF-4, and T-39 flying units of the 18th TFW aren't the only Kadena flying units that regularly demonstrate their capabilities. One of the largest operational bases

It's not all sortie surge. The Kadena marina is just minutes from the base. The facility has boats for rent, scuba-diving gear for sale or rent, and offers sailing lessons, a seafood restaurant, and one of the world's great beaches.

Kadena crews regularly take part in exercises with sister services and allied units. Here USAF and Japanese crew members attend a briefing. (USAF photo by SSgt. Steve McGill)

in the Air Force, Kadena also hosts SAC units flying KC-135s, KC-10s, RC-135s, and SR-71s; a TAC airborne warning and control squadron flying the E-3A; MAC units flying the HC-130 and HH-3; a Navy P-3 Orion unit; and the whole family of Marine Corps aircraft.

Backing up Kadena's flying units are some of the most dedicated and capable support people in the Air Force—including the largest munitions squadron in the Air Force. The 500-person 400th Munitions Maintenance Squadron supports conventional-weapons storage and maintenance for the Pacific theater.

Okinawa's strategic location makes Kadena ideally situated to support real-world contingency operations. For example, hours after Korean Air Lines Flight 007 was shot down by a Soviet fighter, Kadena F-15s were on alert in Northern Japan. Supporting the F-15s were an E-3A from the base's 961st AWACS Squadron and a team of maintenance and intelligence specialists from Kadena units. In addition, Kadena's HC-130s flew almost two dozen missions over the search area, looking for wreckage and possible survivors.

At Kadena, taking care of people is a partner with operational excellence. Kadena people are taken care of and appreciate their exciting mission. Consequently, sixty-eight percent of the base's Air Force people have extended beyond their original tours—twice the rate of two years ago.

Perhaps that's not surprising in light of the improvements to base facilities made in the past few years.

Housing and recreational facilities, once suffering severely from austere funding, have taken on a new look: Almost $2 million was spent in eighteen months to add carpets and new furniture to base dor-

Above: F-15s over Kadena. The 313th Air Division is the parent USAF unit in Okinawa, responsible for some 14,000 acres of real estate at a dozen sites, including Kadena.

Fifty all-weather shelters, like those on the left of this taxiing F-15, were completed by the government of Japan last year at a cost of $3 million.

mitory rooms; five new restaurants and an Airmen's Club have opened; NCO and Officers' Clubs have been renovated; a base marina, complete with beach, boats, and seaside restaurant, added a new dimension to scuba diving, an ever-popular pastime throughout Okinawa; about 500 new housing units have been built and more are scheduled to be built; and the Japanese government contributed a new elementary school and other facilities to support the base population of 24,000 military and family members and civilian employees.

And then, in addition to the challenging mission and greatly improved facilities, there's the island itself.

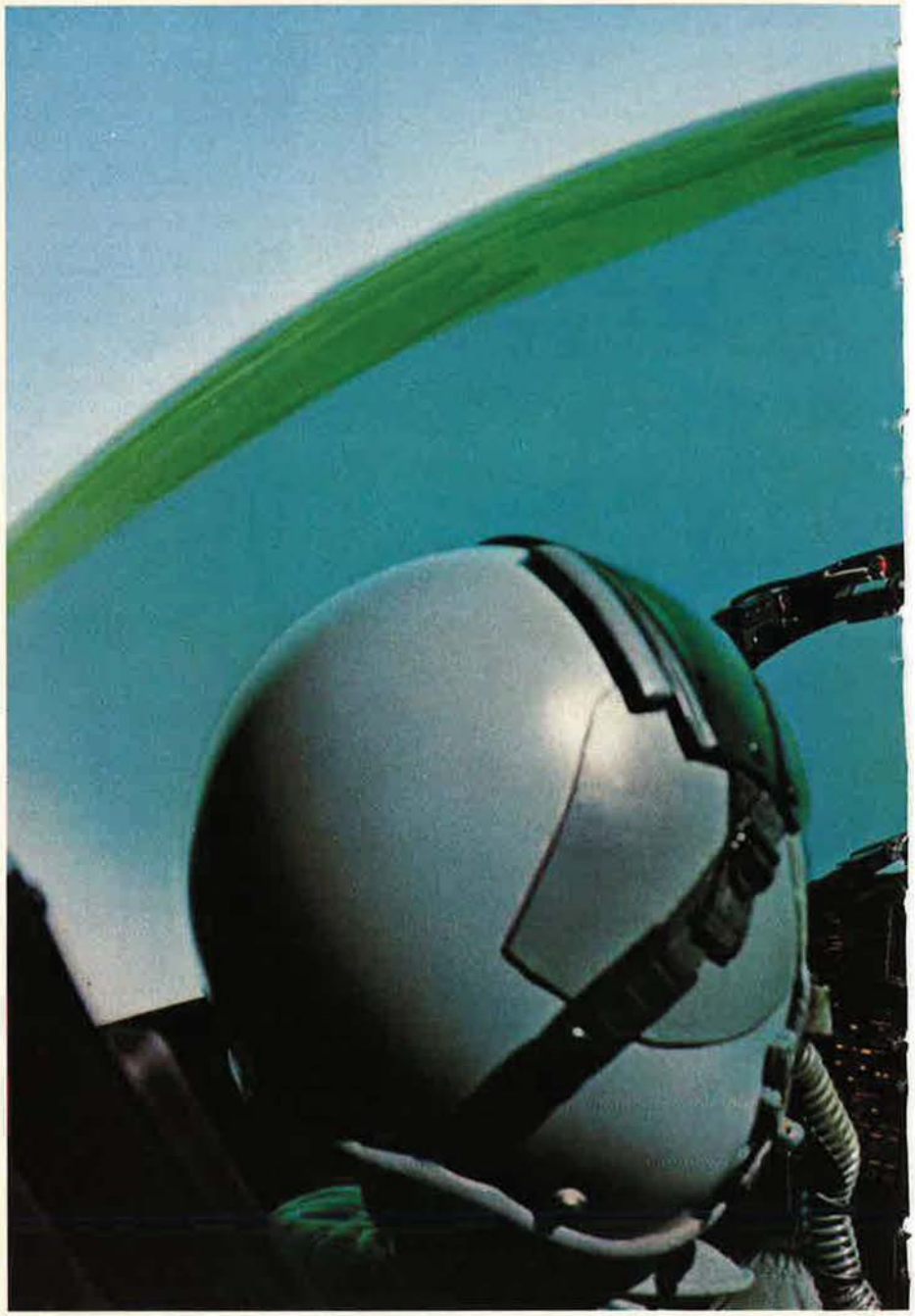
Located about 960 miles from Tokyo and 900 miles from Hong Kong, this Rhode Island-sized island presents a beautiful picture of sloping green expanses and crop fields bounded by the emerald green of the Pacific and East China Sea.

Coral reefs surround the island, making it an ideal place for swimming, fishing, snorkeling, and scuba diving—sports that are popular at Kadena. The Florida-like weather features temperatures ranging from the eighties and nineties in summer to the mid-fifties in winter.

Kadena has taken on a new look—a look that is reflected in the enthusiasm of Kadena's Air Force population for their important mission and the life they've found on Okinawa. ■

Lt. Col. Charles G. Tucker, USAF, is the Deputy Director of Public Affairs for Pacific Air Forces at Hickam AFB, Hawaii. Colonel Tucker was a Contributing Editor of AIR FORCE *Magazine in 1978–79 under the Air Force's Education With Industry Program. A career PAO, he holds a master's in public relations.*

MISSION: OPERATION WARFARE TASK SIMUL



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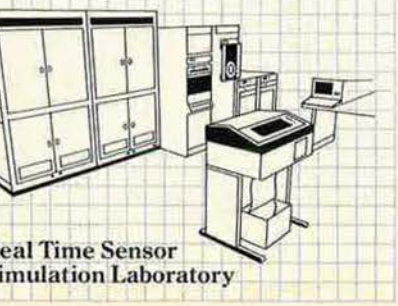

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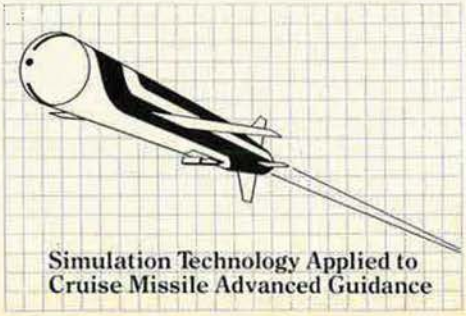

Simulation Technology Applied to Cruise Missile Advanced Guidance

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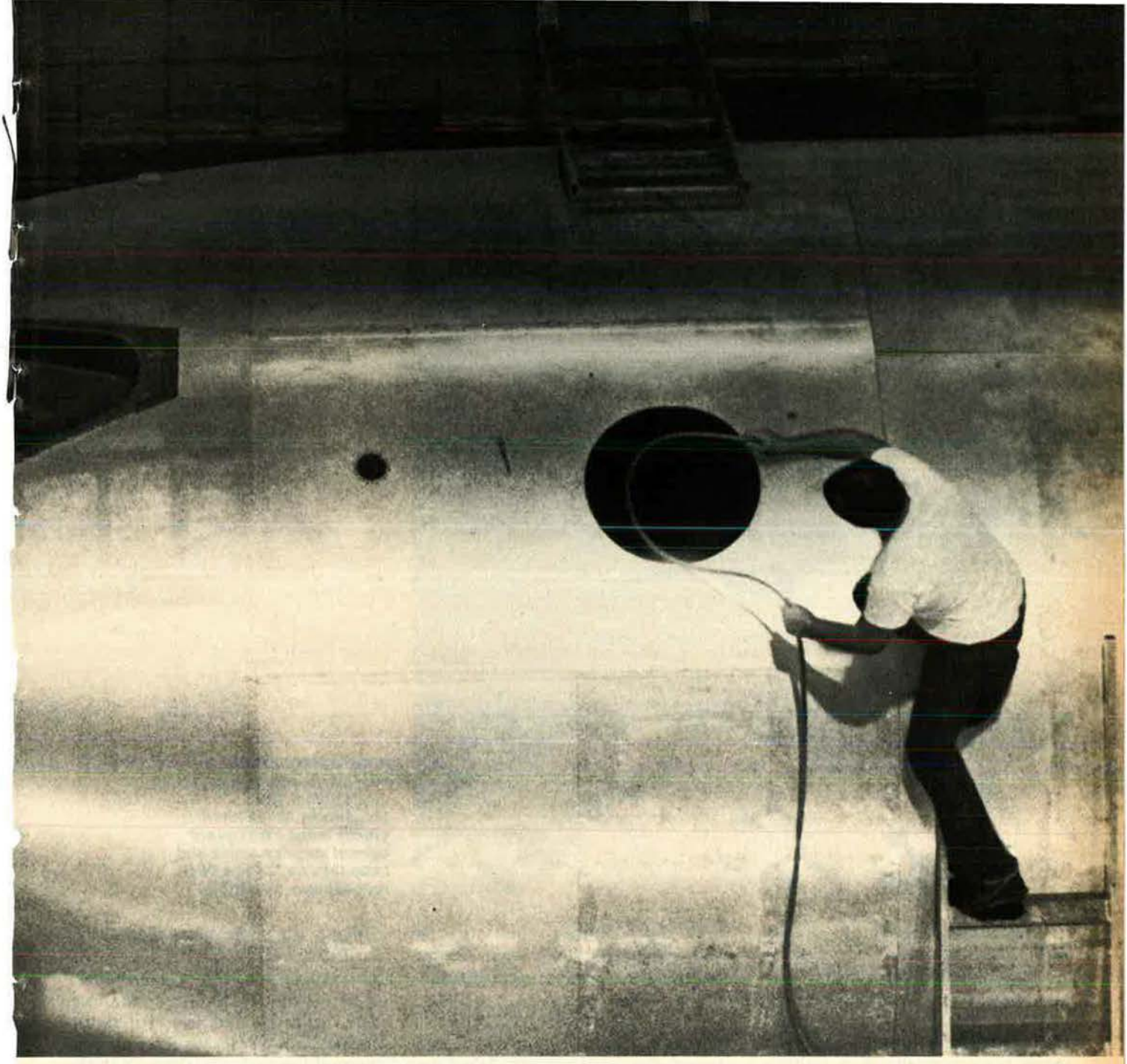
GOODYEAR AEROSPACE

The C-5B. Major assembly off to a fast start.



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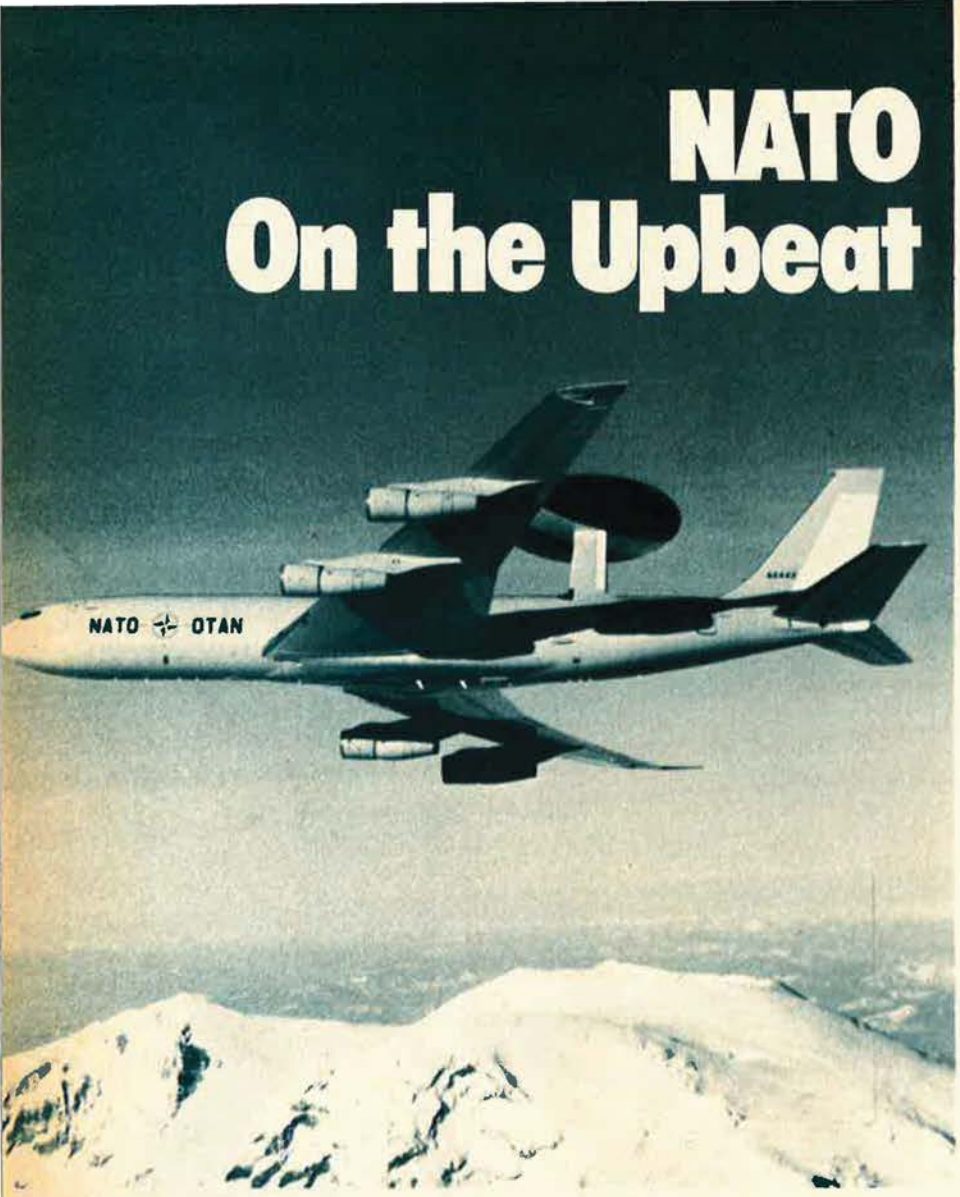
NATO On the Upbeat

Allied air forces would not be blown out in a Warsaw Pact attack.

BY JAMES W. CANAN
SENIOR EDITOR



A NATO E-3A AWACS aircraft on lookout station over Europe. The burgeoning NE-3A force greatly helps NATO guard against surprise attack and keep tabs on Warsaw Pact rear-echelon formations.

In some very important respects, the North Atlantic Treaty Organization is on the upbeat. NATO has a long way to go. Yet it is better off today than it has been for many years, and opportunity is at hand for major improvements of its military capability in the form of weapons, tactics, and force structures.

NATO is often portrayed in the US as a haphazard military confederation of stingy and self-absorbed Western European nations who stand pat and let the Americans do it all in defense of their soil. At Allied Command Europe (ACE) headquarters in Belgium, however, a different, more heartening assessment comes through.

Even though ACE's senior officers candidly acknowledge the Atlantic Alliance's many serious military shortcomings, they stop far short of leaving it for dead. On the contrary, they convey a certain optimism.

For one thing, they agree that if Warsaw Pact commanders are smart, they will not put Allied airpower to the test over Western Europe. They would take on more than they could handle, at least for openers, such officers claim.

Numerous Improvements

NATO's situation has improved in many respects over just the past few years. The introduction of the NE-3A AWACS aircraft as the mainstays of the direly needed NATO Airborne Early Warning (NAEW) system is a major reason for this. Others are:

- US Army Gen. Bernard W. Rogers, Supreme Allied Commander Europe (SACEUR), has introduced a new concept, taking advantage of high-technology weapons and sophisticated C^3I, for counterattacking Warsaw Pact air and ground forces far to the rear of the battlefield, thus foiling their reinforcement of the front. It is controversial, but holds high promise.
- Modernization of ACE fighter and air-to-ground forces is afoot and is being extended—in the form of plans for new, advanced fighters and ever-smarter munitions and submunitions—into the 1990s.
- Despite much political and social agonizing in some Western European nations, the US Pershing II missiles and ground-launched cruise missiles (GLCMs) have been accepted on the continent, with

only a few hitches, and their deployment has begun.

Those missiles will greatly help to redress an imbalance of intermediate-range nuclear weapons that had reached runaway proportions in favor of the Warsaw Pact. Their advent has done wonders for military morale and cohesion within NATO.

- C^3 assets are being coordinated much more fully, utilizing state-of-the-art technologies for the fusion and distribution of information on which command decisions depend. Also in the works, as one ACE officer puts it, are "plans to frame the whole [ACE] C^3 structure for 1990 and later."
- France—a NATO member but still adamantly divorced from the Alliance's military structure—is cooperating with ACE in exercises and in technical and tactical planning to an extent unheard of in recent years.

This leads ACE officials to assume that France, which maintains a division in West Germany and highly capable tactical air units at home, would allocate combat assets to ACE in the event of a Pact attack, all under the banner of self-defense, of course.

France is even anxious to join with West Germany, the UK, Italy, and Spain in developing and producing a new multinational fighter for the 1990s and beyond.

- The flight crews of Allied air forces are first rate, and their training with one another, and with the US Air Forces in Europe (USAFE), leaves nothing to be desired.

There is no longer any chance, as once there might have been, that Allied air forces in Europe would be blown out in a Pact attack.

Matchups and Sustainability

"If it is their airpower vs. our airpower—matching what they've got on their airfields with what we've got on ours—we'd match them, we'd win," confidently asserts one European officer assigned to ACE.

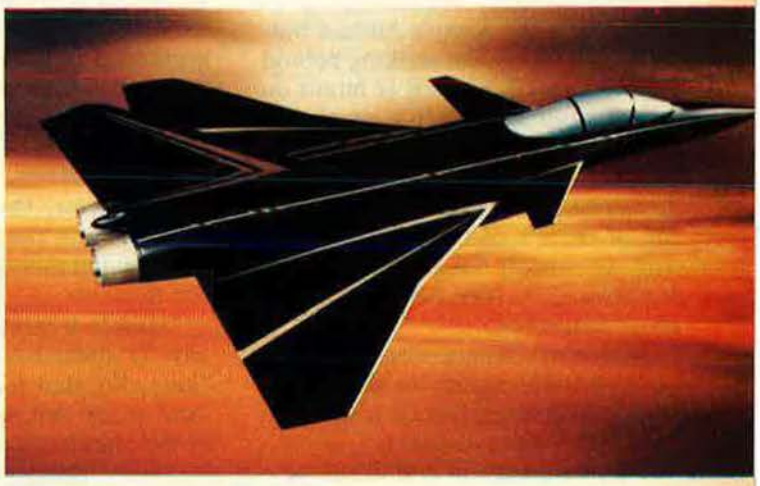
The gut question, though, is one of staying power. The Pact air arm is widening the numbers gap and closing the technology gap in aircraft and missiles. This same adverse trend pertains on the ground.

"How long we could bloody them is getting more problematical all the time," adds another ACE officer. "Our forces are just not sustainable for a long period of time. We may do marvelously well, but at a given point in time, it doesn't matter whether we're ahead or behind, we're going to be out of munitions. High-technology airplanes don't do much good when they don't have something to fire."

Prepositioned US stockpiles of war reserve materiel seem sufficient for American forces in ACE to sustain conventional combat for a month or more, providing that land and air reinforcements arrive from the US in time to do much good.

But such stockpiles of most other Allied nations fall far short of what is required, and it is likely that those nations would have to draw from US supplies amid severe problems of how and where to allocate them under stress.

The big problem for ACE is that the Pact can reinforce its line land units and its forward-based ground-attack and interceptor wings much more quickly than can NATO, which is heavily dependent on reinforcements from the US.



Courtesy of the French Air Force, this artist's drawing depicts Dassault-Breguet's design of the French—and possibly European—fighter of the future.

Low Nuclear Threshold

This is the main reason why General Rogers declares that "the current conventional posture of Allied Command Europe does not provide our nations with adequate deterrence, and leaves the nuclear threshold at a disturbingly low level."

As things now stand, ACE probably would have to turn to tactical nuclear weapons fairly early in the game in order to stop Pact reinforcements from breaking through and rolling on. To SACEUR, however, a rosier scenario for the future looks something like this:

Pact land and air forces assault Allied positions in central Europe along a broad front. They are blunted, but at heavy cost to Allied air and ground units. At one or two points, they nearly break through.

From the east, a second, reinforcing echelon of Pact land Operational Maneuver Groups (OMGs) and air units moves out for the front and for Pact forward air bases. They are scheduled to renew the assault at salients in the Allied line within thirty-six hours. They will almost certainly breach that line.

NATO's AWACS aircraft and TR-1 tactical reconnaissance aircraft, equipped with wonder-working radars and swift, secure communications links, spot the fresh wave of Pact air and ground formations deploying. They pass along what they see, continuously and with precision, to Allied command posts. EF-111s jam Pact communications.

From air and land, Allied standoff missiles and multipurpose submunitions blast bridges, railway lines and switching yards, tunnels, and defiles ahead of the reinforcing armored units. They also catch the armor stacking up behind the chokepoints they have created. They blast airfields in the bargain, destroying many Pact aircraft on the ground, and denying havens for others then in the air.

So the second echelon is stymied. The third is blocked behind it. Neither can get to the front, which is at a standoff. Now it is the Warsaw Pact—not NATO—that must make

the awesome decision to resort to nuclear weapons. FOFA has worked.

The FOFA Concept

FOFA stands for Follow-On Forces Attack, a tactical concept that General Rogers has propounded for NATO. The hot topic wherever ACE's multinational officers congregate, FOFA would provide something that NATO has never had and, given its manpower deficiencies, otherwise never would—defense in depth.

Only in this case, the depth would be behind enemy lines, not NATO's.

SACEUR's concept, now being translated into doctrine, would take advantage of so-called Emerging Technologies ("ET" is a term newly fashionable in NATO parlance) of precision-guided missiles and other smart munitions launched against targets at varying standoff ranges.

FOFA has its genesis in the US Assault Breaker technology program and in the Army's Airland Battle 2000 doctrine for striking behind enemy lines. SACEUR is intent on tailoring both to ACE's particular mission in the form of the FOFA concept, which he regards as the key to the sorely needed strengthening of ACE's conventional forces and to much less reliance on NATO's very tenuous tactical nuclear deterrent.

As General Rogers sees it, ACE's conventional ability to defeat the Pact's follow-on forces hinges on two main improvements:

- In the means of collecting, processing, and disseminating intelligence for locating and identifying targets very deep, maybe 200 to 300 kilometers, behind the battle line.
- In the standoff air and land conventional weapon systems needed to engage and destroy those targets.

European Concerns

Some European allies, Germany in particular, worry that paying the high costs of the high-technology weapons needed to implement the FOFA concept will inevitably result in skimping on funds for NATO's time-honored forward-defense capability. Such allies also suspect that FOFA will lead to more of the same in the European weapons market—Europeans buying high-technology weapons from the US, but, as usual, not the other way around.

General Rogers insists that such fears are unfounded. In his view, FOFA will augment, not detract from, the NATO doctrine of forward defense and flexible response. He also believes that FOFA could well lead, for the first time ever, to a workable way of standardizing weapons among NATO forces.

How? By having companies in each nation take the lead in producing particular types of ET weapons for which they are best suited.

As General Rogers describes it: "The direction in which I think we should go is to say, all right, you, the United Kingdom, you are now producing what is known as the JP-233 Runway Buster, which is relevant to attacking the follow-on forces by keeping their airpower off of us.

"You produce all those for the rest of the nations.

"You, Germany, are just this year, 1984, bringing out this pod that attaches to the bottom of your Tornado aircraft that has 600 to 700 submunitions in it—and you can make them of various types to reach back once those chokepoints are created, and strike those forces that are behind it.

"And you, the United States, you're doing pretty well on precision-guided missiles, so you do that for us.

"Here's a golden opportunity, I say, for specialization, with lead nations allocated to specific systems. And from that specialization will come standardization."

Tall Order

It's a nice idea but a tall order. As General Rogers himself admits: "All we hear is 'Buy America,' 'Buy England,' 'Buy Germany,'—and these sentiments have made it very difficult in the past for us to standardize."

This simply has to change, the General warns, because "we're right at the crossroads now" in choosing the way to greater military and industrial capability in Europe at a price NATO nations can afford to pay.

Skeptics may scoff, but the signs are in SACEUR's favor. General Rogers has managed to get NATO's defense ministers to approve his FOFA concept, from which standardization could flow. He also has introduced the concept into the force and weapons planning goals of all NATO nations.

At a meeting earlier this year, the Conference of NATO Armaments Directors (the officials who match national weapons requirements with NATO force structure goals) undertook a study of SACEUR's proposal for lead-nation specialization in weapons production.

Last May, NATO defense ministers, meeting in Brussels, formally agreed on their common need to exploit emerging technologies for the sake of a better conventional defense of Western Europe. To the expressed satisfaction of US Secretary of Defense Caspar W. Weinberger, they identified eleven systems for immediate consideration—including communications and jamming equipment, laser-guided munitions, and an identification, friend or foe (IFF) system for aircraft that is one of NATO's most urgent requirements.

All are germane to the exploitation of the FOFA concept, which ACE officials believe can be brought into play by the end of this decade if enough nations follow through on it.

Basic to Airpower

In terms of airpower, the concept is far from revolutionary. It is nothing more than the deep interdiction that has always been a basic element of NATO tactical air doctrine. However, it enlivens that doctrine through an infusion of swift intelligence and smart weapons.

"What we did in World War II by going for bridges over the Rhine and targets like that is exactly the same thing we're talking about now," explains one ACE air officer. "But instead of doing it on the basis of two-day-old information about enemy movements, troop trains, or whatever, our whole idea now is to get a complete system for real-time intelligence, feed it into the command structure, and make timely decisions for action—very effective air strikes and surface-to-surface missile strikes.

"The idea is to hit the targets when they're vulnerable, not two days later in a rigidly planned interdiction campaign, but immediately, when they have problems because they have choked up—maybe one of

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their trains has derailed. Then we can attack that point, and two hours later we can handle everything that's blocked up behind it."

Adds another air officer: "We are already trained to do interdiction. Every pilot is taught how to do this. We have the aircraft, we have the crew, we have the commanders in control right now to do it in a limited way."

The Recce Requirement

"The one thing that prevents FOFA from taking place right now is reconnaissance. We do not know what targets we are going to attack. [But] we are planning. We are looking at the disposition of the Warsaw Pact forces. We know what their doctrine is. We know what their tactics are likely to be.

"We could probably come up with a very sound plan—high probability effectiveness where choice targets would be between the FEBA [forward edge of the battle area] and 115 to 200 to 300 kilometers behind the FEBA.

"We could do that today. We do not know what the measure of our success would be. The Warsaw Pact has sound [air] defenses. We have to try to come up with some conclusions, and we are doing this."

Adds yet another ACE officer: "Their [Pact] defenses are awfully tough. They have overlapping coverages. Unless we are very effective in suppressing those defenses, unless we have adequate countermeasures, we are going to get shot down.

"And we need one more thing. It's called surprise."

The problem with this is that NATO would go to war only if attacked, so the element of surprise rests with the other side. The way some ACE officials see it, the Alliance is set up as a punching bag—and sooner or later, punching bags get punched.

The bright side is that NATO is now much better able to see a punch coming. Thanks to its NE-3As and Nimrods, its peripheral vision has vastly improved.

Royal Air Force Tornado and Nimrod aircraft form up tightly. Ground-attack Tornados upgrade the RAF's deep interdiction capability from bases in West Germany. Upgraded Nimrods join the NE-3As in the effective NATO Airborne Early Warning Force (NAEWF).

The NATO Airborne Early Warning (NAEW) Force composed of those aircraft is by now a going concern. NE-3As have been operating from their main base at Geilenkirchen, Germany, since February 1982. More than half of their total complement of eighteen aircraft are in place, and all are expected to be operational by mid-1985.

NE-3A Success Story

"The NE-3As exercise all over Europe all the time," says USAF Gen. James E. Dalton, SHAPE Chief of Staff. "They are a great success story."

In full bloom, the NAEW Force will consist of the NE-3As and eleven British Nimrod Mark 3 aircraft. Both embody improvements over original models, most especially in radar and computer software modifications for tracking targets on land and sea, in increased speed and capacity of computers, and in sophisticated radio gear. Both are capable of relaying information to aircraft and ground stations.

The Nimrods' main operating base is RAF Waddington. They are manned by RAF crews. But the NE-3A squadrons are truly international, composed of crews integrated from eleven nations—Belgium, Canada, Denmark, Germany, Greece, Italy, The Netherlands, Norway, Portugal, Turkey, and the US.

Despite fierce differences between their two nations on NATO's southern flank, the Greek and Turkish members of the NE-3A crews work together smoothly and without acrimony, ACE officers report.

As the first operational force owned and operated not by one nation but by NATO at large, the NE-3A units symbolize what ACE officials see as heightened military ecumenism in the Alliance.

The implications of the NAEW Force for the development of the FOFA concept—let alone for the execution of existing doctrine and tactics—is profound.

Concepts for Employment

At 30,000 feet, each NE-3A can

continuously scan and track air, ground, and maritime targets over a 312,000-square-kilometer area. Loitering well within NATO territory—from the northern tip of Norway south to the Mediterranean and east to Turkey—the NATO AWACS aircraft can look deep into Warsaw Pact environs, detecting and tracking enemy aircraft at very high or very low altitudes over all terrain and giving directions to friendly aircraft as well.

If the shooting starts in Europe, the NE-3As will be dispersed. The first of their three Forward Operating Bases (FOBs) was activated at Konya, Turkey, in late 1983. Two other FOBs, at Preveza, Greece, and at Trapani, Italy, are scheduled for activation late this year.

FOBs for the Nimrod element of the NAEW Force are RAF St. Mawgan and RAF Kinloss. Each of those bases will eventually be capable of accommodating the NE-3As as well.

As of now, the NE-3As are especially significant for the defense of NATO's northern and southern flanks. NATO's central region has a dense, well-developed network of ground-based fixed and mobile early-warning and tracking radars. They provide continuous coverage down to fairly low altitudes.

This is not the case, however, on the flanks, where the more mountainous terrain tends to mask land-based radar coverages. Thus, the flanks are sorely deficient as to radar infrastructures, and their commanders now have much greater reassurance against surprise attack.

Good enough. Still, if war comes to Europe, ACE will have to make some tough decisions, very quickly, about how and where to allocate its NE-3A assets. Such decisions also will pertain to the allocation of, for example, the B-52 bombers on conventional sorties from the US, and F-111 and Tornado aircraft on interdiction sorties from the UK, Germany, and Italy.

Also, as one high-level ACE officer puts it: "We will be looking at tankers too. How many are available in the theater, how are they going to be used, how will they play? Even though they're planned for certain places, are they going to go there when the tactical situation changes? Allocation of all critical all assets will have to be done, and quickly, at the SACEUR level."

There is just no telling how all that will come out under fire. But the intelligence gleaned from the NAEW Force and TR-1 reconnaissance force will certainly help make all things work better for ACE commanders.

Joint STARS Important

The US TR-1 reconnaissance aircraft carrying the precision location strike system (PLSS) will be a big boon to ACE battle execution and to ACE's evolution of the FOFA concept. PLSS is a radar system designed for all-weather strike capability against both emitting and nonradiating targets.

The first TR-1 was deployed with US Strategic Air Command's 17th Reconnaissance Wing at RAF Alconbury, the UK, in February 1983. That wing, which had been activated in September 1982, will be filled out with TR-1s late next year.

Another key player in the tactics of FOFA will be the Joint Surveillance and Target Attack Radar System (Joint STARS), which the Air Force and the Army now agree should be deployed aboard USAFE C-18 aircraft.

Once Joint STARS comes along, it is expected to be highly effective at spotting such moving ground targets as tank and armored personnel carrier formations.

Among other radar development programs conducive to the FOFA concept is the US Advanced Synthetic Aperture Radar System (ASARS) for detecting the movements of such ground targets as tanks and trucks from secure, standoff ranges.

All such systems are destined to make up the C^3I cornerstone of the FOFA concept: intelligence fusion and quick-time command and control against moving targets around the clock in all kinds of weather.

In this context, jammers, too, are highly important. If timely deployment of tactical aircraft against rear-echelon forces proves to be impossible, jammers could be the only means of disrupting those forces.

Land-based missiles clearly have a major role in SACEUR's FOFA game plan. A prime candidate was the joint tactical missile system (JTACMS) now being developed by Martin Marietta Corp. and LTV Corp., makers respectively of the land-based Pershing II and Lance II theater nuclear missiles. Now JTACMS seems to have given way to separate systems for the Army and for USAF, which is considering a new cruise missile.

At the moment and for some time to come, however, only the Allied air forces in Europe have the means of striking deep beyond the battle area in anywhere near the profusion, or with the precision, that the FOFA concept demands.

Questions and Controversy

As do all military innovations, the FOFA concept raises some questions and controversy. When Allied army officers talk of striking deep, they mean maybe thirty to fifty kilometers. Air Force officers talk in terms of five to six times that far. Who—land or air commanders—will decide, and which will have tactical control of the standoff weaponry under what circumstances? Which will come first: counterair strikes against airfields or sorties against armored columns?

All such questions must be worked out in ACE studies now under way and in tryouts in the field. One thing is clear: The deeper the strike, the more defense suppression will be needed.

As General Rogers views it, ACE's job will be to mix and match delivery systems, munitions, and targets in the most effective way under a wide variety of possible circumstances. The bad news is that the targets are becoming more numerous and deadly; the good news, that NATO's delivery systems and munitions are steadily improving.

Tornado Adds Dimension

NATO's main means of deep interdiction have been the US F-111s based in the UK and the UK Buccaneers based in Germany. Now the Panavia Tornado adds dimension to NATO's capacity for striking deep.

RAF Germany has already formed two squadrons of Tornados as replacements for its twenty-year-old Buccaneers at Laarbruch. The RAFG Tornados carry the British JP-233 dispenser of runway-cratering submunitions for destroying airfields.

RAFG is also replacing its

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The Air Force program standards called for specific levels of performance, mission readiness, supply and maintenance efficiency —not to mention tight schedules for outfitting, crew training and delivery of the first three aircraft to Andrews Air Force Base. What's more, two mission requirements—one long range, the other medium range—suggested that two aircraft types were needed to do all the work that has to be done.

In the end, the Air Force decided it could get everything it needed in *one* airplane: the Gulfstream III.

The first C-20A Gulfstream III went into service in September 1983, only three months after contract signing, on schedule, within budget. Now that three C-20A Gulfstream IIIs are on duty, they're living up to the long heritage of superior performance, dispatch reliability, systems dependability, low maintenance requirements and cost-effectiveness of Gulfstream executive jets in transporting key executive teams anywhere in the world.

For example, the Air Force said the new aircraft had to be fully mission capable 85% of the time. The C-20A Gulfstream IIIs are currently working upwards from 95%.

The rate of non-mission capable supply—a measure of the inability to dispatch the aircraft because of a parts shortage—could be no more than 1.0%. With the C-20A Gulfstream IIIs, the rate is only 0.50%.

The Gulfstream III's performance not only meets the mission requirements of the C-140 program, it also fills many overseas travel demands for the Special Airlift Mission Fleet. This capability increases the flexibility and efficiency of the Air Force to meet high priority travel requests, yet the C-20As require only 7.5 maintenance man-hours per flight hour compared to 27 for the C-140s they replaced.

Finally, an example of the mission versatility and cost-effectiveness of the C-20A Gulfstream III in meeting the needs of the Special Airlift Mission Fleet:

One C-20A Gulfstream III departed Andrews AFB on a 13 day trip, logging 43 flight hours and traveling to locations in the Pacific. Upon its return to Andrews AFB, it was cleaned, refueled and put to work the next day flying missions in the United States. It required no maintenance for the entire period.

The U.S. Air Force demanded a lot in its new jet transports. By any measure, the C-20A Gulfstream IIIs are delivering everything it asked for.

And more.

Gulfstream Aerospace

For more information about the C-20A Gulfstream III or other mission capabilities of the Gulfstream III, contact Larry O. Oliver, Manager, Military Requirements, Gulfstream Aerospace Corporation, P.O. Box 2206, Savannah, Georgia 31402. Telephone: (912) 964-3246.

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ground-attack Jaguars with nuclear-capable Tornados. It is moving its Buccaneers and Jaguars back to the UK, with the Buccaneers switching to maritime missions and the Jaguars taking the place of Vulcan bombers.

The German Air Force, which flies F-4F Phantoms in the air-superiority, ground attack, and reconnaissance modes, is concentrating for the moment on replacing its old ground attack F-104s with Tornados. It equips the Tornados primarily for counterair operations, and it is eager to get long-range standoff missiles to hang on them to enhance, and perhaps widen, that role.

Just such a missile, now called the LRSOM, has been designed by Germany's Messerschmitt-Bölkow-Blohm. The cost of developing and producing it may be prohibitive for Germany alone, however, and it, like many other weapons projects in the works, may become a multinational project.

The UK also aspires to a long-range standoff missile for counterair and possibly antiarmor missions.

Germany and France are collaborating in the development of a standoff glide weapon with wings that would range out to twenty-five miles and launch bomblets, antitank mines, and other submunitions. Its technology is based on that of MBB's MW-1 submunitions dispenser now slung under the German ground-attack Tornados.

All through Western Europe, the story has the same sweet overtones, one of national fighter forces on the rise, starting with those of USAFE.

With their coproduced F-16s for air-superiority or ground attack, the Belgian, Danish, Dutch, and Norwegian air forces have moved solidly into modernization. Such modernization is coming along more slowly on the southern flank, but coming nonetheless.

Turkey is buying F-16s. Spain, almost a full partner in NATO, is buying F/A-18s. Greece was expected to announce its choice of a new fighter this summer. The Tornado, which is very important to the improvement of Italy's air arm, was among the candidates of choice in Athens.

And then there is France.

A West German Air Force Tornado roars off on afterburners. Replacing F-104s in the ground-attack mode, Germany's Tornados carry multipurpose munitions and await deployment of a new standoff missile.

Intent on upgrading its sea-based, land-based, and airborne nuclear forces as its first order of priority, France agrees with Germany that nuclear deterrence must remain number one in the minds of European military planners, and that raising the nuclear threshold, as SACEUR proposes, may not be so wise. Germany keeps its voice down about this. As a free-lancer, France is much more outspoken about it. Even so, French units exercise regularly and rigorously with their Allied counterparts in Europe, and French military strategists and tacticians discreetly but earnestly take part in NATO military planning conferences.

More Cooperation

The word in NATO, and at Paris headquarters, *Armée de l'Air,* is, in the words of one French official, that "cooperation in tactics, training, and interoperability is improving all the time."

This has not come about in a political vacuum. French President Mitterrand supported the West German government's decision to permit the initial deployment of Pershing II missiles in Germany last year, and encouraged Bonn to stand fast in the face of Soviet pressure and domestic opposition. Moreover, there is a feeling in Europe that in military relationships, France drew closer to the US, at least as a result of their shared experience in Lebanon.

The French five-year military equipment plan, through 1988, calls for the purchase of airborne early warning aircraft as a prime means of improving the capability for carrying out France's number one requirement: defense of France itself.

As late as this summer, officials in Paris claimed that the E-3A was still very much in the running as a possible choice. But they also noted that the French had a problem with E-3A costs and may choose to install AEW radars, maybe British-made, in such European-built aircraft as the Airbus or the French Transall military transport.

In modernizing its air force but maintaining the current level of 450 combat aircraft (not including trans-

ports), France plans to buy and deploy 165 new Mirage 2000 fighters and sixty new Epsilon trainers—light, relatively inexpensive aircraft from which student pilots will transition into Franco-German Alpha Jets.

The first operational squadron of Mirage 2000AD (Air Defense) fighters was scheduled to be on the ramp this July. Once the air defense complement of the Mirage 2000s has been filled out, replacing Mirage IIIs, nuclear-capable Mirage 2000N strike fighters will begin replacing French Jaguars, probably in 1987.

In this French Air Force photo, a new Mirage 2000 fighter, loaded for bear, works out over Europe. The Mirage 2000 is the key to the modernization of France's air defense and nuclear-attack squadrons at a time of increasing French cooperation with NATO forces.

The air-defense Mirages are armed with Magic IR missiles and Matra 350 radar missiles with look-down/shoot-down capability. Both the Mirage 2000N and the Mirage IV bombers of the French Strategic Air Forces (FAS) eventually will carry the ASMP nuclear, medium-range air-to-surface missile.

In the conventional attack mode for airfield-denial operations, French fighters now come armed with the rocket-assisted, runway-cratering Matra Durandal submunitions-shooting weapons dispensers, also being procured by USAF.

SX Missile

Indicative of a trend that may be under way throughout Europe, France plans to replace its nuclear-capable Mirage IV, at the end of its service life, with a land-mobile, intermediate-range ballistic missile now called SX.

"For our national security, and within our nuclear concept, we think we have a good force and a good military program for giving our government the airpower we need," said a French official in Paris. "We are keeping in front of the threat. We are very confident with our training. But we must guard against letting the gap on technologies close too much. We need standoff weapons and countermeasures. We need to train at operating in a very dense [jamming] environment."

The French Air Force believes it has the fighter of the future (the *Avion de Combat Futur*) all set for development. Dassault-Breguet, which makes the Mirages and which teamed up with Germany's Dornier on the Alpha Jet, designed the twin-engine ACF.

In Paris, at least, the ACF is regarded as potentially superior to the US F-16 and maybe even a near match for the embryonic US Advanced Tactical Fighter (ATF) now in the early stages of design.

The ACF airframe is designed almost exclusively for lightweight composites. The fighter would incorporate integrated, digital fire and flight controls, advanced ECM equipment, and low-observables (Stealth) technologies.

French officials conceded this summer, however, that in order to afford the costs of developing and producing the ACF, France may very well have to—and wants to—team up with other European nations. Such teamwork has been explored for some time by France, Germany, and the UK, with Italy and Spain playing lesser parts.

Defining the EFA

The three main principals in this maneuvering toward the so-called European Fighter Aircraft (EFA) differ as to its requirements and characteristics.

Germany wants a relatively light air-superiority fighter. France and the UK prefer a heavier, multirole fighter, and tentatively plan to buy more of them than the 200 or so that Germany sees in store for itself.

Engines, too, are controversial. France would like powerplants built by its SNECMA. The UK favors Rolls-Royce engines. Germany has expressed interest in US-made engines.

Such differences threatened to dismember the fighter development venture before it ever took hold. Many NATO officials believe, however, that the nations will somehow have to bring off the project cooperatively, for none can afford to go it alone.

Meanwhile, Germany is moving to upgrade the avionics in its F-4F Phantoms, chiefly to improve air-to-air capability. It has the option, if not necessarily the funding resources, of turning to a Dornier/Northrop fighter design, based on Northrop's F-20 fighter technology, as an interim move.

That design could also be the basis of Germany's candidate in the presumptive European Fighter Aircraft program.

One thing seems certain. Whatever shape the future European fighter takes, under whichever auspices, it will be designed to carry the US-made advanced medium-range air-to-air missile (AMRAAM) and the advanced short-range air-to-air missile (ASRAAM) now in development by Germany and the UK.

Specialized Arrangements

The preordained division of those two missile programs as between US and European industries may indeed have been the precursor of the specialized arrangements for new NATO weapons that SACEUR has in mind, courtesy of his FOFA concept.

France is also an interested observer of the NATO ASRAAM program. For now, however, France seems satisfied to stick with new air-to-air missiles being developed by its Matra.

Continued improvement of the quality and capabilities of combat aircraft and their missiles is clearly urgent for the Allied powers, no matter who builds them.

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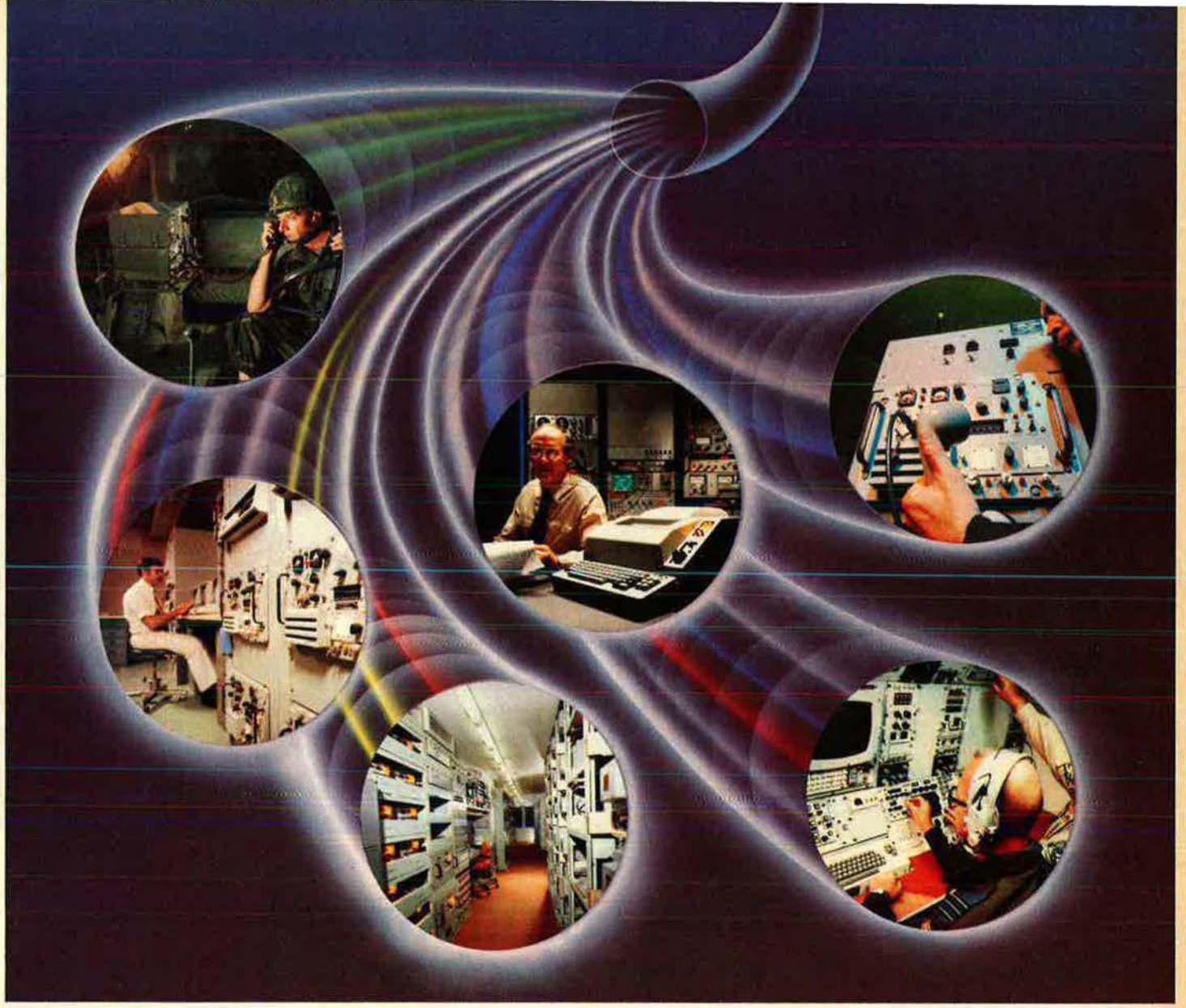

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official, "so in that respect, we've moved forward. But compared with the new generation of Soviet aircraft, the best we can say is that we've probably just about kept pace. Meanwhile, we've lost ground in numbers—and numbers have their own quality."

ACE force comparisons tell the grim story. Over the past ten years, the numbers of Warsaw Pact fighter-interceptors vs. ACE fighter-bombers have remained relatively stable. This has merely perpetuated the bad news. The Pact has 4,370 fighter-interceptors. ACE has 1,950 fighter-bombers.

In the same ten-year period, the Warsaw Pact's total of fighter-bombers actually dropped slightly—from 1,950 down to 1,920. But this is bad news, too, because the number of ACE fighter-interceptors assigned to take on those fighter-bombers has been cut nearly in half since 1973—from 1,400 to 740.

There have been qualitative improvements on both sides, but they may have been more dramatic and continuous in Pact aircraft, avionics, and weaponry, all of which moved up from lower-quality baselines.

Worst to Come

The worst is probably yet to come—in the form of wholesale deployments of the latest and best in such Soviet combat aircraft as the MiG-25E, MiG-29, and MiG-31 interceptors and Su-25 attack aircraft.

Il-76 airborne warning and control aircraft have shown up on the European scene as well, and ACE officials expect deployment there in the near future of new Soviet air-to-ground precision-guided munitions (PGMs) and antiradiation weapons.

Of deadly significance for NATO counterair operations and for deep strikes against enemy ground forces, the Pact's overlapping belts of fixed and mobile SAMs are also being upgraded. Meanwhile, NATO's plans for improving its own air defenses are being carried out more in fits than in starts.

In mid-July, following drawn-out negotiations, the US and Germany finally struck a deal on surface-to-air missiles and arrangements for defending their respective air bases in Germany.

The US agreed to provide Germany with twelve Raytheon-built Patriot missile fire units for operational deployment, plus two more units for training, in return for Germany's purchase of a like number of such units.

Germany also agreed to buy twenty-seven Euromissile-built Roland missile fire units for the defense of two USAFE main operating bases and one forward operating location in Germany.

Moreover, Germany signed up to buy sixty Roland tactical fire units and eight training units for point air defense at German Air Force main operating bases, six of which are US collocated operating bases (COBs) in Germany.

ACE and USAFE officials were heartened by the US-German agreement. It will be some time, however, before the missiles are in place.

Meanwhile, General Rogers was at pains to declare:

"Looking at ACE airpower compared to the regional threat, not only does our air defense capability become questionable, our ability to conduct conventional offensive air operations is also suspect."

Strained Patience

Thus, patience with NATO is strained. There have been some drastic proposals in the US for remedial measures.

Last June, the US Senate narrowly defeated a proposal by Sen. Sam Nunn (D-Ga.), the senior Democrat on the Senate Armed Services Committee and a longtime supporter of NATO, to cut the number of US troops in Europe by 30,000 a year, starting in 1986, unless the European allies come through on their 1978 agreement to raise their defense spending in real terms by three percent a year.

Failing that, said Senator Nunn, they could compensate by beefing up their stocks of ammunition and other war stocks, and by seeing to it that US tactical aircraft are better protected in Europe.

Senator Nunn said that he will reintroduce his bill next year. So Western Europe is on notice.

In a broader vein, former Secretary of State Henry M. Kissinger has proposed giving the Europeans greater military control of NATO (with a European SACEUR, for example) in return for their show of good faith in spending a lot more for their defense.

Absent such a show, Mr. Kissinger would have the US withdraw as many as half of the 220,000 US ground troops west of the Elbe.

Such proposals find no favor with General Rogers and his chieftains at ACE. SACEUR points out that:

- European economies have not recovered as fast or as well as that of the US.
- The European allies increased their defense spending at steady rates during the 1970s, when US defense spending declined in real terms.
- Most of them also bear the costs of military conscription (itself a show of good faith) and of providing real estate, without reimbursement, for Allied forces.
- Their combat units make up ninety percent of the NATO land forces and three-fourths of the NATO air forces confronting the Warsaw Pact.

Walls Closing In

General Rogers is not sanguine. He acknowledges that the walls are closing in on the Allies. He says it will cost them a whole lot more than they are now paying if they are to meet the force structures and weapons goals that NATO has established for the rest of this decade to strengthen its conventional deterrence.

Earlier this year, the General put this in context for the House Armed Services Committee as follows:

"We must do better with the forces already committed to ACE by bringing them up to ACE peacetime standards for manning, equipping, training, sustaining, and reinforcing.

"We must continue to modernize our weapon systems and, as we do, exploit our current and emerging technologies. . . .

"Within ACE, we also need improvements in intelligence, operations, air defense, logistics systems, command and control, and mobilizable reserves."

SACEUR said he is "convinced" that NATO can do, and afford, it all. Despite bad spots here and there, the record of recent years seems, if it can be sustained, to justify his judgment. ■

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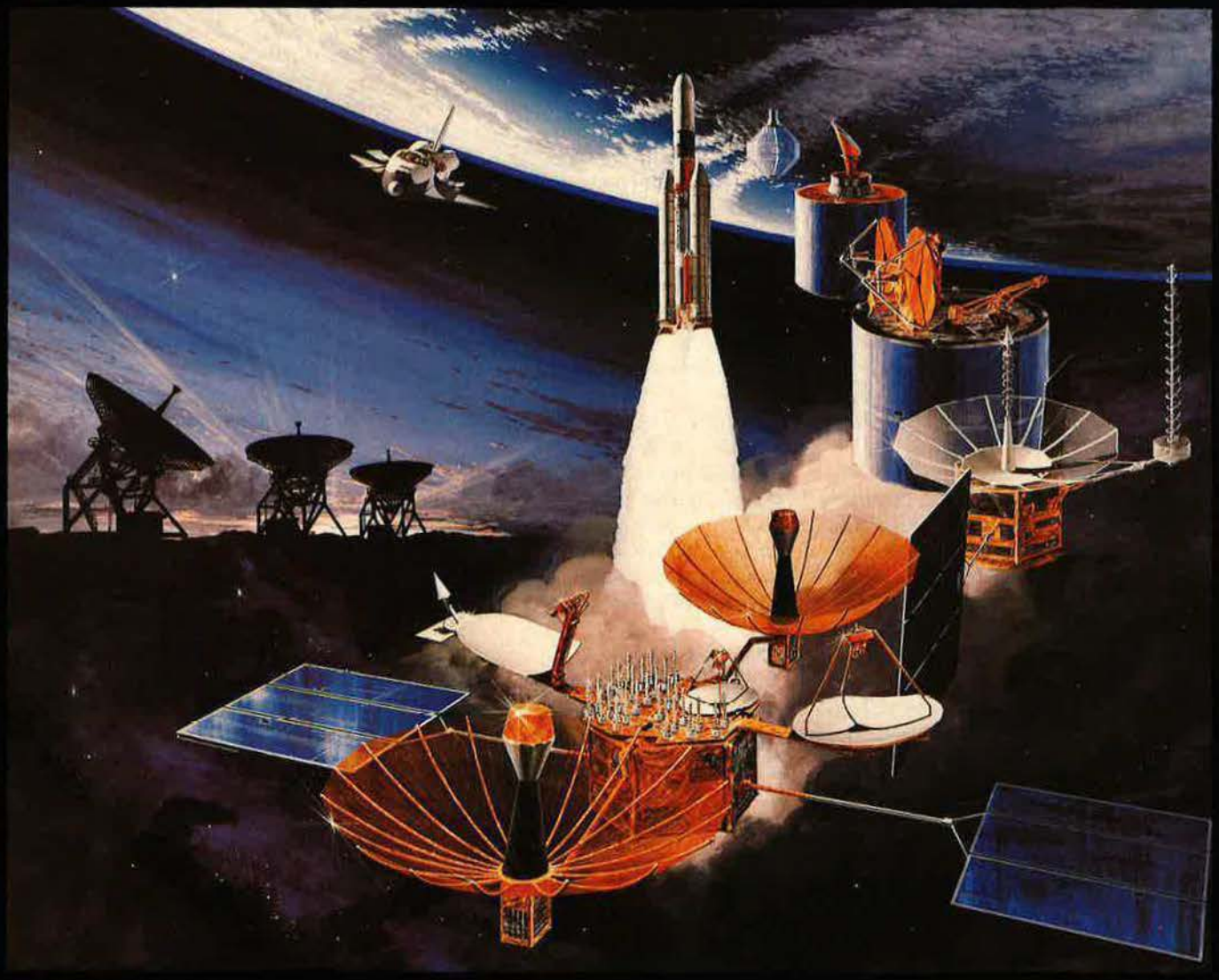

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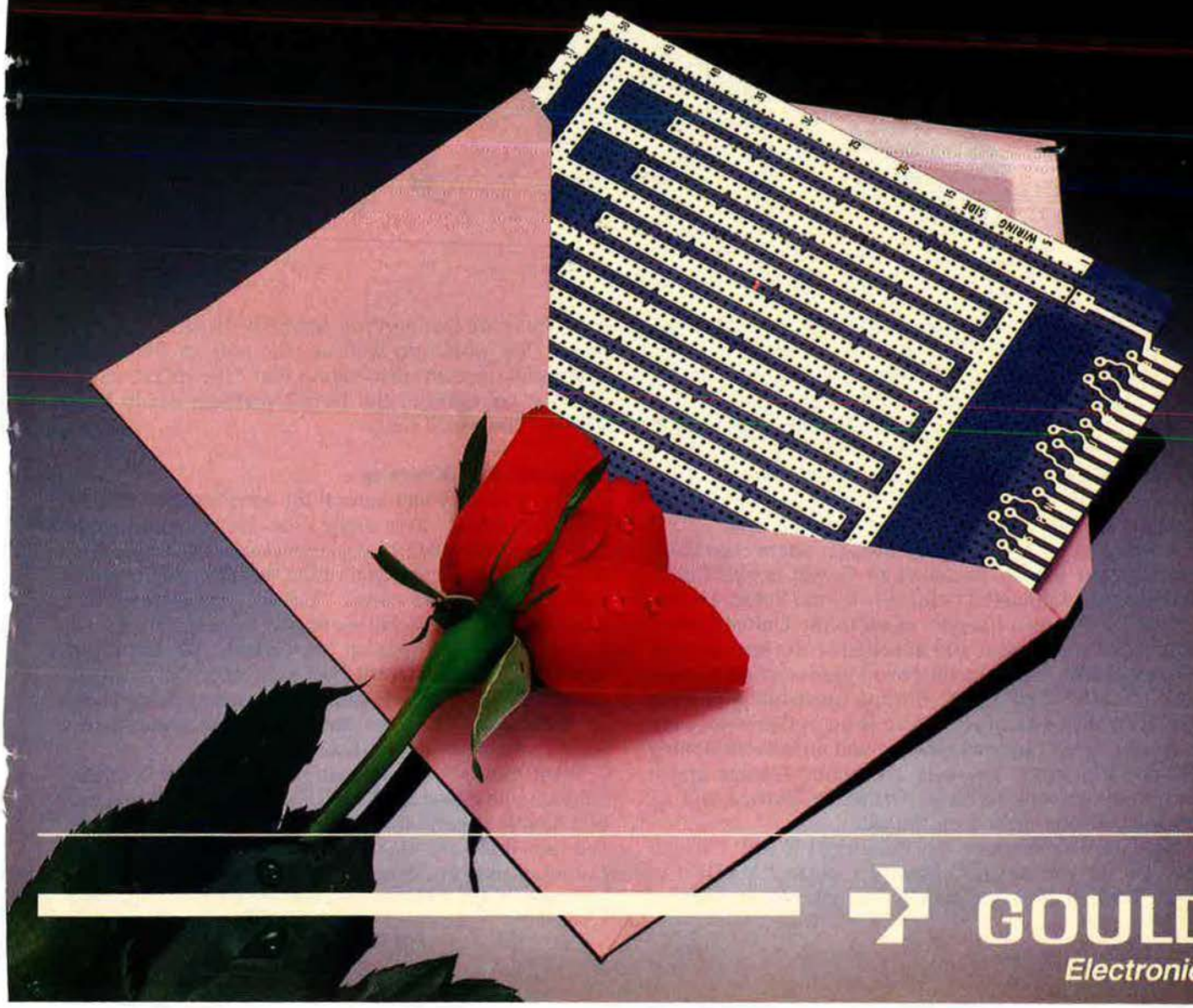

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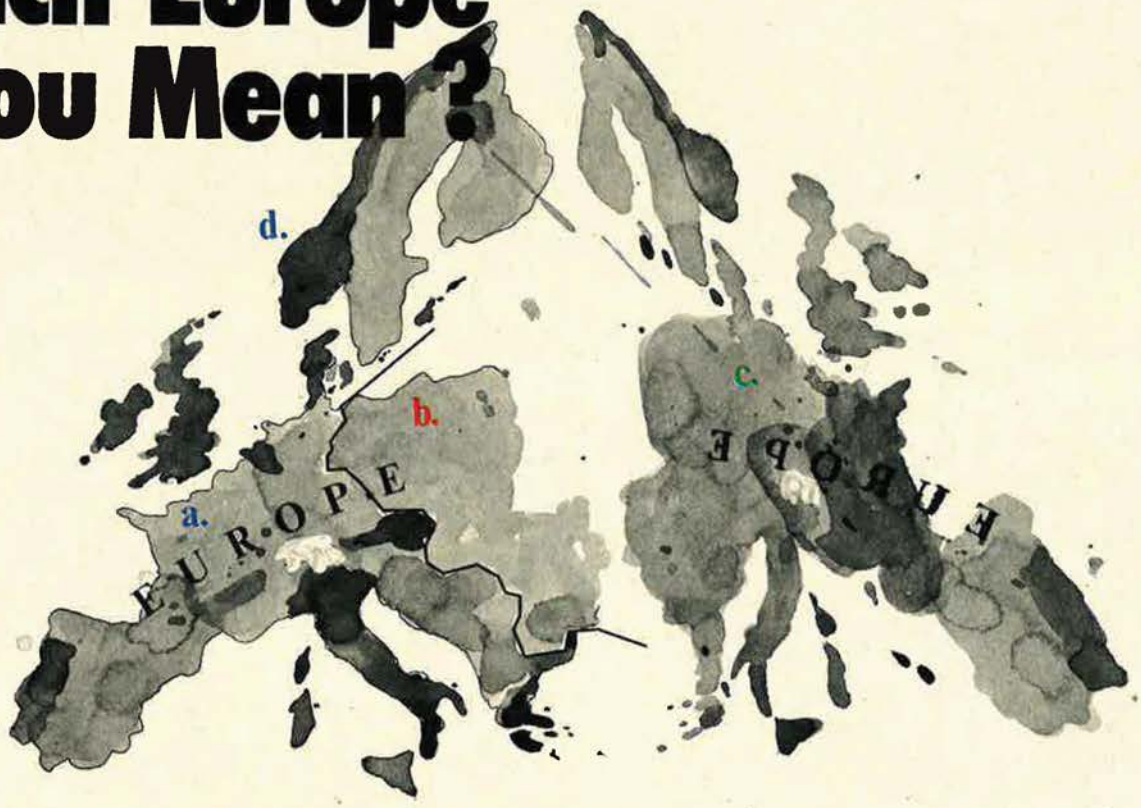
There are several Europes, but no political entity by that name. The US does not understand the various Europes as well as it should—and vice versa.

Which Europe Do You Mean?



BY JONATHAN ALFORD

DAMON Runyon unwittingly provided me with an appropriate title for this article. In his short story "Gentlemen, the King," Runyon's anonymous narrator poses a question of considerable significance in response to Kitty Quick's question if he knows anybody in Europe: ". . . To gain time while I think, I say to Kitty Quick, 'Which Europe do you mean?' 'Why,' Kitty says, greatly surprised, 'is there more than one Europe? I mean the big Europe on the Atlantic Ocean. . . .' "

There are, indeed, several Europes. There is an Eastern Europe, mostly occupied by Soviet armed forces and entirely dominated politically by the Soviet Union. There is a Western Europe, allied to the United States. And there is a neutral and nonaligned Europe perched uncomfortably between the two. There is a rich Europe (the "North") and a poor Europe (generally along the Mediterranean littoral). There is an outward-looking Europe (the ex-imperial powers) and an inward-looking Europe (the rest). There is a Catholic Europe and a Protestant Europe (with an Orthodox Europe and an Islamic Europe tacked on the side).

So Runyon's narrator was quite right to ask, "Which Europe do you mean?" Mostly I mean "NATO Europe," which does adequately describe one part of Europe, but even that part is a distinctly disparate group of states. We would do well to take note of Thierry de Montbrial's recent observation that "the surest way to ruin the cohesion of the NATO partners would be to demand too much unity."

Consider the Diversity

It is quite easy and natural for Americans to think of "the Europeans" as a single race. Not often do we on this side of the water think of ourselves as "Europeans." We know that we live in a rather wealthy and fortunate region of the world called "Europe" (to distinguish it from Asia or Africa), but we mostly think of ourselves as British, German, Spanish, or Turkish. We know ourselves to be very different from each other—in language, culture, history, wealth, and circumstance. What unites an Icelandic fisherman and a Turkish farmer is not much, when you think about it.

What can be said is that some of these countries belong to an Alliance (NATO) because of the proximity of a hostile superpower and that they are "in" Europe. But then there are Austrians and Swedes and Swiss, for example, who are certainly European but who do not belong to NATO. Furthermore, there are other intersect-

ing circles that include some Europeans and exclude others. The European Community excludes, among the NATO countries, Spain, Norway, Portugal, and Turkey but includes Ireland, which is not a NATO member. The Western European Union excludes many more European countries than it includes. For a Greek, public enemy number one is Turkey. Britain and Ireland have certain unresolved local difficulties.

Therefore, it is really rather hard to speak in political terms of "Europe." We are not particularly proud of our inability to cooperate effectively for our own defense, but, in historical terms, it is only very recently that we stopped fighting each other over territory. It is quite remarkable that we think of each other mostly as friends and not as enemies, given the bloodstained near-contemporary history of this small region. And what puts most of us on the same side, so to speak, is our distressing proximity to the Soviet Union and our shared concern that this large military power might decide to take advantage of our individual weaknesses.

But there is no "Europe" that one can yet think of as a political entity or as a military federation. There are just a number of sovereign states of varying size and wealth, all of which tend naturally to see things rather differently.

It is easy to see why Americans should be impatient with this patchwork of old polities that cannot seem to agree about most things. It is worth reminding Americans, however, that they, too, had some local problems uniting the states in a new world, even with the advantages of a common language and shared historical experience. Americans should not expect too much, but they have every right, in view of the engagement of the United States in the defense of Western Europe and the sacrifices made, to expect a good deal. It is time to air a few truths.

US-European Interdependence

We need each other. I would go further and argue that the central organizing principle of the Western Alliance ought to be that we cannot manage without each other. We sometimes, on both sides of the Atlantic, speak as if we could. That is a serious error, for divided we could easily all fall. I do not believe that Europe without the United States could long survive as independent. To engage in arithmetic and add up the collective wealth and manpower of Western Europe and argue that this can counterbalance the power of the Soviet Union is to miss two important points.

The first, already noted, is that Western Europe is *not* a political entity. It has made some tentative first steps in that direction, but even the most optimistic cannot now see a future United States of Europe. Absent that, Western Europe will always be, in terms of power, substantially less than the sum of its constituent parts. To make an obvious point, the Spanish Army makes no contribution whatever to the defense of West Germany, nor does the large French Army make much of a contribution.

The second point is that, collectively, Europe does not have the ability to offset the regional *nuclear* power of the Soviet Union and, in my view, it cannot have. In a crisis, Britain and France can, with their own nuclear forces, bargain with the Soviet Union to an extent, but the rest of Western Europe cannot. There is really no possibility of Britain and France credibly extending nuclear protection to others, least of all to West Germany, which, in this respect as in others, is the key European actor.

Only the United States is in a position to reassure the Federal Republic that a nuclear threat to that country can be offset by the counterthreat of American response. And that threat is only truly credible if there is a physical US presence in the Federal Republic. How large that physical presence should be, we can and should debate in the Alliance, but we need to distinguish intellectually between the contribution that the US conventional forces in Europe make to the common defense of the Central Front and the symbolic presence that, in a purely political sense, serves to convince the USSR that the US is fully engaged in denying Soviet military options—nuclear or conventional—in Western Europe.

Belief in the American commitment to European security would be undermined if the physical presence of US troops were entirely removed.

The former function—the US contribution to direct defense—could surely be substituted by the West Europeans if the effort were made. The latter function could not. In my view, all concerned would quite rapidly cease to believe in the American commitment to European security if the physical *presence* of US troops were entirely removed. That assertion stems from the belief that what ultimately dissuades the Soviet Union from contemplating aggression against Western Europe is the finite probability that *any* war in Europe would quite soon become an unlimited nuclear war. Remove that probability and the calculus is fundamentally changed. The last thing that Europeans should want is to make the world safe for conventional war.

The Stake for America

Why, then, should the United States take risks to assist in the deterrence of Soviet ambitions? What is at stake that would make it worth this investment in resources and political effort? It is easy for Americans to believe that they can opt for a "Fortress America." This seductive notion lay behind George Washington's rather smug iteration of America's "detached and distant situation," which, certainly until this century, permitted American leaders to isolate the United States from events taking place beyond the oceans.

Americans no longer have that option. The US is no longer "detached and distant"; technology has effec-

tively removed the distance. At the same time—and whether the US likes it or not—there is another great power mounting a sustained political challenge to the US. America cannot opt out, as once it could.

The US is the center of a system, just as the Soviet Union is the center of another, and the strength is in the system. We do not need to speak of Soviet conquest, but of influence. If Soviet influence became dominant over Western Europe, the Western system of states would be dramatically weakened and the correlation of forces decisively shifted in the Soviets' favor. I do not think that

Americans no longer enjoy the option of isolating themselves from events across the sea. Technology has overcome the barrier of distance.

the United States could stand alone in a largely hostile world any more than Western Europe could stand alone. We need each other, and if we have each other, the prospects of maintaining some kind of global equilibrium look quite good.

The political calculation that must be made on both sides of the Atlantic is what price must be paid to ensure a minimum of common purpose. The coinage will be varied and cannot, by any calculation, be reduced to a common currency in which some notional ledger can be balanced in terms of equal or proportional sacrifice.

Measuring Contributions

Clearly, we can point to obvious and gross disparities of effort—whether in percentage of GNP devoted to defense dollars per head, fractions of national adult manpower planned for mobilization in war, or capitalization of the armed forces. But then, we all know that it hurts the rich less than it hurts the poor to divert some fraction of their wealth to the common defense. We don't quite know how to do it fairly, but the principle of progressive taxation is firmly established in all our countries and must apply to security.

The balance that must be struck is between accepting backsliding (which is bound to lead to accusations of riding free on a security system that others are paying to maintain) and undue or unfair political pressure (which results from a failure to recognize the nature of the contributions being made). We—the Alliance—ought to do more to find a common and commonly accepted scale of values or yardsticks to apply to our defense efforts. This is not the place to make that attempt, but it may be worthwhile to point out some of the contributions that nations *think* they are making and some of the sacrifices that they feel they are demanding from their peoples.

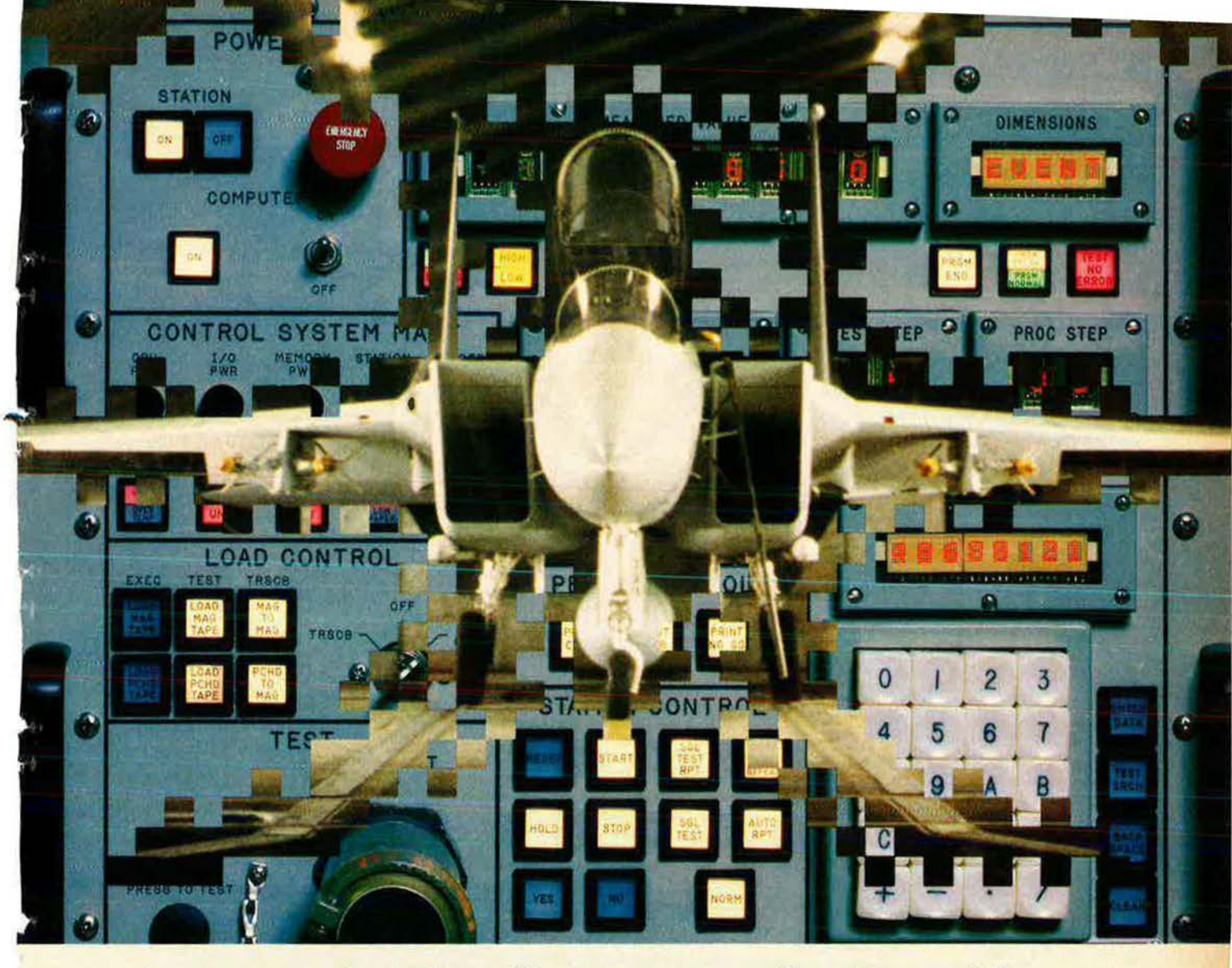
Consistency. Nations will claim credit for steadiness. Particularly in the acrimonious debate about real rates of increase in defense spending, Europeans counter US arguments by pointing out that the fifteen-year record is very different from, say, the five-year record. Of course, US outlays have risen sharply since 1979, but it will be only in 1985 that *real* US outlays exceed those of 1968. Even disallowing the "Vietnam bulge," US outlays were virtually constant from 1965 to 1978, inclusive. Many Europeans will argue that their own record over the same period is generally much better, even if the upward slope has been less steep in recent years than in the case of the US's record.

Arms Procurement. Clearly, it is a great burden for a country to have to import a large fraction of its weapons. The reverse proposition is that a country that is able to export to others within the Alliance does rather well in terms of employment and balance of payments. What either of those is "worth" cannot be estimated because it depends on the general trading and employment position of the country concerned.

Manpower Mobilization. Conscription is an economic burden in itself, and a willingness to mobilize for war the large numbers of reservists created by a system of conscription implies sacrifice. One calculation is that a state with full conscription of a year or fifteen months should be entitled (on economic grounds of missed opportunity costs) to add a notional one percent to its defense GNP percentage. This is hardly true except at times of full employment, but obviously a burden of a kind is imposed as a social tax on those conscripted. What may well be true is that the relatively low manpower cost for a conscripted force frees money for investment in equipment. While the very low pay given to Soviet conscripts is usually adduced as the reason for the high proportion of the Soviet military budget that goes to equipment, the proposition should also hold good for Western forces with a substantial conscript element (albeit to a lesser extent, because Western conscripts are no longer paid a pittance).

Base Provision. Countries that accept large numbers of foreign troops and that provide extensive military facilities—especially for nuclear weapons—do assume a somewhat greater risk than those that remain free of foreign bases. A Federal Chancellor notes that there is a greater geographical concentration of nuclear weapons in West Germany than in any other country of the Alliance (including the US). The US pays some countries well for the use of military facilities, but that is not always the case. Land made available for military purposes has value attached to it.

NATO Account. It is notoriously hard to decide how much of the cost of maintaining a given military establishment should be placed on the Alliance's balance sheet. The United States maintains a major part of its military establishment for purposes that have little or nothing to do with NATO, as narrowly defined. The Western Europeans, on the other hand, can legitimately place virtually all their military budgets on the NATO account. The US will argue that *all* American forces are dedicated to the protection of free-world interests and that Western Europe is part of that world. Nevertheless, until there is more general recognition that many "out-



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of-area" military contingencies are, at least indirectly, the business of the Alliance, the opportunity will arise to challenge the accounting procedures. The cost of the Rapid Deployment Force (RDF) is a good case in point: It might be a general reserve for the Alliance—but it might not be. How should one then apportion its cost?

The Other Side

Each of these arguments can be turned around and used by the US against the Europeans. Consistency is all very well, but the increase in the threat may demand much greater effort; US arms are cheaper on the whole than the European varieties; there is not much point in the US having massive reserve forces that cannot be moved to Europe in any realistic time frame; the bases are there to protect the host countries; stationed forces pump some money into the local economy; the US is providing flexible forces (land, air, and sea)—*all* of which could help to protect European interests.

In short, we do not know how to do the sums, but we must acknowledge the force of the arguments in specific cases. It is not a simple matter of measuring defense budgetary inputs in cash terms in order to decide who are the stalwarts and who are the backsliders. Yet if we try to measure outputs, we come up against all the well-known problems of assessing quality. If the Belgians fail by fifty percent to meet NATO flying hours, that must be a serious deficiency; if the lack of an effective IFF system is assessed as degrading NATO airpower by between forty and sixty percent, that is very serious; if Britain sends large forces to the South Atlantic, they are not in Europe; if the US forces have a rather large drug problem, we certainly ought to worry about it; if one country simply adds to military salaries with a raised budget, there is no increase in output for a raised input.

This catalog is not an argument for complacency—far from it. All Alliance members need to be kept up to a mark of some kind. Failure to meet norms mutually agreed upon says something about political will. The problems tend to arise when those norms are defined by one country alone in accordance with its own political priorities. Vague exhortations "to do more" are not helpful when we have no agreed way of measuring what is being done now.

Analytical Tools Needed

If we are to reduce Alliance tensions and kick the habit of making outrageous claims and counterclaims, we must find better analytical tools than are currently available. The DoD Report to Congress on "Allied Contributions to the Common Defense" of March 1982 seems as fair a statement of the problem as I have yet seen, but, more than that, it offers two useful concepts. The first is that of a "prosperity index" whose "results are very much like a graduated income tax on nations." That would seem to provide the fairest way of determining what inputs ought to be—on the basis of ability to pay. The second concept, relevant to output, resurrects an older idea—that of resolving land forces into Armored Division Equivalents, or ADEs.

Useful though both concepts are, they have a number of flaws. The first is obviously the fact that a prosperity index takes no account of the hidden costs of defense, *e.g.*, conscription. It will be hard to factor in allowances of this kind. The second is that ADEs take no account of contributions to sea and air forces, whose provision in some cases can take up to two-thirds of the money available. The third, admitted in the report, is the difficulty of handling quality on the output side.

If the Alliance can get the input side on to some kind of equitable basis by common consent, a major cause of acrimony would be removed. That is a platitude of the first order, but the approach suggested by the prosperity index is a promising avenue to explore within NATO—provided that there is general recognition that all defense expenditure is ultimately regarded as being on the NATO account or at least as being a contribution, among others, to the security of the free world.

Tensions within NATO will increase unless national ambitions and preferences are brought into line with what would be for the common good.

On how to spend the available money, there has to be a high-level review within the Alliance to determine agreed priorities on forces, roles, and missions. This should be less contentious, given that "fairness" is generally taken to apply to financial contributions for the common defense rather than to the precise allocations of national resources to land, sea, and air forces. The Alliance *ought* to be able to reach agreement in principle, for example, on whether it is best for the Alliance to urge Britain to reduce its navy in order to maintain the British Army of the Rhine. Such important choices reached multilaterally, however, will rarely accord with priorities determined unilaterally.

This is close to being another platitude, but it is high time that NATO looked again at force goals in light of the changing threat. Simply to say that more needs to be done in all fields is a negation of political responsibility and thoroughly *un*strategic. It is incumbent upon the *Alliance* to determine priorities for future investment. There was not much wrong with the Long-Term Defense Plan (LTDP) of 1978 except that, at least in its public presentation, that sense of priorities and what was affordable was absent. Something more thoroughgoing is required to bring *national* ambitions and preferences into line with what would be for the common good.

Whether NATO can now take that initiative must be in doubt, but it is certain that without such a thoroughgoing review we shall muddle slowly downwards, wasting resources in various directions. This will surely give rise to a different kind of acrimony and tension within Europe and across the Atlantic.

Economic Competition

Other tensions exist, but few of them appear to relate so directly to security. We are economic competitors even while we are security collaborators, and the two sometimes get badly mixed together, as with questions of technology transfer and weapons sales to third countries. Moreover, the economic dimensions of arms sales within the Alliance, and especially the one-way traffic on the "Two-Way Street," have again become a major irritant for the West Europeans, who naturally resent protectionism on the part of the United States.

Americans and Europeans should learn to tolerate—not fight—differences of opinion regarding relations with the Soviet Union.

Europeans are reluctant to become wholly dependent on the United States for the supply of modern weapons. We have our own industrial interests to worry about. Unless the flow of traffic can be made more equal in both directions, I predict that Europeans will be driven into a vicious spiral in which we turn away from American price advantages and toward greater European armaments cooperation or national production. This would lead to higher and higher costs and greater R&D-production ratios, and so, ultimately, to smaller numbers of systems entering service at slower and slower rates. This is the road to disaster.

Part of the price that the US must pay for a healthy Alliance is to accept the need to buy those military items that the European allies can produce competitively. If there were a large *European* production base, it would be different, but we have to live with the present reality that there is not. There is a rather small "European" base of true cooperation, together with a number of not-very-large national armaments industries. Greater combination has proved extremely difficult for reasons that are not difficult to understand. American anger at Japanese penetration of the US car market is not so different from European anger at being flooded by US arms. The causes are not so different either. In both cases, we are frustrated by our own inefficiency.

What sets the analogy awry is the free market, which ultimately determines industrial policy and product. After a painful period of adjustment, the US automobile industry is now producing the kinds of cars that people want to buy. With weapons, market forces are largely if not wholly absent, and the buyers, the armed forces, are not responsive to price advantage in the way that car-buyers are. Notions of a free market in weapons collapse in the face of government-controlled monopolies both as buyers and sellers. Thus it is governments that must negotiate more equitable shares of the costs and benefits of the armaments business.

Views Toward Soviets

Lastly, we are most unlikely ever to hold identical views about relations with the Soviet Union, and we should be more tolerant of this diversity. Europeans simply cannot afford outright hostility toward the Soviet Union. We live too close to "the Bear" for that. We do not like the Soviet Union much either, and we are not about to become neutral, despite the posturings of vocal minorities who would have us believe that there is no difference between the US and USSR. But our anti-Soviet rhetoric will be more muted. We were much better served by a form of limited détente than was the United States, and we would like to preserve some of those benefits.

On the other hand, the Europeans should show more understanding of what it is like to be a superpower that believes it is being challenged globally by the other superpower. I believe that the psychology of small and medium powers is fundamentally different from the psychology of great powers, and it has been so throughout history. Great powers tend to feel that they are carrying the load of the world on their backs and are powerfully affected by the enormity of that burden. Smaller powers have much closer horizons and more parochial security interests. This can lead to considerable dissonance. The best we can do is to learn to live with the fact that we are not the same and that we should be tolerant of that diversity.

On the whole, we in Europe are no longer crusaders, but homesteaders. Only great powers can afford to be crusaders, and there is something in the nature of both the US and USSR to make them crusaders after their particular versions of the truth. We are most unlikely to enlist for a crusade; our concern is with protecting the homestead or group of homesteads in which we live. That may be shortsighted, but we shall have enough difficulty in getting the homesteaders to pool their resources for the common defense without pestering them to pursue a distant and insubstantial grail.

One last word to the Europeans. They must be a great deal more understanding of the truth that even superpowers have homesteads. The potential Central American turmoil threatens the American homestead in a way that we are too often reluctant to acknowledge. Not many of us know where the Rio Grande is. We ought to find out.

All Alliances have congenital ailments. They are imperfect and cannot be made perfect. But they also have periodic infections that can be cured. The finger points today at political leaders who fail adequately to distinguish between the curable and the incurable. ■

Jonathan Alford is Deputy Director of the International Institute for Strategic Studies, London, publishers of the annual document The Military Balance, *which is reprinted by special arrangement each year in the December issue of* Air Force *Magazine. Before he joined the IISS in 1977, Mr. Alford had served in the British Army since 1951, in the Royal Engineers and in staff assignments.*

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From the days of Charles de Gaulle, left, to the present government of François Mitterrand, right, French perspectives on defense issues have shown remarkable consistency.

The French national consensus is for a strong defense and a strong Europe—but also for independence in security and foreign policy.

France Debates Its Defense Policy

BY JACQUELYN K. DAVIS

AMONG members of the Atlantic Alliance, France is unique in its national consensus in support of defense policy. Successive French governments in the Fifth Republic, from Charles de Gaulle to François Mitterrand, have emphasized the independent character of French defense policy within a broader Atlantic context with France as an integral, if not an integrated, Alliance partner. Especially in the years since the French decision in 1966 to withdraw from NATO's military command structure while remaining a signatory of the Atlantic Alliance, French perspectives on defense issues have evinced remarkable consistency, with fluctuations in military policy derived from changes in the global strategic environment, especially in the US-Soviet "Strategic Balance," and from the need to reorient France's role in Europe and elsewhere (*i.e.*, Africa and the Persian Gulf) where vital French interests are at stake.

For a majority of Frenchmen, the global strategic environment has changed significantly since the decade

of the 1960s when the United States was widely assumed to be stronger militarily than the Soviet Union. While the French, in general, are disinclined to assess foreign and defense policy exclusively in the context of East-West relationships, their appreciation of changes in the Eurostrategic environment has led to a French defense policy that, in its broadest outlines, appears to be more compatible with the interests of both the United States and NATO.

Indeed, to the surprise of many observers of the French scene, the Socialist President of France, François Mitterrand, has proved to be one of the most ardent spokesmen for the strengthening of NATO defense capabilities. Against a widening force imbalance in Europe and in the face of growing "antinuclear" movements elsewhere in Western Europe, the French President has spoken out eloquently in support of NATO's "dual-track" decision, especially its INF deployment option, and against the strategic decoupling of the United States from the defense of Western Europe. Before the West German Bundestag in January 1983, the French President exhorted the Federal Republic to support deployment of new-generation NATO nuclear weapons if arms negotiations with the Soviet Union failed to reduce or eliminate the threat posed by Soviet SS-20 IRBMs. Later, in a speech in Brussels, the French President astounded his audience by declaring that the East deploys missiles while the West produces pacifists—a remark that was clearly intended to push faltering Alliance members toward a decision to accept the NATO missiles for deployment in their respective countries.

At first glance, such pronouncements by a French President seem to be indicative of a substantive change in French national security policy—away from France's tradition of independence and toward reintegration into the NATO structure, or at least greater European political and defense collaboration. While it may be true that French policy is evolving to emphasize a strengthening of Western defense collaboration, there is little question, even under a Socialist government, that France will continue to emphasize independence in both defense and foreign policy. Of critical importance to sustaining such independence is the modernization of the French nuclear force.

Reflecting this view and underlining the national consensus in support of an independent French national nuclear force was the pastoral letter of the French Catholic bishops entitled "Waging the Peace." In contrast to their American counterparts, the French Catholic bishops persuasively argue that it is the moral imperative of a nation to provide for its own defense and that deterrence is fundamental to national defense in the nuclear age.

The "Europeanization" of NATO

Hence, the contemporary defense debate in France encompasses not the issue of whether or not France should deploy national nuclear forces, but rather the future orientation of French security policy, including the employment options of French military forces. Increasingly, the focus of debate concerns the extent to which France should participate in collaborative efforts designed to promote greater unity within Western Europe on defense issues. Even among avowed Gaullists such as Jacques Chirac, the Mayor of Paris, there is growing appreciation of the need to evolve a "Europeanization" of NATO if the deterrent posture of the West is to be maintained. What has yet to be resolved is the framework within which the Europeans can evolve closer defense collaboration and, more specifically, the role of France in a new security partnership within Western Europe.

Much of the current interest in France with regard to strengthening European defense cooperation can be traced to a growing anxiety over the future of the Federal Republic of Germany, especially its security ties to the West. In recent years, the upsurge of pacifist sentiments in the Federal Republic has contributed to French fears of the potential for development of neutralist policies by the West German government. These fears have superseded historic apprehension in France about a possible revival of German militarism.

French anxiety over the evolution within West Germany of a neutralist outlook in foreign policy has been enhanced by widespread skepticism over the future of the US security commitment to Western Europe. While the credibility of the US extended deterrent guarantee has long been questioned by most French strategic analysts—and indeed has provided a rationale for the development of France's national nuclear force—the viability of the American commitment to defend Western interests, symbolized in the deployment of US ground forces on the Continent, is also being subjected to intense questioning in France. Because a majority of French strategic analysts concedes that the US security commitment to Western Europe (but especially the Federal Republic of Germany) is indispensable to stability on the Continent, most regard greater European defense collaboration as an adjunct to, not a substitute for, the US extended-deterrent guarantee.

To the surprise of many, French President François Mitterrand has proved to be an ardent spokesman for the strengthening of NATO defense capabilities.

From this perspective, therefore, French nuclear forces can never provide an alternative for the US extended-deterrent guarantee. By this conception, French strategic nuclear forces form a credible deterrent only when viewed in the context of the national sanctuary, *i.e.*, France. Any extension of the French deterrent to cover the Federal Republic of Germany challenges the traditional French conception of deterrence of the strong by the weak *(du faible au fort).*

The "Programme Loi" 1984–88

The presentation in 1983 by the Mitterrand Government of its defense planning program for the years 1984–88 was greeted with mixed reactions in France. On the one hand, by the priority it accords to French nuclear forces, the "Programme Loi" strengthens the national deterrence concept; on the other hand, it appears,

"Programme Loi" 1984–88

Major Programs for French Air Forces

Programs	Commissioned		Delivery[1]	
	1984–85	1986–88	1984–88	After 1988
Mirage 2000[2]	56	109	106	129
Airborne early warning system	—	1st and 2d models[3]	1st models	2d model
Helicopters	12	18	26	17
Epsilon (fighter-trainer)	60	—	146	—
Air defense	112	107	224	11
Missiles (air-to-air)	415	780	872	700
Missiles (ground-to-air)	181	330	526	315
New technology air-to-ground armaments	654	1,534	1,680	994

[1] Equipment commissioned before 1988.

[2] Including the Mirage 2000 N.

[3] The word "models" will be used until the choice of a specific system.

at least superficially, to lay the basis for French reintegration in the NATO military command structure. The apparent contradictions in the four-year French defense program arise from conflicting interpretations of France's potential role in the forward battle (*i.e.*, outside of French borders, especially in the Federal Republic of Germany) and, specifically, over the employment options of French tactical-nuclear and conventional forces.

Controversy over the roles of tactical-nuclear and conventional weapons in French military policy is not a recent phenomenon; it has been a constant feature of the French defense debate since the development of the Pluton surface-to-surface tactical missile. At the time of the deployment of Pluton, it was argued by French strategists, de Gaulle included, that tactical nuclear weapons did not dilute the essence of deterrence as was asserted by critics of the program but rather reinforced the French proportional deterrence concept—the notion that a weaker nation could deter a larger, stronger one from aggression against its national territory by the deployment of relatively few nuclear weapons. In this conception, tactical-nuclear weapons, and even to a certain extent French conventional forces, were viewed as a "tripwire" perhaps to be employed prior to, but always in conjunction with, the threatened use of French strategic nuclear weapons.

In the mid-1970s, amid perceptible changes in the superpower strategic-nuclear relationship and against the backdrop of an emerging imbalance in Eurostrategic forces, a school of thought emerged whose proponents sought to change, albeit subtly, the employment options related to use of French tactical-nuclear weapons. Identified initially with former President Valéry Giscard d'Estaing and his Army Chief of Staff, General Guy Méry, proponents of greater flexibility with regard to French tactical nuclear employment options argued in favor of committing French nuclear weapons to support the defense of areas contiguous to French territory which are vital to the security of France itself. By this so-called "enlarged sanctuary" concept, it is contended that French national interests will be served if the territorial integrity of Western Europe, but in particular the Federal Republic of Germany, remains closely linked to the Western community of nations.

To its critics, the Mitterrand Government's "Programme Loi" is said to give undue emphasis to French nuclear-force-modernization programs to the detriment of conventional forces. As such, it has been argued that despite official rhetoric the "Programme Loi" provides for a retreat from the "enlarged sanctuary" concept and appears to give even greater emphasis instead to the role of nuclear forces in the protection of French national territory (*i.e.*, sanctuary). Opposition to the "Programme Loi," particularly from the *Union pour la Démocratie Française* (UDF—Giscard's party), is based on its "illusory sanctuarization of defense," which would inevitably result in "neutralism" in Europe and "impotence" in the world.

Without question, the 1984–88 French "Programme Loi" emphasizes the priority role of an independent nuclear deterrent in the French force structure. In successive interviews, French Minister of Defense Charles Hernu consistently has noted that while the armed forces as a whole are part of an overall deterrence strategy, the main priority remains French nuclear weapons. Specifically, the "Programme Loi" seeks to strengthen France's strategic deterrence posture by augmenting the capabilities of the submarine-based leg of the triad of French nuclear forces and, at the same time, enhancing the survivability of the land-based IRBM and manned-bomber forces.

The priority given to the sea-based leg of the triad in the new defense program reflects the perception of many French strategic analysts that the SSBN/SLBM fleet remains the most survivable and hence the most credible element of France's deterrent posture. Indeed, concern about the vulnerability of French land-based intermediate-range ballistic missiles, eighteen launchers of which are deployed in fixed silos on the Albion plateau in Haute-Provence, has engendered renewed debate—similar to that in the United States over MX—over the future of the land-based missile force in France's deterrent posture.

Based upon a perception of the threat posed by the Soviet deployment of the triple-warhead SS-20 counterforce missile, the Mitterrand Government has provided funds in the "Programme Loi" for the development of a semimobile, land-based intermediate-range missile, designated SX, as a possible replacement for the fixed-based S-3 IRBM force. The SX is described as a three-warhead missile deployed in canisters that can be transported on standardized trucks or by Transall aircraft.

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signed to the Mirage IV-A bomber force. The French Defense Council, in October 1981, had already decided to phase out (from 1985–90) the major portion of the French strategic bomber force based on a widespread perception of the system's vulnerability resulting from the increasing sophistication of the Soviet/Warsaw Pact air defense environment. Fifteen Mirage IV bombers, deploying the new-generation air-to-ground (nuclear) missile (ASMP), will be retained.

The priority accorded by the "Programme Loi" to France's sea-based deterrent force is reflected in program authorizations for SSBNs and SLBMs as well as for construction of eight nuclear-powered, hunter-killer attack submarines. The program provides for the deployment in 1985 of France's sixth SSBN, *l'Inflexible*, with ballistic missiles armed with the M-4 limited-footprint, MIRVed warhead, and the construction of a new-generation ballistic missile submarine. The seventh SSBN is now scheduled to come into service in 1988. It is to be equipped (but probably not before 1999) with a new-generation SLBM, designated M-5, having an improved range (more than 4,000 kilometers) and more sophisticated penetration aids in anticipation of the possibility of "a breakout" by the Soviet Union in its strategic defense (ABM) capabilities.

Implications of Strategic Defense Initiative

In this regard, many French analysts are particularly concerned about the potential implications of the American Strategic Defense Initiative. They worry that any new developments in the ABM/BMD area will undermine the concept of deterrence and render French nuclear forces "useless." Holding to this view, the French representative to the Geneva Disarmament Conference, François de la Gorce, called on both the United States and the Soviet Union to enter negotiations aimed at prohibiting deployment of space-based defensive weapons. He also urged both superpowers to retain the 1972 SALT I ABM Treaty and to reject concepts like the US SDI that would upset the global deterrence equation. (In this context, therefore, President Mitterrand's recent speech calling for a European Space Initiative can be explained as an incentive to keep Europe's technological base competitive with those of the United States and Japan and not as a conviction that space-based Strategic Defense must be pursued by France and its European partners.)

The broad national consensus in support of the general outlines of French strategic-nuclear modernization programs is less apparent with regard to the tactical nuclear component. Many in France cling to the view that to endorse the use of French tactical nuclear weapons in isolation from a strategic weapons employment is to dilute the essence of the proportional deterrence concept. Especially in the context of the "forward battle" (along the NATO Central Front), the employment of French tactical nuclear weapons, as envisaged in the "enlarged sanctuary" concept, is seen as signaling a return by France to the integrated military structure of NATO—a policy option that does not attract widespread public support in France today.

Thus, in keeping with a more nationalistic conception of defense policy and in the hope of fostering strengthened European defense collaboration—as much for political-economic as for strategic-military reasons—the government of François Mitterrand has provided, in its four-year defense program, for the modernization of French tactical nuclear weapons on the basis that such new systems will reinforce the proportional deterrence concept by providing nuclear systems that, if invoked, would not threaten West German territory and, in the case of Hades, as a result of its longer range capability (350 km as compared to Pluton's 120-km range), could strike targets in the German Democratic Republic, Czechoslovakia, or Poland.

Nevertheless, the issue of whether or not French tactical nuclear weapons, specifically the 120 Hades launchers that are to be organized in a regiment under the direct command of the French President (unlike the Pluton whose units are under the command of the French First Army, elements of which are forward deployed in West Germany), would be used in support of a forward deployment (*i.e.*, outside of France) of French conventional forces has provoked heated controversy in parliamentary debate and raised the issue of the role and mission not just of the French First Army but of the newly established Rapid Action Force (*"Force d'Action Rapide"* or FAR).

Ground Forces Undergoing Reorganization

Ostensibly for the purpose of attaining increased versatility and greater mobility and firepower for French conventional forces but probably also having to do with the economics of France's present austerity program as well, the French armed forces are undergoing major reorganization, particularly in their ground force elements. According to Defense Minister Hernu—who was instrumental in gaining the support of the Socialist Party for the independent deterrent force—the key to greater versatility and mobility in French forces lies in the reorientation of their command structures and unit composition.

Many French analysts worry that new developments in the ABM/BMD area, such as the US Strategic Defense Initiative, will undermine the concept of deterrence.

The "Programme Loi" calls for the creation of rapid reaction forces that will comprise, under a single and newly created command, the 11th Parachute Division, the 9th Marine Infantry Division, the 27th Alpine Division, one light armored division, and a newly formed airmobile unit equipped with 120 antitank helicopters, forty support helicopters, and eighty maneuver helicopters. This Rapid Action Force will have a manpower strength of 47,000 troops who could be deployed outside of France in Europe to augment French land forces, which are narrowly "tied" to the operational requirements for the defense of French territory, or overseas. The price of the reorganization will be the reduction of 22,000 troops in the overall strength of the Army (currently 312,000 men), representing a manpower drawdown of approximately seven percent. The Navy and

"Programme Loi" 1984–88

Major Programs for French Nuclear Forces

Programs	Commissioned		Delivery[1]	
	1984–85	1986–88	1984–88	After 1988
SSBN (new-generation X)	—	1X	1	1X
Refitting M-4 on SSBN	1	2	1	3
Aircraft PC Astarte	4	—	4	—
Mirage IV (ASMP) refitting	18	—	18	—
Retooled C-135	7	—	11	—
Mirage 2000 N ASMP	32	38	36	49
Hades Regiment	—	1	—	1
Super Etendard (ASMP) refitting	10	40	43	10

[1] Equipment commissioned before 1988.

Air Force will each lose 3,500 men. These reductions in manpower, while not as great as had originally been feared, nevertheless reinforced a widely held view that France is moving toward a disproportionate, and perhaps dangerous, reliance on nuclear weapons.

Sharing this perspective, General Étienne Copel, Deputy Chief of Staff and head of Airborne Operations of the French Air Force, recently requested (and was granted) early retirement (subject to recall in a crisis) upon the publication of his book entitled *Vaincre la Guerre (How to Win the War),* which suggests that existing French defense planning—*i.e.*, reliance on a national nuclear force—is fundamentally flawed and would lead to military disaster for France. General Copel asserts that the nature of the threat to Western Europe has changed, with the deployment by the Soviet Union of Eurostrategic forces that have the effect of nullifying the deterrence potential of US theater nuclear forces and French and British strategic nuclear capabilities. Consequently, Western Europe faces a formidable Soviet conventional threat as a result of deployment by the Soviet Union of massed armored forces incorporating new technologies and chemical munitions. General Copel calls for the strengthening of French (and NATO) battlefield defensive weapon systems, including widespread deployment of the Enhanced Radiation Weapon (ERW), which he sees as providing the potentially most important contribution to European security in the years ahead.

Not surprisingly, General Copel's formula has revitalized the debate in France over the ERW, refocusing public attention on that contentious issue at a time when the French President appears to be moving toward a deployment decision. President Mitterrand, backed by Defense Minister Hernu, has held to the position that deployment of the ERW in limited numbers (probably for use in the Hades launcher) is not inconsistent with current French strategic thought that eschews any indication of a commitment to a warfighting posture.

The Socialist Party, however, is badly divided on the issue, with many members, especially the left-wing *Centre d'Études de Recherches et d'Éducation Socialistes* (CERES) headed by Jean-Pierre Chevenement, opposed to any ERW deployment. Members of the French Communist Party and the Gaullist *Rassemblement pour la République* (RPR) are opposed to the ERW, while opposition UDF Parliamentarians are divided over the issue.

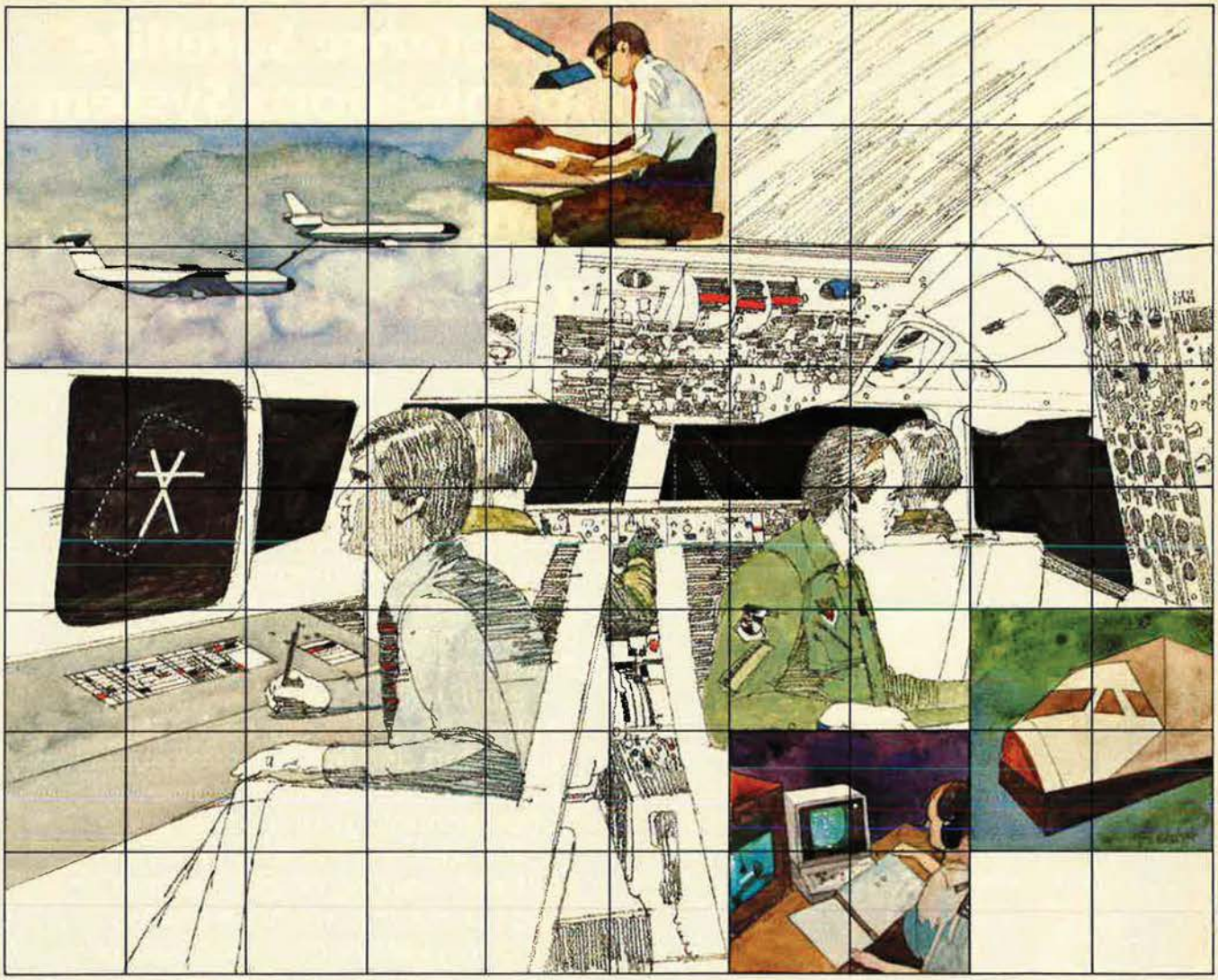
The "Forward Battle" and the FAR

Significantly, the "Programme Loi" makes no reference to a French decision to deploy the ERW, probably because of the lack of consensus in France, especially among the members of the Socialist government, on the role of tactical nuclear weapons. Even though a deployment decision is expected to be made in the near future by the Mitterrand Government, an official announcement is viewed with anxiety by the Defense Council because of its alleged implications for France's European defense posture and its relationship to that of NATO. For some French analysts, however, a decision by the French government to create the FAR implies a willingness on the part of France to participate in the "forward battle," or the defense of the Federal Republic of Germany.

In response, Defense Minister Hernu has noted that the ERW would not be deployed in sufficient numbers to constitute a warfighting capability (at most, 120 launchers) and that FAR troops were created as a deterrent, but did not indicate an increased willingness on the part of France to be drawn into a "forward battle." The fact of stationing the FAR in a forward position does not mean that France accepts the principle of automatic engagement in a front-line battle, but instead that it will intervene in a deterrent capacity during a crisis, in order to defuze it and prevent it from degenerating into a conflict.

Nevertheless, many within the RPR and the Socialist and Communist Parties view the development of the FAR as a subterfuge for the reintegration of French forces into the integrated command structure of the Atlantic Alliance. Others, particularly military professionals and strategists, continue to perceive the development of the FAR as a means of effecting defense budget cuts for conventional forces without incurring contentious debate within the armed services. Supporters of the FAR dismiss both charges on the grounds that France, like other European countries, found it necessary to restructure its national force posture in the face of changes that have occurred in the European security environment, including the development of Soviet Operational Maneuver Groups, and because France's interests outside Europe were increasingly coming under threat, as in Central Africa (from Libya) and the Persian Gulf, for example.

The debate over France's role in the defense of Western Europe was heightened by remarks made in late 1983 by General Charles de Llamby, Commander of the French First Army. General de Llamby, who is tasked



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with the assignment of preparing for the formation of the FAR, stated that he was engaged in a study to determine that force's potential and procedures for action in Europe. As part of his study, General de Llamby is seeking to "draw a distinction between what is necessary for French independent action" and the use of the force in conjunction with NATO logistics and reinforcement systems.

In a National Assembly debate on the 1984 French military budget, the concept of closer French-NATO and French-US ties generated controversy, in particular from members of the opposition as well as the French Communist Party (PCF) and CERES, the left-wing of the Socialist Party. The strength of the combined right- and left-wing opposition to what is perceived to be the loss of French sovereignty spurred the Mitterrand Government to reiterate its strong support for French independence and its commitment to keep France outside NATO's integrated military command.

Franco-German Collaboration and US Extended Deterrent

Even though the French Communist Party abstained from voting on the "Programme Loi" (because of a reference in an annex document to the Soviet threat to Western Europe), the defense budget passed the vote in the National Assembly on May 20, 1983, with little opposition from the left-wing of the majority Socialist Party. Thus, for the remainder of his presidency, François Mitterrand's Socialist Government (without Communist participation) will seek to maintain and modernize France's independent nuclear deterrent capability even if it means cutting back or delaying French conventional-force programs. The current French government, despite its emphasis on Franco-German defense collaboration, steadfastly refuses to discuss with the West Germans employment options of French nuclear (tactical) forces.

This, together with the creation of a separate command structure for the Hades regiment, supports the notion that while France, based on deployment of the FAR, may be willing to intervene in the "forward battle" using conventional forces, the use of tactical nuclear weapons remains, under the Mitterrand Government, tied to a narrower conception of French security interests and based upon the threatened employment of the strategic deterrent force. Thus, the optimism of some Western analysts about a return of France to the Alliance fold seems premature at best, and ill-placed at worst.

Based on its conception of strategy, the current French government will also be reluctant to support any change in US (and NATO) strategy for the defense of Western Europe. Such concepts as "no-first-use" are regarded as an indication of the US determination to decouple American security from the defense of Western Europe. They are dismissed as undermining deterrence and hence the basis for political-military stability on the Continent.

Just as disconcerting to French strategic planners are the numerous US concepts relating to deep strike and the extended battlefield. Defense Minister Hernu has explicitly rejected the second-echelon attack concept that, in his view, would dilute the essence of the Alliance's deterrence strategy. The new US emphasis on strengthening NATO's conventional forces, based on the development and deployment of emerging conventional technologies, is said to challenge the conventional wisdom regarding the disproportion of conventional forces in Europe. Not only would such a strategy allegedly undermine the escalatory threat which, in the French view, is the single most important element in redressing the conventional force imbalance in Europe, but it assumes furthermore that the Soviets themselves would refrain from use of their own nuclear and chemical/biological weapons—a highly dubious assumption, given the emphasis of the Soviet Union on a combined-arms concept and an offensive military strategy predicated on surprise.

This inconsistency of thought with regard to NATO's raising the nuclear threshold has led some analysts in France to assert that the gap between French deterrence strategy and that of NATO will widen if Airland Battle (or any of its variants) becomes the official military strategy of the Alliance. Thus, beyond considerations of cost—which are perceived as being far too high to attract a commitment by NATO members to modernize their respective national conventional forces—French strategists view the proposed change in NATO's Flexible Response Strategy as making more likely the prospect of war in Europe.

Fifteen Mirage IV bombers, deploying a new air-to-ground missile, are to be retained under a plan whereby a majority of France's strategic bomber force is to be phased out by the end of the decade.

Hence, for the period just ahead, France will hold to a conception of military strategy that emphasizes strategic deterrence over the national sanctuary and a strengthening of US and NATO forces that can enhance the credibility of the threat of escalation as a means of strengthening NATO's Flexible Response doctrine and thus helping to deter future war in Europe, the preservation of which remains the essence of French military doctrine and force programs. ■

Jacquelyn K. Davis is a Senior Staff Member and Special Assistant to the President of the Institute for Foreign Policy Analysis in Cambridge, Mass. She holds graduate degrees in international relations from the University of Pennsylvania and, during her career, has written extensively on strategic security issues and has lectured at the Air War College. Dr. Davis is the coauthor of a recent book, The Atlantic Alliance and U.S. Global Strategy. *Her first article for this magazine, "Japan Wrestles With Its Defense Options," appeared in the May '84 issue.*

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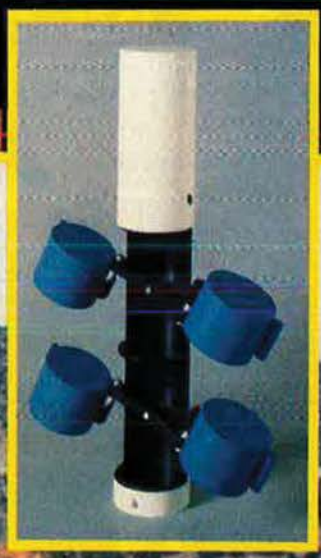

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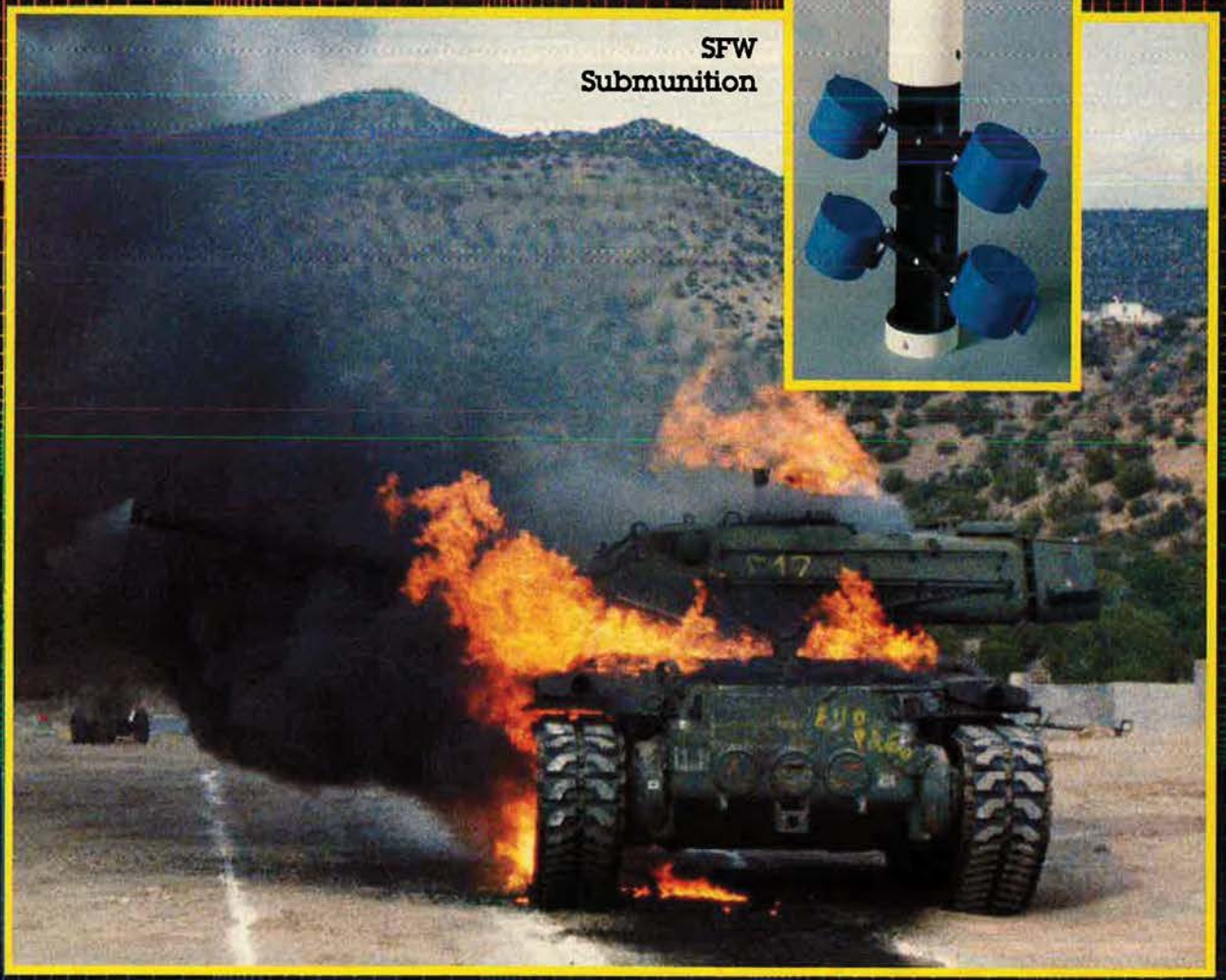

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VIEWPOINT

Amnesty and the Code

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

The disturbing new element in the Academy cheating scandal is that a hundred or more seniors knew what had happened, but did not report it.

Unless things have changed radically since my day, four years at a service academy can seem an eternity. When the day finally does arrive, it is almost too good to be true.

This past May 30 was, even more than usual, a special occasion. Or, at least, it should have been. Things had gone well for the Air Force Academy Class of '84. The football team had defeated Army, Navy, and, incredibly, for the second straight year, Notre Dame; had won the Commander in Chief's trophy; and had topped off the season with a bowl game win. All this with a team whose SAT scores averaged 1,150—400 points higher than the NCAA requirement for athletic eligibility.

As have other classes regularly in the past, the Class of '84 had a Rhodes Scholar. Only a handful of colleges and universities now rank ahead of the Air Force Academy in numbers of Rhodes Scholars, and the same holds true of such other scholarship awards as the Guggenheim.

Besides, this was the Academy's twenty-fifth graduation, and President Reagan himself was doing the honors on a beautiful day in the Rocky Mountain foothills. All in all, everything seemed perfect, although, sadly, it was not. Lurking in the background, like black sheep at a family reunion, were nineteen members of the Class of '84 accused of cheating on a physics exam and thus denied graduation.

Cheating scandals have happened before, but this time there was a disturbing new element. The Cadet Honor Code says, "We will not lie, steal, or cheat, or tolerate among us anyone who does." Tough words, but unmistakably clear. The nineteen were a familiar, if unpleasant, reminder that some people, even cadets, cheat under pressure. What was not familiar was the evidence that knowledge of the cheating was widespread and—in violation of the code—tolerated. When a hundred or more Academy seniors decide to waive the toleration clause, something has gone badly wrong.

As we all know, times are different now than they were in the good old days, whenever *those* were. Magazines that once would have triggered a police raid are sold openly in respectable shops. The drug culture has become all too visible, and there is a pervasive philosophy of getting away with as much as you can. The world today is not an innocent one, and if our young become cynical at an early age, it should come as no surprise.

Thus, when these men and women arrive at the Air Force Academy, it is almost as though they have landed on another planet. Following the loss of their modish locks, they are told a cadet does not lie or cheat or tolerate anyone who does. It is the code that will govern their conduct during the next four years, on the premise that once trained in a strict honor code, cadets will carry those principles into their careers as officers. If the academies are not the bedrock, the standard-setters, for their respective services, then there is little excuse for the considerable sums spent on these institutions.

Over the years, the cadet honor code has had the evident support of the thousands who have passed through the Air Force Academy. The code itself, with superficial variations, was taken from the West Point honor system. Among my moth-eaten souvenirs is a copy of *Bugle Notes*, 1936, a little book designed for the education of plebes as to what West Point was all about. In discussing the honor system, *Bugle Notes* has this interesting thing to say:

"It is obviously difficult, therefore, to instill in writing, a thoroughly clear and complete conception of the Honor System. And it is perhaps well that this is the case, because an honor system, to be feasible and to endure, must not be bound by ironclad rules, but must exist, to a considerable extent, in the minds of the group to which it applies: from which facts it derives a certain degree of flexibility." In other words, the code must be administered with common sense.

Flexibility is where the trouble lies. No one has any problem accepting the prohibition against lying and cheating. Those whose word cannot be relied on are not people you want around. Human nature being what it is, however, most of us would prefer to see the liars and cheaters caught redhanded. Informing on a classmate is a hard thing to do; yet that is what the toleration clause means. My old *Bugle Notes* puts it bluntly:

"Everyone is honor-bound to report any breach of honor which comes to his attention."

There is nothing flexible in that statement, nor is there in the Air Force Academy's toleration clause.

For the vast majority of the 4,400 cadets, the adjustment to a rigid honor code is an easy one. They are, after all, a select group: National Honor Society, student body presidents, achievers, people who never had the slightest reason or inclination to cheat. The toleration clause was the sticking point for the hundred or so who stood by while the nineteen cribbed the Physics 411 exam. Still, they graduated while those who cheated did not.

In the face of this contradictory situation, the Superintendent, Lt. Gen. Winfield W. Scott, Jr., a compassionate man, has given amnesty to those who admitted to cheating. Thoroughly remorseful, they will be allowed to return to the Academy as cadets with a new chance.

Old grads of both West Point and the Air Force Academy may view this decision as certain evidence the place has gone to hell, but they would be wrong. The amnesty decision was, in this instance, warranted, even though it would have been far easier to boot out the nineteen, for the honor system had somehow partially broken down, for reasons General Scott wants to discover. ■

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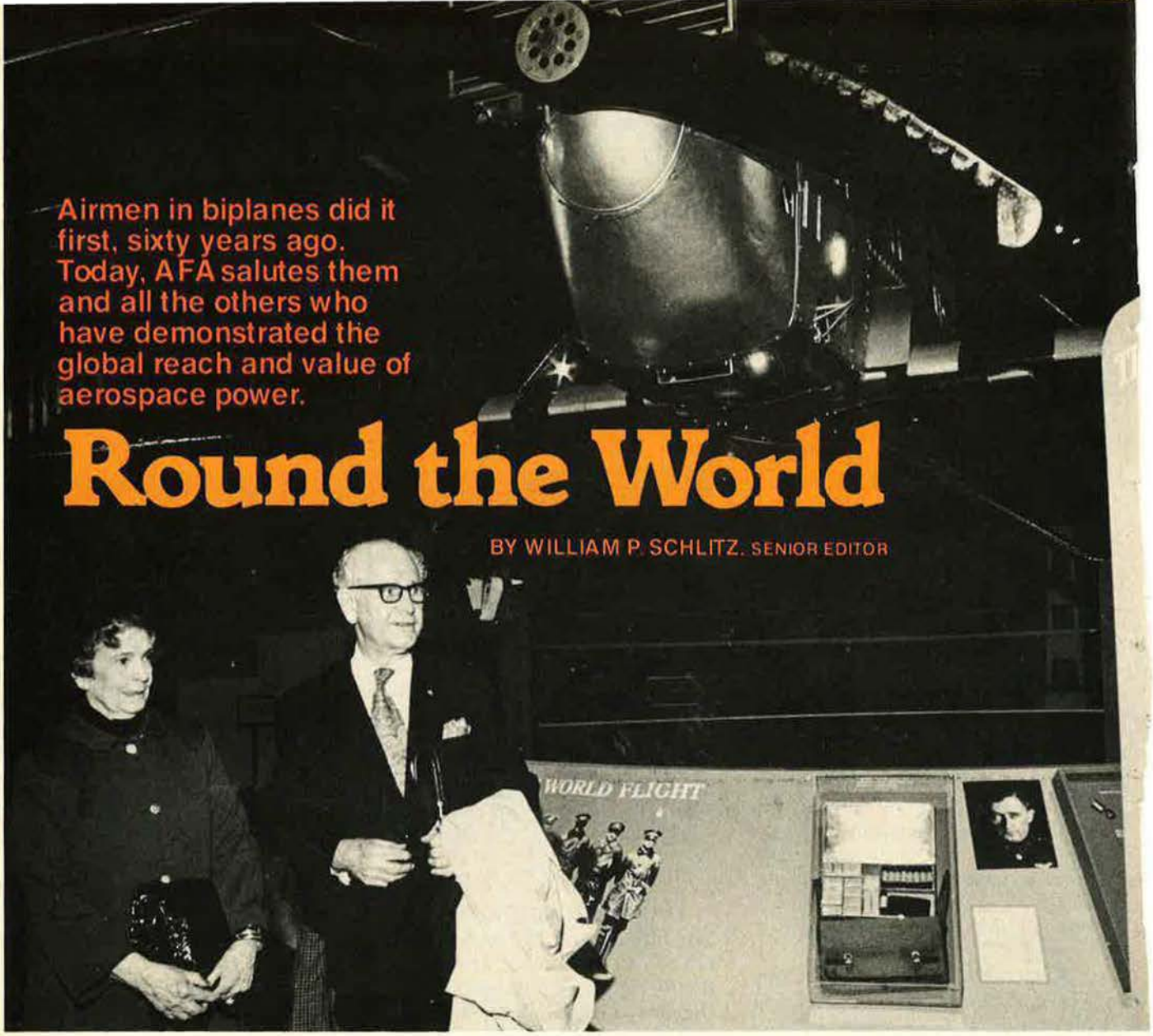

Airmen in biplanes did it first, sixty years ago. Today, AFA salutes them and all the others who have demonstrated the global reach and value of aerospace power.

Round the World

BY WILLIAM P. SCHLITZ, SENIOR EDITOR

In observance of the sixtieth anniversary of the first round-the-world flight, AFA has chosen "Global Access Through Aerospace" as the theme of its 1984 National Convention. Since 1924, there have been thousands of global circumnavigations—in airships ranging from biplanes and bombers to helicopters and spacecraft—and even today, it is seldom a routine feat.

And in recognizing the contribution of all of the round-the-worlders, special homage must be paid to the eight flyers who, shortly after sunup on April 6, 1924, took off from Seattle, Wash., in open-cockpit airplanes for one of the greatest adventures of the century.

It had been barely twenty years earlier that the Wright brothers first demonstrated powered flight, and, although air machines had performed with some distinction in World War I, the Air Service was very much underfunded and in need of greater support. Thus, Brig. Gen. Billy Mitchell, second ranking officer in the Air Service, and his boss, Maj. Gen. Mason M. Patrick, conceived of the daring circumnavigation as a means of focusing public attention—and that of the national leadership—on what aviation had to offer.

Preparations

The aircraft chosen for the undertaking were to become internationally renowned as "World Cruisers." The Air Service acquired four of them directly from the assembly line at the Douglas plant in Santa Monica, Calif. A fifth, the prototype, would become a spare.

These planes were built to Air Service specifications with particular emphasis on rugged airframes. They were designed for use with either conventional landing gear or floats for water landings. They would be powered by war-surplus Liberty engines and have only three flight instruments: altimeter, turn-and-bank indicator, and airspeed indicator. Cruising speed was ninety mph.

The four sturdy craft were named in honor of these cities: *Seattle, Chi-*

LEFT: With the Chicago suspended in the place of honor behind them, Leigh Wade, one of the 1924 round-the-world pilots, and Mrs. Wade are honored at the Smithsonian in 1974. RIGHT: Sailors from USS Richmond give an arriving plane a hand at Reykjavik, Iceland.

cago, New Orleans, and *Boston.*

General Patrick chose the pilots. Maj. Frederick L. Martin was named flight leader, with Lts. Lowell H. Smith, Erik Nelson, and Leigh Wade flying the other three biplanes. Each was allowed to pick his own "mechanician" to ride in the back seat.

Martin named Sgt. Alva L. Harvey; Smith chose Lt. Leslie P. Arnold, also a pilot; Nelson asked for Lt. John Harding, another pilot; and Wade selected Sgt. Henry H. Ogden. All were unmarried, except Martin.

Logistics requirements were staggering. The Liberty engines seldom operated for more than 100 hours without major overhaul or failure, so spares would have to be available in many locations. Support was laid on at fifty-two foreign sites along the route, and everybody from the Navy to the Bureau of Fisheries would be standing by to help as needed.

At Langley Field, Va., the airmen received crash courses in navigation, meteorology, and first aid. There, the pilots flew the prototype World Cruiser for the first time.

As for associated equipment, stowed aboard the four aircraft were rifles and pistols, concentrated food, first-aid kits, tools and engine spare parts, and, not surprisingly, anchors and lengths of rope. Space and weight limitations ruled out life jackets or parachutes.

And thus, with preparations as complete as could be expected and overcoming the usual mishaps and delays, the four World Cruisers took off from the official starting point at Sand Point Field near Seattle on April 6. The great adventure—the first attempt to fly around the world—had begun.

Indications

The first leg of the flight, 650 miles up the west coast to British Columbia, brought indications of what was to come. The crews encountered fog, rain, hail, and strong headwinds, arriving at their first destination in the midst of a snowstorm. All made good landings except *Seattle,* which damaged a float strut, requiring a repair delay of three days. The first hop had taken eight hours and ten minutes of flying time.

The first World Cruiser to be lost was *Seattle.* Blinded by snow, Martin and Harvey crashed into the slope of a mountain. They were uninjured, but it took them ten days to struggle back to civilization. For them, the adventure was over.

Thereafter, despite spine-tingling hazards, equipment failures, and other setbacks, the remaining crews pressed on from point to point around the world, sometimes improvising brilliantly to keep their craft airworthy. Throughout the circumnavigation, except at two points back home in the US, all repair, maintenance, and servicing of the aircraft was conducted by their crews.

The itinerary called for stops in Japan, Indochina, India, Persia, Syria, Turkey, Romania, Hungary, Austria, France, the UK, Iceland, Greenland, Labrador, and Nova Scotia.

The Liberty engines were cantankerous and had to be changed frequently. *Chicago* set down in a crocodile-infested lagoon off the Gulf of Tonkin when its engine conked out. (The Navy brought a spare from Saigon.) In Rangoon, a riverboat ran into *New Orleans.* In Calcutta, Smith fell from the wing and broke a rib, and a mixed audience of people and cows gathered to watch the crews work on the airplanes. And so it went.

Ceremonies

After *New Orleans* cleared the desert—its engine smoking and on its last legs—to set down in Karachi, the soupy weather above Europe seemed almost uneventful. Everywhere, there were ceremonies and crowds. The American airmen had electrified the world with their exploits. In the beginning, few except their fellow airmen had believed they would make it. Now everyone was cheering them on, and the Navy strung out its Atlantic Fleet at 100-mile intervals to see them over their last ocean leg.

Boston went down in the North Atlantic during the flight from the Orkney Islands off the coast of Scotland to Iceland. A US Navy ship on station was alerted to the mishap by *Chicago* and rescued Wade and Ogden. *Boston* sank while being hoisted aboard.

Overcoming hazardous weather and other dangers, the two remaining World Cruisers made it safely back to North America. In a flight south from Maine to Boston, *Chicago* and *New Orleans* were joined by Wade and Ogden in the backup prototype aircraft christened *Boston II*. They landed to the first of many festive welcomes, then proceeded on hops down the eastern seaboard and across the country to their starting point in Seattle.

Billy Mitchell had ordered visits to seventeen cities, including the nation's capital. He was not about to shortchange the Air Service on the publicity aroused by the great adventure.

It had taken almost seven months to cover the 26,345 miles of the route, and flying time was 371 hours and seven minutes. In the years to come, others would do it faster—but these men in their biplanes had done it first.

They had demonstrated something important. Two decades after Kitty Hawk, the airplane had become more than a curiosity. The World Cruisers had shown that global access by air was a reality. Subsequent circumnavigations would elaborate on that theme—and over the next sixty years, *global reach* would become recognized as one of airpower's greatest contributions.

Six of the eight US Army Air Service pilots and "mechanicians" who made the 1924 round-the-world flight smile for the camera at Seattle, Wash. They are, from left: Sgt. Henry H. Ogden; Lt. Leslie P. Arnold; Lt. Leigh Wade, pilot of* Boston*; Lt. Lowell H. Smith, pilot of* Chicago*; Maj. Frederick L. Martin, pilot of* Seattle*; and Sgt. Alva L. Harvey. Missing from the photo were Lt. Erik Nelson, pilot of* New Orleans*; and Lt. John Harding.

Capt. James G. Gallagher, aircraft commander of the Boeing B-50A* Lucky Lady II*, is flanked at the microphones by (left) Stuart Symington, Secretary of the Air Force, and (right) Gen. Hoyt S. Vandenberg, USAF Chief of Staff, who are welcoming him and his crew at the end of the history-making first nonstop round-the-world flight. The flight was made between February 26 and March 2, 1949. It covered 23,452 miles and took ninety-four hours and one minute. The plane was refueled in the air four times by B-29 tankers from the Azores, Saudi Arabia, the Philippines, and Hawaii. The flight helped greatly to develop advanced refueling procedures and to improve equipment.

Salutes

Round-the-world flyers as well as round-the-world flight are being saluted at this year's AFA Convention. Nine aviators, representing a cross section of flights, will be invested as Jimmy Doolittle Fellows during Convention week by the Aerospace Education Foundation, an affiliate of AFA:

- **Maj. Gen. Leigh Wade,** the last surviving member of the 1924 Round-the-World Flight, retired in 1955 following a distinguished career in military and civil aviation dating back to 1916. Eighty-eight and still keenly interested in aerospace matters, he resides in the Washington, D. C., area. General Wade recalls that public excitement preceded the World Flyers wherever they went, and that the welcome celebrations were often as exhaust-

ing as the flights themselves. At one stop in Japan, he says, "twenty-eight days of receptions were planned. We compromised and boiled everything down to three days to give us time for engine changes and repairs." The Flyers landed in Paris on Bastille Day, and "it took us an hour just to get free from the handshaking crowd."

• **James G. Gallagher** was an Air Force captain on February 26, 1949, and aircraft commander of the B-50 *Lucky Lady II* when it took off from Carswell AFB, Tex., to fly nonstop around the world. The feat was made possible by four gravity aerial refuelings en route. The mission took ninety-four hours and one minute, and Captain Gallagher and his crew of thirteen were awarded Distinguished Flying Crosses and won the Mackay Trophy for the year's most meritorious flight. Stuart Symington, Secretary of the Air Force, proclaimed this "an epochal step in the development of airpower." Gallagher retired from the Air Force as a colonel in 1972 and lives in the Washington, D. C., area.

A jaunty Lt. Leigh Wade, before the start of the 1924 flight.

• **Maj. William H. Thurston** and **Maj. John M. Durham** were aircraft commanders of B-52 bombers that flew around the world and performed an operational mission: locating and photographing elements of the Soviet Navy operating in the Arabian Gulf. Their flights originated and terminated in March 1980 at K. I. Sawyer AFB, Mich. Each aircraft received nine aerial refuelings, and flight time was 42.5 hours. The crews reported only minor equipment and communications problems, and their mission won the Mackay Trophy. Thurston is currently assigned to Yokota AB, Japan, and Durham to Carswell AFB, Tex.

• **Donald P. Taylor** built his own aircraft, *Victoria,* in which he took off from Whittman Field near Oshkosh, Wis., in August 1976 to fly around the world. His craft was a modified single-engine T-18, designed by John Thorp. Taylor's circumnavigation took sixty days. He is a retired Air Force lieutenant colonel and a former fighter pilot who flew seventy-nine missions in the China-Burma-India theater during WW II. He resides along the side

Donald P. Taylor, a retired USAF lieutenant colonel, built his own modified T-18, christened it **Victoria,** *and flew it around the world in 1976. His circumnavigation took sixty days. The former fighter pilot is a veteran of seventy-nine combat missions in the CBI during World War II. Colonel Taylor now lives in California. (Photo by Bernie Crampton, Hemet, Calif.)*

Maj. William H. Thurston, aircraft commander of the globe-girdling B-52, one of two that flew around the world in March 1980, is here kneeling at left. Others kneeling are Capt. Charles M. Schencke, navigator, and Capt. Wayne M. Hesser, radar navigator. Standing, from left, are Col. Robert Rodriguez, Director of Operations, 410th Bombardment Wing (he was not part of the B-52 crew); Capt. Corrie J. Kundert, electronic warfare office; SSgt. Samuel J. Carmona, gunner; Capt. Steven C. Nunn, copilot; Capt. Richard M. Zimmerman, instructor pilot; and (also not part of the crew) Col. Marion F. Tidwell, Commander of the 410th Bomb Wing. Maj. John M. Durham was the aircraft commander of the other B-52 that accompanied Major Thurston's plane on the flight.

of his own airstrip near Hemet, Calif.

• **Brooke Knapp** took up flying to overcome a lifelong fear of flying. When she soloed in 1978, that was just the beginning of her career in aviation. In February 1983, she flew a company Learjet, named *The American Dream,* around the world in fifty hours, twenty-two minutes, and forty-two seconds, fifteen hours faster than the previous time in her flight category. There were eleven scheduled refueling stops during the record-breaking flight. Total flying time would have been even lower had *The American Dream* not been forced to make an unscheduled stop on a tiny island 500 miles from Guam for repair of the filter system. Mrs. Knapp holds other aviation records as well, and is the founder of Jet Airways, Inc., an air courier and charter service based in Los Angeles. She has flown in a number of military aircraft, including the F-15. In 1983, President Reagan presented her the FAA Meritorious Award for exceptional achievement in the field of aviation.

Brooke Knapp, who flew a Learjet, The American Dream, around the world at a record pace in 1983.

H. Ross Perot, Jr. (right), and his co-pilot, J. Coburn, who made the first helicopter flight around the world.

• **H. Ross Perot, Jr.,** and his copilot, **J. Coburn,** began the first flight around the world in a helicopter at Love Field, Dallas, Tex., on September 1, 1982. Their two-seat Bell 206 LongRanger landed and refueled fifty-six times in twenty-six countries and set down again in front of Dallas city hall on September 30. The toughest of the refueling stops was aboard a specially equipped ship off the coast of Japan, needed because the Soviet Union denied Perot and Coburn permission to land in Soviet territory. Their helicopter, *Spirit of Texas,* was modified with an extra fuel tank and special navigation and communications gear. It has since been donated to the National Air and Space Museum in Washington. Perot subsequently earned an Air Force commission and completed flight training at Vance AFB, Okla. Coburn is employed by Electronic Data Systems Corp. in Washington.

Michael Collins, as pilot of Gemini-10 and command module pilot for Apollo-11, certainly did his share of round-the-world flying.

• **Maj. Gen. Michael Collins, USAF (Ret.),** was pilot of the Gemini-10 spaceflight mission and command module pilot for the lunar-landing Apollo-11 mission in 1969. A West Point graduate and a former test pilot, he joined NASA's astronaut program in 1963 when the new space age was giving round-the-world flight an additional and very dramatic dimension. In 1970, Collins left the space program and was named Assistant Secretary of State for Public Affairs. In 1971, he became Director of the National Air and Space Museum. He planned construction of the new museum building and later became Under Secretary of the Smithsonian Institution. He is the author of *Carrying the Fire,* a memoir of his experiences as an astronaut. Today, he is an aerospace executive in the Washington, D. C., area. ■

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* International Defense Review 8/1981, pg 1039.
** Reprinted from Communications International, June 1982, pg. 59.

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John W. R. Taylor and Jane's observe a double anniversary this year.

ALL THE WORLD'S SOURCE

BY JOHN T. CORRELL, EXECUTIVE EDITOR

John W. R. Taylor is observing his twenty-fifth year as Editor of* Jane's All the World's Aircraft *at the same time the parent company, Jane's, is celebrating its seventy-fifth year of publication.

IT WAS the control tower on the telephone to the Jane's booth at the international air show. A comparatively obscure Romanian aircraft was inbound, and the tower wanted to know its dimensions before deciding how to park it. In similar and sundry ways, the aerospace community has been turning to Jane's Publishing Company Ltd. and *Jane's All the World's Aircraft* since 1909 for authoritative facts and figures about flying machines.

And 1984 marks a double anniversary: the seventy-fifth year of publication for *Jane's All the World's Aircraft* and John W. R. Taylor's twenty-fifth year as its Editor. This is of special interest to readers of AIR FORCE Magazine, because "Jane's Supplements" and Jane's-furnished galleries of US and Soviet systems and special analyses have been appearing in our pages since February 1971 and because John W. R. Taylor is a Contributing Editor to this magazine.

The Jane's story began in 1897 when a British naval enthusiast, Fred T. Jane, introduced the now-legendary *Fighting Ships*. The first volume on aircraft, which appeared only six years after the Wright brothers established powered flight as a reality, was called *All the World's Air-Ships,* reflecting Fred Jane's naval turn of mind. It became *Aircraft* the following year, and so it has been ever since.

Today, Jane's publishes fourteen different yearbooks, but *Aircraft* and *Fighting Ships* are its major ones. Between annual editions, new developments are reported by John W. R. Taylor and his staff in the "Jane's Supplements," which are featured every other month in AIR FORCE.

Aircraft manufacturers, air forces, and governments cooperate readily with Mr. Taylor as he compiles his material. Even the Soviet Union contributes to some degree. The Soviets do not allow their ordinary citizens access to Jane's reference works—but Soviet officials never miss acquiring their own copies on the first day of publication.

Before coming to Jane's, Mr. Taylor spent seven years in design and technical writing at Hawker Aircraft Ltd. and eight as editorial publicity officer of the Fairey Aviation Group. His list of books and publications runs into triple digits. His son, Michael, and his daughter, Susan, are members of his editorial team. In fact, Susan H. H. Young shares with her father the by-line for "Gallery of USAF Weapons," which AIR FORCE Magazine publishes in its USAF Almanac issue each May.

Mr. Taylor works out of his home in Surbiton, just south of London. Despite his heavy editorial load, he finds time to pursue other interests, which include art, archaeology, skiing, and his five grandchildren. His focus on the future—he is surrounded constantly by mountains of data on the latest in aerospace technology—has not diminished his fondness for history and things of the past. His total typewritten output is his material for AIR FORCE Magazine. The text of his yearbook—amounting to some 1,500,000 words a year—is handwritten. The same firm in Yorkshire has printed *All the World's Aircraft* since 1909.

John Taylor is a charming man, and soft-spoken. But then, he and Jane's are recognized universally as the authoritative sources for data on all the world's aircraft, including obscure ones from Romania: There's no need to shout. ■

AIRMAN'S BOOKSHELF

Jump Jet in Combat

Harrier: Ski-jump to Victory, edited by John Godden. Pergamon-Brassey's International Defense Publishers, Washington, D. C., 1983. 132 pages with photos. $9 softcover; $18 hardcover.

From April 2, 1982, when Argentine forces invaded the Falkland Islands, through June 14, when they surrendered, the Royal Navy, Royal Air Force, and the British Aerospace-built Harrier won the battle for the air over the islands and provided the support necessary for the ground forces to win the war.

The Royal Navy and RAF had not been in a war for almost forty years, and the Harrier, the innovative V/STOL jet fighter, had never been tested in combat. Yet this team, organized overnight, fought and won a war under appalling weather conditions and unbelievable logistical problems some 8,000 miles from England.

A miracle? Yes, but formed of the stuff of most miracles: hard work, dedication, well-trained people, and a special ingredient—the Harrier, an airplane that performed far beyond the claims made for it in its advance booking, an aircraft whose versatility gave the planners the flexibility desperately required in war.

This was dramatically demonstrated when RAF pilots were able to make their first shipboard landings under combat conditions in rough seas after 8,000-mile ferry flights.

This book is a well-edited series of first-hand accounts by the participants: commanders, pilots, engineering officers, and mechanics. Their combined experiences provide an excellent narrative history of the entire campaign. The editor leads off with a crisp overview of Operation Corporate, the code name for the Falklands campaign.

The organization of the campaign's task force, whose initial elements sailed only three days after the invasion, is almost as fascinating a story as the combat itself. Altogether, more than 111 ships were deployed during the campaign, including forty-five merchant ships manned by civilian volunteers.

In any event, the Harrier proved to be the key element. Given the absence of in-range land bases and conventional aircraft carriers, its unique characteristics made it the only fighter the British could deploy.

In fact, according to Admiral Sir Henry Leach, Great Britain's First Sea Lord and Chief of Naval Staff, "Without the Sea Harrier there could have been no Task Force." It was agreed that, under the prevailing weather and sea conditions, standard conventional carrier operations would have been extremely difficult, if not impossible.

The lack of long-range radar early-warning aircraft compounded problems for the British force. Because of lack of sufficient warning to scramble the Harriers in time to intercept enemy aircraft, the British were forced to maintain almost full-time combat air patrols, which is very wearing on both men and machines.

The device for which this book is named, the ski-jump, was a vital factor in Harrier operations. HMS *Hermes* and *Invincible,* the two British carriers in the war, were designed for V/STOL and helicopter operations, and both were equipped with ski-jump ramps on the flight decks.

The ski-jump takeoff technique reduces deck roll by fifty percent for the same weight or allows a thirty percent increase in weight for the usual deck roll. Additionally, the ski-jump provides an extra margin of safety since the Harrier leaves the deck in an upward trajectory, giving the pilot more altitude and time to eject if necessary.

All the authors who flew in combat stressed the courage and dedication of the Argentine pilots, who consistently pressed home their attacks regardless of the opposition and despite the fact that they were operating at their extreme range.

For those who want the details of the British air operations in the Falklands—those day-to-day tidbits that are lacking in standard histories—this book provides them in a concise, readable form.

—Reviewed by Donald S. Lopez, Deputy Director, National Air and Space Museum.

Informative but Flawed

The Wizards of Armageddon, by Fred Kaplan. Simon & Schuster, New York, N. Y., 1983. 452 pages with index, notes, bibliography, and photos. $18.95.

What a title! The wizards of Armageddon were an intellectual elite who, out of the ashes of Hiroshima and Nagasaki, produced the ideas that today govern US nuclear doctrine.

They were a group of mostly civilians who developed the concept of deterrence and who designed, in the event that policy were to fail, the various nuclear warfighting doctrines that apply today. Most of these people worked, struggled, argued, fermented, and fomented at the Rand Corp., the Air Force's think tank in California.

Fred Kaplan, the author, is a young journalist with a doctorate in political science from MIT. He has produced a well-written, fast-paced, articulate book about what he terms "thermonuclear Jesuits," with David Halberstam-like, entertaining descriptions of such men as Herman Kahn, Bernard Brodie, Noel Parrish, Albert Wohlstetter, Andrew Marshall, and hundreds of others involved in the complex and enormously frustrating task of carving out a valid nuclear-deterring and warfighting doctrine and posture.

More importantly, he describes in understandable English such arcane notions as the prisoners dilemma, limited nuclear options, counterforce targeting, and dozens more. People who wish to understand how we came to these dangerous times need to grasp the awful realities of creating a nuclear strategy and force structure against a ruthless adversary who devotes an inordinate amount of its feeble economic resources to besting the United States in this arena. All the-

ories from 1946 on seem to have sunk into the mire of mutual, action-reaction, cutthroat rivalry, driving some of the wizards to stark depression. People wanting to know why may begin with Kaplan's book.

This generous evaluation of *Wizards* unfortunately needs to be balanced by an accounting of the book's shortcomings. While Kaplan writes well, he also writes carelessly, lacking both attention to documentation and understanding of rudimentary military history. These limitations mar the effort, nearly destroying it.

Space permits only a brief example for each category. His descriptions of the "wizards" are cartoons, and sometimes wrong.

Kaplan's documentation, considering his doctorate, is disgraceful. He relies too heavily, furthermore, on oral history and constantly quotes conversations he never heard. The reader is not allowed to know, moreover, from whose point of view the story is being told—character A, person B, or possibly C who overheard the conversation and retells either A's or B's version of it. In some cases, Kaplan does not validate the version he has printed by checking with all parties in the conversation.

The historical inaccuracies, finally, overwhelm his credibility. He writes that the Berlin Airlift in 1948 was conducted by "dropping packages of aid Into the city by parachute for more than 300 days." More unbelievable, Kaplan says that during the Berlin crisis in 1958–59, the Air Force "sent in very-high-altitude transport planes, which Soviet fighters attempted, but failed, to intercept." Worse, he has radar invented in 1942 at his alma mater, MIT, two years after the British used it most competently to help defeat the Luftwaffe during the Battle of Britain. Kaplan also tells us that Nathan Twining was never an advocate of strategic bombing but always of tactical bombing, which will dismay most of the veterans of Fifteenth Air Force.

I blame the publisher, however, for most of these howlers, because professionalism demands that the publisher help the author by providing him with expert assistance.

In sum, this is a book that makes sense of an esoteric world, but it should be read with a wary eye. Had the author and Simon & Schuster been more careful, *Wizards* could have become a classic.

—Reviewed by Col. Alan L. Gropman, USAF, Deputy Director of Air Force Plans for Planning Integration, the Pentagon.

New Books in Brief

C-130 Hercules, by Arthur Reed. In 1951, the Air Force issued a request for proposals calling for "an advanced, all-purpose workhorse . . . aerial vehicle that can go anyplace, anytime." As this book—the seventeenth in Ian Allan's "Modern Combat Aircraft" series—relates, the Air Force got what it asked for and more—a classic turboprop transport that has been built in more than forty versions and operated by more than fifty countries. Versatility has been the key to the phenomenal success of the Hercules, with the aircraft serving across a range of roles—search and rescue, drone launcher, photomapping, surveillance, electronic warfare, satellite retrieval, weather observation, in-flight refueling, gunship, and so on. (In the late 1950s, the agile C-130 even coruscated as the star of an "unofficial" aerobatic team!) In his only relatively short account, author Reed does an admirable job of surveying the Lockheed-built aircraft's thirty-year career. In particular, enthusiasts will appreciate the many photographs of the Hercules in a variety of guises. With appendices. Published by Ian Allan Ltd., available from Motorbooks International, P. O. Box 2, 729 Prospect Ave., Osceola, Wis. 54020, 1984. 112 pages. $14.95.

The Dilemma of Reform in the Soviet Union, by Timothy J. Colton. A difficult agenda confronts the new Soviet leadership headed by Konstantin Chernenko—declining economic growth rates, labor problems, ethnic unrest, and a variety of other domestic and foreign challenges. Author Colton argues in this publication by the Council on Foreign Relations that the Soviets, in order to deal with these worsening problems, will pursue a path of "moderate reform." Acknowledging that "reform is a complex dilemma for the Soviet leaders: a strategy to which they turn with great reluctance," he nevertheless presses his view that "moderate reform" will emerge as the guiding principle in addressing these serious social problems. He sketches out five main areas to which he believes the Soviets must direct their reform efforts, but he cautions that the success of moderate Soviet reform rests "on the political skill of the reformers." Mr. Colton makes a persuasive and well-reasoned case for his concept of moderate reform. However, some—perhaps more cynical—readers may wonder if he is being overly optimistic concerning the flexibility of a seemingly ossified Soviet society or if he has fallen victim in his analysis to the pitfall of

AIRMAN'S BOOKSHELF

"mirror-imaging." With notes. Council of Foreign Relations, 58 E. 68th St., New York, N. Y. 10021, 1984. 128 pages. $6.95.

Everywoman's Guide to Military Service, by Texe Marrs and Capt. Karen Read, USAF. More and more, women are making their mark in the military, which has been, traditionally, a man's world. However, as the authors of this guide point out in their preface, "military service is not for every woman." In this book the authors spell out both the opportunities and challenges for women who are considering a career in the military. Topics addressed include jobs for service women, military discipline and the officer-enlisted system, special concerns for women in the military, and the meaning of commitment to service. Enthusiastic in support of military careers for women but candid in its appraisal of service life, this guide is chock-full of valuable advice for young women (and men) who are considering a military career. With photographs and index. Liberty Publishing Co., 50 Scott Adam Rd., Cockeysville, Md. 21030, 1984. 170 pages. $7.95.

Israeli Air Force: 1948 to the Present, by Yehuda Borovik. A part of the "Warbirds Illustrated" series, this is not an analytical work but rather a pictorial history of one of the world's finest air forces. From the 1948 War of Independence, when the Israelis scoured the world for aircraft irrespective of condition (of about 100 total operational aircraft at that time, the Israeli Air Force had more than thirty types represented), to today's feared air arm consisting of top-of-the-line American F-15s and F-16s and combat aircraft of Israeli manufacture, this book traces the thirty-six-year history of the IAF. Sixty-five aircraft types are represented in this slender book, with many of the photographs having never before been published outside of Israel. A minor complaint is the relative dearth of color photographs. Published by Arms and Armour Press, distributed in the US by Stackpole Books, Cameron and Kelker Sts., P. O. Box 1831, Harrisburg, Pa. 17105, 1984. 72 pages. $7.95.

Operation Barbarossa, by Bryan I. Fugate. Conventional wisdom teaches that the Nazi onslaught on Stalin's Russia in June of 1941 came too late to ensure success—the infamous Russian winter eventually slowed the German armies and decimated their ranks, giving the desperate Russians time to fall back and regroup. Author Fugate argues in this well-researched history that internal divisions among the commanding German generals—"particularly on the part of the ambitious Halder"—did more to contribute to the ultimate failure of the invasion than did the weather or any other factor (save perhaps the blindness of Nazi ideology). Mr. Fugate buttresses his thesis with thorough documentation from primary sources, making for a convincing case. Of especial interest to military professionals will be Mr. Fugate's enumeration of critical strategic and tactical lessons that he believes the Soviets learned from the German invasion. With a Foreword by Col. John Sloan, USA (Ret.), and maps, appendices, notes, bibliography, and index. Presidio Press, 31 Pamaron Way, Novato, Calif. 94947, 1984. 448 pages. $22.50.

Those Wonderful Men in the Cactus Starfighter Squadron, edited by Barney Oldfield and Tom Rhone. Volume II of the two-language publication tracing the history of German pilot training at Luke AFB in Arizona, this book covers the period from 1976—where Volume I left off—to the termination of the binational training program in March 1983. *(See also the article "The Lukewaffe Winds It Up" in the April '83 issue.)* But this book is more than just the history of the training program—it is also a scrapbook and memoir for the thousands of Germans and Americans who participated in the Luke training program and, through the International Friendship Foundation, a vehicle for the continuation of the charitable activities that marked German-American cooperation over the twenty-five years of the program. Volume II features letters of salute from West German Chancellor Helmut Kohl and President Reagan and a "last word" from the "Commander" of the Cactus Squadron, General Johannes Steinhoff. With photographs. Available from the International Friendship Foundation, P. O. Box 1735, Glendale, Ariz. 85311, 1984. 144 pages. $15. (Volume I is still available from the Foundation for $11; readers may purchase both volumes for $25 while the supply lasts.)

—Reviewed by Hugh Winkler, Assistant Managing Editor.

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Remounted and

Behind the Thunderbird pomp and polish is a trim unit that can deploy to combat within hours of a public performance.

BY JON R. DONNELLY

THE commander sat and, like several thousand other spectators, craned and stretched his neck to watch every twist and curve his pilots made as they performed their precision maneuvers.

He watched, however, with the supercritical eye of an expert.

The morning sun reflected on the silver stars and command pilot's wings worn by Gen. W. L. Creech, who was seated on the dais with other VIPs during a recent Thunderbirds demonstration at Langley AFB, Va.

The former Thunderbird and current Commander of Tactical Air Command may have been on the ground, but it was obvious that he also was inside the cockpits of the six red, white, and blue F-16s as they sliced the morning sky in a crowd-pleasing performance.

General Creech served with the

Ready

Thunderbirds from November 1953, the year the unit was activated as the 3600th Air Demonstration Team at Luke AFB, Ariz., until November 1955. During his two seasons, the then 1st Lt. and later Captain Creech flew the right- and left-wing positions in 125 official performances. Following his Thunderbird tour, Captain Creech went on to lead the equally famed USAFE Skyblazers aerobatic team through

Gen. W. L. Creech, then a captain, in an F-84G when he was a member of the first Thunderbirds team in 1953–54.

four show seasons and 399 official demonstrations.

Patron and Mentor

Trading on this extensive background, General Creech has been both a patron and mentor to the Thunderbirds as Commander of TAC. He participates fully in the demanding selection process of the Thunderbird pilots and other key team members. He also has played an important role in polishing the Thunderbird flight maneuvers, and reviews the videotape of each public performance.

He stood firmly behind the team during the aftermath of the tragic 1982 accident, caused by a mechanical malfunction in the leader's aircraft, in which four of its members were killed, and he worked quietly and effectively not only to return the team to flying status but to effect a transition from the T-38 to the F-16—a long-wished-for return to a front-line fighter aircraft. He also conceived and installed a new approach to the Thunderbird mission, wherein all team members, including the pilots, maintain combat proficiency and wherein the demonstration aircraft can be rapidly restored to combat-ready status in a few hours—giving the Thunderbirds a combat mission as well as a demonstration one.

The US Air Force Air Demonstration Squadron—as today's Thunderbird team is officially known—has worked very hard to achieve its stated goals: to support recruiting and retention programs, to reinforce public confidence in the Air Force, to strengthen the morale of Air Force members, to demonstrate the professional competence of Air Force people, and to serve as

a combat-ready unit in the event of war.

The men and women of the Thunderbirds represent to a great extent the competence and the capabilities of all Air Force personnel. "As individuals, we are representative of the skills, job performance, and dedication of all Air Force people," said a team spokesman.

Fighting Unit

The aspect of combat readiness is an important one. It is a common misconception—and one the team would like to see disappear—that the Thunderbirds are strictly for show. They are not stunt pilots.

"Everything we do, from precision flying to maintenance, is predicated on the requirement that we be combat-ready in less than seventy-two hours in any national emergency," said the spokesman. If called upon in crisis or wartime, the team would become part of the 474th Tactical Fighter Wing at Nellis AFB, Nev.

As a flying unit, "we combine those attributes into a self-sufficient flying organization that could be integrated effectively into the regular combat command structure," the spokesman said. The 115 enlisted personnel perform in thirty-five career fields.

Among the skills the team has developed and honed are air-to-surface combat tactics, air-superiority maneuvers, rapid deployment, high sortie rates, and effective maintenance. "We fly periodic weapons-training missions in addition to our demonstration flights," said the spokesman.

The Persuading Argument

Killed during the line-abreast

One of the many demanding maneuvers performed by the team, an opposing knife's edge pass. At right: some of the 10,500,000 spectators who viewed the team last year.

Thunderbirds maintenance technicians check an F-16 engine. Professional members of the Thunderbirds team, the maintenance crews have achieved an impressive record of thirty-one years and nearly 2,600 aerial demonstrations without a cancellation for maintenance reasons.

training maneuver in the Nevada desert on January 18, 1982, were Maj. Norm Lowry and Capts. Willie Mays, Pete Peterson, and Mark Melancon. Between the time of the crashes and March 30, when the accident report was released, General Creech and Air Force Secretary Verne Orr reportedly fought a behind-the-scenes battle within the Defense Department and with Congress to keep the Thunderbird concept alive. Those close to the issue are generous in their praise of both, and of the hard work, tenacity, and eloquence that went into keeping the Thunderbirds in the air. The team's first public performance in F-16s was in March 1983 at Langley AFB. Since then, the unit has resumed its tireless performance pace, including a recent, highly successful, ten-nation European tour.

In the thirty-one years since it was organized, the team has flown nearly 2,600 official performances, flown in all fifty states, and performed in forty-five nations.

The supersonic F-16 Fighting Falcon is the Thunderbirds' eighth mount. When the team's pilots flew their first show on June 8, 1953, they were in F-84G Thunderjets of Korean War fame. Since then, they have flown F-84F Thunderstreaks, as well as F-100C and F-100D Super Sabres, F-105 Thunderchiefs, F-4E Phantoms, and T-38A Talons.

If F-16s enhance the dual capabilities of the Thunderbirds, its people—all of them volunteers—are the "stuff" that makes the concept work. And members of the team can't hide the pride they take in developing a high level of self-discipline and in striving for perfection.

A number of former team members have later achieved high rank. And, like General Creech, most carry with them throughout their careers the professionalism that is a Thunderbird hallmark.

"We're not necessarily the best in the Air Force," said Maj. A. R. Minkel, a Thunderbird pilot and the team's narrator. "We are the best of those who applied for the Thunderbirds. But we represent the best the Air Force has to offer." And that's what the Thunderbirds are all about. ■

Jon R. Donnelly, State Editor and aviation columnist for the Richmond, Va., News Leader, is also an AFA National Director. He has won numerous national, state, and local writing awards during his twenty years as a journalist. He has flown with the Thunderbirds. He was the author of the article "Last of the Keystones" in the July '84 issue and "Guard's Up in Virginia" in October '82.

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Carpet was first used in October 1943 and, as more became available, there was a progressive reduction in the accuracy and effectiveness of German radar-laid flak. More than 7,000 APT-2 Carpet jammers were built at an average unit cost of $400.

The APT-2 Carpet was the first US airborne jammer to go into mass production. Sanders Associates, Incorporated has been a leading developer and producer of airborne radar jamming systems for over three decades.

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One in a series of Sanders advertisements on the history of electronic warfare. Research and text by Alfred Price, author of "Instruments of Darkness," Charles Scribner's Sons, New York. Illustration by Alfred "Chief" Johnson. Sanders Associates, Inc., Nashua, New Hampshire.

Valor at Vigan

When Japanese attacks on the Philippines left the AAF with more pilots than planes, Lt. Russell Church faced a supreme decision.

BY JOHN L. FRISBEE

PEARL Harbor was a disaster, the Philippines a debacle. There the Japanese attack, some nine hours after Pearl was bombed early on December 7, 1941, was no hit-and-run affair but prelude to an invasion for which the vastly outnumbered Americans were ill-prepared.

Army Air Forces first-line aircraft in the Philippines numbered only thirty-five B-17s and seventy-two P-40 pursuit planes, some of the latter assembled the day before the attack. Airfields, the warning system, communications, antiaircraft defenses, and supplies were in deplorable condition, despite the fact that our planners believed the Japanese would hit the Philippines first, if war came in the Pacific.

The first waves of enemy bombers, heavily escorted by fighters, swept over Luzon in the late morning and early afternoon of December 8 (the seventh in Hawaii, east of the International Date Line). News of the attack on Pearl Harbor had left the Philippines command echelon in a state of confusion. Half the bombers and many pursuits were destroyed on the ground. What remained of the pursuit force put up a valiant and costly defense against subsequent bombing attacks.

By December 10, only twenty-two flyable P-40s remained to oppose a large enemy bomber force supported by an estimated 450 fighters. In order to conserve the P-40s, they were restricted primarily to reconnaissance missions.

On December 10, the Japanese landed at Vigan, some 200 miles north of Manila on the west coast of Luzon. Five days later, twenty-five enemy planes were sighted on a field near the town. Abandoning reconnaissance for this opportunity, a fighter attack was ordered for the following day, to be led by Lt. Boyd "Buzz" Wagner, who commanded the 17th Pursuit Squadron. Two days earlier, Wagner had shot down four enemy planes while on a recce mission. He picked as his wingman for the Vigan strike Lt. Russell Church, one of the most experienced pilots in the squadron. Church had graduated from flying school with Class 40-A and had been flying P-40s in the Philippines for a year.

At dawn on December 16, the P-40s came in on their target from the sea, taking the Japanese by surprise. Wagner peeled off first, dropping his six thirty-pound fragmentation bombs on the neatly lined-up enemy planes. His pass across the field aroused enemy AA defenses. Church's P-40 was hit in the nose section as he started his bombing run, and he was immediately engulfed in flames. What happened then was recalled later by Buzz Wagner:

"I [ordered] him to turn back and bail out. Russell did not turn back. He dipped the nose of his blazing ship [and] went down like a hell-bent fireball . . . then flattened out right over the target. I watched while every bomb he carried fell squarely among the grounded planes. . . . The ship still held its course, still flaming, and then it suddenly rocked wildly and plunged sideways to earth. . . . [Many] enemy planes were destroyed by his bombs and that meant we were able to go just that much longer in the Philippines. . . .

"I know that Church knew he was facing certain death when he decided to remain with his mission. . . . What Russell Church did at Vigan that day [was] the most courageous . . . thing I have ever seen in this Pacific war."

(After watching Church's heroic act, Wagner swung back across the field in a series of strafing runs, shot down the only Japanese fighter that got off the ground, and became the first AAF ace of World War II.)

Like so many others on Luzon, Church believed that reinforcements were on the way. If the Americans were to hold out until help arrived, he knew that nothing—not even a burning plane—could be wasted.

Russell Church was awarded the Distinguished Service Cross posthumously for his valor at Vigan. After the war, it was reported that he had been buried with full military honors by the Japanese who witnessed his self-sacrifice in the opening days of that long and bitter Pacific war. ■

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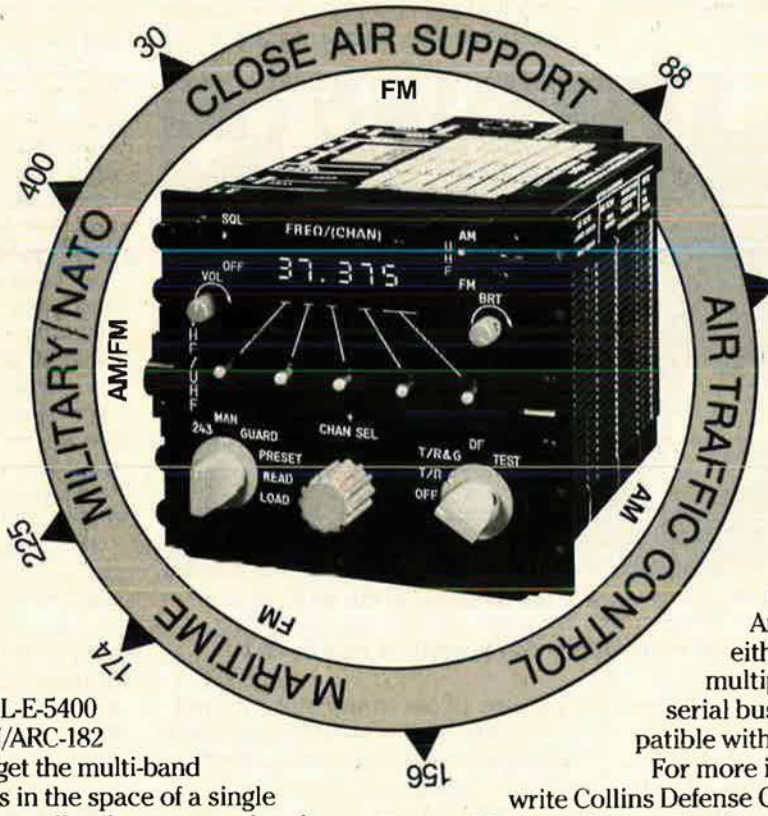

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By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

National POW/MIA Recognition Day

On a beautiful July day, President Reagan kicked off national observance of POW/MIA Day with an address to some 2,000 gathered on the south grounds of the White House *(see photo).* The group included former POWs; representatives of veterans groups, including AFA; League of Family members; active-duty military; and others involved with or interested in the POW/MIA situation.

The White House ceremony was but the beginning for this national day of observance. Across the country, hundreds of ceremonies took place. Balloons were released on a number of occasions to mark the events, and a distinctive small black-and-white POW/MIA flag was displayed. The flag, in fact, flew over the White House, the State Department, the Pentagon, and the VA's central office on July 20 as a symbol of the country's commitment to achieve the fullest possible accounting of all those still missing.

On POW/MIA Day, President Reagan addresses the gathering at the White House. Looking on are (from left) Mrs. Reagan, Vice President and Mrs. George Bush, and Secretary of Defense Caspar Weinberger. (White House photo by Pete Souza)

"We are here today," said the President, "to recognize and honor a small but very special group of Americans—our former prisoners of war and those who are still missing."

The President praised the sacrifices of those being honored and repeated his Administration's strong commitment to continue to press the governments of North Korea, Laos, and North Vietnam for information on America's missing servicemen. He noted that some progress continues to be made in this area, but, to resounding applause, he also stressed to the POW wives in the gathering that "we write no last chapters, we close no books, we put away no final memories until your questions are answered."

At some of the ceremonies, state congressional delegations presented a medal newly authorized by Congress to recognize POWs, MIAs, and their families. The POW/MIA Commemorative Medal is designated to be given to the primary next-of-kin or their designee. It is a three-inch bronze medal with an eagle on the front and the words "You are not forgotten" on the back. It was designed by a Vietnam veteran.

There are some 90,000 surviving American former prisoners of war. Still missing or otherwise unaccounted for in Southeast Asia are 2,489 Americans—942 of them Air Force.

The White House ceremony concluded with a flyover by Navy F-14s in "missing man" formation. President Reagan concluded his remarks by alluding to that formation and saying, "Today I pledge: We will not rest until that formation is complete."

Uncle Sam Wants You—And Your Dog Too

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Dogs must pass some psychological and physical tests before final acceptance. As might be expected, the first and most important test is its response to gunfire. A dog that flinches from the noise of blanks fired into the air from a decreasing distance of 100 feet to thirty feet is rejected out-of-paw.

Secondly, DoD is looking for aggressiveness. Without touching the dog, the evaluator will try to agitate it by acting in a suspicious or threatening manner. A snarling and snapping response is desired. Dogs that cower are eliminated.

Physical checks include heart, lungs, hips, and teeth—all important elements of a fit guard dog. Dogs accepted may perform a variety of duties, ranging from Presidential protection to base guard duty. The Lackland Center trains dogs for all services and most federal agencies.

Owners may donate their dogs or sell them for up to $400. Call toll-free

These four new first lieutenants, all learning the Shuttle business as members of the Manned Space Flight Support Group at Johnson Space Center, Houston, Tex., recently helped each other pin on the new insignia. From left are Albert P. Zelenak, Debra S. Zelenak, Mary K. Dauenhauer, and David E. Dauenhauer. Mary Dauenhauer and both Zelenaks are 1982 graduates of the Air Force Academy; David Dauenhauer graduated from the University of Southern Mississippi.

1-800-531-1066 (in Texas, call collect, [512] 671-4291) for more information.

"When People Vote, People Listen"

That headline is the DoD 1984 voting assistance slogan, and DoD is taking it seriously. In this Presidential election year, a major effort is being made to ensure that each service person is able to exercise the franchise.

DoD estimates that, in 1980, more than half of its members did not vote, some because they thought their vote would make little difference. DoD's Voting Assistance Program Office has sent out frequent reminders this year that every vote is important and that, in some cases, absentee ballots have helped decide close elections. They cite the case, for example, of the Texas Sixth Congressional District primary runoff this year in which one of the nominees was selected initially by a one-vote margin, two votes for the winner having been cast by military absentee ballot.

DoD has also stressed to potential voters the importance of filling out the Federal Post Card Application (FPCA) properly and also getting it in on time. An encouraging note is that, based on the number of FPCAs already used to register and request absentee ballots, 1984 could be a banner year for absentee-voter participation. A spot check indicates that participation is up by some sixty percent over 1980.

Henry Valentino, DoD Program Director, urges voters to notify his office of any problems they encounter in their attempts to vote. Letters should be addressed to the Director, Federal Voting Assistance Program, Room 1B457, The Pentagon, Washington, D. C. 20301. Telephone numbers are AUTOVON 224-4928 or commercial (202) 694-4960.

USAFA Class of '88

The some 1,500 cadets—including about 200 women—who began their studies at the USAF Academy in Colorado Springs last month are the survivors from among almost 13,000 applicants.

There are 211 minority cadets in the new class, including eighty-eight blacks. Entrants are from all fifty states plus two cadets from the Dominican Republic, one from Panama, and one from Peru.

According to Lt. Col. V. L. Thacker, Director of Cadet Admissions and Associate Registrar, "Approximately sixty-six percent of those accepting appointments this year are medically qualified for pilot training."

Air Force Lawyer Borrowed by OMB

In what's believed to be a first, an Air Force Communications Command attorney has been named attorney-advisor on telecommunications matters to OMB.

Capt. Michael L. Weinstein, who was the chief of telecommunications law at Hq. AFCC, Scott AFB, Ill., was selected by officials of OMB to fill the advisory slot in OMB's Information Policy Group, Office of Information and Regulatory Affairs. That office is charged by statute with major responsibilities for telecommunications policy. The charter includes serving as the President's principal advisor on policies for procurement and management of federal communications.

While the group has its own general counsel on staff, Captain Weinstein is its first attorney-advisor for telecommunications matters and also thought to be the first military attorney detailed to OMB. He was selected to fill this post because of his unique blend of legal expertise in the telecommunications and information systems area, including procurement, fiscal, and telecommunications law.

Captain Weinstein earned his Juris Doctor from the University of the Pacific in Sacramento, Calif. He will be on loan from the Air Force for several years. "I'm hoping to bring out some of the important principles I've learned from the AFCC, Air Force, and overall DoD perspectives at this very high policymaking level," he said.

YMCA/USO Continue To Serve Military

DoD and the Armed Services YMCA recently formalized a 123-year-old relationship with the signing of a Memorandum of Understanding. The YMCA organization began its service to the military community shortly after the outbreak of the American Civil War in 1861. The recent Pentagon signing ceremony underscored the cooperation that has gone on since then.

Armed Services "Y" facilities and programs are designed for all service personnel, with a special emphasis on young enlisted people. The network of Armed Services YMCA branches extends from Alaska to Florida, with overseas branches in Scotland and Panama. No membership fees are charged. Programs run the gamut of human concerns from child care and shelter for family members marked by violence to programs of enrichment, financial management, recreation, and education.

Meanwhile, new United Service Organizations (USO) operations in Fort Lauderdale, Fla., and Newport News, Va., were announced by Dennis P. Long, USO's new Chairman *(see August '84 "Intercom")*, and Gen. George S. Blanchard, USA (Ret.), the new USO President *(see photo on the following page)*.

The Newport News plans call for the USO to operate through shopping mall kiosks with a coordinating

New top officers of United Service Organizations (USO) are, left, Dennis P. Long, Chairman, and Gen. George S. Blanchard, USA (Ret.), President. (See also the accompanying item.)

mobile unit van. The new USO operation will serve some 25,000 Army, Navy, Coast Guard, and Air Force people and family members stationed in the area.

The Fort Lauderdale installation is planned as an information center to steer military people to affordable shopping areas, local activities, and points of interest. More than 50,000 military members a year visit Fort Lauderdale, primarily Navy men and women on liberty from ships.

Air Force Trims Force

This month, approximately 1,700 enlisted blue-suiters with normal dates of separation between October 1, 1984, and June 30, 1985, will be involuntarily separated.

Headquarters says the move is necessary due to an anticipated overage of enlisted members at the end of Fiscal Year 1984, which winds up this month. Those being forced out must have less than sixteen years' service. Additionally, they must fall into one or more of the following categories:

- Have been considered but not selected for reenlistment.
- Have been denied or busted from NCO status.
- Serving in grade of airman first class or below and not selected for promotion to senior airman.
- Have five or more lost days during current enlistment.
- Be serving in second or later enlistment and have declined assignment, training, or retraining.

Those identified under this program aren't exempt from administrative discharge or trial by court-martial, which would take precedence over this program. However, those leaving by this new route will get honorable discharges.

Burger King Moves on Base

The Army and Air Force Exchange Service has signed a five-year franchise agreement to test Burger King outlets at selected military installations worldwide. The first franchised facility is scheduled to open at Ansbach, Germany, this month. Facilities at Frankfurt, Mannheim, Aschaffenberg, and Neu-Ulm, as well as nine other Army posts, will follow immediately. The Air Force has queried its major commands to determine their interest in similar outlets but, at press time, no firm decision on a test site had been made.

The test will help the Exchange Service evaluate earnings potential from a product with brand-name recognition. Also to be measured will be the impact on existing AAFES food facilities and dining hall usage. The Army Surgeon General will look at nutritional aspects of the experiment.

Burger King was selected for the test as a result of a competitive solicitation. By 1989, as many as 185 facilities could be in operation under terms of the agreement.

Short Bursts

Recent surveys dramatically point up the current **high regard in which the military is held.** Among adults, a Harris Poll found the military held in "high confidence" by thirty-five percent of Americans, second only to

SENIOR STAFF CHANGES

PROMOTIONS: To be **Lieutenant General:** Harry A. **Goodall;** Truman **Spangrud.**

RETIREMENTS: M/G Donald W. **Bennett;** L/G James R. **Brickel;** L/G George M. **Browning,** Jr.; Gen. W. L. **Creech;** M/G William W. **Hoover;** B/G D. Lynn **Rans.**

CHANGES: M/G William P. Bowden, from DCS/Materiel Mgmt., Hq. AFLC, Wright-Patterson AFB, Ohio, to C/S, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G Charles McCausland . . . **M/G Donald D. Brown,** from DCS/Ops., Hq. MAC, Scott AFB, Ill., to Cmdr., 22d AF, MAC, Travis AFB, Calif., replacing retiring M/G Donald W. Bennett . . . **M/G Kenneth D. Burns,** from Cmdr., 13th AF, PACAF, Clark AB, Philippines, to Dep. Ass't Sec. of Def. (Near Eastern & South Asian Affairs), OSD (Int'l Affairs), Washington, D. C., replacing M/G (L/G selectee) Edward L. Tixier . . . **Col. (B/G selectee) Harold N. Campbell,** from Dep. Dir. of Int'l Prgms., DCS/P&R, Hq. USAF, Washington, D. C., to Vice Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, replacing B/G Charles C. McDonald . . . **B/G Daniel B. Geran,** from DCS for Comptroller, Hq. AFSC, Andrews AFB, Md., to Cmdr., Hq. AFAFC, and Ass't Comptroller for Accounting & Finance, Denver, Colo., replacing retiring B/G D. Lynn Rans.

M/G (L/G selectee) Harry A. Goodall, from Cmdr., 17th AF, USAFE, Sembach AB, Germany, to Dep. CINC, Hq. USREDCOM, & Vice Dir., JDA, MacDill AFB, Fla., replacing retiring L/G James R. Brickel . . . **B/G Albert C. Guidotti,** from Cmdr., 76th Airlift Div., MAC, Andrews AFB, Md., to Vice Cmdr., 21st AF, MAC, McGuire AFB, N. J., replacing B/G (M/G selectee) Robert D. Patterson . . . **B/G Paul A. Harvey,** from IG, Hq. MAC, Scott AFB, Ill., to Cmdr., 76th Airlift Div., MAC, Andrews AFB, Md., replacing B/G Albert C. Guidotti . . . **M/G Charles McCausland,** from C/S, Hq. AFLC, Wright-Patterson AFB, Ohio, to Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, replacing M/G (L/G selectee) Marc C. Reynolds . . . **B/G Charles C. McDonald,** from Vice Cmdr., Ogden ALC, AFLC, Hill AFB, Utah, to DCS/Plans & Prgms., Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G Charles P. Skipton.

M/G Michael A. Nelson, from Cmdr., 313th AD, PACAF, Kadena AB, Japan, to Cmdr., 13th AF, PACAF, Clark AB, Philippines, replacing M/G Kenneth D. Burns . . . **Gen. Jerome F. O'Malley,** from CINC, Hq. PACAF, Hickam AFB, Hawaii, to Cmdr., Hq. TAC, Langley AFB, Va., replacing retiring Gen. W. L. Creech . . . **M/G William E. Overacker,** from Cmdr., 322d Airlift Div., MAC, Ramstein AB, Germany, to DCS/Ops., Hq. MAC, Scott AFB, Ill., replacing M/G Donald D. Brown . . . **B/G (M/G selectee) Robert D. Patterson,** from Vice Cmdr., 21st AF, MAC, McGuire AFB, N. J., to Cmdr., 322d Airlift Div., MAC, Ramstein AB, Germany, replacing M/G William E. Overacker . . . **M/G Charles P. Skipton,** from DCS/Plans & Prgms., Hq. AFLC, Wright-Patterson AFB, Ohio, to DCS/Materiel Mgmt., Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G William P. Bowden.

Col. (B/G selectee) Donald Snyder, from Ass't DCS/Ops., Hq. PACAF, Hickam AFB, Hawaii, to Cmdr., 313th AD, PACAF, Kadena AB, Japan, replacing M/G Michael A. Nelson . . . **M/G (L/G selectee) Truman Spangrud,** from Dir. of Budget, Office of the Comptroller, Hq. USAF, Washington, D. C., to Comptroller of the Air Force, Hq. USAF, Washington, D. C., replacing retiring L/G George M. Browning, Jr. . . . **M/G Robert D. Springer,** from Cmdr., Hq. AFMPC, & Ass't DCS/M&P for Mil. Personnel, Randolph AFB, Tex., to Cmdr., 21st AF, MAC, McGuire AFB, N. J., replacing M/G (L/G selectee) Duane H. Cassidy. ■

major educational institutions. Even better news for recruiters is that a "Who's Who Among American High School Students" poll of high-achiever students found fifty-one percent with "more confidence" in the military; runner-up was the US Presidency with forty-five percent.

New Jersey has pending legislation that would "encourage New Jersey high schools to participate with the armed forces in establishing **Junior ROTC units** within their schools." Special emphasis is placed on identifying "urban high schools" for possible units.

DEERS—the **Defense Enrollment Eligibility Reporting System**—which requires service and retiree family members and retirees to be listed in the nationwide computerized data bank to be eligible for medical benefits, is working. So far, checking of eligibility has surfaced more than $5 million worth of payments that will *not* be made because the recipients were ineligible. At the moment, no one is being denied access to emergency medical care at on-base hospitals, but those who are eligible should ensure they are in the computer. *Any* service personnel shop can verify this.

World Airways is believed to be the first carrier to extend the reduced fare program that many airlines now offer active-duty military people to retirees and their immediate families, including spouse survivors. World says it will offer savings of up to sixty percent on domestic flights and Honolulu and Frankfurt runs.

The Air Force is **converting about a thousand enlisted civil engineering slots** to civilian positions beginning next month. Affected are civil engineering resource managers and protective coating specialists. Phased-out blue-suiters will be encouraged to remain elsewhere in the civil engineering field but will be eligible to retrain into any current skill shortage area.

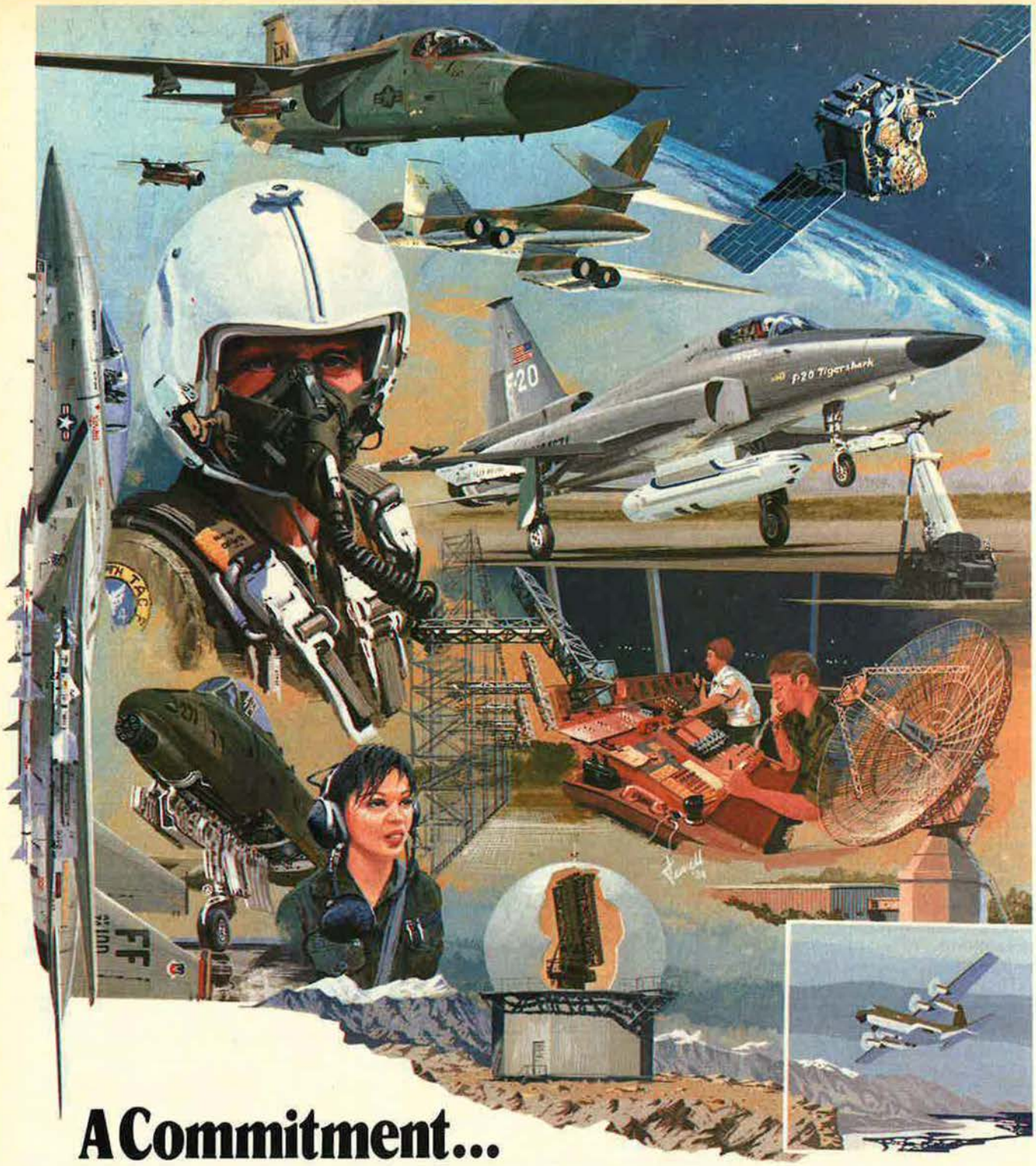
The Air Force Base Career Advisor of the Year is **MSgt. Ronald L. Hagan,** who performs that job at the Air Force Academy. Sergeant Hagan has won other personnel "bests" over his fifteen-year career and is credited as "the driving force" in the improved USAFA retention program.

Air Force **officers who want to become lawyers** should apply now for next year's Funded Legal Education Program or the Excess Leave Program—both allow officers to earn law degrees while remaining on active duty. Base Legal Offices have details.

Three DoD overseas dependent schools have been named among the top 200 outstanding public secondary schools, beating out candidates from forty-eight states, the District of Columbia, and, of course, the DoD system. **Frankfurt High School, Heidelberg High School, and Rhein-Main Middle School** were the three finalists from the competition that included a rigorous review of programs, policies, and practices.

The VA wants **100 percent disabled veterans** to know that they are eligible for dental care at VA Medical Centers. Also, veterans with service-connected disability who are blind in both eyes may receive a **seeing-eye dog.** The VA will pay for the dog and the costs of training the disabled vet and the dog, and will also provide veterinarian care reimbursement.

The Air Force Uniform Board has okayed a **white cardigan sweater** for medical people only. The sweater need not be buttoned, and no accoutrements, such as name tags or grade insignia, may be worn on it. ■



A Commitment... to the United States Air Force

General Electric is proud to provide the United States Air Force with the latest in technologies, products and services for command, control and communications to help maintain its status as the world's finest, agile and ready combat force. We believe they should have the best.

AEROSPACE BUSINESS GROUP

GENERAL ELECTRIC

Intercom

By Robin L. Whittle, AFA DIRECTOR OF COMMUNICATIONS

AFA Leaders Support Bipartisan Scowcroft Commission Report

As this column goes to press, AFA leaders in fourteen states had sent copies of AIR FORCE Magazine's July editorial *("An Ambush of National Consensus," p. 4)* to Members of Congress who either abstained or voted against continued MX missile production in a critical House vote. Citing AFA's longstanding support for the valuable consensus reached in the Scowcroft Commission Report on strategic force modernization, AFA leaders noted the "significant and growing asymmetry between the US and Soviet strategic forces," as outlined in the Association's 1984 Statement of Policy.

By a three-vote margin, the House passed the "Bennett Amendment" (sponsored by Rep. Charles E. Bennett [D-Fla.]) to its version of the FY '85 Defense Authorization bill. The amendment suspended funding for MX for FY '85 unless Congress agreed by joint resolution after April 1, 1985, to continue funding. In a tie-breaking vote, the Senate authorized twenty-one missiles vs. fifteen in the House bill. A joint House-Senate conference was still to resolve the issue as this column went to press.

"As a homeowner and voter in your district," Chuck Warth, Ohio State AFA Vice President and Cincinnati Chapter President, said in a letter to Rep. Thomas A. Luken (D-Ohio), "I hope you will make every effort to preserve our freedom as Americans in future House votes on the MX missile."

Chuck noted that his experience as a prisoner of war during World War II made him well aware of the meaning of freedom and what it takes to maintain it for future generations. "As a concerned citizen, I respectfully request your future support for the MX and all other systems that are critical to the preservation of our nation's freedom," Chuck concluded.

In a letter to Rep. John M. Spratt, Jr. (D-S. C.), South Carolina State AFA President Jim "Doug" Catington said he had polled more than 500 AFA Swamp Fox Chapter members to gauge their reaction to passage of the Bennett Amendment and noted that, "without exception, members expressed dismay at legislation that, in effect, allows the Soviets to dictate negotiation processes as well as influence action on our internal national defense requirements."

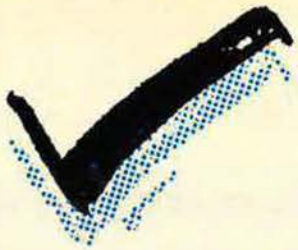
The South Carolina AFA leader cited AFA's full support for the bipartisan Scowcroft Commission Report that would assure development of the MX missile "to counter the 650 Soviet MX-equivalent missiles currently in the inventory while allowing this nation to maintain a viable position relative to arms-control negotiations."

Several AFA leaders contacted their congressmen to express concern about the vote. Ron Chromulak, President of AFA's Joe Walker Chapter in Pennsylvania, visited the district office of Rep. Austin J. Murphy (D-Pa.) to discuss the issue and register his concern as "a constituent and as Pennsylvania State Chairman for the POW/MIA Campaign." He noted that a number of Chapter members contacted Congressman Murphy's office and also registered concern that the bipartisan Scowcroft Commission findings had been virtually ignored regarding MX. Rep. George W. Gekas (R-Pa.) had been contacted as well by the AFA contingent.

Maryland State President Bill Ryon queried Rep. Steny H. Hoyer's (D-Md.) legislative aides on the rationale behind the Congressman's vote when he had voted in favor of the system in the past. Similarly, Jim Kennedy, President of AFA's Thomas W. Anthony Chapter near Andrews AFB, Md., contacted Representative Hoyer's office to express support for the Scowcroft Report.

For three consecutive years, AFA's General Robert F. Travis Chapter in Vacaville/Fairfield, Calif., has sponsored a legislative round-table discussion with Rep. Vic Fazio (D-Calif.) to determine his views on several vital military issues, including strategic modernization programs and MX. "We were curious about his recent abstention from voting because he has supported the MX in previous votes and has been supportive of the mili-

AFA Front Range Chapter President Jim Clark presents a copy of Crusade for Airpower *to Dr. Jim Erdmann in appreciation of Dr. Erdmann's discussion of President Reagan's Strategic Defense Initiative at a joint meeting of the Front Range and Silver & Gold Chapters in Denver, Colo., on June 6. Dr. Erdmann, a retired Air Force lieutenant colonel, is a professor of history at the University of Denver.*



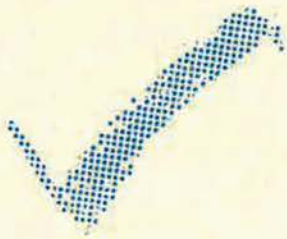
Mark Your Calendars

now for two exciting and informative November national symposia.

November 1–2, Broadmoor Hotel, Colorado Springs, Colo. *In the home city of the Air Force's Space Command, AFA will present a program recognizing the growing, changing role of space and the broad context of national security concerns, with special emphasis on the Strategic Defense Initiative program.*

Then, on ***November 29–30****, the latest edition of AFA's annual national defense symposium at the* ***Hyatt at Los Angeles Airport*** *will feature a searching, authoritative status report on Air Force capabilities and programs as well as a long-range examination of the interplay between new technologies, new requirements, and doctrine.*

Detailed information on the top-notch speakers and topics that will be covered at both of these meetings will be announced shortly.



For your advanced planning, an in-depth evaluation of Tactical Air Warfare capabilities will be the topic of a symposium presented by AFA on ***January 17–18, 1985****, at* ***the Buena Vista Palace, Orlando, Fla.****. Plan now for this mid-winter event.*

AFA

tary in general," said Bob Hazeleaf, Travis Chapter Board Chairman and former Chapter President.

Travis Chapter President Walter Scott noted that the Chapter had highlighted Congressman Fazio's support of key defense programs "in our many presentations to community and civic groups." Longtime Travis Chapter leader Art Littman, who is Vice Chairman of AFA's National Membership Committee, noted that Representative Fazio had been "extremely supportive in reinstating funding for the much-needed, new 300-bed area hospital at Travis AFB when it was threatened." Further, he has supported many key defense programs, according to Mr. Littman, "and he and several members of his staff are members of the Travis Chapter."

Homestead (Fla.) Chapter President John Spencer discussed Rep. Claude Pepper's (D-Fla.) abstention from voting with executive council members and, in an informal poll, found widespread concern among Chapter members.

"We felt it has been difficult enough for this country to reach a consensus on critical defense issues and that once a consensus was achieved, it was irresponsible for our congressional delegations not to carry it through," the AFA leader said.

"Media coverage in this area has not been favorable toward the MX, and there are those who question [the need for this missile] despite the Scowcroft findings," Billy Gould, President of AFA's Metropolitan Philadelphia Chapter, said. "As a constituent, I have expressed my concern to Rep. Lawrence Coughlin [R-Pa.], who voted against MX in the recent vote."

Still other AFA leaders around the country took the time to send copies of the July editorial to their representatives. Authored by Editor in Chief and Publisher Russell E. Dougherty, the editorial concluded:

"In the 1985 authorization requests—and the even more difficult 1985 appropriations process that will follow—we are, in large measure, defining the weapon systems, the support, and the postures we will achieve well into the future—mostly through the 1990s. What we rely on as operational today stems from key decisions in the late 1960s and 1970s. What we will have—or not have—in the year 2000 depends to a very great extent on the decisions taken by the US Congress this year and next."

Dr. George Keyworth II, right, Science Advisor to President Reagan and Director of the White House Office of Science and Technology Policy, accepts an AFA Life Patron Certificate from Edgar Ulsamer, AFA Assistant Executive Director/Policy and Communications, during a ceremony held recently at the White House. Dr. Keyworth was honored for his participation in AFA's national programs, including the National Convention. (White House photo)

Oregon AFA Leaders Organize Defense Education Committees

Significant, innovative approaches are being taken by Oregon State AFA leaders to explain national defense issues in their local communities. Take, for example, what has happened in Eugene. Officials of AFA's Eugene Chapter became increasingly concerned with the number of antidefense and pronuclear freeze groups organized in the town of 105,-624. Some 25,000 are students and faculty at the University of Oregon.

Eugene Chapter President Harry Hance decided to do something about it when he read in the local newspaper that there were more than two dozen antidefense groups in Eugene alone. He called a few friends, and the result was the creation of the "Defense Education Committee," a private, nonprofit corporation established "to educate the public about the necessity of an adequate national defense strong enough to deter our enemies from attacking and to protect us if we were attacked."

Forty-one concerned Eugene citizens showed up at the first meeting earlier this year, and membership now exceeds 150. Some members are retired Air Force and Navy while others have never served in the armed forces and had never been involved in national defense issues prior to participating on the Committee. The Committee is organized to respond and to educate.

One major focus is the media. The Committee includes two librarians who research the issues, providing accurate and detailed information for members to use in their letters to the editor and for the Committee's Speakers Bureau. Recently published letters by Committee members have dealt with the nuclear freeze issue, Soviet disinformation, antidefense biases in the schools, Soviet military power trends, ASAT, and American attitudes toward defense issues.

Further, the Committee sponsors monthly programs featuring knowledgeable defense leaders who have attracted community involvement and bolstered the Committee's membership. Col. Donald "Desi" Arnaiz, USAF, Deputy Chief of Staff for Intelligence, Tactical Air Command, out-

Thirty-three survivors of "Doolittle's Raiders" recently met for a forty-second anniversary reunion in Fort Worth, Tex. Shown, from left, are Dr. Gene Wood, Reunion Banquet Chairman; Mrs. Joe Doolittle; Lt. Gen. Jimmy Doolittle, USAF (Ret.); "Raiders" Robert L. Hite and Jacob D. Deshazer, who both had to bail out over Japan and were interned for the duration of the war; and AFA Board Chairman John G. Brosky, whose feature article on the reunion appeared in the Carnegie, Pa., **Signal-Item** *newspaper.*

lined Soviet military power trends at a luncheon meeting that garnered more than two dozen new members for the Committee.

In addition to monthly programs for members and guests, the organization's Steering Committee meets each month to discuss action plans and strategies. Projects have ranged from organizing a prodefense march down Main Street to counter a similar march by an antidefense group (which resulted in excellent television news coverage for the prodefense side of the story) to manning an information table at the Willamette World Affairs Council symposium on US-Soviet Relations. Committee officials said that there were four tables set up by opposition groups, but that the Committee's was by far the best in terms of quality of materials and popularity. Items included the DoD publication *Soviet Military Power, 1984,* and the Committee newsletter. All were distributed free of charge. Opposition groups sold their materials or asked for donations.

The Committee publishes an informative and attractive newsletter written by Ernest G. Ross, a former broadcast news director who is a member of the Steering Committee. Although he has never served in the armed forces, Mr. Ross has been a student of military strategy for many years. Mr. Ross discusses the issues, reviews pertinent books, and reprints letters to the editor that were written by Committee members and that have been published in the local press.

Keith Byrne runs the Speakers Bureau. Mr. Ross, Committee Chairman Bob Bennett, and Harry Hance, Secretary, have responded to numerous requests by local civic and community groups to speak at their meetings. Roy Nelson serves as Treasurer and the co-librarians are LaVerne Edwards and Ken Wullschleger. These individuals make up the Steering Committee of the Eugene Defense Education Committee.

The success of the Eugene experiment in stimulating community involvement and generating more positive media coverage of defense issues has caused the creation by AFA leaders of a similar committee in Portland, Ore. Dr. Clayton Gross, former AFA National Vice President (Northwest Region) and Oregon AFA President, and current Oregon AFA President Phil Saxton are the organizers behind the Portland effort. The Portland Committee's first newsletter has been published and mailed to 5,000 prospective members.

"What we've done is to organize and structure according to one of the basic philosophical tenets propounded by Dave Noerr [Assistant Executive Director/Field Organizations] in community outreach—namely, involve the nonmilitary sector in a community-wide effort to support a strong national defense consensus," Mr. Hance concluded.

AFA Leaders Work The Issues in Their Local Media Outlets

The flurry of well-written, published articles and television editorials by AFA field leaders around the country deserves recognition. Alamo Chapter President E. F. "Sandy" Faust worked with editors at the San Antonio, Tex., *Light* to get AFA's Field Service Report on military retirement, authored by Assistant Secretary of the Air Force for Manpower, Reserve Affairs and Installations Tidal W. McCoy, reprinted. It was run in its entirety earlier this year.

Faust based his "From Where I Sit" column for the *Defender,* the Alamo Chapter newsletter, on the report and also made it the basis for an article he wrote for the San Antonio Retired Officers Association newsletter. He wrote another article based on the report for a newsletter he produces for the National Bank of Fort Sam Houston. The newsletter reaches 25,000 military retirees around the country. Faust is a senior official at the bank.

He is also working with Texas AFA Secretary George Weinbrenner to get San Antonio *Express News* columnist Glen Martin, a thoughtful writer on defense and public policy issues and a retired Air Force lieutenant general whose last assignment was as Vice Commander in Chief, Strategic Air Command, published in other daily newspapers around the country. *(See p. 64 of this issue for an article by General Martin.)*

Another Alamo Chapter leader, retired Lt. Gen. John Flynn, USAF, who serves as advisor to the AFA National President on veterans matters, wrote an excellent rebuttal in the "Viewpoint" section of the *Light* newspaper in response to claims made by an official of the San Antonio freeze movement that had appeared in the paper. The official argued that a nuclear freeze could be verified and that, in fact, the US has been verifying nuclear explosions and missile tests for years "with full confidence."

General Flynn said the official's statements were correct as far as they went, but failed "probably because of a lack of information" to tell the entire story. The rest of the story cited by General Flynn included the Soviets' improved ability to encrypt their telemetry coupled with the loss by the US of key monitoring stations in Iran; the problems US intelligence faces in gathering data through cloud cover

and darkness; the refusal of the Soviets to permit "on-site" inspections; the exclusive "cold-launch" capabilities of the Soviets' land-based ICBMs, which permit reloading and reusing of their silos; and Soviet blasting of caves in bays and fjords to improve the survivability of their submarine forces, which, like the US submarine forces, use the cold-launch technique. General Flynn concluded:

"In our nation our most cherished freedom is the right to open dissent, but with that right comes an equal responsibility, particularly in organized groups of educated people. That responsibility is informed opinions. Surely the advisory board of the San Antonio freeze movement knows that some of these more informed and knowledgeable retired and active-duty officers are readily available for open discussion of the concerns of this group and can update their information."

In fact, the San Antonio freeze group had responded in the newspaper to an editorial by Ed Cheviot, Vice President and General Manager of KMOL-TV, who cited the fallacies behind the freeze argument as well as its political overtones. (Cheviot has twice been awarded the Walter W. McAllister, Sr., Patriotism Award from the Alamo Chapter for promoting a better understanding of national defense issues and strengthening the ties between the local military and civilian communities. The award is named for Mayor Emeritus McAllister, Sr., who served as Mayor of San Antonio for twelve years.)

Recently, General Flynn was invited to debate the nuclear freeze issue at a taping session in New York for the "Christophers' Closeups" show, which airs through syndication on Sundays. It is hosted by Rev. John Catoir, who is Director of the religious Christophers group. General Flynn confronted a heart specialist from the "Physicians for Social Responsibility" and a theologian, both of whom supported a nuclear freeze. When General Flynn quoted statistics showing the much greater percentage of the federal budget spent on social and human services programs than on national defense, one of the participants said he didn't believe it.

In another instance, when General Flynn quoted Soviet armament trends from the book *Soviet Military Power,*

AFA STAFF PROFILES

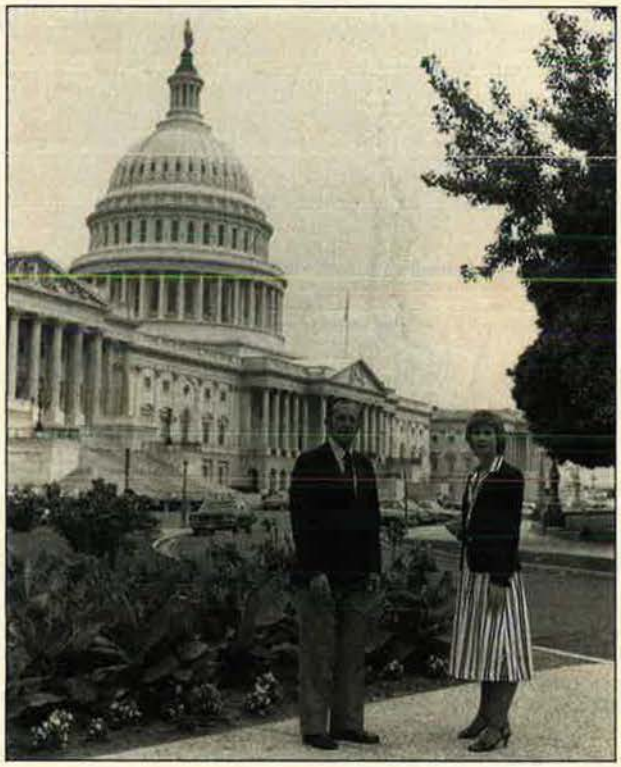
On the People Front

Almost every week when Congress is in session, AFA field organizations receive an analytical update on developments in military personnel matters on Capitol Hill. And that's only a partial indication of what has occupied the attention of Ben Catlin, AFA's Assistant Executive Director for Manpower and Reserve Affairs, and his assistant, Ann Gardner, for the week just past.

Since 1980, Catlin has been the Association's point man on the "people front," responsible for monitoring congressional hearings and floor action, working with legislators and congressional staffers on a daily basis, and serving as a principal advisor to AFA's elected leaders in the development of policy positions on personnel issues. In addition, he maintains a working contact with other military associations and is the staff coordinator of support for AFA's newly established Retiree Council.

Col. Benjamin S. Catlin III, USAF (Ret.), takes a special interest in matters pertaining to the Air Force Reserve and the Air National Guard, his final assignment on active duty having been as Commander of the Air Reserve Personnel Center in Denver, Colo. His military career spanned thirty years and included, as he puts it, "perfect attendance in all three wars." His wartime record began with flying B-29s and B-24s during World War II and extended to Vietnam, where he served two tours and flew 169 missions. He retired in 1974, and was with the Reserve Officers Association before coming to AFA four years ago.

Ann Gardner worked for the Air Force Directorate of Manpower and Personnel in the Pentagon before joining the AFA staff in 1983. Previously, she was assistant secretary to the head football coach at the University of Notre Dame and, at the same time, a weekend television reporter for the NBC affiliate in South Bend, Ind. She produced her own public-affairs talk show on South Bend radio. The National Organization of Women's Clubs named her as one of the "Outstanding Young Women of the Year" in 1983.



—Photo by Paul Kennedy

Ben Catlin, AFA's Assistant Executive Director for Manpower and Reserve Affairs, and Ann Gardner, his assistant, spend much of their time on Capitol Hill.

1984, the other guest said he didn't believe it. Concluded the General, "It's surprising that educated people refuse to hear the other side when the facts don't conform to their own erroneous impressions." The show will air through syndication around the country sometime this fall.

In another instance, AFA National Vice President (Great Lakes Region) Howard Strand adapted a scenario by two Texas A&M professors (Steve Pejovich and Charles Maurice) on what could occur the day after "The Day After." The article ran in the "Opinion/Commentary" section of the Battle Creek *Enquirer* recently. The scenario graphically depicted the chilling elements of subjugation and oppression that "anyone who lived in Eastern Europe in 1945 could identify and relate to," the AFA leader wrote.

Former AFA National President and Board Chairman Joe L. Shosid authored an article, "Ignorance, Distortions Abound on 'Liberal' Military Retirement," that appeared in the Fort Worth *Star-Telegram's* "Expressions" section. Fort Worth Chapter President M. N. "Dan" Heth wrote a letter to the editor on the same subject.

Richard W. Hoerle, who served as President of AFA's Capt. Eddie Rickenbacker Memorial Chapter in Columbus, Ohio, in 1981–82, wrote two excellent letters to the editor that were published in the Columbus *Dispatch* recently. In response to city officials purchasing new automobiles for city departments, Mr. Hoerle asked, "Isn't it odd that the city cannot protect the citizens with fifteen-year-old automobiles, yet the Congress of the United States of America expects the Air Force to protect the freedom of this nation and the world in B-52 aircraft that [soon will be] thirty years old?" In the other letter, Mr. Hoerle wondered about the support by every high-ranking Ohio state official for a presidential candidate who opposes the B-1 bomber when elimination of the program would cut about 10,000 jobs from the state economy.

Retired aerospace engineer Ed Przybys, who serves as Secretary of AFA's Sedona Chapter in Sedona, Ariz., writes a regular column entitled "Flightline" for the Sedona *Red Rock News.*

AFA Board Chairman Judge John Brosky is a former writer for the *Signal-Item* newspaper in Carnegie, Pa., and periodically does features and stories for the paper. Recently, the AFA leader did an in-depth report on the forty-second reunion of the thirty-three survivors of the Doolittle Raiders held in Fort Worth, Tex. A full newspaper page was devoted to Judge Brosky's story, which captured a nostalgic, emotional event while reiterating the importance of the Tokyo raid and the sequence of events that took place back in 1942.

Former Cleveland Chapter Communications Director Leo D'Arcy hosts a radio interview show called "Guestline," which airs over station WELW in Cleveland, Ohio. Recently, D'Arcy sent in a cassette of an interview he conducted with Maj. Gen. George L. Monahan, Jr., Director of Development and Production for the Deputy Chief of Staff, Research, Development and Acquisition, Hq. USAF, that covered a range of issues relating to the capabilities and sophistication of such new aircraft as the F-16 and F-15.

These are examples of what field leaders are doing in support of AFA's policy goals in their local communities. The list is by no means complete, but represents samples that have been sent to AFA headquarters in recent weeks.

AFA and Jimmy Castro, left, have been good friends for more than thirty years. AFA's first National President, Lt. Gen. Jimmy Doolittle, USAF (Ret.), remembers him well from the days when AFA resided in the old Mills Building at the corner of 17th St. and Pennsylvania Ave., the spot from which Jimmy Castro has sold newspapers to Washington's power brokers for more than three decades. On July 18, AFA Executive Director Russ Dougherty presented Jimmy with an AFA membership and something he'd always wanted, an autographed photo of General Doolittle. Jimmy's many friends from offices along Pennsylvania Ave. greeted the presentation with enthusiastic applause. AFA National President Dave Blankenship and most of the AFA staff, as well as other AFA leaders, were on hand, as was Oliver T. Carr, a Washington-area developer who recently built a kiosk for Jimmy to protect him from the elements. The photograph of General Doolittle, pictured in the background, was immediately hung by Jimmy, who is a Coast Guard veteran. (Photo by Robin Whittle)

At the Academy, the 30th Squadron Wins Honors as Outstanding

The theme was "silver"—as in silver wings and silver anniversary. Earlier this year, at The Broadmoor Hotel in Colorado Springs, Colo., AFA hosted its twenty-fifth Salute to the US Air Force Academy's Outstanding Squadron. Co-hosted by AFA's Colorado Springs/Lance Sijan Chapter, the glittering event honored the cadets of the 30th Squadron.

The 30th won because, in the words of C/1C Craig A. Hughes, Spring Term Cadet Squadron Commander, "we developed a very strong sense of pride and a driving spirit to succeed. A team approach, strong competitive spirit, and a winning attitude toward all of our endeavors ultimately led to the festivities we are enjoying tonight."

Speaking to the theme, AFA National President David L. Blankenship briefly sketched the Academy's twenty-five-year history of providing graduates to the blue-suit ranks. He noted that AFA began its Salutes in 1959, the

year the Academy graduated its first class. Since then, he pointed out, "more than 16,600 young men and women have graduated. More than 1,000 more will swell those ranks next week, when the class of 1984—the largest in Academy history—graduates.

"More than 11,000 of those graduates are still on active duty. One graduate—Lance Sijan, for whom the local AFA Chapter is named—has received the Medal of Honor . . . sixteen [have received] the Silver Star. Seventeen are now general officers, and five of those are wearing two stars."

President Blankenship then introduced the emcee for the evening, someone whose presence and accomplishments pointed up the many changes that have taken place at the Academy since the first class graduated.

For this was 1st Lt. Michelle D. Johnson, who in 1981 served as the first-ever female cadet commander of the cadet wing. Going on to Oxford University after graduation, where as a Rhodes Scholar she earned a degree in politics and economics, Lieutenant Johnson currently is in the final phase of undergraduate pilot training at Williams AFB, Ariz.

Lieutenant Johnson, in addition to her role as mistress of ceremonies, took a few moments to reflect on how the Academy experience had prepared her for her admittedly short but obviously successful—Air Force career. She urged the cadets to become involved in as many aspects of Academy life as possible, since this involvement could have possible application to future opportunities for leadership.

Also addressing the black-tie audience of more than 600 were Gen. Lawrence A. Skantze, USAF, then Vice Chief of Staff and now Commander of Air Force Systems Command, and Lt. Gen. Winfield W. Scott, Jr., USAF, Superintendent of the Academy.

AFA National President Blankenship then made the presentation of AFA's Outstanding Squadron Trophy to the 30th. Coming forward to accept it were the two Cadet Squadron Commanders, Fall Term Commander Cadet Lt. Col. Brian A. Simpson of Milton, Fla., and Spring Term Commander Cadet Lt. Col. Craig A. Hughes from San Diego, Calif. After presenting each of them with special recognition in the form of AFA Life Memberships and announcing that each member of the 30th Squadron would receive a specially struck pewter AFA mug, President Blankenship unveiled the trophy *(see photo).*

A highlight of the event-filled evening was the appearance of Miss Dolores Bedard in an entertainment interlude entitled "Music of Modern America." The popular young singer—many AFAers will remember her performance at the 1983 National Convention—brought to the audience a superb performance of today's music and a rousing rendition of the Air Force song. AFAers will be pleased to know that Miss Bedard will appear—along with Tennessee Ernie Ford—at the thirteenth annual Air Force Ball in Los Angeles, Calif., on November 30.

The "silver" evening was marked by one more presentation as President Blankenship presented to Lieutenant Johnson, on behalf of AFA, a set of silver wings in anticipation of her successful completion of pilot training. This left no doubt that, for all those in attendance, the memories of this special evening honoring the cadets of the 30th would be "silver" indeed.

—By James A. McDonnell, Jr.

"Officially" presenting the Outstanding Squadron Trophy, AFA National President David L. Blankenship (right) gives Fall Term Cadet Commander Lt. Col. Brian A. Simpson a plaque for permanent display by the Squadron. (Photo by TSgt. Guido C. Locati, Jr.)

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.

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Unit Reunions

Air Weather Service Ass'n
Former Air Force Weather Service personnel of Northern California will meet on October 6, 1984, at McClellan AFB, Calif. **Contact:** Milt Sipple, 2589 Dumbarton Ave., San Jose, Calif. 95124. Phone: (408) 267-2555.

Air Force Rocket Propulsion Lab
The Air Force Rocket Propulsion Laboratory personnel reunion will be held in Lancaster, Calif., on November 2–4, 1984. **Contact:** Beth A. Douthett, 3165 S. Batavia, Las Vegas, Nev. 89102. Phone: (702) 876-3718.

Ranch Hands
Members of the Vietnam Ranch Hands will hold their reunion on October 5–7, 1984, in San Antonio, Tex. **Contact:** Ralph Dresser, Route 4, Box 2238, Lake Hills, Tex. 78063. Phone: (512) 751-3335.

Thunderbirds Alumni Ass'n
The USAF Thunderbirds will hold a reunion on November 16–18, 1984, in Las Vegas, Nev. **Contact:** Thunderbirds Alumni Association, P. O. Box 4004, North Las Vegas, Nev. 89030.

2d Air Division Ass'n
Members of the 2d Air Division, Eighth Air Force, will hold their reunion on October 4–7, 1984, in Palm Springs, Calif. **Contact:** W. F. Davenport, 13762 Loretta Dr., Santa Ana, Calif. 92705.

5th Combat Cargo Squadron
The 5th Combat Cargo Squadron will hold its reunion on September 21–23, 1984, in Washington, D. C. **Contact:** Herbert Lyon, 8645 N. E. 7th St., Bellevue, Wash. 98004. Phone: (206) 455-3775.

17th Bomb Group
A reunion for the 17th Bomb Group will be held on October 4–7, 1984, in Phoenix, Ariz. **Contact:** Sid Collins, 1217 Dover St., Mesa, Ariz. 85203. Phone: (602) 833-8031.

27th Fighter-Bomber Group Ass'n
Former members and families are invited to attend the 27th Fighter-Bomber Group reunion to be held on October 19–21, 1984, in Scottsdale, Ariz. **Contact:** L. A. "Bulldog" Smith, 4449 Charlotte Ann Dr., Louisville, Ky. 40216.

30th Bomb Group
The 30th Bomb Group will hold a minireunion on October 14, 1984, at the March AFB, Calif., Officers' Club. **Contact:** Bob McGinnis, 27th Bomb Squadron, 6120 N. Camellia Ave., Temple City, Calif. 91780. Phone: (1-818) 287-6370.

31st Photo Recon Squadron
Veterans of the 31st Photo Reconnaissance Squadron will hold their reunion on October 5–7, 1984, at the William Penn Hotel in Pittsburgh, Pa. **Contact:** Ralph Gowetski, RD #1, Box 297, Natrona Heights, Pa. 15065. Phone: (412) 295-9844.

33d Photo Recon Squadron Ass'n
The 33d Photo Reconnaissance Squadron will hold its reunion on October 14–16, 1984, at the Econo Lodge in Cocoa, Fla. **Contact:** Rev. Neal E. Lake, 640 Jacaranda St., Merritt Island, Fla. 32952. Phone: (305) 452-8785.

Class 40-G
A reunion for members of Flying Class 40-G will be held on November 5–9, 1984, in Tucson, Ariz. **Contact:** Don Green, P. O. Box AP, Truckee, Calif. 95734.

Class 42-H
Kelly Field Flying Class 42-H will hold a reunion on October 11–14, 1984, at the Rancho Viejo Resort in Brownsville, Tex. **Contact:** Louis A. Raeke, Jr., 9106 Balcones Club Dr., Austin, Tex. 78750. Phone: (512) 258-1984. Allan F. Beck, 1204 California St., N. E., Albuquerque, N. M. 87110. Phone: (505) 256-3350.

Class 44-J (LaJunta, Colo.)
A portion of the announcement in the July 1984 issue concerning Class 44-J was inadvertently omitted. The announcement should have read: Pilot Class 44-J of La-Junta, Colo., will hold a reunion on September 29–30, 1984, in Amarillo, Tex. **Contact:** John C. Adams, P. O. Box 843, Panhandle, Tex. 79068. Phone: (806) 537-3813.

66th Fighter Wing Ass'n
A reunion for the 66th Fighter Wing will be held on October 11–13, 1984, at the Radisson Hotel in Charlotte, N. C. **Contact:** Carroll M. Bowman, 4120 Estes Rd., Nashville, Tenn. 37215. Phone: (615) 269-4700. William C. Daniels, Jr., 4242 Kingswood Rd., Charlotte, N. C. 28211. Phone: (704) 366-3825.

92d Bomb Group
A reunion for the 92d Bomb Group will be held on October 3–7, 1984, in Shreveport, La. **Contact:** Charles J. Kelly, 6304 Pawnee Trail, Shreveport, La. 71107.

93d Fighter Squadron
Veterans of the 93d Fighter Squadron will hold their reunion on October 12–14, 1984, at the River Front Holiday Inn in St. Louis, Mo. **Contact:** John J. "Doc" Dougherty, 201 Bartram Lane, Ocean City, N. J. 08226. Phone: (609) 398-5375.

94th Fighter Squadron
Members of the 94th Fighter Squadron will hold a reunion in conjunction with the 1st Fighter Group on October 4–7, 1984, in Hampton, Va. **Contact:** Harry E. McConnell, 600 Sherry Dr., N., Trotwood, Ohio 45426.

F-100F "Misty FACs"
The 56th Tactical Training Wing will host a reunion for members of the F-100F Commando Sabre Operation—known as the "Misty FACs"—on November 8–11, 1984, at MacDill AFB, Fla. **Contact:** George D.

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Cranston, P. O. Box 4945, Tampa, Fla. 33677. Phone: (813) 877-5747. 56th Tactical Training Wing (TAC), Protocol Office, MacDill AFB, Fla. 33608.

325th Fighter Group
The 325th Fighter Group, "Checkertail Clan," will hold its reunion on October 11–14, 1984, at the Dunfey Hotel in Dallas, Tex. **Contact:** Dan Penrod, 69 Keswick Ave., Pittsburgh, Pa. 15202. Phone: (412) 766-6190.

342d Fighter Squadron
Former members of the 342d Fighter Squadron are invited to meet on October 11–14, 1984, in Washington, D.C. **Contact:** Frank Love, 3837 Taft Ave., Alexandria, Va. 22304. Phone: (703) 751-5994.

351st Bomb Group Ass'n
Members of the 351st Bomb Group, stationed in Polebrook, England, during World War II, including the 508th, 509th, 510th, and 511th Bomb Squadrons, will hold their reunion on October 3–7, 1984, in conjunction with the 8th Air Force Historical Society, at the Westin Bonaventure Hotel in Los Angeles, Calif. **Contact:** Ben Schohan, 398 Catawba Ave., Westerville, Ohio 43081.

370th Bomb Squadron
Members of the 370th Bomb Squadron, the "Long Rangers," will hold their reunion on September 27–29, 1984, in Colorado Springs, Colo. **Contact:** Ira Anderson, 1800 Sybil Lane, Tyler, Tex. 75703. Phone: (214) 561-2832.

376th Air Refueling Squadron
The 376th Air Refueling Squadron will hold its reunion on September 28–30, 1984. **Contact:** C. L. Sammons, 2603 Ormond Pl., Bossier City, La. 71111. Phone: (318) 742-8552.

379th Bomb Wing
The 379th Bomb Wing, Wurtsmith AFB, Mich., will hold its first reunion on October 6, 1984, at the Fort Myer Officers' Club in Arlington, Va. **Contact:** Harold W. Andress, 9666 Masterworks Dr., Vienna, Va. 22180. Phone: (703) 938-3182.

381st Bomb Group
Members of the 381st Bomb Group will hold their reunion on October 4–7, 1984, on the grounds of the Air Force Academy in Colorado Springs, Colo. **Contact:** T. Paxton Sherwood, 515 Woodland View Dr., York, Pa. 17402. Phone: (717) 848-4680.

391st Bomb Group Ass'n
The 391st Bomb Group will hold its reunion on October 11–14, 1984, at the Best Western Landmark Hotel in Myrtle Beach, S. C. **Contact:** Bob Cox, 600 Seaford Ave., Massapequa, N. Y. 11758.

463d Bomb Group
The 463d Bomb Group Historical Society's fifth annual reunion will be held on October 2–5, 1984, at the Cherry Hill Inn, Cherry Hill, N. J. **Contact:** Alfred D. Richards, Brook Hollow Dr., Gladstone, N. J. 07934. Phone: (201) 234-2694.

492d Bomb Group
A reunion will be held for the 492d Bomb Group, North Pickenham, England, on October 3–7, 1984, at the Bonaventure Hotel in Los Angeles, Calif. **Contact:** Elmer W. Clarey, 2015 Victoria Ct., Los Altos, Calif. 94022. Phone: (415) 961-0231.

801st/492d Bomb Group
The 801st/492d Bomb Group, the "Harrington Carpetbaggers," will hold its reunion on October 3–7, 1984, in Los Angeles, Calif. **Contact:** Sebastian H. Corriere, 4939 N. 89th St., Milwaukee, Wis. 53225. Phone: (414) 464-8264.

815th Troop Carrier Squadron
Members of the 815th Troop Carrier Squadron, stationed at Ashiya, Japan, during the 1954–57 era, will hold their first reunion on September 21–23, 1984, in Nashville, Tenn. **Contact:** Hugh Perry, 15380 Old Hickory Blvd., Nashville, Tenn. 37211. Phone: (615) 834-8380.

868th Bomb Squadron
A reunion will be held for the 868th Bomb Squadron, Thirteenth Air Force, on September 20–23, 1984, at the Sheraton National Hotel in Arlington, Va. **Contact:** Vince Splane, 2676 Blanding Blvd., Middleburg, Fla. 32068. Phone: (904) 282-4620 (home) or (904) 282-9371 (office).

ARIA/EC-135N
I would like to hear from members of the 6549th CAMS for the purpose of planning a reunion.
Please contact the address below.
Robert Van Patten
1501 Old Estill Springs Rd.
Tullahoma, Tenn. 37388
Phone: (615) 455-6136

USAFSS-ESC Alumni Ass'n
Members of the United States Air Force Security Service-Electronic Security Command (USAFSS-ESC) are planning to hold their reunion on September 28–29, 1984.
Please contact the address below.
USAFSS-ESC Alumni Association
6960 ESW/CC
San Antonio, Tex. 78243

437th Fighter Interceptor Squadron
The 437th Fighter Interceptor Squadron is planning a reunion to be held in October 1984 at the now-inactivated Oxnard AFB, Calif., and would like to hear from former members.
Please contact the adddress below.
George Denardo
1171 Baywood Court
Camarillo, Calif. 93010

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But today's soaring hospital costs—*up to $500 a day* in some major metropolitan medical centers—can run up a $20,000 bill for even a moderately serious accident or illness.

Your 25% of $20,000 is no joke!

AFA CHAMPLUS® protects you against that kind of financial catastrophe *and* covers most of your share of routine medical expenses as well.

HOW AFA CHAMPLUS® WORKS FOR YOU!

WHO IS ELIGIBLE?

1) All AFA members under 65 years of age who are currently receiving military retired pay and are eligible for benefits under Public Law 89-614 (CHAMPUS), their spouses under age 65 and their unmarried dependent children under age 21 (or age 23 if in college).
2) All eligible dependents of AFA members on active duty. Eligible dependents are spouses under age 65 and unmarried dependent children under age 21 (or age 23 if in college).

EXCEPTIONAL BENEFIT PLAN

(See chart at right)

FOUR YEAR BASIC BENEFIT. Benefits for most injuries or illnesses may be paid for up to a four-year period.

PLUS THESE SPECIAL BENEFITS . . .

1) Up to 45 consecutive days of in-hospital care for mental, nervous, or emotional disorders. Outpatient care may include up to 20 visits of a physician or $500 per insured person each year.
2) Up to 30 days care per insured per year in a Skilled Nursing Facility.
3) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Residential Treatment Center.
4) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Special Treatment Facility.
5) Up to 5 visits per insured per year to Marriage and Family Counselors under conditions defined by CHAMPUS.

YOUR INSURANCE IS NON-CANCELLABLE

As long as you are a member of the Force Association, pay your premium time, and the master contract remain force, your insurance cannot be celled.

ADMINISTERED BY YOUR ASSOCIATION . . . UNDERWRITTEN BY MUTUAL OF OMAHA

AFA CHAMPLUS® insurance is ad istered by trained insurance professio on your Association staff. You get pro reliable, courteous service from pe who know your needs and know e detail of your coverage. Your insuran underwritten by Mutual of Omaha, largest individual and family health in ance company in the world.

AFA OFFERS YOU HOSPITAL BENEFITS AFTER AGE 65

Once you reach Age 65 and are co e under Medicare, AFA offers you prot tion against hospital expenses not c ered by Medicare through the *Senior A Benefit Plan* of AFA Hospital Indem Insurance. Members enrolled in A CHAMPLUS® will automatically rec e full information about AFA's Medicare s plement program upon attainment of A 65 so there will be no lapse in covera

AFA CHAMPLUS® BENEFIT SCHEDULE

Care	*CHAMPUS Pays*	*AFA CHAMPLUS® Pays*
	For Military Retirees Under Age 65 and Their Dependents	
Inpatient civilian hospital care	CHAMPUS pays 75% of allowable charges.	CHAMPLUS® pays the 25% of allowable charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $6.55 per day subsistence fee, not covered by CHAMPUS.	CHAMPLUS® pays the $6.55 per day subsistence fee.
Outpatient care	CHAMPUS COVERS 75% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 25% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.
	For Dependents of Active-Duty Military Personnel	
Inpatient civilian hospital care	CHAMPUS pays all covered services and supplies furnished by a hospital less $25 or $6.55 per day, whichever is greater.	CHAMPLUS® pays the greater of $6.55 per day or $25 of the reasonable hospital charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $6.55 per day fee, not covered by CHAMPUS.	CHAMPLUS® pays the $6.55 per day subsistence fee.
Outpatient care	CHAMPUS covers 80% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 20% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.

NOTE: Outpatient benefits cover emergency room treatment, doctor bills, pharmaceutical and other professional services.

There are some reasonable limitations and exclusions for both inpatient and ou patient coverage. Please note these elsewhere in the plan description.

Against Costs CHAMPUS Doesn't Cover

APPLY TODAY!
JUST FOLLOW THESE STEPS

Choose either AFA CHAMPLUS® Inpatient Coverage or combined Inpatient and Outpatient coverage for yourself. Determine the coverage you want for dependent members of your family. Complete the enclosed application form in full. Total the premium for the coverage you select from the premium tables on this page. Mail the application with your check or money order for your initial premium payment, payable to AFA.

AFA's CHAMPLUS®

LIMITATIONS

Coverage will not be provided for conditions for which treatment has been received during the 12-month period prior to the effective date of insurance until the expiration of 12 consecutive months of insurance coverage without further treatment. *After coverage has been in force for 24 consecutive months, pre-existing* conditions will be covered regardless of prior treatment.

EXCLUSIONS

This plan does not cover and no payment shall be made for:

a) routine physical examinations or immunizations

b) domiciliary or custodial care

c) dental care (except as required as a necessary adjunct to medical or surgical treatment)

d) routine care of the newborn or well-baby care

e) injuries or sickness resulting from declared or undeclared war or any act thereof

f) injuries or sickness due to acts of intentional self-destruction or attempted suicide, while sane or insane

g) treatment for prevention or cure of alcoholism or drug addiction

h) eye refraction examinations

i) Prosthetic devices (other than artificial limbs and artificial eyes), hearing aids, orthopedic footwear, eyeglasses and contact lenses

) expenses for which benefits are or may be payable under Public Law 89-614 (CHAMPUS)

PREMIUM SCHEDULE

Plan 1—For military retirees and dependents (Quarterly Premiums)

Inpatient Benefits

Member's Attained Age	Member	Spouse	Each Child
Under 50	$19.03	$23.30	$14.85
50–54	$26.16	$32.01	$14.85
55–59	$36.16	$44.28	$14.85
60–64	$43.62	$53.41	$14.85

Inpatient and Outpatient Benefits

Under 50	$26.80	$31.05	$37.13
50–54	$36.83	$42.68	$37.13
55–59	$50.92	$59.02	$37.13
60–64	$61.41	$71.20	$37.13

Plan 2—For dependents of active-duty personnel (Annual Premiums)

Inpatient Only	None	$ 9.68	$ 5.94
Inpatient and Outpatient	None	$38.72	$29.70

APPLICATION FOR AFA CHAMPLUS®

Group Policy GMG-FC70
Mutual of Omaha Insurance Company
Home Office: Omaha, Nebraska

Full name of Member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

Date of Birth _____ Current Age ____ Height ____ Weight ____ Soc. Sec. No. _____
Month/Day/Year

This insurance coverage may only be issued to AFA members. Please check the appropriate box below:

☐ I am currently an AFA Member.

☐ I enclose $15 for annual AFA membership dues (includes subscription ($14) to AIR FORCE Magazine).

PLAN & TYPE OF COVERAGE REQUESTED

Plan Requested (Check One)
☐ AFA CHAMPLUS® PLAN I (for military retirees & dependents)
☐ AFA CHAMPLUS® PLAN II (for dependents of active-duty personnel)

Coverage Requested (Check One)
☐ Inpatient Benefits Only
☐ Inpatient and Outpatient Benefits

Person(s) to be insured (Check One)
☐ Member Only
☐ Spouse Only
☐ Member & Spouse
☐ Member & Children
☐ Spouse & Children
☐ Member, Spouse & Children

PREMIUM CALCULATION

All premiums are based on the attained age of the AFA member applying for this coverage. Plan I premium payments are normally paid on a quarterly basis but, if desired, they may be made on either a semi-annual (multiply by 2), or annual (multiply by 4) basis.

Quarterly (annual) premium for member (age ____) $_____

Quarterly (annual) premium for spouse (based on member's age) $_____

Quarterly (annual) premium for ____ children @ $ $_____

Total premium enclosed $_____

If this application requests coverage for your spouse and/or eligible children, please complete the following information for each person for whom you are requesting coverage.

Names of Dependents to be Insured	Relationship to Member	Date of Birth (Month/Day/Year)

(To list additional dependents, please use a separate sheet.)

In applying for this coverage, I understand and agree that (a) coverage shall become effective on the last day of the calendar month during which my application together with the proper amount is mailed to AFA, (b) only hospital confinements (both inpatient and outpatient) or other CHAMPUS-approved services commencing after the effective date of insurance are covered and (c) any conditions for which I or my eligible dependents received medical treatment or advice or have taken prescribed drugs or medicine within 12 months prior to the effective date of this insurance coverage will not be covered until the expiration of 12 consecutive months of insurance coverage without medical treatment or advice or having taken prescribed drugs or medicine for such conditions. I also understand and agree that all such pre-existing conditions will be covered after this insurance has been in effect for 24 consecutive months.

Date _____, 19 ____ _____
Member's Signature

9/84

NOTE: Application must be accompanied by check or money order.
Send remittance to:
Insurance Division, AFA, 1501 Lee Highway • Arlington, Virginia 22209-1198

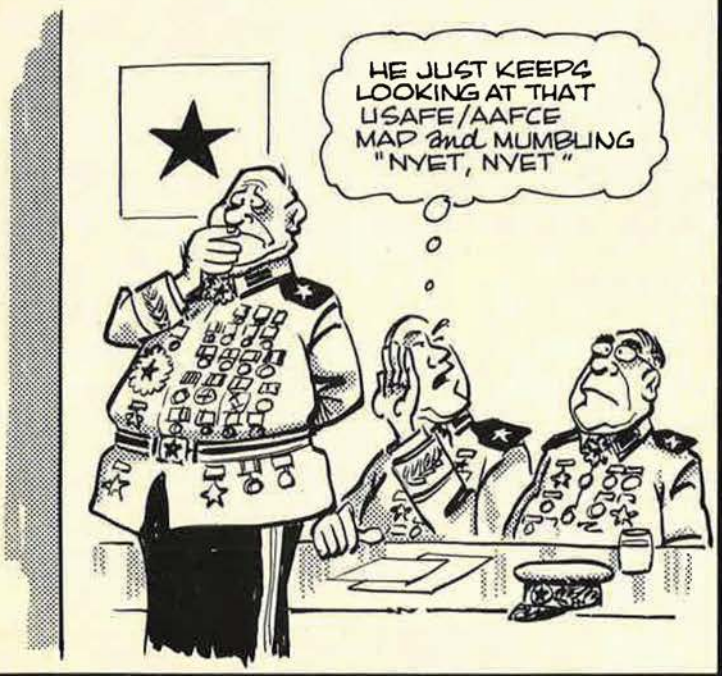
Form 6173GH App.

Bob Stevens'

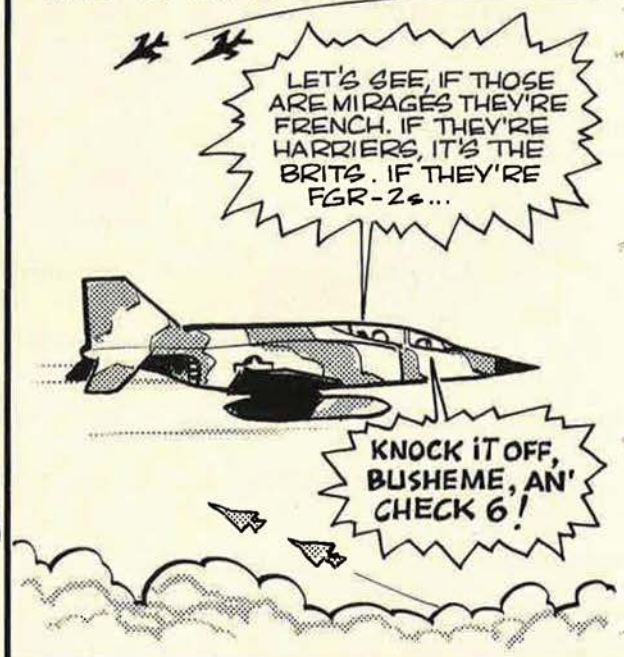
"There I was..."

GERMANY. JUST 7 MIN. BY JET FROM THE BAD GUYS, USAFE UNITS - 35 TAC SQDNS & 130,000 BLUE SUITERS - WOULD BE AMONG THE FIRST TO MEET 'EM EYEBALL TO EYEBALL. THE CINC USAFE, WHO ALSO COMMANDS ALLIED AIR FORCES, CENTRAL EUROPE (AAFCE), SAYS "OUR JOB IS TO FLY, FIGHT *and* **WIN!!**"

SHOULD THE SOVIETS THINK ABOUT PRESSING THE ISSUE, **1600** AIRCRAFT COULD LAUNCH FROM 70 PLUS BASES IN SHORT ORDER - IT'S ENOUGH TO MAKE ONE THINK TWICE!



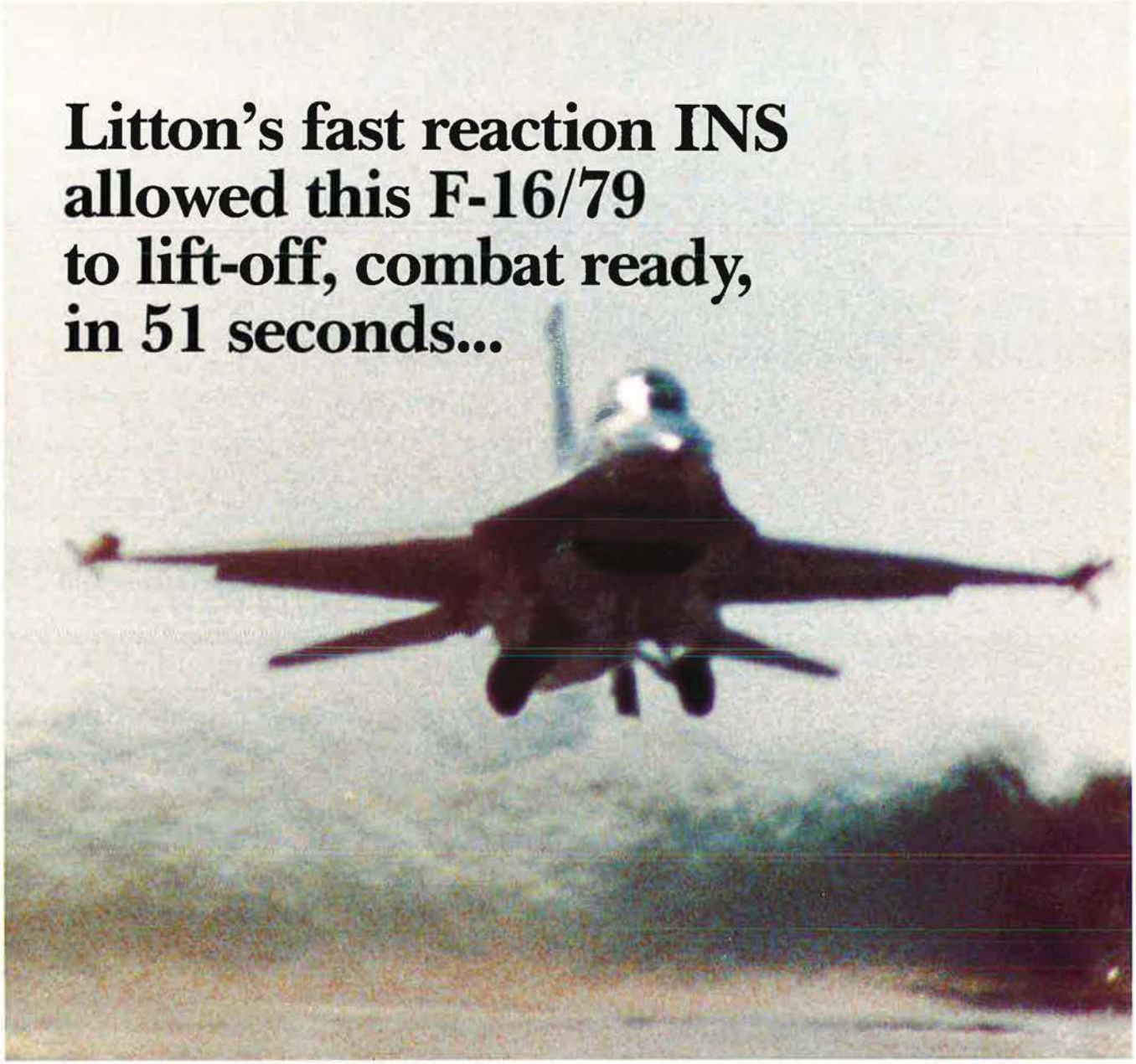
TACTICAL UNITS, LIKE THE 526 TFS BLACK KNIGHTS (AKA "TINHEADS") *and* 512 TFS DRAGONS (AKA "LIZARDS") TROLL THE SKIES NEVER KNOWIN' WHAT THEY'LL SNAG...



AT DECIMOMANNU - "DUTCHY" FOR SHORT - DOWN IN THE MED MOST NATO FIGHTERS JOIN UP FOR A EUROPEAN "RED FLAG".

PLANS CALL FOR USING THE GERMAN AUTOBAHN AS EMERGENCY LANDING STRIPS -

Litton's fast reaction INS allowed this F-16/79 to lift-off, combat ready, in 51 seconds...



Fast alignment

From a cold start, and without ground power, Litton's fast reaction LN-39 standard INS permits **brake release in less than 35 seconds.** INS alignment is performed concurrently with engine start. . .when the pilot and his aircraft are ready, so is the INS. It fully supports all INS-dependent avionics, and combat mission requirements.

Hands-off scramble

The INS will automatically start and align upon application of aircraft power. When the pilot releases his brakes and begins his taxi or take-off roll, Litton's new "Auto-Nav" feature will automatically switch the Inertial Navigation System from the alignment to the navigate mode. **The pilot touches no INS controls during the entire scramble sequence.** Auto-nav eliminates the degraded performance associated with failure to switch to "nav" before brake release.

Litton's fast reaction LN-39 INS allowed the demonstration of **the fastest combat-ready scramble that has ever been achieved.**

If you would like to know more about Litton's navigation system that will help you scramble faster than ever before, contact our Director of Business Development at 818-715-4321, or write to Litton Industries' Guidance and Control Systems, 5500 Canoga Avenue, Woodland Hills, California 91365.

Litton

WHEN THE WEATHER TURNS FOUL, WE NEED TO KEEP OUR RESISTANCE UP.

To hostile ground forces, bad weather presents a good opportunity.

Rain, sleet and clouds compromise the radar and firepower of most fighters. So foul weather offers just the cover ground forces need to make their move.

Night can be their ally as well.

How serious a problem is this? Worldwide weather statistics show that most nations are under clouds or in darkness 70% of the time—rendering most fighters useless.

The solution: Combat aircraft like the dual role F-15E, impervious to bad weather and night.

Nothing can cloud the F-15's view. Computer navigation coupled with photo-quality sensors let Eagle crews identify and track targets over any terrain, day or night, in good weather and bad. And the F-15's all-weather missiles seek out and succeed against their targets in any kind of weather.

The all-weather, day and night, dual role F-15 Eagle. It's the most potent of adversaries any time, all the time.

MCDONNELL DOUGLAS