SEPTEMBER 1985/$5

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

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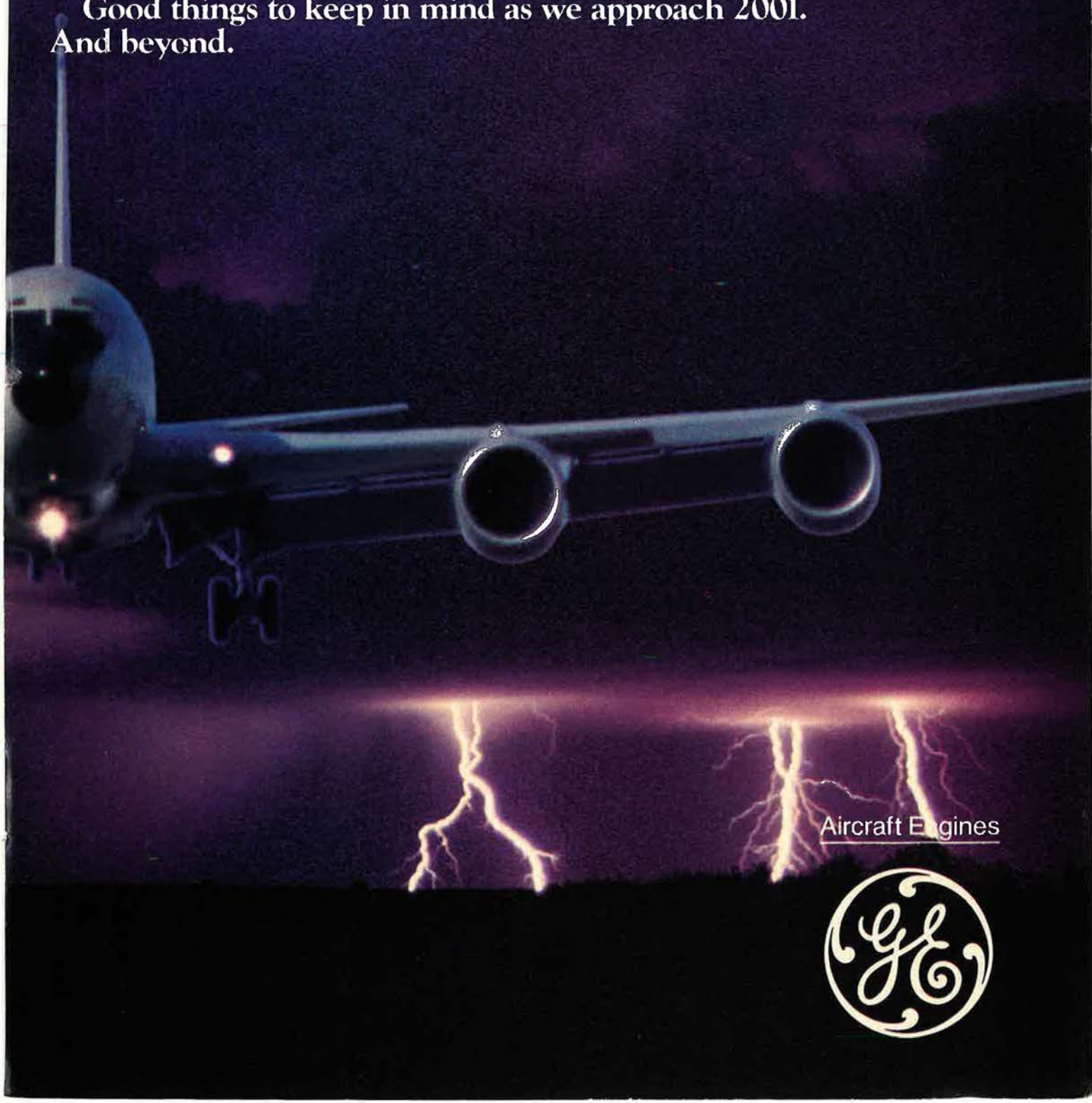

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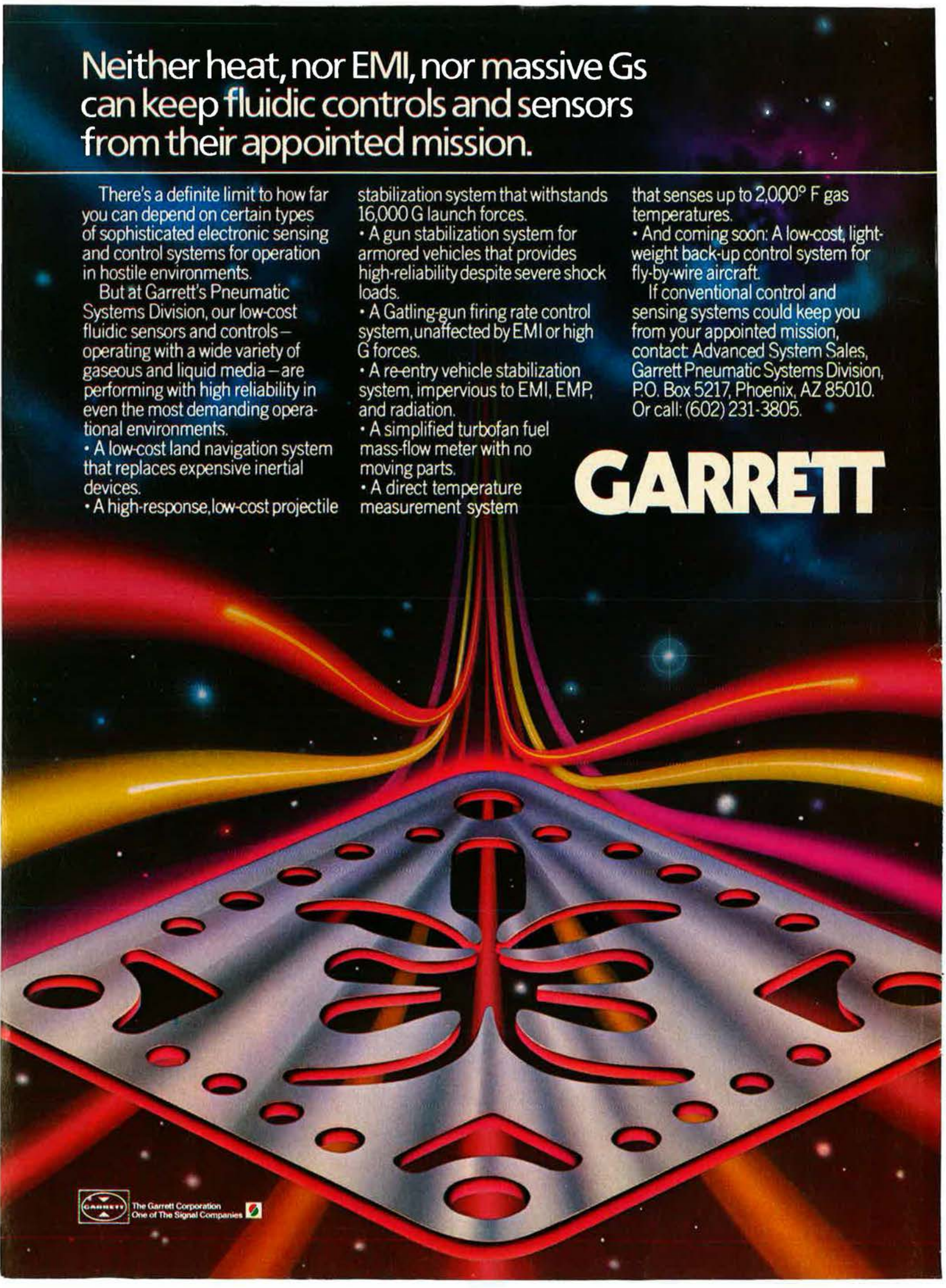

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SEPTEMBER 1985
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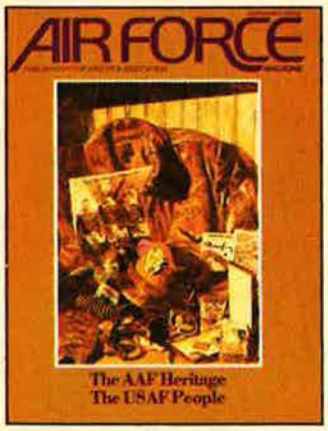

About the cover: Jim Dietz's painting "Silver Wings" recalls the heritage of the United States Air Force. A special section on "USAF People" begins on page 48. (Print courtesy of the Air Force Art Collection, from the original painting by artist Jim Dietz)

Special Section: USAF People

Features

Departments

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A GUEST EDITORIAL

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AIRMAIL

Central America

I disagree with the letter in the August '85 issue *(p. 10)* from Mr. Dom Ayala, Jr., concerning Gen. T. R. Milton's "Viewpoint" on Central America *(see "Dominoes Again," June '85 issue, p. 126).* I think the General's article raised some important points. I'm particularly perturbed that Mr. Ayala accused the General of sensationalism.

I strongly disagree that the Soviets have been "extremely reluctant in getting involved in Nicaragua," as Mr. Ayala stated. The massive military aid sent by Moscow suggests otherwise. I believe that President Reagan's steadfast stand is the primary deterrent that has kept the Soviets from gaining a broader foothold in the region. . . .

Nicaragua's importance is its strategic location. If the Soviet expansion had been successful, Nicaragua would have become the third point of their "Caribbean Triangle" strategy. The "triangle" would have consisted of Cuba, Grenada, and Nicaragua and would have thus created a chokehold on many US shipping lanes. But thanks to the strength of our President, Grenada is no longer a threat and Nicaragua is slowly becoming an economic nightmare for the Soviets. Nicaragua's proximity to the Panama Canal and all of Central America makes it an excellent staging area for terrorism, insurrection, and political sabotage. . . .

I can't see how any careful observer of the region can honestly say that the United States has forced the Sandinistas into the Soviet camp. The Sandinistas, through corrupt mismanagement and growing civil discontent, have found because of their lack of legitimacy that the Soviets are the only economic allies they can find. Militarism and creating external military threats are the only adhesive the Sandinistas can find to keep their little empire intact and their people under control.

Sadly, Mr. Ayala failed to understand the importance or magnitude of the problem when General Milton referred to 30,000,000 refugees. The refugee threat is not solely from Central America. The impending threat is that Communist-inspired terrorism and civil strife will migrate to Mexico. There are more than 109,000,000 people living in Mexico and Central America.

The object of Soviet interference in the Western Hemisphere is to disrupt and destabilize governments and countries that have generally known peace. By causing problems close to the US, the Soviets hope to distract our attention from the rest of the world so that they can continue to meddle and interfere in the internal affairs of other developing countries.

None of us wants to see another Vietnam. But I don't want to see any more Afghanistans, Kampucheas, or Ethiopias. As lovers of democracy and freedom, we can't allow the Soviets to ride roughshod over the developing countries of the world. Each nation has the right to determine, for itself, how it will rule and be ruled without *any* foreign interference.

As citizens of the United States, we must safeguard the free evolution of self-rule throughout the world. Remember that, in 1776, we were a developing nation that had to throw out tyranny. We have no mandate to interfere with foreign states, but we do have a responsibility to thwart the Soviets from interfering. I hope Mr. Ayala and all other Americans will consider this.

1st Lt. Stephen Howard, USAF
Hurlburt Field, Fla.

After reading Col. Alfred Hanlon's letter, "Dominoes Again," in the July '85 issue *(p. 12),* I went back to General Milton's article in the June '85 issue to see what I had missed. I read it carefully, compared it with Colonel Hanlon's letter, and couldn't find the basis for his comments. It finally seemed to resolve into three elements.

The first was his support of Rep. Michael Barnes. Representative Barnes has a solid record against the Administration and in favor of the Sandinistas. He was one of ten congressmen who wrote to Daniel Ortega and promised continued support against US aid to the Contras. Most recently, in documents exposed by Evans and Novak, he was identified with five other congressmen as working with Nicaraguan Communists to undermine US policy.

The second is conjecture. Colonel Hanlon must be a disciple of Rear Adm. Gene R. LaRocque, head of the Center for Defense Information, and stridently antidefense.

Finally, the Colonel says, "Let's wait until all those millions start pouring across our southern borders. Only then should we do something about it. . . ."

What does he have in mind?

Col. Frank Schnekser,
USAF (Ret.)
Placerville, Calif.

Not Cost-Effective?

Re: The article "High Space Heats Up" by James W. Canan in the July 1985 issue *(p. 60).*

Mr. Canan was in error when he stated that the Complementary Expendable Launch Vehicles (CELVs) offer a cost savings to the Air Force over Shuttle flights. This is a common mistake resulting from the Space Shuttle having fallen far short of its original goals. However, the Space Shuttle is still less expensive than any of our [other] existing launch vehicles. To use Mr. Canan's example of the launch of a small weather satellite on a refurbished Titan II, such a satellite would be integrated into a previously scheduled Space Shuttle mission. This would offer a savings in both time and money over scheduling, integrating, and launching the sat-

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

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Charles E. Cruze, Richard M. Skinner

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Charles E. Cruze
1501 Lee Highway
Arlington, Va. 22209-1198
Tel: 703/247-5800

Director of Marketing Services
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Richard A. Ewin
Overseas Publicity Ltd.
91-101 Oxford Street
London W1R 1RA, England
Tel: 1-439-9263

Italy and Switzerland
Dr. Vittorio F. Negrone, Ediconsult
Internationale S.A.S. Piazzo Fontane Marose 3
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Tel: (010) 543659

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ellite on its own independent vehicle.

The reason for the CELVs and for refurbishment of the Titan IIs is to provide an alternate route to space. The catastrophic loss of a Space Shuttle, particularly if the accident were to occur on the pad, would mean months of delay to scheduled launches. This would create a backlog of flights that would have to be handled by a Shuttle fleet reduced in strength by twenty-five percent.

The Air Force has recognized that it cannot afford such a loss of time and has authorized the expending of funds to assure our access to space by retaining the expendables. The additional cost to the Air Force to retain the capability is not small, but it is a price that must be met.

Capt. James Sloan, USAF
Carson, Calif.

Duck Doings

Your short feature on the O-2 in the July '85 issue, "The Duck Lives," was timely, in that I recently visited Shaw AFB, S. C. Although my main purpose was to spend time with the 363d TFW and get a little exposure to the Air Force's tactical community, the overall tour of the base included the busy flight line. One of the chief residents was the 507th Tactical Air Control Wing, whose thirty to forty O-2s were lined up on the ramp for a considerable distance. In their overall green paint scheme with underwing rocket pods, the Cessnas of the 507th were preparing to participate in a large exercise, and throughout the day, the twin-boom aircraft were taking off singly or in pairs.

Obviously, the "Duck" is alive and well—at least for a time—and not only at Patrick AFB, Fla., but at Shaw, too. Although not one of the Air Force's more glamorous aircraft, the O-2 enjoys a proud history.

My guide at Shaw was a former O-2 FAC with more than 800 hours in the type, and although he transitioned to the F-16, with A-7 time along the way, he still spoke proudly of his association with the little O-2.

Peter Mersky
NAS Norfolk, Va.

King of the Skies?

Re: The article "The Fabulous Fortress" in the July 1985 issue, page 118.

While I enjoyed reading this article about the "Queen of the Skies," the B-17, someone on your staff should give equal treatment to the "King of the Skies"—the B-24!

Maybe the B-24 was no beauty, but it could still, with one engine down, fly rings around a B-17. The only advantage a B-17 had over the B-24 was that it could fly 5,000 feet higher. The B-24 was head and shoulders a faster plane and could fly longer distances. It was also better able to defend itself because of its four turrets.

So how about a nice word for the B-24s in an article in a forthcoming issue? The King deserves it!

It was once said that the Army Air Forces, during World War II, separated the "men" from the "boys" by assigning the "boys" to the B-17s!

Joseph B. Rifkin
Sunrise, Fla.

Railroading Engineers?

The lead item in the July 1985 "Bulletin Board" column prompts me to write. The quotations and the awards to engineers are certainly impressive and inspiring, but Air Force management of its resource of technically trained officers leaves a great deal to be desired.

Now that the engineer shortage of a few years ago has turned into an engineer surplus, the Air Force is in the process of placing more than 150 experienced engineers into acquisition officer and other nonengineer slots. Since the Air Force is a pilot-oriented service, I will make my point in pilot-related terms.

Engineers, like pilots, are rightfully proud of their unique skills and the effort that went into acquiring them, and they want nothing more than to be what they are. Engineers will leave the service rather than do nonengineer jobs, as pilots will (and have) rather than do nonpilot jobs. The analogy breaks down, however, when one realizes that virtually anyone who is physically qualified can be made into an acceptable entry-level pilot in one year while it takes at least four years to turn a person with some very special talents and skills into an engineer.

Rather than attempt the tough job of retaining engineers as engineers, the Air Force will discard them. Engineers will leave, and the shortage will return, not to be cured for many years. Weapon system design and integration, never an easy task and in need of the application of more blue-suit engineering now, will suffer. The cycle will repeat because of rigid and unimaginative personnel management.

As long as the Air Force personnel

system remains an unresponsive dinosaur, in which officers' careers are "managed" by line-of-sight thinkers and in which by-name requests by supervisors desperate for talented individuals are ignored in the interests of satisfying a numbers game, we will be chronically short of properly applied engineering talent.

Maj. Richard Colarco, USAF
Offutt AFB, Neb.

Thirtieth Class?

I have enjoyed AIR FORCE Magazine for years, but an error should not go uncorrected.

The article "The Thirtieth Class" by Gen. T. R. Milton on page 122 of the July '85 issue should have been titled "The Twenty-seventh Class." The first class entered the Academy in 1955 and graduated in 1959. The Class of 1985 is the twenty-seventh class to graduate from the Academy—not the thirtieth, as he states.

The Academy was authorized by President Eisenhower in 1954, and the cadets were moved from their temporary facilities at Lowry AFB, Colo., to the Academy in the fall of 1958.

Perhaps General Milton meant that there have been Air Force Academy cadets for thirty years, but the Class of 1985 is not the thirtieth class.

Capt. Steven Boyce, USAF
Cos, Colo.

One small correction to Gen. T. R. Milton's article in the July 1985 issue, "The Thirtieth Class," is in order.

While 1985 is the thirtieth year of the Air Force Academy, the Class of 1985 is the twenty-seventh graduating class. The first graduating class was the Class of 1959.

Capt. Thomas Lash, USAF
Redondo Beach, Calif.

• *Captains Boyce and Lash are correct.*—THE EDITORS

3,000-Mile Error

Re: The photo on page 60 of the July 1985 issue.

The caption to this photo reads: "Space Shuttle *Discovery* booms from Pad 39A at Vandenberg AFB, Calif., on Mission 51-C—the first Shuttle launch dedicated to military space deployment. . . ."

Unless DoD has sneaked one past us, I think you'll find that Flight 51-C was launched from Pad 39A at Kennedy Space Center in Florida on January 24, 1985. The first launch from Shuttle Launch Complex Six ("Slick 6") at Vandenberg AFB is presently scheduled for March 20, 1986.

I continue to enjoy the magazine. I was particularly pleased with the July '85 issue's tribute to the "Duck" *(see "The Duck Lives," p. 128).* I logged about 175 missions over the "Trail" in what we then called the "Oscar Deuce." That was sixteen years ago, but the memories of some of those night missions are still vivid, especially those when the guys on the ground appeared to be celebrating the Fourth of July in our direction!

Stuart W. Shadbolt
Titusville, Fla.

Your cutline on page 60 of the July 1985 issue left me wondering if I had overslept last winter and missed our first Space Shuttle launch from Vandenberg AFB, Calif.

Actually, our first launch from Vandenberg won't be until March of 1986. Besides, when Vandenberg makes history next spring with the world's first polar-orbiting Space Shuttle, I hope that you give us better billing!

Capt. Rick Sanford, USAF
Vandenberg AFB, Calif.

• *Mission 51-C was indeed launched from Kennedy Space Center. We regret our error.*—THE EDITORS

No Paper Taiwan?

Once again, Gen. T. R. Milton has gone on his travels for your magazine, hearing only what he wants to hear and seemingly writing more with a view to pleasing his hosts than informing his readership. In his haste to air some all-too-predictable views on the security situation for Taiwan *(see "Taiwan's Lonely Stand," p. 104, June '85 issue),* some significant points were glossed over.

General Milton gives the impression that the Republic of China Air Force (ROCAF) operates only a few clapped-out F-5s and F-104s. In fact, this force has now received no fewer than 308 F-5E/F models, which serve in four wings (about twelve squadrons). Four other Asian air forces use it as their primary air defense fighter. Updated with conformal ECM, late-model AIM-9 and AGM-65 missiles, and new targeting systems, it could be an effective aircraft for many years hence against medium-level threats.

Those 103 former German Air Force F-104Gs will supplant the 114 Starfighters that were previously supplied to Taiwan and that serve in a fifth fighter wing. Other air defense assets there include the five Army battalions, which are receiving 280 Improved Hawk surface-to-air missiles, adding to a force of ninety-six Nike-Hercules and 122 earlier Hawks. A modern, US-supplied air defense radar system is in place.

Not a bad lineup for a relatively small territory surrounded by water, especially when compared with the air capability on the mainland. By every recent account, the PRC's air force is either small or obsolescent, backed by only the most rudimentary infrastructure. Furthermore, the PRC leadership had made it clear that the armed forces do not rate high on its list of priorities for modernization.

It is not clear why General Milton considers the 1950s-vintage F-6 (a MiG-19 copy) to be "comparable" to the F-5E, since very few of them have even a small ranging radar, let alone air-to-air missiles of the standard of Sidewinder.

Egypt, by the way, received its F-6s seven years ago. The General is confusing the F-6 with the F-7, China's version of the MiG-21. The Egyptians are indeed receiving 100 of the latter, but for operational training rather than front-line duty. The F-7 is no state-of-the-art fighter. After all, it essentially resembles the early 1960s MiG-21F. Incidentally, the PRC is exporting its production of the F-7 at the expense of its own air force, which has largely to make do with the F-6.

As for the "F-8s, F-10s, and F-12s" that are entering service with the PRC's air force within the next few years in substantial numbers, perhaps General Milton would care to share his knowledge of these significant advances with us. So far, the only substantive reference to these types in the open literature has been the details of the F-8 that were released by the Chinese last year.

According to your own "Jane's Supplement" in the April '85 issue, the F-8 is "quite an old design." It is seriously underpowered and lacking in modern avionics. The Chinese themselves admit that it entered only limited production.

Chris Pocock
Uxbridge, Middlesex
England

AIRMAIL

Corsair in Combat

The letter from Mr. Leslie Davis in "Airmail" in the June '85 issue of AIR FORCE Magazine, "The Corsair *Could* Have?" caught my attention and sent me to my copy of Robert Sherrod's *History of Marine Corps Aviation in World War II* to review the events surrounding the Corsair's South Pacific combat debut *(June '85 issue, p. 15).*

On pages 134 and 135 of his excellent history of Marine Corps aviation in WW II, Sherrod records the arrival of VMF-124 and their Corsairs on Guadalcanal on February 12, 1943. The squadron escorted a rescue mission the day it arrived, flew the PB4Y escort to Bougainville the following day, as described by Mr. Davis, and, on February 14, St. Valentine's Day, had their introduction to the Zero and its crack Japanese pilots.

Sherrod describes the "St. Valentine's Day Massacre": "On 14 February, their third day in the combat area, the F4U pilots learned that Japanese flyers had not lost their skill or aggressiveness. About fifty well-alerted Zeros were waiting for the raid on Kahili Field in southern Bougainville. The Japanese shot down two F4Us, two Navy PB4Ys, two P-40s, and the entire top cover of four P-38s, with a loss to themselves of only three Zeros, one of which collided with an F4U. This 'Saint Valentine's Day massacre' was a painful blow to the Guadalcanal-based flyers of all services."

Certainly there can be no arguing the fact that the Corsair was a great fighter, but, all things considered, it would appear that the P-38 was the logical choice for this mission. In addition to its firepower, it had the required range and twin-engine reliability.

June was another fine issue. I especially appreciated the thought-provoking feature article by Gen. T. R. Milton, USAF (Ret.), on the Taiwan problem.

Capt. W. E. Scarborough,
USN (Ret.)
Hilton Head Island, S. C.

Facing Reality

I read Peter Petersen's article, "Germany and Its Peace Protesters" *(May '85 issue, p. 66),* with a deep sense of relief.

It seems that, finally, at least some of the young West Germans are awakening from their dream that to deploy nuclear missiles in Europe would cause a nuclear war with Russia and that to withdraw unilaterally or prevent emplacement of nuclear missiles on European soil would cause Russia to remove its missiles, prevent a nuclear war, and ensure a lasting peace. Facing reality may be harsh, but it is the only way to deal with reality.

If these same young men and women could now combine and use their energies to help their divided nation to reunite through economic, cultural, and diplomatic channels, then maybe they could achieve a lasting peace in Europe that they, and I, so desperately desire.

SSgt. John T. Weber, USAF
Lajes Field, Azores

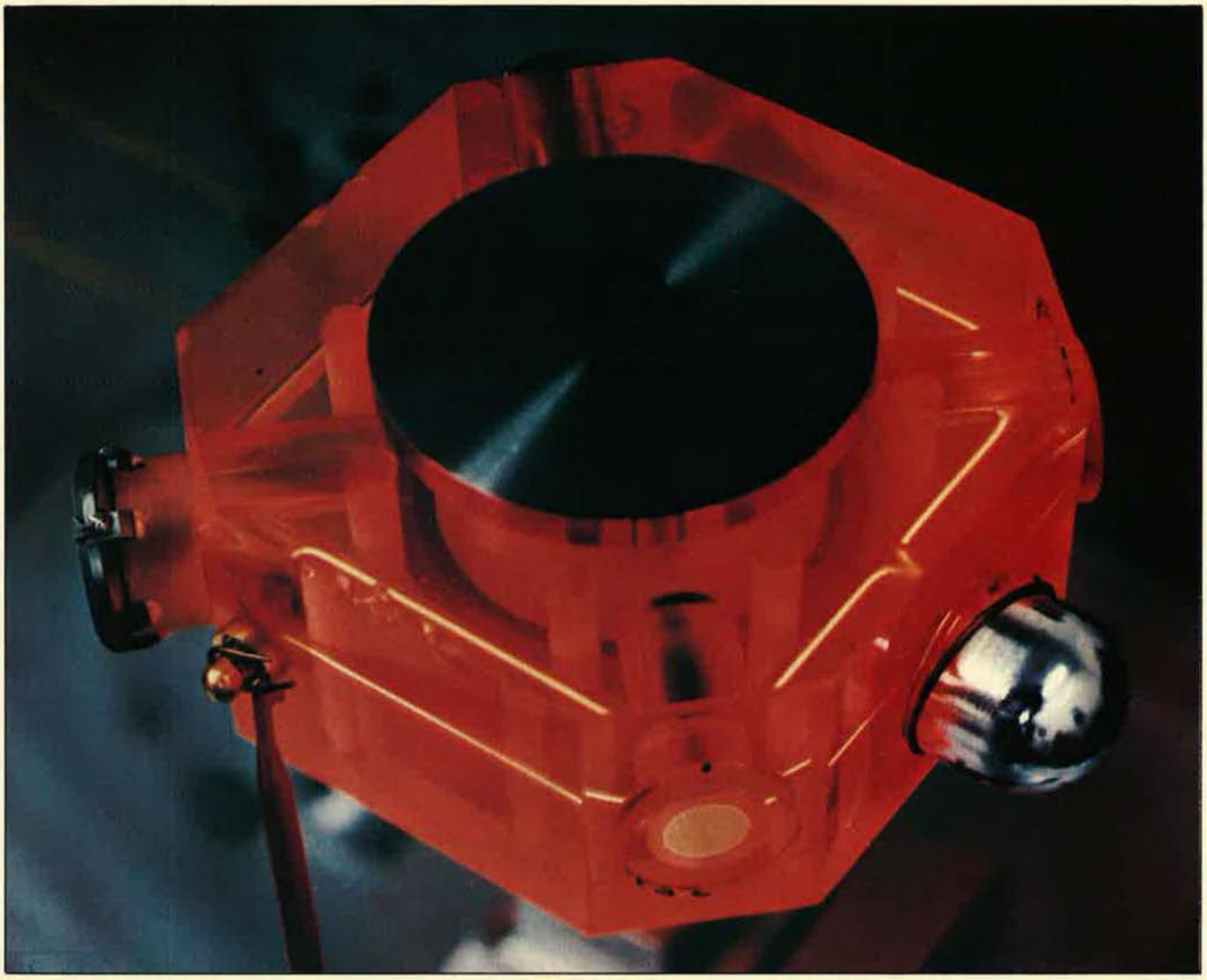
Shortchanged Chaplains?

Recently I had occasion to read the May 1985 issue of AIR FORCE Magazine, the "Air Force Almanac 1985." I was impressed with the scope of the coverage of the Air Force community and the great attention paid to detail and statistics.

I was also struck by something else that causes me to raise a question. Is there any reason that there is no mention of the Air Force Chaplaincy in the Almanac? There are, as you know, many men and women—priests, ministers, and rabbis—who have dedicated their lives to the service of military personnel and their dependents. I am sure that they consider themselves a vital part of the Total Force.

I am curious to know why they were omitted from the Almanac.

Rev. Daniel A. Cassiero
New York, N. Y.



Compared to any triangle, Litton's square "ring" laser produces measurably less backscatter, a definite benefit.

USAF selects Litton for Standard RLG INU, world's first military RLG production program.

C-130 and RF-4C aircraft to receive first units, with HH-60A and EF/F-111 soon after.

The United States Air Force has selected Litton's Guidance and Control Systems Division, long a world leader in inertial navigation, to produce the LN-93 Standard RLG Inertial Navigation Unit. Litton's LN-93 was the first RLG system to successfully complete all tests at the Central Inertial Guidance Test Facility, Holloman Air Force Base, New Mexico, and will be the Form-Fit Function alternative to the AN/ASN-141, currently manufactured by Litton for the F-16, A-10, FB-111, and other Air Force and Army aircraft. Initially, the Standard RLG INU will be employed in the C-130 Self-Contained Navigation System and the RF-4C, and later in the HH-60A and EF/F-111. A variant of the LN-93 will be purchased for the F-15; the two configurations will share over 90% commonality.

The LN-93 Standard Ring Laser Gyro INU is Litton's most recent system to employ Ring Laser Gyros in strapdown configuration. As there are no moving parts, these gyros will have significantly better reliability than earlier-design spinning-wheel gyros. The LN-93 system employs the same 28cm pathlength Ring Laser Gyro and much of the same electronics as both the Litton commercial LTN-90 Inertial Reference System, and LN-92 RLG INS, currently under development for the U.S. Navy CAINS II. The high reliability guaranteed by Litton will allow the Air Force to employ a two-level maintenance approach, eliminating the need for test equipment at base shops. Initial deliveries will support aircraft integration activities in the fall of 1985.

LN-93 Standard RLG INU, a full step ahead.

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AIRMAIL

• *There is no sinister reason why the Air Force Chaplaincy is not covered in depth in the Almanac issue. (Chaplains are listed in the table of major career fields on page 191 of the May '85 issue.) Many Air Force institutions and personnel categories receive only cursory or no coverage in the Almanac because it is just not possible to be completely inclusive. We do attempt to provide coverage of these units and people in feature articles and reports in other issues. For instance, the Chief of Air Force Chaplains is featured as part of our annual "USAF Secretariat and Command and Staff" photo directory, which begins on page 81 of this month's issue.*—THE EDITORS

Uncertain Silo Site

Your photograph of the Minuteman III silo at Vandenberg AFB, Calif., on page 54 of the May 1985 AIR FORCE Magazine is not a Vandenberg silo.

I was assigned to the Refurbishment Section of the 394th Intercontinental Ballistic Missile Test Maintenance Squadron at Vandenberg for four and a half years and have never seen this facility. The job of the Refurbishment Section is to rebuild the launch facilities after an operational test launch from Vandenberg. I have also been giving tours of Vandenberg launch facilities for the last few years now and have never come across this facility. Over my six-and-a-half-year stay here at Vandenberg, I have been out to every active launch facility, and this is not one of them.

There are a few discrepancies in this photograph that led me to the realization that this is not a Vandenberg facility. The item that caught my eye first was the light built into the silo wall. No Vandenberg launch facility has lights installed. Lights could not handle the intense heat and pressure from repeated launches.

Second, there is no "pucky" (a silicone-base insulative material) covering the mounting hardware within the silo. Pucky is used to protect and insulate hardware and mating surfaces against the force of the blast and the intense heat that accompany the launch.

Third, the absence of a set of first motion switches, which indicate that the launcher closure door has opened during the launch sequence, is apparent.

The fourth discrepancy I question is the large rectangular black area on the silo wall. I have never seen anything like that in our silos.

The fifth item that proves this is not a Vandenberg silo is the nicely painted white silo walls. At Vandenberg, with the buildup of missile blast on the silo walls, it is not cost-efficient to paint the silo walls after each launch.

As you can see, this could not possibly be a "Vandenberg" test-launch silo.

SSgt. John E. Gellentien, USAF
Vandenberg AFB, Calif.

• *Sergeant Gellentien makes a strong case for his allegation (and he may perhaps be right after all), but, according to the Air Force, the photo depicts a test-launch silo at Vandenberg AFB, Calif.*—THE EDITORS

308th SMW

I am currently working on a history of the 308th Strategic Missile Wing at Little Rock AFB, Ark. The Titan II missiles located in central Arkansas are currently being deactivated and are scheduled to be retired completely by October 1987.

An unofficial history of the 308th is

scheduled to be published in the near future. I would greatly appreciate any information readers might be able to provide. I am especially trying to obtain the current addresses and telephone numbers of former 308th SMW commanders.

Any assistance will be greatly appreciated. Please contact me at the address below.

TSgt. David A. Levin, USAF
308th SMW/HO
Little Rock AFB, Ark.
72099-5000
Phone: (501) 988-6024
AUTOVON: 731-6024

442d TFW

The 442d Tactical Fighter Wing is in the process of gathering photographs of all of the aircraft types that have been flown by the unit throughout its history. These will be placed in a permanent, museum-quality display in the headquarters building and will depict the flying history of the wing.

The wing has also been known over the years as the 442d Troop Carrier Group, the 442d Troop Carrier Wing, the 442d Military Airlift Wing, the 442d Tactical Airlift Wing, and the 442d Tactical Fighter Group.

We would like very much to hear from anyone who may have photographs of 442d aircraft that they can lend or donate to us. All photos will be carefully handled and professionally copied. Those on loan will be promptly returned. All donors will be credited in the display.

Please note that we are interested only in photos of 442d aircraft. Please contact us at the address below.

Maj. Richard A. Taylor,
USAFR
442d TFW
Richards-Gebaur AFB, Mo.
64030-5000

F-105 Thunderchief

With the passing of the Republic F-105 Thunderchief from all flying units, it seems there are a great many people saddened.

The F-4 has its admiration society, the Phantom Phanatics. Is such beyond the realm of possibility for all of us Thud freaks? A few of us believe there should be a similar organization to preserve the memory of the big Republic fighter.

At present, I am simply exploring the interest of others in the establishment of such a group. If the idea of a society of those enamored of the F-105 sounds appealing to you, please write to me and give me your ideas about the goals and direction such a group should establish. If sufficient numbers respond, then I and a couple of others will move ahead.

AIRMAIL

Incidentally, I was a crew chief with the 562d TFS/23d TFW at McConnell AFB, Kan., from 1969–73, which is where I got my enthusiasm for all things F-105.

Fred Hall
1615 Calvert
Lincoln, Neb. 68502

Roll Call

I am trying to locate or contact any of my fellow former flight crew. We flew with the Fifteenth Air Force, 449th Bomb Group, 716th Bomb Squadron, out of Italy. I was flight engineer.

Crew members included Lt. Donald Beck, Lt. Robert Homill, Alvin Accobee, Captain Webb, Harold Wedell, Fred Stella, Carlos Wilton, and Waldo Cain.

Varia B. King
3703 Woodbury Rd.
Murfreesboro, Tenn. 37130
Phone: (615) 896-4090

I am searching for information on the following deceased USAAF pilot: Lt. Dean F. Burnett, serial number 0 727 399. He served with 7th Fighter Squadron, 49th Fighter Group, and was killed in action on November 26, 1942, in New Guinea.

Lieutenant Burnett had been assigned previously to the 44th Fighter Squadron, 18th Fighter Group. He was stationed somewhere in the South Pacific, possibly on Guadalcanal. His mother received letters of condolence from two officers of the 7th Fighter Squadron—Capt. William P. Martin and Lt. Franklin A. Nichols.

Anyone having any information about this officer should contact me at the address below.

Russell C. Heater
6707 Edsal Rd.
Springfield, Va. 22151

I am trying to locate the following aircrew members: James J. O'Connor, Robert L. Taylor, Charles L. Moeser, William R. Gricher, and John Hancock.

These men served with the 307th Bomb Group, Thirteenth Air Force. We will be holding a reunion at the Red Carpet Inn in Milwaukee, Wis., on May 16–18, 1986.

Everett M. Anderson
6515 60th Ave.
Kenosha, Wis. 53142

I am a former member of the US Eighth Air Force and am seeking information about any survivors of the crew of a B-24 that crashed and burned on the return from a mission to Frankfurt, Germany, on March 16, 1944.

Lt. John Scarborough was the pilot, and the bombardier was Lt. David Edmonds of Whitemarsh, Pa.

Any information about the survivors of this crash or those who lost their lives in it would be greatly appreciated.

Please contact me at the address below.

Forrest S. Clark
220 Fairmont Ave.
South Plainfield, N. J.
07080

A former Women's Royal Air Force colleague is attempting to locate two friends who served in USAF and whom she knew in England.

Phyllis Wilson is looking for a Mrs. Pat Inglis, the wife of a USAF colonel, who was in the hospital with Phyllis at Nocton Hall, Lincolnshire, during the Christmas of 1953. Also, she is looking for Bud Fletcher, who knew her late sister, Barbara Wilson, also of the WRAF.

These persons or anyone knowing where they can be contacted are asked to write or call me at the address or telephone number given below.

Jean D. Conway
3609 E. 32d St., Apt. 3
Tulsa, Okla. 74135
Phone: (918) 747-5257

I would appreciate hearing from anyone who can give me information concerning my brother, 2d Lt. Elbert S. Wood, who died on October 14, 1943, while on Mission 115 to Schweinfurt, Germany. He was the sole casualty on a B-17 that was piloted by George C. Bettinger of the 306th Bomb Group, 369th Bomb Squadron.

Other crew members included Abraham Block, Leland A. Dowden, Samuel F. Gerking, Gordon F. Lewis, Donald E. Williams, James F. Montana, Elmer W. Mills, and Linden K. Voight.

Please contact me at the address below.

W. Raymond Wood
1801 Ridgemont
Columbia, Mo. 65203

I am attempting to locate two friends with whom I was stationed at Bitburg AB, Germany, from 1976–79.

I would like to get in touch with MSgt. Frank Mahron. Also, I am looking for TSgt. Gary Smokov, who

worked at the message center. Both were in Alaska when I last heard from them.

If you know the whereabouts of these two men, please contact me at the address below.

Tom Remillard
741 Agate St.
San Diego, Calif.
92109-1040
Phone: (619) 274-7388

Anyone knowing the whereabouts of Rex Benjamin—fearless B-26 radar bombardier-navigator who flew in Korea in 1951—should contact me at the address below. Rex served in the 731st Bomb Squadron.

The 452d Bomb Wing is having its thirty-fifth anniversary reunion on August 10, 1985, at the Rocker Club at Los Alamitos Naval Air Station in California. I hope to see Rex and all the 452d/731st "Night Tigers" there.

Col. Bill Schlosser,
USAF (Ret.)
P. O. Box 1807
Rancho Santa Fe, Calif.
92067
Phone: (619) 756-4529

I would be delighted to hear from anyone who flew on the crew of *Satan's Lady,* a B-17F, during May to September 1945. She was assigned to the 306th Bomb Group, 369th Bomb Squadron, at Thurleigh in England.

Crew last names are Smith, O'Hara, Palumbo, Systma, DeHart, McCue, McCall, and Pinney. As a crew, we flew thirty-four missions, the last one on September 5, 1945.

Earl Saunders
13452 Gable Hill Dr.
Sun City West, Ariz. 85375

Help! I am trying to locate the following person for purposes of communication and a reunion.

He is Benjamin T. Rich, the "Pistol Packin' Mama" from Mt. Airy, Ga. We served together in 1943 and 1944 at MacDill Field and in England and France. We were corporals in the armament sections of B-26 outfits.

When I heard last from Ben, he was a technical or master sergeant stationed at Eglin AFB, Fla.

John E. Field
33 S. 69th E. Ave.
Tulsa, Okla. 74112

The 78th Fighter Squadron is looking for all veterans of the unit during World War II. We would like to compile all the addresses of former members from that era.

Persons knowing of deceased members are requested to forward such information as well.

Please write to the address below.

Col. James B. Tapp,
USAF (Ret.)
4210 Constellation Rd.
Lompoc, Calif. 93436

I am trying to locate or contact Maj. Marvin F. Rich, USAF. He was the base operations officer at Shemya AFB in the Aleutians when we were based there in 1962.

Anyone having any information about Major Rich is asked to contact me at the address below.

Frank A. Faist
10811 N.E. Sacramento St.
Portland, Ore. 97220

I would like to hear from members of the "Dirty Thirty," Detachment 2, 55th Weather Reconnaissance Squadron at Hickam AFB, Hawaii.

Among those names I remember are Pettinato, Huber, Begeny, Pittman, Sinclair, Levelee, Linehan, Bohannon, Brewster, and Harmon.

Please contact me at the address below.

Maj. Don R. Ferriolo,
USAF (Ret.)
7087 Tuckaway St.
San Diego, Calif. 92119
Phone: (619) 460-7100

Collectors' Corner

I collect models, pictures, information, and books and magazines on modern military aircraft. I would like to receive donations of any of the items listed above. It would be greatly appreciated.

Please contact me at the address below.

Robert Quintero
2516 Hillside Dr.
Logansport, Ind. 46947

I buy, sell, and trade aircraft models—old or new, built or unbuilt. I can also make models to your specifications. I have a large collection and am very good at model construction.

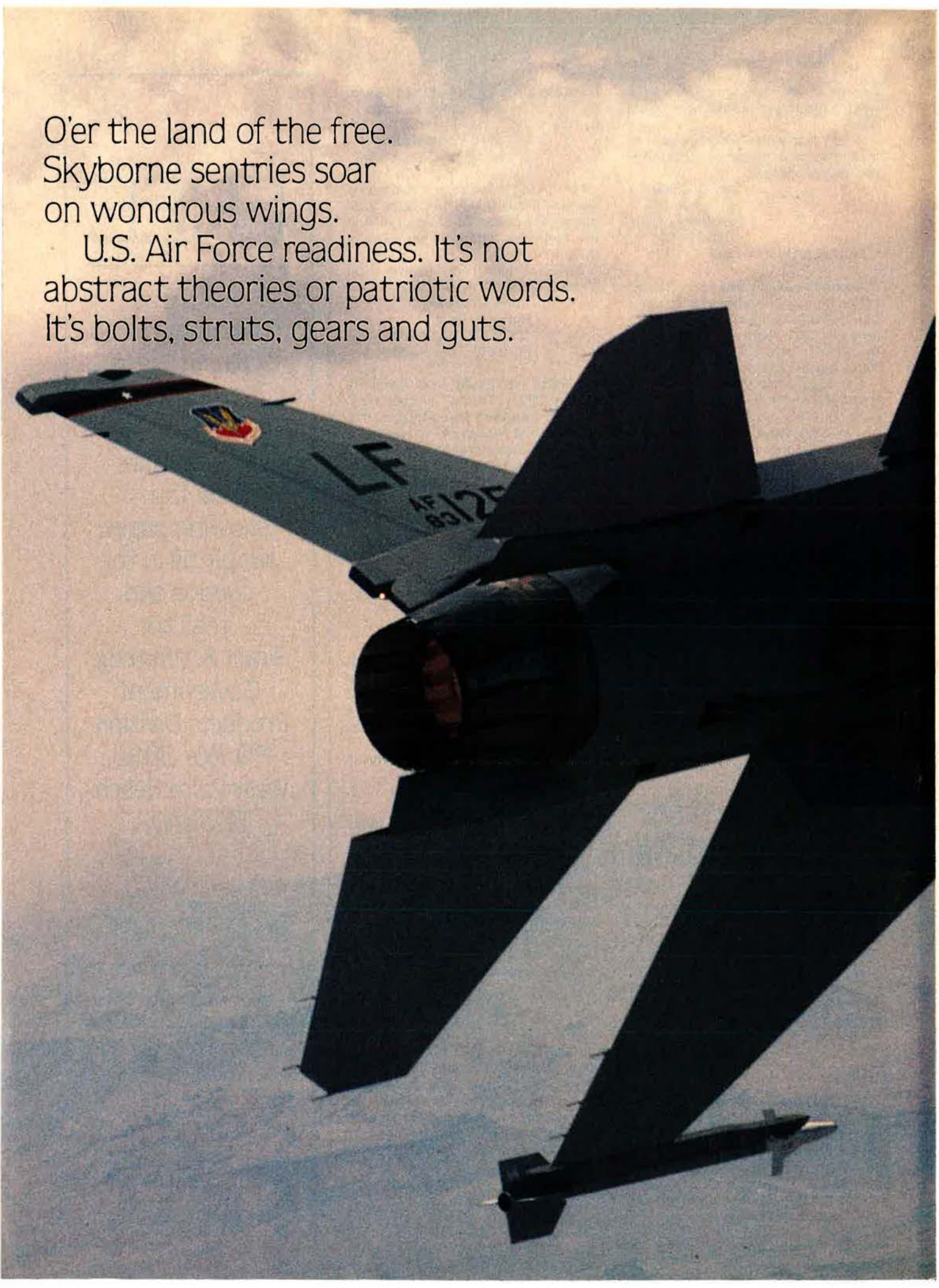
If you are interested in buying, selling, or trading aircraft models, please contact me at the address below.

Joe Percivalle
75 Sycamore
Cabot, Ariz. 72023

I am a collector of US military patches and unit crests. I am also trying to obtain brief histories of each unit, if possible.

It would be greatly appreciated if any readers could send me any of the above items. Please contact me at the address below.

Barry Couser
Box 64
Webster, Pa. 15087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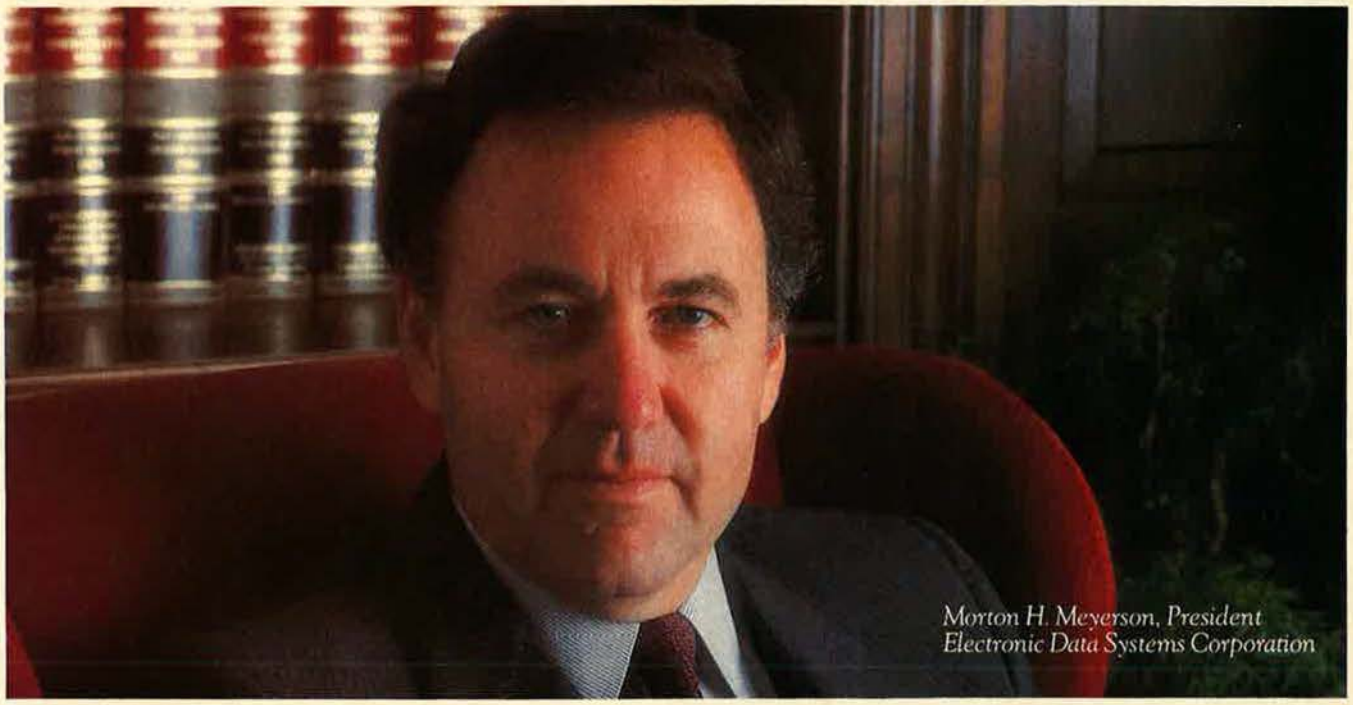

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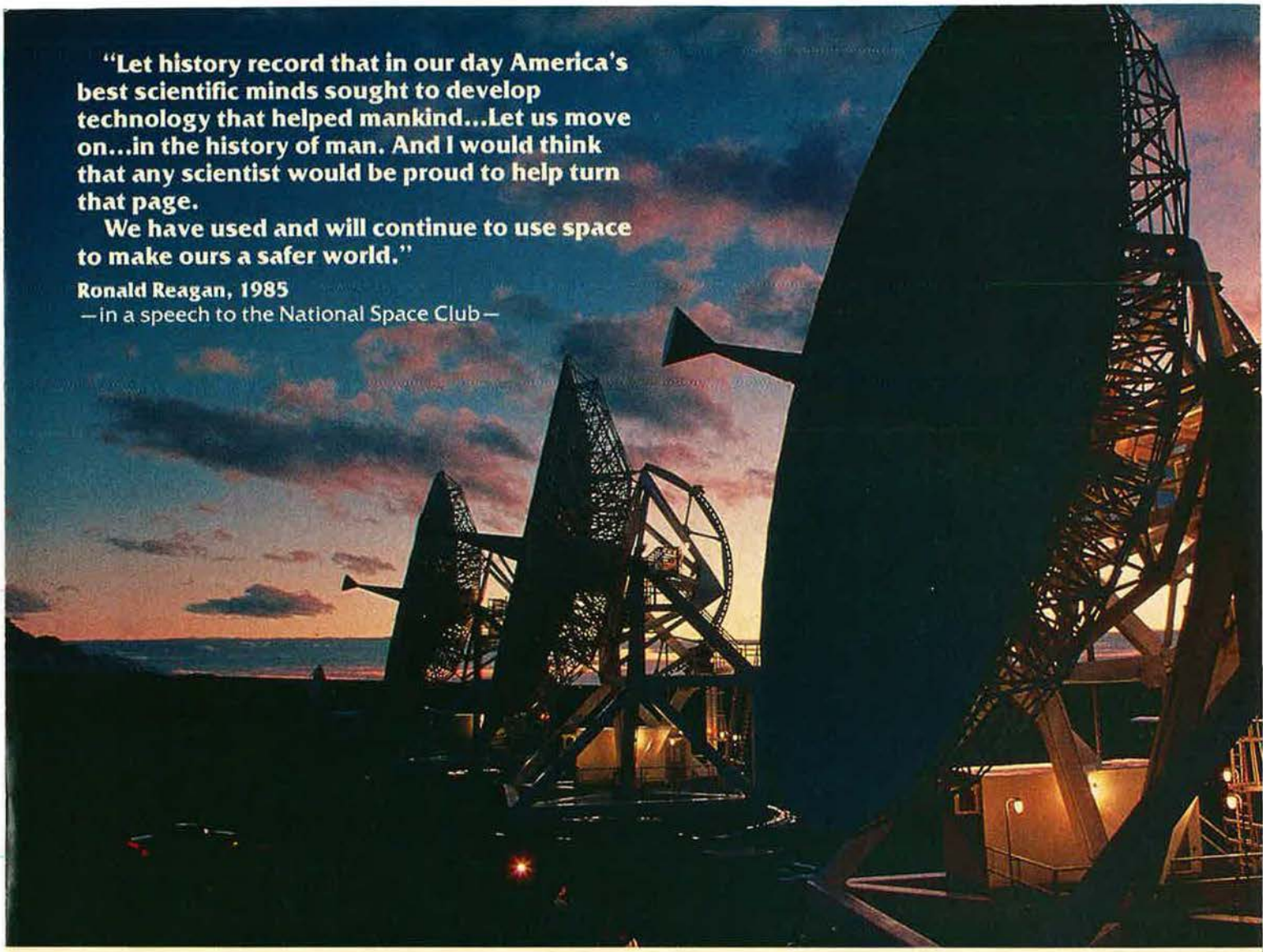

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y taking words apart
piece by piece, Gutenberg
found a whole new way to
put them together.
or centuries scribes had to hand-letter words slowly, stroke by stroke,
until a page could finally be completed.
Then about 1450 an ingenious craftsman named Johannes Gutenberg was
struck by a simple, yet profound idea.
Each individual letter of the alphabet could be cast in metal. The letters
then could be arranged into words, sentences and paragraphs.
Now pages of writing could be reproduced faster than any scribe had
ever imagined.
Gutenberg had the vision to take the metalworking technology of his
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them for unique new applications.
It's challenging work. But at IBM Federal Systems Division it's what
we thrive on. Maybe that's why the more
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make it happen.
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IN FOCUS...

In Prospect: 'Forecast II'

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

Twenty years ago, Project Forecast was a USAF success story. Now the Commander of AFSC has been authorized to undertake a similar study, looking ten to twenty years into the future.

Washington, D. C., August 5

The Air Force has decided to repeat a success story of more than twenty years ago—Project Forecast. Air Force Secretary Verne Orr and USAF Chief of Staff Gen. Charles Gabriel have authorized Gen. Lawrence A. Skantze, Commander of Air Force Systems Command, to start "Forecast II." General Skantze expects that the project will result in an interim report by November of this year and to be completed by about February 1986.

The original Project Forecast, launched in 1963 at the direction of then-Secretary of the Air Force Eugene Zuckert, was completed in 1964. The project brought together large numbers of experts from the Air Force, the Federal Contract Research Centers (FCRCs), and industry who projected out, over a ten- to twenty-year period, potential technological breakthrough areas and the cost associated with translating them into operational reality. Forecast I spawned a host of successful programs and technologies, including AMSA (the Advanced Manned Strategic Aircraft, which became the B-1B), large transports and turbofan engines that led to such aircraft as the C-5, Boeing 747, and DC-10, and advanced composite materials that opened the door to Stealth (low-observable) technology, among many others.

Forecast II will, in general, use the approaches pioneered by its namesake. As General Skantze put it, "The purpose is to take a group of bright people from the technical and the operational requirements sides of the business and set them aside to think about what kind of [technological] leverages we can and should get." Two basic factors make the prospects of Forecast II particularly exciting and promising, according to General Skantze.

One is that when the President commits the nation to such undertakings as putting man on the moon or the Strategic Defense Initiative, "the process really moves" and new technologies are spawned. From the Air Force's point of view, "we need to look at this technology to see what this could yield in terms of combat capability that we will be concerned about," according to General Skantze.

The second circumstance that helps make the timing of the project fortuitous is the pending formation of a Unified Space Command. This will, "in effect, [result] in a CINC Space who will in fact become the advocate for space systems and get into the arguments of tradeoffs—say [the merits and consequences of procuring] a space-based radar vs. another fighter wing." These types of tradeoff issues can be expected to peak in the next decade.

Now is the time, General Skantze said, to look at candidate technologies to "see where they are going and to decide where the payoffs are and what to push." In the past, he points out, the Air Force lacked a high-profile, high-leverage space systems advocate and relied mainly on a branch of AFSC, the Space Division, to defend space-hardware requirements against competition from other Air Force acquisition priorities.

The team of AFSC experts assigned to Forecast II on a more or less permanent basis is headed by Vice Commander Lt. Gen. William E. Thurman and project codirectors Brig. Gen. Charles Stebbins, Deputy Chief of Staff for Science and Technology, and Brig. Gen. Eric B. Nelson, Deputy Chief of Staff for Plans and Programs. This group will work closely with senior aerospace personnel involved in advanced technology work, according to General Skantze. Forecast II, the Air Force believes, has the potential to rival its forerunner by serving as a prescient, long-term national roadmap in such fields as propulsion, structures, and electronics.

SALT Compliance to Affect NATO INFs?

The Administration's recent decision to continue US compliance with the terms of SALT II on a temporary, conditional basis may have major and, in general, unforeseen impact on NATO's intermediate-range nuclear forces (INFs). The Alliance's triad of deterrent capabilities consists of three fundamental elements—the US strategic nuclear deterrent forces, a variety of INFs, and the conventional forces. A key component of the INFs involves some 400 warheads carried by the US Navy's Poseidon SSBNs. These warheads are carried by about forty-eight SLBMs and represent roughly the aggregate throw-weight of three Poseidon SSBNs.

This warhead total is officially and permanently "dedicated" to the Supreme Allied Commander Europe (SACEUR), even though these NATO warheads and SLBMs—the latter mainly of the C-4 type—are carried on an intermixed and changing basis by an unspecified number of the thirty-one remaining Poseidons. If the Administration decides to comply with SALT II beyond the end of this year—when the accord that the US never ratified would have expired—the US will eventually have to dismantle ten of the remaining Poseidon SSBNs as other new systems—the B-52s converted to carry air-launched cruise missiles (ALCMs)—start to butt up against the SALT II ceilings.

While it is theoretically possible that the US would choose to cut back the number of Poseidon-based SLBMs dedicated to the US strategic deterrence capability—the SIOP (for single integrated operational plan) forces—this is not likely. Neither Congress nor the Joint Chiefs of Staff would probably be amenable to such a cutback in SIOP forces at a time

when Soviet offensive strategic capabilities are increasing rapidly and the nuclear balance is tilting more and more in Moscow's favor.

The major function—although not the only one—assigned to the SACEUR-dedicated 400-plus Poseidon warheads is to cover the growing number of Soviet SS-20s, the three-warhead intermediate-range ballistic missiles. The SS-20s and their mobile launchers are "soft" and, hence, suitable targets for the Poseidon warheads, which lack clear-cut hard target kill capability because of inadequate accuracy. The most likely and suitable substitute for the Poseidon warheads—if these boats are to be sacrificed to SALT II compliance—is an expanded force of US ground-launched cruise missiles (GLCMs) and Pershing IIs stationed in NATO Europe.

A one-for-one substitution of single-warhead GLCMs and Pershing IIs for each of the 400-plus Poseidon warheads probably would not give an equivalent deterrence effect; the Poseidon warheads are dispersed on a number of relatively survivable SSBNs and thus would probably have to be replaced on a two-for-one or better basis in order to yield the same operational deterrence leverage.

Considering the traumatic effect in political terms of NATO's commitment to the deployment of 572 of these weapons in NATO Europe—and the virulent Soviet response that it triggered—the consequences of increasing the GLCM and Pershing II forces might well be political tremors sufficiently severe to break up the Alliance. A bitter irony attends the just-discovered dilemma: Representatives of the European NATO member states meeting with Secretary of State George Shultz in June of this year came down squarely in favor of continued US compliance with the terms of SALT II. They were not aware of the possibility that their recommendation could sharply increase the deployment of the politically unpopular GLCMs and Pershing IIs on their sovereign territory. While it might be theoretically possible to offset cutbacks in SACEUR-dedicated SLBMs with SLCMs—sea-launched cruise missiles—this would be a poor bargain; the Soviets already are doing this.

Unified Space Command to Manage SDI Forces

While it won't be known for some time to come what military capabilities—if any—will be derived from the Strategic Defense Initiative (SDI, or "Star Wars") program, the Administration decided recently to put the future Unified Space Command in charge of whatever forces might be deployed as a result of this R&D program.

A Unified Space Command is to be formed on October 1, 1985, in line with a White House directive. Assigning all future SDI-derived forces to the new command—even though hardly more than a political gesture this early in the life of the SDI research and development program—underscores the importance of the Unified Space Command from the outset. (The Unified Space Command was caught up initially in interservice wrangling over what operational forces should—or should not—be assigned to the command and over whether it should be headed on a rotational basis by senior officers from all the services or be led always by an Air Force four-star general officer and deputies from the other services. These questions appear to have been settled recently.)

Meanwhile, Gen. B. L. Davis, just prior to relinquishing command over SAC, told an AFA symposium that while the Strategic Air Command should participate "in the evolution" of the SDI program and whatever forces might result from it, strategic defensive forces are properly in the bailiwick of the new Unified Space Command or, in the case of defenses against air-breathing strategic forces, the Aerospace Defense Command. SAC, he stressed, "is in the offensive business, and I can't foresee that over the next fifty years we will phase out all offensive forces."

Asserting that SAC supports the concepts associated with SDI, he pointed out, however, that the US has historically been less than steadfast in its commitment to strategic defenses. He cited specifically the dismantling in 1959 and 1960 of "a perfectly good system against bombers" and, later on, the scuttling of the Safeguard ABM system at Grand Forks, N. D., even though the ABM Treaty of 1972 permitted the deployment of such a localized and numerically circumscribed system.

At the same AFA symposium, Brig. Gen. Robert R. Rankine, Jr., USAF's key liaison officer with the SDI organization, aired significant and novel political nuances associated with the SDI program: SDI does not "represent a shift from the basic deterrent strategy of the US, but [rather seeks] new means for enhancing deterrence." That policy of deterrence has not changed in its fundamentals as a result of the US commitment to SDI, he stressed, but "shifts in the basis for deterrence" have been necessitated because of the increasing lethality of the USSR's and this country's ICBM forces in relation to one another. As a result, "defenses against ballistic missiles have the potential of increasing substantially the uncertainties in the success of nuclear attack by an enemy, thoroughly confounding his targeting strategy and thus significantly reducing or eliminating the utility of preventive attack." He emphasized that "the defensive system need not be perfect to accomplish this objective, but must meet three important criteria:

"First, it must be effective against the offensive systems and countermeasures that exist or could be deployed.

"Second, it must be sufficiently survivable so that it would not encourage an attack on the system itself by either enemy defensive or offensive systems. If it were not survivable, then it might invite a defense suppression attack as a prelude to an offensive attack, thereby decreasing, rather than increasing, crisis stability.

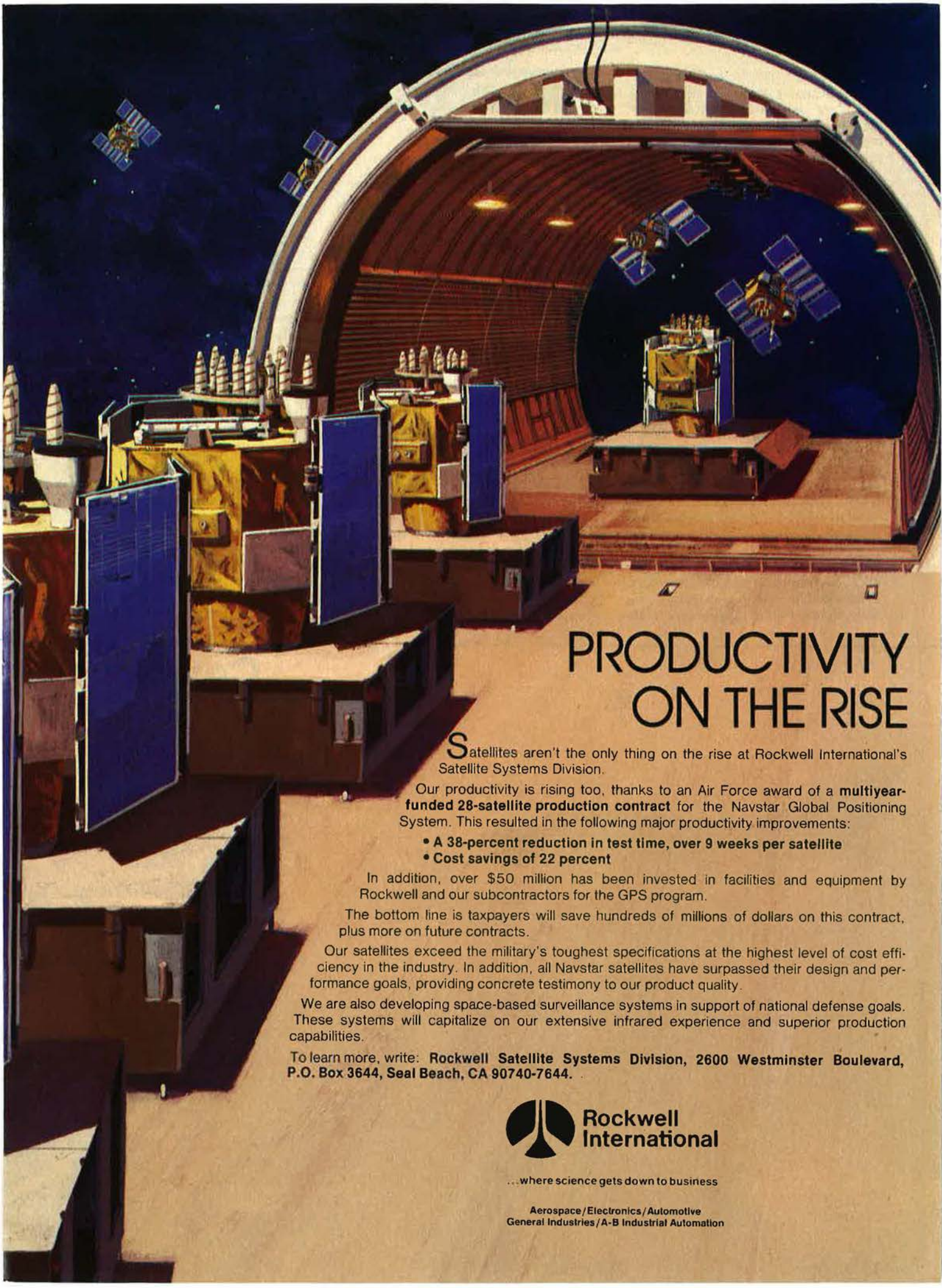
"Third, the effectiveness of defenses must [be such that the defensive weapons can] be preserved at lower cost than any offensive proliferation or countermeasure attempts to overcome them. If that were not the case, the existence of defenses would encourage, rather than discourage, proliferation.

"Providing for cost-effective and survivable defense is the key challenge to the SDI technology program and [underscores] the need for research before an informed decision to begin system development is possible."

General Rankine reported that the Air Force is undertaking a comprehensive examination of the work in progress or planned within the SDI program, with an eye on using its products and concepts in other appropriate areas, "military and commercial."

Commission Named on Defense Management

The White House, on July 15, 1985, established a "Blue Ribbon Commission on Defense Management" to carry out a sweeping review of what is right and what is wrong with how the Department of Defense does business, internally as well as with its contractors and Congress. Headed by



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David Packard, a highly regarded captain of industry and a former Deputy Secretary of Defense, the Commission includes fourteen permanent members experienced in high-level management. The panel's mandate is to take a critical, year-long look at ways to improve the defense acquisition management process and the organization of the Department.

The Commission's first order of business is to analyze and critique DoD procedures and activities associated with the procurement of military equipment and materiel. This report is due at the White House by December 31, 1985. An interim report, encompassing the balance of the issues to be reviewed by the Commission, is to be submitted not later than March 31, 1986. The panel's final report is to go to the President by June 30 of next year.

The Air Force's position on the newly formed panel, known informally as the Packard Commission, came across loud and clear in this comment by AFSC Commander Gen. Lawrence A. Skantze: "The Blue Ribbon Commission . . . is an idea whose time has come." He added, "The panel could offer hope of sanity. We need a coherent approach to buying weapon systems. Piecemeal laws just cost too much. For immediate purposes, a moratorium on procurement legislation would help."

IN FOCUS...

Congress has the opportunity to backstop the work of the Packard Commission by such measures as adopting a two-year budget. Reviewing annually about 2,000 procurement programs and more than a thousand research and development efforts in detail is time-consuming and wasteful and invites unnecessary changes and program instability, the AFSC Commander stressed. Saying that the recent avalanche of proposed and enacted laws meant to cure a few isolated problems "can make your eyes water," the head of the Air Force Systems Command pointed out that, on the procurement side alone, sixty-four congressional committees and subcommittees grind out thousands of laws that DoD and the services, in turn, transform into "more thousands of pages of regulations. The cost of implementation is staggering, and so is the work load of the average program manager."

Two of the specific tasks assigned the Packard Commission by the White House include studies and recommendations "concerning congressional oversight and investigative procedures relating to the Department of Defense [as well as recommendations on] how to improve the effectiveness and stability of resource allocations for defense, including the legislative process." The Commission's central job is to probe the "budget process, the procurement system, legislative oversight, and the organizational and operational arrangements—both formal and informal—among the Office of the Secretary of Defense, the Organization of the Joint Chiefs of Staff, the Unified and Specified Command system, the military departments, and Congress."

The President's Executive Order translated these broad charges into specific instructions, some of which might prove seminal in revamping the way the national security job is done. Included here is the admonition to "consider the value and continued role of intervening layers of command on the direction and control of military forces in peace and war." Equally blunt is the charge to "review the ade-

Combat: the

quacy of the current authority and control of the Secretary of Defense in the oversight of the military departments and the efficiency of the decision-making apparatus of the Office of the Secretary of Defense." The Commission is to take similar no-holds-barred looks at how the Organization of the Joint Chiefs of Staff does its job as well as at the "adequacy of the defense industrial base."

Administration Committed to 100 MXs

A recently enacted National Security Directive (NSDD) reaffirmed the President's determination to insist on the deployment of a full complement of 100 MX Peacekeepers. The NSDD, congressional sources point out, instructs the Defense Department either to recommend by January 1986 a specific survivable basing mode or to outline by that date demonstration efforts that will point the way to a survivable deployment for the second fifty Peacekeeper ICBMs. The directive also calls for a critical review of the small ICBM program, with the emphasis on operational effectiveness rather than arms-control criteria.

A joint Senate-House conference panel—convened to resolve differences in the FY '86 defense authorization bills drafted by the two chambers—reportedly okayed deployment of only fifty Peacekeeper ICBMs in Minuteman silos rather than 100, as requested by the Administration. But the panel left the door open to basing another fifty missiles in a fashion that would make these weapons more resistant to a Soviet first strike.

Meanwhile, four Republican senators, Pete Wilson of California, Dan Quayle of Indiana, Phil Gramm of Texas, and Jeremiah Denton of Alabama, weighed in heavily in a joint public letter against any concessions on MX as a means for gaining House support for the Strategic Defense Initiative (SDI) or the small ICBM (SICBM, or "Midgetman") program: "The limits imposed by the Senate on MX are, though less crippling than those of the House, so great that its purpose will remain undermined even if the House yields completely to the Senate position."

Recommending categorically against trading up on SICBM for trading down on MX, the four Senators stressed that accelerating the Midgetman program "at this time, with all its apparent defects and unresolved questions of design, cost, and basing [problems], would flatly violate the letter and spirit of the Senate requirement that major study and review of this program [are] mandatory before major acquisition decisions are made." The joint letter asserted that the House must be blocked from issuing a "license to blunder at double-time on the small missile."

Washington Observations

★ Sen. James A. McClure (R-Idaho) recently issued a noteworthy warning, the gist of which is that "the sum of all the Soviet offensive and defensive missile construction activity we see throughout the USSR at factories, test ranges, and deployment bases indicates the Soviet intention to 'break out' of the SALT I ABM Treaty and the SALT II Treaty limiting offensive weapons. This Soviet SALT breakout is a serious threat to American and NATO security. Indeed, it is the most dangerous national security threat we have ever faced."

★ Problems with the complex space target could delay the next test of the F-15-launched ASAT until November. There is the option to conduct such a test earlier by using a "dead" US satellite. That approach, however, would not provide precise information about miss distances if the weapon fails to achieve a direct hit. ■

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CAPITOL HILL

By Brian Green, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., July 30

Authorization Conference Concludes

On July 26, Senate and House conferees tentatively concluded their efforts to resolve differences between the versions of the military authorization bill passed by the two chambers. Final approval of the compromise by the full House and Senate is pending at this writing. The House vote is expected to be very close, reflecting dissatisfaction among some members with the conference compromise on chemical weapons production and the degree to which House conferees acceded to other Senate positions.

The House had earlier approved $124 million for production of chemical weapons, but only on the condition that NATO's North Atlantic Council formally agree to chemical modernization and to deployment on European territory.

The Senate had approved production unconditionally. The conference compromise language authorizes production, but requires that the President consult with US allies before production begins.

Because of the sensitivity of the issue, Chairman of the House Armed Services Committee Rep. Les Aspin (D-Wis.) took the unusual step of insisting that the chemical weapons compromise be submitted separately to the full House for approval. Should the House reject either that compromise or the authorization package as a whole, the conference would have to reconvene to resolve the remaining differences.

Key Compromises

The conference approved a cap of fifty MX missiles to be deployed in existing Minuteman silos. The possibility of deploying more than fifty missiles depends on finding another basing mode that Congress believes will be more survivable. Twelve missiles were approved for construction in FY '86. The House bill had included a permanent deployment cap of forty MX missiles and provided no funding for FY '86 construction. The Senate version had called for a "pause" at fifty missiles that are to be deployed in Minuteman silos, pending further basing studies.

Three tests of the US antisatellite (ASAT) system against targets in space were approved for the remainder of FY '85 and all of FY '86. Three tests had been approved for FY '85, but, for technical reasons, the Air Force has yet to conduct any of them. The Senate bill had authorized three additional tests for FY '86, while the House had voted to ban any further testing unless the Soviets resumed testing of any of their ASAT systems against objects in space.

The sum of $2.75 billion was approved for the Strategic Defense Initiative (SDI), splitting the difference between the Senate's $3 billion and the $2.5 billion approved by the House. The Administration had requested $3.7 billion. House language restricting how the money could be spent was dropped. Distribution of the cuts is now at the discretion of the program director.

Spending on the small ICBM (SICBM, or Midgetman) will increase by $100 million over the Administration request of $624 million. The Senate had fully funded the Administration request. The House had approved a $150 million increase, in spite of Pentagon assertions that additional funding cannot be absorbed at this time.

While the House had approved defense spending of $292.6 billion—a "no-inflation" freeze—the conferees agreed to the Senate figure of $302.5 billion, a freeze that compensates only for the projected cost of inflation. They did so without the guidance of a budget resolution. The effort to reach a compromise on the overall size of the federal budget remains deadlocked in a conference of the House and Senate Budget Committees.

Funding Restored

The House, in its authorization bill, had sought to terminate more than thirty programs that had been funded by the Senate. Funding for most of these was restored in conference, though sometimes at levels far below Administration requests.

The conference reached a compromise on AMRAAM (Advanced Medium-Range Air-to-Air Missile). The panel authorized $101 million for R&D, procurement expenditures of $150 million, and advance procurement of $30 million and permitted $29.4 million of unexpended FY '84 funds to be carried forward to FY '86.

All the procurement money and more than half the R&D money would be "fenced" until Secretary of Defense Caspar Weinberger certifies that the missile meets its specifications and that a fixed-price contract has been negotiated. Total production costs are not to exceed $5.2 billion (in FY '84 dollars) for 17,000 missiles. The conferees agreed to kill the AMRAAM program unless Secretary Weinberger provides this certification by March 1, 1986.

The House had sought termination of the program in FY '86, citing technical complexities and cost overruns. The Senate had authorized $200 million of the original $366.5 million Administration procurement request and fully funded the R&D request.

The Short-Range Attack Missile II (SRAM II), the intended replacement for aging SRAM I missiles carried on B-52s, was another program the House had sought to terminate. The conferees authorized $35 million for SRAM II. The Senate had authorized $64 million of the $79 million sought by the Administration.

The conferees authorized $240 million for the Joint Surveillance and Target Attack Radar System (JSTARS), the level previously approved by the Senate. Funding was, however, transferred from Air Force R&D to a defense agency R&D account. This program is designed to develop an airborne radar capable of long-range detection and designation of moving and stationary ground targets. The House had sought termination of JSTARS, based on House Armed Services Committee arguments that the C-18, the JSTARS platform agreed to by the Army and Air Force, is not survivable and that there are cheaper alternatives. ■

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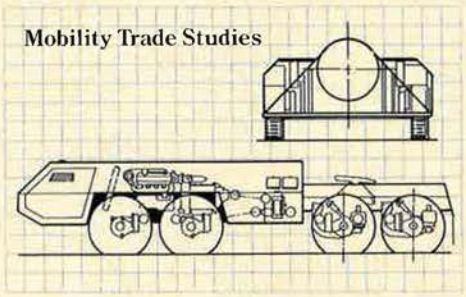
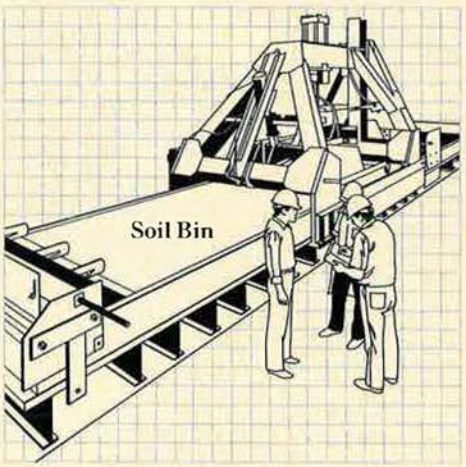
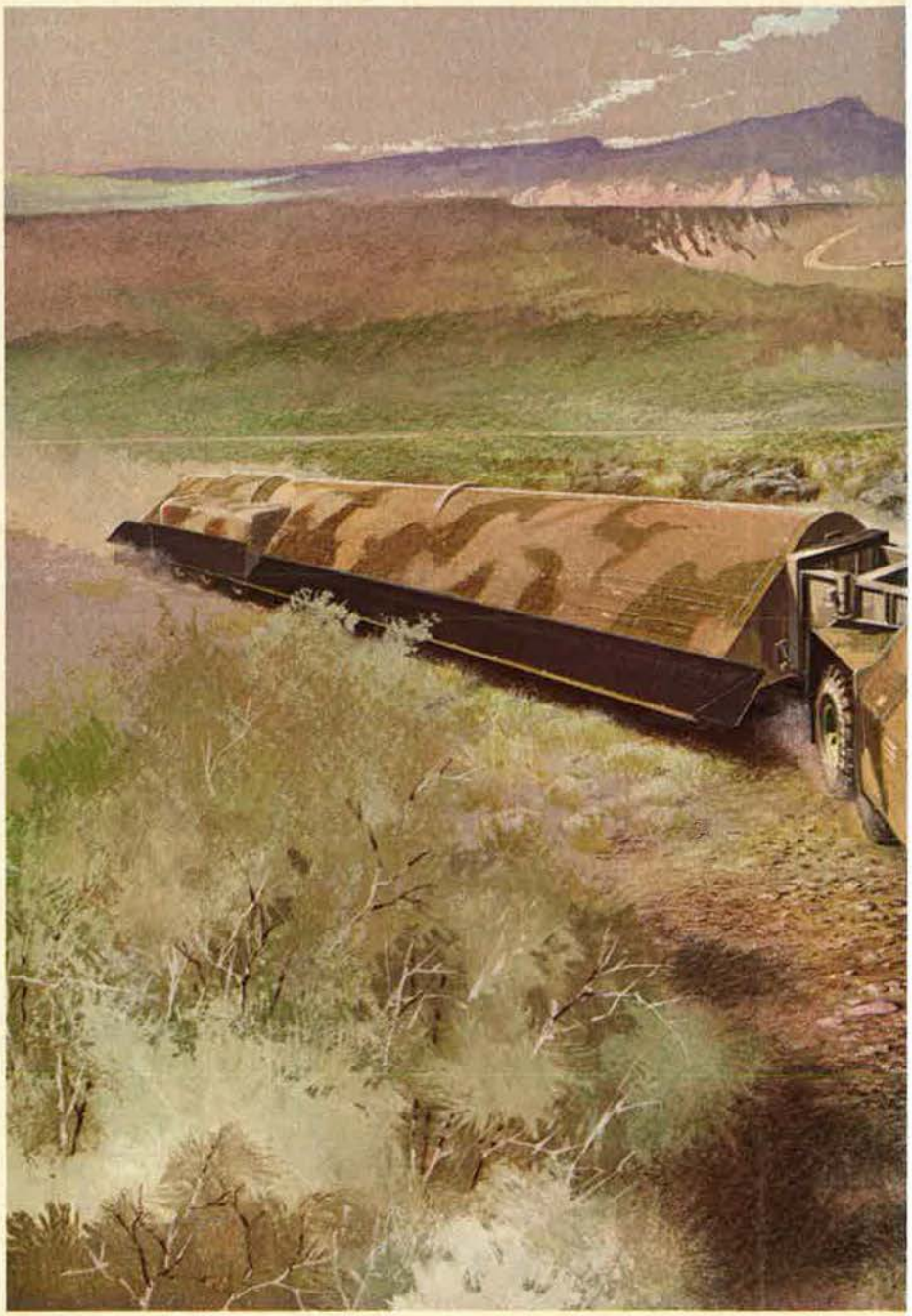


The problem is developing a survivable, practical concept for mobile operations under a variety of conditions. What combination of speed, hardness, and off-road capability will optimize survivability, security, and operational cost while minimizing environmental impact?



How much ground friction will the designs require for survivability? Goodyear and Boeing designed and created unique equipment to test candidate HML configurations on various soils to maximize blast resistance.



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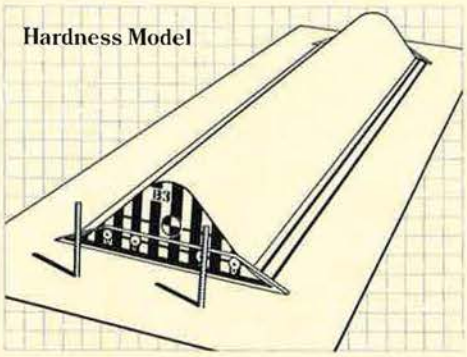
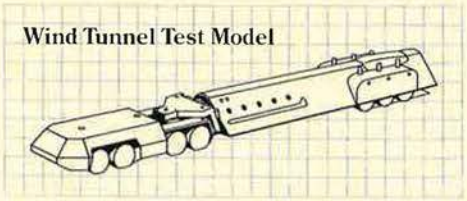
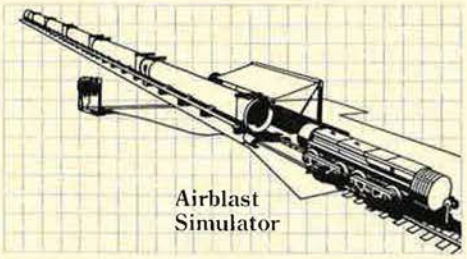


Preliminary concepts and shapes were evaluated during the Direct Course simulated airblast testing last summer.



Test models were evaluated and refined in extensive wind tunnel testing.



Additional scaled test facilities have been created to approximate actual operational conditions and to refine the HML concepts.

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GOODYEAR AEROSPACE

AEROSPACE WORLD
News, Views & Comments

By James P. Coyne, SENIOR EDITOR

Washington, D. C., August 5

★ In the wake of the Walker spy case, Secretary of Defense Caspar W. Weinberger has directed that specific actions be taken to improve the security of classified information. One of the more interesting actions is that the Navy will be required to centralize clearance adjudication. Until now, the Navy, unlike the Army and Air Force, has permitted 3,000 military commanders in separate locations to determine whether or not servicemen or women will receive clearances. The Navy has been directed to establish a centralized authority similar to those of the Army and Air Force.

Other actions include:

• Creation of a commission to review and evaluate DoD security policies and procedures in light of the Walker case. Retired Army Gen. Richard G. Stilwell will head the panel, which will consist of high-level military and civilian representatives from DoD. General Stilwell retired in February as Deputy Under Secretary of Defense for Policy. The commission will identify systemic vulnerabilities or weaknesses and make recommendations to correct them.

• A ten percent reduction in the number of clearances within DoD, to be completed by October 1. There will also be a ten percent reduction in the number of requests for background investigations, which are required before a clearance can be issued, for FY '86. These reductions will be followed by attempts to make even sharper cuts, especially in the number of persons cleared for access to sensitive information and top-secret information. Currently, 4,300,000 military, civilian, and contractor personnel have DoD security clearances.

• Improved classified document control. Ways will be developed to increase the care taken in making judgments on the creation of classified documents and in their handling after they are classified. It is hoped this will result in fewer secret and top-secret documents and a reduction in their dissemination.

• Better controls over individual access to classified information. Supervisors are directed to be more aggressive in restricting access to classified documents. This will include making specific notations in an individual's record regarding the information or activities to which he has access and carrying out an annual review of each employee's continued need for access.

The first Air Force production F-15 to be built under the multistage improvement program (MSIP) flies over the McDonnell Douglas Corp. facilities prior to delivery ceremonies in St. Louis, Mo.

• Continuation of the polygraph test program. The test, included by Congress in the FY '85 Defense Authorization Act, permits DoD to conduct a test of the polygraph by using 3,500 individuals to gather a data base. When the test is completed, its results will be reported publicly. Depending on test results, the polygraph may continue to be used in the future in personnel security review procedures, or its use may be expanded.

• Obtaining legal authority for DoD background investigators to gain access to state and local criminal history records. Some state and local jurisdictions have statutes prohibiting checks of criminal records for other than law-enforcement purposes. In these jurisdictions, DoD might never become aware that a person being proposed for a security clearance may have a criminal involvement record.

In a letter to the Secretaries of the military departments, Chairman of the Joint Chiefs of Staff, and the directors of all defense agencies, Secretary Weinberger noted that the number of personnel security investigations requested in 1984 was up fifty percent over the number of requests in 1975. "This," he said, "has caused great demands on the investigative resources of the Defense Investigative Service, [which] has not kept pace with the burgeoning requests for investigations."

★ The first production F-15 to be built by McDonnell Douglas Corp. under the multistage improvement program (MSIP) was delivered to the Air Force during June 20 ceremonies in St. Louis, Mo. Under contracts from the Air Force totaling $361.1 million so far, the company is adding the improvements to all future F-15s and retrofitting some models already in service.

MSIP F-15s have the following improvements:

• An IBM Federal Systems Division central computer that stores four times more information and processes data three times faster and twenty percent more reliably than the old computer.

• A tactical electronic warfare system that consists of an enhanced Nor-

throp ALQ-135 internal countermeasures system, a Loral ALR-56C radar warning receiver, a Tracor ALE-45 chaff dispenser, and a Magnavox ARC-164 electronic warfare warning system.

• A new programmable armament control set built by Dynamics Control and a cockpit display built by Sperry Corp. for selecting and arming weapons.

A future MSIP improvement will be a new Hughes APG-70 radar with significantly increased data-processing capability and memory capacity. New electronics technology makes the radar thirty-three percent more reliable and will enable F-15 pilots to distinguish airborne targets more easily. The radar has an improved electronic countermeasures capability.

In addition to the greatly improved radar, the MSIP program will eventually include provisions for the advanced medium-range air-to-air missile (AMRAAM), an antisatellite system, and the joint tactical information distribution system (JTIDS).

McDonnell Douglas has produced more than 900 F-15 Eagles. With a loss rate of 3.8 aircraft per 100,000 flying hours, the F-15 is the safest fighter in history.

★ With the help of the Air Force System Command's Electronic Systems Division (ESD) at Hanscom AFB, Mass., the Marine Corps can now turn out battlefield intelligence reports in minutes instead of hours. The first transportable, computerized Marine Intelligence Analysis Center is being used for training at the Naval Systems Weapons Center at Dahlgren, Va.

"The Air Force and Marine Corps joined forces to develop automated processing equipment that can be set up and running within a few hours of delivery," explains Marine Capt. Patrick L. Carey, ESD program manager. "We cut report preparation time by using keyboards and video terminals to enter intelligence information into the computer. This eliminates having to type paper reports and store them in heavy file cabinets. Data retrieval time is reduced to seconds."

In the field, Marines set up at least two of the eight-by-twenty-foot shelters to form an Intelligence Analysis Center. Technicians in the automated data-processing and communications shelter maintain the data bank and monitor the Center's communications equipment. Teletype, digital data link, and voice radio terminals are used to exchange information with other intelligence systems.

In a second shelter, Marine analysts use keyboard video terminals to extract information from the data base about enemy troop strength, weapons, and possible targets. They compose intelligence reports on the screens and send them electronically to the battle commander's headquarters. Up to three analyst shelters can be supported by one data-processing and communications shelter.

A 2,500-pound precision guided GBU-15 is released from an F-4 during weapons-effectiveness tests at Eglin AFB, Fla. Since 1980, the unit cost of the GBU-15 has dropped from $194,000 to $127,000.

"The Intelligence Analysis Center, with its computerized data bank, is like a library," explains Captain Carey. "It contains all we know about the enemy and is constantly updated."

The Center is also the heart of a larger, transportable Marine Air-Ground Intelligence System—MAGIS for short. This has shelterized units that develop and analyze aerial photography. Another MAGIS segment processes electronic intelligence information gathered by aircraft specially equipped to locate enemy radars and radio communications jammers. All MAGIS equipment is packed inside shelters that can be towed or transported by ship, aircraft, or train.

USAF is supplying the Marines with five more Intelligence Analysis Centers under a $23,667,000 contract awarded to the American Development Corp., North Charleston, S. C.

★ The GBU-15 precision guided weapon, which officially entered USAF's operational inventory last summer, has become a prime example of how the cost of a weapon system can be reduced over its production life. The unit cost of a GBU-15 in 1980 was $194,000; this year, it is $127,000.

In 1983, production line improvements by the contractor, Rockwell International Corp.'s Missile Systems Division, reduced assembly hours more than fifty-seven percent. In the same year, use of the "should-cost" technique resulted in a $20 million reduction in cost in FYs '84 and '85. "Should-cost" involves cost analyses at the contractor's plant that identify

Milton Caniff and His Offspring

Fifty-one years ago, artist Milton Caniff sent Terry Lee—then little more than a lad in knee pants—to China in search of treasure. The ensuing encounter with river pirates was thrilling stuff, and *Terry and the Pirates* became a classic of the comics page.

Millions, however, know Terry best as the all-American airman he became in World War II. And perhaps none of the wartime *Terry* strips is more fondly remembered than the one that appears as a guest editorial this month *(see p. 4)*. It says so many things so well that the text of it was once read into the *Congressional Record*, and it seemed fitting that it should lead off this issue, which recalls the heritage of the Army Air Forces.

In 1947—the same year the Air Force became a separate service—Caniff began a new strip, *Steve Canyon*, and in due time that intrepid aviator was also flying for the US Air Force. The strip is still running. For those whose local newspapers don't carry it—or for those who want to read it all again from the beginning—there's Milton Caniff's *Steve Canyon* Magazine, published by Kitchen Sink Press, No. 2 Swamp Rd., Princeton, Wis. 54968. The current issue has the daily and Sunday strips from February 19 to June 7, 1950.

specific inefficient and uneconomical practices in management or operations and that establish valid price levels. Data produced by the analyses is used to obtain lower acquisition costs during contract negotiations.

As costs have gone down, the weapon's reliability has been maintained, as proven by reliability demonstration assurance tests. As a result, weapon system integration tests have been reduced from one out of eleven units to one out of forty-eight units.

The GBU-15 is a 2,500-pound precision guided weapon used for interdiction of high-value targets and for defense suppression. It provides an extended standoff capability and reduced launcher aircraft exposure to enemy defensive fire. The weapon is TV-guided. The pilot has the option of locking it onto the target for automatic guidance or of guiding it manually to the target.

It is controlled by an AXQ-14 data link, which utilizes electronics carried in the weapon and in a pod mounted on the launching aircraft and a display and control panel in the cockpit. In the future, it will be equipped with an infrared target seeker for night and under the weather employment.

The infrared version is designated AGM-130.

★ The Air Force has taken delivery of the 1,000th F-16 produced by General Dynamics. The F-16C was assigned to the 363d Tactical Fighter Wing at Shaw AFB, S. C.

This was the 831st production F-16 delivered to USAF. The other 169 were delivered to the air forces of Israel, Egypt, Pakistan, and Venezuela. Another 370 F-16s have been coproduced on two assembly lines in Europe for the air forces of Belgium, Denmark, the Netherlands, and Norway, using major components produced by General Dynamics. In addition to the nine nations now flying the aircraft, orders have been placed by South Korea, Turkey, Greece, Singapore, and Thailand. The US Navy recently ordered the F-16 as one of its new adversary flight crew training aircraft—the Navy also uses the Israeli Kfir (US designation F-21) for this training.

Military pilots have logged more than 750,000 hours in the Fighting Falcon. The USAF worldwide mission capability rate has remained at more than eighty percent, with a record high of 89.4 percent from March 28 to April 3 of this year. Mission capability rate is a statistical measure of how much time an aircraft is available to fly and perform its wartime mission.

AEROSPACE WORLD

★ The Indian Air Force has taken delivery of a squadron of French Mirage 2000 fighters less than a year after the aircraft became operational with the French Air Force. India is the first foreign country to purchase the fighter.

Indian pilots ferried the aircraft

The 1,000th F-16 has been delivered by General Dynamics to the Air Force. The F-16C was assigned to the 363d Tactical Fighter Wing, Shaw AFB, S. C. After more than 750,000 military flying hours, the USAF worldwide mission capability rate has remained at higher than eighty percent.

Culmination of a ten-year construction project, this Wright-B Flyer replica takes off from Huffman Prairie (now part of Wright-Patterson AFB, Ohio) with a crew of retired USN Lt. Cmdr. John H. Warlick, pilot, and retired USAF Gen. Russell E. Dougherty, AFA Executive Director, copilot. The aircraft is owned by Wright-B Flyer, Inc., a nonprofit corporation dedicated to the preservation and reenactment of historic aviation achievements. (Photo by R. W. Maxwell)

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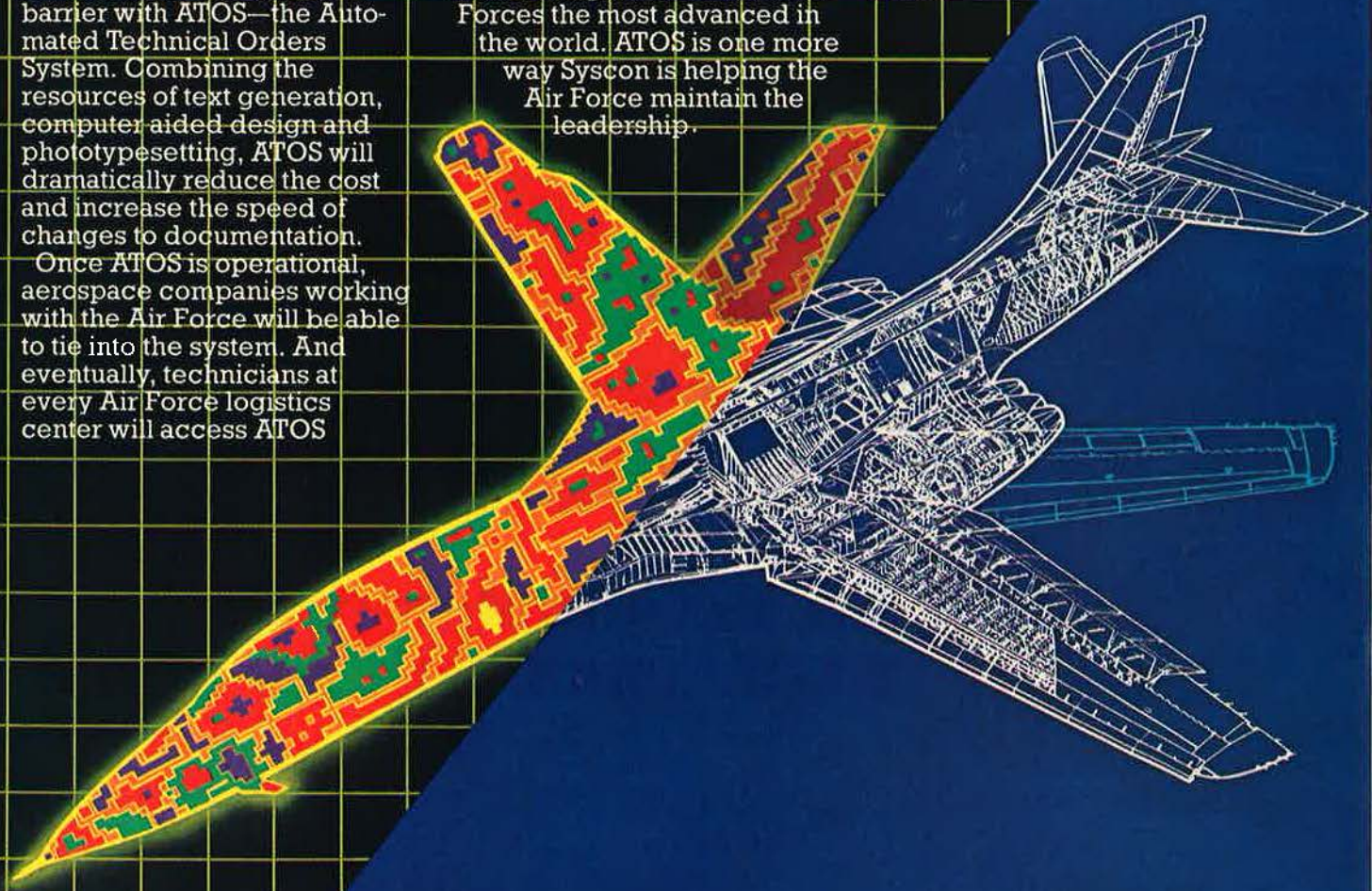

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from Bordeaux-Merignac AB in France to Gwalior, Central India, a distance of 4,300 nautical miles. Pilots and ground crews were trained in France by the French Air Force.

The Indian government has placed a firm order for forty Mirage 2000s, with an option to increase the buy.

★ Fighter aircraft that "jump" into the air without using an inclined ramp during takeoff from short runways are the subject of a $1.3 million USAF contract study by Lockheed-California Co. Lockheed will pay part of the study cost.

The twenty-nine-month program will examine three types of takeoff and landing surface conditions—rough, soft, and short fields, with most of the attention given to short runway takeoffs. "Most modern aircraft can attain the necessary lift for takeoff at reduced speeds if they can achieve the proper angle and have sufficient thrust," says Max Gamon, the program's principal investigator.

To fulfill these conditions, the company is developing a system that would release a charge of high-pressure gas into the landing gear struts, causing an aircraft to "jump" upward. Having been literally thrown into the air, the aircraft could rotate to the proper angle in approximately half the normal takeoff distance. For rough runway takeoffs, a softer landing gear spring and electronically controlled damper is being developed.

The devices will be incorporated in an F-16 main and nose gear. The F-16 gear was chosen because it is in wide use and has characteristics similar to those on other fighters. Landing gear modification and testing will take place at Wright-Patterson AFB, Ohio. The technology transition plan, for incorporation of the gear into an actual aircraft, will conclude in early 1987 and could result in the system being in widespread use by 1990, the company says.

★ A memorandum of understanding has been signed by the United States, Great Britain, and the Federal Republic of Germany to do a feasibility study for coproduction of the Long-Range Standoff Missile (LRSOM). Primary mission of LRSOM will be to attack high-value fixed targets, such as airfields, with high-explosive munitions. Proposed launch aircraft are the B-52, F-15, F-16, and the Tornado.

AFSC's Armament Division at Eglin AFB, Fla., acting as lead agent for the three countries, awarded study contracts to General Dynamics and Boeing Aerospace Co. Working with General Dynamics will be Hunting Aerospace Engineering Ltd. of the United Kingdom and Dornier GmbH of Germany. Boeing will work with British Aerospace and GEC Avionics of the UK and Messerschmitt-Bölkow-Blohm of Germany.

LRSOM will be a low-cost missile designed specifically to meet the theater mission requirement and will use conventional munitions. It will be capable of employing both developmental and existing munitions, dispensers, propulsion, and guidance technologies. NATO standardization and interoperability are primary goals of the program. LRSOM is expected to be in the field by the early 1990s.

AEROSPACE WORLD

★ The Air Force observed the twentieth anniversary of the first Titan IIIC liftoff last summer. Several participants in the original launch participated in a simulated countdown as they viewed film of the historic launch that took place at Cape Canaveral, Fla., on June 18, 1965.

With the Titan IIIC, the nation's space program entered a new era. Never before had such large useful payloads been possible as the new booster system handled. The booster consisted of a complete Titan II plus two strap-on solid-fuel motors providing more than 2,400,000 pounds of thrust. It had a multistart-capability vehicle called Transtage.

The 1965 test launch carried a 21,000-pound dummy satellite made of inert materials and with no scientific payload. Later launches boosted bundles of eight communications satellites into orbit at a time. That is what enabled the US to establish the Defense Satellite Communications System.

The Titan IIIC carried aloft more than eighty Defense Department and NASA satellites. The Titan series of launchers has achieved a ninety-five percent launch success rate.

The last Titan IIIC was launched in March 1982. Its replacement, the Titan 34D, carried the first inertial upper stage. It had a "stretched" main vehicle plus two five-and-a-half-segment solid-rocket motors. It was developed to maintain mission flexibility and lift capability as new and heavier satellites are built.

The 34D can place 4,000-pound payloads into geostationary orbit or 30,000-pound payloads into low-earth orbit. The booster can use Transtage and other vehicles as its upper stages.

The Long-Range Standoff Missile (LRSOM), shown here in an artist's conception, is the subject of a coproduction feasibility study by the US, Great Britain, and West Germany. It will employ conventional munitions.

AEROSPACE WORLD

★ Martin-Baker, the British company that manufactures the ejection seat in Air Force and Navy F-4 Phantoms and the Navy A-6 Intruder, F-14 Tomcat, EA-6B Prowler, and F/A-18 Hornet, has been awarded a Navy contract to develop a new high-technology escape system. Designated the Navy Aircrew Common Ejection Seat (NACES), it will be installed in the McDonnell Douglas F/A-18 Hornet and T-45 Goshawk and in the Grumman F-14D Tomcat and A-6E Intruder.

By utilizing a standard ejection seat for all these aircraft that requires the same spare parts and tools, the Navy expects to improve logistic support for the aircraft and greatly reduce life-cycle costs. The contract includes initial production options for 734 ejection seats. About forty percent of the items in the seat will be manufactured in the US by East-West Industries of New York, Teledyne of California, and BDM Corp. of Virginia. US content will increase to about eighty percent when a second source supplier in the US is selected.

★ Two Minuteman III intercontinental ballistic missiles were launched from Vandenberg AFB, Calif., within two hours of each other, the Air Force has announced. The unarmed missiles landed in the target area in the Kwajalein missile range 4,200 miles away.

The missiles were the 108th and

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the 109th in a series of operational test launches of Minuteman. The launches were the culmination of more than three months of work by task force teams from F. E. Warren AFB, Wyo., and Malmstrom AFB, Mont. The teams stayed with the missiles from their removal from operational status through their transportation to Vandenberg and emplacement in the silos there.

The F. E. Warren missile combat crew launched the first missile at 1:22 a.m. PDT, followed by the Malmstrom AFB crew, which launched the second Minuteman III at 3:15 a.m.

★ Several models of the hard mobile launcher for the small ICBM (SICBM) were subjected to a high-explosive test at White Sands Missile Range, N. M., in a Defense Nuclear Agency test called "Minor Scale."

Engineers detonated a hemisphere containing 4,800 tons of ammonium nitrate and fuel oil to produce a blast effect approximating an eight-kiloton explosion. About 300 separate experiments in addition to the hard mobile launcher model test were sponsored by the US military services, other government agencies, and foreign governments and were subjected to the blast effects of the simulated nuclear explosion.

Two contractor teams—Martin Marietta/Caterpillar and Boeing/Goodyear—have been funded by the Air Force to evaluate competitive hard mobile launcher models. The contracts, which provide for missile handling, missile and component assembly, flight and ground testing, and system analysis functions for the SICBM test program, total $447.6 million, of which $45.6 million has been obligated to date.

During "Minor Scale," both teams obtained blast response data in the eight to fifty psi overpressure range on one-sixth-scale designs.

The three-stage SICBM will be approximately forty-six feet long, weigh 30,000 pounds, and carry a single reentry vehicle to a nominal range of 6,000 nautical miles. It is being designed for possible basing in mobile as well as fixed launchers. Basing decisions will be made in the fall of 1986, with initial deployment scheduled for 1992.

★ The use of large mosaic focal plane detector arrays that can be placed in earth orbit is being analyzed by the Air Force Space Technology Center at Kirtland AFB, N. M., under two contracts totaling $1.9 million that have been awarded to Honeywell's Electro-Optics Div. in Lexington, Mass.

The detector arrays will search vast areas of space for man-made orbiting objects. An array would consist of many sensor packages that could detect an object from the heat generated by that object. Two types of sensors will be used: one that can identify objects between the sensors and the earth and another type that can detect objects far out in space. The difference in backgrounds—the warm earth or the cold backdrop of space—presents different sensing problems.

The detector arrays will be useful in locating satellites and other systems placed into space by other nations.

★ The National Aeronautic Association has selected retired USAF Gen. B. A. Schriever as an Elder Statesman of Aviation for 1984. General Schriever served as Commander of Air Research and Development Command and of its successor, Air Force Systems Command, as well as Commander, Air Force Ballistic Missile Division. He was responsible for development of the US intercontinental ballistic missiles. Under his direction, the Atlas, Titan, and Minuteman ballistic missiles and their supporting systems took shape and formed the intercontinental missile defense shield that continues to protect the country today. He retired from active duty in 1966.

Other Elder Statesmen selected by the NAA for 1984 are Dr. Robert T. Jones, the NASA scientist who pioneered wing sweepback; David D. Thomas, an aviation safety pioneer who was the first presidentially appointed career Federal Aviation Administration deputy administrator; Dr. Richard T. Whitcomb, who developed the "area rule" for designing transonic and supersonic aircraft; and Steve Wittman, well known barnstormer, test pilot, and air racer from Oshkosh, Wis.

★ The General Thomas D. White USAF Space Trophy for 1984 has been awarded to Lt. Gen. Forrest S. McCartney, who has played key roles for

An MBB BO 105 LS helicopter demonstrates its single-engine capability by hovering on one engine above Pike's Peak, in Colorado, the first helicopter to accomplish this feat. After tests in the South American Andes, it has been certified for takeoffs and landings at altitudes up to 20,000 feet.

AEROSPACE WORLD

the Air Force in the Space Shuttle and Strategic Defense Initiative (SDI) programs.

Secretary of the Air Force Verne Orr presented the award at a dinner at the National Geographic Society in Washington, D. C. The trophy is given

The General Thomas D. White USAF Space Trophy for 1984 has been awarded by the National Geographic Society to Lt. Gen. Forrest S. McCartney, Commander, Space Division, AFSC. USAF Secretary Verne Orr (left) makes the presentation.

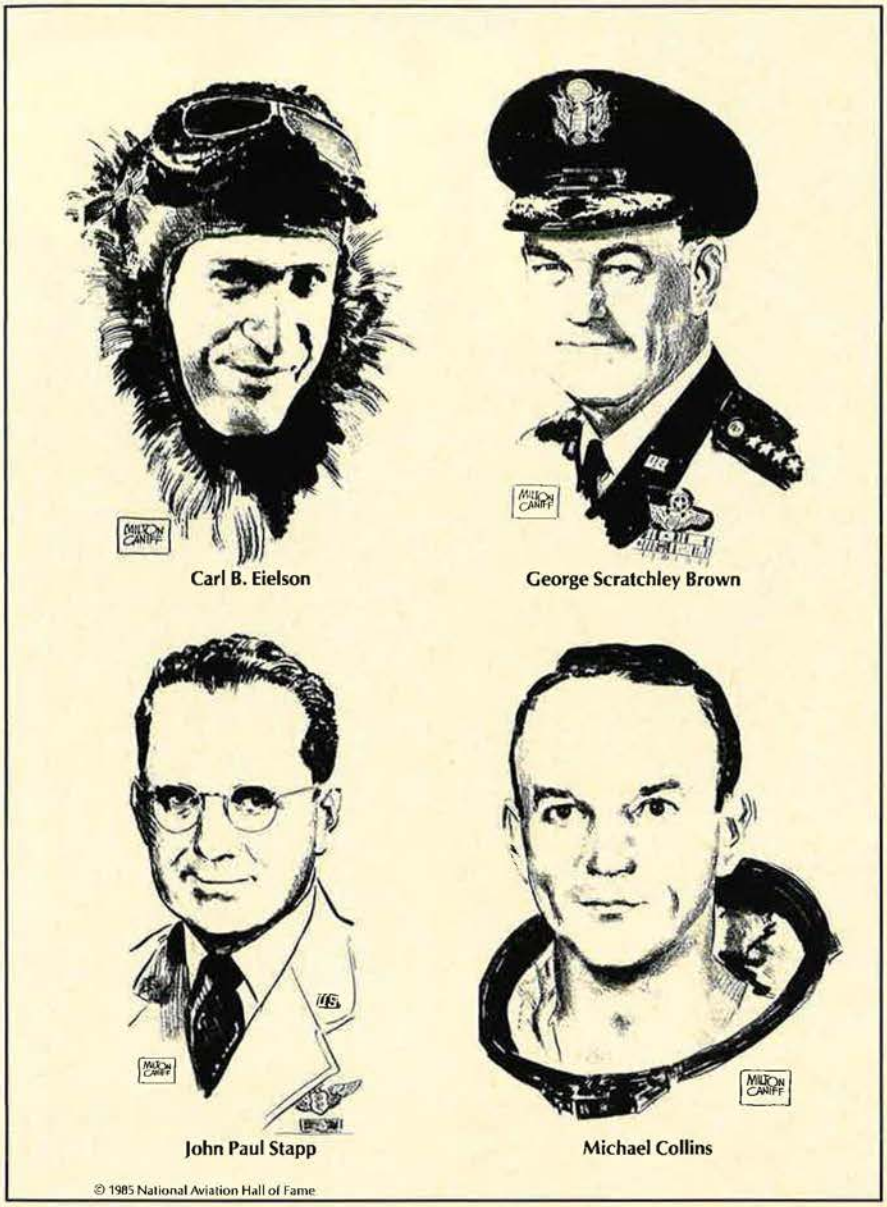
to the military or civilian member of the Air Force who made the most significant contribution to progress in aerospace. It is named in honor of the former USAF Chief of Staff, who died in 1965.

General McCartney is Commander of the Space Division of the Air Force Systems Command. As DoD manager of Space Shuttle operations, he ensured "effective and economical DoD operational support of the Space Shuttle program," according to his award nomination. His division is a lead agency in implementation of the President's SDI.

The trophy was established in 1961 by Dr. Thomas W. McKnew, Advisory Chairman of National Geographic Society's Board of Trustees.

★ Four American military aviation greats were enshrined in the National Aviation Hall of Fame in Dayton, Ohio, on July 20. They are Gen. George S. Brown, Michael Collins, Carl B. Eielson, and Dr. John Paul Stapp.

General Brown had a distinguished combat record as a heavy bombardment pilot and commander in World War II and went on to become Commander of Seventh Air Force at the height of the Southeast Asian conflict, Chief of Staff of the US Air Force, and, finally, Chairman of the Joint Chiefs of Staff.

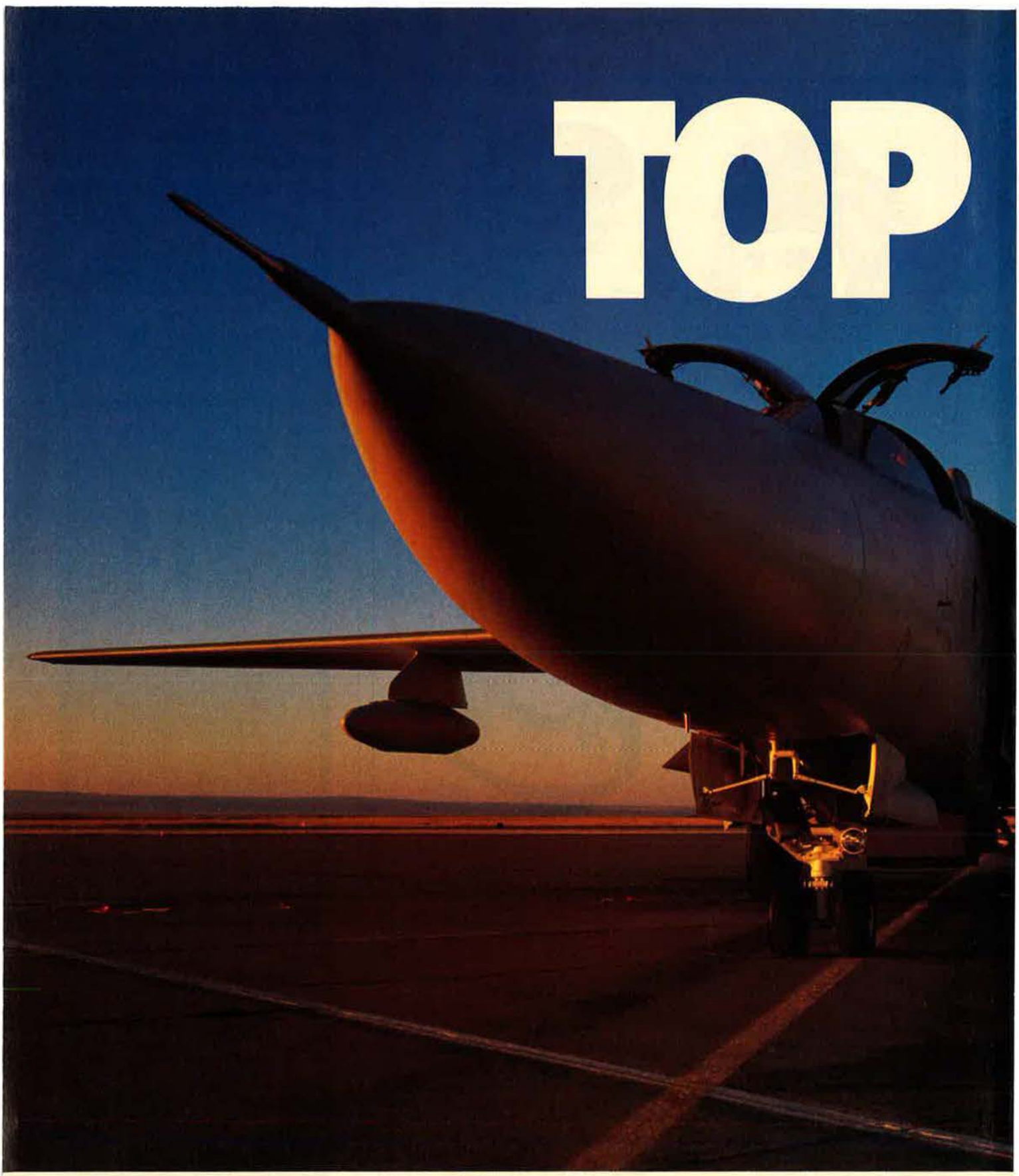


These four American military aviation greats were enshrined in the National Aviation Hall of Fame in Dayton, Ohio, for accomplishments in Arctic flying, military leadership, high-speed survival research, and space exploration. All but Eielson were active-duty USAF members.

Michael Collins was the Command Module Pilot on the Apollo-11 lunar landing mission, which placed the first men on the moon. After leaving active duty, he served as Assistant Secretary of State for Public Affairs and then became Under Secretary of the Smithsonian Institution, for which he directed development of the National Air and Space Museum in Washington. Now an aerospace consultant, he retired from the Air Force Reserve as a major general.

Carl B. Eielson became an army pilot in 1919, but left active duty to pursue a law degree. Traveling to Alaska, he became an expert in flying in the far north and was the first to fly the airmail in Alaska. He was the first man to fly over the Arctic Ocean and won international acclaim, as well as the Distinguished Flying Cross and the Harmon Trophy, for flying over the North Pole in 1928. A first lieutenant in the Reserve and a colonel in the North Dakota National Guard, he was killed while flying a mercy mission in a storm over the Bering Sea in 1929.

Dr. (Col.) John Paul Stapp proved that man could survive high-speed ejections from aircraft by subjecting himself to experiments with rocket-powered sleds. He set a ground speed record in a sled of 632 miles per hour, slamming to a halt at the end of the run in only 1.25 seconds. On some runs, he withstood forces of more than thirty-five Gs. His research was key to later development of improved survival systems in aircraft and the requirement for seat belts in automobiles. He retired in 1970. ■



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Winners With Wings

AFA's Tunner, Chennault, Power, LeMay, and O'Malley awards recognize the top aircraft and missile crews in the Air Force.

First-ever recipients of the Gen. Jerome F. O'Malley Award for the best Air Force reconnaissance crew are Majs. Robert F. Behler (left) and Ronald D. Tabor.

BY MAJ. MICHAEL B. PERINI, USAF

WHEN AFA presents its awards this year to the top aircraft and missile crews, another category of airmen will step into the winner's circle. The Gen. Jerome F. O'Malley Award will be presented for the first time to the reconnaissance crew judged the best in the Air Force.

The O'Malley Award winners will be honored at the AFA National Convention in September, along with winners of the four traditional crew awards: the Lt. Gen. William H. Tunner Award for the best aircrew in MAC, the Lt. Gen. Claire L. Chennault Award for the outstanding aerial warfare tactician, the Gen. Thomas S. Power Award for the best strategic combat missile crew, and the Gen. Curtis E. LeMay Award for the top strategic aircrew.

The new reconnaissance crew award is given in the name of Gen. Jerome F. O'Malley, who flew the first operational mission in the SR-71 and who, at the time of his death in April 1985, was Commander of Tactical Air Command. Selection of winners of the five awards is made by the US Air Force and is based on achievement in 1984.

Best Reconnaissance Crew

Two SR-71 aircrew, Maj. Robert F. Behler and Maj. Ronald D. Tabor of the 9th Strategic Reconnaissance Wing at Beale AFB, Calif., are the first winners of the Gen. Jerome F. O'Malley Award.

"Being chosen is significant," says Major Behler, air-

craft commander. "Being [chosen as] the first recipients is quite overwhelming."

"General O'Malley was an airman's airman," says Major Tabor, reconnaissance systems officer. "The award is a very great honor."

The foremost achievement for the two airmen was a top-secret mission they flew in the SR-71 Blackbird in 1984. The Pentagon says only that the mission took place in a part of the world where the SR-71 had not flown in years, that it was very successful, and that the results exceeded the highest expectations of the intelligence community. The Strategic Air Command says they returned with data that had "far-reaching effects on the formulation of US foreign policy and international events during that period of world tension." Majors Behler and Tabor were chosen specifically for this mission because they were already recognized as top hands.

They flew twenty-nine other highly productive missions in the European, Arctic, Pacific, Caribbean, Southeast Asian, and Middle East theaters in 1984. Early in the year, they performed an emergency air refueling rendezvous to save their aircraft after an in-flight emergency.

In addition to their flying, Behler and Tabor rewrote the mission qualification phase of the SR-71 training program. "Everything builds from the training program," says Major Tabor. They also updated all SR-71 operational scenarios flown in the simulator.

They see training and coordination as the keys to their success. "We spent twelve to fourteen hours a day together, five days a week, for a year," says Major Tabor. "We started out together, trained together, and now fly together," says Major Behler.

Major Behler has accumulated more than 4,500 hours of flying time in forty-five different aircraft, including eight foreign aircraft. He has flown sixty operational missions and 430 hours in the SR-71. Major Tabor has some 2,800 flying hours, including sixty operational reconnaissance missions and 380 hours in the SR-71. The Blackbird provides them plenty of challenge. "You are always flying on the edge," says Major Tabor. "Decisions must be made instantaneously because of the speed of the aircraft. You have to know what the other crew member is thinking."

Majors Behler and Tabor were also selected as prime liaison between the 9th Strategic Reconnaissance Wing and the AFLC SR-71 flight-test program. They are responsible for coordinating modifications to the SR-71 that will keep it the free world's most versatile manned reconnaissance aircraft. "The SR-71 is not a procedurally regimented aircraft," says Major Behler. "Flying it is not simply a matter of guiding a machine through its paces."

Majors Behler and Tabor won the Fifteenth Air Force Reconnaissance Crew of the Year Award in 1984. Major Behler has been named director of operations for Detachment 4, 9th SRW. In his new job, he will be responsible for all SR-71 reconnaissance flights in Europe and the Middle East. Major Behler has been selected for promotion to lieutenant colonel and nominated for senior service school, and Major Tabor has been selected to attend intermediate service school.

"Clearly, Majors Behler and Tabor have matched General O'Malley's exacting standards—they are the best of the best," says Gen. B. L. Davis, then Commander in Chief of SAC.

Best Airlift Aircrew

A fierce storm—complete with snow, thunder, and wind—at Ramstein AB, Germany, was the setting for the action for which crewmen from the 62d Military Airlift Wing, McChord AFB, Wash., won the Tunner Award.

The crew consisted of Capt. Patrick Moran, aircraft commander; Capt. Fred Sager, copilot; MSgt. Ted Horton, loadmaster; Sgt. Gerry Danielson, flight engineer; and Sgt. Don Buescher, flight engineer.

On January 15, 1984, while preparing to depart for RAF Mildenhall, Captain Moran and Sergeant Horton were inspecting the cargo on their C-141B aircraft when the storm began suddenly. The StarLifter shook violently in winds gusting to 100 knots.

"Next thing we knew, our plane was being bounced around," says Sergeant Danielson. He turned on the number three hydraulic pumps for emergency braking. The parking brake had also been set, but additional braking was required by Captain Sager to hold the aircraft in position.

Their airplane was now secured, but things were not so calm elsewhere on the flight line. "Oh God!" somebody yelled. "That plane's moving!" An unmanned C-141 had jumped its chocks and was rumbling directly toward the 62d aircraft. "It was freak winds," says Sergeant Horton. "The rear doors of the C-141 were open, and they acted like sails as the plane turned toward us."

Sergeant Danielson turned off electrical power and warned Captain Moran and Sergeant Horton in the cargo compartment of the danger. The entire crew evacuated.

The runaway C-141 turned as it rolled, scraping the wing of the 62d MAW plane. It continued on toward two parked C-141s, one of which was loaded with 120,000 pounds of fuel. Sergeants Danielson and Buescher sprinted toward the oncoming StarLifter.

Sergeant Danielson scrambled aboard first, hurting his leg in the process. Once inside the cockpit, he started

the auxiliary power unit, turned on the number three hydraulic pumps for braking, and radioed ground control to alert the fire department and crash response team.

Sergeant Buescher was also able to board the still-moving aircraft and jumped into a pilot's seat to apply the brakes. Although the parking brake had been set prior to the storm, it took the combined efforts of Sergeants Danielson and Buescher to bring the aircraft to a stop, just short of the two parked C-141s.

Sergeants Danielson and Buescher both received Air Force Commendation Medals for their heroic efforts.

Sergeant Horton reflects on the attributes of a great aircrew: "You must work like a team, as we did on that day. Everyone has to be a self-starter. In emergencies like this, you don't have time to shout instructions."

"Periodically, our people are thrust into situations demanding extraordinary action under the worst circumstances," says Gen. Thomas M. Ryan, MAC Commander in Chief. "Once again, several of our young people have demonstrated such performance."

Crew S-200 of the 308th Strategic Missile Wing, Little Rock AFB, Ark., won the Gen. Thomas S. Power Strategic Missile Crew Award. From left are Capt. Robert E. Servant, commander, 1st Lt. Beverly J. Rollins, deputy commander, TSgt. Carmen A. Malone, and SSgt. Rodney L. Holder.

Best Combat Missile Crew

"Attitude of your crew is crucial," says Capt. Robert E. Servant, "especially as you try to keep your crew motivated to do its best, to keep your missile system on alert."

That conviction helped Captain Servant's Titan II crew—S-200 of the 308th Strategic Missile Wing—win the Gen. Thomas S. Power Strategic Missile Crew Award, topping more than 750 other missile crews in Strategic Air Command.

The Little Rock AFB, Ark., crew includes 1st Lt. Beverly J. Rollins, deputy commander; SSgt. Rodney L. Holder, missile systems analyst; and TSgt. Carmen A. Malone, missile facilities technician. The crew was cited by SAC for "sustained superior performance in their senior evaluator duties, in the handling of missile potential hazard situations, and in their self-improvement and community involvement efforts."

While on alert in January 1984, the crew noted a drop in the Stage I oxidizer tank pressure that threatened to take their missile off alert. The crew also noted a corresponding drop in launch duct temperature. Realizing that these problems were probably the result of maintenance work that was being performed with the silo door open, S-200 halted the maintenance and closed the door. The launch duct temperature and tank pressure immediately began to rise, keeping the missile on alert.

On another occasion, a maintenance team replaced the Power Distribution Control Chassis Unit (PDC-3) in the control center. The new unit malfunctioned, blowing a fuse and shutting down one of the complex power supply units. Smoke began to pour from the PDC-3. S-200 stepped in and cut power to the malfunctioning unit, extinguishing the fire before it could spread. Even so, the crew wasn't finished. They checked the malfunction themselves and directed a maintenance team to remove the new PDC-3 and reinstall the old one, placing the power supply unit on line and restoring normal power to the complex.

S-200 performed crew evaluator duties for the wing and trained newly assigned evaluators. During SAC's 1984 Missile Combat Competition, S-200 received AFA's award for "Best Titan Operations." They helped win the "Best Titan Wing" trophy and the Eighth Air Force "Best Operations" award for the 308th SMW.

"Experience plays a big part," Captain Servant says of his crew's success. "We have thirty-seven years of combined experience in the Titan II weapon system. Also, a willingness to put in extra hours studying the system, giving up some family life with shift work, and picking out the best attributes from other crews you've been on."

Captain Servant has earned seventeen "Highly Qualified" (highest possible) ratings on evaluations, while Lieutenant Rollins, Sergeant Malone, and Sergeant Holder earned a total of twenty-nine Highly Qualified ratings. Captain Servant, Sergeant Malone, and Sergeant Holder have been awarded Eighth Air

Force Crew Member Excellence awards for their performance during standardization evaluations.

According to SAC officials, S-200's achievements played a large part in the 308th SMW's taking the Col. Lee R. Williams Award as the "Best Missile Wing in SAC" for the second consecutive year.

Sergeant Holder has been picked for promotion to technical sergeant, but will probably never sew on the stripes. He has been selected for OTS and will be a Minuteman Missile Launch Control officer after commissioning.

Then-Commander in Chief of Strategic Air Command Gen. B. L. Davis called S-200's accomplishments "unparalleled" and commended their "sustained superior performance and professionalism."

Aerial Warfare Tactician

Maj. William F. Hodgkins, whom Lt. Gen. Robert E. Kelley, Vice Commander of Tactical Air Command, calls "*the* outstanding practitioner in the art of aerial warfare," is the winner of the Lt. Gen. Claire Lee Chennault Award.

An F-15 pilot, Major Hodgkins is the chief of Weapons and Tactics, 18th Tactical Fighter Wing, Kadena AB, Okinawa, Japan.

Out front with new ideas and initiatives, he led efforts to increase the unit's combat readiness through tactical deception (TD), electronic combat, F-15/B-52 interoperability and electronic interference resolution, and large-force employment. "He has taken each of these areas to new levels of tactical proficiency by identifying and solving nearly all of the potential problems," according to TAC officials.

For example, Major Hodgkins, as the wing TD officer, improved the awareness among aircrews of the importance and advantages of tactical deception (deceiving an enemy by generating false impressions of weaknesses, strengths, or intentions) in the tactical environment. "TD is like trick plays in football," Major Hodgkins says. "It took some education, since many of the crews didn't understand or have confidence in the value of TD."

He suggested the first PACAF TD conference, hosted it, and was named USAF Tactical Deception Officer of the Year during it.

Major Hodgkins developed comprehensive TD plans for employment exercises, including a Team Spirit exercise. "We have always built our exercises around confrontation," he says. "Our fighters vs. theirs. My program involved techniques ranging from communications out/communications deceptive launches, deceptive formations with emissions control, emphasis on communications and operational security procedures, and intentional leaking of bogus information intended for potential adversaries."

Maj. William F. Hodgkins won the Lt. Gen. Claire Lee Chennault Award for being "the outstanding practitioner in the art of aerial warfare." He flies the F-15.

He was also intensively involved in revitalizing the electronic combat program for his unit. Because of his efforts, each fighter squadron in PACAF now has a trained electronic combat officer. Another Hodgkins initiative was an interoperability exercise involving Kadena-based F-15s and Guam-based B-52s. Data from that exercise led to some changes in F-15 tactics and in B-52 ECM procedures.

Major Hodgkins did a complete study of the high-altitude ingress option for the Korean theater. Tactical Air Command says that his analysis "is sure to have an impact on future tactics development."

He is a member of the Korean Air Tactics Team, which analyzes and evaluates electronic and communications intelligence gathered on the North Korean Air Force. Major Hodgkins is a frequent writer for the *Korean Air Tactics Bulletin*.

What forces shape a tactician? "Experience—a big one," Major Hodgkins says. "We are getting away from actual combat experience in the cockpit. Most of the guys now flying weren't in Vietnam. So the exercises are important in observing how effectively your tactics work." He also credits his training at the Tactical Fighter Weapons Center at Nellis AFB, Nev., as a positive influence.

The Major attributes his success in these areas, in

Consistent excellence won the Gen. Curtis E. LeMay Strategic Aircrew Award for this FB-111 crew. They are Maj. Paul E. Murr, aircraft commander (left), and Capt. Bradley L. Moffett, radar navigator.

part, to a former Chennault Award winner. "Lt. Col. Jere T. Wallace is an extremely talented aviator," he says. *(See* AIR FORCE *Magazine, October 1983 issue, p. 36.)* "He has insight into combat that the rest of us can only hope to have. He got me more involved than just trying to keep good hands and a smart head in flying aircraft. He got me to look outside the cockpit."

Strategic Aircrew Award

A year's worth of professionalism, performance, and teamwork won the 1985 Gen. Curtis E. LeMay Strategic Aircrew Award for crew S-55 of the 308th Bombardment Wing. This FB-111 crew from Plattsburgh AFB, N. Y., includes Maj. (Lt. Col. selectee) Paul E. Murr, aircraft commander, and Capt. Bradley L. Moffett, radar navigator.

"To not do well was not acceptable to either of us," Major Murr says. "We set objectives. Paid attention to details. That's what made the difference on bringing us out on top."

Major Murr and Captain Moffett had an average damage expectancy of 0.99 on operational readiness inspections in 1984. "Brad is great when it comes to hitting targets," Major Murr says. "He can memorize bomb runs, is a superb systems operator, and knows the technical aspects of the equipment."

They achieved perfect scores on readiness testing, including practice of emergency war order launches and executions. "Captain Moffett and I have crewed together for five years," Major Murr says. "We know each other, and that's a definite advantage."

The two also won the Eighth Air Force Blue Ribbon Crew Award for outstanding operational readiness inspection performance and represented the 380th Bomb Wing in SAC's Bombing and Navigation Competition for 1984. "Spirited teamwork and aggressiveness" earned this outstanding crew the coveted title of "Best FB-111 Crew in SAC," according to SAC officials. Additionally, crew S-55 contributed significantly to the wing's capture of the Fairchild Trophy. "We always aim high, and we think we can do better each time we fly," Major Murr says. "We are always striving for perfection."

There were individual accomplishments, too. Major Murr graduated from the National Security Management Course, completed the Central Flight Instructor Course, and upgraded to instructor pilot. Captain Moffett was an Eighth Air Force nominee for the National Jaycees' Ten Outstanding Young Americans. He was also selected as the wing's Company Grade Officer of the Year in 1984.

Both crew members subscribe to the whole-man concept. "You can't just fly aircraft anymore," says Major Murr. "Getting involved outside of flying is important too."

Major Murr was a founding member of the high school Parent, Teachers, Student Organization and has been active with the Plattsburgh High School Athletic Booster Club. Captain Moffett was wing project officer for Air Force Academy summer programs and developed the squadron reception program for SAC inspection teams. He coached the wing volleyball team to a championship and volunteered as a foster parent for an emotionally-disturbed child.

SAC officials lauded this year's LeMay Award winners. "They have a diversity of interests and activities and excel at their primary duty—bombing." ■

Maj. Michael B. Perini is Deputy Chief of the Operational Forces Branch in the Secretary of the Air Force's Office of Public Affairs. An Education With Industry officer with AIR FORCE *Magazine in 1982–83, Major Perini holds a bachelor's in social studies from Washington State University and a master's in social studies/education from the University of Southern Mississippi. He served as Chief of the Public Affairs Division of the 1st Tactical Fighter Wing at Langley AFB, Va., and has also served as a public affairs officer at Hill AFB, Utah, and Keesler AFB, Miss. He joined the Air Force in 1972 after receiving his commission through the AFROTC program. He is now a regular contributor to this magazine.*

The well-equipped, well-trained ANG operates all around the world.

The Global Guard

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

THE term "Total Force" has been with us for many years now. What began as a concept and then became policy is now the backbone of our nation's military framework. Total Force provides flexibility as well as strength. It provides economic efficiency, maximizing the use of military hardware and the abilities of highly skilled, trained, and deeply motivated people. The men and women of the Air National Guard are essential members of the Total Force team.

Although the Air National Guard plays an important

This F-15 bears markings of the 159th Tactical Fighter Group, Louisiana Air National Guard. The 159th TFG is the first ANG unit to be made up of F-15s transferred from USAF's active fighter force. Such modernization makes the ANG an increasingly potent part of USAF's Total Force team. The Georgia ANG is slated for F-15s next year.

—ANG photo by Lt. Col. Don Borowski, 102d FIW, MA ANG

South Dakota ANG A-7s take off from RAF Waddington in the United Kingdom during exercise Coronet Buffalo. That overseas deployment involved thirty-six South Dakota and Iowa ANG aircraft.

role in each of its home states and territories, we are also fulfilling our worldwide commitment as part of the Total Force.

In the flying arena, we continue to provide sixty-eight percent of the Air Force's interceptor force as well as fifty-three percent of the reconnaissance force, twenty-nine percent of the tactical air support, thirty-two percent of the tactical airlift, twenty-five percent of the tactical fighters, seventeen percent of the air refueling tankers, and fourteen percent of the rescue and recovery capability of the total Air Force.

Readiness has been, and continues to be, our watchword, and we are now at our highest state of readiness. On any given day this year, Air National Guard members could be found performing their vital missions at points all around the globe. Several of our flying units deployed to European bases to train with active Air Force units and our allies.

One of these deployments, Coronet Buffalo, was the largest single deployment of fighter aircraft to the United Kingdom since World War II. This deployment took thirty-six A-7s and more than 950 Guardsmen from the South Dakota and Iowa Air National Guard to RAF Waddington in England. The large number of aircraft and personnel created a realistic training environment, making it a valuable experience for both the Air National Guard and the Royal Air Force.

In another European deployment, A-10 Thunderbolt IIs from the 175th Tactical Fighter Group, Baltimore, Md., went to a German base for training. The unit made the trip to the continent by "island hopping," demonstrating the capability to deploy without air refueling, if necessary. This marked the second time that the Air National Guard had tested this transoceanic deployment concept. In FY '84, we successfully moved A-7s from Michigan to Italy without air refueling.

Since 1977, Air National Guard fighter units have been at Howard AFB, Panama, 365 days a year to support the US Southern Command under Operation Coronet Cove. Our fourteen A-7 units share this responsibility on a rotating basis. This year-round deployment is supported by air refueling from ANG KC-135 units. Six months of the year, ANG C-130 units are also based at Howard AFB to support Volant Oak, which provides theater airlift in Central and South America.

In addition to these long-standing commitments, other Air Guard aircraft, such as OA-37s, participated in such major Joint Chiefs of Staff-sponsored exercises as Universal Trek in Central America.

On Daily Alert

Here at home, our air defense and tanker units add a new dimension to the traditional part-time image of the Air Guard. Air defense units were on alert every day, while tankers stood alert in support of Strategic Air Command commitments. Air Guard F-106 and F-4 aircraft scramble routinely for visual checks of unidentified aircraft flying in US airspace along our coasts. With the introduction of more modern aircraft into the Air Guard as well as modifications to existing aircraft, our readiness can only increase.

The year 1985 is proving to be a banner one for the Air Guard; we received our first F-15 Eagle in the 159th Tactical Fighter Group, Louisiana Air Guard, in June. We now have one F-15 unit, with another scheduled for Georgia in FY '86. We also continue to receive the F-16 Fighting Falcon. Our second F-16 unit at Kelly AFB, Tex., will be operational next year, and two more of our air defense units, in Massachusetts and Florida, are currently scheduled to convert to the F-16. Our unit at Tucson, Ariz., will receive F-16s to conduct ANG F-16 training.

We also marked our return to the strategic airlift mission in 1985 when the first C-5A joined the Air Guard in New York this past July. C-141 StarLifters will follow in FY '86.

In addition to gaining new aircraft, we are also modifying some of our forces. By early 1986, we will have completed the reengining of our KC-135 Stratotankers, making them more efficient, more economical to operate, and more mission capable. Programs are under way to increase the number of aircraft assigned to our F-4 units as a cost-effective means of increasing capability, and we are also converting from F-4C and D model aircraft to F-4Es.

All of our flying activity is a visible sign of our involvement as part of the Total Force. But our flying units are only part of the story. Our mission support units are also doing their share as part of the total defense team.

Communications Support

Again in 1985, the Air National Guard was a key player in overall communications support for the Air Force, particularly in the areas of combat information systems, tactical air control, and engineering installation.

The ANG is now providing seventy percent of combat information systems, sixty percent of tactical air control, and fifty-five percent of engineering installation for the Air Force.

Like our flying units, our communications people have been on the move, honing their skills in unfamiliar training environments. Our combat information systems units have deployed to every theater—from Europe to the Pacific and from Alaska to the Caribbean.

One of our eight combat information systems groups, the 226th CISG from Gadsden, Ala., deployed more

—ANG photo by Lt. Col. Robert Dillon, 135th TAG, MD ANG

Maryland ANG A-10 Thunderbolt II aircraft from the 175th Tactical Fighter Group, Baltimore, fly over Iceland en route to West Germany. They made the flight without air refueling.

than 750 people to eighteen individual European exercises this summer, while ANG tactical air control units were part of three deployments to Norway, Italy, and Denmark.

In addition, the Air National Guard supported every major Joint Chiefs of Staff exercise in 1985 with information systems support personnel, units, and equipment.

Readiness was also a driving factor for our civil engineers. Twenty-three Prime BEEF teams of approximately fifty personnel each trained with their active-duty counterparts in Spain, Germany, Korea, and the United Kingdom. Our Prime RIBS teams supported Air Force requirements with deployments to Air and Army National Guard and Air Force bases in the US as well as locations in Europe, Korea, and above the Arctic Circle in Alaska.

At home, our base civil engineering units handled construction projects worth $111 million and a $120 million base operations maintenance and repair budget, ensuring that our facilities were in top condition to meet the training challenge throughout the Guard.

Our medical personnel are also a vital part of the Total Force. Medical readiness has assumed even greater importance in recent years, and a large portion of needed wartime medical skills must come from the reserve components. In response to these readiness requirements, existing Air National Guard medical units are programmed to undergo substantial personnel growth over the next five years. Aeromedical evacuation units will grow also in both size and numbers to meet wartime patient movement requirements. This expansion will help meet the increasing peacetime medical requirements as the Air National Guard mission grows.

All of these training deployments and activities, both in the flying and mission support areas, demonstrate the challenge we face as our role in the Total Force continues to expand. While aircraft and equipment modernization help us to meet the challenge, the real key to our success is our people—the citizen-airmen of the Air National Guard. Thanks to these dedicated Americans, we are getting the job done.

Our personnel strength is at an all-time high. We closed out the last fiscal year with a record 105,000 Guardsmen and fully expect to meet our goal of 108,000 for FY '85. Equally important to recruiting is retention, and I'm happy to report that we have also been successful in keeping experienced men and women in our units.

Experience Is Key

Experience is really the key to our success, a success that has been proven in competitions with our active-duty counterparts. At last year's William Tell competition, the 177th Fighter Interceptor Group, Atlantic City, N. J., took first place in the F-106 category, while the 142d Fighter Interceptor Group, Portland, Ore., took top honors in the F-4 contest. Air Guardsmen also took first place in the F-4 and F-106 Top Gun awards.

One area in which experience is paramount is maintenance. Some of our maintenance personnel spend their whole careers with one unit, working on one type of aircraft and learning that airplane inside and out. It is this experience, which cannot be duplicated in any classroom, that is our secret weapon for success.

It is this experience that won for us the F-106 and F-4 top maintenance awards at William Tell. Also, at Volant Rodeo, the international airlift competition, the 167th Tactical Airlift Group, Martinsburg, W. Va., representing the 133d Tactical Airlift Wing, won the trophy for the best C-130 maintenance. The 176th Tactical Airlift Group, Anchorage, Alaska, took a close second place in the timed competition at Volant Rodeo. In this competition, cargo is onloaded and offloaded while the transport's engines are running.

I am proud to report that the Air Guard reached another milestone this past year. In August of 1984, two members of the 147th Fighter Interceptor Group at Ellington AFB, Tex., were members of the Space Shuttle astronaut crew. We now have four Air Guardsmen wearing astronaut wings, signifying their flights on the Space Shuttle.

When I look to the future of the Air National Guard, I see the Total Force challenge getting tougher because the issues facing our nation are getting tougher. Faced with balancing the budget, an increasing Soviet threat, and growing commitments worldwide, our mission increases in responsibility and importance. We are going to have to do more with existing assets and use our increases in capabilities and equipment wisely. It is not an easy task.

I can assure you, however, that with the training, expertise, commitment, and dedication we've exhibited in the past, the willing men and women of the Air National Guard are capable of meeting that challenge and of continuing their proud performance as members of the Total Force in defense of this nation and its allies. ■

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.

AFA's Team of the Year honors go to the troops who brought the ground-launched cruise missile on line.

The GLCM Team

BY BRENDA BEAUREGARD
AFA ASSISTANT FOR PROGRAMS & AWARDS

The members of the 1985 Team of the Year proudly display their AFA citations for outstanding contributions to the ground-launched cruise missile dispersal flights at RAF Greenham Common, United Kingdom, and Comiso AS, Italy. From left to right are Sgt. Paul J. Leanza, SSgt. and Mrs. Charles N. Wilson, SSgt. George Hamilton III, Mrs. and TSgt. (now MSgt.) Donald E. Tharp, and Mrs. and TSgt. Thomas R. Emmert.

It's never easy to bring a new weapon system on line, and it's a particular challenge when the system is both unique and controversial. That was the job, however, in the fielding of the ground-launched cruise missile (GLCM).

The Air Force has nothing similar to GLCM in its operational lineup and has not had for many years. And when GLCM was deployed in response to the relentless buildup of tactical nuclear forces in Europe by the Soviet Union, it was met with major protests from the European "peace" activists.

The 1985 AFA/Air Force Team of the Year award goes to five GLCM airmen whose achievements were special during GLCM's deployment and workup to operational capability.

• **MSgt. Donald E. Tharp,** Security Police training NCO at RAF Greenham Common, the first GLCM site, where protesters were on hand in large numbers. He had no precedent to rely on as he developed a training program for defense of off-base dispersals. In seventy-five days, he prepared more than fifty lesson plans, conducted more than 100 classes, and managed several field exercises. Many of his plans and procedures are now standard for GLCM units.

• **TSgt. Thomas R. Emmert,** ground radio communications technician at Comiso AS, Italy, the second GLCM site. He established the Communications Maintenance section and readied the comm links, which passed acceptance inspections in record time. He resolved numerous equipment malfunctions in the field, without test equipment to help find the problems. When repairs in the field were impossible because spare parts weren't available, he devised "workaround" procedures so that the mobile GLCM launch control center could stay in business.

• **SSgt. Charles N. Wilson, Jr.,** vehicle mechanic at Comiso AS and critical vehicle and supply vehicle team chief on dispersals. In one instance, he found and fixed a fuel leak before it became a major problem—avoiding environmental damage and perhaps a fire and also saving the fuel. He supervised modification of the M.A.N. tractors that tow mobile GLCM units and set up the Vehicle Maintenance section, gearing it to repairs in the field.

• **SSgt. George Hamilton III,** independent medical technician at RAF Greenham Common. He researched and wrote the medical response chapter for the procedures manual of the first GLCM wing and coordinated medical support training and directed medical aspects of dispersal exercises. His concept paper on evacuation of injured flight members was presented at a United Kingdom Medical Planners conference.

• **Sgt. Paul J. Leanza,** missile systems analyst at Comiso AS. He was highly rated by inspectors as a forklift operator during missile upload and download, and his areas of responsibility were found error free in a management inspection. He developed consolidated tool kits for his section, doing the job so well that his approach was recommended to other sections. Contractor teams often asked for him by name to assist them in troubleshooting the system. ■

Looking ahead to new aircraft, new missions, and new people.

Modernizing The Air Force Reserve

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

ABOVE: An F-16, one of many new Air Force Reserve enhancements, cruises American skies.

New aircraft, new missions, and new people are the challenges and opportunities facing today's Air Force Reserve. We will be modernizing many of our units over the next several years, completing plans through 1988. These changes strongly emphasize the Total Force policy by modernizing the Air Force Reserve with newer, more capable aircraft. We're extensively participating in flying missions and exercises with our active-force counterparts on a routine basis.

We have already updated our aircraft in both fighter and airlift forces. In January 1984, the 419th Tactical Fighter Wing at Hill AFB, Utah, became the first Reserve unit to own and fly the F-16, replacing the Air Force's last F-105s. Six months after being modernized, the 419th successfully proved its combat readiness during the three-week exercise Patriot Glacier in Alaska. By the end of the year, the 419th had received its full complement of twenty-four aircraft. Also, the 482d TFW at Homestead AFB, Fla., updated all eighteen of its F-4C Phantom II jets with the newer D model.

Airlift improvements last year included eight C-130Es for the 908th Tactical Airlift Group at Maxwell AFB, Ala., replacing sixteen smaller C-7A Caribous. In December, the first C-5A in the Air Reserve Forces was flown into Kelly AFB, Tex. All sixteen of the C-130B aircraft presently assigned to the 433d Military Airlift Wing at Kelly are being replaced by sixteen C-5As, to be phased in over the next four years.

Unit modernizations and conversions for 1985 are also advancing as planned. Early in the year, the 303d Aerospace Rescue and Recovery Squadron at March AFB, Calif., converted to the tactical airlift mission when it received eight C-130B aircraft from Kelly AFB,

An Air Force Reserve Associate crew aboard an active-duty KC-10 practices refueling hookups. The Reserve supplies half of all USAF strategic airlift and KC-10 tanker crews.

Tex., replacing six HC-130H rescue aircraft. The HC-130Hs went to the 304th ARRS in Portland, Ore. The 901st Tactical Airlift Group at Peterson AFB, Colo., grew to sixteen unit-equipped aircraft after it received Kelly's eight other C-130Bs and was redesignated the 302d Tactical Airlift Wing.

Further aircraft modernization is planned for five other Reserve units over the next three years. In addition, three other units will change both aircraft and missions. In 1986, the 459th TAW at Andrews AFB, Md., will convert from eight C-130E aircraft to eight C-141Bs in order to assume a new strategic airlift mission. The 439th TAW at Westover AFB, Mass., will make a similar mission conversion in 1988, changing from C-130E aircraft to C-5As. The third significant unit conversion and mission change is planned for the 302d Special Operations Squadron at Luke AFB, Ariz. In 1987, the unit will become a tactical fighter group, trading its six CH-3 helicopters for twenty-four F-16C and D model fighters straight from the factory.

Modernizing our force with current aircraft is critical, but we're also anticipating future modernization with the new C-17 transport aircraft. We need the C-17 to replace our aging fleet of fifty-six C-130As, now averaging twenty-eight years of age and not scheduled for replacement until the 1990s. The current plan calls for the C-17 to replace older aircraft in both active-duty and Air Reserve Forces units. This is a workable goal if procurement plans are continued. The C-17 isn't estimated to be ready for its first test flight until 1989. If the program suffers delays, twenty percent of our tactical airlift force aircraft will soon be well over thirty years old, with no replacement available.

Current plans call for buying 210 C-17s instead of adding more C-5s and C-130s, saving a projected $16 billion in life-cycle costs. The C-17 will also require 14,800 fewer aircrew and support personnel.

The C-17 is about the size of a C-141 transport and can carry outsize combat equipment over intercontinental distances. It also can land on small, unpaved airfields less than 3,000 feet long. Total development costs will be about $4 billion.

People and Readiness

Recruiting continues to be a major focus for the Air Force Reserve. In FY '84, we attained an end strength of 70,318, well exceeding the programmed end strength of 69,880. This was the seventh year in a row that we surpassed our goal. For FY '85, we have programmed an end strength of 74,829, an increase of almost 5,000 people and the largest single-year increase ever. In FY '86, that strength "floor" rises to 77,400 people. This includes 208 more aerial port personnel, 115 aeromedical evacuation personnel, and 1,026 more civil engineering specialists.

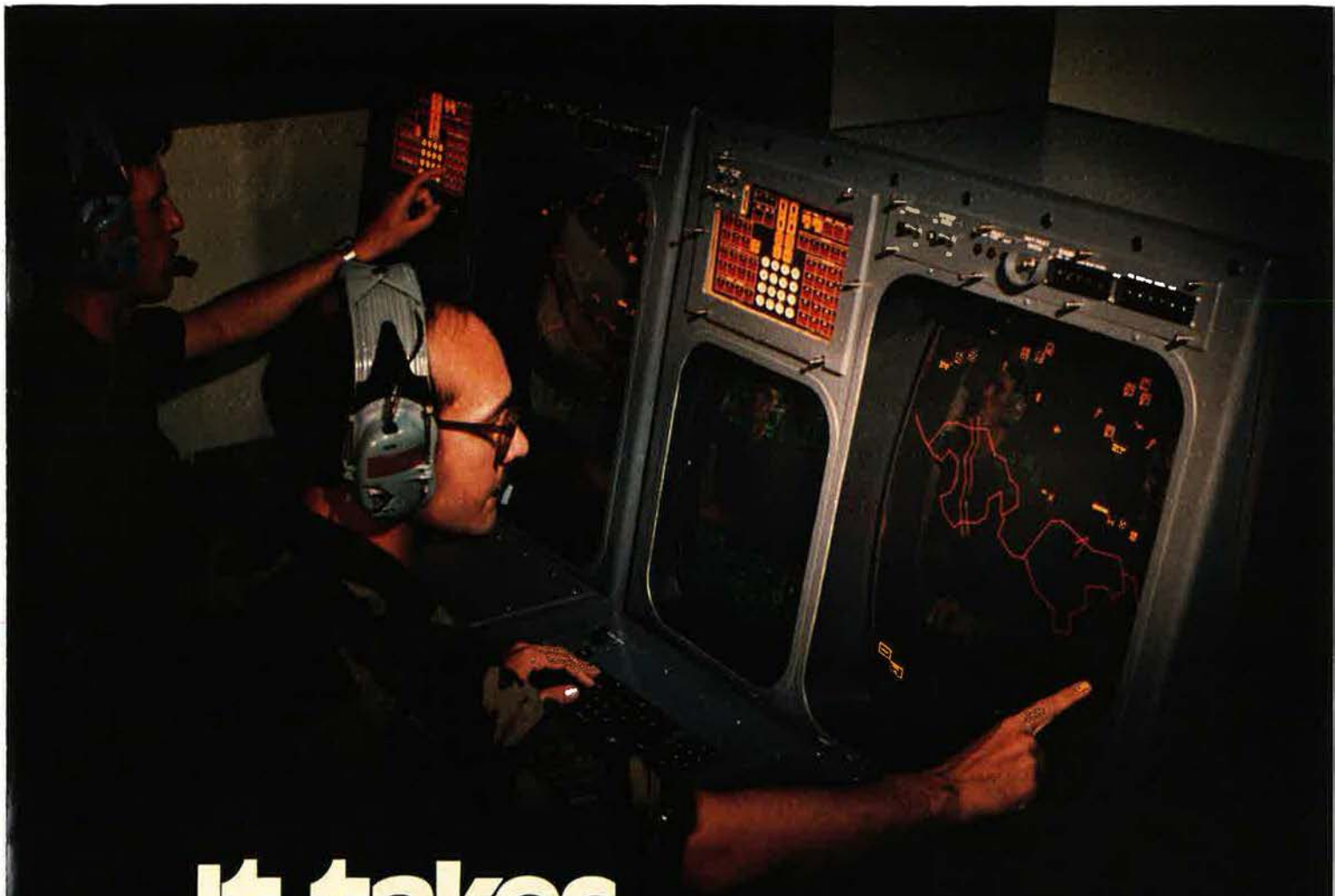
Several new units will be added in the next three years. These include one KC-10 Associate flying squadron, three KC-10 Associate maintenance squadrons, and ten civil engineering squadrons. The KC-10 Associate flying squadron will be activated at Seymour Johnson AFB, N. C., in 1986, with fifteen Reserve aircrews flying ten active-duty aircraft. Eventually, there will be thirty-six Reserve aircrews for eighteen active-duty aircraft. The three KC-10 Associate maintenance squadrons will be at March AFB, Calif., and Barksdale AFB, La., in 1986, and at Seymour Johnson AFB, N. C., in 1987.

Seven of the new civil engineering squadrons will be established in 1986 at Elmendorf, Davis-Monthan, Chanute, Offutt, Kirtland, Griffiss, and Pope AFBs. The remaining three units will be established in 1987 at McConnell, Holloman, and Seymour Johnson AFBs. These new units will have a noticeable impact on Reserve strength, adding more than 1,000 Reservists and civilian personnel.

Reservists can be proud of the position they've earned as a part of today's Total Force. It is now stated policy that Reserve and active-force perspectives will be a part of all Air Force plans, programs, manning, equipment modernization, and employment considerations. Our Total Force mission is twofold. First, we *train* for combat and support duties to be ready when called upon during mobilization. Second, we perform these roles *on a daily basis* with the active force, consistent with our training and mobilization taskings.

The Air Force Reserve has fifty-six flying units and 155 mission support units supplementing the active force. Nearly two-thirds of our flying units are equipped with their own aircraft, totaling 437. The remainder operate under the Associate program, where Reserve units collocated with active-duty units use active-duty aircraft to share maintenance and flying requirements.

Reserve readiness is maintained to the same criteria and inspection intervals as the active force. Again, daily participation in active force requirements is the key to our success. For example, we now supply half of all the Air Force's tanker and strategic airlift crews for the KC-10, C-9, C-5, and C-141 aircraft and forty percent of all the C-5 and C-141 wartime maintenance personnel. We fly one-third of all global airlift missions and seventy percent of all hurricane-watch missions for the continental United States. We also provide seventy-one percent of Military Airlift Command's medical crew capability.



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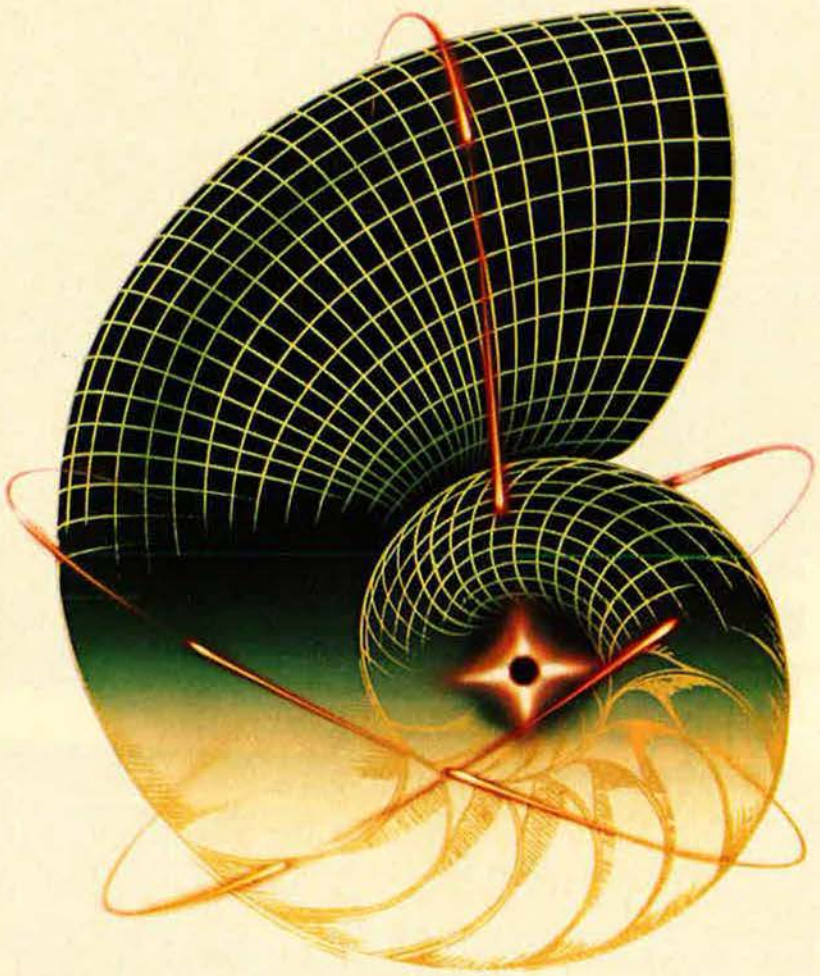

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Such Reservists as this flight engineer firing his door-mounted gun on a rescue and recovery helicopter take part in many combat exercises each year.

This pivotal Reserve participation has proven itself in several national emergencies. During the Grenada rescue operation, Reserve crews flew twenty strategic and four tactical airlift missions and eleven tanker sorties totaling 329 flying hours. The first Americans rescued out of Grenada were flown back to the US by an all-Reserve crew. Reservists flew six strategic airlift missions in Lebanon for the Marines immediately after their Beirut headquarters was destroyed.

Last year, four rescue and recovery squadrons saved twenty-eight people from life-threatening emergencies. Typical missions included guiding home a civilian pilot who was lost at night over the Atlantic Ocean and rescuing three military helicopter crewmen who had crashed at sea.

In May 1984, four Reservists joined with an active-duty C-141 crew to bring back the remains of the Vietnam Unknown Soldier for Memorial Day Services at Arlington National Cemetery. Ninety Reservists from three squadrons participated in those ceremonies.

Daily mission support in airlift, air rescue, medical evacuation, and weather reconnaissance has also helped to maintain Reserve readiness. In FY '84, our airlift units logged nearly 141,500 flying hours, air-dropping or airlanding more than 416,000 people and nearly 146,000 tons of cargo. Our Associate aeromedical evacuation crews flew 2,436 missions, carrying more than 80,000 patients. The Reserve's only weather reconnaissance squadron, the 815th at Keesler AFB, Miss., logged nearly 1,300 flying hours, probing eight major tropical storms and four hurricanes.

Reserve support to Strategic Air Command's air refueling mission has been another avenue for maintaining readiness. During FY '84, we flew more than 6,700 missions, refueling more than 9,000 aircraft. Our tanker fleet of twenty-four KC-135s is being improved with the JT3D engine, allowing greater fuel savings, offload capability, and increased operating safety. The new engines also require less maintenance.

Participation in Exercises

Exercises were a large part of our Total Force efforts. We participated in seventy-eight exercises last year. Among those were Patriot Partner in Germany, Team Spirit in Korea, Gallant Eagle in California and Nevada, and Brim Frost in Alaska. In more than 86,000 instances, our people tested themselves alongside their active-force counterparts. Tactical fighter support was equally strong, as our 216 Reserve fighters completed 46,600 flying hours in routine missions and numerous exercises.

Reserve crews from the 919th Special Operations Group at Duke Field, Fla., supported all Space Shuttle launches from the Kennedy Space Center. Their AC-130 aircraft provided launch site aerial surveillance and booster tracking capability.

The Air Force Reserve was also involved in other areas of space operations. Reserve Maj. Charles L. Veach of the 924th Tactical Fighter Group at Bergstrom AFB, Tex., distinguished himself as one of the Reserve's best when he became one of seventeen new astronauts. He was selected as a mission specialist based on his civilian employment as a NASA pilot and his expertise in astronomy, extraterrestrial geology, and orbital mechanics.

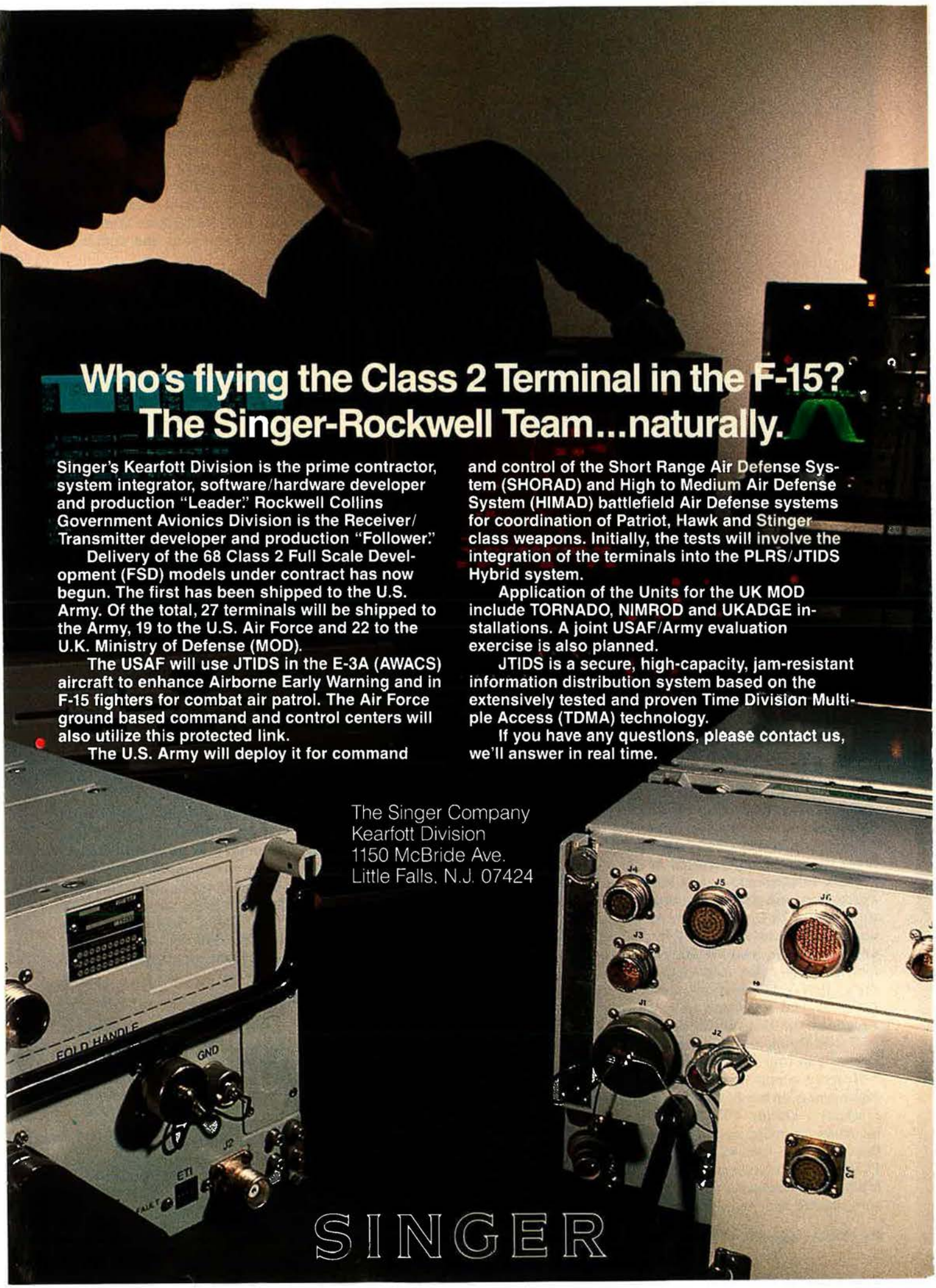
I'm also very proud of our successful efforts to promote efficient financial management. For example, on travel fares arranged by the Reserve's Scheduled Airline Ticket Offices, we saved more than $4.2 million between March 1983 and April 1985 when compared with standard commercial coach fares.

As I've just described, we've been very busy keeping our equipment current so that we can meet Total Force readiness requirements. But people will always be our most important resource. This includes not only our Reservists but also their families as well. We often take for granted the contributions that husbands, wives, and children make. Together, parents and children develop a unique relationship to keep the family working effectively. Without each family member's support, we'd simply have no Reservists.

In addition to our current personnel support programs, we're also working with employers to help Reservists maintain their voluntary Reserve affiliations. Without employer support, we have no Reservists.

The citizen-airmen in our Air Force Reserve maintain a time-honored tradition of defending our country by assisting our active forces. Today, that support has grown into a daily mission. We will continue to grow, modernizing our total force to meet our changing national defense needs. ■

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.



Who's flying the Class 2 Terminal in the F-15? The Singer-Rockwell Team...naturally.

Singer's Kearfott Division is the prime contractor, system integrator, software/hardware developer and production "Leader." Rockwell Collins Government Avionics Division is the Receiver/Transmitter developer and production "Follower."

Delivery of the 68 Class 2 Full Scale Development (FSD) models under contract has now begun. The first has been shipped to the U.S. Army. Of the total, 27 terminals will be shipped to the Army, 19 to the U.S. Air Force and 22 to the U.K. Ministry of Defense (MOD).

The USAF will use JTIDS in the E-3A (AWACS) aircraft to enhance Airborne Early Warning and in F-15 fighters for combat air patrol. The Air Force ground based command and control centers will also utilize this protected link.

The U.S. Army will deploy it for command and control of the Short Range Air Defense System (SHORAD) and High to Medium Air Defense System (HIMAD) battlefield Air Defense systems for coordination of Patriot, Hawk and Stinger class weapons. Initially, the tests will involve the integration of the terminals into the PLRS/JTIDS Hybrid system.

Application of the Units for the UK MOD include TORNADO, NIMROD and UKADGE installations. A joint USAF/Army evaluation exercise is also planned.

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AFA honors the twelve Outstanding Airmen of the Year.

Best of 600,000

BY CMSGT. CHARLES E. LUCAS, USAF (RET.)

AMONG the thousands of people at this year's AFA National Convention will be twelve airmen who, in a sense, are carrying proxies for more than eighty percent of today's uniformed Air Force. They are the Outstanding Airmen of the Year, selected in competition involving some 600,000 enlisted members of the regular Air Force, Air Force Reserve, and Air National Guard.

Since AFA initiated the recognition program in 1956, 459 airmen have been named as one of the 462 Outstanding Airmen. Three airmen have been selected twice: SMSgt. Harold F. Renneberg, Jr. (1961 and 1966), SMSgt. John R. Schuman (1966 and 1968), and SMSgt. Freddie J. Walton (1969 and 1970).

The number of airmen selected each year has varied. There were nineteen the first year. The all-time high was twenty-four in 1969, the year before the "Golden Dozen" was established as an appropriate number.

Like their predecessors, this year's Outstanding Airmen are a bit awed by the attention received from local units and major commands. Then there's the recognition ribbon and their designation as official representatives to the AFA National Convention. It takes a while for the full meaning of their selection to sink in. A heavy responsibility accompanies the title of Outstanding Airman of the Year.

Most of the airmen, the younger ones in particular, have had little opportunity to mingle with senior staff officials, let alone "tell them what I think." Thus, there are occasions during the convention when some of the airmen find themselves at a loss for words. The Secretary of the Air Force has been known to ask for a candid opinion of a recently implemented policy. Similarly, the Air Force Chief of Staff sees the Outstanding Airmen as a vital resource for information on recruiting and retention.

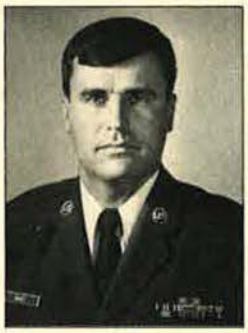
And when the Chief Master Sergeant of the Air Force sits them down and outlines what is expected of them during the next twelve months, the airmen understand that the honor carries a price. They are expected to contribute heavily in the months ahead.

Much of the success of the AFA program has come from just that. The "graduates" do contribute. Some offer more and for a longer period than others, but each leaves his or her legacy.

Two of the chosen few, CMSgt. Don Harlow (1967) and CMSgt. Jim McCoy (1974), later served as Chief Master Sergeant of the Air Force. Others have become senior enlisted advisors for major commands and separate operating agencies.

It is in awareness of this that AFA provides such a grand program for the Outstanding Airmen. Last year, for instance, they met with President Reagan. Since 1978, each has been asked to extend his public service commitment for at least another year by serving on AFA's Enlisted Council.

This year's twelve Outstanding Airmen again form an impressive group:



MSgt. Bruce E. Brady of Fairchild AFB, Wash.

• **MSgt. Bruce E. Brady,** thirty, NCOIC, 92d Munitions Squadron, Fairchild AFB, Wash. His unit's maintenance data collecting reporting rate (0.5) is the lowest in SAC. His support of Global Cruise, the air-launched cruise missile live-launch program, was judged best in the Air Force.

A twelve-year Air Force veteran from Kittery, Me., Sergeant Brady is a distinguished graduate of SAC's NCO Academy. He is working on a degree in criminal justice. He and his wife, Robin, who is from Gwinn, Mich., have a young son.

MSgt. Richard T. Brisson of Charleston AFB, S. C.

• **MSgt. Richard T. Brisson,** thirty-one, C-141B instructor flight engineer, 20th Military Airlift Squadron, Charleston AFB, S. C. Sergeant Brisson was credited with the upgrade of eleven student engineers

in minimum time. He helped develop a MAC fuel savings advisory system that is now taught to pilots and engineers.

Active in the Charleston Jaycees, he helped raise nearly $1 million to combat various children's diseases. He was cited by the community as one of its Outstanding Young Citizens. Originally from Miami, he has been in the Air Force for thirteen years. His wife, Deanna, is from Mullins, S. C.

SMSgt. Donald L. Carlock of Boise ANGB, Idaho.

• **SMSgt. Donald L. Carlock,** thirty-seven, avionics communications-navigation systems superintendent, 124th Tactical Reconnaissance Group, Boise ANGB, Idaho. Sergeant Carlock is credited with suggesting a way to reduce by sixty percent the number of man-hours needed to service RF-4C central air data computers. He also found alternate supply sources for fuel flow and oil pressure transmitters for J79 engines. His work was instrumental in the selection of Idaho RF-4Cs as the best maintained aircraft in the ANG.

He is a member of the Jaycees and Lions. He coaches Little League baseball and is a Girl Scout leader. Father of two children, Sergeant Carlock and his wife, Darlene, live in Kuna, Idaho.

MSgt. David A. Castro of McClellan AFB, Calif.

• **MSgt. David A. Castro,** thirty-four, engineering assistant technician, 2852d Civil Engineering Squadron, McClellan AFB, Calif. As surveillance monitor for the base's military construction program, he coordinated efforts for $32.8 million worth of major projects. He frequently serves as interim project engineer.

The fifteen-year Air Force veteran coaches intramural sports and has been involved in a variety of projects supporting the underprivileged. Both he and his wife, Mary, are from Laguna Niguel, Calif.

MSgt. Miles W. Davis of Mather AFB, Calif.

• **MSgt. Miles W. Davis,** thirty-seven, training supervisor, 3506th USAF Recruiting Group, Mather AFB, Calif. Ranked first among more than 200 flight supervisors in the Recruiting Service, he led his flight at San Bernardino, Calif., from a marginal performance to second in the nation. He is responsible for training recruiter-salesmen in the group's eleven-state area. An Air Force photographer for fourteen years, he became a recruiter in 1981.

He is a member of the San Bernardino Chamber of Commerce and chaired the city's Cleanup Committee. He was cited by California Gov. George Deukmejian for his contributions to civic, educational, and charitable causes. Sergeant Davis is from Eureka, Calif., and he entered the Air Force in 1967. He and his wife, Pamela, of Twin Cities, Minn., have three children.

• **SMSgt. Eddie Flowers,** thirty-eight, aircraft production superintendent, 325th Aircraft Generation Squadron, Tyndall AFB, Fla. Sergeant Flowers established Tyndall's first F-15 aircraft maintenance unit and doubled the mission-capable rate to 80.3 percent, well above TAC's sixty-five percent goal. His effectiveness in aircraft scheduling consistently exceeds ninety percent.

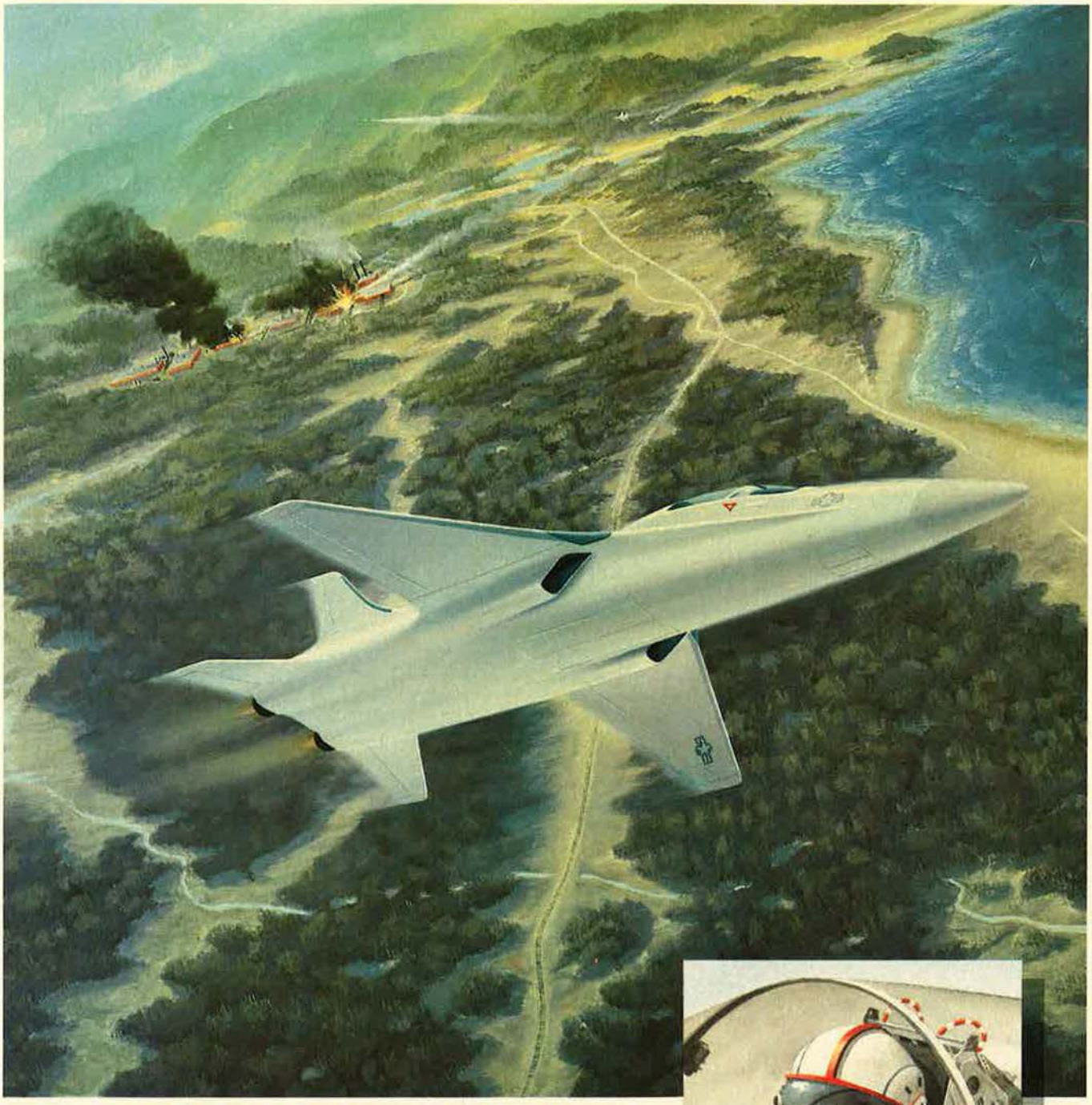
SMSgt. Eddie Flowers of Tyndall AFB, Fla.

His outstanding maintenance performance over a nineteen-year career has included work on all primary mission aircraft assigned to SAC, MAC, and TAC. A graduate of the Senior Noncommissioned Academy, he also holds a baccalaureate degree in psychology. Sergeant Flowers and his wife, Gloria, both from Cincinnati, Ohio, have two children.

MSgt. Leslie E. Gore, Jr., of Fort Polk, La.

• **MSgt. Leslie E. Gore, Jr.,** forty, tactical air command and control technician, Detachment 6, 507th Tactical Air Control Wing, Fort Polk, La. For two years, Sergeant Gore has headed the winning team in the worldwide command and control competition, beating out twenty-four other teams for top honors. He was first in his class of 551 at Fort Benning's airborne school.

Detachment Commander Lt. Col. Edward L. Cox sees Sergeant Gore's selection as a tribute to all Air Force controllers. "He is the most dynamic leader in the career field, which is one that many people don't know about." Controllers can spend an entire Air Force career working with Army units. The Alexandria, La., native entered the Air Force in 1965. He and his wife, Jackie, of Mohawk, Tenn., have three children. He coaches Little League baseball and helped organize the Cornerstone Baptist Church near Fort Polk.



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SMSgt. Thomas E. Heinzinger of Kirtland AFB, N. M.

• **SMSgt. Thomas E. Heinzinger,** thirty-three, production control superintendent, 1606th Civil Engineering Squadron, Kirtland AFB, N. M. He was nominated for Outstanding Airman while serving at USAFE's San Vito AS in Italy, where his microcomputer system improvements, reduction of construction and transportation costs, and economic analysis of alternate power sources for a satellite communications facility led to total savings of $1.2 million.

Active in church activities, he was a key figure in supporting a fund drive that raised $25,000 for youth programs. Hailing from Scarsdale, N. Y., he entered the Air Force in 1969. Sergeant Heinzinger and his wife, Kathryn, of Oshkosh, Wis., have two children.

SrA. Kathryn J. Kelleher of the Air Force Academy.

• **SrA. Kathryn J. Kelleher,** twenty-two, chief clerk, 1876th Information Systems Group, Air Force Academy, Colo. Initiative demonstrated in orderly-room management during her first permanent assignment resulted in money and manpower savings and improved efficiency. Airman Kelleher introduced a sponsorship letter and questionnaire to ease arrivals of new personnel. She also improved controls and accountability in leave records and increased timeliness in management of airman performance reports.

She serves as the unit representative on the Academy Advisory Council. She has been an active participant in programs for foster children and senior citizens. She is pursuing a degree in technical management, which she started before entering the Air Force in 1982 at Muskegon, Mich.

SSgt. Randall A. Tabor of Elmendorf AFB, Alaska.

• **SSgt. Randall A. Tabor,** twenty-three, technical reporting systems manager, 6981st Electronic Security Squadron, Elmendorf AFB, Alaska. Frequently cited by aircrews for "excellent" communications support, Sergeant Tabor is credited with changing a weak exploitation management program into a model of perfection. His technical reports earned an accuracy rate of more than ninety-nine percent.

The Randolph, Vt., native entered the Air Force in 1980. He completed requirements for an associate degree from the Community College of the Air Force with a perfect 4.0 grade average. He is active in intramural sports on base and in community physical fitness programs, serving as an instructor. He is single.

• **Sgt. Reginald R. Washington,** twenty-two, USAF Honor Guard, 1100th Air Base Wing, Bolling AFB, D. C. Sergeant Washington was nominated for Outstanding Airman by Alaskan Air Command for achievement as a materiel facilities specialist with the 343d Tactical Fighter Wing, Eielson AFB, Alaska. He sustained a 100 percent on-time delivery rate of priority supplies during an operational readiness inspection. His initiative in vehicle care turned a lagging program into the best on base. His standards are now used to measure all base programs.

Sgt. Reginald R. Washington of Bolling AFB, D. C.

Originally from Mobile, Ala., he entered the Air Force in 1981. He spearheaded various fund-raising efforts at Eielson AFB. He was a junior deacon and usher in church and served as a youth advisor.

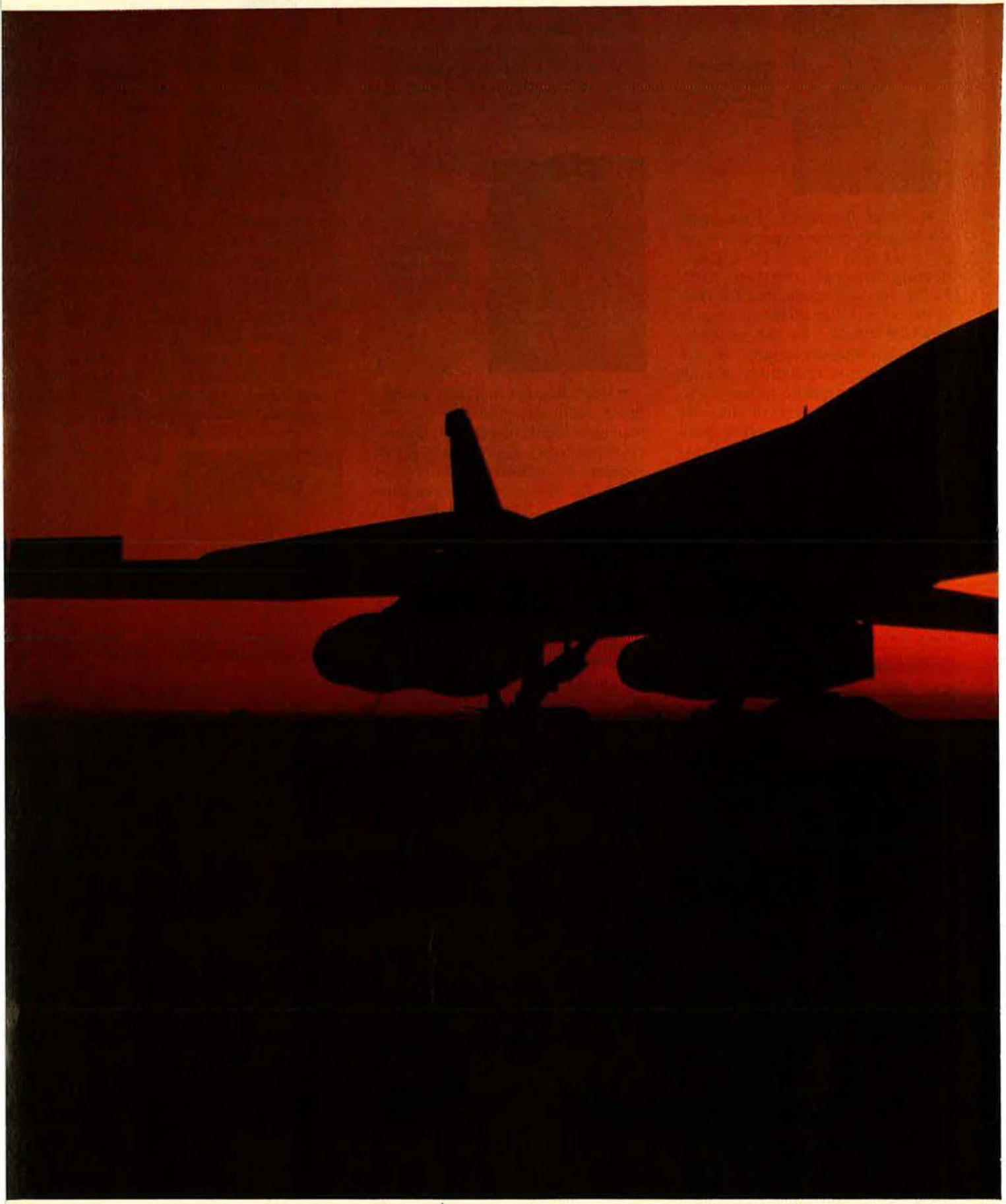
MSgt. Jefferson P. Yoder of Whiteman AFB, Mo.

• **MSgt. Jefferson P. Yoder,** twenty-nine, security specialist, 351st Security Police Squadron, Whiteman AFB, Mo. Sergeant Yoder's new methods for combat readiness reporting were rated best in the SAC wing. His model installation proposal for a squadron reorganization resulted in better operations and an annual savings of $488,000.

A native of Northumberland, Pa., he joined the Air Force in 1973. He is a volunteer dispatcher for a local police department. His fund-raising efforts provided $3,000 for retarded children and $2,000 for a memorial to four security policemen and two helicopter pilots who were killed in the line of duty. He and his wife, Vicki, of Concordia, Mo., have three children. ■

From 1958 to 1964, CMSgt. Charles E. Lucas, USAF (Ret.), was stationed at Hq. USAFE, Ramstein AB, Germany. During this tour, he accompanied US forces to Lebanon, the Congo, and India and served on numerous relief missions and in support of the Berlin Crisis. In 1966, he became editor of the Air Force News Service in the Office of the Secretary of the Air Force. He retired in 1972 and has served since then as a public-affairs officer for the Veterans Administration.

SUNDSTRAND ACTUATION SYSTEMS. A SWEEPING ADVANCE



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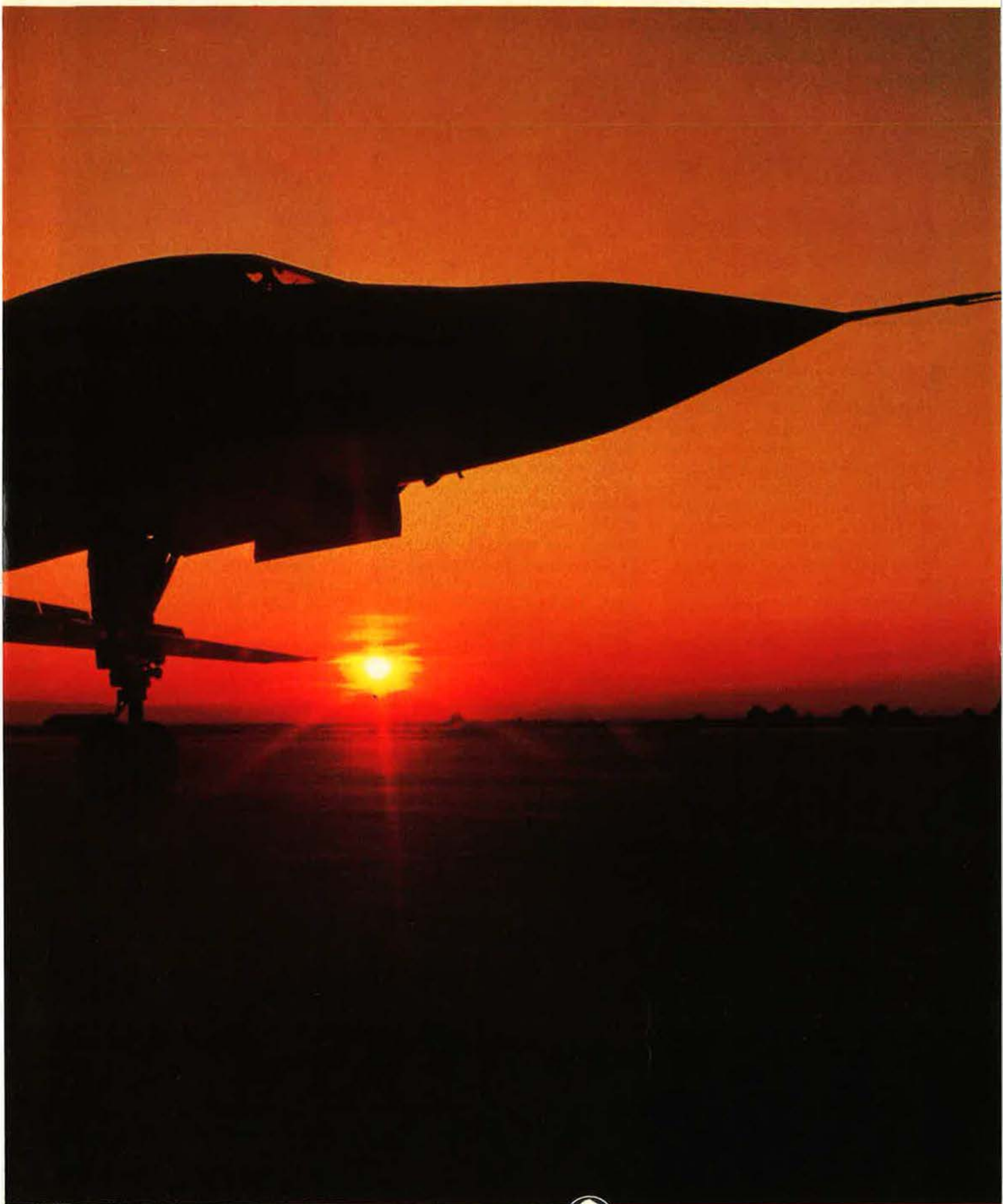

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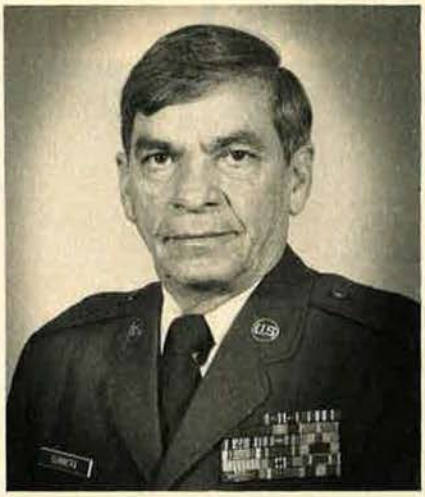
The 1985 Chief Red award winner believes in keeping maintenance standards high.

Decades of Excellence

BY CMSGT. CHARLES E. LUCAS, USAF (RET.)



CMSgt. Burl E. Summers, this year's winner of the Chief Red award.

In reflecting on a thirty-three-year career as an aircraft maintenance technician—thirty years of which were spent in the Air National Guard—the 1985 winner of AFA's Chief Red Maintenance Award, CMSgt. Burl E. Summers, observes that "the Guard today is better supported by the regular Air Force. It realizes now that the Guard is a reliable resource in time of need. We're getting 100 percent support now. That wasn't the case when I came in."

Chief Summers works with the 134th Air Refueling Group at McGhee Tyson Airport, Tenn., and takes justifiable pride in his unit's excellent safety record. "We have not had an accident attributed to maintenance since the unit converted to tanker aircraft in the early '60s. That is the quality of work we perform." In large part, the 1,000-man Tennessee Air National Guard unit near Knoxville performs such quality work because of the standards demanded by Chief Summers, the group's aircraft maintenance manager.

Chief Summers will receive the Chief Red Award at the AFA National Convention. Established last year, the award recognizes an Air National Guard enlisted man for outstanding contributions to aircraft maintenance and honors the memory of CMSgt. Dick Red, whose dedication to aircraft maintenance during a nearly forty-year career with the Arkansas Guard is legendary. Chief Red died in October 1982.

During the Korean War, Chief Summers served a two-year tour of duty as an aircraft mechanic with the Marine Corps, gaining valuable experience. Assignments included duty in Japan in support of combat missions over Korea.

Back in his native Knoxville, the whine of Air Force F-86s enticed civilian Summers to nearby McGhee Tyson Airport in 1955. He was hired as an engine technician. Following deactivation of Air Force units at the base in 1957, Summers signed on as a quality control supervisor with the Air National Guard.

The arrival of F-104 aircraft at McGhee Tyson a year later posed new challenges for Chief Summers. But an even larger challenge loomed—his unit was activated and assigned to Ramstein AB, Germany, during the 1961 Berlin Crisis. During his ten-month active-duty tour, Chief Summers found himself working at bases in Libya, Italy, Norway, and France.

Shortly after returning to Tennessee and ANG status, his unit converted to F-102s. A year later, the group was assigned an air refueling mission, and for the next twelve years, Chief Summers and his maintenance teams serviced KC-97 tankers. During this period, Chief Summers deployed with his unit to Rhein-Main AB, Germany, for annual combat-readiness exercises. In 1976, the 134th reequipped with KC-135 aircraft.

Whatever the mission, whatever the aircraft, Chief Summers responds with excellence. He was instrumental in getting afterburner repair on F-86s changed from depot- to field-level maintenance, thus realizing savings of thousands of dollars. He was directly responsible for ensuring that all quality standards were met in the modification of the upward ejection seats on ANG F-104s. His maintenance acumen is reflected in numerous revisions of technical publications and job guides.

Aircraft conversions and mission changes require frequent and extensive technical training for maintenance men. Despite this heavy training work load, Chief Summers finds time for self-improvement in other areas. He was among the first graduates of the Guard's NCO Academy and was one of the first aircraft maintenance people to be certified in cardiopulmonary resuscitation (CPR). Five months after receiving his CPR certificate, Chief Summers revived his fourteen-year-old son, Danny, who had received a shock from high-tension power lines while performing farm chores. Chief Summers urges all his maintenance people to complete CPR courses. Annual refresher training is mandatory.

Though he never met Chief Red, Chief Summers hopes he can live up to his example. "I am very proud of this award!" declares the Chief. "I'm going to share it with all of those at McGhee Tyson who helped make it possible."

Retirement? Not in the near future, the fifty-six-year-old Summers says. "This award gives me new incentive. There will be time enough later for some carpentry, fishing, and golfing!" ■

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Find out more about our award-winning GPS capabilities. For details, contact: Director of Business Development, Navigation and Range Systems, Interstate Electronics Corporation, P.O. Box 3117, Anaheim, CA 92803. Telephone (714) 758-0500.

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Total Forcemanship

BY MAJ. MICHAEL B. PERINI, USAF

—ANG photo by SSgt. Jacqueline S. Walker

Maj. James F. Barnette of ANG's 112th Tactical Fighter Group, Pittsburgh, Pa., won the 1985 Earl T. Ricks Award for outstanding airmanship.

IN RECOGNITION of exceptional performance by the Air National Guard and Air Force Reserve, AFA presents four special awards each September at the National Convention in Washington, D. C. They are the Earl T. Ricks 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 1985 ANG and AFRES award winners are world-class airmen.

The Ricks Award

"I knew I was coming down pretty fast," recalled Maj. James F. Barnette, a flight commander with the 112th Tactical Fighter Group, Pittsburgh, Pa.

It was September 19, 1984, and Major Barnette was fighting not only for his own life but also for the lives of the citizens of Steubenville, Ohio, 22,000 feet below. The rate of descent for his A-7D, officials later noted, was more than 500 feet for every mile of flight.

The problem appeared ten minutes after takeoff from Greater Pittsburgh IAP on what would have been a night gunnery mission for the flight of two A-7Ds. Major Barnette's aircraft developed engine trouble and loss of thrust. "After the engine blew, I notified the lead aircraft, declared an emergency, and turned back toward Pittsburgh," he said.

An experienced A-7D driver, Major Barnette tried various emergency procedures to get some response out of his aircraft, but his Corsair continued to drop. "I felt sure that I could find an airport even if I couldn't make Pittsburgh," he remembered.

He quickly began dumping fuel. "I am always concerned about punching something off the plane, but I decided to jettison the wing fuel tanks," he said.

The emergency was further complicated when only one tank came off. It soon became apparent that dumping fuel and jettisoning only one wing tank would not reduce the A-7D's weight and drag sufficiently to allow landing in Pittsburgh. Another airport would have to do. As the aircraft continued to fall, this option was quickly eliminated as sparks and thirty-foot flames suddenly burst from the jet's tailpipe.

"The 'Doctor' [Maj. Raymond F. Leanza, who was

piloting the other aircraft] began shouting at me to eject before I got too low," he said. "I was too close to downtown Steubenville, so I decided I would stay with the aircraft until clear of the city."

A daylight ejection is not a desirable event, but, flying at night and below 2,000 feet, Major Barnette placed his life in jeopardy to ensure the safety of the citizens in this small midwest town. "I aimed for the 'Black Hole'—a sparsely populated area with no visible lights," he said.

After his A-7D was well clear of the city, Major Barnette pulled the ejection handles. "It was my first time. The wind blast snapped my head back as I rode up the rails. I came down through trees and landed on a cliff near the Ohio River," he said.

The A-7D crashed 300 yards from him. The Major was not injured.

A DC-9 copilot for US Air, Major Barnette gives credit to Major Leanza. "It is so important for wingmen to stress that one should get out of the aircraft. It is so easy to delay and delay," he said. "Doctor was there all the way, making sure I'd survive."

Major Barnette was invited back to Steubenville recently, where the citizens honored him for his heroism and concern for their town.

Members of North Carolina's 145th Tactical Airlift Group at Charlotte take to the field. The 145th TAG's impressive record won it in the ANG Outstanding Unit Award for 1985.

A maintenance crewman of the 452d Air Refueling Wing, March AFB, Calif., works on a KC-135's engine. The SAC-dedicated 452d won the AFRES Outstanding Unit Award.

ANG Outstanding Unit

The Air National Guard Outstanding Unit Award for 1985 goes to North Carolina's 145th Tactical Airlift Group stationed at Charlotte, N. C.

According to ANG officials, the group racked up an impressive record of achievements during the past year, including outstanding inspection evaluations, a superior aircraft safety record, top-notch recruiting and retention results, and excellent training accomplishments.

Last year, the unit flew 872 missions, logged more than 3,900 hours, transported some 3,000,000 pounds of cargo, and delivered 11,694 passengers. Also, the 145th had the Modular Airborne Fire Fighting System responsibility for the eastern US.

With twenty-six consecutive years of accident-free flying, the unit is justifiably proud of its safety record. As of December 1984, the unit had accumulated 114,024.1 accident-free flying hours.

During 1984, the group deployed to twelve locations around the world and participated in several major US military exercises. At Red Flag in August 1984, the unit's C-130s did not miss a single mission for maintenance or mechanical problems. Group personnel and aircraft participated in Volant Oak—resupply missions for US government offices in Central and South America.

The group received the Air Force Outstanding Unit Award for "exceptionally meritorious service" from June 1982 to June 1984. Also, the group's 145th Mobile Aerial Port Squadron was selected for the second time as the Outstanding Air Reserve Forces Mobile Aerial Port Squadron of the Year in Twenty-Second Air Force and Military Airlift Command.

The 145th is compiling an impressive record in humanitarian airlift. It delivered more than 100,000 pounds of disaster relief supplies to tornado-striken areas and, in another emergency, airlifted special vehicles to contain an explosive toxic chemical situation at a train derailment.

Recruiting results for the group were 102.8 percent of the goal, fourth best among ANG units. Their retention rate of eighty-four percent exceeds the National Guard Bureau goal.

More than 120 federal and state awards were earned by unit personnel during 1984. "Standards of excellence and commitment to be the best unit in the Air Guard have accounted for much of our success," said Col. William T. Bundy, Jr., 145th Commander.

AFRES Outstanding Unit

Receiving this year's Air Force Reserve Outstanding Unit Award is a SAC-dedicated aerial refueling unit, the 452d Air Refueling Wing headquartered at March AFB, Calif. The unit also received this special AFA award in 1977, 1981, and 1983.

The unit has been a pioneering force in the air refueling mission for the Air Force Reserve. Between April 1984 and March 1985, wing KC-10As and KC-135s logged 17,340 flying hours and delivered more than 70,000,000 pounds (that's 11,000,000 gallons) of fuel to 9,248 aircraft from all major Air Force commands, the US Navy, the Marine Corps, and the German Air Force.

The 452d, AFRES's largest flying unit, continued to support operations in the Middle East in 1985. Also, the

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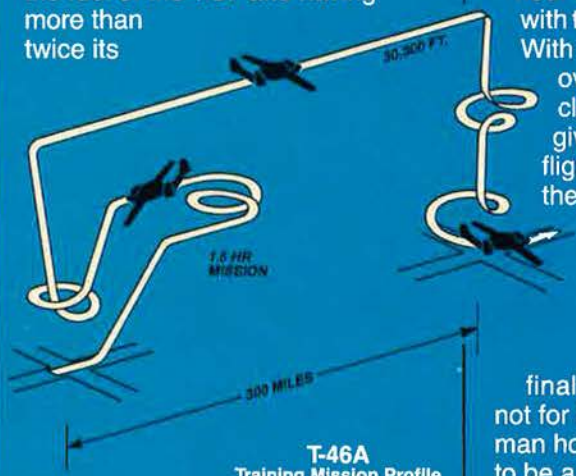
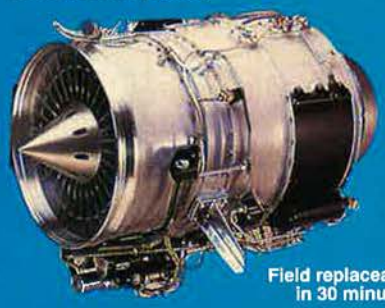


T-46A
Training Mission Profile

Twin Garrett F109-GA-100 turbo fans push the agile trainer to 450+ MPH top speed. The engines' 18,000 hour operating life is consistent with the 20,000 hour airframe life. With a 40% greater efficiency over other engines in their class, the Garrett power plants give the T-46A an expanded flight envelope and help ease the transition to advanced first line fighters such as the F-15 (as opposed to performance-limited single engine turbo props).

And when the T-46A finally comes down to earth, it's not for long, because maintenance man hours per flight hour project to be a mere 4.5.

The USAF needed a safe, high performance trainer without a high price tag. In the 650 T-46As entering production in 1986, they'll get precisely what they need for tomorrow's pilots.



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For complete information on the T-46A, write to: Marketing Director, Fairchild Republic Company, Farmingdale, New York 11735, or call (516) 531-2464.

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unit provided air refueling support for the USAF Thunderbirds on their 1984 deployment to Europe.

In October 1984, one of the wing's KC-10s escorted seven F-15s from Kadena AB, Japan, to Tyndall AFB, Fla., for exercise William Tell. The 7,000-mile nonstop flight lasted more than fourteen hours.

The wing's 336th Air Refueling Squadron (AREFS) at March AFB, Calif., has had a perfect flying safety record for more than thirty-six years. The 314th AREFS at Mather AFB, Calif., has been accident-free since May 1979. The 72d AREFS, based at Grissom AFB, Ind., has had a clean accident record since its inception in July 1978. "Despite flying in areas as diverse as the Egyptian desert and the South Pole, neither KC-10 associate unit has had an accident," AFRES points out.

The 452d and its 4,500 people have an Air Force-wide reputation for efficiency and professionalism that is directly reflected by awards and recognition from USAF, SAC, and Fifteenth and Eighth Air Forces. The unit attained excellent results during a SAC operational readiness inspection. SAC officials rated the battle staff, aircraft generation statistics, mission effectiveness, combat mission folders, and communications support very high. The unit got outstanding marks in the AFRES Management Effectiveness Inspection.

In addition, a combat evaluation group inspection held in December 1984 resulted in another "outstanding" evaluation for both KC-135 and KC-10 crews. The unit was given AFRES's highest scores ever. The wing's 78th AREFS and their Associate unit, the 32d AREFS at Barksdale AFB, La., earned the McDonnell Douglas Trophy for the highest point total for a KC-10 team at the 1984 SAC Bombing and Navigation Competition.

A wing-wide aviation fuel conservation program is expected to save an estimated $3,575,000 annually, based on a fuel cost of $1.30 per gallon. In the first nine months of 1984, the 336th AREFS at March AFB saved more than $655,000—a sum exceeding the squadron's payroll for that same period.

Also, 452d units have undertaken community service projects in both the US and Canada. These include conducting employer orientation flights, participating in the Toys for Tots Program, and fingerprinting more than 500 children at local shopping malls so that they can be positively identified in case of abduction.

The President's Award

"My God, this time it really could happen!" thought Maj. John H. Taylor, Jr., of the 302d Tactical Airlift Wing and commander of the Peterson AFB, Colo., crew that received this year's award.

Major Taylor had survived other in-flight emergencies in fourteen years of flying the C-130 Hercules. But the situation on September 30, 1984, was so improbable that the flight manual offered no guidance for recovery. "In a few more seconds, we would have rolled the transport over," Major Taylor said.

Immediately after takeoff from St. Joseph Municipal Airport, Mo., on a practice airdrop mission, the C-130B lost aileron control when a retainer securing the aileron cables failed.

With the aircraft at only 200 feet of altitude and in a left turn approaching forty to fifty percent bank, the crew had only seconds to respond. "We confirmed the symptoms of the malfunction and attempted to control the aircraft's roll using rudder inputs and differential power," Major Taylor said.

Flying wing in the formation, the C-130B was receiving considerable wake turbulence from the lead aircraft, requiring instantaneous, instinctive rudder and throttle inputs from the pilots.

Reacting with speed and creativity, the crew discovered that the aileron trim controls were operational and could be used to turn the aircraft. Because of the slow response of the trim and the great potential for overcontrolling the aircraft, use of the trim to turn the airplane presented extraordinary difficulties. "The aircraft felt like a pig," Major Taylor said.

Major Taylor and copilot Lt. Col. Jim L. Folsom used the control column and throttles to control the aircraft's airspeed, pitch, and altitude and managed directional control with trim and rudder and differential throttle inputs. While the pilots were busy, the navigator, Capt. Wesley G. Langland, identified possible landing sites. MSgt. Richard A. Dickow, flight engineer, and loadmasters SSgt. Marshall H. Hopkins and SSgt. Jerome M. Skiles attempted to identify the source of the malfunction.

—USAFR photo by SrA. Dave Pettinari

This topnotch C-130B crew from the 302d Tactical Airlift Wing, Peterson AFB, Colo., won the AFA President's Award. Pictured are, from left, Lt. Col. Jim Folsom, copilot; Maj. Jack Taylor, pilot; SSgts. Marshall Hopkins and Jerry Skiles, loadmasters; Capt. Wes Langland, navigator; and MSgt. Dick Dickow, flight engineer.

The crew made a careful turn back to the airport and elected to land on a runway aligned with their heading. Lowering flaps and landing gear created considerable air disturbances, which altered the trim and handling of the aircraft. Variable crosswinds presented additional difficulties, but the crew managed to bring down the aircraft safely.

Major Taylor attributed the successful recovery of the C-130B to the crew's experience and coordination. "If any link in the human chain had broken, we would have died," he said.

Major Taylor is a flight instructor for TWA, and Colonel Folsom is his boss—manager of TWA's 727 flight engineer training program. Captain Langland is a reserve technician for the unit. Sergeant Dickow is a civilian technician for the 302d TAW, and Sergeant Skiles is also a reserve technician. Sergeant Hopkins is the squadron loadmaster and runs his own steam railroad line in Colorado. ■

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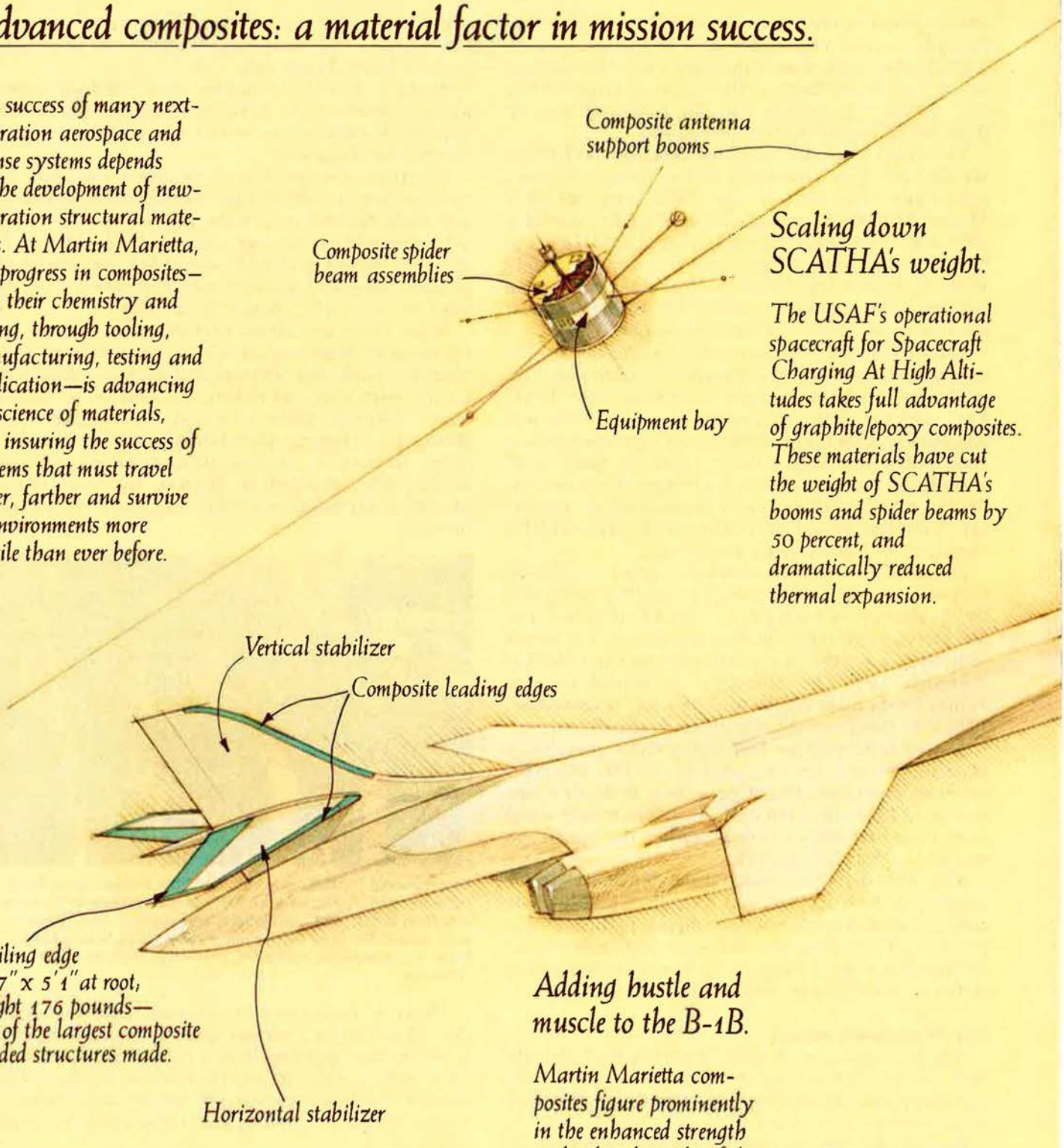

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The USAF's operational spacecraft for Spacecraft Charging At High Altitudes takes full advantage of graphite/epoxy composites. These materials have cut the weight of SCATHA's booms and spider beams by 50 percent, and dramatically reduced thermal expansion.

Adding hustle and muscle to the B-1B.

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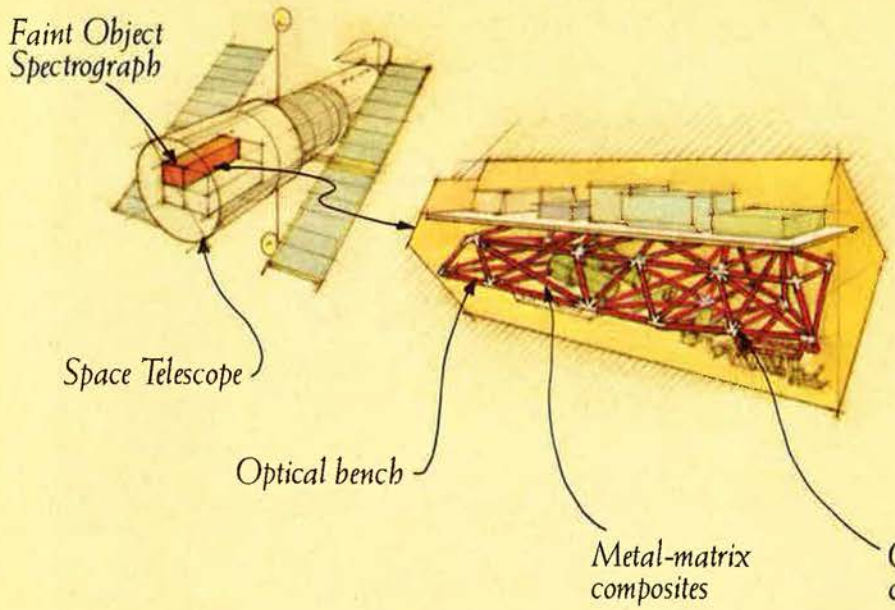
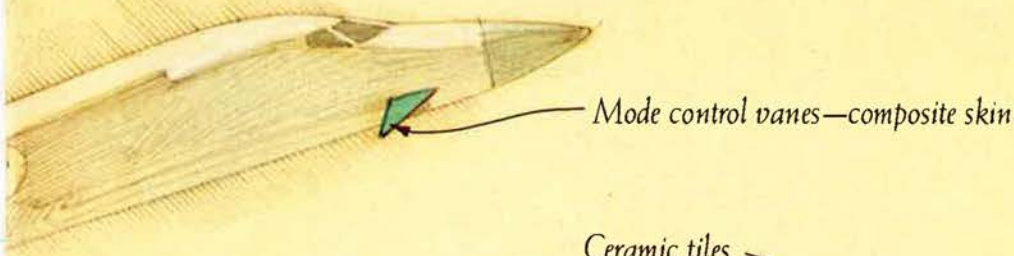
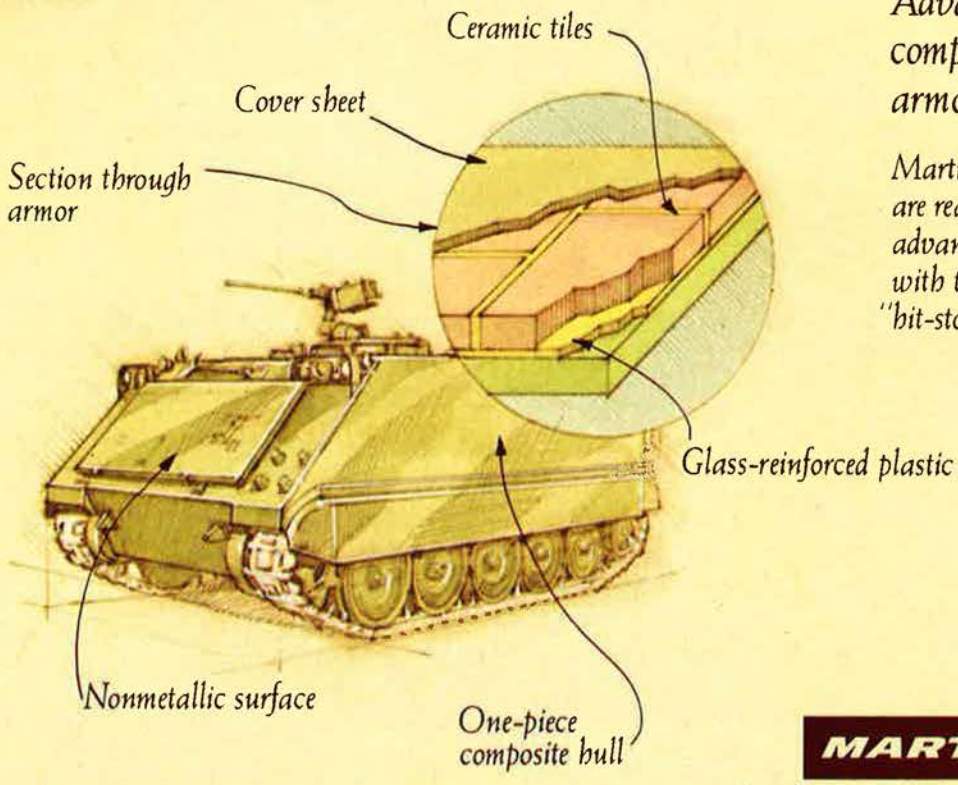


High-dimensional stability for the FOS.

The Faint Object Spectrograph relies on Martin Marietta metal-matrix composites to provide a dimensionally-stable optical bench, which will enable NASA's Space Telescope to accurately measure light from distant galaxies and stars.





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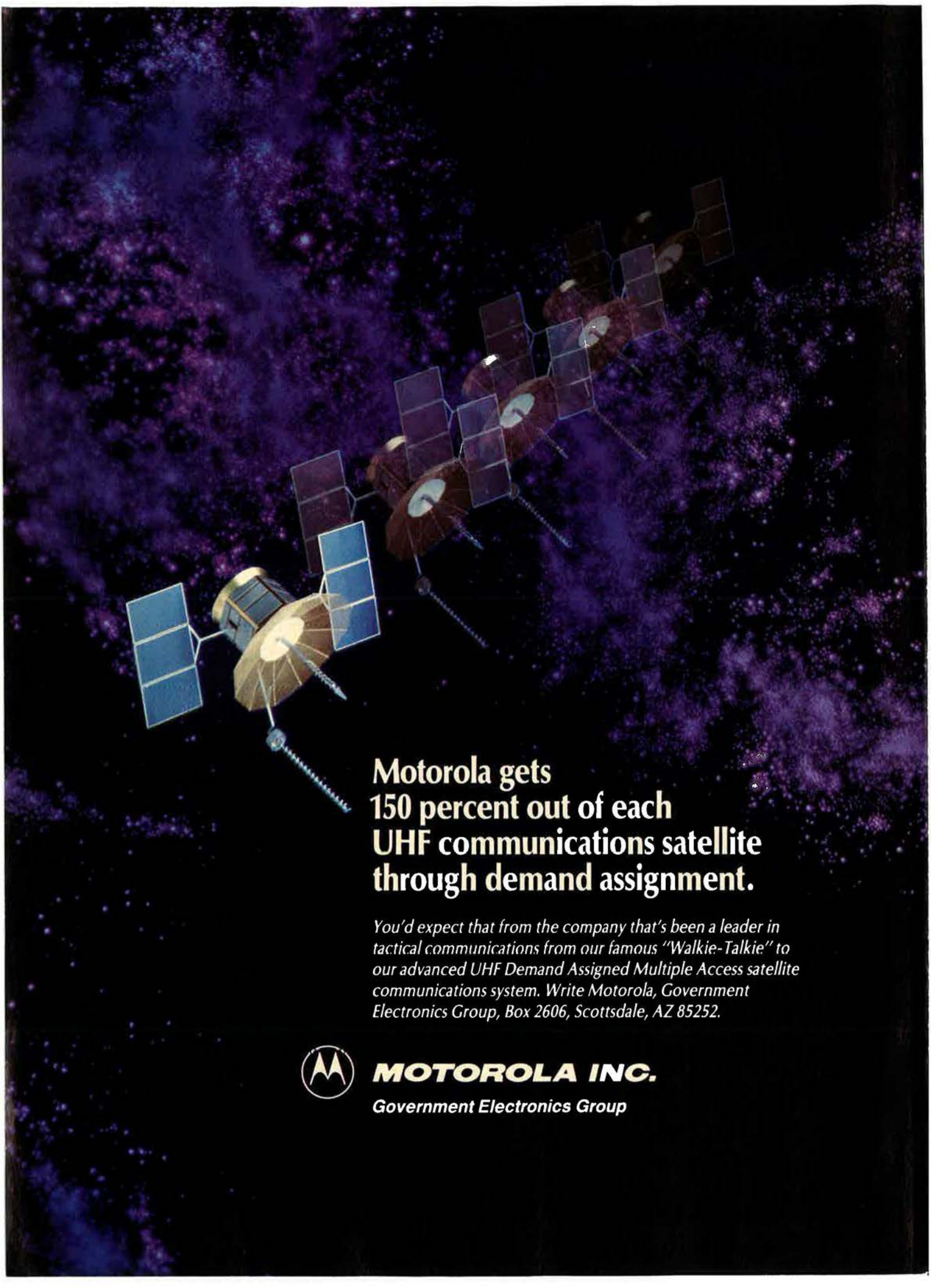

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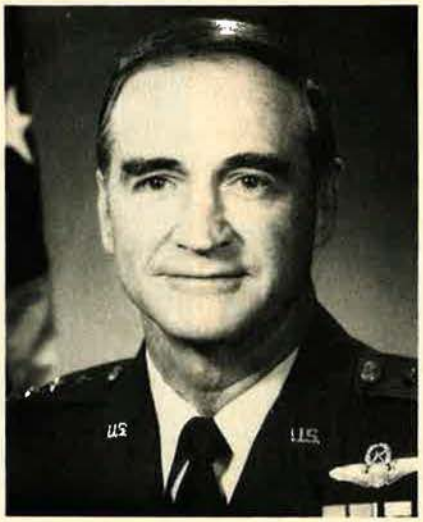

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Eglin AFB, Fla.

USAF Tactical Fighter Weapons Ctr.
Maj. Gen. Eugene H. Fischer
Nellis AFB, Nev.

USAF Air Defense Weapons Ctr.
Brig. Gen. Richard A. Pierson
Tyndall AFB, Fla.

28th Air Div.
Brig. Gen. William K. James
Tinker AFB, Okla.

United States Air Forces in Europe (USAFE)

Hq. Ramstein AB, Germany

Gen. Charles L. Donnelly, Jr.
Commander in Chief

CMSgt. John R. McCauslin
Senior Enlisted Advisor

Deputy CINCUSAFE for Southern Area and COMAIRSOUTH
Lt. Gen. James R. Brown
Naples, Italy

3d Air Force
Maj. Gen. Thomas G. McInerney
RAF Mildenhall, England

16th Air Force
Maj. Gen. William A. Gorton
Torrejon AB, Spain

17th Air Force
Maj. Gen. William J. Breckner, Jr.
Sembach AB, Germany

TUSLOG
Maj. Gen. Ralph E. Havens
Ankara AS, Turkey

65th Air Div.
Brig. Gen. John C. Scheidl, Jr.
Sembach AB, Germany

316th Air Div.
Brig. Gen. Cecil W. Powell
Ramstein AB, Germany

USAF's Separate Operating Age

Air Force Accounting and Finance Center

Hq. Lowry AFB, Colo.

Brig. Gen. Daniel B. Geran
Commander

CMSgt. Michael K. Thompson
Senior Enlisted Advisor

Air Force Commissary Service

Hq. Kelly AFB, Tex.

Brig. Gen. M. Gary Alkire
Commander

CMSgt. Glenn H. Lewis
Senior Enlisted Advisor

Air Force Inspection and Safety Center

Hq. Norton AFB, Calif.

Maj. Gen. Fred A. Haeffner
Commander
(effective Aug. 31, 1985)

CMSgt. Ronald L. Rude
Senior Enlisted Advisor

Air Force Legal Services Center

Hq. Washington, D. C.

Maj. Gen. Robert W. Norris
Commander
(effective Sept. 1, 1985)

CMSgt. Jerry L. Becker
Senior Enlisted Advisor

Air Force Manpower and Personnel Center

Hq. Randolph AFB, Tex.

Maj. Gen. J. B. Davis
Commander

CMSgt. Arthur C. Shelton
Senior Enlisted Advisor

Air Force Audit Agency

Hq. Norton AFB, Calif.

J. H. Stolarow
Auditor General

Brig. Gen. Basil H. Pflumm
Commander
Deputy Auditor General
(Detailed to the Pentagon)

Air Force Engineering and Services Center

Hq. Tyndall AFB, Fla.

Col. Robert G. Gilbert
Commander

CMSgt. Norman F. Karaszewski
Senior Enlisted Advisor

Air Force Intelligence Service

Hq. Washington, D. C.

Maj. Gen. (Lt. Gen. selectee)
Leonard H. Perroots
Commander

CMSgt. Roger Loughry
Senior Enlisted Advisor

Air Force Management Engineering Agency

Hq. Randolph AFB, Tex.

Col. David P. Lohmann
Commander

CMSgt. James W. Garrison
Senior Enlisted Advisor

Air Force Office of Medical Support

Hq. Brooks AFB, Tex.

Col. Harold W. Grinstaff
Commander

CMSgt. Daniel E. Chapman
Senior Enlisted Advisor

ncies

Air Force Office of Security Police

Hq. Kirtland AFB, N. M.

Brig. Gen. P. Neal Scheidel
Commander

CMSgt. Robert C. Agee
Senior Enlisted Advisor

Air Force Operational Test and Evaluation Center

Hq. Kirtland AFB, N. M.

Maj. Gen. Richard W. Phillips, Jr.
Commander

CMSgt. Raymond F. Enright
Senior Enlisted Advisor

Air Force Service Information and News Center

Hq. Kelly AFB, Tex.

Col. Paul F. Heye
Commander

CMSgt. David A. Sheeder
Senior Enlisted Advisor

Air Force Office of Special Investigations

Hq. Bolling AFB, D. C.

Brig. Gen. Richard S. Beyea, Jr.
Commander

CMSgt. Roy T. Day
Senior Enlisted Advisor

Air Force Reserve

Hq. Robins AFB, Ga.

Maj. Gen. Sloan R. Gill
Commander

CMSgt. Henry J. Scott
Senior Enlisted Advisor

Air Reserve Personnel Center

Hq. Denver, Colo.

Col. Franklin E. Glass, Jr.
Interim Commander

Direct Reporting Units

Air Force Academy

Colorado Springs, Colo.

Lt. Gen. Winfield W. Scott, Jr.
Superintendent

CMSgt. Larry L. Vance
Senior Enlisted Advisor

Air National Guard

Hq. Washington, D. C.

Maj. Gen. John B. Conaway
Director

CMSgt. Bernard E. Carbon
Senior Enlisted Advisor

Air Force Technical Applications Center

Patrick AFB, Fla.

Col. Richard J. O'Lear
Commander

CMSgt. John T. Horsch
Senior Enlisted Advisor

USAF Historical Research Center

Maxwell AFB, Ala.

Lloyd H. Cornett, Jr.
Director

Air Force Generals Serving in Joint and International Slots

FOUR STARS

Gen. John T. Chain, Jr.
Chief of Staff, SHAPE
Mons, Belgium

Responsible for reviewing and recommending policies to SACEUR that affect the operational capability of forces assigned from member nations of NATO to Allied Command Europe, in addition to directing, coordinating, and supervising all activities of the SHAPE staff.

Gen. Richard L. Lawson
Deputy Commander in Chief,
US European Command
Vaihingen, Germany

Responsible for ensuring maximum combat readiness of forces assigned to subordinate commands and advises USCINCEUR on the formulation of policy for the conduct of combat operations within the entire European theater.

THREE STARS

Lt. Gen. James A. Abrahamson
Director, Strategic Defense Initiative Organization
Office of the Secretary of Defense
Washington, D. C.

Program Director for the nation's strategic defense effort, with a goal of developing and deploying an effective defense against ballistic missiles.

Lt. Gen. James R. Brown
Commander, Allied Air Forces Southern Europe
Deputy Commander in Chief, USAFE,
for the Southern Area
Naples, Italy

Conducts air operations and manages the total Southern Region land-based air resources in support of the region's NATO nations.

Lt. Gen. Edgar A. Chavarrie
Deputy Assistant Secretary of Defense for
Military Personnel and Force Management
Office of the Secretary of Defense
Washington, D. C.

Principal advisor to the Assistant Secretary of Defense (Manpower, Installations and Logistics) on policy matters affecting active-duty and retired military personnel and their dependents. Primary mission is to pursue manpower and compensation policies that are in the best national interest and that meet service needs.

Lt. Gen. Philip C. Gast
Director, Defense Security Assistance Agency
Office of the Secretary of Defense
Washington, D. C.

Manages activities relating to the transfer of US defense equipment, services, and military education and training by sale or grant to friendly countries.

Lt. Gen. Harry A. Goodall
Deputy Commander in Chief,
US Readiness Command
Vice Director, Joint Deployment Agency
MacDill AFB, Fla.

Assists CINCREDCOM in providing a general reserve of combat-ready forces to reinforce other unified commands, and in mobilization planning for a unified command comprised of all CONUS-based major combatant general-purpose Army and Air Force forces.

Lt. Gen. Jack I. Gregory
Chief of Staff, Combined Forces Command
Deputy Commander US Forces, Korea
Deputy Commander in Chief UN Command, Korea
Seoul, South Korea

As the second senior military representative in the Republic of Korea, he assists CINCUNC in exercising combined command of UN Forces and is the senior US representative in Status of Forces Agreement negotiations.

Lt. Gen. Alfred G. Hansen
Director, J-4
Joint Chiefs of Staff
Washington, D. C.

Advises the JCS Chairman on joint and combined worldwide logistics/transportation matters, and evaluates the capabilities of joint and specified commands to logistically support current operational activities, contingency operations, and plans.

Lt. Gen. Winston D. Powers
Director, Defense Communications Agency
Washington, D. C.

Coordinates and manages all United States defense communications requirements.

Lt. Gen. John L. Pickitt
Director, Defense Nuclear Agency
Washington, D. C.

Provides support, staff advice, and consolidated management of all US nuclear weapons, stockpiles, testing, and research.

Lt. Gen. Herman O. Thomson
Director, J-5
Joint Chiefs of Staff
Washington, D. C.

Responsible for JCS planning, formulation, and analysis of US worldwide defense policy.

OFFICE OF THE SECRETARY OF DEFENSE

Maj. Gen. Stuart H. Sherman, Jr.
Deputy Ass't Secretary of Defense for
Guard/Reserve Manpower and Personnel
Office of the Secretary of Defense
Washington, D. C.

Serves as the principal staff assistant and advisor to the Assistant Secretary of Defense, Reserve Affairs, with specific responsibility for overall supervision and the development, evaluation, and implementation of policies for Guard/Reserve manpower, personnel, and compensation.

Maj. Gen. Claudius E. Watts III
Senior Military Assistant to the
Deputy Secretary of Defense
Office of the Secretary of Defense
Washington, D. C.

Serves as the Executive Assistant to the Deputy Secretary of Defense, advising and assisting him in all areas encompassing the entire range of defense responsibilities and national security affairs.

OFFICE OF THE JOINT CHIEFS OF STAFF

Maj. Gen. Donald O. Aldridge
JCS Representative for START
Joint Chiefs of Staff
Washington, D. C.

Represents the Joint Chiefs of Staff at the International Strategic Arms Reduction Talks held in Geneva, Switzerland, works closely with the Joint Staff and the military services in preparing negotiating positions, and participates in on-site discussions.

Maj. Gen. Thomas C. Brandt
Chief, Joint Planning Staff for Space
Joint Chiefs of Staff
Washington, D. C.

Recommends policy to the JCS Chairman and to the Director of the Joint Staff in relation to the technical aspects of space systems development, employment, and integration into the national defense effort.

Maj. Gen. Bradley C. Hosmer
Vice Director, Joint Staff
Joint Chiefs of Staff
Washington, D. C.

Responsible for assisting the Director of the Joint Staff in supervising, coordinating, and administering the work of the Joint Staff, and for providing guidance to certain specialized activities of the Organization of the Joint Chiefs of Staff.

Maj. Gen. John P. Hyde
Deputy Director for Defense-wide C^3 Support
Joint Chiefs of Staff
Washington, D. C.

Responsible for assuring the integrity, compatibility, evolutionary capability and technical efficiency of all defense-wide communications systems employed in support of command and control requirements designated by the Secretary of Defense.

USCENTCOM/JDA/USREDCOM

Maj. Gen. Leon W. Babcock, Jr.
Director, J-5 (Plans and Policy), and
Inspector General, US Readiness Command
MacDill AFB, Fla.

Principal advisor to CINCREDCOM on plans, policies, tactics, and procedures for rapid and effective deployment of combat-ready forces.

Maj. Gen. Archer L. Durham
Director of Deployment
Joint Deployment Agency
MacDill AFB, Fla.

Directs worlwide joint service mobilization deployment planning and coordination for the Joint Chiefs of Staff.

Maj. Gen. Davis C. Rohr
Deputy Commander in Chief
US Central Command
MacDill AFB, Fla.

Deputy Commander in Chief of a Unified Command responsible for US military and security interests in a nineteen-country area in the Persian Gulf, Horn of Africa, and southwest Asia.

Maj. Gen. Russell L. Violett
Chief, United States Military Training Mission
Dhahran, Saudi Arabia
(effective Sept. 1, 1985)

Responsible for coordination and integration of all military aspects of the US security assistance program to Saudi Arabia.

NATO/SHAPE/EUCOM

Maj. Gen. Louis C. Buckman
Chief of Staff, AIRSOUTH
Hq. Allied Forces Southern Europe
Naples, Italy

Assists COMAIRSOUTH in conducting air operations and managing the total southern region land-based air resources in support of the defense and preservation of the integrity of NATO nations in the southern region.

Maj. Gen. Thomas L. Craig
Director, J-5, (Plans and Policy)
US European Command
Vaihingen, Germany

Develops plans, programs, and policies on all matters pertaining to war plans, force structure, and other elements of JCS support by USCINCEUR in coordination with other unified and specified commands.

Maj. Gen. Larry D. Dillingham
Deputy Commander, 6th Allied Tactical Air Force
Izmir, Turkey

Assists the Commander, 6ATAF, as the head of a multinational air force that conducts air operations in support of ground forces and provides air defense of the southeastern NATO region.

Maj. Gen. Ralph E. Havens
Commander, TUSLOG
Ankara, Turkey

Designated by CINCUSAFE as in-country point of contact for all USAFE matters.

Maj. Gen. Edward J. Heinz
Director, J-2, (Intelligence)
US European Command
Vaihingen, Germany

As the senior US military intelligence officer in the European theater, he is responsible for providing intelligence support to USCINCEUR, formulating intelligence plans, policies and programs, and overall management of joint/combined theater intelligence activities.

Maj. Gen. Gerald D. Larson
DCS Air, AFNORTH
Hq. Allied Forces Northern Europe
Kolsaas, Norway

Principal advisor to AFNORTH on all allied air operations in the command.

Maj. Gen. Randall D. Peat
Assistant Chief of Staff, Operations, SHAPE
Mons, Belgium

Responsible for assisting in the development and implementation of operational and contingency plans and formulation of force requirements for Allied Command Europe.

PACIFIC COMMAND

Maj. Gen. Walter C. Schrupp
Deputy Chief of Staff
Hq. Pacific Command
Camp Smith, Hawaii

Assists the Chief of Staff, PACOM, in supporting CINCPAC mission to advance the national policies and interests of the US in the Pacific and Indian Ocean areas, to include assisting in the preparation of plans, conduct of operations and exercises, and coordination of all PACOM assigned and gained forces.

SOUTHERN COMMAND

Maj. Gen. Henry D. Canterbury
Deputy Commander in Chief, USSOUTHCOM
Commander, US Southern Air Division, TAC
Howard AFB, Panama

As Deputy CINC, Southern Command, responsible for all joint military matters in Latin America; as Commander of USAF Southern Air Division, responsible for USAF support to Southern Command.

FEDERAL AND DEFENSE AGENCIES

Maj. Gen. Schuyler Bissell
Deputy Director
Defense Intelligence Agency
Washington, D. C.

Assists the Director of DIA in providing timely military intelligence upon which long-range military plans are formulated.

Maj. Gen. Lawrence D. Garrison
Commander, Defense Construction Supply Center
Defense Logistics Agency
Columbus, Ohio

Responsible for managing a worldwide distribution of repair parts for all military weapon systems, including aircraft, ships, submarines, automotive vehicles, missiles, and construction materials.

Maj. Gen. Paul H. Hodges
Director, Inter-American Defense College
Fort McNair, Washington, D. C.

Responsible for the conduct of senior executive level courses of study and associated research in the management of resources in the interest of national security to enhance the preparation of senior military officers and career civilian officials for positions of high trust in the federal government.

Maj. Gen. Donald P. Litke
Deputy Director (Acquisition Management)
Defense Logistics Agency
Cameron Station, Va.

Responsible for the agency's worldwide contracting activities to include providing all services and DIA a wide range of technical and administrative contract support.

Maj. Gen. Joe P. Morgan
Executive Director, Quality Analysis
Defense Logistics Agency
Cameron Station, Va.

Principal staff advisor for the development and application of major policies, plans, programs, and procedures relating to quality and reliability analysis of major systems, equipment, supplies, and services procured on government contracts.

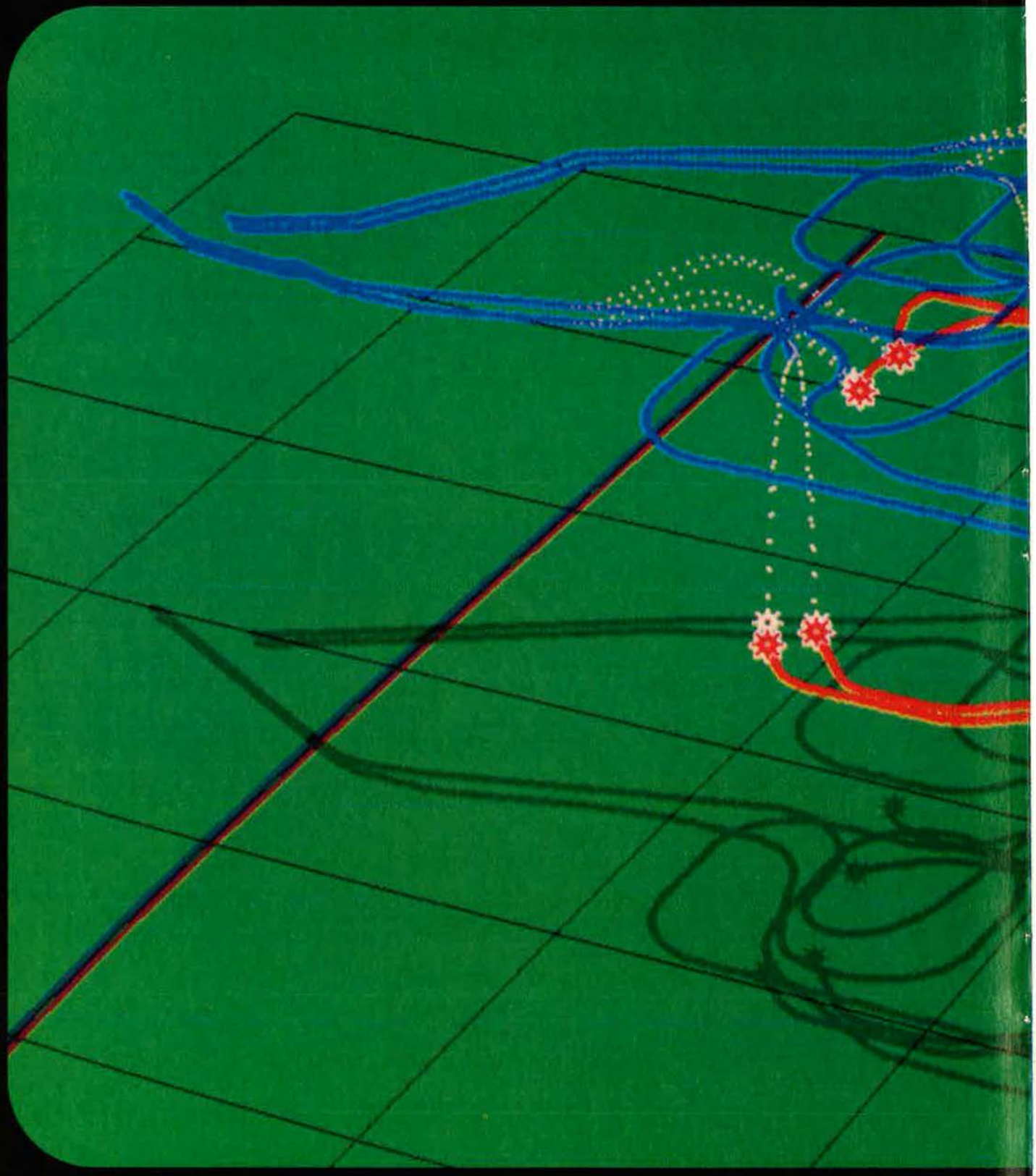
Maj. Gen. Robert A. Rosenberg
Director, Defense Mapping Agency
US Naval Observatory, Washington, D. C.

Responsible for providing support to the Secretary of Defense, the military departments, the JCS, and other DoD components on matters concerning mapping, charting, and geodesy. Coordinates all plans, programs, and policies affecting DoD MC&G resources and activities.

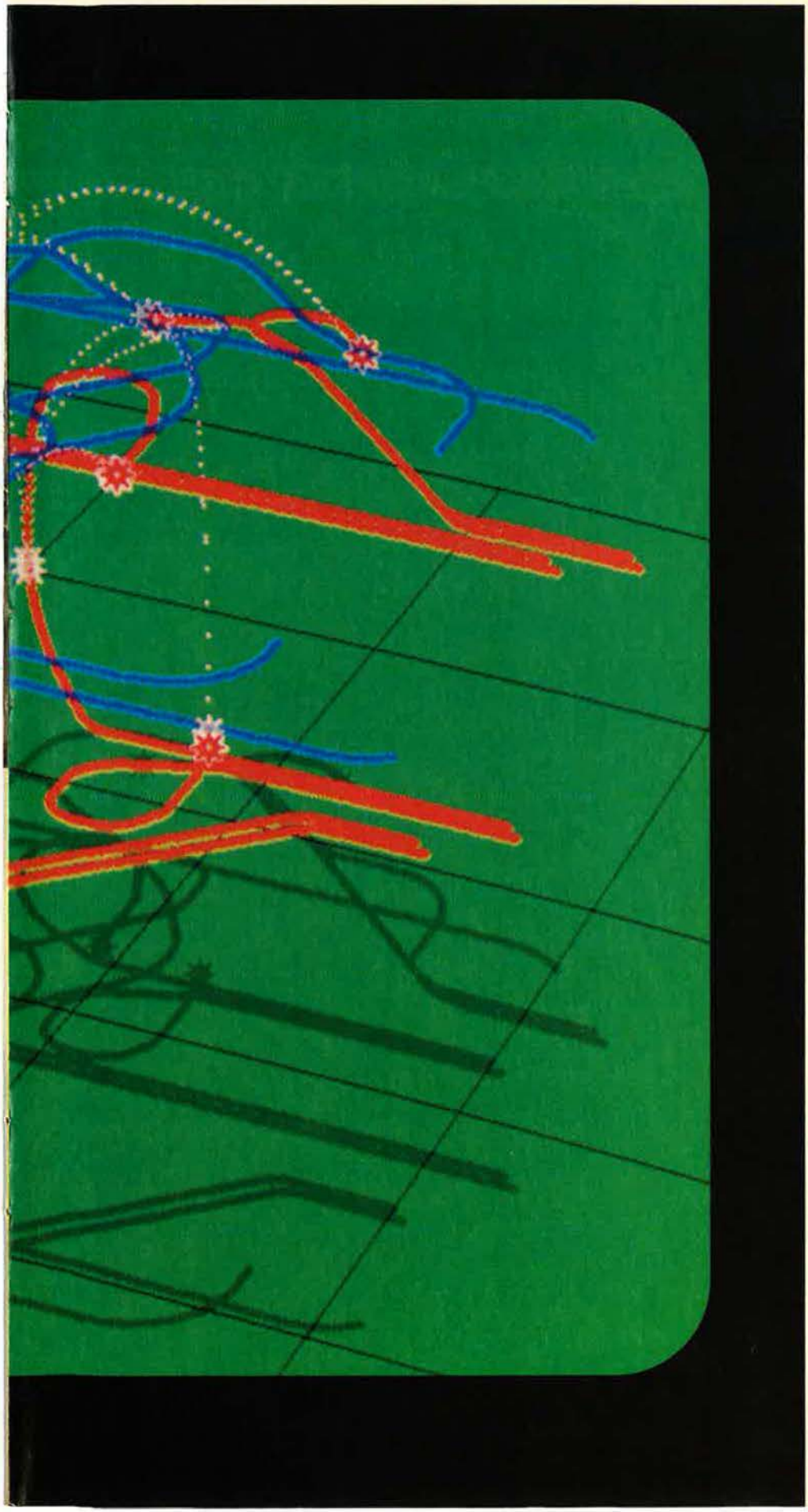
Maj. Gen. Perry M. Smith
Commandant
National War College
Fort McNair, Washington, D. C.

Commands the NWC, which prepares senior US military and State Department officers for the planning and formulation of high-level national strategy.

ONLY ONE PLANE HAS WON 632



DOGFIGHTS WITH THE SOVIET SU-27. THE BOEING ATF.



You are looking at a computer graphic of an air battle between an advanced tactical fighter (ATF) designed by Boeing and a Soviet fighter of the future.

This dogfight took 450 seconds to complete. And although it involved twelve aircraft and eight direct hits, not one plane left the ground. Not one life was lost.

This combat encounter is just one of hundreds simulated on the Boeing Air Battle Computer. It lets us test various designs of *any* plane in combat against *any* opponent.

For the Boeing ATF, we have explored how various wing designs will affect speed and signature. How speed will affect maneuverability and performance. And, perhaps most important of all, how final design will affect winning and losing.

We are using the Air Battle Computer to integrate current research, as well as technological developments from the 325 advanced fighter contracts that Boeing has won in the last ten years.

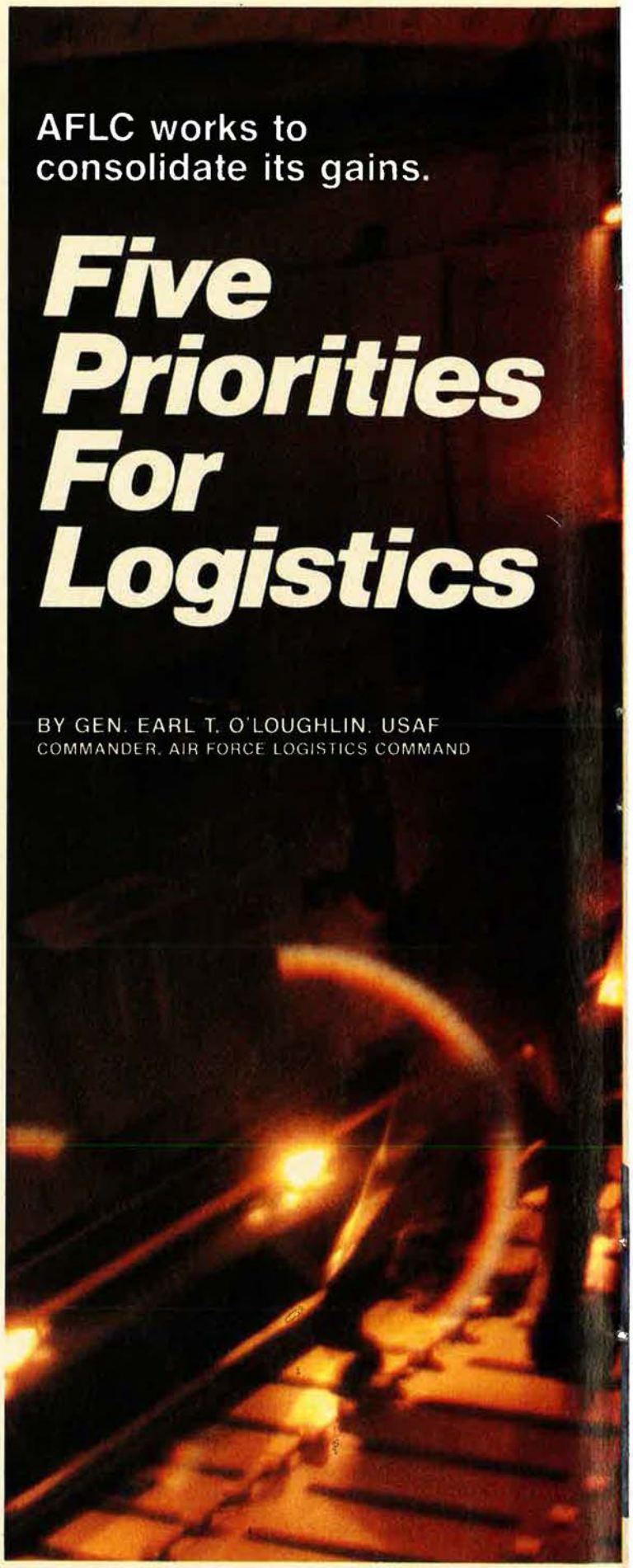
The result: An advanced tactical fighter design that outperforms the Soviet fighters. Every time.

BOEING

AFLC works to consolidate its gains.

Five Priorities For Logistics

BY GEN. EARL T. O'LOUGHLIN, USAF
COMMANDER, AIR FORCE LOGISTICS COMMAND

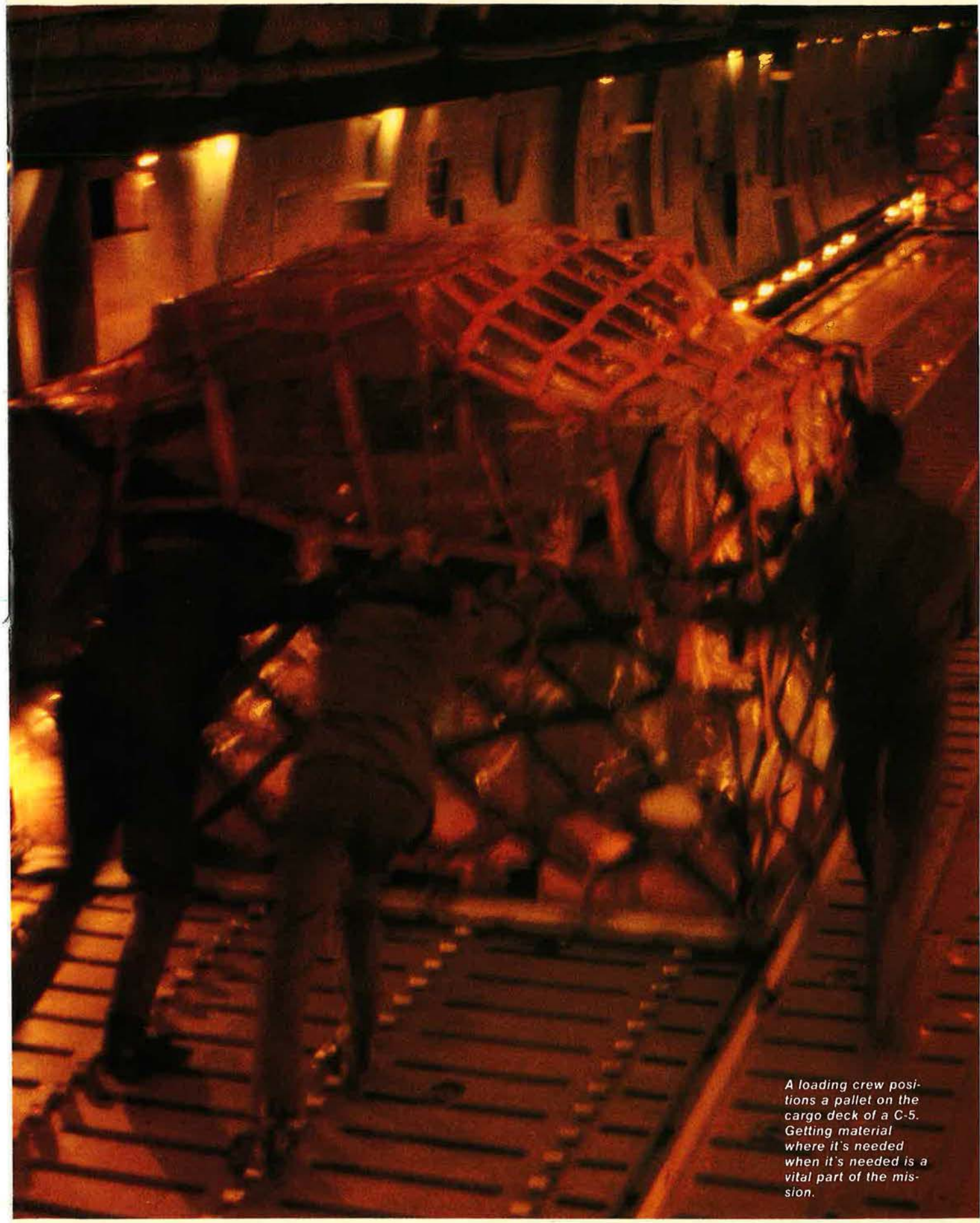


IN RECENT years, the Air Force Logistics Command (AFLC) has aggressively pursued numerous initiatives to upgrade its logistics processes and to make them responsive to wartime needs. Many of these initiatives take advantage of new and emerging technologies that promise state-of-the-art improvements in the way logistics operations are conducted.

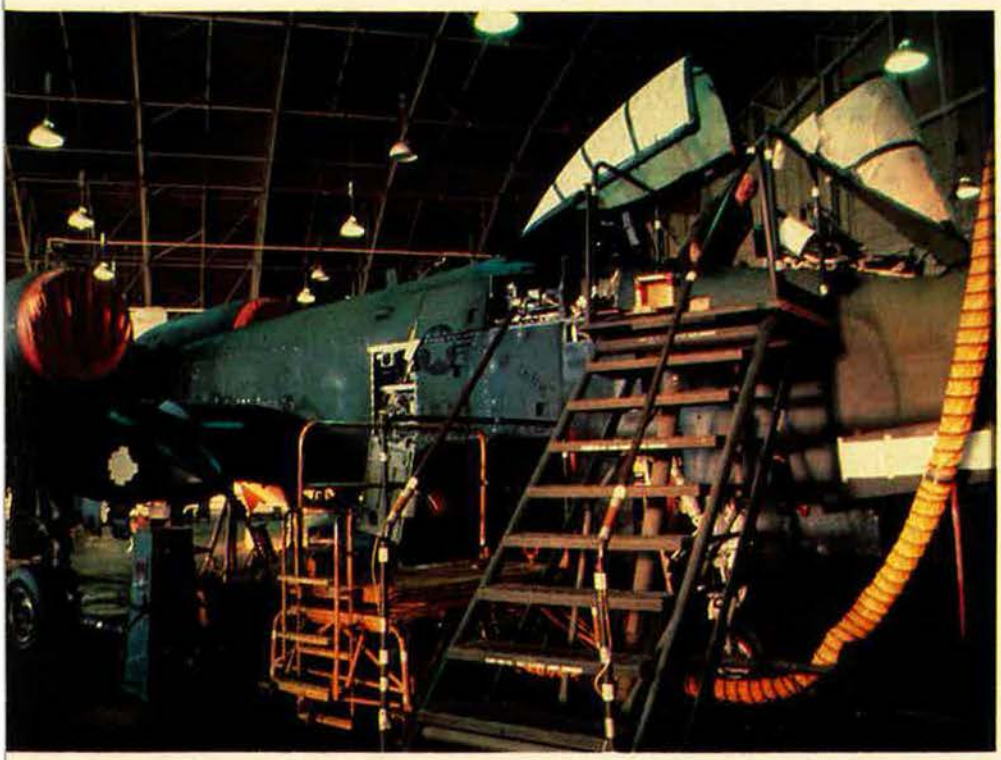
Our efforts have produced an Air Force-wide awareness that all elements of the logistics system must be integrated with the needs of the operational forces. To achieve this capability, we have made several changes within AFLC, such as establishing the Logistics Operations Center (LOC) and the Air Force Acquisition Logistics Center (AFALC). This reorientation has noticeably improved Air Force readiness in general and logistics responsiveness under specific circumstances, such as Grenada.

Since I became Commander in September 1984, we in AFLC have periodically assessed our progress. We are particularly proud of our people's achievements in making logistics one of the keystones of Air Force decision-making. But we recognize that we must consolidate our gains; future progress must not come at the expense of basic logistics support. With all this in mind, I've established five equal priorities to stabilize the command's operations even as we move toward full wartime capability.

- **Weapon System Support.** Here we emphasize improvements to weapon readiness and sustainability, realistic war simulations, and optimum allocation of resources to the fighting wings. AFLC must stay in tune with customer needs, identify critical logistics elements, and reprogram available resources to ensure balanced support.
- **ADP System Modernization.** AFLC is now pushing for modern, real-time computer systems. These include automation improvements essential to better use of our resources, such as better visibility on assets, requirements accuracy, and effective stock control and distribution. We must develop logistics C^3 systems that can respond to the demands of both peace and wartime.
- **Financial Management.** We must do a better job of identifying fund requirements for specific program objectives. We need a flexible, near real-time capability to realign funds with changing mission needs, to make trade-off decisions wisely, and to enhance the credibility of our financial forecasts.
- **Quality of Life.** The command is striving to unlock the creative potential of AFLC's work force through better working conditions, performance incentives, and improved security measures. We are redressing a long-term decline that has undermined our efforts to attract the highly qualified and motivated people we need at all levels.
- **Image of the Command.** AFLC fully intends to build



A loading crew positions a pallet on the cargo deck of a C-5. Getting material where it's needed when it's needed is a vital part of the mission.



Depot-level maintenance requires in-depth knowledge of such weapon systems of increasing sophistication as this A-10. Smaller inventories of high-value aircraft and missiles must be supported for ever-lengthening life cycles by Air Force Logistics Command technical experts.

a positive image with the public, Air Staff, Congress, the other major commands, other services, and allied countries. We want to emphasize our current capabilities rather than to rationalize our limitations and shortcomings.

None of the five points is difficult to understand, but on the other hand, none of them is easy to put into practice. We try to get a little bit better every day.

The Truth About Spares

Despite the impression that may have been conveyed by publicity on the prices of spare parts, Air Force Logistics Command has been a careful steward of the taxpayers' money. Last year, AFLC realized savings of more than a half-billion dollars by implementing Defense Secretary Caspar Weinberger's initiatives on spare parts purchasing. While abuses and system blunders will never completely disappear, vigorous action can force them down to an irreducible minimum.

Headlines appear when the system doesn't locate *all* the overpriced items in our inventory of approximately 835,000 items. Studies show that we're *vulnerable* to overpricing on about thirty-six percent of the items we buy, but these items represent only about six percent of the dollar value of what we buy. At present levels, six percent overpricing represents a total danger zone of around $300 million annually, concentrated among low-value parts.

What concerns me is that the price of perfecting the system may eventually exceed what the problems are costing us. I would further submit that the issue of productivity underlies most of the recent criticism directed at the armed forces and defense industry for cost overruns and spare parts overpricing.

During the decade of the 1960s, the national urgency to close the "missile gap" with the Soviet Union called for dramatic achievements rather than budget savings. However, compared to that era of Sputnik and Apollo, we presently live in an extremely cost-conscious period. Of course, no one can deny that public support has also changed dramatically since the decade of the 1970s, when disenchantment with the Vietnam War kept defense expenditures at sharply reduced levels. Americans now realize that we must strengthen our military defenses, but this consensus does not constitute a blank check.

Over the past two years, public attention has focused not only on the *amounts of funding* necessary for military readiness, but also on the *efficiency of the system* that provides that vital capability. Taxpayers have begun to question the productivity—the outputs that matter—of a defense establishment that they consider already to have sufficient inputs to get the job done.

One defense critic compared the present situation to the numerous commissions of inquiry that the French Parliament held during the 1930s to investigate reports that French contractors had overcharged in building the bunkers on the Maginot Line. This critic also claims that we're looking through the wrong end of the telescope, that we have too many people who specify inputs into the system instead of the outputs that count. In short, he criticizes the defense industry and the Pentagon for low productivity.

More Stringent Standard

Whether or not it is always stated in those terms, this productivity issue lies at the root of the current defense debate. What has become a fact of life is that Congress, the media, and the public at large hold the joint government/industry defense effort accountable to a more stringent standard than ever before. However, the principal problem does not lie in the actual operation of the system.

Instead, the problem lies in public perceptions of how the defense system apparently works. At present, the prevailing attitude is that we cannot be trusted. The sug-

Network Engineering

The job: Knit advanced computers into complex networks.

The Solution? TRW.

The architecture of information may be as critical to its usefulness as the information itself. Orchestrating the flows of information between processors is a demanding art. Interfacing numbers of computers, some in distant locations, to satisfy varying specifications and requirements is a part of the design process which can make the difference between system success or failure.

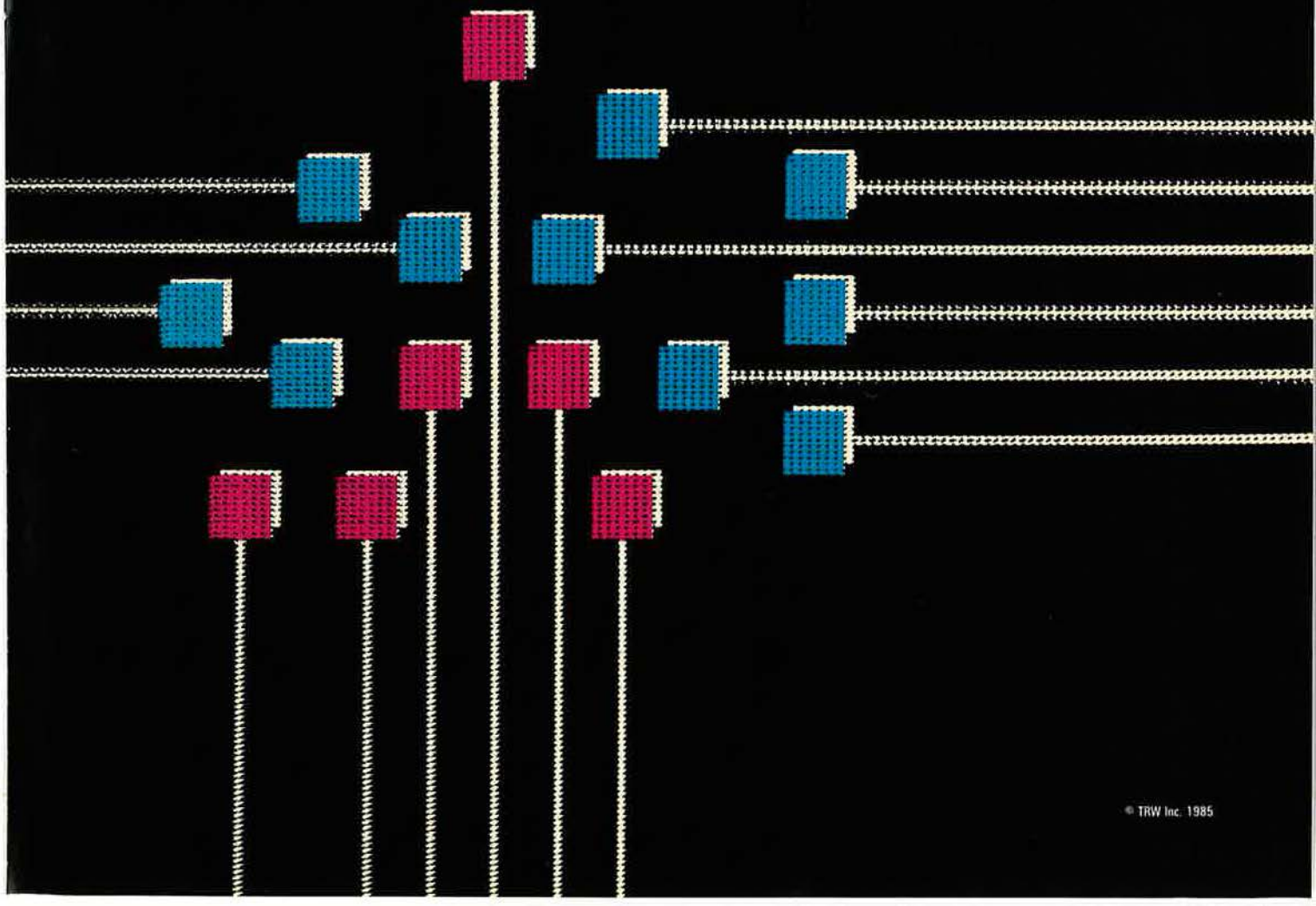
Our TDRS—Tracking and Data Relay Satellite—Ground Station broke new ground. Its eleven internetted mainframes, reconfigurable and fault tolerant, defined the state-of-the-art.

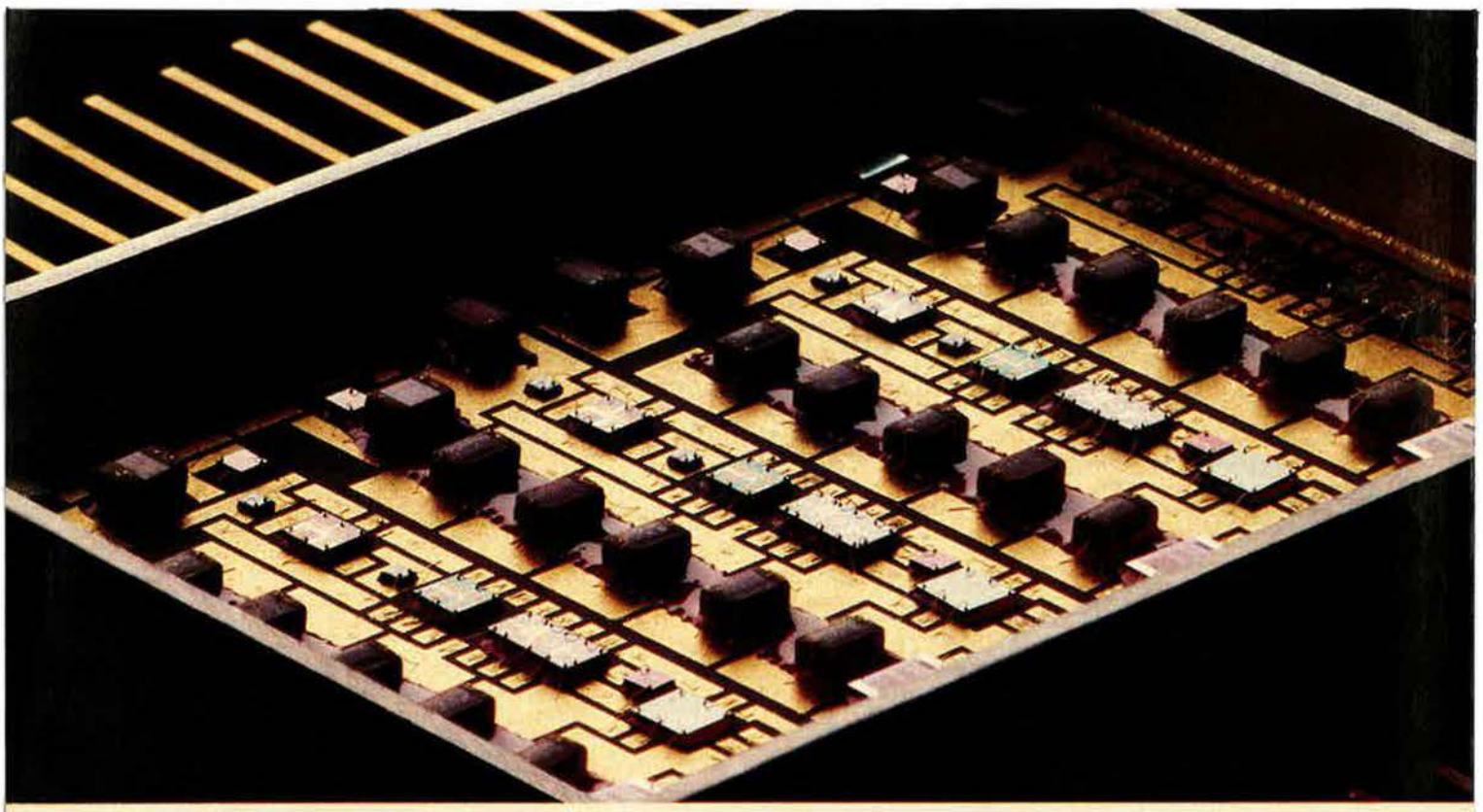
Today, we are successfully using computer-aided design tools for efficiently laying out sets of processors, design tools similar to those used by chip designers. These tools allow us to analyze more architectural options in one or two weeks than previous projects have been able to analyze in two to three months. We're applying these same CAD techniques to software too, modeling the systems architectures, with the goal of automating their design.

For loosely or tightly coupled networks, in growth-oriented configurations with high availability requirements, no one can architect advanced networks like TRW.

TRW

TRW Defense Systems Group





How to bring new ideas to the surface.

At Aerojet, we're advancing the frontiers of electronic circuitry by taking a close look at surfaces.

Because today, that's where many problems with state-of-the-art circuits crop up. Aerojet is investing in people and advanced instrumentation for a new activity called "Surface Sciences." Here, chemical, spectrographic and electron micrographic techniques are used to analyze and evaluate a variety of surface conditions and effects. And it's paying off with sharpened eyes for space sensors and improved performance and reliability for many other electronic devices.

A lot of other ideas surface at Aerojet, too. Like decoys that play siren songs for torpedoes. Advanced CAD/CAM technology that lets us build exciting devices from perfectly predictable parts. And we're researching low-signature rockets.

At Aerojet we believe that putting resources into technology today is our best investment in tomorrow. Case in point: We've tripled R & D outlays over the past three years. No wonder so many ideas surface at Aerojet. If you have one you'd like to get off the ground, bring it to us. We'll make it fly.

Aerojet General Corporation, 10300 North Torrey Pines Road, La Jolla, CA 92037/ (619) 455-8500.

AEROJET GENERAL

A GENCORP COMPANY

Where ideas fly.

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gestion that inefficient labor practices, $7,000 coffee makers, and $650 ash trays represent merely the tip of a sinister iceberg of waste and mismanagement finds many adherents. Each new revelation adds to their number.

Those of us who are responsible for the operation of the system can demonstrate otherwise. Given the scope of the procurement process, these overpriced items represent aberrations that are minimal in dimension. Even at that, the stories that have appeared were not discovered randomly, but required careful examination of literally thousands of transactions. In our hearts, we know we have a system that works very well and that we improve every time a glitch does appear.

If you consider that AFLC represents the Air Force's main source of logistic support, it becomes imperative that we take the lead in resolving the present situation. Log Command is not an institutional abstraction, nor is it just the Headquarters at Wright-Pat. I continually emphasize to my people that *all* of us constitute AFLC, and our combined attitudes and efforts make the organization real and workable. What we do, and what our subordinates accomplish, do in fact affect the public's perceptions of how the defense system works.

The whole purpose of the accountability program, which we recently initiated throughout Logistics Command, is to emphasize this matter of integrity and personal responsibility. Without going into details, let me simply point out that every commander, manager, and supervisor in AFLC is held personally accountable for meeting the accepted standards of performance. When managers in the field take action to fulfill this responsibility within their own organizations, they are assured that my staff and I will back up their judgments.

Last September, the Chief of Staff and the Secretary of the Air Force directed in a joint letter that reliability and maintainability (R&M) and other elements of supportability become coequal objectives for every program—along with cost, schedule, and performance. That long-awaited directive sparked a major evolution that is gathering momentum daily. The Air Force is committed to emphasizing R&M throughout the acquisition process and to institutionalizing this commitment.

All of us know that life-cycle costs—ownership costs—get locked into a weapon system very early on. By the requirement validation phase (even before we get the program go-ahead), approximately eighty percent of the life-cycle costs have been committed. Actual expenditures at that time are still very low—less than five to seven percent—but future spending has been pretty well locked up. That curve is familiar to anyone who's worked the tradeoffs between cost, schedule, and performance.

The Pattern Confirmed

In December 1984, our Air Force Acquisition Logistics Center (AFALC) at Wright-Patterson AFB completed a study that reaffirmed earlier efforts and that looked at the system's life cycle not in terms of cost, but in terms of the timing of the major decisions affecting life-cycle expenses. The AFALC study confirmed that:

- By the end of concept studies, seventy percent of the key decisions on the weapon system have been made.

Automated material-handling systems are becoming essential as supported systems all over the world become more complicated. The requirement for larger numbers of components continues to increase the volume of the parts flow. Moving pallet loads mechanically is still an important part of the process.

- By the end of system design definition, eighty-five percent of the decisions defining total life-cycle cost are operative.
- Ninety-five percent of those decisions have been made by full-scale development.

When we consider that operation and maintenance account for the largest chunk of these life-cycle costs, reliability and maintainability considerations take on primary importance.

Using life-cycle cost as a constraint, we have optimized design tradeoffs between performance features of new systems and their corresponding support requirements. This provision covers both Government-Furnished Equipment (GFE) as well as Contractor-Furnished Equipment (CFE). The contractor thus trades off cost, performance, and R&M earlier and at lower levels than ever before, but only to the extent that system requirements—such as high reliability on mission-critical subsystems—can be satisfied.

Designing to a life-cycle cost in this manner sets a goal that includes not only acquisition but also outyear support expenses for the weapon system. Tradeoffs must be made in this total context. What we have gained is the flexibility to spend money up front, during acquisition, in order to gain a later payoff in lower support costs.

An Air Staff reorganization to establish the focus for a clear, strong R&M program has been implemented. In my opinion, all the appropriate organizations are now taking R&M very seriously, and we are moving to extend that pressure throughout every phase of the life cycle of our weapon systems.

At the B-1 Roundtable that AFA sponsored this year *(see "Here Comes the B-1B," August '85 issue),* I pointed out some of the challenges and issues posed for military logisticians by introduction of the B-1 into the operational inventory. Let me review those specific points briefly, since they apply generally to all Air Force strategic systems.

Massive injections of new technology always accompany the introduction of major weapon systems, putting new requirements on the work force because the shift in nature and emphasis of the work is toward engineering and engineering-related functions.

Driving the Future

In a nutshell, four specific considerations are going to drive logistics support requirements well into the twenty-first century:

- The shift in work load toward engineering functions.
- The reliance on fewer weapon systems with longer and longer service lifetimes.
- The impact of avionics enhancements as a force multiplier, particularly as they affect the availability of follow-on spares.
- The trend toward total integration of weapon systems.

Massive injections of new technology invariably accompany the introduction of major weapon systems and put a severe strain on our people resources in AFLC. Our work load does not decrease in absolute terms, but it tends to shift in nature and emphasis toward engineering and engineering-related functions.

Also, unlike the private sector, AFLC has to support operational systems throughout their lifetimes as well as having to establish support systems for newly developed production items. The B-1B typifies the smaller inventory of high-value aircraft and missiles that we expect to support for ever-lengthening life cycles.

Further, the Air Force has increasingly come to rely upon electronics enhancements to multiply combat capability. When we got the B-52 thirty years ago, only about one percent of its unit cost was tied up in avionics. Now, nearly ninety percent of all the work we do on the "Buff" is electronics/avionics mods. Already, in the B-1B, these avionics costs are almost twenty percent of the unit cost of each airplane. That carries its own series of challenges.

If we realistically plan to maintain a weapon system such as the B-1B over twenty-plus years, that life cycle and the rapid progress of the commercial electronics industry are fundamentally at odds, especially for any items that are more than five years old.

Finally, this general acceleration toward total avionics integration will profoundly impact the way we support strategic systems. In the B-1B, when data from flight controls, weapon delivery, and electronic warfare systems all become enmeshed in the computer architecture of an information integration network, the old functional classifications become meaningless. Very soon we won't be able to separate the system into discrete areas for our AFLC Technology Repair Centers to handle.

These concerns are not going to evaporate. Consider the logistic demands of the ATB "Stealth" bomber when it enters the inventory, when we'll also have the B-52 and the B-1 to support. To meet these challenges, we need to continue to move toward system engineering, aided considerably by shrewd, vigorous exploitation of technology, if we expect to support our operational strategic systems in the future.

Now, as in the past, all of us engaged in national defense must continue to act as responsible trustees of public funds and to get full value for every dollar. This commitment makes it imperative that we strive to improve a procurement system that is already generally sound. We must continue to move toward our ultimate goal—enhanced readiness and a strong, cost-effective national defense to keep the nation free. ■

Gen. Earl T. O'Loughlin has been Commander of Air Force Logistics Command since September 1984. A native of East Tawas, Mich., General O'Loughlin is a command pilot with more than 6,000 hours of flight time in bombers ranging from B-29s to B-52s. He has received numerous decorations, including the Distinguished Flying Cross and the Bronze Star.

Mission Readiness Is Up

The tactical fleet is better able to engage and sustain combat than it was in 1980.

Recently, I reviewed the story behind the excellent mission-ready rates that our Tactical Air Force fleet has achieved. Morale and productivity are on the upswing. In this regard, AFLC considers itself to be just one part of the overall defense team. We support the hard work and leadership of the tactical commands themselves.

Within AFLC's Logistics Operation Center, we have a system control officer assigned to each of six aircraft systems in the Tactical Air Forces to keep us ahead of the power curve.

On the accompanying chart, readiness factors give us the state of the airplane fleet on opening day of the next conflict. We have to have improved readiness as a continuous goal and aim our programs to increase it.

To measure aircraft condition, we look at Mission Capable (MC) and Fully Mission Capable (FMC) rates, which rise in good times. On the other hand, a falling TNMCS rate (Total Not Mission Capable/Supply) is also good news for logisticians. Now that increased funding has been converted into the spares we need (and that pipeline is more than two years long, by the way), we've brought down this rate by more than thirty percent.

If readiness shows us how prepared we are on the first day of the next conflict, then sustainability measures how prepared we are to continue to fight—stamina, in other words. We evaluate sustainability by looking at our WRSK/BLSS kits (War Reserve Supply Kits and Base Level Supply Spares), supplies and spare parts kept back for use only during wartime. We will use the kits to supply the increased demands of combat flying until industrial production can come on line. Obviously, the more kits we have, the better off we are. We have forty percent more kits now than in 1980.

Possessed aircraft—the number of airplanes we have—have increased by twenty-seven percent since 1980. Flying hour totals have increased even more. We're flying fifty percent more hours now than we did four years ago. If our fleet size increases by twenty-seven percent and our flying hour totals go up by fifty percent, then we're flying each individual airplane more now than we did in 1980. And that is a significant indicator of how well the system is working.

The red and yellow blocks on the bar chart show how many sorties we've gained since 1980. We see a forty-nine percent overall increase in productivity. Part of that enhanced capability comes about because we have more airplanes now than we did back then. That part can be computed.

If we maintained our present enlarged aircraft fleet but flew them only at the readiness rates we had four years ago, we'd still have the red block. This amounts to about two-thirds of the total overall increase; it shows how procurement—buying more and newer aircraft—improves our warfighting ability.

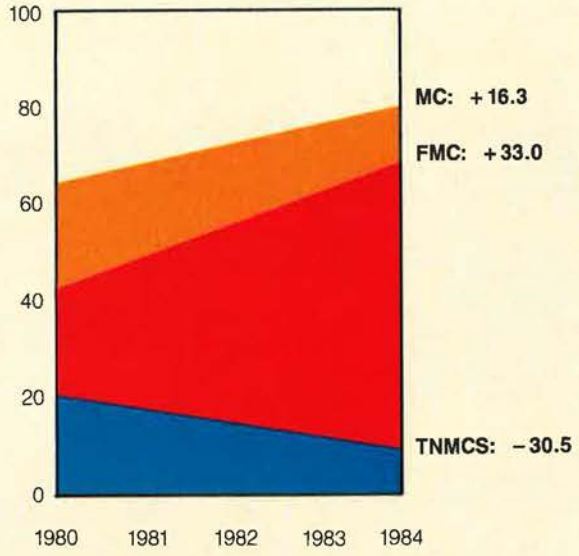
The yellow block—one-third of the total—represents the increased ability we've gained by combined team work. As the readiness graph shows, we've improved our mission-capable and fully mission-capable rates in the last four years. We've reduced the number of aircraft grounded for lack of spare parts as well. The tactical commands that own these birds have done a good job of maintaining and managing them. We in AFLC have done our best to support them by finding out what they need, getting it, and delivering it to the squadrons on time.

Another way to look at it: Our 16.3 percent increase in readiness since 1980 and the twenty-seven percent increase in the number of possessed aircraft mean that we have realized a forty-nine percent overall gain in warfighting capability.

Please note that we're focusing on the bottom line here—that is, how many tactical aircraft we have ready for combat. Spare parts are necessary for a ready force, but simply stocking supply shelves won't tell us how well we're doing. That's why we in AFLC now keep careful track of the health of each weapon system.

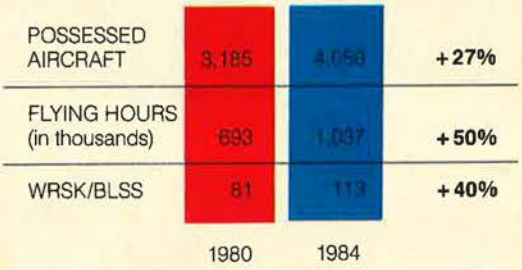
—GEN. EARL T. O'LOUGHLIN, USAF

Readiness Percentages



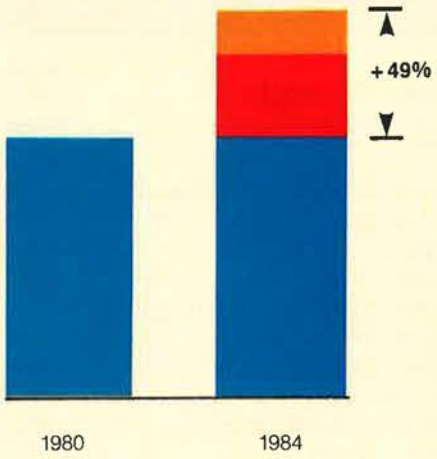
Factors depicted are for the F-4, E-3, F/EF-111, F-16, F-15, and A-10.

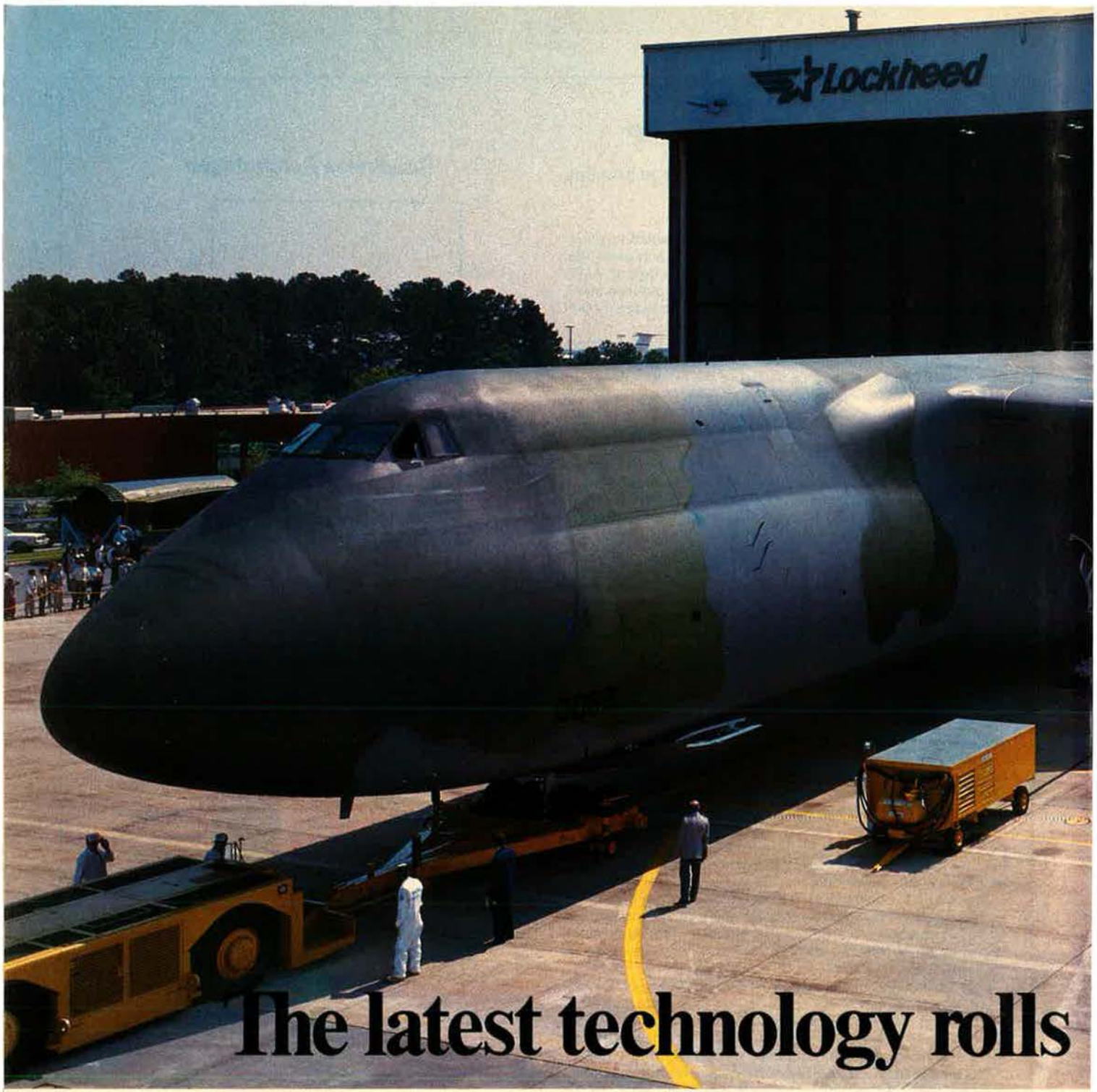
Sustainability



Sortie Capability

First Day of the War





The latest technology rolls

Marietta, Georgia—
July 12, 1985

Advanced production techniques have given shape to an advanced new airlifter.

The first USAF C-5B has rolled out on time and within cost projections at Lockheed-Georgia. Throughout its assembly, sophisticated technology has streamlined the airlifter's production and ensured the integrity of its construction. Lockheed's attention to quality assurance has created an aircraft with exceptional reliability. This helps the C-5B to move directly from rollout to early test flights, then on to delivery later this year, ready for operational service.

The C-5B incorporates design innovations throughout its structure and systems. Its airframe uses new alloys with enhanced resistance to corrosion and fatigue. Its flight deck is fitted with improved avionics. New engines with increased reliability have been installed, as well as lighter, more durable carbon brakes.

Innovative production control techniques and systems have been an important part of the C-5B program. A computerized real-time Assembly Status Tracking System has been important in keeping production on schedule and costs

Lockheed-Georgia

out the latest in airlifters.

under control. Another Lockheed tracking system oversees first article product assurance. Together with new manufacturing procedures and an experienced work force, the efficiency of C-5B assembly has been exceptional.

In September, this new C-5B will take to the air. Before the end of the year, it will join the C-5As now serving with the Military Airlift Command. Each new C-5B will serve well into the next century, and contribute to a dramatic increase in America's ability to airlift virtually all of the Army's fighting equipment, including M-1 tanks, to any trouble spot around the world.

The men and women at Lockheed-Georgia, as well as Lockheed's suppliers in 43 states, can take pride in their role in bringing the C-5B to flight readiness. They have built one of the world's finest airlifters. And they have done it right on schedule.

Innovation
Giving shape to imagination.

The world's largest submarine force keeps growing, and Soviet shipyards have production capacity in reserve.

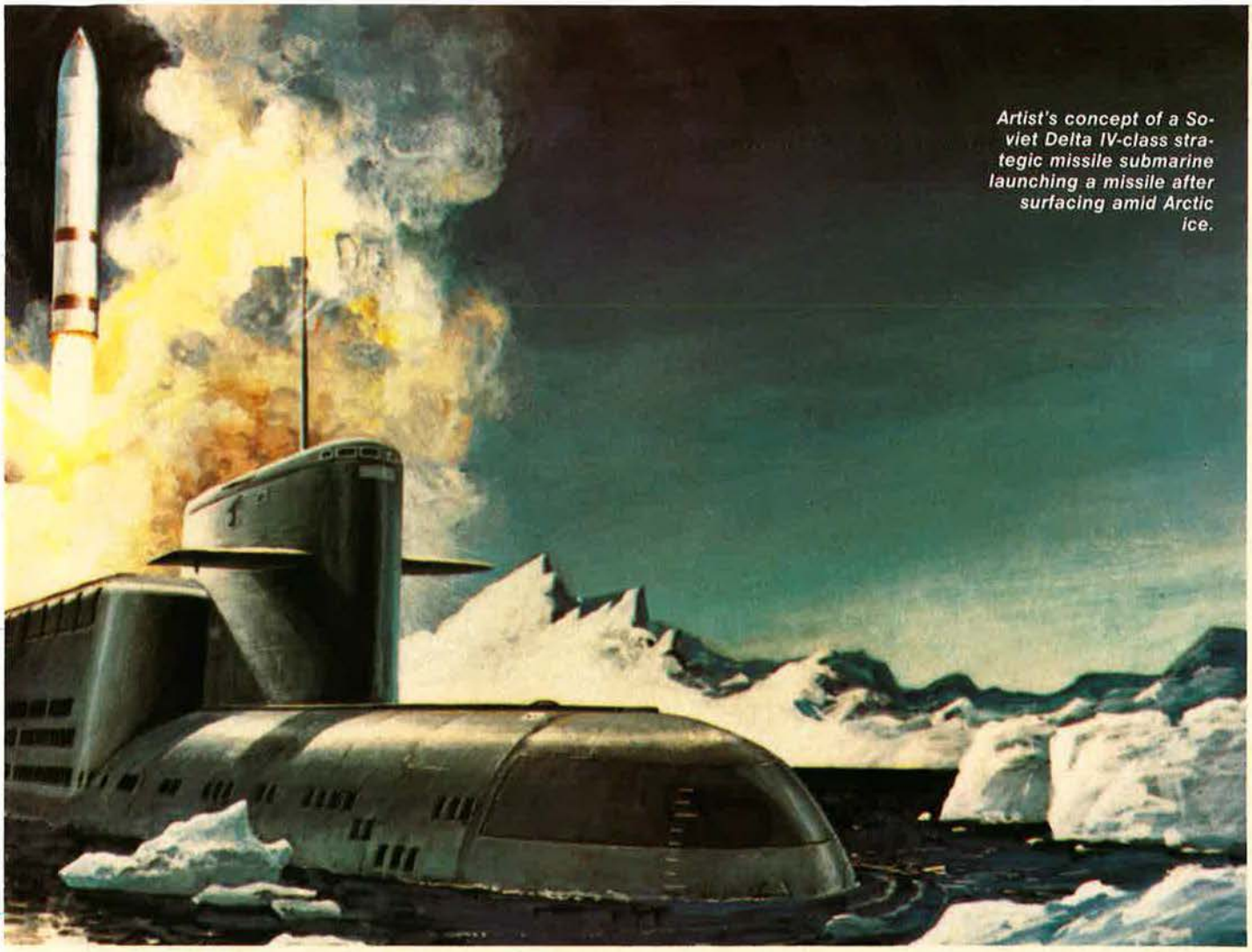
THE SOVIETS BELOW

BY NORMAN POLMAR

THE Soviet Union operates the world's largest submarine force, with more nuclear submarines and more strategic missile submarines than all other navies combined. There are currently sixty-two modern, nuclear-propelled strategic missile submarines in Soviet service, armed with some 950 ballistic missiles. About 300 of those missiles have multiple warheads. The current construction effort is producing more than two new submarines of this type every year, with a significant increase in the building rate possible with existing shipyard facilities.

It is difficult to compare US and Soviet strategic missile submarine programs. The US Navy reluctantly entered the field, fearing another roles-and-missions battle with the US Air Force such as had occurred in the carrier vs. B-36 controversy of the late 1940s. In contrast, the Soviet Navy developed strategic missile submarines as a matter of course, with submarines having been a focus of naval development in Russia under both czars and commissars.

After World War II, the Soviet Navy, like the US Navy, based its development of land-attack cruise missiles on German technology. The principal US program, the Regulus, achieved a limited operational capability in the late 1950s. Regulus was launched from surfaced submarines as well as from cruisers and aircraft carriers. The US Navy program died in the mid-1950s when its funds were transferred to the new Polaris ballistic missile project.



Artist's concept of a Soviet Delta IV-class strategic missile submarine launching a missile after surfacing amid Arctic ice.

The contemporary Soviet cruise missile program led to the SS-N-3 Shaddock (these are US-NATO designations), which became operational in 1960 in the land-attack role. The Shaddock was fitted to surface ships and submarines. It was a turbojet-propelled missile with a range of more than 400 nautical miles in the land-attack role, carrying either 2,200 pounds of high explosives or a nuclear warhead. The land-attack version was rapidly supplemented by an antiship version, with ranges out to 250 nautical miles when external targeting means were available.

In the Soviet Navy, unlike the US Navy, the strategic cruise missile program was conducted in parallel with a submarine-launched ballistic missile (SLBM) effort. Again drawing on German technology, the Soviets initiated ballistic missile programs immediately after the war and by 1955 had test-fired a modified Army missile from a surfaced submarine.

The first operational Soviet SLBM was the SS-N-4 Sark, which entered service in 1959–60. The missile had a range of only some 350 nautical miles, suffered from limited accuracy, and was launched only from the surface.

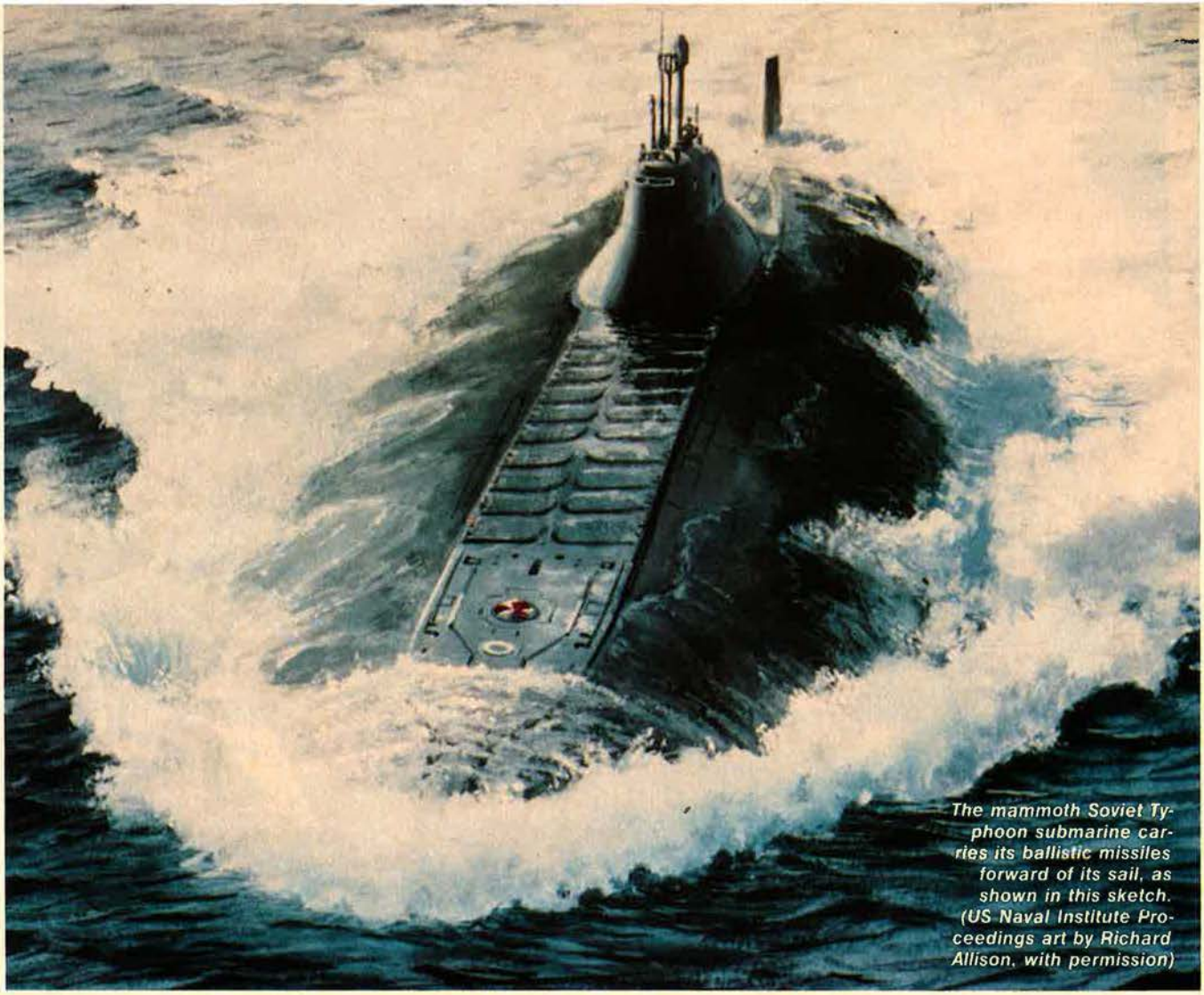
Khrushchev Stops Program

The Soviets began converting existing Zulu-class diesel submarines to launch the SS-N-4 SLBM. At the same time, construction began on new classes of diesel and nuclear-propelled submarines to carry these missiles. This ambitious strategic submarine program came to a halt in the late 1950s when Party Secretary Nikita Khrushchev, continuing his cutback of naval and other conventional forces, established the Strategic Rocket Forces to control the nation's long-range ballistic missiles. Within the Navy, the Shaddock was reoriented as an anticarrier weapon, and the SLBM construction program was halted, having produced several Zulu-class diesel conversions (two missile tubes), twenty-three Golf-class diesel submarines (three tubes), and eight Hotel-class nuclear submarines (three tubes).

Almost all carried the SS-N-4 Sark SLBM. The missile paled in comparison with the US Polaris A-1, which had become operational in late 1960. Already in development was the underwater-launch SS-N-5 Serb, and from 1963 this missile was retrofitted to most of the Golf and Hotel submarines. In addition to underwater launching, the SS-N-5 had a range of some 700 nautical miles (still far short of the 1,200 miles of the Polaris A-1, which was increased to 1,500 miles in the A-2 missile in 1962 and to 2,500 miles with the A-3 in 1964).

The only criterion by which these early Soviet SLBMs were superior to their American counterparts was in payload, with the Soviet weapons having a warhead estimated at one megaton for the SS-N-4 and 800 kilotons for the SS-N-5, compared to perhaps 700 KT for the American A-1 and A-2 missiles and only 200 KT in each of the three reentry vehicles of the A-3.

The hiatus in Soviet SLBM programs was short-lived.



The mammoth Soviet Typhoon submarine carries its ballistic missiles forward of its sail, as shown in this sketch. (US Naval Institute Proceedings art by Richard Allison, with permission)

When John Kennedy entered the White House in January 1961, his Administration immediately accelerated Navy SLBM and Air Force ICBM programs. Shortly thereafter, the Soviets failed in their efforts to deploy reliable, long-range ICBMs rapidly, leading Khrushchev to attempt to install shorter-range missiles in Cuba in late 1962 and precipitate the Cuban missile crisis.

Yankees and Deltas

These events caused the Soviets to reconsider strategic policy, and the Red Navy was again assigned a strategic strike role. Keels were laid down at two shipyards for a new class of large strategic missile submarines, closely patterned after the American Polaris. Later given the confusing Western code name of Yankee, the new submarine was 429 feet long, displaced 9,600 tons submerged, and could carry sixteen long-range SS-N-6 missiles.

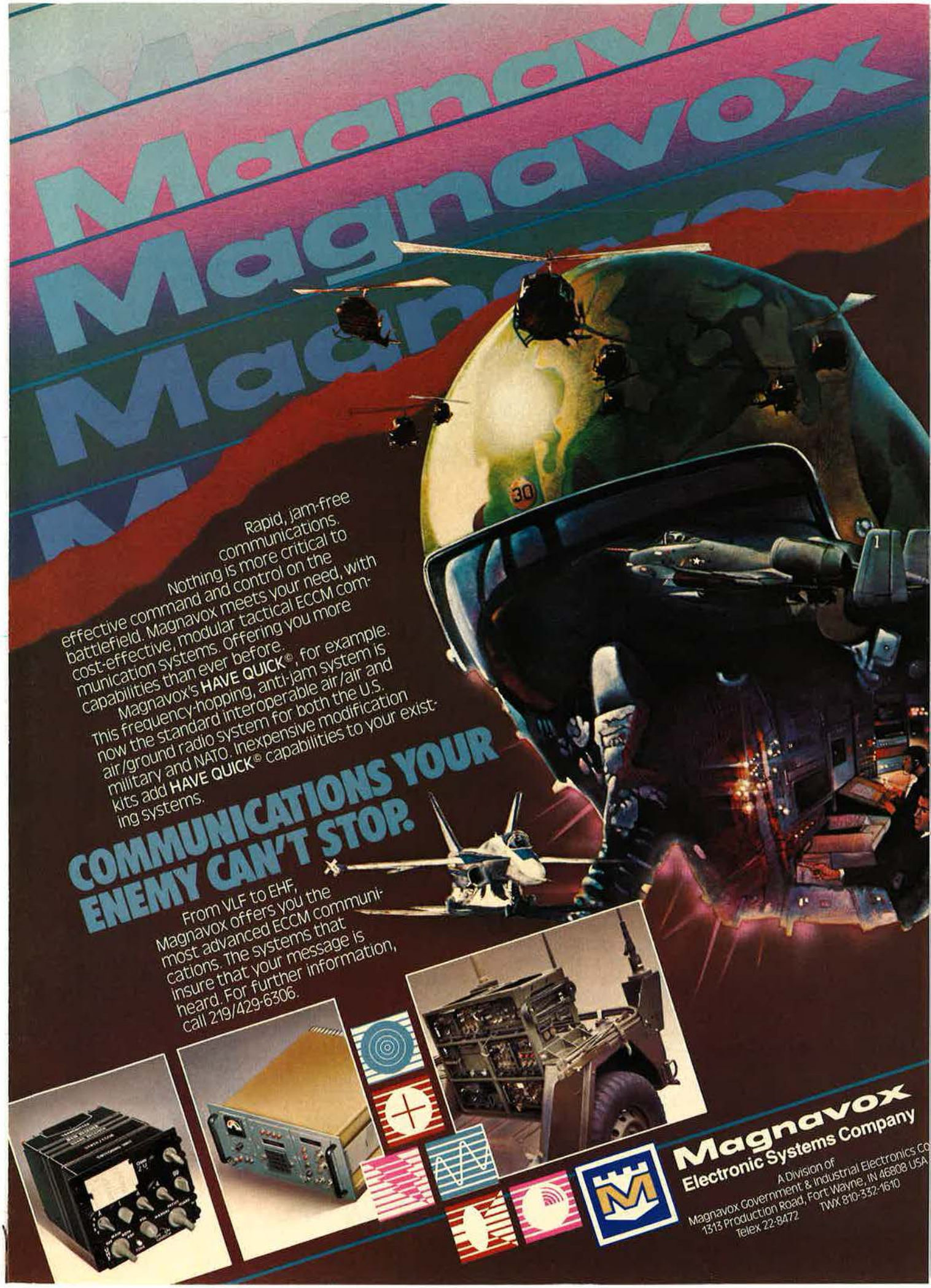
The missile itself, while shorter than the SS-N-4 or -5, had a range of 1,300 miles, and increased accuracy, and could deliver about one megaton against a fixed target. The shipyards at Severodvinsk on the Arctic coast and Komsomolsk on the Siberian coast began series production, delivering the first unit in 1967. The Soviets produced thirty-four Yankees between 1967 and 1974, each carrying sixteen SS-N-6 missiles. The -6 was a single-RV missile in the original configuration with its 1,300-mile range. The Mod 2 carried a single RV, also about one megaton, to 1,625 miles, while the Mod 3 had the longer range, with two reentry vehicles released against the same target (MRV configuration).

As the last Yankees were launched, a newer and larger SLBM submarine took their places on the building ways at both Severodvinsk and Komsomolsk—the Delta I class. At 462 feet and 11,750 tons, this was the world's largest undersea craft. Eighteen Delta I submarines were built, each carrying twelve of a larger missile, the SS-N-8. With a range of some 4,200 nautical miles, this missile could permit submarines in port on the Arctic and Pacific coasts of the USSR to target virtually all of the United States.

US Option Voided

The availability of the Delta I/SS-N-8 voided a major US antisubmarine concept—that of interdicting Soviet missile submarines as they passed through such straits, or "chokepoints," as the Greenland-Iceland-Faeroes gaps to reach the open sea. With longer missile ranges, the SLBM submarines could be kept in home waters, where they could be more easily protected by other submarines, surface ASW forces, and land-based aircraft. And, of course, they could seek the cloak of the Arctic ice pack, either firing through openings in the ice or coming out under the edges to launch missiles.

Following the Delta I program the Soviets shifted, briefly, to the larger Delta II with sixteen SS-N-8 mis-



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siles and then to the Delta III with sixteen missiles of the improved SS-N-18 type. This submarine is 511.5 feet long and displaces 13,250 tons submerged. In all, thirty-six of the various Deltas were built through 1982. After a brief building respite, the lead Delta IV, a larger submarine with sixteen of the SS-N-23 missiles, was completed at Severodvinsk in 1985.

The missile design bureaus kept pace with the submarine designers. The SS-N-8 SLBM was followed into test flight by the unusual SS-NX-13. Also designated KY-9 for its test flights from Kapustin Yar west of the Caspian Sea, the -13 was an *antiship* ballistic missile with a range of a few hundred miles. Ship targets would probably have been detected by satellite, with the missile carrying a maneuvering warhead (MaRV) with terminal guidance that could home on the target ship. There is also some speculation that the -13 was intended for use against US strategic missile submarines. The SS-NX-13 was flight-tested from 1970 until November 1973 and then abruptly canceled.

The SS-N-17 was also an unusual SLBM. It was deployed in 1978, but only in one Yankee-class submarine. This is a single-warhead weapon, being the first Soviet solid-propellant SLBM and the first to employ a post-boost vehicle (PBV), or "bus," to aim the reentry vehicle. It is credited by US defense officials with having a greater accuracy than previous SLBMs. There has also been some speculation that the missile was a follow-on to the SS-NX-13, the increased accuracy being necessary for attacking a moving target at sea. This theory is supported by the similarity in size of the SS-N-13 and SS-N-17 missiles.

More conventional was the larger SS-N-18 missile for the Delta III. This missile introduced multiple independently targeted reentry vehicles (MIRV) in Soviet submarine missiles. The SS-N-18 Mod 1 missile entered service in 1978, seven years after the US Poseidon MIRV missile became operational. The Mod 1 could deliver three RVs, each with an estimated payload of 200 KT, to targets 3,500 nautical miles away. The Mod 3 could carry seven RVs of that size the same distance, with the Mod 2 being a single-RV missile (450 KT) with a range of 4,325 miles.

The new Delta IV submarine carries the larger SS-N-23, expected to become operational in 1985–86, with increased range and accuracy over earlier SLBMs as well as the ability to deliver more reentry vehicles than the SS-N-18.

Emergence of Typhoon

The line of development from the Yankee-class submarines through the Delta series was straightforward. The basic design, modified from that of the early US Polaris submarines, was modified and enlarged. But in the late 1970s, US satellite photography indicated that a still larger submarine of a different configuration was being assembled in the huge No. 3 submarine building hall at Severodvinsk. This hall is considerably larger than the adjacent hall No. 1, which was erected in World War II to build two battleships simultaneously, side by side. (There are more submarine building ways at Severodvinsk, one of five Soviet submarine construction yards, than are available at both US shipyards now building submarines.)

The submarine that emerged from hall No. 3 in September 1980 was larger than any previous undersea craft previously built and introduced a new configuration to submarines. Soviet leader L. I. Brezhnev had referred

Moscow's "Strategic Reserve"

Class	Number	Years Completed	Missiles	Warheads per Missile
Golf II	13	1958–62	3 SS-N-5	1 RV
Golf III	1	modified	6 SS-N-8	1 RV
Golf V	1	modified	1 SS-N-20	6–9 MIRV
Hotel II	1	1962–67	3 SS-N-5	1 RV
Hotel III	1	modified	3 SS-N-8	1 RV
Yankee I	21	1967–74	16 SS-N-6	1 RV in Mods 1 and 2 2 RV in Mod 3
Yankee II	1	modified Yankee I	12 SS-N-17	1 RV
Delta I	18	1972–77	12 SS-N-8	1 RV
Delta II	4	1974–75	16 SS-N-8	1 RV
Delta III	14	1975–82	16 SS-N-18	3 MIRV in Mod 1 1 RV in Mod 2 7 MIRV in Mod 3
Delta IV	1	1985—building	16 SS-N-23	several MIRV
Typhoon	3	1983—building	20 SS-N-20	6–9 MIRV

Former Strategic Missile Submarines

Golf II	3	modified for communications role
Hotel II	2	modified for special roles
Yankee I	10	inactive; some may be undergoing conversion to SSN
Yankee SSGN	1	modified cruise missile test ship (SS-NX-24 missile)
Yankee SSN	1	modified attack submarine

This chart illustrates the evolution and growth of the Soviet strategic missile submarine force. Golf and Hotel class submarines were not included under SALT. Golf III and V and Hotel III were modified for ballistic missile test and evaluation. Golf III and Hotel III appear to have then become operational units. "SSGN" in the Yankee SSGN entry indicates "guided missile."

This Yankee-class submarine exemplifies the first "modern" class of Soviet ballistic missile submarines. The first Yankee was completed in 1967.

to a giant new missile submarine as the *Tayfun* in 1974 during discussions with President Gerald Ford at Vladivostok. NATO adopted this term for the submarine, known in the West as the "Typhoon."

The submarine is 561 feet long, about the length of the US Trident submarines (or slightly longer than the Washington Monument is high), and displaces some 25,000 tons submerged, about one-third more than the Trident. The Typhoon is some eighty-two feet in beam, compared to 42.5 feet for the Trident submarines. The larger beam is accounted for by the Typhoon's having *two* submarine pressure hulls fitted side-by-side within her outer hull. Naval analyst and author Norman Friedman estimates that this unique configuration was adopted because the weight of the missile payload with an elongated single pressure hull would have overly stressed the hull in a conventional submarine design.

Under the Ice

The Typhoon's missile tubes are nested between the inner pressure hulls, forward of the sail structure (which is atop the control spaces; these form a separate pressure compartment). While public details of the ship's torpedo arrangement are limited, they appear to be fitted in the bow, indicating still another pressure compartment. Other distinctive features of the Typhoon include her low, flat sail structure and partially shielded propeller shafts. These and other features have led the US Navy's Director of Naval Intelligence, Rear Adm. John Butts, to observe that "Typhoon's ice-penetrating features clearly demonstrate the Soviets' firm commitment to operating under the ice."

Admiral Butts has also noted, "In addition to equipping their newer SSBNs [ballistic missile submarines] for under-ice operations, the Soviets are taking other measures to decrease the vulnerability and thereby enhance the strategic strike capability of their SSBN force. Submarine tunnel complexes are under construction at some SSBN bases in the Northern and Pacific Ocean Fleets."

The Typhoon SSBN's missile payload is twenty SS-N-20 weapons, the largest SLBM yet produced. The three-stage -20 is estimated to be forty-nine feet long, compared to thirty-four feet for the US Poseidon C-3 and Trident D-4 missiles that are now in service. The SS-N-20 is reported to carry six to nine MIRV warheads and have a range of some 4,500 nautical miles. An improved version is expected to be deployed in the near future.

The missile is said to have encountered some development problems, but became operational about 1983 and went to sea that year in the first Typhoon submarine. The Typhoon submarines are now being completed at about one-year intervals, with three being reported operational by early 1985.

At the same time, construction of the Delta IV submarines continues, with two units having been launched by early 1985, one of which is now considered to be operational.

Within Treaty Limits

Under the terms of the SALT I and unratified SALT II agreements, the Soviet Union is limited to sixty-two modern strategic missile submarines with 950 missiles. The Soviets have kept within these treaty limits, as indicated in the table on p. 107. Not included under these constraints are the surviving Golf (diesel) and Hotel (nuclear) submarines armed with older SLBMs. The newer strategic missile submarines are all assigned to the Northern (Arctic) and Pacific Fleets, where they can operate in Soviet coastal waters or have access to major ocean areas. Only six of the Golf-class missile submarines are in the Baltic Sea, presumably to provide a theater strike capability against NATO. A similar role is reported for the seven Golf-class submarines in the Pacific Fleet, their targets being Japan and China.

(A treaty prevents Soviet submarines in the Black Sea from exiting for operational missions; hence, comparatively few diesel and probably no nuclear submarines are based there. The only ballistic missile submarine in the Black Sea is the lone Golf V type, used as a test platform for the SS-N-20 missile.)

As the newer missile submarines have been completed, the Soviets have laid up the older Yankee-class boats. One has been converted to a test-bed for the new SS-NX-24 cruise missile, and at least one other has been modified to an advanced attack submarine configuration. The status and configuration of the other Yankees retired from the strategic SLBM role are not known in detail.

In addition to constructing the Typhoon and Delta IV strategic missile submarines, Soviet shipyards are producing several classes of nuclear and diesel attack submarines totaling some eight to ten submarines per year.

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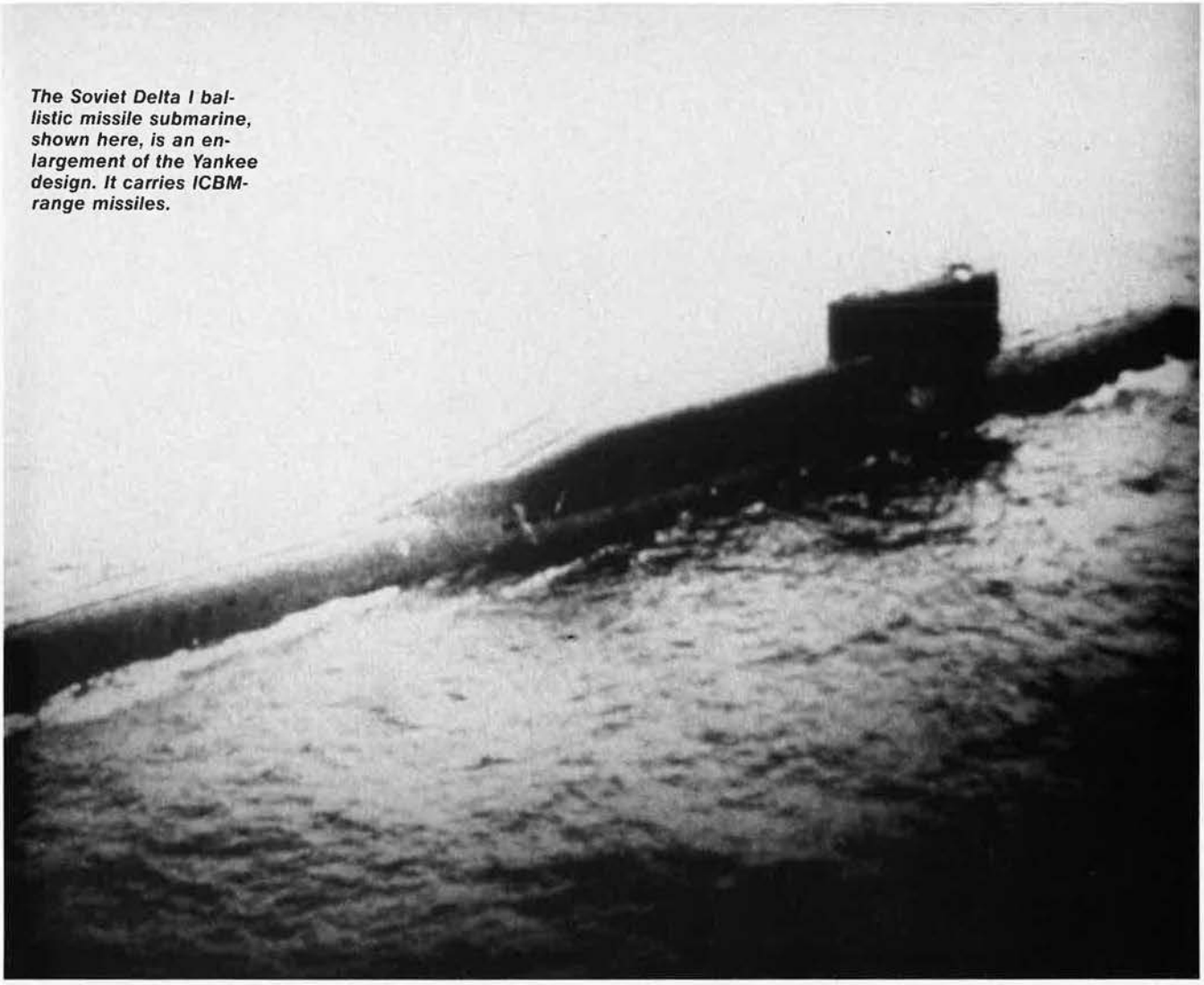


The Soviet Delta I ballistic missile submarine, shown here, is an enlargement of the Yankee design. It carries ICBM-range missiles.

While this is about twice the rate of production of US nuclear submarines, the Soviet shipyards are not now working at full capacity. Thus, should the Soviets decide to "break out" of the SALT agreements, they could increase the rate of construction of SLBM submarines significantly, probably with little disruption to the current attack submarine programs.

Spending on SLBMs

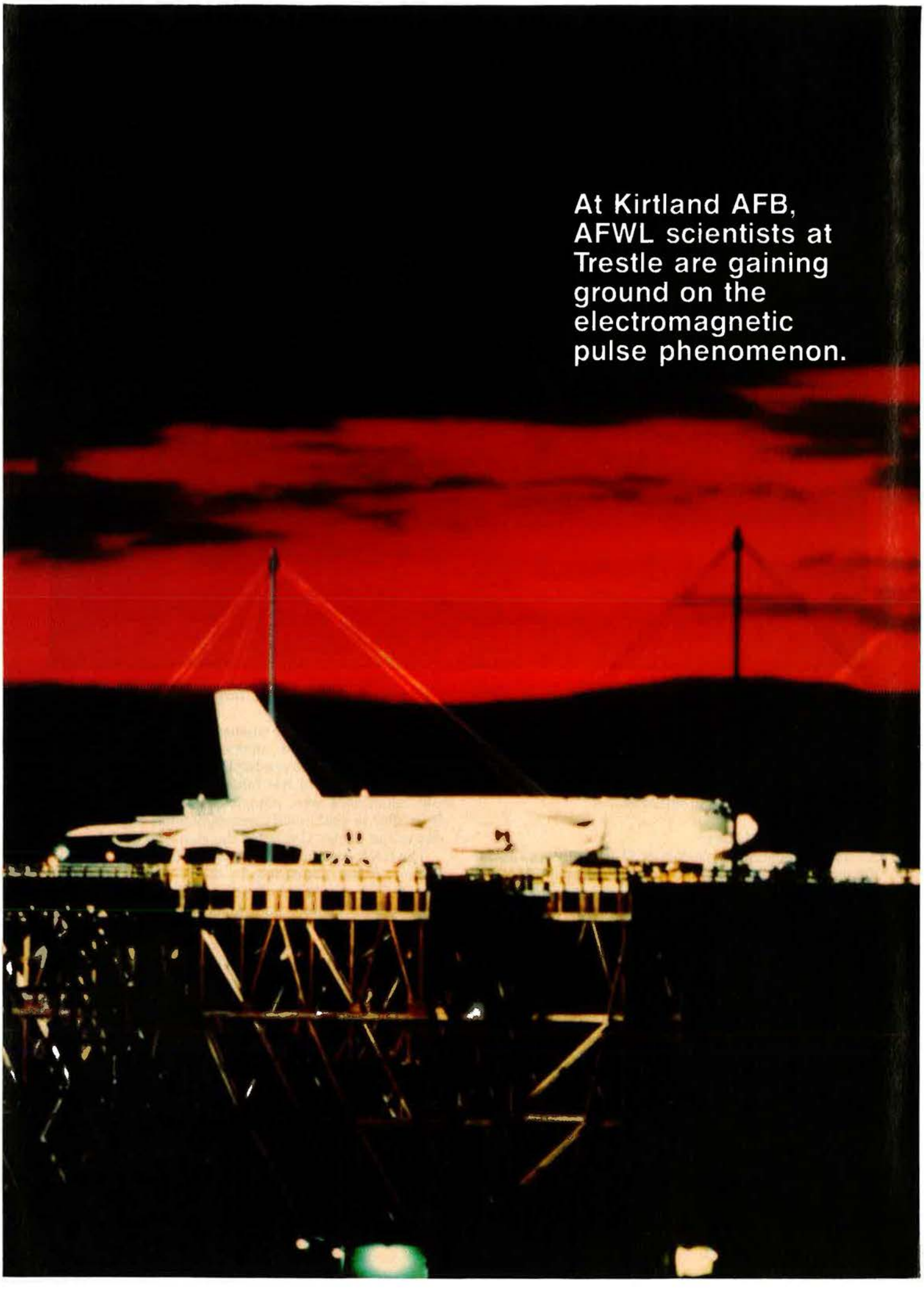
The implications of the Soviet SLBM effort are significant. The shortfalls in the quality and quantity of the Soviet ICBMs in the early 1960s that led to the rejuvenated SLBM program have long since been corrected. Today the Soviet Union has a large and ambitious ICBM program *(see Soviet Aerospace Almanac,* AIR FORCE *Magazine, March '85 issue).* Still, considerable resources are being allocated to the Soviet SLBM force, with some of the justification for Soviet surface warships and other programs apparently being based on defending strategic missile submarines from Western antisubmarine forces.

The Soviet SLBM program offers the Soviet leadership a highly survivable strategic offensive force—sometimes referred to as a "strategic reserve" in Soviet writings. The ranges of modern SLBMs make them, in effect, mobile ICBMs. The launching submarines can operate within Soviet coastal waters or under the Arctic ice pack, where their vulnerability to allied antisubmarine forces is greatly reduced but their ability to strike major US strategic targets is relatively unimpeded.

The importance of the submarine in Soviet naval strategy and of the SLBM submarine in national strategy indicates a continued production and hence modernization of the Soviet SLBM force. While no strategic missile submarines were completed in the United States from 1967 to 1981, such construction has been continuous in the Soviet Union for the past two decades.

The US Navy currently plans to attain a force level of twenty Trident submarines by the late 1990s, when the last of the earlier Polaris/Poseidon submarines will have been retired. There is no evidence that the Soviets will slow their rate of missile submarine development and construction; thus, the USSR should be able to maintain a force of at least sixty modern, nuclear-propelled strategic missile submarines for the foreseeable future. ■

Norman Polmar is an analyst and author specializing in US and Soviet naval and aviation subjects. He has directed or participated in several major studies in these areas for the Navy, various Defense Department agencies, and US and foreign aerospace and shipbuilding firms. He is currently a member of the Secretary of the Navy's Research Advisory Committee (NRAC). The author of many books, including the historic volume The American Submarine, *he is a regular contributor to* AIR FORCE *Magazine. His most recent article was "The Other Leg in the Triad" in the July '85 issue.*


At Kirtland AFB,
AFWL scientists at
Trestle are gaining
ground on the
electromagnetic
pulse phenomenon.

EMP

BY CAPT. NAPOLEON B. BYARS, USAF

An aircraft is tested for EMP effects atop Trestle, a Kirtland AFB, N. M., tower that is the world's largest wooden structure and EMP simulator.

TRESTLE towers twenty-three stories high above the plains near the Manzano Mountains. It is an unmistakable landmark at Kirtland AFB on the edge of Albuquerque, N. M.—especially so when an airplane is on top of the stand for testing. Constructed from six and a half million board feet of lumber, Trestle is the world's largest wooden structure and the world's largest electromagnetic pulse (EMP) simulator.

It was built primarily to test the EMP-hardened B-1B bomber and can accommodate aircraft as large as the E-4. A number of Air Force systems have been put through the paces on Trestle. Its height and wooden composition allow scientists to observe EMP effects on aircraft as if they were in flight, without ground or magnetic interference.

Trestle is a central element in USAF's response to potentially crippling effects of EMP on military assets, including the command control and communications network supporting strategic nuclear forces.

For decades, scientists have been investigating EMP and its effects on solid-state electronics. The work assumes critical importance as the United States relies more and more on sophisticated electronics to maintain its qualitative edge in weapon systems.

EMP is electromagnetic energy generated by a nuclear detonation. In a high-altitude nuclear burst, the electromagnetic wave is caused primarily by reactions that occur when gamma radiation knocks electrons off air molecules. These electrons twirl in the earth's magnetic field and behave like a radio transmitter, sending out an intense pulse that can couple onto an electronic system and cause circuit upset or burnout.

Scientists have warned that EMP damage could threaten the survivability of intercontinental ballistic missiles, the B-52 bomber fleet, and land- and space-based C^3 assets.

EMP does not discriminate. A nuclear detonation in space could generate an electromagnetic pulse that would travel hundreds of miles, coupling onto the national power grid, commercial communications lines, ground radars, and transportation systems.

Concerns have been allayed somewhat by steps taken to harden the vital electronics in key weapon systems against nuclear effects, including EMP. The E-3A AWACS, the Minuteman missile force, C^3 assets, and the E-4 airborne command post have all been hardened against EMP to some degree.

The Air Force Weapons Laboratory

The primary research facility for testing the vulnerability and survivability of USAF systems is the Air Force Weapons Laboratory (AFWL) at Kirtland. Within the AFWL structure, two components of the Nuclear Technology Office (NTO)—the Aircraft and Missiles Division (NTA) and the Space, C^3, and Reentry Systems Division (NTC)—have been steadily at work, making significant strides on the EMP problem.

"Electromagnetic pulse effects are more of a problem for the defender than the attacker," said Leonard M. Contreras, Deputy Chief of AFWL's Nuclear Technology Office. "If the attacker elected to use EMP as a weapon, it would not knock our aircraft out of the sky. They would be able to continue on their mission. But our pilots would be uncertain as to how badly onboard systems were degraded. The problem with EMP is not primarily breaking something, but degrading or upsetting something."

To study EMP effects on black boxes, electronics, and wiring inside aircraft, missiles, vehicles, and other systems, AFWL engineers and scientists operate several testing facilities—the Vertically Polarized Dipole II (VPDII), the Horizontally Polarized Dipole (HPD), the AFWL Los Alamos Scientific Laboratory Electromagnetic Calibration System (ALECS), and Trestle.

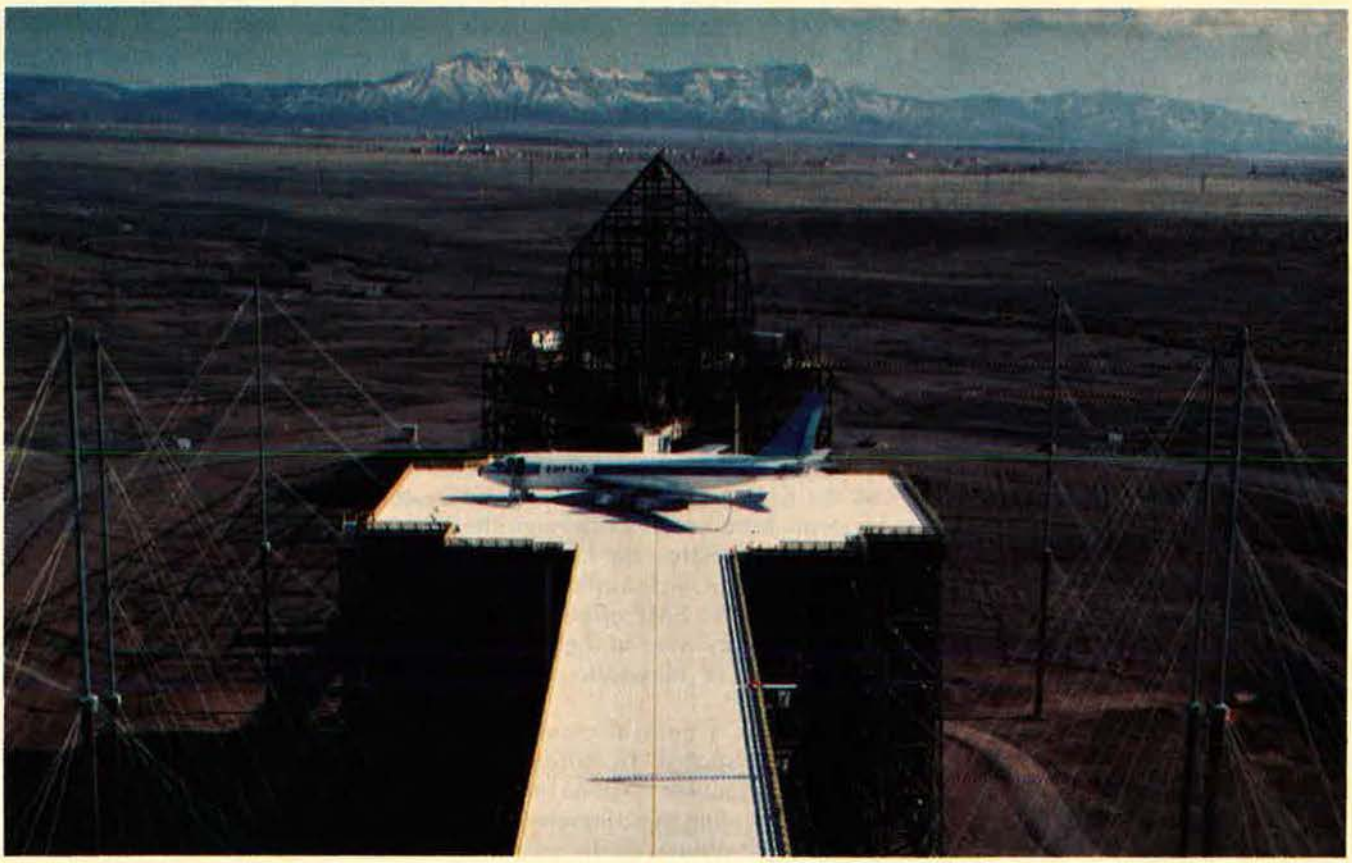
Construction of Trestle began in 1973, but slowed as a result of cost growth and inflation and in the aftermath of President Carter's decision to cancel the B-1. Trestle took six years to complete. Wood was chosen as the primary building material because its dielectric qualities allow scientists to observe the EMP effect on aircraft as if they were in flight. Trestle's twin multimillion-volt pulsers discharge into the wire antennas along the sides of its 200-by-200-foot laminated wood deck, generating a pulse that simulates the EMP phenomenon.

In the five years since Trestle achieved initial operational capability (IOC), it has been used to test a number of aircraft, including the B-52. Although the results of these tests remain classified, engineers admit that EMP can be a serious problem.

"We haven't burned anything to a cinder out there," said one engineer, "but as we get more into fly-by-wire systems, people are getting more queasy about EMP and digital circuit upsets."

Shock Treatment

A single EMP test exposure, or "zap," lasts a fraction of a second. An aircraft may be exposed fifty to sixty times a day. The duration of a typical test program is up to four months. Since EMP exposure at levels generated at Trestle have no harmful health effects, aircraft parked on Trestle are often tested



As seen from its ramp, Trestle looms above the New Mexico plain, backdropped by the Manzano Mountains. Embodying six and a half million board feet of lumber, Trestle was built primarily to test the B-1B bomber's resistance to EMP, the electromagnetic energy generated by a nuclear detonation. EMP is a major threat to the solid-state electronics in today's combat aircraft.

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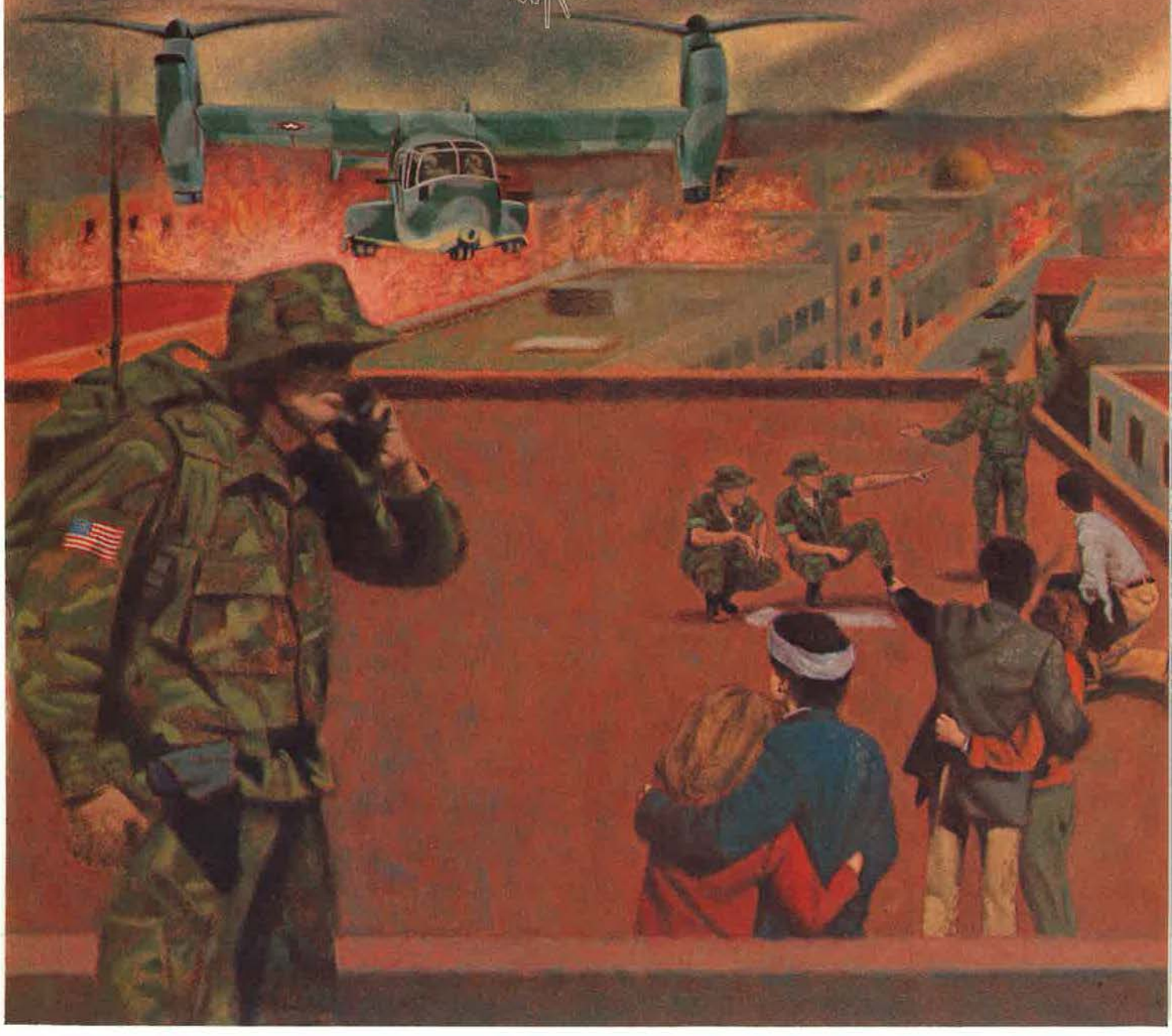

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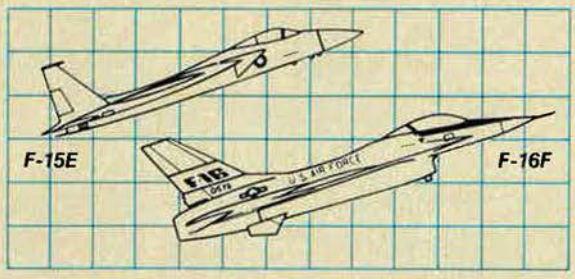

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with operational crews on board. As one AFWL engineer put it: "We put a crew on board to see if anything starts to smoke, or if radar screens blank, or control surface actuators respond, or if engine performance is affected."

Any idea, though, that EMP testing involves zapping aircraft to see if they break is grossly misleading.

"What we have attempted to do is identify high-risk areas in aircraft or systems," said Lt. Col. Roger S. Case, Jr., executive officer of the Nuclear Technology Office. "EMP testing involves more than testing aircraft with simulators. There's also testing of individual components from the transistor level up, the testing of line-replaceable units or black boxes by electronically exciting the pins, as well as operational subsystem-level testing."

Pointing to the production and delivery of 100 B-1Bs by mid-1989, the Air Force says that it intends to field an inventory of nuclear-hardened systems. AFWL engineers have already begun supporting the B-1B developers, who are tentatively structuring EMP tests to be conducted sometime in 1988.

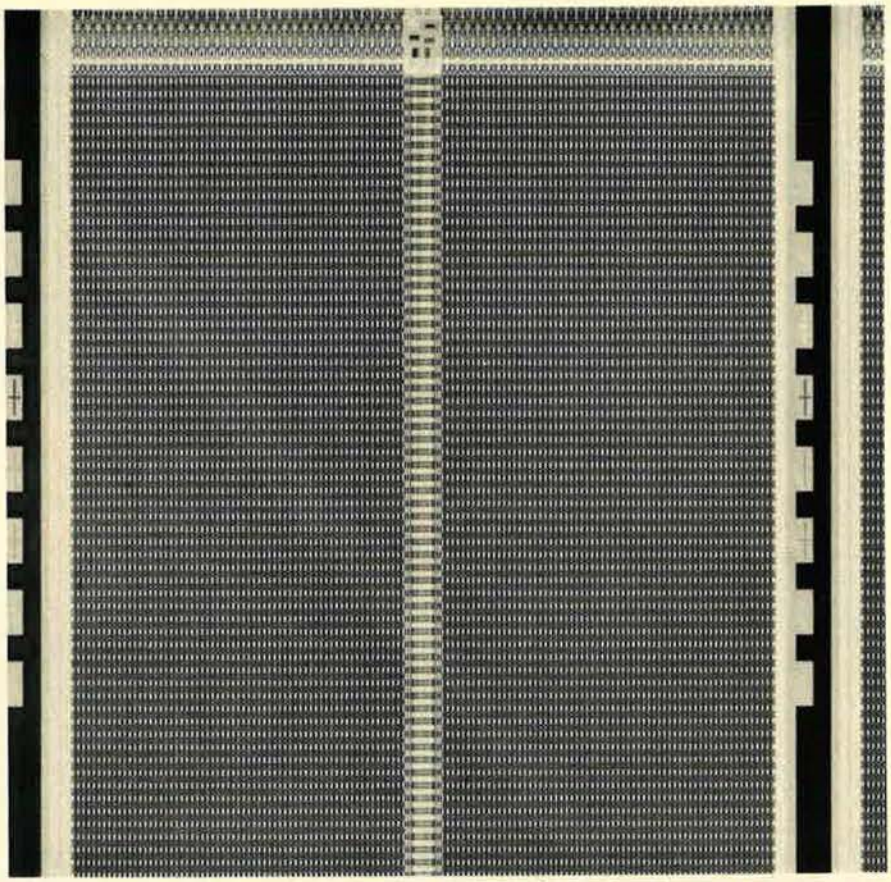
"EMP protection is not a black art," said Colonel Case. "It's good, solid engineering. It simply requires a decision and associated funding to actually implement protection."

The B-1B is proof that aircraft can be produced with affordable EMP hardness designed into them.

The topic of EMP has been written about openly in Soviet literature for some time. Posters depicting EMP effects appear on bulletin boards in Soviet factories. Some scientists believe that extensive atmospheric testing of nuclear devices by the Russians prior to the test-ban treaty allowed them to experience EMP effects and to collect a massive data base for research on an EMP weapon. Soviet military doctrine, which emphasizes creating confusion in the societal and military structure of opposing forces prior to surprise attack, is consonant with the use of EMP.

EMP and IHARDS

To avoid US forces being caught unaware of a high-altitude nuclear detonation, another group of scientists in the Nuclear Technology Office at AFWL has designed and tested the Improved High-Altitude Radiation Detection System (IHARDS). IHARDS consists of three four-by-seven-foot detectors placed approximately 800 feet apart.



Built for resistance to electromagnetic radiation, this semiconductor chip, shown here larger than life, exemplifies the military's attention to building circuitry capable of withstanding gamma radiation generated inside weapon systems by external EMP.

"These sensors detect high-altitude EMP and set off an alarm in the command post," said Dr. Babu K. Singaraju of the Nuclear Technology Office. He stressed that IHARDS uses smart electronics, requires little maintenance, and can detect EMP instantaneously. "The whole idea of SAC being caught off guard by high-altitude EMP has been eliminated," said Dr. Singaraju.

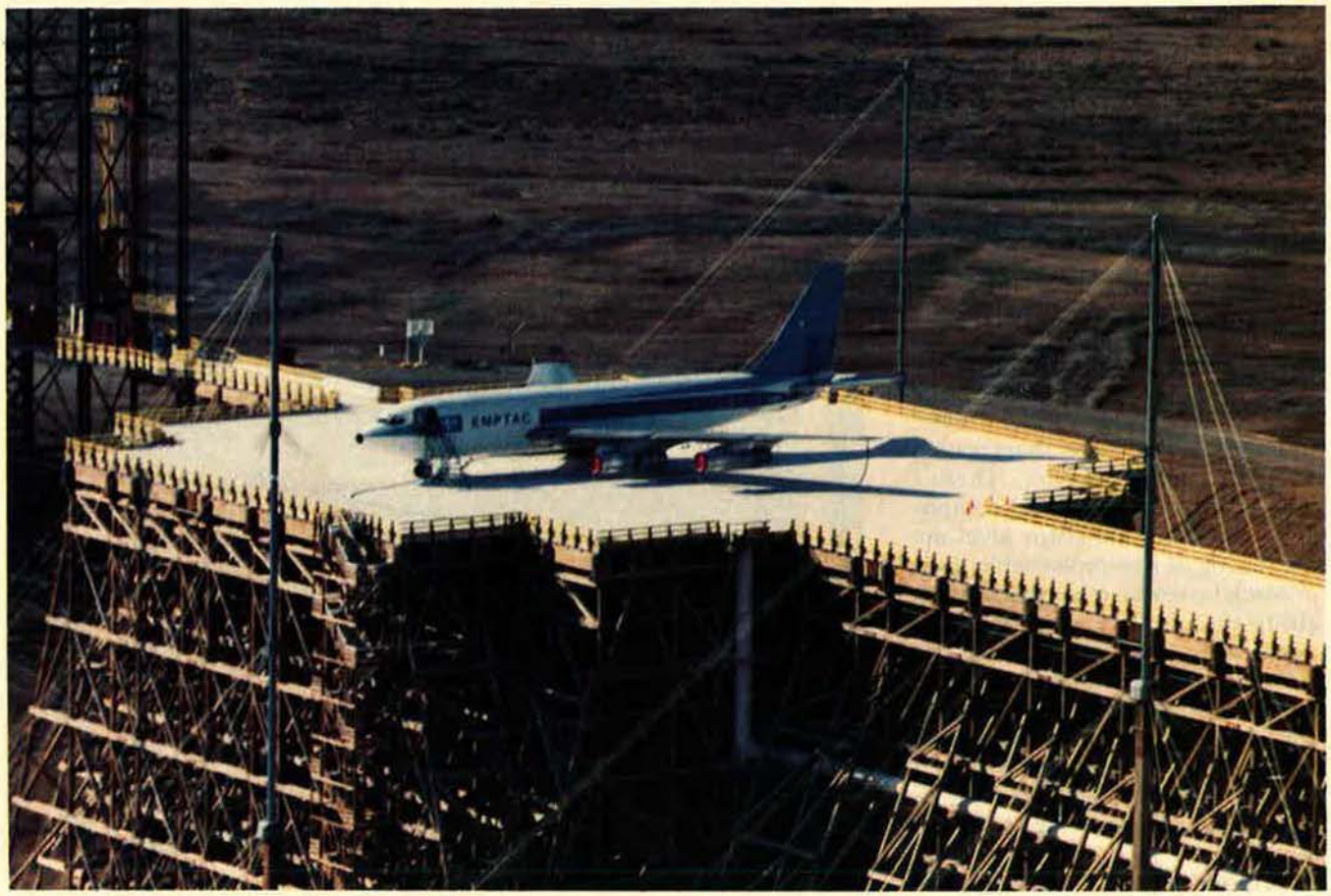
IHARDS is small enough to put atop buildings or at the ends of runways. A special shielded cable connects the detectors to filter junction boxes that feed into the IHARDS control panel.

An IHARDS system has been installed at Strategic Air Command (SAC) headquarters at Offutt AFB, Neb., and another is being installed at the North American Aerospace Defense Command Cheyenne Mountain Complex, Colo. The Air Force plans to acquire twenty-four detectors and place them at selected bases as part of an aircraft alerting communications system. Military leaders will be made aware instantly of a high-altitude nuclear explosion so that they can, in accordance with national command directives, respond to the situation.

"The Air Force is concerned about the EMP surprise attack scenario," said Lt. Col. Marion P. Schneider of the NTC Division. "IHARDS will provide independent verification to theater commanders of a nuclear detonation occurring somewhere on their side of the world."

EMP Protection Over Time

To determine just how long EMP protection in aircraft will last, a Boeing 720B has been modified to serve as the Electromagnetic Pulse Test Aircraft (EMPTAC). The EMPTAC test program will be conducted over a five-year period. During this time, EMPTAC will be a dedicated nonflying test-bed aircraft. Engineers hope to develop hardness surveillance techniques, improve hard-



Trestle's proportions show up starkly in this close-up perspective of the upper part of the tower in relation to the EMP test aircraft on its platform. Trestle is managed by the Air Force Weapons Laboratory (AFWL) at Kirtland AFB. AFWL is the primary research facility for testing the vulnerability and survivability of USAF systems and is making progress in coping with EMP.

ening technology, and develop alternate test technology to transfer to Air Force Logistics Command (AFLC) and flight-line maintenance shops in operational commands.

"You've got to have some way to go in periodically and examine aircraft to find out whether all the hardening features are still in place," said Dean I. Lawry, EMPTAC program manager. "EMPTAC will let us see what aging does to EMP protection. We also have to develop surveillance testing that is doable by AFLC with the personnel and resources they have." Without such provisions, people tasked to perform maintenance and modifications might well inadvertently damage EMP hardness.

Because B-1B systems are designed to work even if EMP hardness measures have been damaged from aging or day-to-day wear and tear, crews operating the plane would be unaware of their EMP vulnerability. AFWL engineers hope to develop the technology one day to warn crews automatically when a plane's EMP protection has been degraded. They admit that such a system will take years to develop. Still, the EMPTAC program is a step in that direction.

EMP and Space

The EMP threat to satellites and ground systems is complicated when gamma rays generated by an exoatmospheric or near-ground nuclear detonations interact with system surfaces. This interaction creates free electrons inside systems and produces system-generated EMP (SGEMP) and internal EMP (IEMP). Hardening techniques, such as external shielding, are ineffective against SGEMP and IEMP because the EMP is produced inside the satellite or ground system.

To protect space and ground systems from SGEMP and IEMP, engineers have begun shielding individual microchips and using special terminal protection devices that filter out and prevent EMP from reaching critical microelectronics. In addition, they are testing a new generation of microchips that has radiation hardness built in. These radiation-hardened electronics also offer enhanced EMP protection without adding weight. Using a combination of hardening techniques, AFWL scientists and engineers have significantly improved the survivability of Air Force systems.

"Air Force systems that have missions throughout the conflict spectrum need to be survivable in the environments within which they operate," said Colonel Schneider, "and that includes a nuclear one." ■

Capt. Napoleon B. Byars, USAF, is currently assigned to the Secretary of the Air Force Office of Public Affairs. He holds a bachelor's in journalism from the University of North Carolina and a master's in communication from the University of Northern Colorado. He was a Contributing Editor of AIR FORCE *Magazine in 1984–85 under the Air Force's Education With Industry Program. Previously, Captain Byars was Professor of Aerospace Studies at the University of Miami, Fla.*

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Norway's small but effective air force has an important role in defending NATO's northern flank.

The Royal Norwegian Air Force

BY B. AALBAEK-NIELSEN

Photos courtesy of the Norwegian Defense Command's Press and Information Department

Only two NATO countries border directly on the Soviet Union—Turkey in the south and Norway in the north. One hundred and twenty-two miles of common frontier separate Norway and the USSR in an area north of the Arctic Circle, only a short distance from the world's most heavily armed region—the Kola Peninsula.

The Soviet Northern Fleet, which includes more than sixty percent of Russia's ballistic missile submarines, is based at Murmansk. Any Soviet force seeking access to the Atlantic through the Greenland-Iceland-United Kingdom Gap must pass close to Norway's coast. Norwegian Navy and Air Force bases, from which the Kremlin's strategic and theater moves can be monitored, are of great importance to NATO.

Very strong air formations are also based on the Kola Peninsula, including some 340 fighter aircraft and many reconnaissance planes. The airfields can be used for nuclear-capable bombers. In addition, there is a large number of missiles with ranges from 185 to 2,250 miles located on the peninsula.

Although this massive array of Soviet weapons is not directed primarily against Norway, its presence is a decisive factor in Norwegian defense planning and force deployment.

Norway's Defense—Alone And Allied

Ever since NATO was established in 1949 with Norway as a founding member, that country's defense has been based on two pillars: Norway's own efforts and allied reinforcements.

The total peacetime strength of Norway's armed forces is about 55,000, of whom 12,000 are civilians. About 28,000 conscripts serve for twelve months in the Army or fifteen months in the Navy and Air Force. In wartime, however, the mobilized strength would be about 300,000, or 8.5 percent of the population, including some 90,000 in the Norwegian Home Guard.

A Norwegian F-16 Fighting Falcon, built by Fokker in the Netherlands, intercepts a Soviet Backfire over the Barents Sea not far from the common border between Norway and the Soviet Union.

Since 1977, when NATO adopted the goal of three percent annual increases in defense spending, Norway has, on average, more than met that goal. But out of a total 1984 defense budget of 12.948 billion Norwegian kroner ($1.657 billion), only 20.4 percent was for major equipment, while 39.6 percent went for wages. That, indeed, is a very big problem at a time when most of the equipment supplied under the US Military Assistance Program is either obsolete or approaching obsolescence. Funds for replacing this equipment are inadequate, and up to now a disproportionate part has been for the F-16 program, which ended in June 1984 with the delivery of the last of seventy-two Fokker-built Falcons from the Netherlands.

Norway's armed forces cannot, by themselves, defend a mainland area of 149,410 square miles and a continental coastline of 13,050 miles. Allied reinforcement is vital to Norway.

Currently, NATO has the equivalent of four brigades and sixteen air squadrons assigned to reinforce the Northern Flank as a whole and Norway in particular. These forces include 5,000 troops from the multinational Allied Mobile Force (AMF), a British-Dutch commando brigade with another 5,000 troops, an earmarked Canadian air-sea transportable brigade group, and a US Marine amphibious brigade. US forces number about 13,000 men, with the air units having about the same strength as the entire Norwegian Air Force.

Ideally these forces should be based in-country, but Norway's pledge to the Soviet Union that nuclear weapons and foreign military forces would not be based in Norway in peacetime rules that out. To overcome this problem, allied forces are permitted to preposition heavy and bulky supplies and equipment in Norwegian storage facilities. A comprehensive agreement, signed in 1981, provides for prepositioning the American brigade's heavy equipment—including vehi-

cles, artillery, and supplies—at Trondelag, where ultimately it will be stored underground.

Evolution of the Norwegian Air Force

Until 1944, all air units were integral parts of the Norwegian Army or Navy. Although most of the aircraft were obsolete when Germany attacked Norway in April 1940, both Army and Navy air units took part in defending the country. When it was obvious that further resistance in Norway was impossible, all military aircraft with enough range were flown to Great Britain. Later in 1940, personnel from these units were moved to Canada, where a flying school called "Little Norway" was established near Toronto.

In April 1941, the first Norwegian maritime squadron was formed and equipped with twenty-four Northrop N-3PB single-engine float planes ordered by the Norwegian government before the German attack. Two months later, this unit, No. 330 Squadron, was based in Iceland under command of the RAF Coastal Command, flying N-3PBs and later six Consolidated Catalina patrol bombers. In 1943, half of the squadron was moved to Scotland and equipped with Sunderland flying boats. During the war, 330 Squadron logged 7,500 flying hours on the N-3PBs and 12,000 on the Sunderlands.

Two fighter squadrons, Nos. 331 and 332, were established in June 1941 and January 1942 with pilots trained at Little Norway. No. 331 Squadron had the lowest accident rate and the highest number of air victories of any Allied fighter squadron in Europe during 1943. The two squadrons shot down 180 enemy aircraft, probably destroyed thirty-five more, and damaged 123. The squadrons themselves lost seventy-three aircraft. A fourth squadron, No. 333, was assigned a great number of special tasks.

On November 10, 1944, the Army and Naval Air Services were united to form the Royal Norwegian Air Force. By the end of the war, the RNAF had 2,700 personnel. Two hundred eighty-eight of its men had been killed during the war.

The RNAF Today

In 1985, the RNAF has a standing force of some 9,500 men, of whom 5,000 are conscripts. Reserve forces number 25,000, and there is an Air Force Home Guard with 2,500 men who are organized into ten air defense batteries.

Because of Norway's length from north to south (more than 1,250 miles, comparable to the distance from Oslo to Rome), the command structure is divided into Air Command North Norway and Air Command South Norway. There are two squadrons, 331 and 334, equipped with F-16s at Bodø in the north, and 332 and 336 Squadrons, also flying F-16s, are stationed at Rygge in the south. In all, the RNAF operates sixty F-16As and twelve F-16Bs in interceptor, attack, and antishipping roles.

Before the F-16 entered service in 1980, the main fighter types were F-104G/CF-104 Starfighters and F-5/RF-5A Freedom Fighters. Thirty-five F-5As and RF-5As out of a total of ninety-six that were procured are being retained for an operational conversion squadron and a reconnaissance flight.

In 1969, No. 333 Squadron received seven Lockheed P-3B Orions. These aircraft are used for the very important task of sea surveillance to the north and west of Norway and in coastal areas where, in recent years, they have participated in hunting for unidentified submarines in some of the deep Norwegian fjords. The Orions operate out of Andoya, on one of the islands to the northwest. Proposals to modernize their electronic equipment have been prepared.

The RNAF has two transport squadrons, one with six C-130H Hercules and three Falcon 20S aircraft and one with four DHC-6 Twin Otters and two UH-1B helicopters.

The primary task for the C-130s is support missions for the Army. An air transport wing can be ready on twenty-four hours notice for UN operations anywhere in the world, and aircraft from the Norwegian 335 Transport Squadron are well known for their contribution to UN peacekeeping operations in the Congo and the Middle East. The C-130s have also contributed to humanitarian relief actions in disaster areas.

The Twin Otters, excellent STOL aircraft, are used mainly in the northern parts of the country for liaison and for support of military units in remote areas with only small airstrips. The Falcon 20S aircraft are used for checking stationary military navigation equipment as well as for electronic warfare training.

Other aircraft in the RNAF inventory are ten Westland Sea King Mk 43 search and rescue (SAR) helicopters, operated by No. 330 Squadron with its main base at Bodø and detachments at Banak, Sola, and Ørland. On rescue missions, the long-range helicopters operate in close cooperation with the two rescue centers at Bodø in the north and Sola in the south.

F-5 Freedom Fighters like this one often carry long-range tanks to allow them to cover most of Norway's 1,250-mile length.

A P-3B Orion leaves its operating base on the northwest island of Andoya on a maritime surveillance mission.

There are also twenty-six UH-1B utility helicopters (ten of them in storage) and six Lynx Mk 86s used by the Coast Guard from *Nordkapp*-class patrol vessels. Another six Lynx are operated by Air Force personnel.

In accordance with the policy of integrating uniformed and civilian personnel, much of the maintenance of RNAF equipment is done by such civilian organizations as the Scandinavian Airlines System (SAS), which has signed a fourteen-year contract to overhaul four Hercules or Orions a year. The Air Force has also signed an agreement to modify fourteen Super Puma helicopters used by civilian operators for offshore operations so that the helicopters can supplement the Air Force's helicopter fleet in time of war.

Twenty-one Saab Safari elementary trainers are used by the RNAF flying school at Vaernes Air Station. Primary pilot training takes place in Norway. The program lasts for sixteen months, including eight weeks of elementary military training followed by an eleven-week flying period, twenty-seven weeks at sergeant school, and twenty weeks at war college. Secondary specialized training for fighter duty, naval/transport pilots, helicopter pilots, or navigators is in the United States and lasts from eleven to sixteen months. Training is completed in Norway, either in squadrons where the personnel will serve or, for fighter pilots, in the operational conversion squadron at Rygge Air Station.

Ground-Based Air Defense

The Air Force has a battalion of Nike-Hercules surface-to-air missiles deployed around Oslo. The battalion is organized in four batteries and totals 128 missiles. In 1984, the battalion completed a refurbishment program. Three of the batteries are operated by reservists.

For base defense, there are four active and seven reserve battalions, armed largely with 40-mm Bofors L/70 and L/60 light antiaircraft guns with Contraves Super Fledermaus fire control, which is now being uprated.

As part of the prestocking agreement, it was decided to lease from the United States six batteries (fifty-four launchers) of Improved Hawk missiles. These will be delivered between 1985 and 1987. The system will be enhanced under the Norwegian Adapted Hawk (NOAH) program by adding eighteen Acquisition Radar and Control Systems (ARCS) provided by Hughes-Kongsberg Våpenfabrikk (HKV). These systems are based on the Hughes Aircraft Co.'s Low-Altitude Surveillance Radar (LASR) with Kongsberg fire-control centers.

Norwegian air defenses are integrated in the NATO Air Defense Ground Environment (NADGE) radar command and control system and supported by the NATO Airborne Early Warning Command's E-3A Sentry, which uses a Forward Operating Location at Ørland in central Norway and provides a valuable means of reconnaissance and early warning.

Until the German invasion of Norway in April 1940, Norway had maintained a neutral, antimilitarist policy. But the experience of that time made it clear to the Norwegians that both establishing a strong national defense structure and cooperating closely with allied nations were necessary to avoid a repetition of what happened in 1940.

Norway has always emphasized the defensive purpose of its actions. A confidence-building policy toward the Soviet Union continues, including demilitarization of the island groups to the north of Norway and the decision not to allow either nuclear weapons or foreign troops to be stationed on Norwegian soil in peacetime.

Nevertheless, no one should doubt the Norwegians' resolve to maintain their independence by all means available to them. If necessary, that includes calling for NATO reinforcements, which, every second year, demonstrate their peacekeeping role through allied training exercises in Norway. ■

B. Aalbaek-Nielsen has been President of the Danish Air Force Association since 1960 and Editor of its official publication, Propel, *since 1970. He is founder and head of Danish Aviation and Space Publishing. A former captain in the Danish Air Force, he serves presently as a group leader in the Ground Observer Corps of the Danish Home Guard. His earlier article for* Air Force *Magazine, "The Danish Air Force Looks Ahead," appeared in the May '85 issue.*

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While the US hesitates on strategic modernization, the Soviets prepare to deploy two new ICBMs and flight-test three more.

Gains and Gaps in Strategic Forces

BY EDGAR ULSAMER
SENIOR EDITOR (POLICY & TECHNOLOGY)

THE *pièce de résistance* of AFA's national symposium on strategic issues, held on June 27–28, 1985, was history in the making: the arrival of the first operational B-1B at Offutt AFB, Neb., and the symbolic turnover of the aircraft to Strategic Air Command by Air Force Secretary Verne Orr. The event's climax was with a dramatic demonstration of the B-1's high-speed, low-level penetration capability. The participants in the symposium—including Sen. Barry Goldwater (R-Ariz.), Chairman of the Senate Armed Services Committee, then CINCSAC Gen. B. L. Davis, and AFSC Commander Gen. Lawrence A. Skantze—were part of the welcoming committee that witnessed the arrival of the aircraft from Edwards AFB, Calif.

Secretary Orr and General Skantze termed the B-1 program a resounding success, "ahead of schedule and under cost." The latter pointed out that although it took two decades to produce the first B-1, once the go-ahead was given, "it's been a positive case study in program management." After nailing down the requirements, General Skantze said, "the Air Force stuck to them. Cost, schedule, technical, and supportability needs caught equal attention." But the program, he added, is more than a successful product of a strong military and industry team: "It's a testament to a forward-thinking Congress and American public. Without their consensus, the bomber leg of the triad—and so the whole triad—would not be as strong as it is today."

But in spite of their obvious pride in and support of the B-1B program, the symposium speakers shied away from recommending continued acquisition of the B-1B beyond the 100 aircraft currently budgeted. General Davis conceded that SAC could easily "find uses for additional B-1s, but we have to allow for what the budget affords . . . in a world of finite resources." He stressed that "I can live with 100 B-1s," provided they are backed up by the Advanced Technology Bomber (ATB), also known as Stealth, "which takes advantage of a lot of technology that simply can't be put on the B-1B." Asserting that "there are no show-stoppers" slowing down the ATB, he emphasized that it "is in our interest to pursue that program and to produce" the Stealth bomber. General Skantze explained that the Air Force's two-bomber policy was born in 1981 of the need to "put 100 B-1s rapidly into the force." At that time, he said, ATB had to be considered a high-risk venture, making the case for a two-bomber approach all the more compelling.

Consistent support of this approach by the Air Force has been "our strength," but it does not mean that, as "individual Air Force officers, we wouldn't want some more B-1s." But personal desire must not stand in the way of USAF's fundamental bomber strategy or jeopardize the ATB program. The Commander of AFSC's Aeronautical Systems Division, Lt. Gen. Thomas H. McMullen, told the AFA meeting that the dispute over B-1 vs. ATB "is behind us" and that there is no good reason to resurrect it: "The issue now is to sustain the momentum" of the ATB program.

Referring to a congressional amendment that would require public disclosure of the total costs of the ATB program before Congress authorizes production of the Stealth bomber, General Skantze suggested that such a measure was not in the national interest at this time:

"The things we do in the Stealth technology program [represent] the highest technical leverage that we can generate to buy the technological edge over [the Soviet Union's quantitative advantages]. Maintaining the details of these programs—even their dollar values—in a classified form benefits national security. I would not want to make this public unless it is absolutely necessary."

The Strategic Threat

The growth of Soviet military capabilities is prolific across the board, but especially pronounced in the strategic offensive and defensive sector, the Defense Intelligence Agency's Deputy Director for External Affairs,

The first operational B-1B aircraft made a dramatic arrival at Offutt AFB, Neb., at the time of the AFA symposium on strategic issues.

***ORR:** B-1 ahead of schedule, under cost.*

A. Denis Clift, told the AFA symposium. Major strides by the USSR, the DIA official explained, include the development and pending deployment of two mobile advanced-technology ICBMs, the ten-warhead SS-X-24 and the initially single-warhead but eventually MIRVed SS-X-25. The SS-X-24 is expected to be deployed in silos next year and on rail-mobile launchers the year thereafter. This weapon will replace the MIRVed SS-17 and SS-19 silo-based ICBMs that carry fewer warheads. The SS-X-25 seems to be a replacement for the SS-11s.

A version of the mobile SS-X-25 appears capable of carrying several warheads. This weapon is designed to be "hidden in the countryside," which makes tracking, monitoring, and targeting by the US difficult, according to Mr. Clift. In addition, the SS-X-25, which is roughly the same size as the US Minuteman ICBM, is housed in "garages" with sliding roofs and thus can be launched rapidly, even when these weapons are not dispersed in the field in on-road or off-road mobile fashion. The USSR's commitment to the mobile deployment of its new family of ICBMs clearly represents a major investment decision. Such systems require substantially broader support infrastructures than do silo-based systems and thus are much more costly to operate and maintain.

In addition to the two new mobile ICBMs, the SS-X-24 and SS-X-25, the Soviets will put at least three other new ICBMs into flight test in the near future, Mr. Clift disclosed. These new weapons are part of the so-

called fifth generation of Soviet ICBMs and include a new silo-based heavy ICBM to replace the SS-18 (the world's largest ICBM with about twice the throw-weight of MX), a new version of the SS-X-24, and a new version of the SS-X-25. The follow-on to the SS-18 and the growth version of the SS-X-24 are solid-propellant missiles, according to the DIA official. The current rate of buildup suggests that, by the mid-1990s, the Soviet ICBM inventory will be made up almost entirely of new, fifth-generation systems.

In the related and, under certain circumstances, complementary field of intermediate-range ballistic missiles, the Soviets are expected to have fielded more than 450 SS-20 launchers by 1987. More new SS-20 bases were started in 1984 than in any previous year. The total would have been even higher if the Soviets had not deactivated SS-20 bases in the central USSR to convert to SS-X-25 bases. A follow-on to the SS-20 began flight tests in 1984. This new version also carries three warheads and probably provides improved lethality. The presently deployed SS-20 force carries about 2,400 warheads, according to Mr. Clift.

The modernization program is equally intense and comprehensive in the field of Soviet sea-based strategic offensive forces and will result over the next few years in the replacement of the entire MIRVed Soviet SLBM force and the deployment of much better nuclear-powered ballistic missile submarines (SSBNs). In addition to the deployment of Delta IV and Typhoon SSBNs that is under way, an advanced new class of Soviet submarines is likely to enter the force in the early 1990s. Also in the offing is the deployment of the new SS-NX-23 SLBM on Delta IV and Delta III SSBNs. The increased range of this new SLBM, relative to that of the SS-N-18 missile carried by the Delta class, will make the SS-NX-23-equipped SSBNs more survivable. They will be able to operate closer to Soviet shores, where their own naval forces can protect them better. There is also evidence that the Soviets are readying a replacement for the SS-N-20, which is a six-to-nine MIRV SLBM carried by the Typhoon-class SSBNs, as well as a growth version of the SS-NX-23, Mr. Clift said.

The Soviet commitment to modernize comprehensively their strategic offensive forces extends to the USSR's strategic bombers. The fact that the Soviets—for the first time since the 1960s—are modernizing their bombers on a high-priority, all-encompassing basis suggests that Moscow is assigning a greater role in intercontinental attack to these weapons. Especially noteworthy in this context is the fact that the Soviets did not want to delay this modernization by waiting for the full operational capability of their brand-new Blackjack bomber. As an interim step, Moscow instead resumed production of an older type of heavy bomber, the Bear, and thus was able to deploy a new air-launched cruise missile, the AS-15 ALCM, at least four years earlier than otherwise possible, according to the DIA official. About twenty-five of the newly produced Bear bombers, known as the "H" models, have entered the Soviet inventory so far, he added. Blackjack, a strategic bomber similar to the B-1B but faster and larger, is expected to enter the operational inventory in about three years.

The AS-15 ALCM is the first in a series of deployments of long-range, land-attack cruise missiles. US intelligence experts expect to see between 2,000 to 3,000 nuclear-armed cruise missiles enter the Soviet inventory over the next ten years. These new cruise missiles will include air-launched, sea-launched, and ground-launched variants. Among these new designs, according to Mr. Clift, is the 3,000-kilometer-range SS-NX-21, which will be carried by such new Soviet attack submarines as the Victor III class, the Sierra class, the Mike class, and the Akula class.

Growth in Intercontinental Attack Forces

In the aggregate, the growth of Soviet strategic offensive forces over the next few years could result in a doubling of the number of deployed nuclear warheads.

CLIFT: SS-X-25s in the countryside.

The Soviet strategic forces consist now of some 9,000 warheads deployed on some 2,500 ballistic missile launchers and heavy bombers. Assuming that the Soviets remain roughly within the limits specified by SALT II—meaning that they only modernize and don't increase the number of launch platforms—their deployed warhead inventory will grow to somewhat more than 12,000. If, on the other hand, the Soviets exercise no restraint and instead choose to step up their capabilities, US intelligence credits them with the ability to reach an inventory of deployed warheads by the mid-1990s of somewhere between 16,000 and 21,000.

Hand in glove with the expansion of Soviet strategic offensive forces is an across-the-board modernization of strategic defenses. The Soviets are expected by 1987 to complete the modernization of their antiballistic missile (ABM) system ringing Moscow. Consisting of 100 silo-based high-acceleration missiles and modified Galosh interceptors, this system will provide the Soviets with both an exo- and an endoatmospheric (outside and inside the atmosphere) defense capability, according to Mr. Clift. This improved intercept capability will probably be adequate to protect key targets in and around the Soviet capital from small-scale strategic attacks.

By the end of the decade, a new network of large phased-array radars will probably have achieved full operational status, giving the Soviets a much improved capability for ballistic missile early warning, attack assessment, and accurate target tracking. The US intelli-

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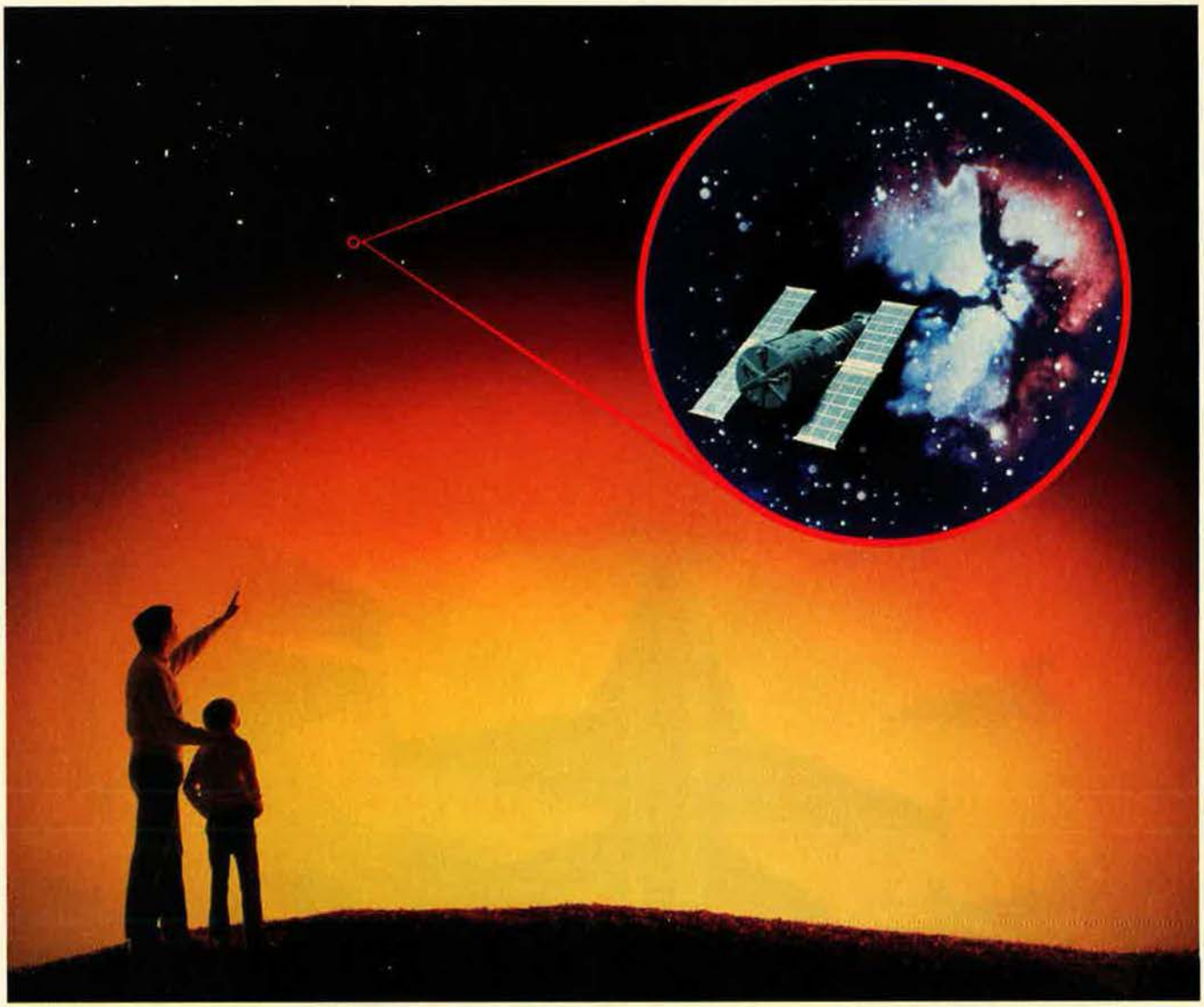

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gence community is not sure if this network of phased-array radars will constitute the backbone of a Soviet territorial ballistic ABM system or is merely a first step in that direction, to be followed by additional generations of advanced ground-based ABM radars.

Augmenting the ABM efforts currently in train is the pending deployment of the SA-X-12, a versatile, hybrid system that can engage conventional aircraft, cruise missiles, and tactical ballistic missiles. This mobile system will probably be deployed in quantity with Soviet ground forces by the end of this year and is judged to be effective against some types of US strategic ballistic missile reentry vehicles as well. This weapon, the DIA official pointed out, blurs the distinction between air defense and ABM systems. As the Soviets develop yet newer, more capable air defense missile systems, this differentiation problem is bound to become more severe.

It is clear already to US intelligence experts that the USSR's continuing development programs give that country the potential for widespread ABM deployments. The Soviets have in production the major components for an ABM system that could be used for widespread or even nationwide coverage. The components include radars, above-ground launchers, and the high-acceleration missiles that will be deployed around Moscow. The US intelligence community has concluded that the Soviets could undertake rapidly paced ABM deployments to strengthen the defense of Moscow, defend key targets in the Western USSR, and extend protection to key targets east of the Urals by the early 1990s. Complementing the Soviet ABM program is the modernization of the USSR's air defense network.

Deployment of highly capable, new, low-altitude strategic air defense weapons is being stepped up. Deployment of the new SA-10 all-altitude surface-to-air missile (SAM) is proceeding apace. New combat aircraft with much better capabilities against low-flying aircraft are entering the Soviet inventory in large numbers, and deployment of the Mainstay airborne warning and control system (a counterpart to USAF's E-3A AWACS) is getting under way. However, there is general consensus in the US intelligence community that, during the next ten years, Soviet air defenses probably won't be capable of inflicting sufficient losses against attacking US bombers and cruise missiles to prevent large-scale damage to the USSR.

Protecting the Leadership

To the Kremlin, the *sine qua non* of "winning" a nuclear war is to ensure the survival of the leadership of the state and party. With as little as a few hours' warning, Mr. Clift told the AFA meeting, a large percentage of the wartime management structure could survive the initial effects of a large-scale US nuclear attack. US intelligence sees evidence of up to 1,500 relocation facilities for Soviet leaders at the national and regional levels. Deep underground facilities for the top national leadership probably guarantee their survival in case of a protracted conflict.

Closely linked to Soviet efforts to achieve a survivable infrastructure are programs that bolster the survivability of their command and control facilities. The Soviets' confidence in their ability to wage global conflict while at the same time limiting damage to the "motherland" hinges on the twin requirements of protecting their own command and control facilities against destruction by US strategic forces and of the ability of their strategic forces to disrupt or destroy this nation's command and control systems. Because of the extensive redundancy and extreme hardness built into the Soviet command and control net, it seems highly likely to US intelligence experts that the Soviets could maintain overall continuity and connectivity of these facilities, even though some degradation might occur. Also, they might lack adequate endurance. Conversely, there is little doubt that the Soviets, in case of nuclear conflict, plan to launch repetitive attacks against US and allied strategic command control and communications (C^3) nets in an attempt to prevent or impair the coordination of retaliatory strikes. The obvious objective would be to ease the burden on Soviet strategic defenses and to deny the US the ability to marshal military and civilian resources to reconstitute its forces.

SKANTZE: "Classic vacillation" on MX.

Advanced Technology Threats

The Soviets treat space as an integral part of their overall offensive and defensive force structure, not as a separate arena or a sanctuary, according to US intelligence assessments. At the same time, the Soviets do not yet appear capable of denying the US use of its space assets in case of global war. The Soviet ASAT space weapons—backstopped by the nuclear-armed Galosh ABM interceptors and two ground-based high-energy lasers—appear capable of destroying or interfering with some US national security spacecraft in near-earth orbit. At the same time, they seem to lack the ability on a comprehensive basis to threaten military spacecraft in higher orbits.

In the view of US intelligence experts, it is likely that the Soviets would attempt to destroy or damage US satellites during an intense conventional conflict or in the initial stages of a nuclear war. It is probable, however, that Soviet ASAT capabilities would not survive a US nuclear attack. The Soviets appear to recognize this shortfall and are working on improved ASAT systems.

A critical first step in this direction, the DIA official

suggested, involves intense buildups of space-launch capabilities and development of a "spaceplane" capable of performing ASAT missions. Such a vehicle might do double duty by also serving as a defense mechanism for future large space stations. The Soviets are adding two huge launch systems to their arsenal of launchers. One of these new launch systems generates about 1,000,000 pounds of thrust on liftoff, while the other one appears capable of producing up to 6,000,000 pounds of thrust and of delivering into orbit payloads weighing as much as 150 tons, according to Mr. Clift.

The potential benefit of directed-energy and kinetic-energy weapons in such missions as warfare in space, air defense, conventional warfare, and, over the long term, ballistic missile defense seems abundantly clear to Soviet planners and designers. The US intelligence community, Mr. Clift told the AFA meeting, estimates that the Soviet laser program, measured by US standards, amounts to a $1 billion a year effort. Two facilities at the Saryshagan test range appear to include high-energy lasers potentially capable of functioning as ASAT weapons. A massive Soviet program seems to aim at the development of ground-based laser weapons for terminal defense against US ballistic missile RVs. The Soviets are expected to test the feasibility of a ground-based ABM laser during the 1980s, probably using one of the high-energy laser facilities at Saryshagan. Operational deployment of such a weapon, the DIA official speculated, probably won't occur until after the year 2000.

DAVIS: Fifty is better than none.

Other high-energy laser developments under way in the Soviet Union seem to be oriented toward strategic air defense applications as well as for use aboard aircraft. In addition, work is progressing on high-energy laser weapons for use in space. It is likely, the DIA official said, that the Soviets will test a prototype high-energy, space-based laser ASAT weapon in low orbit by the first half of the next decade. But even if the tests are successful, such a system probably could not reach operational status in less than ten years from now.

There is evidence that major research programs in progress in the Soviet Union are probing the feasibility of space-based particle-beam weapons. The technical requirements associated with such an undertaking are judged to be extremely severe and militate against the probability of prototype testing before the year 2000, Mr. Clift suggested. In another area of advanced technology, that of radio-frequency (RF) weapons, the Soviets are thought to have mastered all associated research and development hurdles and are probably capable of developing prototypes of such a system. RF weapons can interfere with or destroy critical components of missiles and satellites. Lastly, the Soviets are known to have conducted major research and development programs since the 1960s on technologies with potential applications for hypervelocity kinetic-energy weapons.

Overall, US intelligence finds that Soviet strategic offensive and defensive forces absorb about one-fifth of that nation's defense spending. Current US estimates suggest that the combined investments and operating expenditures for projected Soviet strategic offensive forces—comprised of intercontinental attack and intermediate-range weapons—and strategic defensive forces will grow by between five and seven percent over the next five years. This growth rate forecast assumes that there will be no widespread ABM deployments. If, on the other hand, the Soviets decide to go ahead with a territorial ABM system, spending on strategic forces in the aggregate might increase by as much as ten percent over this period. While Soviet economic problems appear to be severe, there is no evidence that the Kremlin will forgo any major strategic programs, according to US experts.

The ICBM Challenge

The decision by Congress to curtail the Administration's acquisition and deployment level of MX was discussed by a number of symposium speakers and faulted on operational as well as economic grounds. The effects of different administrations and Congress continually adjusting the number of MX Peacekeepers to be produced and deployed, according to General Skantze, are profound: "In fact, we will never produce Peacekeeper missiles at an economic rate because of the political perturbations." He termed the MX program a classic case of vacillation by Congress and the executive branch. The missile was conceived in the mid-1960s, but Congress did not authorize full-scale development of the missile until 1979.

"After three false starts with earlier basing modes that cost the taxpayer $3.5 billion, Congress last year voted to deploy 100 Peacekeepers in Minuteman silos. Now, some elected officials don't like the basing mode for Peacekeeper and are restricting the number we can . . . produce and deploy. . . . That costs money and more money. It sends confusing signals about our national will [and] detracts from our ability to provide an essential military capability," the AFSC Commander complained. General Davis commented on Congress's plans to limit the missile's deployment by saying that "fifty is better than none, but it's not enough to meet the very real military requirement." He termed it "unfortunate" that MX "has become such a political football. Military requirements and military utility hardly enter into the debate anymore."

General Davis and Maj. Gen. Aloysius G. Casey, the Commander of AFSC's Ballistic Missile Office, pointed out that reducing the number of deployed MXs to fewer

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than one hundred weapons—and thus to fewer than 1,000 warheads—does violence to the economics of the program because a fixed number of 123 additional missiles is needed for long-term testing, regardless of the size of the deployed force. Based on an assumed life span of fifteen years, the Joint Chiefs of Staff and SAC determined that 123 spare missiles—108 for operational test and evaluation (OT&E) and another fifteen for "aging surveillance"—are needed to demonstrate on a recurring basis to both the National Command Authorities and the Soviets that the weapon will work well and reliably in an operational environment. This number of test assets, General Davis said, is an irreducible minimum for maintaining an essential level of confidence in

CASEY: ***Deterrence is a relative term.***

the operational effectiveness of the MX "whether you deploy [fifty, one hundred], or a thousand."

General Casey termed the halving of the number of deployed MX Peacekeepers a "very unwise choice for the country." A fifty percent cut in the number of deployed MX missiles and of the warheads they carry results in a cost savings of only $2.883 billion—or thirteen percent of the total program costs—because of the requirement for 123 spare missiles, he pointed out. Shaving thirteen percent off the total program costs by cutting the deployed force in half would have major repercussions in terms of the weapon's operational effectiveness and arms-control leverage, he stressed. Beyond the obvious impact on the credibility of the US strategic deterrent, deploying 500 fewer MX warheads—and fifty fewer missiles—than planned would result in a "degradation of the resilience of Peacekeeper to SLBM attacks that [involve] relatively short arrival times." The Soviets, for one, would have fewer hardened launch control centers to contend with as the number of deployed MX missiles is reduced, according to General Casey.

Congress's vote on the MX program last year, he explained, was focused almost exclusively on the weapon's contribution to arms control at the expense of "its military value." Also, General Casey told the AFA meeting, "Our own rhetoric about survivability over the past ten years also has shifted the emphasis away from the value of the weapon [and] its contributions to deterrence." He stressed that the heart of deterrence "is the fear of counterattack" and that, concomitantly, "the survivability of nuclear forces should not be looked at as an absolute quantity." There isn't any system, he explained, "that can't be wiped out when enough of a threat is applied. Deterrence is a relative term measured [by] the price of the attack, the relative ability to withstand the attack, and the response of the surviving force." Measured against these standards, MX "has great military value" because of its large throw-weight and accuracy, he pointed out. He added that if absolute survivability were the ultimate and sole measure of merit of effective deterrence, there would be an easy answer to the problem: "We know how to build a survivable missile. We [would] put it deep under ground [even though] it might take a few weeks to get out." When people are told that, under this scheme, it would take a few weeks to fire the missile, "their eyes glaze over. The point is that absolute survivability is not the most important military characteristic" of a strategic nuclear weapon, General Casey said.

Historically, he suggested, deterrence of totalitarian regimes worked when it imbued would-be aggressors with the fear of losing the underpinnings of their political existence, their military forces. Nazi Germany did not invade England during World War II because Hitler, who cared little about his own "countervalue" targets, apparently feared that he might lose the Wehrmacht in the process, General Casey theorized. He extended this reasoning to argue that in deterring the Soviet Union it is as important to make clear that both its countervalue and counterforce targets would be attacked and destroyed in case of nuclear war. This circumstance makes the hard-target capability of the US strategic offensive forces—embodied by MX—the cornerstone of effective deterrence, he told the AFA meeting.

The BMO Commander calculated that one MX Peacekeeper warhead is the equivalent of about five or six Minuteman III warheads in terms of hard-target kill capability. Referring to the contention that the US Navy's newest SLBM—the D-5, which is expected to enter the operational inventory by the end of this decade—could and should be substituted for MX, General Casey suggested that this would be an unwise decision: "I have great respect for the US Navy's SLBMs. But let me say that right now we have demonstrated better performance and accuracy [in eight MX test flights] than [are the hoped-for] goals of D-5."

The SSBN force, like the other elements of the strategic triad, have their own peculiar pluses and minuses and achieve full effectiveness only in concert with other strategic weapons. The drawbacks associated with SSBNs, he explained, are "that they are vulnerable in port, they are relatively vulnerable at sea, they have to worry about command and control, and should they ever get a location threat [meaning to become detectable in broad ocean areas], they would be reduced to very few targets."

General Casey found it ironic that Congress would pressure the Administration to reduce the MX deployment at a time when the Soviets need to be dissuaded from continuing their massive buildup of new, large-throw-weight ICBMs: "The deployment of one hundred MX Peacekeepers is really the minimum we [must] do in

furtherance of our planned approach to arms control and, ultimately perhaps, of the reduction of" the MIRVed ICBMs on alert. The Air Force, he said, will continue its highly promising work on superhard silos as a possible means for increasing the survivability of MX.

The SICBM Program

The central importance of the ICBM force to strategic deterrence, General Davis told the AFA meeeting, is behind the Air Force's and the Administration's plan to have "one system deployed, one in production, and another in development. It's a situation we haven't seen in the strategic arena for a very long time." The ICBM in development is the small ICBM (SICBM), or Midgetman. General Casey said the SICBM program is "off to a fast start," with twenty-three contractors already signed up and industry providing excellent contributions to the broad concept definition in progress. The program's full-scale engineering development phase is scheduled to get under way in October 1986, he reported.

The Air Force and its contractors are examining ways to base the new weapon in superhard silos as well as to deploy it in hardened mobile launchers. The latter approach, he explained, offers flexibilities similar to those of SSBNs and strategic bombers, meaning "you can operate in different areas and [thereby] change the attack price." Superhard silo basing, on the other hand, "has all the advantages of fixed silos in terms of O&M costs." New techniques promise that this basing mode "can be made much, much harder than we originally thought." A bonus aspect of these technical advances, he added, is the fact that the cost of superhardening has come down from the original estimates. Also, ICBMs deployed in superhard silos, "regardless of what happens to SDI [the Strategic Defense Initiative], are the most easily defended system" by means of ballistic missile defenses.

General Skantze, elaborating on the Air Force's management approach to the SICBM program, said that "in pre-full-scale development, every stage of the small ICBM is being competed. We have two to four contractors working on each subsystem." Because of budget considerations, "we will 'down-select' to one for each system segment for [full-scale development]; however, our goal is to maintain second sources through FSD if feasible. Early contractual and technological competition minimizes risk during production and sets the stage for a reliable, capable, affordable weapon system."

Assuming that the SICBM is held to a single-warhead configuration, there "can't be any doubt that its cost-per-warhead will be greater than that of MX," General Casey told the AFA meeting. The entire cost of the MX program, based on one hundred deployed and 123 spare missiles, comes to $16.6 billion in FY '85 dollars or $21.5 billion in "then-year dollars," he said. This translates into a cost of $166 million per fielded missile—or "$16.6 million per warhead that is ninety-eight percent of the time on alert for twenty years." Measured in current dollars, that figure is below the fielded cost of Minuteman II, he said. The fielded per-warhead cost of Midgetman, General Casey reported, "probably will be five to six times that [of MX], because a missile goes with every warhead."

The Need for SRAM II

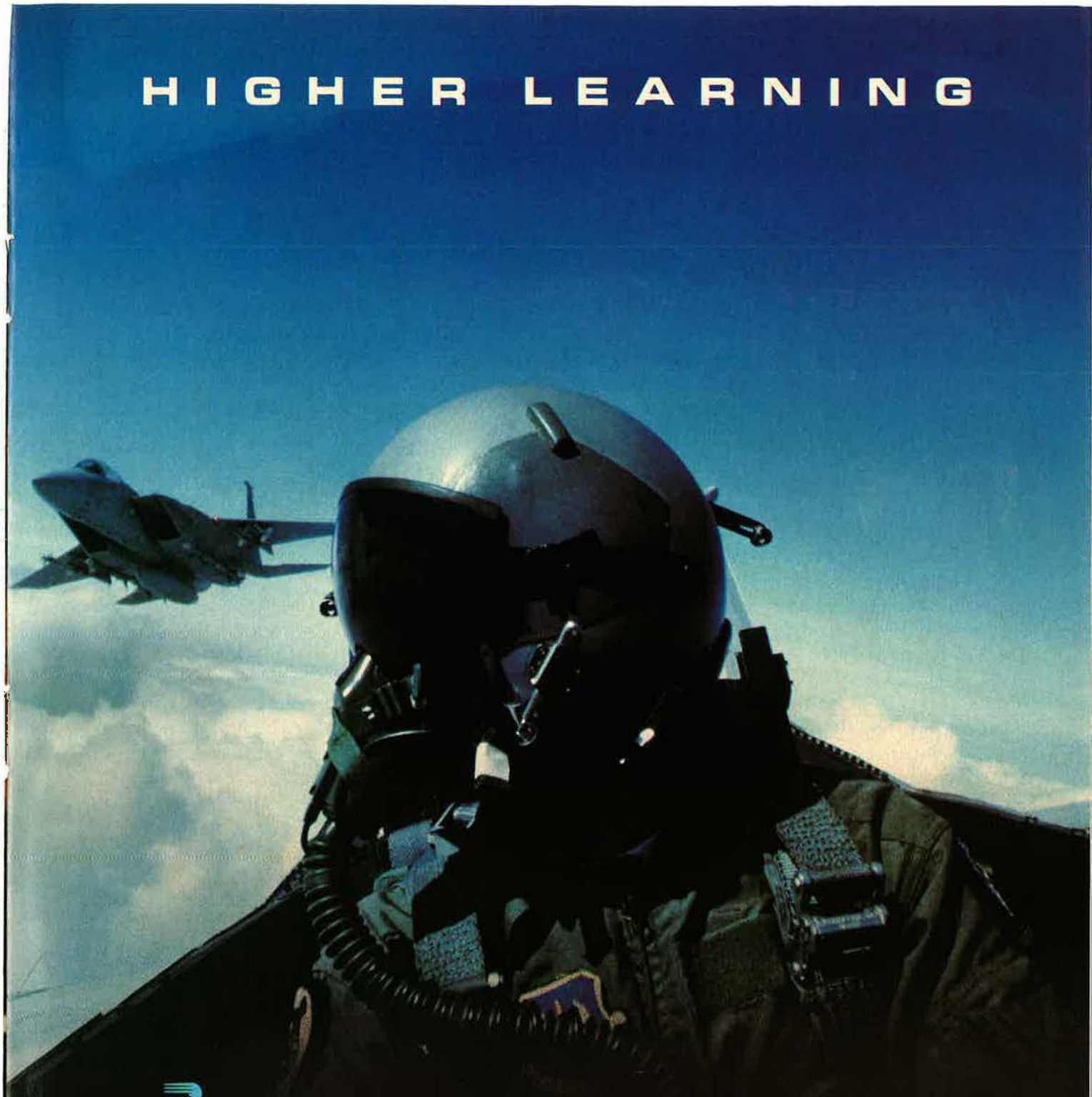
One of the key issues dividing this Congress involves standoff weapons that can augment strategic bombers in nuclear as well as conventional warfare. Key here are SRAM II, the advanced cruise missile (ACM), and JTACMS, the joint tactical missile system. The short-range attack missile (SRAM) now in operation is a rocket-propelled missile, the last one of which was delivered ten years ago. As General McMullen pointed out, the SRAM force is approaching the end of its service life. Its replacement, SRAM II, he explained, is to be carried on penetrating bombers, the B-1B initially and eventually also on ATB. The SRAM II program is in "pre-full-scale development, which means we're defining the missile

McMULLEN: Success falls on the cutting room floor.

and answering fundamental questions like whether it will be rocket- or ramjet-propelled." (Since then, the Aeronautical Systems Division reportedly recommended to the Department of the Air Force that ramjet propulsion be dropped from further consideration.) The central traits of the SRAM follow-on design, he added, are greater survivability, range, accuracy, and reliability than the original design.

The first generation of operational cruise missiles, known as the ALCM-B, started to enter the inventory about five years ago; the last of the 1,763 ALCM-Bs will be delivered to SAC in October 1986, according to the ASD Commander. The program—"one of the successes that [in terms of media coverage] falls on the cutting room floor"—is being completed on schedule and under cost, with the Air Force having turned back "nearly $40 million in budget savings during the last two years," he reported. He added that "the high survivability, the long range, and the accuracy of the relatively low-cost cruise missile [place] a large number of enemy targets at risk, even in the face of more sophisticated air defenses and hardening measures." Once launched by the bomber force from standoff positions, "it penetrates well because it is small and flies low—and hence is hard to detect. At the same time, because we send in lots of them, the cruise missile will create confusion; they should saturate and thereby dilute enemy defenses" and make life much easier for the penetrating bomber force that follows.

HIGHER LEARNING



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SCIENCE/SCOPE

A prototype Amraam missile passed within lethal distance of a target aircraft in the first guided launch of its full-scale development program. The unarmed weapon was launched from a U.S. Air Force F-16 flying at Mach 0.85 at an altitude of 21,000 feet. It was fired from behind a QF-100 drone flying at Mach 0.7 at 21,800 feet over White Sands Missile Range in New Mexico. Telemetry data indicate the 12-foot-long, 335-pound missile met all test objectives. The flight also verified Amraam's interface with the F-16's avionics system and the performance of its active radar guidance capabilities. Hughes Aircraft Company is developing the AIM-120A advanced medium-range air-to-air missile and its companion rail launcher for the Air Force and Navy.

The U.S. Army's Bradley Fighting Vehicle System will pack more punch when equipped with the new TOW 2 antitank missile. The armored vehicle's TOW weapon subsystem design, which incorporates an integrated day/night sight unit, is being modified to fire the TOW 2. The missile features improved guidance and a more potent warhead designed to defeat advanced enemy armor. Design and tests of the TOW 2-compatible subsystem, including day and night firings against stationary and moving targets, have been completed. Hughes is delivering TOW (Tube-launched, Optically tracked, Wire-guided) subsystems to FMC Corporation, the vehicle developer and system integrator. Deliveries of the TOW 2-compatible subsystems are scheduled to begin late this year.

Designed for easy installation and maintenance, a helicopter night vision system cuts life-cycle costs and downtime. The Hughes Night Vision System (HNVS) is a low-cost, forward-looking infrared (FLIR) system that provides excellent imagery and object detection in any visibility condition, day or night. The system is compact, lightweight, and totally comprised of a few interchangeable units and assemblies. Installation is fast and units may be switched between aircraft within minutes. A proven avionics interface, programmable software formats, and extensive built-in and fault-isolation testing provide fast set-up, easy modification, and simplified maintenance.

A new process called vacuum brazing will soon help manufacture advanced radar components for U.S. fighter aircraft. Vacuum brazing forms extremely strong joints between lightweight metals, allowing engineers to design parts that previously could not be manufactured. The process involves treating parts with a special brazing alloy and a small amount of magnesium. The parts are placed inside the vacuum furnace, which normally operates at a pressure of one millionth of an atmosphere, and heated to temperatures of 1100°F. Because vacuum brazing requires no flux, it is far more economical than conventional flux dip brazing, in which components are dipped into molten salts. The process also eliminates corrosion caused by trapped or residual flux. Hughes engineers are investigating how vacuum brazing might be used to fabricate heat dissipators and other radar parts.

Static electricity, which can damage sensitive microelectronics even in small doses, is being combatted on missile manufacturing lines at Hughes. The production lines in Tucson, Arizona, are being equipped with conductive floor tiles and new work benches that have antistatic tops. These steps have been completed for the air-to-surface IR Maverick, parts of antitank TOW, and the central circuit card assembly areas. In addition, all assembly, test, and inspection employees are required to wear new antistatic ground straps and lint-free smocks. Static electricity can cause reliability problems with sensitive electronics and optical components in the missiles built in Tucson.

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HUGHES
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At the time the decision was made to terminate the ALCM-B buy at 1,763 missiles, development of a follow-on system, the advanced cruise missile (ACM), was initiated. This program, General McMullen said, is now in full-scale development and will result in a weapon that "outdoes ALCM in important areas like range and penetrability." Other details of this design, which incorporates advanced low-observable technology, are classified.

The JTACMS, in addition to serving as a sophisticated conventional standoff missile, could, in the view of some congressional experts, serve as a substitute for SRAM II if it were equipped with a nuclear warhead. JTACMS is a promising candidate for deployment on all strategic bombers—B-52, B-1B, and ATB—according to General McMullen. He suggested, however, that its primary application should be in conventional warfare missions.

General Davis acknowledged that the combination of HE (high-energy conventional explosives) and the accuracy of standoff weapons measured "in tens of feet" makes it possible to attack some SIOP (single integrated operational plan, this country's strategic masterplan) targets by nonnuclear means. Advanced conventional weapons of this type, General Davis told the AFA meeting, "have enough lethality to do the essential job, such as taking down [Soviet] plants that are producing strategic nuclear material."

Such targets, he explained, don't require total destruction. Taking down part of the target to put the plant out of commission would be sufficient. "We can do this with nonnuclear weapons. As a result, it might be attractive to deal with certain parts of the SIOP targeting complex by conventional means, even though we won't be able to do the whole job without nuclear weapons." Over time, he predicted, an increasingly greater share of SIOP targets could be dealt with in this manner, "but I don't believe we will ever be able to disinvent nuclear weapons."

In the related field of theater warfare by conventional means, Aeronautical Systems Division is working on technologies that enhance SAC's ability to perform such missions: "We are upgrading the conventional weapon capability of the non-ALCM-carrying B-52Gs to include the Harpoon antiship missile and the capability to interface with any conventional weapon built to MIL STD [military standard] 1760—a standard definition of the interface between weapons and aircraft," according to General McMullen. Another significant ASD effort in support of SAC's bomber fleet, he said, is the Common Strategic Rotary Launcher, which "will mount up in the B-52H bomb bay and will carry all of the air-droppable, air-launched strategic weapons." General McMullen added that these launchers, "with a slight mod[ification], will then be used on the B-1B when the B-52s phase out. What's more, a . . . similar launcher will go on the ATB."

The F100 Engine Spares Situation

Both Gen. Earl T. O'Loughlin, the AFLC Commander, and General Skantze dealt with allegations of catastrophic spares problems associated with the F100 engine. Of the 108 planned F100 spare engines for the F-15 force, General O'Loughlin said, "I have thirty-four." Asking rhetorically "Is this bad?" he answered, "Not half as bad as in 1980 when I had thirty aircraft sitting at Robins AFB without engines at all." The overall spares supply, he explained, is growing at the same rate as spares funding. The tactical air forces (AAC, TAC, USAFE, and PACAF) were recently able to raise their mission capabilities standard to eighty-five percent, General O'Loughlin said, adding that "many of the F-16 squadrons are at ninety-two percent."

AFLC's target in terms of spare engines for the F-16 is fifty-nine units of the F100-200 type: "Yesterday, I had seventy-four, so I am over on the Dash 200s." The F100 engine, the AFLC Commander told the AFA meeting, is plagued by a "diffuser case problem. It looks like a manufacturing flaw. We are not sure how many [engines] this will affect." Correction of this problem is difficult because spare parts have been "subbed out" to a high degree, with the result that the prime contractor, Pratt & Whitney, "doesn't have full control over the engine anymore [and] probably doesn't manufacture more than twenty percent of that engine."

***O'LOUGHLIN:** Support is up for operational forces.*

General Skantze also attributed the current F100 spares problem to the excessive "breakout" of parts that "puts more vendors into the picture as well as more piece parts and [that increases the role of] small business." This breakout requirement, he said, "has made the whole process more difficult and nearly doubled the time [it takes] to get a purchase order out." Even before that purchase order can be issued, the process now has to contend with competition advocates and people looking for evidence of overpricing as well as the breakout criteria: "With good intentions, we have made the whole process more difficult, and we are not getting any more people" to carry the new, extra work load, according to General Skantze.

General O'Loughlin, looking at the problem in broader terms, suggested that "lots of industries want out of the defense business. They have gone on to other things because of the capital it takes to get on board" as well as the requirement to comply with a plethora of federal regulations. He predicted that key areas where this "drying up of industry" interest will adversely affect defense programs next are "bearings as well as large forgings and castings." ■

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DEFENSE COMMUNICATIONS

ABOVE: A member of Philippines special forces takes part in a joint exercise. OPPOSITE: A member of the Philippines New People's Army.

Manila is not even close to going the way of Saigon. But then neither was Saigon in 1960.

The Questionable Future of The Philippines

BY GEN. T. R. MILTON, USAF (RET.)
CONTRIBUTING EDITOR

On July 4, 1946, the United States gave the Philippines its independence, honoring a pledge made in 1934. The process of an orderly transition to freedom had been interrupted by World War II, but during those war years the bond between the two countries had been strengthened, and independence, following so closely on Philippine liberation, further cemented it. Or so it seemed at the time.

Unhappily, an insurrection was stirring in the Philippines in 1946, and the new Republic found itself in serious trouble. The People's Anti-Japanese Army, better known as the Huks, a shortened form of the Tagalog name for the guerrilla movement, was beginning to show its true colors. Its interest in the Japanese had been only for the moment; its actual goal was a Communist Philippines.

Ramon Magsaysay, a brave and incorruptible man, then appeared on the scene, first as Defense Secretary and then as President. With a remarkable USAF officer, Col. Ed Lansdale, at his side as his *éminence grise*, he was able to put down the rebellion. The Magsaysay-

Gamma-Liaison photo by Sandro Tucci

Lansdale campaign against the Huks combined relentless military action with a wise program of land reform and guerrilla amnesty. By 1954, the Huk rebellion was effectively over, and the Republic of the Philippines was ready to take its place as a rising Asian nation.

But along the way something went wrong. The United States, serene in its conviction that representative democracy was every country's due, had bestowed a US-style constitution on its former ward, but after the brief tenure of the incorruptible Magsaysay ended with an airplane crash, Filipino politicians began to display an aptitude for the worst features of American politics. Wheeling and dealing became the order of the day.

In 1961, Diosdado Macapagal won the presidency in an election marked by general outrage at the corruption of the previous Garcia administration. Macapagal gave every indication of a sincere desire to reform Philippine politics and to provide the country with an honest regime. Whatever his intention, things failed to work out that way. The Macapagal years passed in the customary tropical torpor, and politicians continued on the take.

Democracy had done nothing for the little fellow in the barrio. Crime, sometimes indistinguishable from a resurgent Huk movement, became endemic, and even minor politicians traveled about with pistol-toting bodyguards. The Philippine armed forces were mainly bystanders at the scene, with neither power nor much in the way of government support.

This was the situation inherited by Ferdinand E. Marcos when he became president in 1965. A dynamic man in those days—handsome, a rousing speaker, and, like Magsaysay, a certified hero of the Japanese war—he had a well-known temper, a trait he shared with Magsaysay. All in all, Marcos seemed the man for the job.

Two Decades of Turbulence

Twenty years later, the Filipinos are not so sure. Things have been up and down during those two decades—up in the early Marcos days and then down. Today, the situation in the Philippines is hauntingly similar to that of 1950. The New People's Army rebellion has not yet reached the 1950 level, but is headed in that direction. A land of intelligent and industrious people, with no menacing neighbors, the Republic of the Philippines should be, along with Taiwan, an Asian model of free enterprise. Instead, it is debt-ridden, unemployment is high and rising, and it is faced with a dangerous insurrection. What went wrong?

A visitor to Manila might say that nothing has gone wrong, for the old city has never looked better. Luneta Park, Roxas Boulevard (formerly Dewey Boulevard), and the entire downtown waterfront are tributes to the beautification efforts of Mrs. Marcos, First Lady—a title that has become quasi-official—and Governor of Metro Manila. Beautiful and clean though it may appear to be, Manila is a misleading symbol of Philippine progress. The slums are still there—just better concealed. It is necessary to look behind the facade.

For whatever reason, former Spanish colonies suffer from an almost total lack of *noblesse oblige*. Old and wealthy families isolate

themselves from the poor, and the Philippines, despite the long history as an American colony, seems stuck in this Spanish tradition. Newly rich Filipinos easily adapt to it. Therefore, when the sugar market collapsed, workers were left without jobs, income, or hope. Since there are more than 4,000,000 people directly employed in the sugar industry, this is a formidable number of potential government enemies. The island of Negros, for example, is almost entirely occupied with sugar production, and Negros, not surprisingly, has become fertile ground for the NPA. The fact that Roberto Benedicto, a powerful figure who controls the sugar industry, is, or was, President Marcos's close friend contributes to the NPA's advantage.

As for coconuts, another basic Philippine commodity, the market for coconut oil and copra is here again controlled by one man, Eduardo Cojuangco, Jr., reputed to be the most powerful man in the Philippines next to the President himself. He has extensive holdings on Luzon and Mindanao and a large and efficient private army officered, in part, by former Israelis. Cojuangco is generally conceded to be a kingmaker, a man who will have a decisive say as to who will follow Marcos in Malacanang Palace. Meanwhile, the Republic of the Philippines is functioning without a Vice President, and President Marcos's health has been a subject of speculation. While he has announced that he will run again in 1987, nevertheless the future of Philippine politics is difficult to read.

The Aquino Murder

Benigno Aquino's murder on the tarmac at the Manila Airport had a profound effect. He has become a martyr, a rallying symbol for people of various political colorations who oppose the Marcos regime.

During my days at Clark, Aquino was Governor of Tarlac, a province just north of the air base. He stood in refreshing contrast to the corrupt politicians elsewhere in central Luzon and gave every indication of being a supporter of our military presence there. A sometimes naïve man, Aquino had among his associates a sprinkling from the radical left. Not surprisingly, militant opponents of the American bases are now marching under the Aquino banner.

Gamma-Liaison photo by Robin Moyer

Ferdinand E. Marcos. A dynamic man when he became president in 1965, his future now seems uncertain, though he plans to run again for office in 1987.

Thus far, the bases have not been affected by the NPA, although the shadowy leaders of that movement have called for American withdrawal. At this stage of the insurrection, however, the NPA has evidently decided to leave the bases alone, concentrating instead on the classic Maoist tactic of building support among the populace.

Informed estimates of NPA strength put the actual armed guerrilla force at about 10,000, with perhaps as many as a million supporters. The insurgency is growing throughout the islands, but it is strongest, according to Philippine military sources, in northern and southern Luzon, in certain areas in the Visayas, and most particularly in Mindanao, where there are nineteen guerrilla fronts as compared to fourteen in Luzon and seven in the Visayas.

While much of the popular support for the NPA appears to be simply a reaction against the status quo, the hard core of the NPA is avowedly Marxist. Rodolfo Salas has taken over the chairmanship of the Communist Party, replacing the jailed José Sison, and is thus the titular head of the NPA, but Sison's master plan is being followed. Its underlying theme is anti-Americanism.

The People's Republic of China has long since established diplomatic relations with Manila, and the PRC is openly in favor of the American bases, which creates a different situation for the NPA than was the case at the time of the Huks. In the days of the Huk insurgency, Red China gave at least moral support to Maoist revolutionaries. With Mao not only gone but in PRC disfavor, the NPA is on its own, with no visible outside support. Guns and ammunition are principally of US origin, captured from the Philippine armed forces and, even more easily, from the Civilian Home Defense Forces, a poorly trained, generally undisciplined organization charged with barrio security. Nonetheless, with the USSR firmly entrenched at Cam Ranh Bay in Vietnam, the possibility of outside support is very real. Given the present state of the Philippine armed forces, supply runs across the South China Sea would be child's play, if the Soviets decide on that course.

Small Military Establishment

When Ferdinand Marcos came to power, the Philippine armed services—Army, Navy, Air Force, and Constabulary—numbered about 55,000, a small establishment to oversee the security of an archipelago made up of 7,100 islands. But with the Huks quiescent, no external threat, and a major United States presence at Clark and Subic, the Philippine armed forces appeared adequate.

As crime, riots, and general lawlessness spread throughout the islands, the military task of internal security called for larger forces. When the country seemed on the verge of anarchy in September 1972, Marcos declared martial law. The following year, the Philippines scrapped the US-style form of government in favor of a nominal parliamentary system that bestowed almost dictatorial power on the President.

The role of the military during these years grew in importance, and so, naturally, did the number of se-

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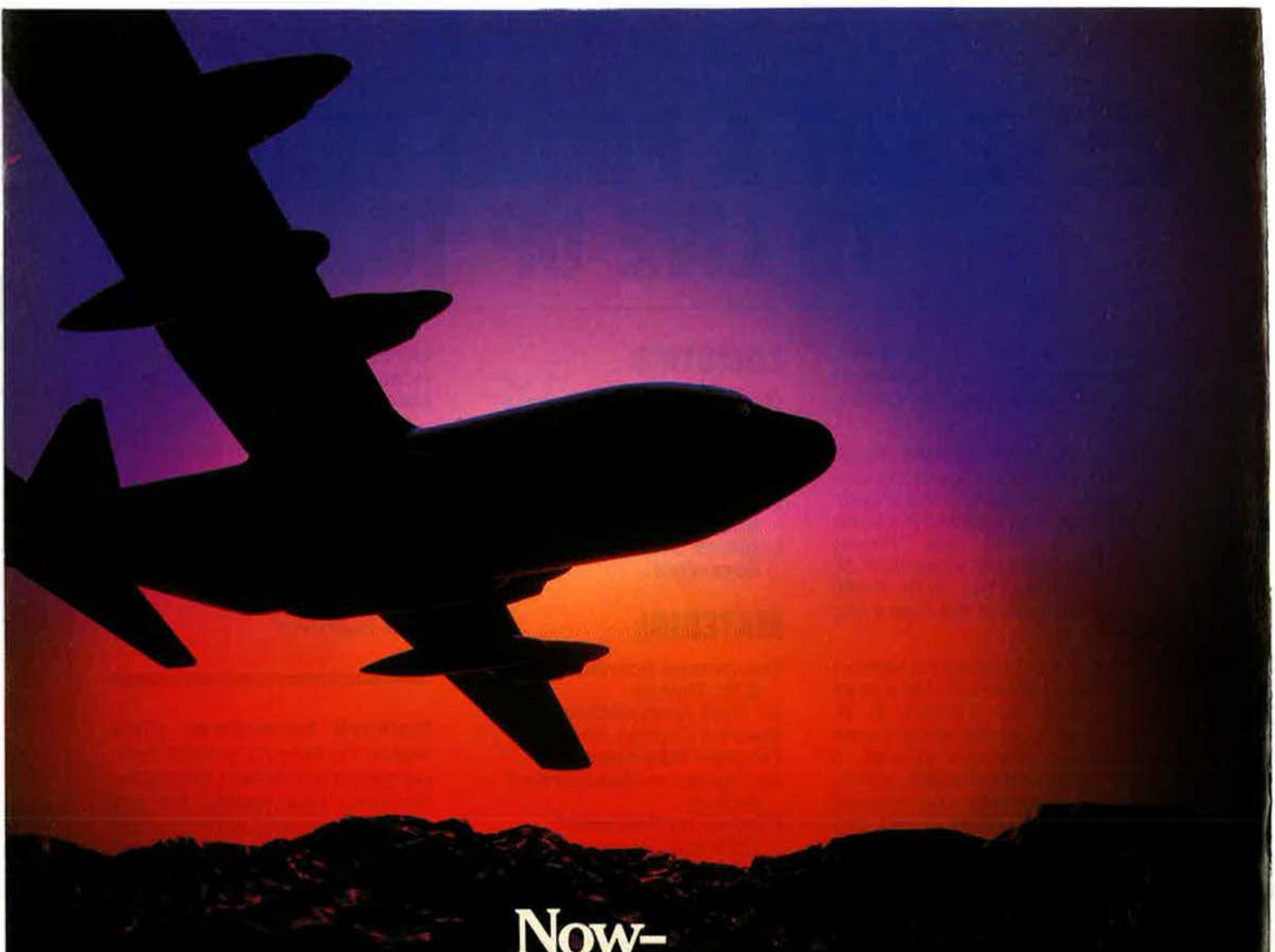

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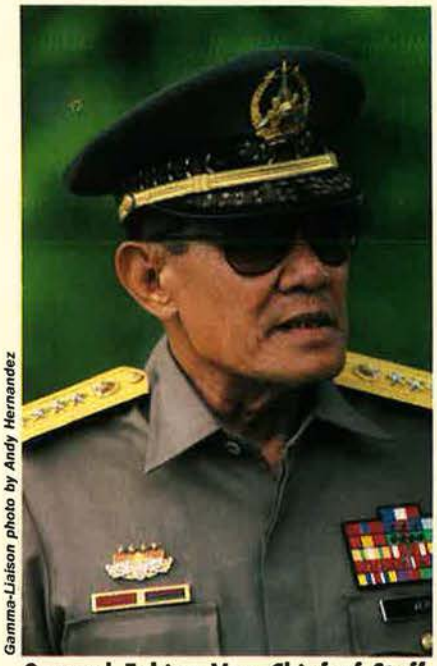
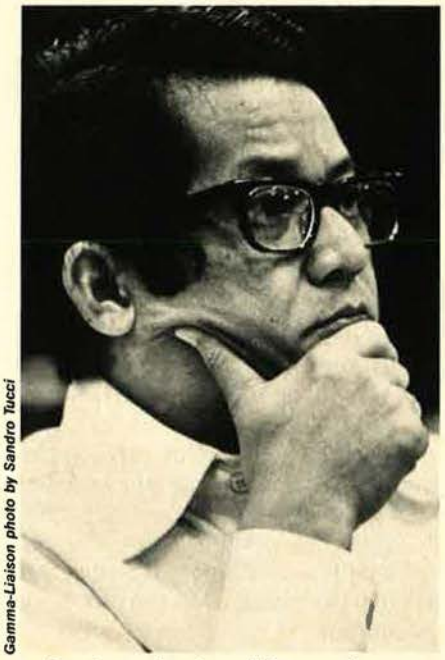
nior officers. Martial law officially ended in 1981, but there is little perceptible difference in the way the country is run. The President still wields almost total power, with the military there to back him up. In recent years, as martial law was relaxed, there has been vocal opposition to Marcos and a free, even vindictive, opposition press.

If Benigno Aquino had not been murdered, perhaps events in the Philippines would not have unfolded so rapidly. The NPA insurgency might have remained more an aggravation than a serious threat and the Marcos opponents disorganized. The Aquino murder, however, has proven to be a most serious setback to the credibility of the Marcos government as well as to the Philippine armed forces. The NPA has been the beneficiary.



Gamma-Liaison photo by Andy Hernandez

General Fabian Ver, Chief of Staff of the armed forces, came to power as a presidential favorite and has risen from aide to his present eminence.



Gamma-Liaison photo by Sandro Tucci

Benigno Aquino. His murder on the tarmac at Manila Airport has had a profound effect. He has become a symbol for those who oppose Marcos.

Ver and His Allies

General Fabian Ver, Chief of Staff of the armed forces and thus the senior military officer, came to power as a presidential favorite. A Marcos cousin, Ver's military career has been spent in direct service to the President; he has risen from aide, chauffeur, and bodyguard to his present eminence. As might be expected, all the current service chiefs owe their promotions, and presumably their allegiance, to General Ver. Therefore, when the commission investigating the Aquino murder decided that the trail led to the military and, by inference, to General Ver, there was consternation in the armed forces headquarters at Camp General Emilio Aguinaldo. Ver, Brig. Gen. Luther Custodio, and various enlisted men were directly implicated.

The enlisted men charged with complicity in the Aquino murder are housed in a temporary stockade, which, as it happens, is across the street from the Philippine Air Force Golf Club, where they are treated to the occasional meal. General Custodio is in quarters arrest; General Ver has taken leave of absence during the trial. In my casual lunchtime meeting with him, Ver appeared unconcerned, even jovial, and, as it turned out a few days later, with reason. The prosecution has been denied use of most of the critical evidence, and President Marcos has declared he will reinstate General Ver to his former position if he is found innocent. As this is written, that action seems a foregone conclusion.

Meanwhile, Lt. Gen. Fidel Ramos, Ver's deputy, a West Point graduate and a highly respected officer, is Acting Chief of Staff. It is not an enviable position. All retirements of senior officers have been postponed for the duration of the trial, so Ramos must deal with the same old crowd. If there were any doubts as to where the loyalties lie, they were dispelled by a full-page newspaper advertisement supporting General Ver and signed by eighty percent of the Philippine generals. A notable exception was General Ramos.

The armed forces are badly in need of a major overhaul, of that there can be no question. Training is spotty and, in the case of ground troops, sometimes nonexistent. There are severe shortages of communications equipment, rolling stock, and medevac helicopters. Bullet wounds are thus often fatal for lack of medical care, a sure cause of low morale. Military pay is grossly inadequate, leading to poverty and thievery in the lower ranks and corruption at the senior level. The Air Force is chronically short of fuel and spare parts, and the Navy has most of its ships riding at anchor for the same reasons.

All in all, the Philippine armed forces are in poor shape to deal with a rising insurgency, one that appears to be taking to heart military tactics found in US Army manuals. One rare encouraging sign has been the demand made recently by a substantial number of junior and middle grade officers, Philippine Military Academy graduates, for military reform. Perhaps someone will listen.

Essential US Bases

In the meantime, the US Air Force at Clark AB and the US Navy at Subic Bay go about their business, officially unaware of Philippine troubles. There are other installations, like Camp John Hay at Baguio and various communication sites, but Clark and Subic, together with its airfield at Cubi Point, are the essential ones. Beyond the fact that they are magnificent bases, almost irreplaceable in dollar terms, these two distant outposts are the

key to the projection of US power in Southeast Asia and points west.

Without Subic, the Navy's Seventh Fleet would, for many purposes, face a long haul back to Pearl Harbor. Clark provides logistic and medical support for anything that might arise in the South Pacific and serves as well as a base for operations over the South China Sea. Its Crow Valley gunnery and bombing range is one of the finest and most realistic to be found anywhere.

The cost of relocating these bases in, say, the Marianas would be enormous; their geographic advantages cannot be found anywhere else. Nevertheless, the years since 1946 have seen a certain erosion in the US position at Clark and Subic. Although the damage has thus far been peripheral, it has been erosion all the same.

The first base agreement, signed in 1947, was for ninety-nine years. Clark and Subic had, of course, been American bases prior to Philippine independence, and the 1947 agreement essentially continued that status. As time went on and nationalism began to assert itself, various modifications to this agreement were enacted. Finally, in 1979, Clark and Subic, together with the various satellite installations, became Philippine bases under the command of Philippine base commanders. The United States was given the use of certain facilities and areas and, to quote the agreement, "shall have effective command and control over such facilities and over United States personnel. . . ."

The agreement is reviewed every five years. In any case, it expires in 1991, the ninety-nine years having been renegotiated to twenty-five in the revised agreement of 1966. So far, the arrangement has been harmonious enough, thanks to intelligent local cooperation between Filipino and American commanders. The bases, however, are no longer US enclaves, as once they were.

The rent we pay for our occupancy of these bases amounts to $900 million over the five years ending in 1989 and is broken down as follows: Military Assistance: $125 million; Foreign Military Sales Credits: $300 million; and Economic Support Fund Assistance: $475 million.

This is obviously an important contribution to a financially strapped Philippine government, to say nothing of the thousands of jobs the bases provide. All things being equal, then, we can probably expect a long-term extension of the agreement when 1991 rolls around.

The NPA Agenda

Whether or not this happens depends on how things go during the next few years. As we noted earlier, the NPA, thus far, has not disturbed the bases, but if we are to believe the rhetoric, they are on the target list. Since none of the bases could function efficiently if it were under determined attack, or even guerrilla harassment, other pastures, at such a point, would begin to look greener.

As yet, there is no reason to believe the insurgency will reach that stage. The Philippine armed forces, with a total strength of 155,000, are large enough to contain and defeat 10,000 guerrillas, especially when the guerrillas are without outside help. Being large enough, however, is meaningless without the leadership, training, and morale necessary for successful military action.

Back in 1950, when Ramon Magsaysay became defense minister, he found himself head of a barracks-bound military with no great urge to fight. The Huks, accordingly, were on the move, and Magsaysay began to make unannounced visits at odd hours to military units. Sometimes these lightning visits resulted in the summary relief of a commander. At other times, Magsaysay found what he was looking for, and a promotion was forthcoming. The overall effect of this dynamic man's campaign was a restoration of morale, self-esteem, and combat leadership. That, combined with imaginative social reform, was responsible for the defeat of the Huks.

Now, thirty-five years later, the armed forces are once more in need of rejuvenation. Somehow, and for whatever reason, the image of the Philippine military has become badly tarnished. Fine young officers are still being turned out at the Military Academy in Baguio, there are capable, even outstanding, leaders at every level, and no one has ever doubted the fighting qualities of the Filipino military man. The trouble lies deeper, and the solution will require major changes in the structure. How and when, or even if, this will come about is a matter of conjecture.

The Republic of the Philippines will have a presidential election in 1987. President Marcos has put a damper on speculation about the election by announcing, last spring, that he will run again, health problems or no. In fact, he has looked more like his old self in recent appearances, but the rumors do persist of occasional setbacks in what appears to be a chronic kidney disease.

The real speculation has to do with the office of vice president, at the moment, unoccupied. It seems doubtful that Mrs. Marcos will be in line for the job, in view of the country's present unrest, although she remains a possibility. Over the years of the Marcos dynasty, Imelda Marcos has become far more than the President's wife. She is, in many ways, almost a coequal of the President himself, one whose picture shares official walls with that of her husband.

If President Marcos succeeds himself for another six-year term, the dynasty will have become a fixture. More to the point, negotiations on the future of Clark and Subic will be under his aegis, and there is no reason to believe he would not favor a new lease.

His likely opponent in the 1987 election is Salvador Laurel, a man who has a slightly jaundiced view of the continued American presence. He has stated that he would retain the bases until 1991, then hold a plebiscite. Since plebiscites are sensitive as to how the question is worded, and Filipinos an emotional and unpredictable lot, we might not wish to wait around in the face of an uncertain future. Certainly, it will

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Gen. T. R. Milton, USAF (Ret.), is a longtime Contributing Editor to this magazine. His forty-year military career included combat service with Eighth Air Force in World War II, participation in the Berlin Airlift, command of Thirteenth Air Force in the Philippines, service as Air Force Inspector General and USAF Comptroller, and duty as the US Representative to the NATO Military Committee. He retired from active duty in 1974 and makes his home in Colorado Springs, Colo.

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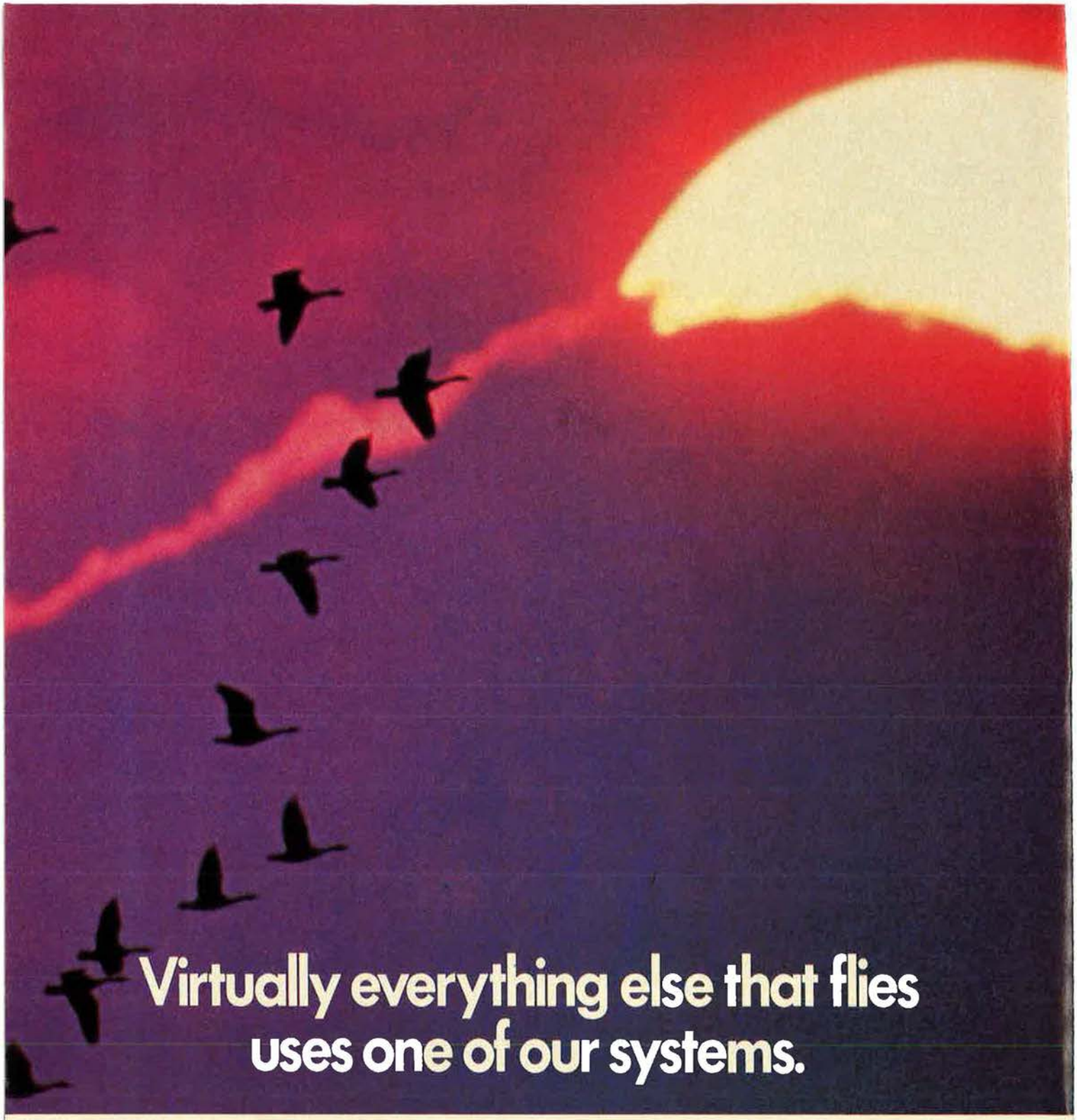

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Choices for Marcos

The old quarters at Clark have stood there a long time, dating back to the turn of the century when Clark was known as Fort Stotsenberg. They have housed the horse cavalry, the Japanese briefly, and the Air Force these past forty years. When 1991 comes around, it will be just twelve years short of a century that the United States has been established at Clark. For old times' sake does not qualify as a military reason to stay on, but there are other valid ones. The Philippines are going through troubled times, but they have been through troubled times before. Beyond that, the relationship between the United States and the Republic of the Philippines is far closer than that of allies. It is one of old and trusted friends, or at least, it has been up until now.

The next few years will determine the future of that friendship. Without question, the Marcos regime is an unpopular one among a great many Filipinos. The seedy reputation of the armed forces is a major contributor to that unpopularity. For better or worse, we are associated with the Marcos regime. The United States thus finds itself in a delicate position. Clearly, there is rising opposition to the Marcos family rule and, with it, a rise in anti-Americanism. How deep this anti-Americanism really goes is hard to determine, but, as an educated guess, it is not very deep just now. Whether it grows from here on will depend to a very great extent on the behavior of the Philippine government.

If President Marcos will face up to the fact that his military forces are held in low esteem and widely viewed as both corrupt and inept, he will know what to do. A reformed military, adequately paid, trained, and disciplined, could deal with the NPA in short order. Anti-Americanism would then recede to the radical fringe. But if nothing is done to repair the military's image and effectiveness, the next few years could see our long association come to an end. Manila is not even close to going the way of Saigon, but neither was Saigon in 1960. ■

It was different then. Today, we have no MacArthurs.

MacArthur's Final Return

General Douglas MacArthur keeps his promise to the Philippines that he will return as he wades ashore at Leyte in October 1944.

Anti-Americanism, the war cry of Philippine leftists these days, was nowhere in evidence during the fall of 1961. Gen. Douglas MacArthur had come back for a final visit, and the nation was in an exuberant mood.

The festivities came to a climax on the Luneta, a park facing Manila Bay. More than a million Filipinos crowded the area to get a glimpse of the old general while he stood on the stand reviewing a seemingly endless parade. Dressed in the familiar khakis and the battered old cap with scrambled eggs, MacArthur looked all his eighty-odd years when the parade began. At its end, he appeared no older than he had been at Leyte Gulf.

That evening, the President of the Philippines gave a dinner at Malacanang, the presidential palace. It is an elaborate old building in the Spanish style and served as the governor's palace during Spanish times and later as the residence of American High Commissioners before Philippine independence. MacArthur's father had been one of those residents.

The state dining room of Malacanang is open on the sides, in the tropical manner. The only lighting that evening was from hundreds of candles. When MacArthur rose to speak, the Pasig River serving as a backdrop, a hundred or more guests were absolutely silent, waiting to hear what the old man would say. He had nothing in the way of notes.

"As I stand here tonight," he began, "the ghosts of friends of former years pass before my eyes." Then he named them, all the historic Philippine figures of this century. He paused slightly when he pronounced the single American name, Arthur MacArthur, and went on. His talk ended on a sentimental and melancholy note. It was his farewell to a land he loved. He would never again return.

That night, Douglas MacArthur could have been president of the Philippines for the asking. The aura of Philippine-American affection lingered long after he had gone.

We tend to forget the valor that Filipinos displayed in the war against Japan. They outnumbered US troops five to one on Bataan and suffered accordingly. And when surrender came, a great many took to the hills to fight on as guerrillas. Ferdinand Marcos, a rising senator who was there in Malacanang with MacArthur that evening, won both the American Distinguished Service Cross and the Philippine equivalent of the Medal of Honor, the Medal of Valor.

The MacArthur visit was a reminder of the troubles our two countries have shared and of the bonds between us. We have no more MacArthurs, but perhaps we could find other ways to recapture those old and splendid memories.

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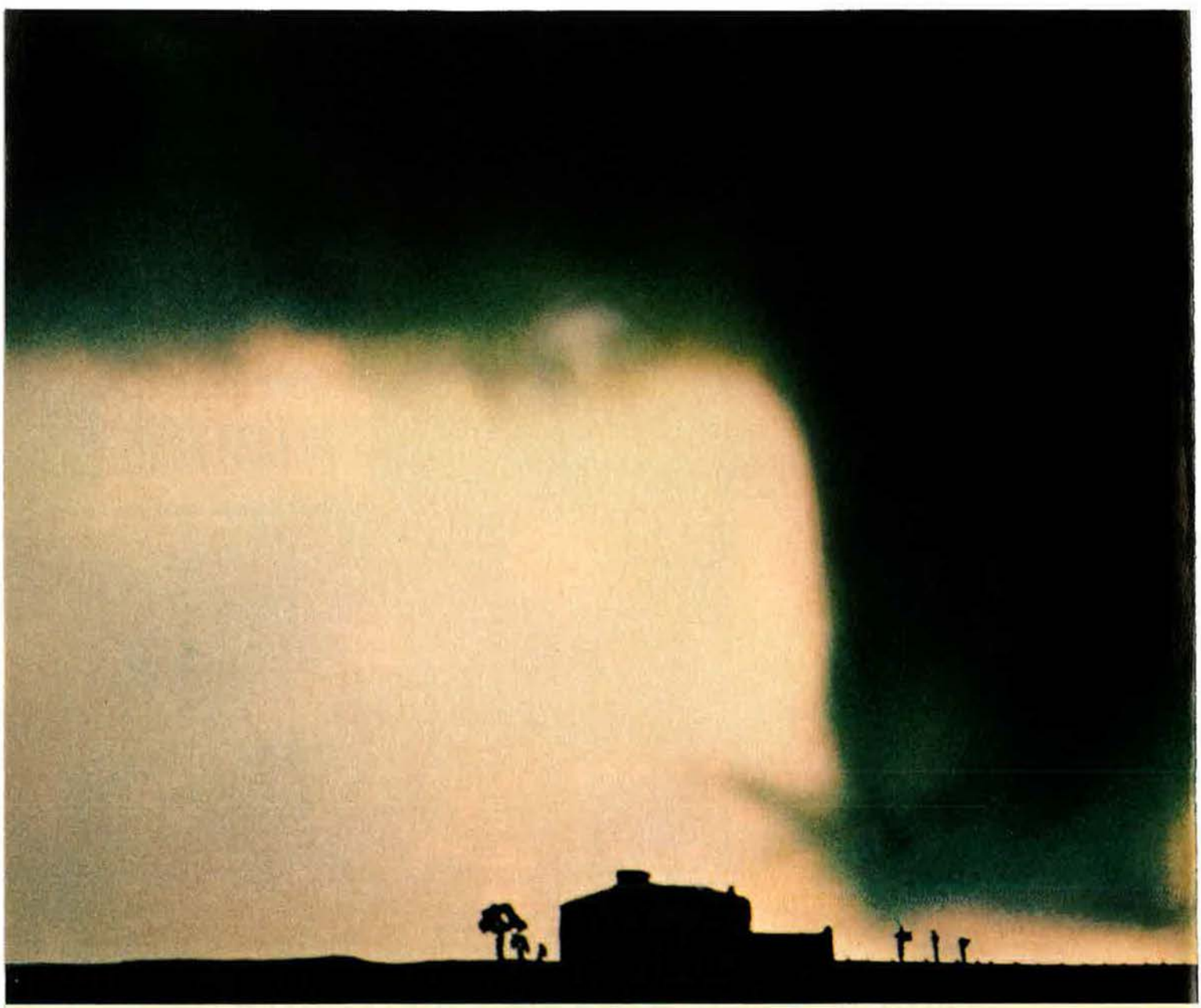

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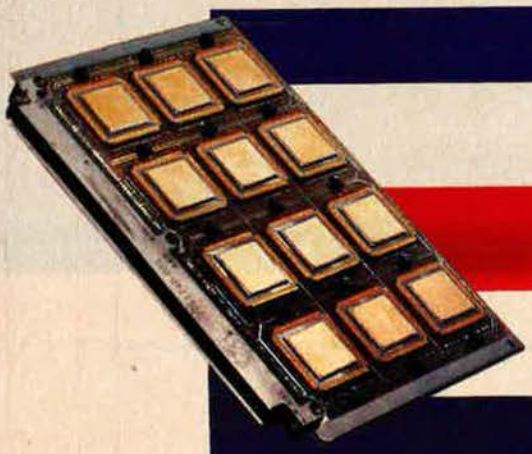

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Brig. Gen. Billy Mitchell, second from left, with fellow officers in Germany shortly after the end of World War I, during which his crusade for airpower began to take hold.

Billy Mitchell sacrificed a brilliant career to achieve recognition of airpower's place in national defense.

Warrior, Prophet, Martyr

BY JOHN L. FRISBEE
CONTRIBUTING EDITOR

SIXTY years ago, on October 28, 1925, the highest-ranking military tribunal in the history of the United States Army met to try a fellow officer on charges of conduct prejudicial to "good order and military discipline [and] conduct of a nature to bring discredit upon the military service." The defendant was Col. William Mitchell, and he had sacrificed his career for what he believed to be—and what later was proved to be—the best interests of the country.

Billy Mitchell shared the fate of others whose view of the future threatened the notions of those rooted in the past. Mitchell grasped the potential of aviation more accurately and in greater detail than any of his American military contemporaries, and he foresaw the course of world events more clearly than all but a few statesmen. His appreciation of the role airpower would play in those events was prophetic. More than any other man, he set the course that military aviation would follow in the quarter century from World War I to the end of World War II.

If any man can be said to be the father of the United States Air Force, it is Billy Mitchell.

Mitchell the Warrior

Mitchell was the eldest son of a wealthy and politically influential Milwaukee family. He was born in Nice, France, on December 29, 1879, while his parents were temporarily living abroad. Billy grew up on the family estate near Milwaukee and in Washington, D. C., where his father served in both the House of Representatives and the Senate.

Physically, Billy Mitchell was not a large man, but at five feet nine inches and 150 pounds, he was an accomplished horseman and polo player, an avid sportsman, a tennis player of tournament quality, and a man of extraordinary physical endurance. With an iron will, infinite self-confidence, and boundless energy, he was born to command. Eloquent, sometimes flamboyant, often intemperate, and with a mind that soaked up new ideas like a sponge, he was the most colorful figure in the history of American military aviation.

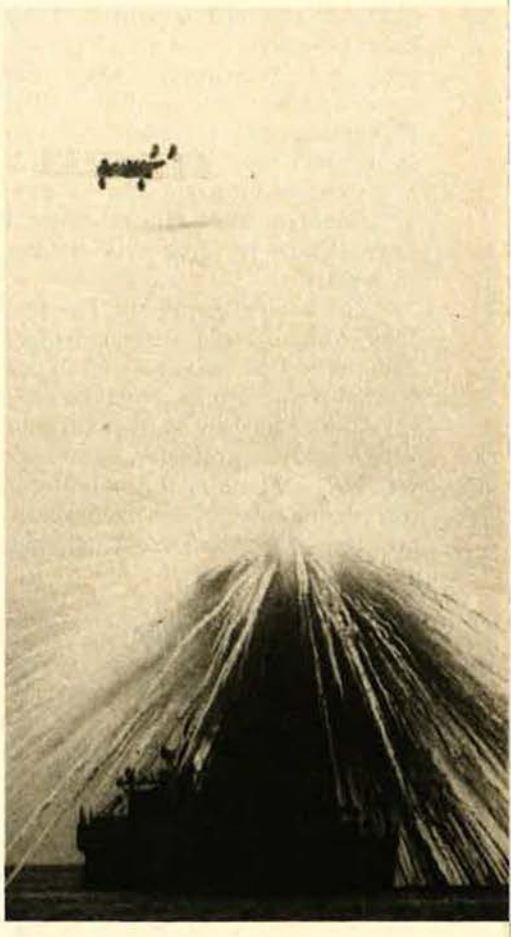
When Billy Mitchell first became associated with the Signal Corps's Aeronautical Division, he had behind him seventeen years of service that was unique among his contemporaries. His military career began in April 1898. He was sitting in the Senate gallery the day that the United States declared war on Spain. Young Mitchell, who was in his third year at Columbia College (now George Washington University) immediately enlisted in the 1st Wisconsin Regiment, the unit with which his father had served during the Civil War. At the age of eighteen, probably as a result of parental intercession, he became the youngest officer in the Army, but to his chagrin, his service in Cuba with the Signal Corps came after the fighting was over.

Mitchell then volunteered for duty in the Philippines, where the Army was fighting the Philippine leader Emilio Aguinaldo. At nineteen, he served briefly as Gen. Arthur MacArthur's chief signal officer. (This was Douglas MacArthur's father.) Mitchell and his men strung many miles of telegraph line while under fire from the guerrillas. When supplies failed to arrive from the States, Mitchell improvised, as he was to do many times in the years ahead, using barbed wire and wrappings from old cannon barrels in place of telegraph wire. At the end of his Philippine duty, he returned to Washington by way of Japan and China—the start of a lifelong interest in the Orient and of a firm conviction that there would someday be war between the US and Japan for control of the western Pacific.

Brig. Gen. Adolphus Greely, an Arctic explorer and the Army's Chief Signal Officer, then sent Mitchell to Alaska in the summer of 1901 to find out why the Corps's work of laying a telegraph line across the Territory was progressing so slowly. Billy came back with an answer. The men were trying to build the line in the summer, when horses sank to their knees in the muskeg and when it was almost impossible to move equipment and supplies. It was, they said, impossible to work in fifty-degree-below-zero winter weather.

Mitchell's solution was to position all components and supplies in the winter, when the ground was frozen, and then to erect the line in the summer. Greely sent his innovative lieutenant back to Alaska to supervise a particularly difficult segment of construction, much of it across territory where no white man had been before. Mitchell completed the job in the summer of 1903 and came home as the Army's youngest captain. He had not lost a man to desertion, which was epidemic among garrison troops in the Territory, many of whom slipped away to join the gold rush.

During the next ten years, Mitchell commanded a Signal Corps company doing demonstrations and experimental work at the Signal School, Fort Leavenworth, Kan. At that time, the Corps was the most technically advanced branch of the Army, responsible for investigating the military uses of balloons, dirigibles, kites, radio, and rockets. Mitchell apparently had little interest in the Wright brothers' invention, which the Army was considering. He was the first Signal Corps



Proving Billy Mitchell's point about the efficacy of air-delivered weapons, a US Martin MB-2 attacks the USS* Alabama *with phosphorous bombs, one of which scores a direct hit on the crow's nest.

officer to attend the School of the Line, followed by the Staff College, both at Leavenworth. After that came another tour of duty in the Philippines that included visits to Japan and China, and then, in 1913, he was assigned to the War Department General Staff—the first Signal Corps officer to serve with that august body.

While a member of the General Staff, Mitchell told a congressional committee that aviation should not be removed from the Signal Corps to satisfy the few active airmen. Like most Army officers, he considered the airplane useful mainly for reconnaissance. Within a few years, his view of aviation was to change dramatically.

Introduction to Aviation

After more than two years on the General Staff, Mitchell was assigned as deputy chief of the Aviation Division under Lt. Col. George O. Squier. The Division had fewer than fifty officers and about twenty airplanes, all of them trainers. Mitchell threw himself into his new duties with characteristic energy, fighting for better flying training and larger aviation budgets.

He decided that he should learn to fly. At age thirty-six, Mitchell was too old to enter the Army's flying school, so he commuted on weekends to the Curtiss Aviation School at Newport News, Va., for private lessons, largely at his own expense. After four days of instruction, he soloed in December 1916.

Billy Mitchell knew that advancement lay where the action was, and in 1917, that was in Europe, where the Great War was nearly three years old. He lobbied for and won an assignment to France in March 1917 as an aeronautical observer, arriving with a few hours in his pilot logbook just as the United States declared war on Germany. Without funds or authority, but fluent in French and with many personal and family friends in Paris, he set up an office, arranged to spend several days in the trenches with French troops, flew across the lines with a French pilot, and got some informal "operational training" from veterans of the air war. He then began flooding the War Department in Washington with requests and recommendations that were generally ignored.

A turning point in Mitchell's understanding of airpower was his two-day meeting with Maj. Gen. Hugh Trenchard, commander of the Royal Flying Corps, soon to become the Royal Air Force. Trenchard convinced Mitchell that the airplane was essentially an offensive weapon and that all aviation should be centrally controlled under the command of an airman. In addition to supporting ground forces directly, military aviation should be used to strike an enemy's aerodromes and "means of supply, subsistence, and replacements" behind the front lines. Trenchard also believed that there could be no victory on the ground until control of the air had been won—an idea shared by French airmen.

Gen. John J. Pershing, commander of the American Expeditionary Force, arrived in France on June 13, 1917. Mitchell had prepared a proposal for an air force made up of squadrons attached to armies, corps, and divisions under command of ground officers and a second, distinct force for independent operations behind the enemy's lines, reporting directly to the top command. Emphasis in the War Department and in America's airplane production was on observation planes, and Pershing rejected Mitchell's proposal. However, he did remove Army aviation from the Signal Corps and established the Air Service, AEF.

Mitchell, who had been promoted to lieutenant colonel in May and to colonel in September, was given command of the training establishment in France. After months of administrative confusion and bickering among senior Air Service officers, the first American squadron went into action in April 1918. In May, Pershing brought in his West Point classmate, Brig. Gen. Mason Patrick, to straighten out the administrative and command snarls. Three months later, Mitchell became Chief of Air Service, First Army, the top combat post and the one he had wanted all along.

In September, the brash young colonel was able partially to test his theories of air warfare that owed much to Trenchard and perhaps to other Allied airmen. During the St.-Mihiel offensive, Mitchell was given command of some 1,500 Allied aircraft. To avoid detection by the Germans, he moved his units forward at night and in bad weather. When the offensive kicked off, Mitchell used a third of the force to support the ground troops directly. The remainder, both bombers and pursuits, were held in a general headquarters reserve and used independently against German supply and concentration points as much as thirty-five miles behind the lines. It was not "strategical" bombing, but it was the first time that centrally controlled air forces were used in that way to isolate a battlefield. Mitchell was promoted to brigadier general and commanded a similar but somewhat smaller force used in the same way during the Meuse-Argonne campaign in the closing weeks of the war.

General Mitchell, left, and a French air officer take a break beside Mitchell's own SPAD XVI (now in the Smithsonian's Air and Space Museum). The author writes that General Mitchell, more than anyone else, "set the course that military aviation would follow in the quarter century from World War I to the end of World War II."

Mitchell himself flew many missions over the lines, observing the work of his squadrons. In July 1918, while on a solo reconnaissance flight in bad weather, he discovered German troops crossing the Marne on pontoon bridges. With this intelligence, the Allies moved to halt the German advance. For that and other combat missions, Mitchell was awarded the Distinguished Service Cross.

Shortly before the Armistice was signed on November 11, 1918, Mitchell got Pershing's permission to use American aviation units in a large-scale, truly strategic operation against German war production and transportation facilities, but the war ended before the Inter-Allied Independent Air Force, commanded by Trenchard, could go into action. He also worked out a plan for parachuting infantry behind the lines at Metz and supplying them by air. In his book, *Global Mission*, Hap Arnold described the plan as "a complete example of modern paratroop tactics, long years before the Germans, Russians, or British even thought of them."

Mitchell the Prophet

Aside from a few of the top aces, Billy Mitchell was probably the best-known American airman of World War I. He was also one of the few who understood that airpower was a new and potentially decisive force in warfare. In his wartime diary, Mitchell described an October 9, 1918, attack on a German concentration area by 322 French aircraft under his command. Mitchell watched the bombing from his own plane and later wrote: "Just think what it will be in the future when we attack with one, two, or three thousand airplanes at one time; the effect will be decisive."

Unlike many idealists, Mitchell did not believe that the Great War had ended armed conflict for all time. His conviction was undimmed that war with Japan was inevitable, and within a few years he foresaw the resurgence of German militarism. It was with this background of public appeal, understanding of aviation's potential, and political foresight that Billy Mitchell conducted a six-year campaign for airpower that culminated in his 1925 court-martial.

When Mitchell left Europe in February 1919, he expected to become Director of Military Aeronautics, but by the time he arrived in Washington, the Army Air Service had been established, with Maj. Gen. Charles T. Menoher as its chief. Menoher, a strict disciplinarian, had been a distinguished division commander during the war, but had never flown and knew little about aviation. Mitchell became Chief of Training and Operations and reverted to his permanent rank of colonel. The personalities of the two men never meshed, but Menoher did recognize Mitchell's tactical genius. Mitchell soon became the dominant figure in the Air Service, overshadowing his chief in the public eye, to Menoher's undisguised irritation.

In an appearance before the Navy General Board in 1919, Mitchell outlined his views on national defense in what he foresaw as the coming air age. With some modifications generated by time and technology, these views determined his objective throughout the remainder of his life. He supported a department of defense with three separate services for land, sea, and air, operating under the policy direction of a committee composed of the Secretaries of Defense, State, and Treasury along with the civilian heads of the three services. Only in that way, he believed, could defense plans and operations be coordinated and the continued purchase of expensive but obsolete equipment be stopped. At the top of his list of dinosaurs was the battleship. He proposed to the Board that tests of aerial bombing against surface ships be conducted—an idea that the Navy shunned for the next two years.

Billy Mitchell was not essentially anti-Navy. He believed that submarines were necessary and encouraged the building of aircraft car-

riers, but he also understood that the country, to the extent it was interested in military affairs at all, was concerned only with defending American shores. If surface fleets could be shown vulnerable to aerial bombardment, the Air Service would be recognized as America's first line of defense, with an important independent mission—coast defense—that would justify the establishment of a separate air force. Mitchell's vision of airpower extended far beyond that, to an air force capable of long-range strategic operations against an enemy, but, for the present, the coast defense mission would do.

For two years, Mitchell tried to sell his ideas within the executive branch of government and to Congress, but with little effect. His midwest populist instinct told him that the key to success lay in public support. As Assistant Chief of the Air Service, a position to which he was appointed in the summer of 1920, he promoted air races and aviation demonstrations and at least generated enough support in Congress to overcome the Navy's resistance to bombing tests against warships.

In July 1921, Mitchell's 1st Provisional Brigade, operating out of Langley Field, Va., sank three German warships, including the supposedly unsinkable battleship *Ostfriesland*. Overnight, Mitchell, now a brigadier general, became a national figure, and the Air Service enjoyed a brief position on the front pages. Despite the demonstrated vulnerability of capital ships, the Joint Army-Navy Board announced, with Army Chief of Staff Pershing concurring, that the battleship was and would remain the backbone of the fleet. The Navy was, however, awakened to the need for aircraft carriers to protect the fleet from air attack.

As a result of what General Menoher considered Mitchell's insubordinate "publicity seeking" during preparation for and conduct of the bombing tests, Menoher asked Secretary of War John W. Weeks to remove Mitchell as assistant chief. Although Weeks was no admirer of Mitchell, who had become too hot to handle, the Secretary declined and accepted Menoher's resignation instead. Menoher was replaced in October 1921 by Maj. Gen. Mason Patrick, who had been Mitchell's immediate boss during the war. Chief of Staff Pershing thought Patrick was the only man who could manage Mitchell.

After the 1921 tests, Mitchell had called on Alexander P. de Seversky to develop a bombsight, working with the Sperry Gyroscope Co. It was the forerunner of the World War II Norden bombsight. Mitchell also encouraged Dr. Sanford Moss in his work on a supercharger for airplane engines. The Moss invention saved the day when, for the 1923 bombing tests in which two obsolete American battleships were sunk, the Navy insisted that the Air Service bomb from 10,000 feet—higher than the MB-2 bombers could go with a full load. In a crash program carried out by people from McCook Field, Ohio, Mitchell's bombers were equipped with superchargers in the nick of time.

General Menoher's replacement, Mason Patrick, considered Mitchell both the foremost American authority on air warfare and "a spoiled brat." Their relations were never close, but Patrick did eventually accept many of Mitchell's ideas and became an ardent supporter of airpower, even learning to fly at the age of sixty. He kept Mitchell out of Washington (and out of the headlines) much of the time, inspecting units and traveling abroad to observe foreign military developments.

One of Billy Mitchell's greatest but little known contributions to the evolution of airpower was a manual, "Notes on the Multi-Motored Bombardment Squadron," that he wrote and distributed throughout the Air Service in 1923. Needless to say, it was not approved by the General Staff. Mitchell's strategic doctrine drew on the work of Italian airman Giulio Douhet and the RAF's Trenchard, but with primary emphasis on military and military-supporting targets rather than cities.

Although its centerpiece was strategic bombing, Mitchell believed that pursuit aircraft were needed to gain control of the air and for bomber escort. The pursuits should not be tied to bomber formations, but should seek out and destroy enemy fighters in the air and on the ground—a method the Eighth Air Force adopted with great success in World War II after eighteen months of lesser success with close-escort tactics. Mobility of the entire centrally controlled force was essential, Mitchell wrote, and cargo aircraft should be developed to support the combat elements. His manual was the first comprehensive American statement on the employment of airpower.

Another of Mitchell's prophetic achievements was a 325-page report on his nine-month trip to the Far East in 1923–24. He forecast with amazing accuracy the development of Japanese naval power and airpower that would make possible the attacks on Hawaii and the Philippines seventeen years later. The War Department General Staff suppressed the report until ten months after Mitchell's resignation and then released its totally negative evaluation only after much prodding by Congress.

Billy Mitchell was well aware that his vision of airpower's potential was far ahead of technology, but he believed that, with adequate funding, the gap could be closed in a few years. That funding didn't materialize until the eve of World War II. Nevertheless, Mitchell pushed the engineers at McCook Field and a reluctant aircraft industry to produce more powerful engines, new aircraft—particularly bombers with greater range, speed, and payload—flight instruments, improved ordnance, better radios, and air defense systems.

Retired Maj. Gen. Leigh Wade, one of the pilots on the Air Service's 1924 round-the-world flight, was a young test pilot at McCook in the early 1920s. He recalls that whenever the engineers developed a new plane or, more often, modified an old one, Billy Mitchell would come out from Washington to fly it. According to General Wade, Mitchell was an excellent pilot.

Mitchell the Martyr

Although the charismatic Mitchell was a popular public figure, there was no outcry for Congress to respond in a substantive way to his crusade for independent airpower, to his forecast of other wars somewhere beyond the horizon, or to his warning about the sad state of the Air Service. By early 1923, total personnel strength of the air arm

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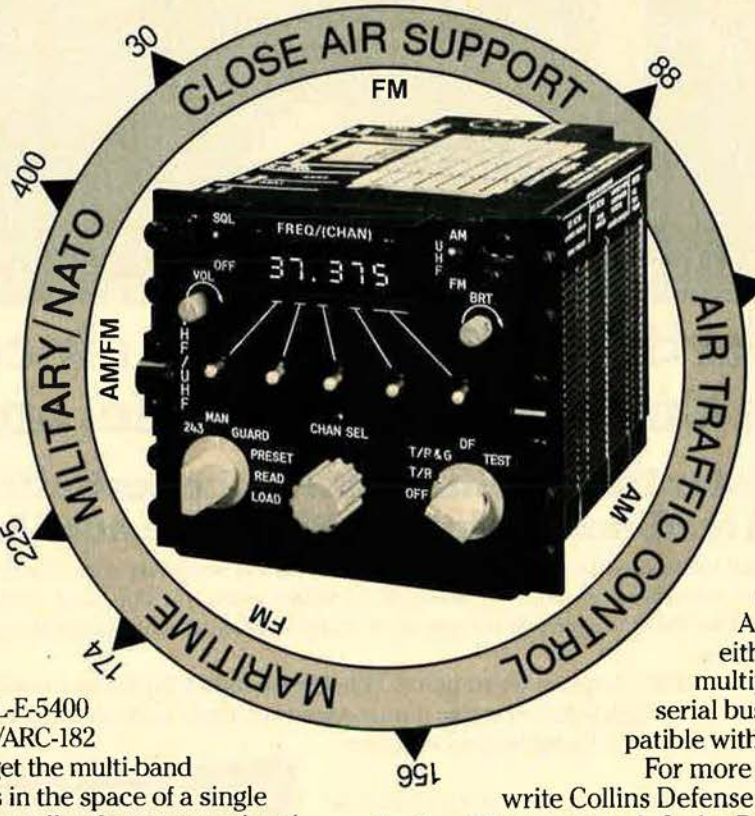

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had fallen to just over 9,000. All but a handful of planes were World War I leftovers. Air Service appropriations were down to $12 million in FY 1924. In fairness, it must be said that the Army and Navy weren't much better off.

To recapture public attention, Mitchell launched a vigorous campaign of writing and speaking. His tone became more and more strident in congressional testimony and his claims less and less demonstrable. Often he defied War Department policy.

Mitchell opened his stepped-up campaign for public support in an October 1924 speech at a National Aeronautic Association meeting. For the first time, he described publicly his ideas on strategic air operations that he now believed might actually win a war. "We can so smash up [the enemy's] means of production, supply, and transportation by bombardment that there is a great probability that the armies will never come into contact on the field of battle." This idea was anathema to the Army and Navy, and not entirely without reason. The newest Air Service bomber, the Curtiss NBS-4 Condor, had a top speed of 100 miles an hour and a radius of action of less than 300 miles. There was no immediate enemy in sight, and the national concept (if there was such a thing) of military action was purely defensive. Again, Billy Mitchell was too far ahead of his time, but he had planted the seeds of an air strategy that would germinate slowly.

Mitchell followed his NAA speech with a series of articles in the *Saturday Evening Post,* one on strategic air war, another a plea for an independent air force. Hap Arnold, the Air Service Chief of Information, cautioned Mitchell about his inflammatory public statements. Mitchell replied: "When senior officers won't see facts, something unorthodox, perhaps an explosion, is necessary. I'm doing it for the good of the Air Force, for the future Air Force, for the good of you fellows. I can afford to do it. You can't."

Mitchell was not a wealthy man, but he had outside income from a family trust and other sources adequate to maintain an estate at Middleburg, Va., a string of polo ponies, and a yacht—all undeniably assets in recruiting supporters for his airpower campaign. Nevertheless, his appointment as Assistant Chief of the Air Service was due to expire at the end of March 1925. Each blast at the military establishment reduced the likelihood of his reappointment and his chance of ultimately becoming the Air Service chief. Billy Mitchell was well aware of that.

Billy Mitchell, left, with George Patton on the Mitchell estate, Boxwood, near Middleburg, Va., in the mid-1930s. Both men were destined to become legendary US military figures in later years.

The last straw was his testimony before the Lampert Committee of the House of Representatives that was investigating aviation (an almost-annual process during the '20s) in early 1925. In February, Mitchell told the committee that airmen were being silenced by the Army brass and charged that senior Army officers were twisting the truth in their testimony. Secretary of War Weeks and the top echelons of the Army and Navy wanted Mitchell out of Washington. Despite Mason Patrick's defense of his assistant chief, Mitchell was reduced to his permanent rank of colonel and transferred to Fort Sam Houston, Tex., as the Eighth Corps Area's aviation officer.

In a farewell address before leaving Washington, Mitchell told his audience:

"As compared to other branches of the service, we may say that armies are in a stage of arrested development [and] navies are in a stage of diminishing national importance . . . but the power of the air is gradually assuming the dominating role which the future holds in store for it.

"The effect of the advent of airpower and the rapidity of means of communication is to centralize systems of national defense into a single department with subdivisions for the air, the land, and the water.

"We who have been interested in the creation of this great power know that a change will come only through the pressure of public opinion or disaster in war. We wish to avoid the latter."

With few exceptions, the press was critical of Secretary Weeks for firing his second-ranking airman, who became once more, as he had been after the 1921 bombing of the warships, a national hero. Mitchell himself showed no resentment toward Weeks. "This country owes me nothing. I owe it everything," he said.

With no command and few duties at Fort Sam Houston, Mitchell turned out a flood of articles and interviews attacking entrenched notions of national defense and elaborating on his concepts of airpower. His book, *Winged Victory,* was published in August, further angering the War and Navy Departments. Then, in the first week of September, the Navy suffered two disasters that brought Mitchell's differences with Washington to a head. A Navy PN-9 airplane disappeared on what Mitchell considered a poorly planned attempt to fly from the west coast to Hawaii (in time, the crew was rescued), and the Navy's "aerial battleship," the dirigible *Shenandoah,* was caught in a storm and crashed in Ohio with the loss of several lives.

The newspapers asked Mitchell for a statement on the crash. On September 5, he distributed a 6,000-word paper, accusing the Navy and

War Departments of "incompetency, criminal negligence, and almost treasonable administration of the National Defense." He went on to review the lamentable state of national preparedness and to repeat charges against the Army and Navy that he had been making for several months. Billy Mitchell knew what the consequences would be.

Within two weeks, charges against Mitchell were preferred by President Coolidge and Secretary Weeks. When Mitchell arrived in Washington to face a court-martial, he was greeted at Union Station by a crowd of several thousand who came to see a David who had defied the bureaucratic Goliath. But before the proceedings began, Mitchell was called to testify before a Coolidge-appointed board chaired by Dwight Morrow that was investigating aviation problems. It was apparently the President's futile hope that the board would divert attention from the Mitchell court-martial.

The court, comprising four major generals (including Douglas MacArthur) and five brigadier generals, convened on October 28, 1925. All members of the court were either acquaintances or close friends of the defendant. Mitchell was allowed to introduce any evidence he chose. He made no attempt to defend himself against the charges, but rather used the trial, which was front-page news for weeks, as a means of broadcasting his ideas about airpower and national defense.

One can hardly disagree with the court's verdict of "Guilty," announced on December 17, but the sentence—five years suspension from active duty without pay or allowances—was unusually harsh. In effect, it either would keep him in the Army, subject to military discipline, or force him to retire voluntarily, thus relieving the Army of the alternative of dismissal from the service, which would have raised a public outcry. President Coolidge reduced the sentence to five years suspension at half pay, but Mitchell, feeling he could continue his campaign for airpower more effectively as a civilian, resigned his commission on February 1, 1926.

Billy Mitchell spent the ten years until his death on February 19, 1936, at Boxwood, his estate near Middleburg, Va. After a whirlwind speaking tour, he settled down to raising horses and writing about defense subjects, with more than seventy articles published before his death. Frequently he was called as a witness before congressional committees, and he maintained close contact with Air Corps leaders.

Mitchell continued to confront his old foes and, after 1928, a new one—the Great Depression, which affected not only his personal fortunes but also those of the Air Corps. He did live to see the GHQ Air Force established in 1935—a centrally controlled, consolidated air strike force that was a long step toward recognition of airpower's independent strategic capabilities—but not to witness the vindication of his concept of strategic air warfare in World War II or the reality of an independent United States Air Force in 1947.

A Summing Up

Billy Mitchell was not a visionary or a dreamer. He was a man who combined extraordinary foresight, a mind that was open to new ideas, and a propensity for action. Like many outstanding combat leaders, he was impatient with routine and willing to challenge military dogma.

There was no air officer of the early 1920s so well equipped to influence public and congressional opinion as Billy Mitchell—a colorful and articulate war hero with powerful family and personal connections in the worlds of politics, diplomacy, industry, the media, and society. He had a flair for the dramatic and unshakable faith in the rightness of his belief that airpower offered a new and less sanguine method of warfare that challenged the preeminence of the older services. Without public support, he believed, airpower could not flourish in an atmosphere of military conservatism. He was prepared to sacrifice personal ambition, which he had in abundance, for the greater goal of national preparedness against a new kind of warfare that he believed would engulf the world in a not-too-distant future.

Mitchell was the first American airman to expound a comprehensive view of the use of airpower. His ideas served in the 1930s as the basis for development of American air doctrine at the Air Corps Tactical School. The men largely responsible for codifying that doctrine—Harold Lee George, Kenneth Walker, Haywood Hansell, and Laurence Kuter—later wrote the plan for Army Air Forces operations in World War II that was a greatly refined version of Mitchell's strategic concepts. General Hansell has written that Billy Mitchell "was, in my opinion, the founding father of American airpower."

Mitchell was certainly the dominant figure in American aviation during its formative years of the 1920s. He was, Hap Arnold said, "the officer most responsible for the progress of the Air Service, for maintaining the interest and morale of its personnel in the lean years." He inspired a generation of airmen—among them Arnold, Tooey Spaatz, Ira Eaker, Harold George, Frank Andrews, George Kenney, and Jimmy Doolittle—who were to become air leaders in World War II and who were guided by Mitchell's precepts. Mitchell's followers completed his quest for organizational independence, acceptance of the dominant position of airpower in deterring or fighting a war, and recognition of its place as a major instrument of American foreign policy.

Billy Mitchell's greatest weakness—his intolerance of those who lacked the foresight to share his vision of aviation's potential—was also his strength. It destroyed his military career, but it was the driving force in his fight for national understanding of a new and dominant dimension in military affairs. ■

John L. Frisbee was Editor of AIR FORCE *Magazine from December 1969 until June 1980. During a distinguished Air Force career, from which he retired as a colonel, he served as fighter and bomber pilot, planner on the Air Staff and at major commands, and as a teacher at West Point and the Air Force Academy. He served as special assistant to the Secretary of the Air Force. He holds bachelor's degrees in economics and Latin American studies and a master's in international relations and is a graduate of the Armed Forces Staff College and the Canadian National Defence College. His "Valor" series is a regular monthly feature of this magazine.*

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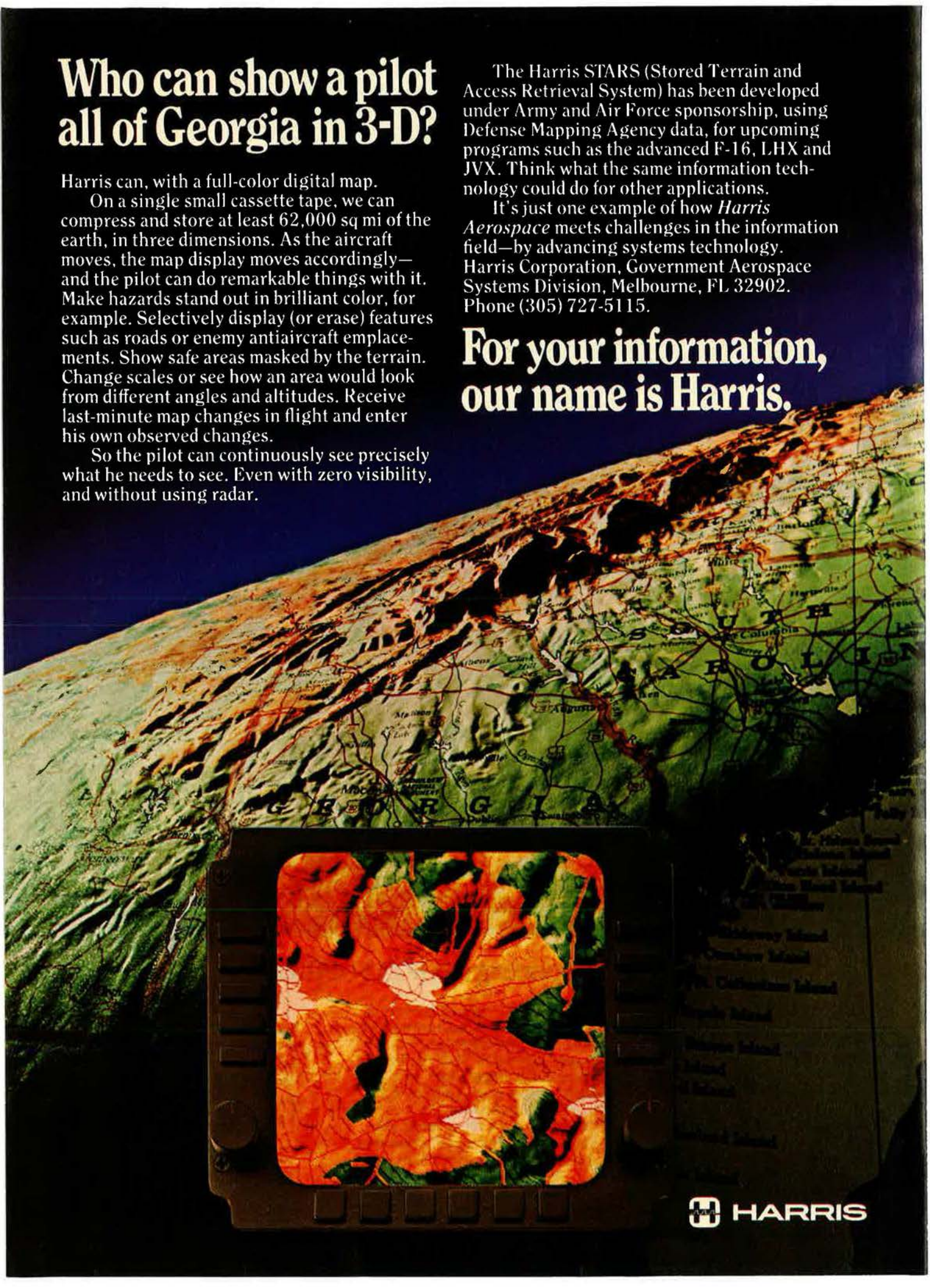

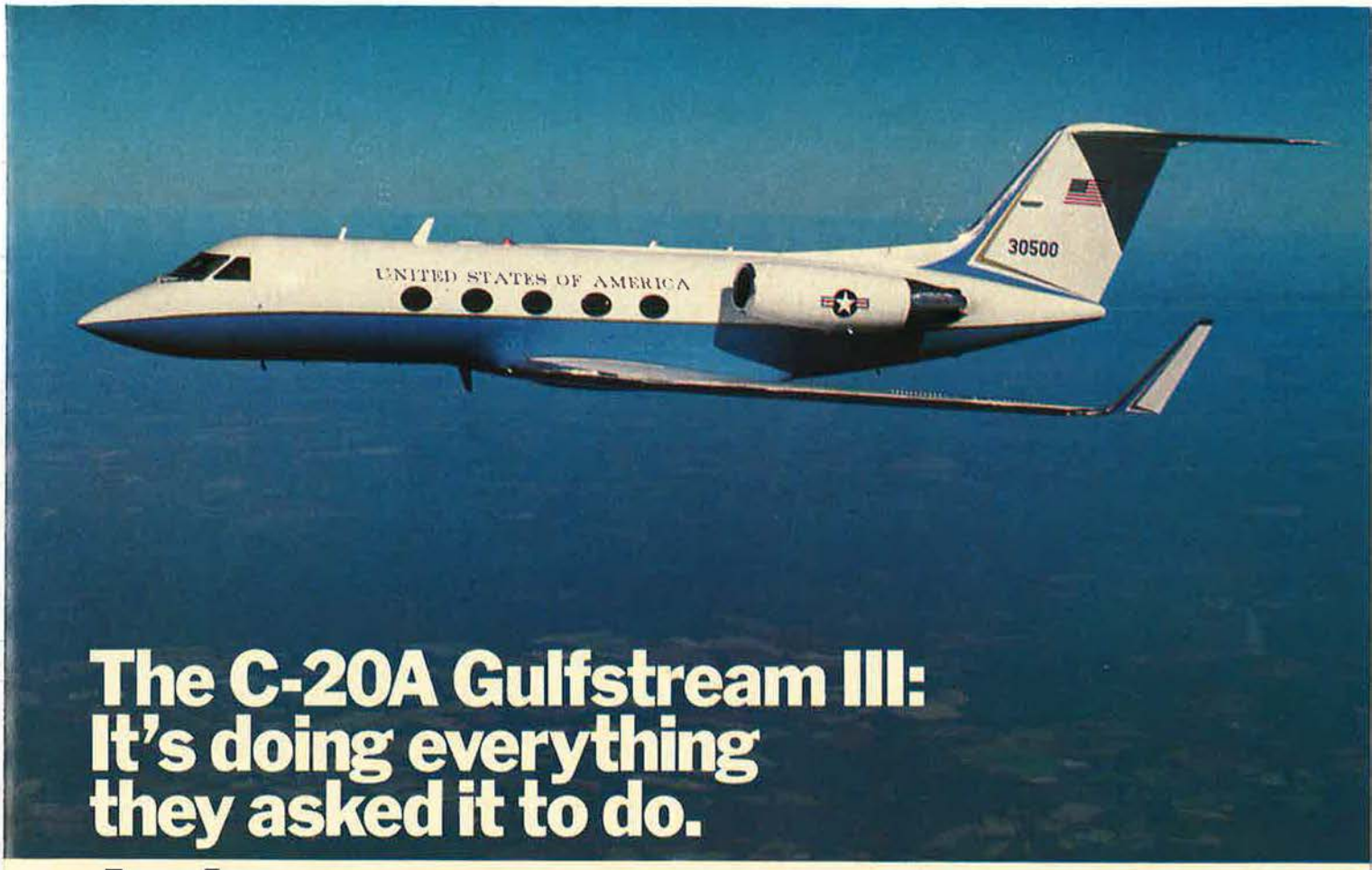

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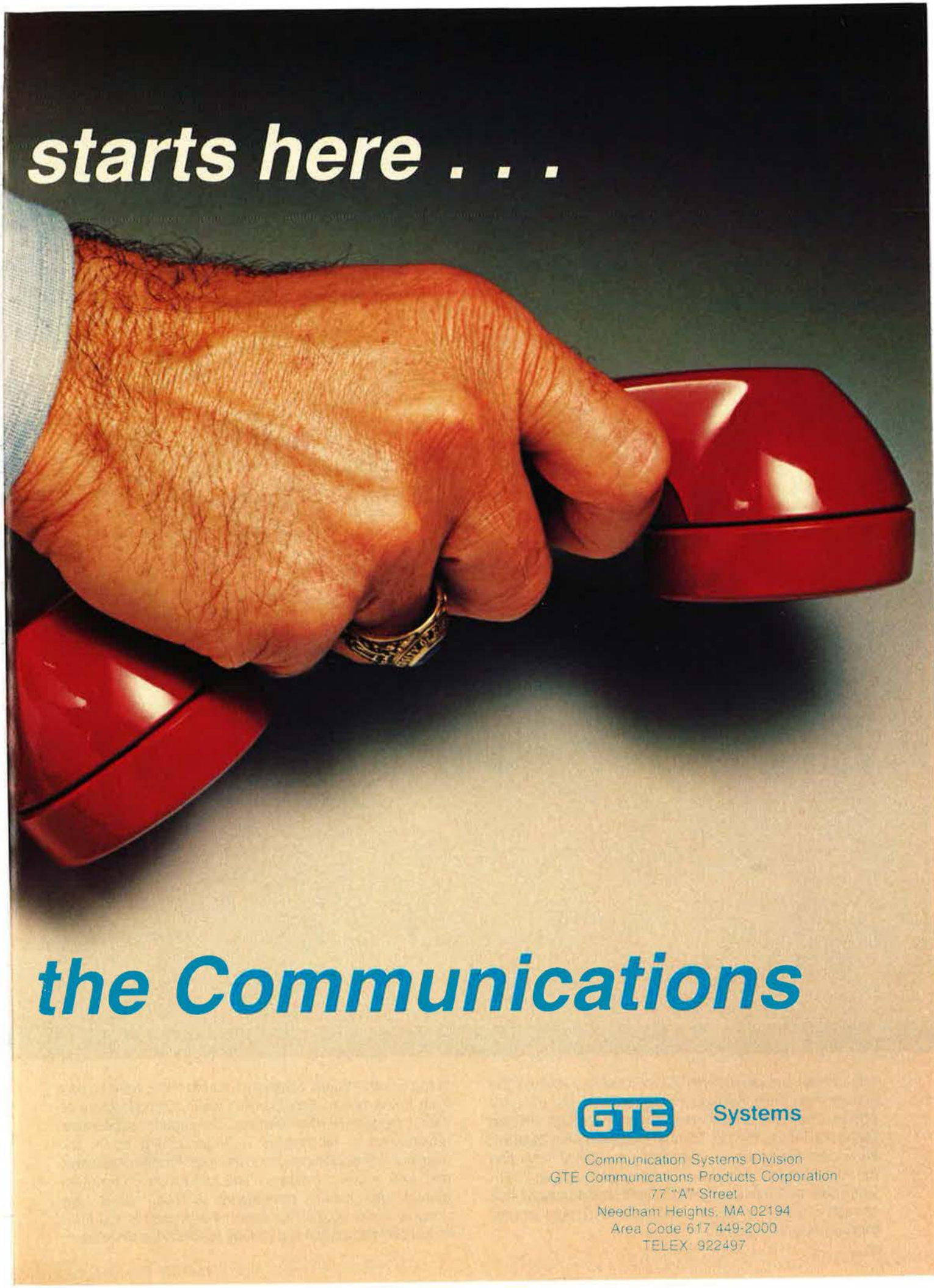

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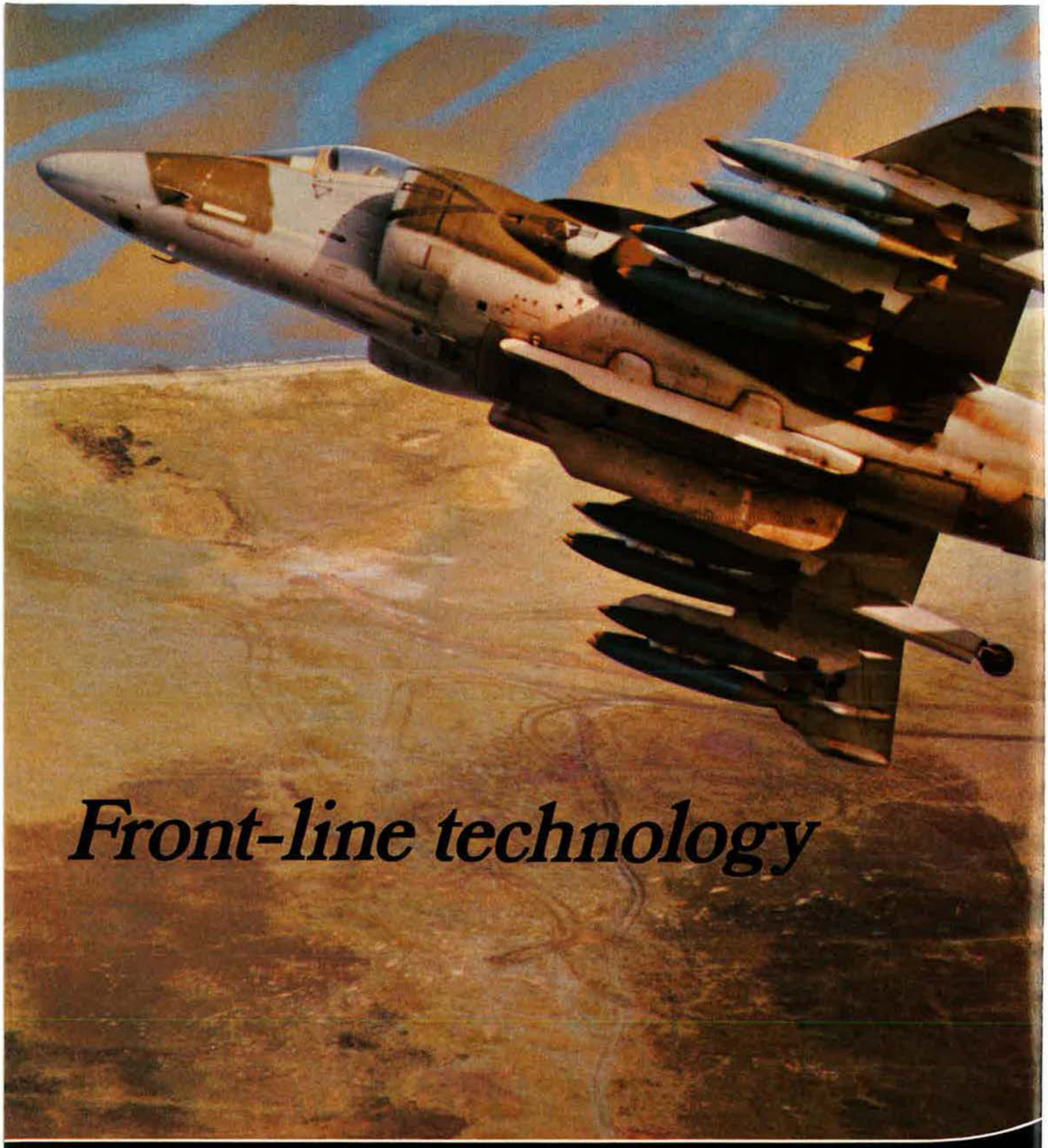

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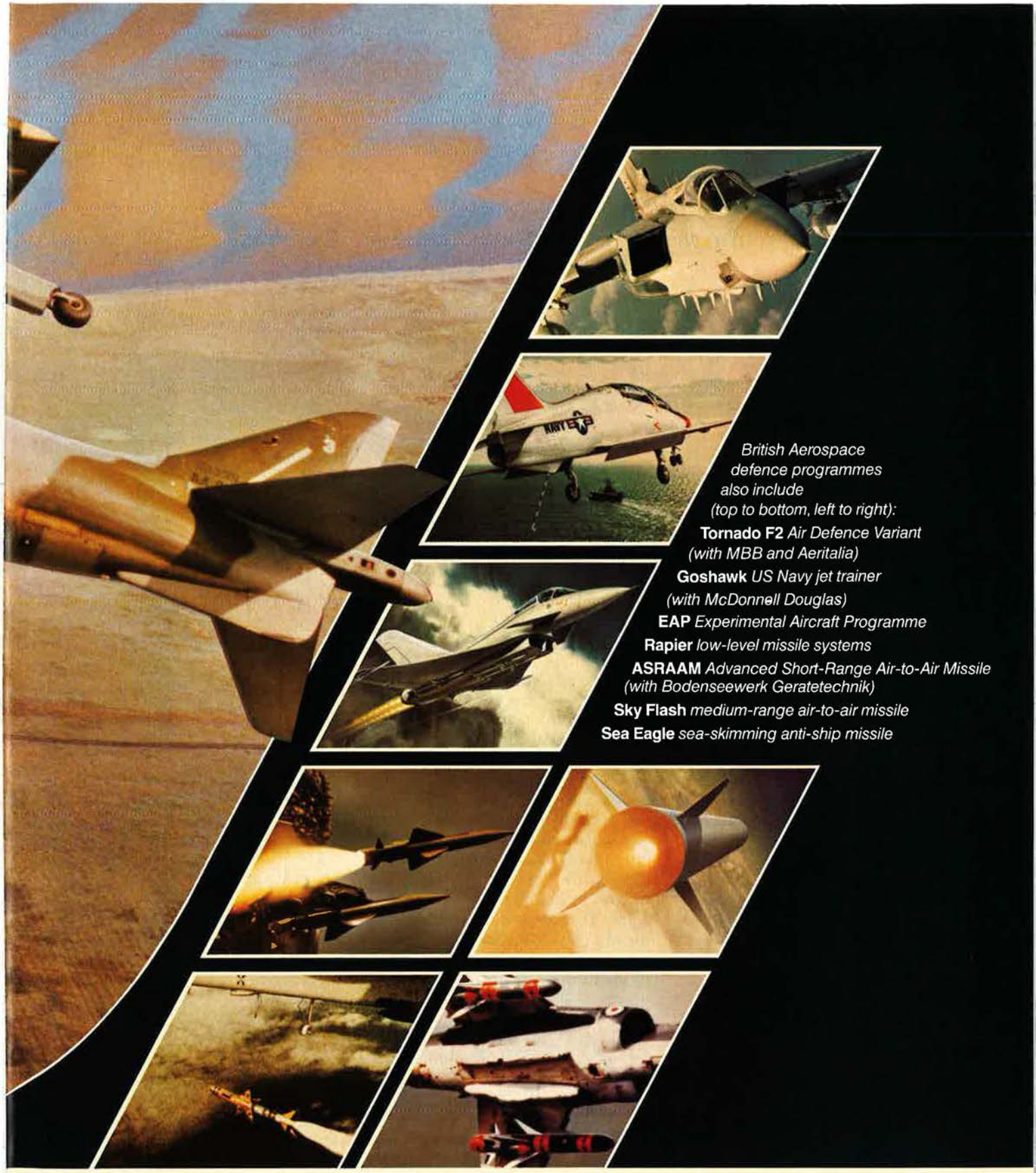

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BAe 151

In the legendary airman's own view, five accomplishments are the most significant.

Doolittle's Greatest Contributions

Taking a cue from Richard Arlen and Buddy Rogers, Jimmy Doolittle stands in front of one of his favorite airplanes, the Curtiss P-1 Hawk. By the mid-1920s, Doolittle was gaining a reputation as one of the finest racing, aerobatic, and experimental test pilots in history.

BY C. V. GLINES

AVIATION pioneer, wartime hero, scholar, businessman, first president of the Air Force Association, and more. When a man has distinguished himself in as many ways as has James H. Doolittle, it is inevitable that his achievements will be reviewed, analyzed, commented on, and argued about.

For the record, though, Jimmy Doolittle himself believes his most important contributions to have been these five:

- The first accurate measurement of the effects of acceleration in flight.
- The first takeoff, flight, and landing completely on instruments.
- Work done on the development and production of 100 octane fuels in the 1930s.
- Organizing and commanding the first air raid on Japan.
- Commanding the Twelfth, Fifteenth, and Eighth Air Forces during World War II.

The Work at MIT

In 1924, while working toward his master's degree at the Massachusetts Institute of Technology, Doolittle needed a topic for his thesis. He chose the measurement of the stresses and strains that an aircraft is subjected to during various flight maneuvers. All previous measurements of how much an aircraft could take before it self-destructed had been done on the ground by placing sandbags on the wings and horizontal stabilizers until they broke from the weight. When aircraft were manufactured, a safety factor number was designated, based on the weight of the aircraft and the weights placed on the wings. For example, if an aircraft had a safety factor of eight, it meant that it would take weights eight times the weight of the aircraft before failure would occur.

"I didn't think that was necessarily true," Doolittle said. "I flew one airplane, a Fokker monoplane, and the download on the tail and the lower longerons caused the tail to break down. Although I got it on the ground and didn't have to jump, I knew the download on that airplane wasn't enough to make the tail come off.

"So, I had had some experience with the load on tail surfaces and the loads on wings, so I felt I knew when they would break and when they wouldn't. So what I was trying to do [for the thesis] was impose on this airplane increasing loads to see

what would happen. I carried an accelerometer in the cockpit so I would know exactly what acceleration there was. If there was an acceleration of four and the aircraft weighed 20,000 pounds, I was putting a load of 80,000 pounds on it.

"The Fokker came back after the last flight I made after placing the greatest strain on it I could without a serious failure in flight, and I found that the wing had failed. It had actually broken at the connecting points at the fuselage. When the load was taken off, they settled back down into their normal position. I had placed a load eight times the weight of the aircraft on it.

"The Fokker wing was made of plywood, with internal ribs. It was supposed to withstand that load, and it did, but no one had actually tried it in flight before.

"My thesis, developed from those flights in the Fokker, was subsequently published in every scientific foreign-language journal. They didn't think so much about it in the United States, but in Italy, Germany, England, and France, they considered it significant. I had a deluge of mail from all over the world asking for more information."

Ironically, Doolittle's subsequent work for his doctorate at MIT was not as significant in his eyes. It was a study of the wind velocity gradient at various altitudes and the effect of the wind on aircraft at sea or ground level.

"I borrowed a pontoon plane from the Navy," he said. "The work I did was not as precise as I wanted to have it because I had nothing better than my eyes to say how high I was above the water surface when I put a heavy load on the plane. That was a weakness in my research. I could tell when I was very close to the water because every so often I would touch it. I could tell the difference between six inches and a foot and a half, but at five to ten feet above the water, I could never be sure whether I was five, eight, or ten feet.

"When I turned the dissertation in, I thought it had some value, but it was turned down as not being erudite enough for a doctoral thesis. I had to make a lot of mathematical computations to satisfy the professors to warrant giving me the doctorate. As far as I know, other

than the professors who read it, I only received one letter afterward. The fellow only said he read it. He condemned it by what he didn't say and offered no criticism or comments. Since that time, I have never heard one word about the dissertation.

"As far as I'm concerned, the master's thesis was more significant. I felt at the time that they expected a doctoral thesis to be so abstract that few people could understand it. That's a condemnation of the system, which is not a fair statement, but that's what I thought at the time."

The Blind-Flying Experiments

The second major accomplishment—the 1929 blind-flying experiments under the auspices of the Daniel Guggenheim Fund for the Promotion of Aeronautics—"was very important indeed," according to Doolittle. "I think that was the most valuable contribution that I made to aviation."

Prior to his experimental flights, hundreds of pilots had lost their lives while trying to fly through cloud and fog. They relied on their senses, which quickly went awry once the body's relationship with the ground was broken. If no solution to the problem was possible, pilots would forever be grounded in bad weather.

Carl Cleveland, the noted aviation writer, put it this way:

"To give the airman eyes in the fog, to enable him to orient himself both as to the attitude of his aircraft and its position with relation to its goal in swirling mists, in blinding snow, in the heart of the cloud blanket, when all the landmarks by day and the lights of great cities and airports by night should be blotted out, this was a task at once of underlying scientific importance and of high romance."

To carry out the purpose for which the Guggenheim Fund had been established—to promote and advance the art, science, and business of aviation—a Full Flight Laboratory was established in 1928 at Mitchel Field, Long Island, and furnished with the necessary facilities and equipment. Doolittle was borrowed from the Air Corps to head the laboratory, assisted by Professor William G. Brown of MIT.

"Our first task was to study the work previously done in fog flying," Doolittle said. "Tethered balloons had been used, with very limited success, [so] we quickly abandoned the idea. A 'lead-in cable' idea was tried out. This was a system consisting of an electrified cable strung around a landing field, which led to a landing area. It required very delicate sensing equipment in the airplane, and it was necessary to make a difficult precision turn into the field at low altitude. This was also abandoned. Experiments were tried with sonic and radio altimeters, fog penetration lights, fog dispersal methods, and even dragging weights on aircraft equipped with long tail skids. All were discarded.

"The low-frequency radio range had been developed by the Bureau of Standards and the Army by that time and was in limited use for air navigation," Doolittle recalled. "An adaptation of this radio range in the form of a homing beacon seemed to offer the greatest promise for our use. It could also be readily tied in with the radio receiver and other conventional airplane equipment of that period."

Two aircraft—a Consolidated NY-2 training plane to test instruments and other equipment and a Navy Vought Corsair O2U-1 for cross-country flying—were acquired for the project. Lt. Ben Kelsey was placed on temporary duty along with Doolittle to assist as safety pilot.

It was soon apparent when tests got under way that what was needed was an accurate, reliable, and easy-to-read instrument that showed exact heading and precise attitude of the aircraft, particularly for the initial and final stages of blind landings. Two German-made artificial horizon instruments were studied, but were unsatisfactory. Doolittle sketched a rough picture of a dial for an instrument he thought would do the job and showed it to Elmer Sperry, who headed the Sperry Gyroscope Co. According to Doolittle, "It had the face of a directional gyro superimposed on an artificial horizon." However, Sperry advised two instruments for simplicity of construction.

Over the period of the experiments, Doolittle, with Kelsey as safety pilot, made hundreds of blind and simulated blind landings. "To make a blind landing," Doolittle recalled, "the plane was put into a glide at sixty mph, with some power on, and flown directly into the ground. Although this was about fifteen miles above stalling speed, the landing gear absorbed the shock of landing, and if the angle of glide was just right, the airplane didn't even bounce. Actually, after a while, it was possible to make consistently perfect landings by this method. To assure just the right amount of power in the glide, a mark was placed at the proper place on the throttle quadrant.

"It was during the radio phase of our tests that we concluded that while aural signals were satisfactory for rough navigation, it would be much better if we had a visual indicator in the cockpit for the precise directional control needed during the final phase of blind landings. A semiportable, two-leg homing range was installed, [using] a homing beacon and a fan-type marker beacon.

"In the cockpit was an indicator connected to the radio set that consisted of a pair of vibrating reeds. If the pilot was to the right of the radio beam, the left reed vibrated more vigorously. If on course, both reeds vibrated through the same arc. As the plane approached the radio station, the amplitude of vibration increased. A single reed started to vibrate as the fan marker was approached. It reached maximum amplitude, then quickly dropped to zero when the plane was directly overhead, rapidly built up to maximum again, then tapered down as the plane pulled away. The homing range also had a distinct null in the headset when the airplane was directly over the range station."

As the tests progressed, instruments and radio equipment were continually improved. A total of eleven instruments, besides the normal engine instruments, was being used as the tests neared completion in September 1929.

September 24, 1929, proved to be a perfect day for a trial under actual conditions. Fog had rolled in to Mitchel Field from the ocean, and Mr. Guggenheim and his associates were called to the field to witness a demonstration. However, Doolittle thought the fog would burn off before anyone could get there to see it.

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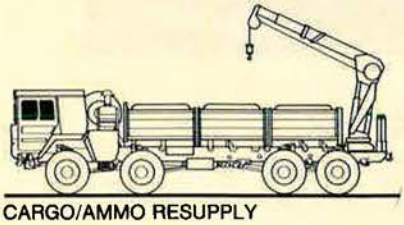

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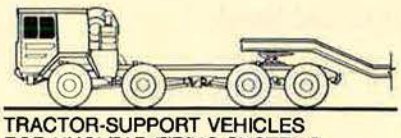

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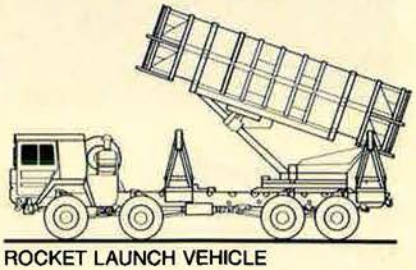

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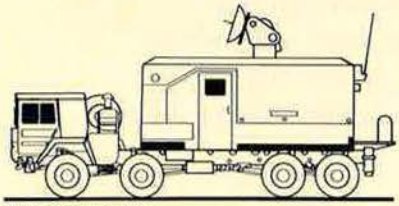

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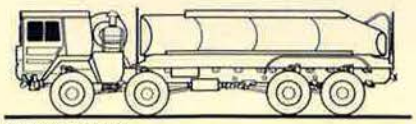

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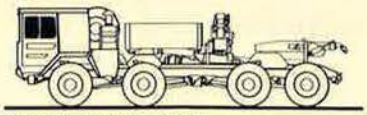

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Doolittle had a special hood constructed (shown here in the down position) for the Consolidated NY-2 to ensure that the first blind flight would be made on instruments alone. Even though Doolittle made the flight with Lt. Ben Kelsey in the front seat as a safety pilot, Lieutenant Kelsey held his arms over his head to prove to ground observers that only Doolittle was at the controls.

"Though we were all disappointed, *we* were there, and the fog was there, so I decided to make a real fog flight," Doolittle said. "The NY-2 was pulled out and warmed up. The ground radios were manned and the radio beacons turned on. I taxied out and took off. Came through the fog at about 500 feet and made a wide swing coming around into landing position. By the time I landed ten minutes after takeoff, the fog had just started to lift.

"About this time, Mr. Guggenheim arrived, so we decided to do an 'official' under-the-hood flight. I'd just made a real flight in the fog, so [I] wanted to go alone, but Mr. Guggenheim insisted that Ben Kelsey be taken along as safety pilot." Doolittle made the flight totally under the hood, as he had so many times before, and proved his theory that men could fly by instruments alone.

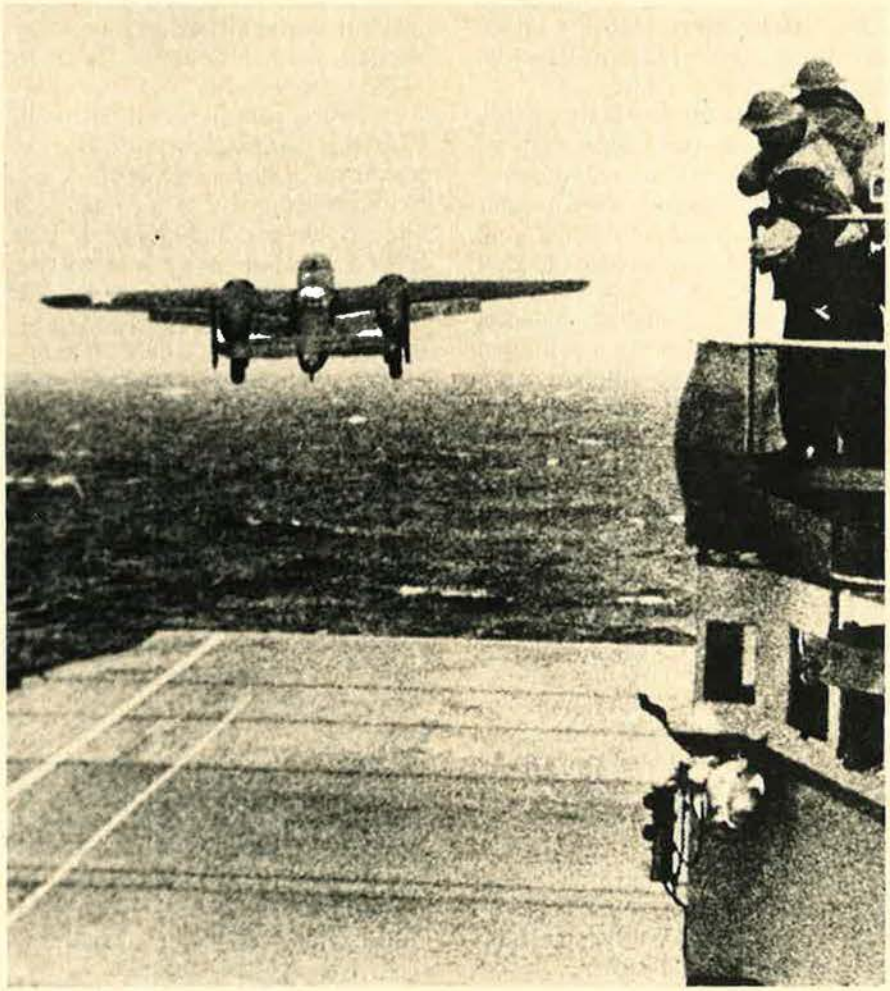
The experiment had lasted ten months and three weeks. It was a milestone in aviation progress and marked the end of the "seat-of-the-pants" era in aviation. Although it did not represent a final solution to the problems of all-weather flying, it was a start. Commercial and military aviation had, by Doolittle's dedication to the task at hand, advanced out of its primitive state. Aviation's worst enemy, weather, had always been a barrier to all scheduled operations. The enemy was licked and the barrier torn down that foggy day on Long Island in September 1929.

The 100 Octane Experience

When the blind-flying experiments were concluded, Doolittle received an offer from the Shell Oil Co. to join its staff in St. Louis and lend his name and experience to its aviation division. His reason for leaving was economic.

"Both my mother and Joe's [Mrs. Doolittle's] mother were ill, and we could not take care of them on a first lieutenant's salary," Doolittle said. "I went with Shell in 1930 at exactly three times my military salary." Doolittle was given the job of coordinating the aviation activities of three Shell companies—Shell Oil in San Francisco, Shell Petroleum in St. Louis, and Shell Eastern in New York.

In the early 1930s, a far-reaching decision had to be made about the



In one of the most famous shots of World War II, the first B-25, with Doolittle at the controls, lifts off from the deck of the USS Hornet *on April 18, 1942. The Doolittle raid on Tokyo was a great psychological boost to American morale.*

future of aviation gasoline. This was the depth of the Depression, and not many companies were thinking too far ahead. With Doolittle's urging, however, Shell invested several million dollars in research facilities to make a product that had no market at the time—isooctane, the basis for 100 octane gasoline.

During this time, Doolittle also spent those early years racing and seeking point-to-point speed records. The object was not only to sell the world on Shell products but also to make the point that racing would lead to improved engines, fuels, lubricants, and aircraft designs. The American public followed the fast-moving Doolittle's every flight with great interest. His flying achievements were covered in every newspaper, and writers speculated on what records he would go after next. He won the Thompson Trophy Race in 1932 in the Granville Gee Bee, "the most dangerous airplane I ever flew." After that race, he announced to a disbelieving press corps that he intended to give up the sport and concentrate on developing 100 octane gasoline.

Doolittle justified this research by pointing to the "superplanes" that the Air Corps had on the drawing boards. Engines with greater horsepower would be needed and, in turn, would create a demand for a higher octane fuel. Top Shell officials had to be convinced. Aviation products were not their principal money-makers. The company produced 91 octane gasoline because that was what the airlines then being established, along with the military services, were using.

"High-compression engines would operate very well on gasoline made from oil from the West Coast," Doolittle recalled, "but it did not make very good lube oil. The oil from Pennsylvania made excellent lube oil, but very poor airplane fuel. Much work was being done here and in England on getting more power out of engines and avoiding detonation, which causes loss of power.

"Sam Heron of McCook Field, along with a British counterpart, did some fine work in determining those attributes of a fuel that would be most suitable for aviation use. They learned what caused detonation and how to avoid it.

"Tetraethyllead was introduced and made the gasoline better. However, if too much was put in, you would get spark-plug fouling. The trick was to blend in the right mixture.

"The engine/fuel question was a hen-and-egg situation. Engine manufacturers said they could build the engines if the fuel were available. The oil men said they could make the fuel if they could be assured of buyers.

"I wasn't the only one working on the problem in the oil business. Eddie Aldrin, father of astronaut 'Buzz' Aldrin, was aviation manager for Standard Oil of New Jersey and was doing a lot of work trying to sell their fuel. I got much more credit than he did, although I'm not entitled to it. He never got the credit he was due for his efforts.

"I had a tough job persuading Shell to go ahead. The first isooctane we developed had to be sold at way below cost in order to get it tested. And when we agreed to make the amount of fuel the Army wanted, it wasn't enough for us to make economically.

"The top research man at Shell, who was aware of my efforts, referred to all this as 'Doolittle's folly.' So, even in my own company, I had trouble persuading people that what I wanted to do was worthwhile. My job was to try to sell the use of this fuel before there was any use for it. We lost money on every gallon we sold until the demand built up. Later developments proved that we were right—that the power we could pull from our engines was better than the Germans could get from theirs."

In his book *Development of Aviation Fuels,* S. D. Heron said that Doolittle had risked his future by persuading Shell to go heavily into plant expansion for the 100 octane production. "The risk taken by Doolittle was shown when the Wright Field plans for service tests of 100 octane fuel were opposed by the Army General Staff. . . . Had the General Staff been able to foresee that the daily consumption of 100 octane fuel . . . would be 20,000,000 gallons," he would not have had as much difficulty.

In 1944, the New York *Times* editorialized that the development of 100 octane fuel was "one of the vital underlying factors in our superiority over the enemy. The margin in speed and performance provided by such gasoline has heavily weighted the odds in our favor and saved hundreds of lives. . . . Many companies and individuals have shared in the achievement represented by our dominance in high-octane fuel. It should not be forgotten, however, that among the many debts that American airpower owes to Lieutenant General Doolittle is his insistence a decade ago, when, as a civilian, he was in charge of the aviation department of Shell, that his company carry on energetically research in 100 octane gasoline."

The Tokyo Raid

Of all of his accomplishments, the 1942 raid against Japan led by Doolittle seems to be best remembered, especially by those who served in World War II. It was a classic air action, with all the elements of surprise and boldness. First conceived by a Navy submarine captain in January 1942, the project was passed to Doolittle, who coordinated the modification of the aircraft, the training of the crews, and liaison with the Navy.

The raid was not planned as a mission of great destruction. The total bomb load of the sixteen aircraft was only 32,000 pounds—a miniscule amount compared to the later poundage delivered to Japan by B-29s. Doolittle wrote before the mission that a surprise air raid "is most desirable now due to the psychological effect on the American public, our allies, and the enemy."

In our recent conversation, Doolittle said, "Retrospectively, I think it was a carefully planned, hurried operation. 'Hurry' was of the essence because we needed some good news so badly, and this was our chance to get some good news. I think it was a very good operation, and although we lost all our airplanes, it was good for the country."

In the days immediately after the raid, however, Doolittle did not see it that way. It was his first combat mission, and he thought it was a complete failure. At that time, he had no way of assessing the effect of the mission on either the enemy or the United States. It really wasn't until after the war that its full psychological impact was felt.

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"I sat in the wreckage of my airplane [after bailing out] and felt it was the lowest point in my life. I was thoroughly discouraged. I knew that what had happened to me had happened to the others."

Did he have any doubts about the raid's success as a surprise attack?

"When we took off from the carrier, we had given up any hope of a surprise attack. On the other hand, although the Japanese knew we were coming, knew where we were, they did not know we had fairly long-range aircraft. They expected us to come the next day.

"If the man upstairs is on your side," Doolittle said, smiling, "who can be against you? He certainly had our fate in both hands."

Did he view the mission as the high point in his career?

"Well, it certainly got more public acclaim, but I think commanding the Twelfth, Fifteenth, and Eighth Air Forces were much bigger jobs. The Tokyo Raid was sort of a flash in the pan. The other [tasks] were over a much longer period of time."

Gen. "Tooey" Spaatz, General Doolittle, and crews of the Eighth Air Force's 303d Bomb Group discuss results of the March 1945 raids on the oil refinery complex at Halle, Germany. Doolittle would command the Eighth, Twelfth, and Fifteenth Air Forces at various times during World War II.

North Africa to the Pacific

As soon as it was announced that Doolittle had received the Medal of Honor for leading the Tokyo Raid, he was sent on a tour of defense factories to give encouragement talks to workers. His theme: Despite the losses in the Pacific, US military forces *could* strike back and would be doing it again and again in the months ahead.

When the Tokyo Raid moved off the front pages and interest in Doolittle waned, Gen. H. H. "Hap" Arnold put him on other special projects and then nominated him to General Eisenhower to take over the Twelfth Air Force being formed for an invasion of North Africa. "You go on to Britain and report to Ike's headquarters," Arnold said. "I don't think there'll be any problem."

But there was a problem. Eisenhower had never met Doolittle and preferred any of three other generals—"Tooey" Spaatz, Tony Frank, or Ira Eaker, all of whom had remained in the service after World War I and who had worked their way up through positions of ever-greater responsibility. Doolittle had been away from the military for a decade and had not established any reputation as an organizer or administrator.

After a brief meeting in Britain during which the two exchanged views, Eisenhower cabled Arnold that he still preferred any one of the other three. Arnold replied that Eisenhower could have whomever he wanted, but that he still recommended Doolittle. Reluctantly, Eisenhower gave in and adopted a wait-and-see attitude toward this former racing pilot who had just won the Medal of Honor.

Once assigned the responsibility, Doolittle leaped into the task of organizing a new combat air force with customary gusto.

The invasion of North Africa began on November 7, 1942. The Twelfth Air Force consisted of about 550 fighters and bombers and established itself quickly in the northwest corner of the continent. The basic strategy for the allies was to drive eastward, force the Germans and Italians out of North Africa, and eventually defeat the Axis powers in the Mediterranean by pounding away at military targets in Italy.

"Although the landing operations went reasonably well," Doolittle recalled, "I almost didn't get there. Four days before the invasion, I was flying to Gibraltar as a passenger in a B-17. We flew parallel to the French coast and were going around Portugal when we were attacked by four Luftwaffe Ju-88s. The pilot immediately dove for the wave tops so the fighters couldn't get underneath us. Bullets came through the B-17's skin, but, fortunately, didn't hit anything vital. However, the copilot was wounded. After helping to give him first aid, I got into his seat. We didn't have any further trouble and landed safely."

He had trouble getting the Twelfth into shape as a smooth-running outfit, however. The enemy was well-organized, and although a strong beachhead was established, Doolittle quickly found the weaknesses. "In those early days, the British had a distinct advantage over us," he said. "They had combat experience, and the Americans had virtually none, particularly the ground troops. The British had an excellent communications and intelligence network—much better than ours."

As the busy days turned into weeks and Doolittle proved that he was an organizer as well as a tactician, he still had to "sell myself to Eisenhower." Eisenhower chastised him for flying a new model Spitfire instead of being available when Eisenhower called one day.

"You can either be a major general [he was still a brigadier] in charge of my air," Eisenhower told him, "or be a second lieutenant and go fly all the Spitfires you want. I can fix it either way. Which do you want?"

"I told him I would rather be a major general handling his air. 'All right', he said. 'Stay at it!' It took me about a year to convince him I could do the job."

The campaign in North Africa slowly accomplished its objectives, but not without losses. Doolittle flew a number of missions, either as pilot or copilot because "I wanted to see with my own eyes what went on." He had many successes and a few failures. He recounted one of the latter as "the most unsuccessful mission I ever led."

One of the Few Failures

"It was in June 1943 that our intelligence reported the presence of three Italian warships—two heavy cruisers and a battleship—in the harbor at La Spezia. We wanted to get them because they could do a lot of damage to our supply lines. We thought we planned well for the mission. I ordered three bomb groups—one for each ship—to get them. We put about 100 B-17s in the air, armed with 2,000-pound demolition and 1,400-pound armor-piercing bombs on each airplane. Our plan called for us to come at right angles to the ships and, hopefully, sink them.

"The mission was easy. The weather was good, the flak was light, and the three ships were just sitting there waiting for us. Everyone bombed, and there were geysers and smoke all around them. We thought that we had got them all.

"We were wrong. Reconnaissance photos taken afterward showed that we didn't hit one of the cruisers, the other only had a turret blown off, and the battleship, the *Roma,* just sat there as if nothing had happened. We couldn't believe our eyes! After Italy surrendered to the Allies, the *Roma* was sunk by a single radio-controlled bomb dropped by a German bomber."

A year after Doolittle took over command of the Twelfth Air Force, he was assigned command of the Fifteenth, a new strategic air unit that would operate out of Italy. In December 1943, he was ordered to England to take over the Eighth Air Force from Ira Eaker the following month.

The Eighth was indeed a step up in terms of responsibility for Doolittle, now a three-star general, the first and only reserve officer to reach that rank. There were about twenty-five heavy bomber and fifteen fighter groups under his command, a total of 5,000 aircraft, plus all the other service organizations. It was during the period from January 1944 through the end of the war in Europe that Doolittle thoroughly proved his mettle.

After assessing the forces available to him, he instituted some significant changes. First was a change in formation flying. The bomber formations had to be tightened, Doolittle recalled, and they had to stop running away from the cripples. He reported: "The speed of bombardment formations en route to and from, and particularly when departing from the target area, must be reduced to the extent necessary to ensure that the slowest airplane is able to maintain its proper place." This innovation prevented losses because an entire formation could bring its firepower to bear to protect the cripples, instead of letting them fall behind to be picked off by the Luftwaffe.

Another innovation was the formation of the 1st Scouting Force, which used P-51s to reconnoiter the various targets and keep commanders informed about the weather as they penetrated deeper into Germany. This came about because of Doolittle's unhappiness with the weather forecasts he was getting. The result of this change was an increased number of missions, a lowered accident rate (midair collisions were a serious threat in bad weather), and lives saved.

An oft-told story about another change in tactics was occasioned by a visit to the headquarters of Maj. Gen. William E. Kepner. On the wall of Kepner's office was a sign bearing the motto of the Eighth's fighter pilots: OUR MISSION IS TO BRING THE BOMBERS BACK. The basic mission of the Eighth's fighters was to protect the bombers, not go after the Luftwaffe's fighters.

"I thought about that a minute," Doolittle said, "and then told Bill that that motto no longer was in effect. I said his mission henceforth would be to destroy the German Air Force. I told him to take that sign down."

As could be expected, there was great opposition to this decision by the bomb group commanders, but elation among the fighter groups. Doolittle has no trouble justifying it in retrospect. Adolf Galland, the Luftwaffe fighter commander, confirmed the change in tactics as a decisive one in his book *The First and the Last.* He wrote: "Only now did the superiority of the American fighters come into its own. . . . Wherever our fighters appeared, the Americans hurled themselves at them. They went over to low-level attacks on our airfields. Nowhere were we safe from them; we had to skulk on our own bases. During the takeoff, assembling, climbing, approaching the bombers, once in contact with the bombers, on our way back, during landing and even after that, the American fighters attacked with an overwhelming superiority."

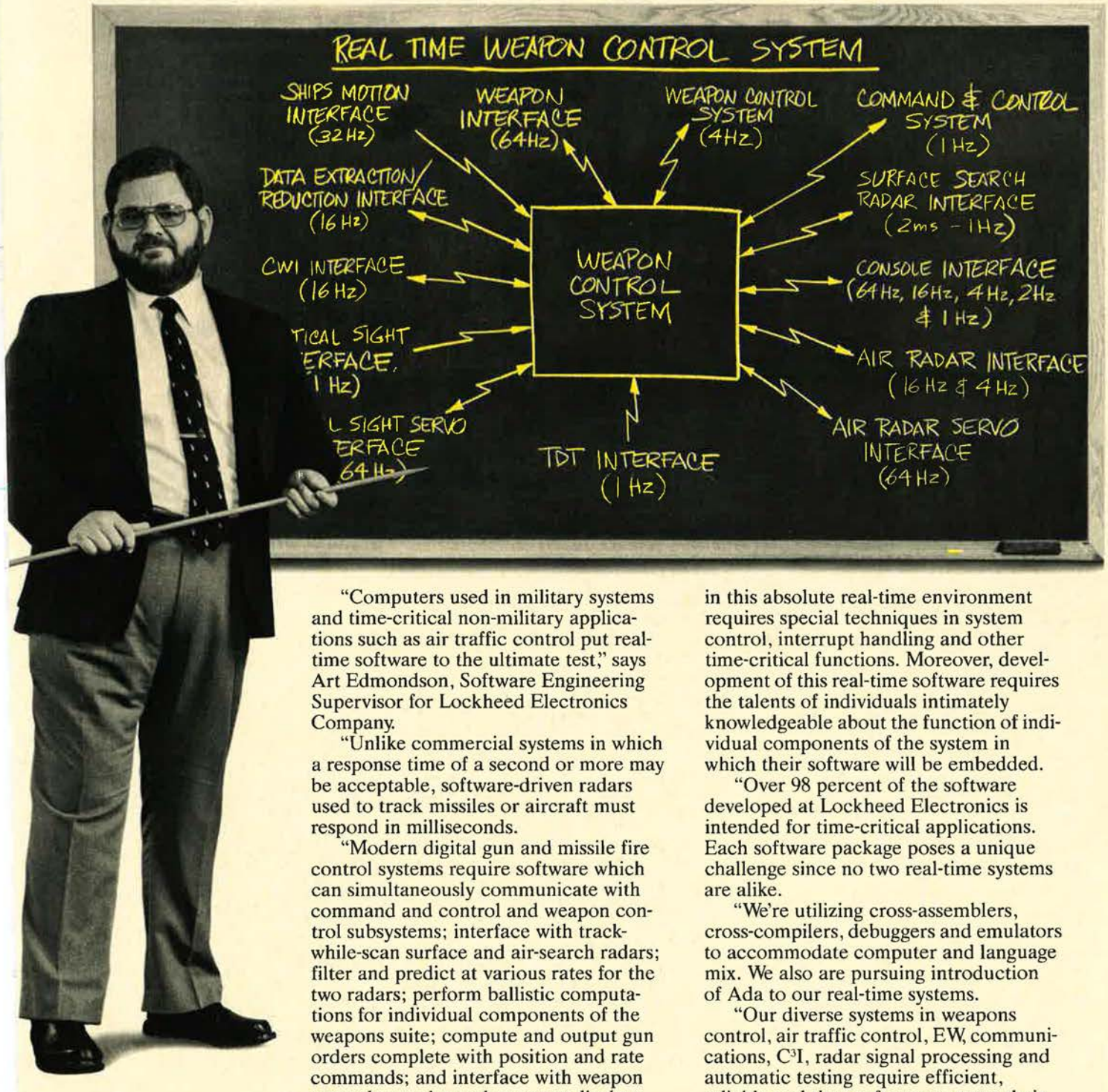
"As far as I'm concerned," Doolittle said, "that decision to unleash our fighters was the most important military decision I made during the war."

After V-E Day, Doolittle was ordered to take the Eighth Air Force to the Pacific. The second atomic bomb dropped on Nagasaki on August 9, 1945, and signaled the end of hostilities. As Doolittle stood on the *Missouri's* deck during the surrender ceremonies, he was deeply glad it was all over. He had risen from the grade of major in 1940 to lieutenant general in 1945. He had received the nation's highest honor and had commanded the mightiest bombing force the world had ever known. ■

C. V. Glines is a free-lance writer, a magazine editor, and the author of numerous books. His by-line appeared among the pages of this magazine many times during the 1960s and most recently in the July '85 issue with the article "The Fabulous Fortress." He is a retired Air Force colonel. His most recent book, Round-the-World Flights, *was reviewed in the December 1983 issue of* AIR FORCE *Magazine.*

Innovation

Art Edmondson on advances in real-time software technology.



"Computers used in military systems and time-critical non-military applications such as air traffic control put real-time software to the ultimate test," says Art Edmondson, Software Engineering Supervisor for Lockheed Electronics Company.

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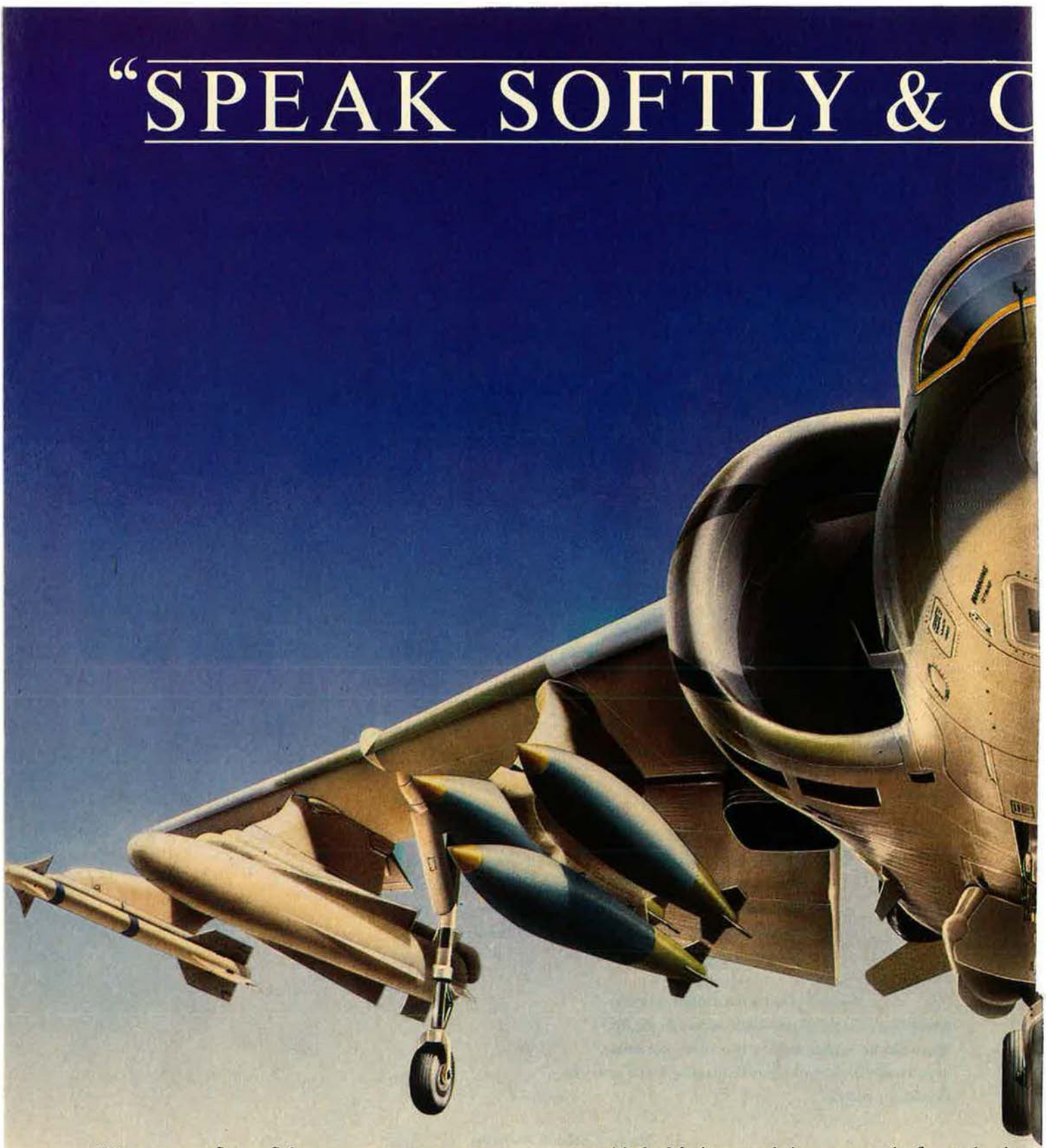

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An Airpower Chronology

FROM PEARL HARBOR TO V-J DAY

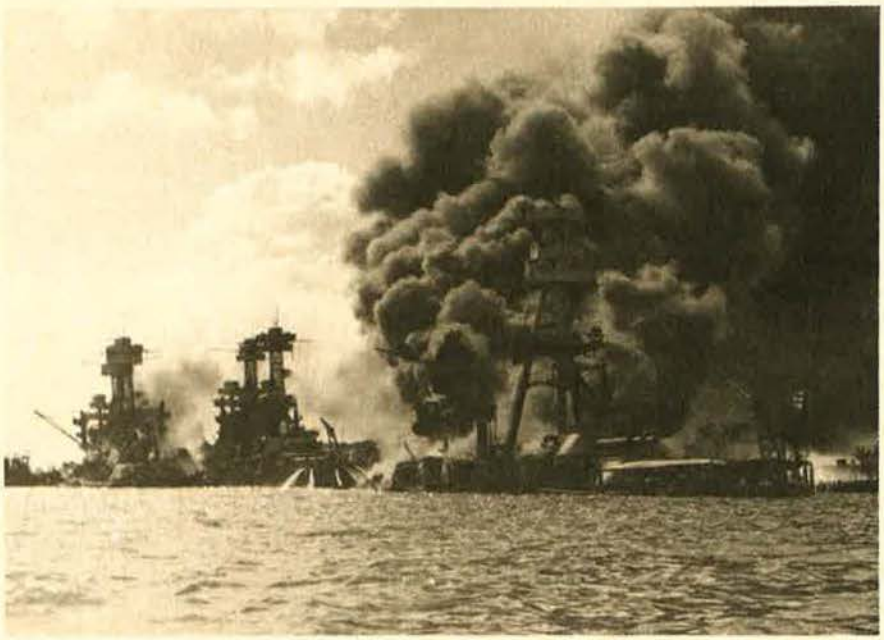
FORTY years ago, the world's most destructive war finally came to an end. From that war came a peace that endures to this day. In large measure, the events of four decades past determine the shape of today's world.

One result of that war was the establishment of an independent United States Air Force. The waging of World War II had proved, once and for all, the vital importance of airpower.

Heeding philosopher George Santayana's aphorism that "those who cannot remember the past are condemned to repeat it," AIR FORCE Magazine presents on this fortieth anniversary of victory a Chronology of Significant Aerospace Events. Spanning the days from the Japanese attack on Pearl Harbor through the war in Europe to the final surrender that September day aboard the USS *Missouri*, this list spells out the significant contributions of American airpower to the ultimate victory of the Allies. While the chronology is not inclusive, it features many events that added to the development of aerospace technology, promoted the organizational maturation of the Air Force, and carried the fight to the Axis powers.

This chronology is based in part on an official USAF publication, issued in 1972 on the twenty-fifth anniversary of the Air Force.

—THE EDITORS



US warships ablaze in the aftermath of the Japanese air attack on Pearl Harbor. That attack brought the US into World War II and heralded the new age of airpower.

1941

December 1: The Civil Air Patrol is established by an Executive Order.

December 7: The Japanese attack Pearl Harbor.

December 8: An estimated 60,000,000 Americans listen to President Roosevelt on the radio as he asks Congress to declare war.

December 10: Aircraft from the USS *Enterprise* sink a Japanese submarine north of the Hawaiian Islands—the first Japanese combat ship sunk by US forces in World War II.

December 10: B-17 bombers attack Japanese shipping in the first American air offensive of the war.

December 18: Lt. "Buzz" Wagner, USAAF, becomes the first American ace of World War II by shooting down his fifth Japanese plane over the Philippines.

December 20: The America Volunteer Group (Claire Chennault's Flying Tigers), in action over Kunming, enters combat for the first time.

1942

January 28: Hq. and Hq. Squadron of the Eighth Air Force are activated at Savannah AAB, Ga., with Col. Asa Duncan as commanding officer. (Three years later, the Eighth observed its third birthday with a 1,000-plane raid on the Reich. In three years, it flew more than 250,000 bomber and 210,000 fighter sorties, dropped 518,000 tons of bombs, and destroyed 13,000 planes.)

February 20: Navy Lt. "Butch" O'Hare shoots down five Japanese bombers in five minutes. He would later be given the Medal of Honor.

February 22: The first American air headquarters in Europe in World War II, US Army Bomber Command, is established in England, with Brig. Gen. Ira C. Eaker commanding.

February 23: B-17s attack Rabaul, the first Allied raid on the newly established Japanese base.

March 1: Ensign William Tepuni, flying a Lockheed Hudson, sinks a German submarine—the first German sub sunk by US forces in World War II.
March 9: The War Department is reorganized into three autonomous forces: Army Air Forces, Ground Forces, and Services of Supply.
March 13: The first USAAF detachment reaches the China-Burma-India (CBI) theater.
March 21: Gen. Jonathan Wainwright moves his headquarters to the island of Corregidor. With no hope of resupply, the situation on Bataan appears futile.
April 2: Tenth Air Force planes fly their first mission in the CBI, bombing the Andaman Islands.
April 9: Bataan falls to the Japanese. About 35,000 American and Filipino troops fall into Japanese hands, and the "Bataan Death March" begins.
April 18: Sixteen B-25s commanded by Lt. Col. James H. Doolittle take off from the USS *Hornet* and attack Tokyo.
May 4–8: The Battle of Coral Sea becomes the first naval engagement fought solely by aircraft.
May 6: After a bitter, lengthy fight, Corregidor surrenders.
May 14: The Women's Army Auxiliary Corps (WAAC) is established by Congress. "Auxiliary" status would be dropped in 1943, and, as the Women's Army Corps, it became an integral part of the Army.
June 4–6: At the Battle of Midway, the Japanese suffer a severe defeat, ending their offensive to the east and marking a major turning point of the war.
June 18: Maj. Gen. Carl A. "Tooey" Spaatz is appointed to command Eighth Air Force in the UK.
July 4: The first AAF bomber mission over Western Europe in World War II is flown over four airdromes in Holland by six crews of the 15th Bombardment Squadron in American-built RAF Bostons.
July 4: The Flying Tigers are incorporated into the AAF as the 23d Pursuit Group.
July 7: A 396th Bombardment Squadron B-18 sinks a German submarine off Cherry Point, N. C., in the first sure "kill" off the Atlantic coast by aircraft.
August 7: US forces in the Pacific take the offensive for the first time with the invasion of Guadalcanal. The campaign will take six months to complete.
August 16: Air Force participation in the North Africa campaign begins as planes attack German positions on the Egyptian front.
August 17: The first American heavy bomber mission in Western Europe in World War II is flown by B-17s of the 97th Bombardment Group against the Rouen-Scotteville yards in France.
August 19: The P-51 makes its debut in combat over Dieppe. An RAF Mustang is credited with downing a German fighter.
August 20: The first US planes land at Henderson Field on Guadalcanal.
September 1: The first airborne engineering unit, the 871st Airborne Engineers, is activated at Westover Field, Mass.
September 23: Brig. Gen. James H. Doolittle is appointed commander of Twelfth Air Force.
September 29: The Eagle Squadrons, comprising American flyers who served with the RAF, are formally taken over by VIII Fighter Command and organized into the 4th Fighter Group.
October 1: The first flight in the US by a turbojet aircraft, the Bell XP-59A, is made at Muroc, Calif.
October 9: Sixty US B-17s launch the heaviest daylight raid of the war so far, attacking industrial targets at Lille, France.
November 8–11: Army carrier-based planes support the invasion of North Africa.
December 2: The first nuclear chain reaction (fission of U^{235}) is accomplished under the direction of Enrico Fermi at the University of Chicago.
December 4: B-24s attack Naples harbor, the first US raid on Italy.

1943

January 14–23: Roosevelt, Churchill, and the Combined Chiefs of Staff meet at Casablanca to plan Allied strategy.
January 27: B-17s of the 1st Bombardment Wing, Eighth Air Force, attack Wilhelmshaven and Emden in the first American bombing of Germany.
February 9: All organized Japanese resistance ends on Guadalcanal.
February 18: The first class of thirty-nine flight nurses graduates from AAF School of Air Evacuation, Bowman Field, Ky.
March 4: Bismarck Sea action ends. A major Japanese effort to reinforce Lae is turned back by aircraft of the Southwest Pacific Air Forces. Japanese shipping totaling 40,000 tons is sunk, and fifty to sixty enemy planes are destroyed.
March 10: Fourteenth Air Force is activated under the command of Maj. Gen. Claire Chennault.
April 4: The B-24 *Lady Be Good* overshoots its base at Soluch, Libya, and is not heard from again. The wreckage was found 440 miles into the Libyan desert in 1959 by an oil exploration party.
April 5: Operation Flax, a concentrated attack on Axis air transport services between Italy and Tunisia via airdromes in Sicily, is begun by planes of Northwest African Air Forces and results in claims of 201 enemy planes destroyed.
April 21: Capt. Fred Smith, a P-38 pilot in the Aleutian campaign, sinks a Japanese minesweeper and sends one of the most alliterative messages of the war: SAW STEAMER, STRAFED SAME, SANK SAME, SOME SIGHT, SIGNED SMITH.
May 30: US forces secure Attu island, bringing the Aleutians campaign to a close.
June 11: Several weeks of Allied bombings cause the Italian garrison on Pantelleria to surrender. The island is the first large defended area to be conquered by airpower.
June 25: 130 B-17s drop 300 tons or more of bombs on Messina, Sicily—the heaviest single attack made to date by Northwest African Air Force.
July 2: Lt. Charles Hall shoots down a German Focke-Wulf 190 over Sicily and becomes the first black US flyer to down an Axis plane.
July 10: Allied airborne troops land at Gela and Syracuse, Sicily, in the first large-scale airborne operation attempted by the Allies in World War II.
July 14: Messina, Sicily, is hit by 212 Allied bombers, which drop 800 tons of bombs.
July 19: 500 Ninth Air Force bombers strike airfields and railroad marshaling yards in Rome, dropping 1,000 tons of bombs.
July 24–25: The first in a series of massive RAF and USAAF raids on Hamburg begins.
August 1: Mediterranean-based B-24s carry out low-level attacks on the Ploesti oil refineries in Romania in the first large-scale, minimum-altitude attack by AAF heavy bombers upon a strongly defended target; it is the longest major bombing mission to date in terms of distance from base to target.
August 13: The Secretary of the Navy establishes the Office of the Deputy Chief of Naval Operations (Air); Vice Adm. J. S. McCain is named first DCNO (Air).
August 15: US Army troops and Marines land on Vella Lavella in the Solomons.
September 13: The 52d Troop Carrier Wing drops more than 1,200 paratroopers of the 82d Airborne Division on the beachhead at Salerno, Italy, without the loss of one man or one plane.
September 27: P-47s with belly tanks go the whole distance with Eighth Air Force bombers for a raid on Emden, Germany.
October 5: US ships and planes begin bombardment of Wake Island.
October 12: Fifth Air Force planes open the offensive to isolate Rabaul and neutralize the Bismarck archipelago.
November 3: 500 Eighth Air Force B-17s attack Wilhelmshaven in the heaviest daylight raid of the war to date.
November 22–26: At the Cairo Conference, Roosevelt and Churchill, along with Chiang Kai-shek, agree that B-29s will be based in the CBI for strikes on the Japanese home islands.
November 25: China-based Fourteenth Air Force planes destroy forty-two Japanese planes on the ground in the first US raid on Formosa.
December 5: P-51s begin escorting US bombers to European targets.
December 17: Orville Wright presents the 1943 Collier Trophy to his former pupil, Gen. H. H. Arnold, Commanding General, Army Air Forces, for outstanding achievement in aviation.
December 24: 670 B-17s and B-24s bomb the Pas de Calais area in the first major Eighth Air Force assault on German V-weapon sites.
December 26: Preinvasion bombing of Cape Gloucester (New Britain) completely destroys enemy defenses; Fifth Air Force adopts term "Gloucesterizing" to describe complete target destruction.

1944

January 1: United States Strategic Air Forces in Europe (USSTAF) is activated.
January 11: Allied bombers launch Operation Pointblank, designed to cripple the German aircraft industry and render the Luftwaffe ineffective before the Normandy landings.
January 22: 1,200 sorties by Mediterranean Allied Air Force planes support ground forces as they hit Anzio beaches.
January 29: In the largest US air operation to date, 800 heavy bombers of Eighth Air Force

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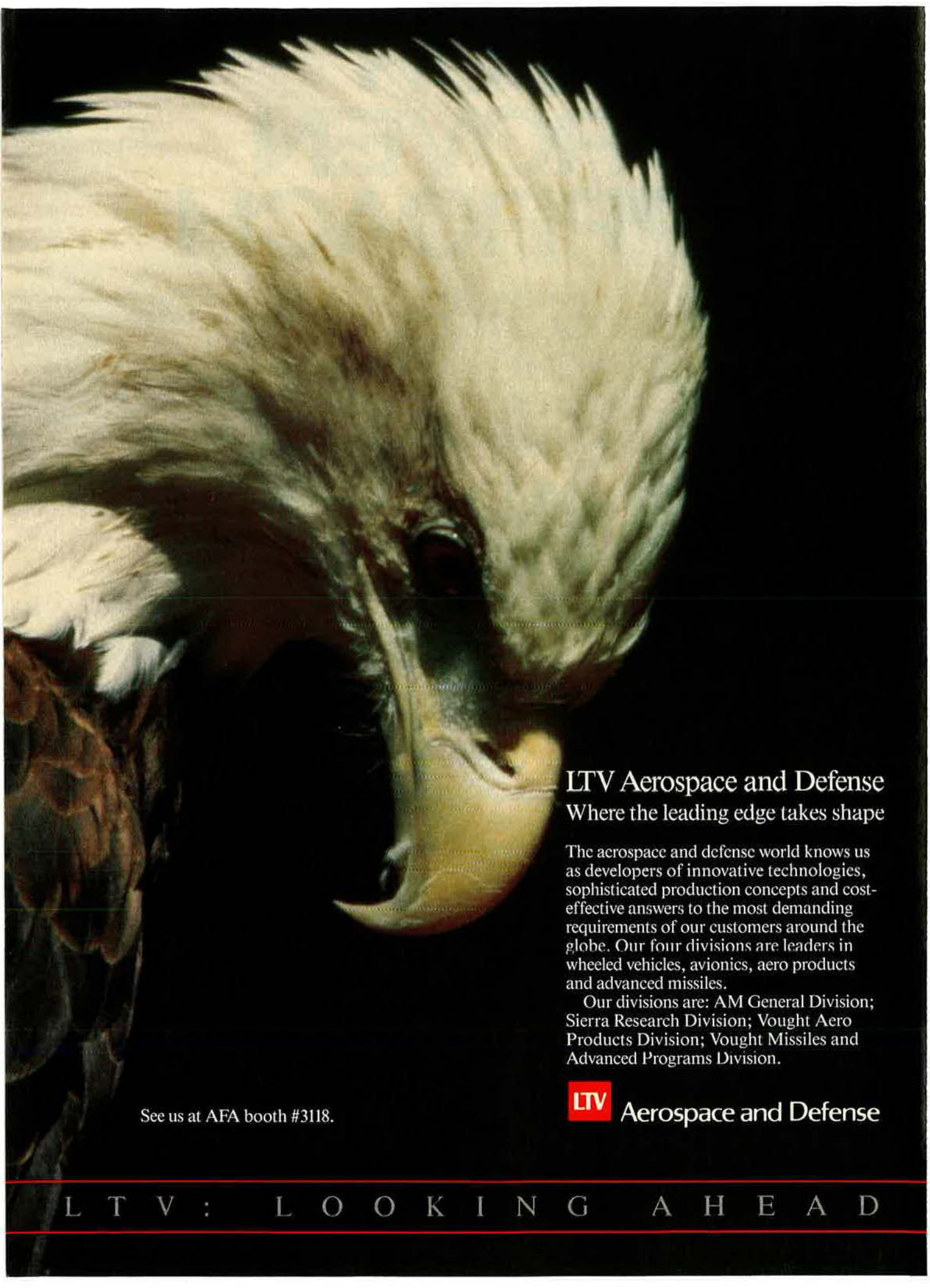

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drop 1,886 tons of bombs on Frankfurt, Germany.

January 30: Fifteenth Air Force planes attack German air bases in the Po Valley, limiting further Luftwaffe activity in Italy.

January 31: US forces invade Kwajalein in the Marshall Islands. This island is the first of Japan's prewar territories to fall.

February 2: Stalin agrees to permit American planes to use six Russian bases for shuttle bombing operations.

February 3: About 1,200 B-17s, B-24s, and escort fighters attack Wilhelmshaven and Emden, Germany.

February 15: Medium and heavy bombers make a 254-plane attack on the Abbey of Monte Cassino, Italy, ahead of the Fifth Army.

February 17: Twelve radar-equipped TBF-1Cs attack Truk from the USS *Enterprise* in the first night bombing attack in the history of US carrier aviation.

February 17: American forces land on Eniwetok and meet little resistance. The island is taken four days later.

February 20: The first mission of "Big Week"—six days of strikes by Eighth (England) and Fifteenth (Italy) Air Forces against German aircraft plants—is flown.

February 23: For the first time, carrier-based planes attack the islands of Saipan, Tinian, Rota, and Guam, in the Marianas.

February 29: Fifth Air Force aircraft support the first landings on the Admiralty Islands, thus isolating Rabaul.

March 2: More than 350 sorties are flown by US bombers in support of the Anzio beachhead in Italy.

March 4: In the first major USAAF attack on Berlin, 660 heavy bombers unload 1,600 tons of bombs.

March 25: The first operational use of the VB-1 "azon" bomb, with movable control surfaces adjusted by radio signals, is made by Fifteenth Air Force against Avisio Viaduct and successfully closes the Brenner Pass.

March 26: Marine Corsairs from Engebi fly the first fighter escort for AAF B-25s during a 360-mile bombing mission against Ponape.

March 28: Fifteenth Air Force flies its first 1,000-ton raid, striking communications targets in Italy in support of Operation Strangle, designed to cut off logistical support to German troops in central Italy.

March 30: Navy Task Force 58, under Vice Adm. Marc A. Mitscher and boasting eleven carriers, begins a series of attacks on Palau, Yap, and Ulithi as a prelude to landings at Hollandia.

April 3: US bombers attack Hollandia in the heaviest attack to date on the base in New Guinea.

April 8: B-24s knock out the twin spans of the Sittang bridge, the most critical rail target in Burma.

April 24: The Strategy Section of the War Department's Operations Division determines that "the collapse of Japan can be assured only by the invasion of Japan proper."

May 10: The Chengtu Project (construction in China of five bomber and six fighter fields) is completed. Begun in January, the task was accomplished by 400,000 coolies using primitive methods.

May 11: Operation Strangle (March 19–May 11) ends. Mediterranean Allied Air Forces' operations against enemy lines of communication in Italy totaled 50,000 sorties and 26,000 tons of bombs dropped.

May 12: 800 US bombers with American and RAF escorts attack synthetic oil plants in Germany. Allied losses amount to forty-six bombers and ten fighters, while the Germans lose 200 aircraft.

May 20: Naval aircraft attack Japanese-held Marcus Island.

May 21: Operation Chattanooga Choo-Choo, which is the systematic attack by Allied aircraft on trains in France and Germany, begins. Some 900 locomotives and 16,000 freight cars will be destroyed in ten days.

May 31: First launch of experimental VB-7 vertical bomb, using television.

June 2: The first shuttle bombing mission using Russia as eastern terminus is flown. Lt. Gen. Ira C. Eaker, head of Mediterranean Allied Air Forces, flies in one B-17.

June 5: XX Bomber Command flies its first mission, attacking Bangkok.

June 6: In an effort unprecedented in concentration and size, Allied aircraft fly approximately 15,000 sorties on D-Day.

June 6: US planners set October 1, 1945, as the date for Operation Olympic, the invasion of Japan.

June 9: Allied aircraft begin operations from bases in France.

June 11: US naval and air forces attack Guam, Saipan, and Tinian in the Marianas.

June 11: American bombers, taking off from shuttle bases in Russia, bomb Focsani in Romania.

June 13: The first German V-1s fired in combat are launched from France against England—four of eleven strike London.

June 15: Forty-seven B-29s of XX Bomber Command fly from bases in Chengtu, China, and attack Yawata in the first B-29 strike against Japan.

June 15: The Marines invade Saipan, an island necessary for basing B-29s.

June 19–20: "The Marianas Turkey Shoot"—in two days of fighting, the Japanese lose 476 aircraft to just 130 American planes (eighty percent of which ran out of fuel or could not find their carriers in the dark).

June 22: The GI Bill is signed into law.

July 5: The Northrop MX-324 makes the first rocket-powered flight by an American military aircraft.

July 7: B-29s bomb naval targets at Sasebo on the Japanese home island of Kyushu.

July 9: Saipan secured by US forces.

July 17: P-38s make the first napalm raids on a fuel depot at Coutances, France.

July 21: Marines and Army troops invade Guam and meet modest resistance.

July 22: The first all-fighter shuttle raid is made by Italian-based US Lightnings (seventy-six) and Mustangs (fifty-eight) of Fifteenth Air Force, attacking Nazi airfields at Bacau and Zilistea, northeast of Ploesti, Romania. The planes land at Russian bases.

July 24: The Marines land on Tinian Island.

July 25: More than 2,400 bombers attack German positions in front of the American lines at St.-Lô over a three-hour period.

August 1: Tinian secured.

August 4: The first Aphrodite mission (radio-controlled aircraft carrying 20,000 pounds of TNT) is flown against rocket sites in the Pas de Calais area.

August 7: Carrier Division 11 is commissioned. Composed of carriers *Saratoga* and *Ranger,* it is the first US division specifically commissioned for night operations.

August 10: Guam is secured, completing the US capture of the Marianas.

August 15: In the greatest one-day effort in the Mediterranean to date, Mediterranean Allied Air Forces fly 4,249 sorties, including landing 9,000 airborne troops in southern France.

August 28: USAAF 78th Fighter Group claims the destruction of an Me-262, the first jet to be shot down in combat.

September 13: US shuttle bombing raids to Russia end when Red Army advances place the bases too far from the front.

September 14: A successful flight into a hurricane to gather scientific data is made by Col. Floyd B. Wood, Maj. Harry Wexler, and Lt. Frank Reckord in a Douglas A-20.

September 17: Operation Market Garden begins: 1,546 Allied aircraft and 478 gliders carry parachute and glider troops in an airborne assault between Eindhoven and Arnhem in Holland to secure a Rhine crossing at Arnhem.

October 10: Okinawa is attacked by US naval aircraft from seventeen carriers.

October 14: US Navy aircraft complete a three-day sweep of Formosa, destroying 280 Japanese aircraft.

October 23–26: The Battle of Leyte Gulf features carrier air as well as surface action, and kamikaze attacks are introduced.

November 1: An F-13 (reconnaissance variant of a B-29) is the first American aircraft to fly over Tokyo since the Doolittle raid.

November 5: B-29s bomb Singapore.

November 10: Thirty-six B-25s of the Fifth Air Force attack a Japanese convoy near Ormoc Bay, Leyte, sinking three ships.

November 16: In the largest air-ground cooperative effort to date, more than 4,000 Allied planes drop more than 10,000 tons of bombs in front of the First and Ninth Armies.

November 17: Land-based American fighters appear over Manila, Bataan, and Corregidor for the first time since early 1942.

November 24: Eighty-eight B-29s from the Marianas attack Tokyo in the first very heavy bomb strike against Tokyo and the first mission by XXI Bomber Command against the Japanese home islands.

December 8: US bombers and naval ships begin the systematic bombing of Iwo Jima as a prelude to invasion.

December 17: Maj. Richard Bong shoots down his fortieth enemy plane in the Pacific.

December 17: On the forty-first anniversary of the Wright brothers' first flight, the 509th Composite Group (the atomic bombing unit) is established at Wendover Field, Utah.

December 21: Gen. H. H. Arnold becomes General of the Army—the first airman to hold this five-star rank.

1945

January 22: Navy task forces complete three weeks of action against Luzon, Formosa, the Ryukyus, the Pescadores, Okinawa, and Hong Kong, with an aerial score of more than 600 enemy aircraft destroyed and 325,000 tons of enemy shipping sunk.

January 25: In the largest mining operation of the war, B-29s drop 366 mines in the approaches to Singapore.
January 28: Clark Field in the Philippines is retaken by American forces.
February 3: 959 B-17s carry out the largest raid to date against Berlin by American bombers.
February 16: Troop carrier C-47s drop 2,065 paratroopers on Corregidor after long and heavy air bombardment of enemy guns and positions.
February 16: The Navy begins thirty days of attacks on Iwo Jima, Okinawa, the Ryukyus, and Tokyo, destroying 648 enemy aircraft.
February 19: US Marines invade Iwo Jima after a seventy-two-day bombardment.
February 20: The Secretary of War approves plans to establish the White Sands Proving Ground, a rocket-firing installation.
February 25: B-29s begin night incendiary raids on Japan; 334 aircraft drop 1,667 tons of fire bombs and destroy fifteen square miles of Tokyo.
March 2: The first of Iwo Jima's airfields are opened to US transports. Fighters begin operations four days later.
March 9: In a change of tactics to double bomb loads, Twentieth Air Force sends more than 300 B-29s from the Marianas against Tokyo in a low-altitude, incendiary night raid, destroying about one-fourth of the city.
March 11: The greatest weight of bombs dropped in a USAAF strategic raid on a single target in Europe falls on Essen as 1,079 bombers release 4,738 tons of bombs.
March 14: Italian-based American bombers cooperate directly with the Red Army in attacks on tactical targets, selected by the Russians, in Austria, Hungary, and Yugoslavia.
March 16: Iwo Jima is declared secure.
March 17: 307 B-29s drop 2,300 tons of incendiaries on Kobe, Japan.
March 18: 1,250 US bombers, escorted by 670 fighters, strike Berlin its heaviest daylight attack—3,000 tons of bombs on transportation and industrial areas.
March 24: Flying from southern Italy, approximately 150 B-17s drop 357 tons of bombs on industrial targets in the first Fifteenth Air Force bombing of Berlin.
March 27: B-29s begin night mining missions around Japan, eventually establishing a complete blockade.
April 1: In what was to become the last, and bloodiest, major amphibious operation in the Pacific, the invasion of Okinawa begins.
April 4: A YR-4 helicopter of a Tenth Air Force air-jungle rescue detachment lands in enemy territory in Burma and evacuates a survivor of a PT-19 crash.
April 7: The first fighter-escorted missions by B-29s are flown against Japan.
April 9: The last US B-17 rolls off the line at Boeing's Seattle, Wash., plant.
April 10: Thirty of fifty German Me-262 jet fighters are shot down by US bombers and their P-51 escorts. The German fighters shoot down ten bombers—the largest loss of the war in a single mission to jets.
April 16: Gen. Tooey Spaatz announces that all strategic operations in Europe have ceased.
April 23: PB4Ys of Patrol Bombing Squadron 109 launch two Bat missiles against enemy shipping in Balikpapan Harbor, Borneo, in the first combat use of the only automatic homing missile in World War II.
May 7: German Col. Gen. Alfred Jodl signs the instrument of surrender at Eisenhower's headquarters (a converted schoolhouse) in Reims, France, at 1:41 a.m.
May 8: President Truman declares May 9 V-E Day.
May 16: Fighter-bombers begin an assault on the Ipo Dam area (Luzon) in the largest mass napalm employment in the Pacific war.
June 22: Okinawa is declared captured by US forces. The price paid to capture this island—16,000 men, thirty-six ships, and 800 aircraft—was a key consideration in the decision to use the atomic bombs on Japan.
June 26: B-29s begin nighttime raids on Japanese oil refineries.
July 14: A-20s from Hollandia set fire to Japanese oil fields at Boela, Ceram, in the first use of rocket bombs in the Southwest Pacific.
July 16: The world's first atomic device is detonated at Alamogordo, N. M.
July 24: An armada of 1,600 planes attacks Japanese airfields, the naval base at Kure, and ships in the Inland Sea.
August 6: The "Little Boy" (uranium) atomic bomb is dropped on Hiroshima from B-29 *Enola Gay,* commanded by Col. Paul W. Tibbets, Jr.
August 6: Maj. Richard Bong, America's leading ace of the war, is killed in a P-80 accident.
August 9: The "Fat Man" (plutonium) atomic bomb is dropped on Nagasaki from B-29 *Bock's Car,* commanded by Maj. Charles W. Sweeney.
August 14: Japanese Emperor Hirohito announces the unconditional surrender of Japan.
August 15: V-J Day proclaimed.
August 27: B-29s make their first supply drop operation to Allied POWs in the Weihsien camp near Beijing, China.
September 2: Official Japanese surrender ceremonies take place in Tokyo Bay aboard USS *Missouri.* ■

Aboard the battleship* Missouri *forty years ago, US Fleet Admiral Chester W. Nimitz signs the document signifying the Allied victory in World War II. US airpower's major contribution to that victory led to the establishment of the US Air Force.

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THE HF RADIO HEARD 'ROUND THE WORLD.

This is what Wycombe Abbey School looks like today, forty years after it served as wartime headquarters for the mighty Eighth Air Force. John Gray, author of the accompanying article, took the photo when he returned to England this spring.

The last man out of Eighth Air Force headquarters at High Wycombe returns for another look.

Pinetree Revisited

BY JOHN O. GRAY

DURING two cold and rainy days last June, I made it back to High Wycombe, Buckinghamshire (near London), for "one last look" at Wycombe Abbey School—the World War II headquarters of the Eighth Air Force. I had been assigned to this headquarters during much of World War II. This was my first trip back in all these years.

As we used to do during the war, I took the train from London to High Wycombe. The trip took a little more than forty minutes, about half the time it took during the war.

High Wycombe now has high-rise buildings and glass-walled offices. They appear dreadfully out of place. The Red Lion portico on High Street still stands. Here Benjamin Disraeli unsuccessfully campaigned to be a Member of Parliament in 1832, and here, a hundred and three years later, Winston Churchill rallied support in the postwar election.

Wycombe Abbey School was not only the site of our headquarters but also residence for most of us. The Abbey stands as regal as ever. An addition has been made to the main building, and attractive modern dormitories for the upper-grade girls now stand where our volleyball court used to be. The beautiful chapel remains, and the attractive grounds to the east of the Abbey that were our "playing fields" for softball, touch football, and the like and the site of a fantastic V-E Day banquet are still emerald green, though now without base lines, base markers, and goal posts. The little lake remains, but the swans have been replaced by several dozen ducks.

Shortly after V-E Day but before General Doolittle's reassignment to the Pacific, he asked that the Eighth Headquarters conduct a function commemorating the end of the fighting in Europe. It was, he stipulated, to be a "dignified affair," with refreshments, food, and dancing for the headquarters staff, their guests, and leading civic leaders of the High Wycombe area, plus key members of the Royal Air Force. The banquet was conducted on a gorgeous evening (the sun at that time didn't set in England until around 10:00 p.m.) on the lawn just east of the Abbey. An armada of B-17s and B-24s flew over in their own salute. While this was a joyous occasion, the staff and all the guests were ever mindful of the Eighth Air Force airmen who had lost their lives in the war over Europe.

Wycombe Abbey itself, originally an eighteenth-century mansion and

—Photo by Nancy Johnson

It may not be the same bench, but it's the same man in the same setting. LEFT: John Gray at Wycombe Abbey, spring of '85. RIGHT: Gray during his wartime years there.

The V-E Day banquet was requested by Jimmy Doolittle, Eighth Air Force commander, and was held on the Wycombe Abbey School lawn. The photo was taken by Bill Ammen.

set in 250 acres of parkland, became a school in 1896. Except during World War II, it has remained an all-girls school, now with 480 young women ages twelve to eighteen from around the world, including the US, in attendance. One of their new dormitories is named "Pinetree," World War II code name for Eighth Air Force Headquarters.

It was in the large reception room in the main entrance to the Abbey that headquarters alumni will remember we took turns sitting as Officer of the Day. On one wall is an oak plaque with these words:

WYCOMBE ABBEY SCHOOL SERVED AS THE HEADQUARTERS OF THE UNITED STATES VIII BOMBER COMMAND FROM APRIL 1942 UNTIL JANUARY 1944, AND AS HEADQUARTERS OF THE UNITED STATES EIGHTH AIR FORCE FROM THEN UNTIL OCTOBER 1945. IN THESE BUILDINGS WERE CONCEIVED, PLANNED, AND DIRECTED THE MIGHTY AIR ASSAULTS ON GERMANY WHICH, WITH THOSE OF THE ROYAL AIR FORCE, PAVED THE WAY FOR ALLIED VICTORY IN EUROPE.

It is now forty-three years since, as a Wycombe Abbey School brochure says, "desks were moved out, detailed maps of Europe moved in, classrooms turned into 'ops' rooms, and top-secret files substituted for school records."

As I left the Wycombe Abbey grounds that cold, rainy June afternoon, I couldn't help reflecting on those World War II days. I thought I heard someone shout, "Play ball!" I'm *sure* I heard echoes of the big band sound. It had to be the sound of the Glenn Miller Army Air Forces Orchestra. Not surprisingly, about all that current High Wycombe residents remember of the wartime Abbey and the Eighth Air Force Headquarters is that "Glenn Miller played there." And indeed he did, on July 29, 1944, one of his last major concerts.

In the audience that day were Eighth Air Force Commander Lt. Gen. (now Gen.) Jimmy Doolittle and his Vice Commander, Maj. Gen. Orval A. Anderson. I wonder how many people remember that Orval Anderson was Glenn Miller's uncle? I believe Glenn Miller's mother was the General's sister. I suspect that this relationship might well have been what motivated Glenn Miller to become a member of the Army Air Forces.

On my way up Amersham Hill to the railway station for my return to London, I stopped in at what I remembered as a pleasant pub. I introduced myself to a typically personable, gray-haired pubkeeper. "Do you remember the Eighth Air Force Headquarters at Wycombe Abbey?" I asked. "Not really," he responded, "I was only ten years old at the time."

On the train on my way back to London, I remembered that I was the one who locked the gates of Wycombe Abbey for the last time in late October 1945. Those of us who had remained there until then were being transferred to USAFE in Germany. For the life of me, I can't remember what I did with the key—but perhaps that's just as well. ■

John O. Gray is currently a consultant to the Air Force Association after having served on the AFA National Headquarters Staff for twenty-one years. A retired Air Force brigadier general, he served on the Headquarters Staff of the Eighth Air Force during most of World War II and later in Washington with Hq. USAF and the Air Force Office of Information. Gray, from Spokane, Wash., and a graduate of the University of Idaho, retired as AFA Assistant Executive Director in 1978.

Meanwhile, in the Pacific . . .

While John Gray and his colleagues at Hq. Eighth Air Force were celebrating V-E Day and winding up things at Wycombe Abbey *(see accompanying article)*, SSgt. Richard M. Skinner and his fellow members of Seventh Air Force, in the Western Pacific, were preparing for the final assault on Japan. The hammer blows of August—the dropping of the atomic bomb on Hiroshima, the Russian entry into the war against Japan, the bombing of Nagasaki, and the Japanese capitulation—finally culminated in the surrender ceremony aboard the battleship *Missouri* in Tokyo Bay on September 2, 1945.

Skinner, who since 1951 has been Managing Editor of this magazine, had entered the Army Air Forces in April 1943. After basic training in Miami Beach, he was trained at Pawling, N. Y., as a cryptographer. His first assignment was to an antisubmarine squadron at Fort Dix, N. J. In October 1943, he went overseas with the 30th Bomb Group, a B-24 outfit and at the time one of only two heavy bomb groups in Seventh Air Force. Initially based at Wheeler Field, his unit later arrived on Saipan on the day neighboring Tinian was being invaded. He later transferred to the 11th Bomb Group on Guam and was there when the war ended in Europe. He arrived on Okinawa early in July 1945 and was there through V-J Day and until December 1945.

Following are excerpts from his letters of August and September 1945 to his family in Princeton, Ill. They capture some of the flavor and feeling of the final days of the war.

Ryukyus, August 12 [1945]

. . . From all indications, by the time this reaches you the big fight should be all over, and how we're all hoping so. Everyone is all keyed up waiting for the end, just as the guys were in Europe last May. I can't seem to get it thru my head that the end of all this mess is actually in sight after all this time. However, after so many past disappointments, I'll believe it for sure only when the shooting stops.

And speaking of shooting, what a demonstration was put on here two nights ago when the first word came in that Japan wanted to surrender. The flash came by radio at just 12 minutes after 9 in the evening. A few minutes later a couple of tracers went scooting across the sky; then it seemed every gun on the island cut loose. What a sight—strings of red and white tracer, searchlights weaving their own sort of pattern, red, orange, green flares, star shells and other pyrotechnics bursting all over the sky and finally the heavy stuff from the bigger AA guns. To contribute their bit, some jokers in a nearby coral pit blew up about three times the normal charge of dynamite. The whole show lasted more than half an hour and watching it was about as safe as sitting on a hot keg of powder, for all the stuff that went up indisputably had to come down again. Needless to say I was crouched up under my steel helmet, but nevertheless I wouldn't have missed it for anything. . . .

Ryukyus, August 15

From all the reports I've heard on the radio today, I guess you people must be going crazy back there—and with good reason. This—as they say in the movies—must be "it"! Truman's statement of the Japs' capitulation, which you must have heard shortly after 6 p.m. on Tuesday—no doubt while you were just about sitting down to supper—reached here at just 2 minutes past 8 this morning. I overslept breakfast (a very rare instance) because I stayed up late last night to finish some work, and got up shortly before 8 to hear the news. The announcer started in with the same line we've been catching for the last few days—"No answer yet from the Japs"—and then suddenly he broke in with Truman's message. It was the word we've all been waiting for, but it was interesting to note that there was no wild rejoicing such as the demonstration put on five nights ago. The other night would seem to have been the spontaneous release of everyone's pent-up feelings—just getting it out of our systems. Of course I'll feel better when the whole deal is signed and sealed, but nevertheless I can safely say my morale has jumped many points since about two weeks ago. . . .

Richard Skinner, then a staff sergeant, shown here on Guam in April 1945. After the war, he finished college, earned his master's degree in journalism, was recalled to the Air Force during the Korean War, and then joined the staff of* AIR FORCE *Magazine.

Okinawa, Ryukyu Islands
Monday, September 3, 1945
(V-J Day, plus one)

. . . I'm sure you were all listening to the radio yesterday, to hear both the surrender ceremony and President Truman's address, and you were in all probability hearing the same program that we caught. According to my detailed calculations, that broadcast should have reached you at approximately 8:30 p.m.—that is, Saturday night, while here we heard it at 10:30 on Sunday morning (I'm fourteen hours ahead of you now, you know). At any rate, as a means of formalizing the occasion it seemed very well done. Gen. Doug's voice came thru very clearly, and also that of Brother Nimitz, but the announcer who gave the blow-by-blow description of the signing itself spoke too fast, and we couldn't catch more than about half of what he said. I imagine you realize that that program was a rebroadcast—the actual signing took place at 9:00 Sunday morning, an hour and a half before the radio show. . . .

Okinawa, September 7, 1945

. . . We had a very pleasant surprise a couple of days ago. To start at the beginning, there was a boy named Manniere in our Communications Section back at Fort Dix who came overseas with us. At Wheeler Field he went on combat as a radio operator, and was sent with his crew to Kwajalein. That was about the first month or so of 1944. He and his crew had completed a number of missions when one day about the end of May they started out from Kwajalein, refueling at Eniwetok, on a bombing and photo reconnaissance mission over Saipan. The planes had just left the target when they were jumped by a bunch of Jap fighters. Manniere's pilot dropped back to protect a plane that was lagging behind, and just about that time a Zero downed him. The plane crashed almost immediately, but not before four men bailed out. The Japs, incidentally, strafed the parachutists all the way down, probably killing them, and also shot up the floating wreckage of the plane. Well, we all gave up hope of ever seeing Manniere again, for the plane crashed in flames and was only about 40 miles from Saipan anyhow. You can imagine our feelings, for Manniere was about the best-liked fellow in the outfit—got along swell with everyone. To get to the point, the boy came waltzing in the other day, having just been repatriated from a prison camp in Tokyo. He looks surprisingly well, and hasn't changed a bit. It was a most pleasant surprise to find so many of his old outfit here, and to find that he has been so well remembered. His pilot and co-pilot lived thru the experience too—the bombardier also got out of the crash but died later on the way to Japan. But really, I've never seen anyone so happy as that boy is now, and of course for good reason. He says that the Japs didn't treat him as badly as they did many others—the food was terrible, but that was the worst part. I wouldn't be surprised if other crews that have gone down along the way and been given up for lost would start showing up from now on. Imagine how his folks must be feeling now—he evidently couldn't even let them know he was alive.

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VIEWPOINT

The Last Great Conflict

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

The seeds of World War II were sown years before. Idealistic preoccupations took the place of realistic preparedness, and another generation was left to pay the price.

Grafton-Underwood, a bucolic hamlet in Cambridgeshire, has somehow escaped the urban blight that has been the fate of so many other places within reach of London. Perhaps because it borders on the expansive holdings of the Duke of Buccleuch, it remains essentially unchanged from the days when an American air base was nearby and more Americans than British claimed Grafton-Underwood as home.

A modest monument on the village outskirts marks the site of the airfield, an area long since returned to farming. Only crumbling pavement and a few dilapidated Quonsets persist in the place where thousands of Americans lived out their war. The villagers have not forgotten, however, and neither have the Americans. There is a stained-glass window in the old stone church that depicts a B-17 and that has as its inscription "Coming Home."

The 384th Bomb Group came home to Grafton-Underwood 316 times, leaving behind, in dead and missing, 1,600 men. The story is typical and was repeated all across the Midlands. The airfields that once threatened to pave over that part of England are mainly gone, but remembrances of one kind or another are to be found in the villages. From time to time, Americans come, sedate and unrecognizable survivors of yesteryear's overpaid, happy-go-lucky, hell-raising Yanks. World War II, for all its savagery and discouraging long-term results, has somehow become the war people like to remember. Or at least some people. Those who fought in the Pacific are entitled to different, less mellow, recollections. The Bataan Death March will forever continue to be as inexplicable as Hitler's concentration camps.

The final mission returned to Grafton the afternoon of April 25, 1945. That day, the last American bombs fell on Germany, and while there were still two more weeks until Germany's surrender, the air war was over. Any further bombardment would simply complicate the infantry's task.

As it happened, on that very same twenty-fifth of April, the world's statesmen gathered in San Francisco to draw up a charter for the United Nations. President Roosevelt's death only two weeks earlier had been a distinct shock to all of us in England, British and Americans alike. Roosevelt had been the President we had known for thirteen years; we had come to look on him as a permanent presence in the White House. The flags were at half-mast that April day when the Charter Conference convened in San Francisco, a likely enough omen now that we look back. That April, however, we were still ingenuous, a nation that had come from comfortable isolation behind its ocean barriers to fight a war for freedom.

We had arrived in England with theories about air warfare that, as it turned out, needed a little adjusting. Bombers, we discovered, were no match for fighters in daylight, no matter how many guns they mounted. We tried defensive formations and even (with the B-40) an aerial version of the battleship, but the Luftwaffe was just too formidable. Our definitive lesson on the limitations of daylight bombing came in October 1943, when some of us, having got together above the thick English clouds, set off for Schweinfurt. We lost sixty B-17s that day, and while the ball-bearing works were heavily damaged, the Luftwaffe appeared to have carried off the victory. A loss rate like that was not sustainable.

Yet the theory of daylight precision bombing was faultless; it was only our tactics that needed fixing. Schweinfurt, for all the beating we took, was a near catastrophe for Germany's war industry—near, because we were too decimated after that day in October to return and finish the job.

The P-51 Mustang, arguably the single most decisive weapon in World War II, solved the problem of daylight bombardment tactics. Once the P-51s arrived and Wright Field finally got the word about the need for long-range drop tanks, no target was safe from the bombers.

We will never again see armadas such as those of the Eighth Air Force in 1945. When the bomber formations departed Lowestoft, or another such spot on the East Anglian coast, they stretched almost over the horizon, and the contrails formed solid stratus to make life difficult for those bringing up the rear. The fighters formed their own curving contrails as they crisscrossed the bomber route. For the defenders of Hitler's Reich, it was a fearsome spectacle.

Looking back on that increasingly distant war, it is difficult to reconcile the emotions of those years with the way we feel now, when former enemies have become friends and one of our former friends, if not perhaps an enemy, is distinctly unfriendly. The intense hatred for the Japanese during the war years has been largely replaced these days by remorse over Hiroshima and Nagasaki. What people forget is that Hamburg and Berlin had their own terror, lasting for months, and before that, Rotterdam, Warsaw, Coventry, and London. Pearl Harbor, we should recall, laid the groundwork for Hiroshima.

Scarcely twenty years passed between World War I and World War II, so the last great conflict did accomplish something beyond ending the Thousand-Year Reich and the Greater East Asia Co-Prosperity Sphere. Forty years and running is a long time between great wars.

Sir James Barrie, delivering a farewell address as rector of St. Andrews University in May 1922, spoke movingly of a generation buried in the fields of France. "By the time the next eruption comes, it may be you who are responsible for it and your sons who are in the lava. All, perhaps, because this year you let things slide."

As we know, they did let things slide. Preoccupations like the League of Nations, the Kellogg-Briand Treaty, and Munich took the place of realistic preparedness, and another generation paid the price. ■

AIRMAN'S BOOKSHELF

An American Hero

Yeager: An Autobiography, by Brig. Gen. Chuck Yeager, USAF (Ret.), and Leo Janos. Bantam Books, New York, N. Y., 1985. 331 pages, with photographs and index. $17.95.

If you have ever wondered where the "right stuff" comes from, Chuck Yeager's answer in this exciting and engrossing autobiography is that while you may be born with it, you must work hard to keep it.

Born into a poor family in the hills of West Virginia in 1923 and raised in the town of Hamlin, population 400, Yeager was bagging squirrels for dinner—often the only meat on the table—by the time he was six. His dad was first a railroad man and then a driller in the natural-gas fields, gone on the job from Monday through Friday. When he was home, he set a good example for his sons, working constantly around their "two-story, four-bedroom house with a big parlor and a smokehouse in the back . . . what I thought was a small palace on a hill."

Chuck grew up hunting deer, bear, quail, and wild turkeys with his father and the other men of the town. "Every kid in Hamlin was raised with a gun, and there were few, if any, poor shots; even so, I was pretty good. Shooting is a matter of good eyesight, muscular control, and coordination. . . . I never got excited or flustered sighting on game; that wasn't my nature. . . . [Also], I had exceptional 20/10 vision."

His natural skills were honed by his responsibilities. Young Chuck helped his father in the gas fields when he wasn't in school. He maintained the small gasoline engines that powered the water pumps: "When I encountered dome regulators flying the X-1, I knew more about them than the engineers from working with Dad's regulators as a kid." From making and racing bobsleds, he learned to be coordinated and to avoid skids—"that's probably the reason I flew coordinated and kept the ball in the middle."

In high school, he "excelled at anything that demanded dexterity or mathematical aptitude. . . . I was terrific at pool and ping-pong, good in basketball and football." He played trombone in the high school marching band and "would've been a damned good trombone player if only I practiced." He did all right with the girls, too, "through a combination of trial and error. Mom began raising hell when I came home at two in the morning." But he was terrible in history and English, and the teachers "had to search for reasons to pass me."

To hear Chuck Yeager tell it, shucks, he was just naturally gifted with a lot of qualities that made him into a pretty good pilot. But he inadvertently reveals that he always had what are probably the main success ingredients in any field: "Like Dad, I had certain standards that I lived by. . . . I was a competitive kid. . . . Whatever I did, I determined to do the best I could at it. I was prideful about keeping my word and finishing what I started. . . . I'm stubborn and strong-willed and opinionated as hell." Surprisingly, although he saw his first aircraft when he was fifteen, he never dreamed of becoming a pilot.

In the summer of 1941, he had graduated from high school and didn't have a job. There wasn't much going on in Hamlin, so he talked to a visiting Army Air Forces recruiter and signed up as an enlisted man. The AAF made him an airplane mechanic. His boss, the maintenance officer, gave him his first airplane ride, and he got airsick. Nevertheless, he signed up for the "Flying Sergeants" program because "three stripes and you were out of pulling KP and guard duty." He got airsick on his first few flights in training, too.

His natural abilities enabled him to master military flying, although it was hard work at first. By the time he had fifteen flying hours, Yeager had become so proficient that an instructor complimented him by assuming that he had been an experienced pilot in civilian life. Flying became fun, and he was soon the outstanding student in the class. Before he finished advanced training in the P-39, he was logging up to 100 hours a month, most of it at tree-top level. The regulations had changed when the class graduated, so the graduates were commissioned as flight officers, not sergeants.

He met his future wife, Glennis, the first and only love of his life, at a USO dance just before he was to go overseas. He admired her because she was pretty, but also because she was capable of holding down three jobs, including being the social director of the local USO. Although they did not speak of marriage before he was sent overseas, he mailed his pay to her in war bonds. She banked the bonds for their future. He named every one of his aircraft for her, including the Bell X-1, in which he was the first man to fly faster than the speed of sound.

In the war in Europe, although he was the most junior man in the squadron, he was soon leading full squadron missions, to the chagrin of higher-ranking but less capable pilots. Shot down by a Focke-Wulf 190, he made contact with the Maquis, the French resistance fighters. Even though he couldn't speak French, he joined them on some of their operations before being spirited to the Pyrenees on the frontier between France and Spain. While escaping across the mountains in subfreezing temperatures with another American pilot, both were discovered by the Nazis. The other pilot was wounded as they escaped by sliding down a precipitous mountain slope in the dark. After the Nazis departed, Yeager bodily dragged the wounded pilot up the mountain and, after a night-long journey, into Spain and freedom.

Upon returning to his outfit, he discovered that he was to be sent home. Yeager protested all the way up the chain of command to General Eisenhower, seeking permission to remain in the theater to fly more combat missions. Ike personally interviewed Yeager and obtained permission from Washington for him to stay. By the end of the war, Chuck had twelve kills, including five in one day.

Interspersed with the combat stories and accounts of his exploits in

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The Exposing of "Emil-Emil."

During 1942 Royal Air Force radio monitors noted a new code-word in the German night fighter vocabulary: "Emil-Emil." Other intelligence indicated that "Emil-Emil" was an airborne intercept radar, but before countermeasures were possible, its frequency had to be discovered. With Winston Churchill's personal approval, Wellington aircraft of Number 1473 (Wireless Investigation) Flight were sent over Germany with orders to invite attack by night fighters to discover the German radar frequency. After several unsuccessful missions, on 3 December a Junkers 88 took the bait. As it closed in, Pilot Officer Harold Jordan, the special radio operator on the Ferret, noted strong radar signals on 492 MHz. There was just time to pass a report back to base by radio before the night fighter opened fire.

Although his aircraft was severely damaged and four of its six crewmen wounded, the Canadian pilot, Sergeant Ted Paulton, nursed the crippled Wellington back to England and set it down in the water close to the coast. All of the crew were rescued.

We salute the bravery of the crew during this, one of the epic missions in the annals of electronic intelligence. Sanders Associates, of Nashua, New Hampshire, are leaders in the development and production of radar intercept and analysis equipment.

SANDERS

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.

experimental test flying is a plethora of other stories detailing practical jokes, hairy close calls in the air, two-fisted drinking parties between missions, tips on flying tactics, and myriad other tales. What reader knows that Yeager was once court-martialed for machine-gunning a horse? Or that envious fellow military experimental test pilots forced the Air Force to send him back to test pilot school after he had flown several X-series aircraft and had become the first man to fly faster than sound? Or that his idea of a practical joke was to drop a handful of live cartridges into a roaring pot-bellied stove? Or that he was—and is—a good father and husband?

The tales—pungent, sometimes funny, and sometimes bitter—are strung out through the book and include the inside stories on all of his better-known exploits in test flying. He offers candid comments on the civilian test pilots who were collecting tens of thousands of dollars a flight for the kind of missions he was flying on a captain's salary.

Particularly interesting are the portions of each chapter titled "Other Voices." These are short commentaries by such people as Glennis and Maj. Gen. Albert Boyd, his longtime boss and mentor, as well as childhood and adult acquaintances and friends.

The reader will respect, like, and even admire Chuck Yeager when he has finished this book. Here is the perfect example of the American dream. He started with nothing and, using only his own capabilities, ended up with everything, including fame and fortune. He came close to death many times and escaped. He triumphed over enemies of his country in two wars. He vanquished his own enemies, who would have kept him from his destiny in test flying. He became that most unusual of men—the universally acknowledged best in his field.

One wonders what he would have become if he had not listened to the recruiter's pitch in Hamlin, W. Va., in the summer of 1941. An infantry grunt? A railroad man? A gasfield worker? Professional hunter? Bartender? Whatever career he might have chosen, the reader knows he would have become the best man in it, and he would have had a helluva good time getting there, too. As General Yeager puts it in his own words, "As hard as Dad worked, he enjoyed it, and that was an important lesson, too. Tramping alone through the woods with a rifle, or in a cockpit with a throttle in my hands—that's where I was happiest. And that's how I've lived my life. . . . If I auger in tomorrow, it won't be with a frown on my face."

At the end of the book, General Yeager says that questions put to him on whether or not he has the right stuff annoy him, "because it implies that a guy who has the 'right stuff' was born that way. . . . All I know is I worked my tail off to learn how to fly, and worked hard at it all the way. . . . In the end, the one big reason why I was better than average as a pilot was because I flew more than anybody else. If there is such a thing as the 'right stuff' in piloting, then it is experience."

Of course, there is also "luck. The most precious commodity a pilot carries. Luck, pure and simple."

—Reviewed by James P. Coyne, Senior Editor.

AIRMAN'S BOOKSHELF

New Books in Brief

Air Superiority, by Bill Gunston. Instead of his usual competent aerospace histories and hardware studies, prolific aviation expert Bill Gunston undertakes here an analysis of how the battle for air superiority might go in the European theater. Lamenting the West's seeming unwillingness to provide adequately for its defense, he tackles the Soviet threat and then proceeds to a cogent enumeration of the West's air defense deficiencies, which include insufficient ground-based air defenses, the need for more electronic countermeasures and weapon system survivability, and the concentration of NATO forces at too few large (and easily targetable) air bases. In his concluding overview, author Gunston underlines the importance of airborne early warning and control and precision-guidance and standoff munitions and calls for greater Western exploitation of VTOL technology. Readers are sure to find that the spare concinnity of the author's analysis captures the East-West air balance neatly in a nutshell. With photos. Published by Ian Allan Ltd., distributed by Motorbooks International, Osceola, Wis., 1985. 112 pages. $11.95.

Angels, Bulldogs, and Dragons, by Bill Marshall. When Jimmy Doolittle assumed command of Eighth Air Force during World War II, he instructed his fighter pilots to seek out and destroy the German air force in the air and on the ground. The 355th Fighter Group especially took the latter part of that directive to heart. The unit developed innovative strafing tactics and was eventually credited with destroying more aircraft on the ground than in the air. Here author Marshall tells the day-to-day story of the group, buttressing the operational chronology with lists of unit citations, commanding officers, aces, and losses. Also included are more than 200 vintage photographs and a number of mission anecdotes. Published by the Champlin Fighter Museum, 4636 Fighter Aces Dr., Mesa, Ariz. 85205, 1984. 178 pages. $14.95.

The Devil's Birthday: The Bridges to Arnhem 1944, by Geoffrey Powell. Following the breakout from the Normandy beachhead and the dash across France in late summer 1944, the Allied armies faced stiffening resistance from the Germans and longer and longer supply lines. British Field Marshal Sir Bernard Montgomery conceived a daring plan, whereby the Allies' sole strategic reserve—the First Allied Airborne Army—would be committed with other units to an attack behind German lines in Holland. The object was to seize major bridges and open a "back door" into Germany, ending the war in 1944. Known as Operation Market Garden, this major airborne thrust proved an unmitigated disaster for the Allies—the notorious "bridge too far." Author Powell, a company commander during Operation Market Garden, explains in this tautly written book how a series of errors and just plain bad luck doomed the attack from the start. With a foreword by General Sir John Hackett and photos and maps, notes, sources, and index. Franklin Watts, Inc., New York, N. Y., 1985. 276 pages. $18.95.

Military Airlift Command Historical Handbook, by Dick J. Burkard. This handbook, which spans the years from 1941 to 1984, is a compilation of vital statistics on Military Airlift Command. Chock full of basic historical information on such topics as command lineage, notable airlift operations, commanders, headquarters staff and functions, aircraft inventory, subordinate units and commanders, and other historical data, the booklet provides a thumbnail sketch of the structure and significant events in the forty-year-plus history of the world's first strategic airlift force. With photos. Published by the MAC Historical Office, Scott AFB, Ill., 1984. 114 pages.

—Reviewed by Hugh Winkler, Assistant Managing Editor.

Recalling the past and recognizing those who helped shape it.

To Remember and Honor

STUDENTS of the development of airpower find themselves blessed by an unusual and fleeting happenstance: Their finest primary source materials are living, breathing time travelers whose memories span virtually all the years of military aviation. Among these are the men who broke new ground and who created a legacy of pride and achievement that today undergirds the United States Air Force.

The Air Force Association and the Aerospace Education Foundation gathered together a number of these airpower pioneers and senior statesmen for two events that, fortuitously, occurred on the same day in Washington last June. The day saw the Foundation's Roundtable called "Remembering the Past," which featured Lt. Gen. Elwood "Pete" Quesada, Gen. Jacob Smart, Gen. Leon Johnson, and Gen. Curtis LeMay, segue into the evening's "Salute to the Senior Statesmen of the Air Force," sponsored annually by AFA and AEF and attracting a distinguished audience of civilian and military dignitaries.

With retired Gen. Bryce Poe serving as rapporteur, the Roundtable, which was held at AFA National Headquarters in Virginia, provided the opportunity for those who were "present at the creation" to reminisce about the past—and to emphasize the value of remembering what has gone before. As General LeMay noted in his remarks, "Sometimes I think we don't remember the past well enough."

General Quesada, the legendary tactical air commander, astonished absolutely no one with his opening declaration that "the fighter pilot won the war." Characterizing the fighter pilot of his day as "a buccaneer type," he went on to draw a distinction between fighter pilots of the past and those serving today. "When you think of the equipment that the fighter pilot of today has to master, you realize that he cannot be reckless. He has to be quite professional and highly trained. He can't be a buccaneer."

General Smart, who experienced World War II from such vantage points as the 1943 summit meeting at Casablanca, the cockpit while a bomb group commander, and the barracks of a German POW camp, joined the Air Corps in 1931. Over the next ten years, he watched as the Air Corps expanded and matured, readying itself for the coming war. He noted that, in the 1930s, it was not only "necessary to build our military force—the beginning of airpower as we know it today—it was also necessary in those days to achieve some understanding of its worth, of its potential value in time of peace—and particularly in time of war. That necessitated, among other things, demonstrating to ourselves the capabilities of the Air Force."

During the Salute to Senior Statesmen dinner, Aerospace Education Foundation President George Hardy, right, greets airpower pioneer Jimmy Doolittle as Mrs. Hardy looks on.

General Johnson, who is perhaps best known for leading American B-24s against the Ploesti oil refineries in Romania, remembered the beginning of his military career—in the infantry. After spending a year and a half charging a skeleton squad up the same dusty hill, he decided that "it looked better to be up in an airplane," flying down and "taking pot shots at us on the road," rather than "being down there receiving it." After some difficulty, General Johnson transferred to the Air Corps, but found life as an airman difficult during the Depression. "The world was safe for democracy. . . . We didn't see anything on the horizon. Most of us were trying to do our jobs and be good officers, but we didn't see that we had any heavy responsibility." That was soon to change.

General LeMay, perhaps more than any other airman, is responsible for building the foundation on which modern American airpower rests. While he averred that we sometimes don't remember the past well enough, he also believes that, on occasion, "we remember the past too well and [are] slow to make changes." As he observed, "We've got a lot of smart people. . . . If they're cut loose, I think they could really come up with some fantastic things. We have the capability to do these things now, but we're too much inhibited by the past. We're going by the book, and if we go by the book, we're safe, nothing's going to happen to us."

In closing the Roundtable discussion, General Poe asked the panelists to turn toward the future and proffer a word of advice to the Air Force Academy Class of 1985. General LeMay exhorted the graduating cadets never to forget that "the sky's the limit. You can do some wonderful things. What you get done depends on how hard you work at it. Take off your coat and get busy!"

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That sentiment resonated in the achievements of those who were honored and who attended later that evening at the annual "Salute to the Senior Statesmen of the Air Force," held across the Potomac River at the Bolling AFB Officers' Club. The dinner audience had gathered to recognize senior Air Force, AFA, AEF, and civilian leaders and to witness the investiture of eight persons as Jimmy Doolittle or Ira Eaker Fellows—the eighth Fellowship being presented by AFA National President Marty Harris in a dramatic surprise near the end of the evening.

One purpose of the Salute to Senior Statesmen dinner was the presentation of Doolittle and Eaker Fellowships. Sen. Barry Goldwater sponsored an Eaker Fellowship for Supreme Court Justice Sandra Day O'Connor, who pauses here to receive congratulations from Senator Goldwater and former AFA National President Jimmy Doolittle.

AFA and AEF Executive Director Russell E. Dougherty kicked off the program by leading the dinner audience during the presentation of the colors and the singing of the national anthem. Following the invocation by AFA National Chaplain Richard Carr, the audience recognized several Air Force, AFA, and AEF leaders: AFA President Harris, CMSAF Sam E. Parish, USAF Chief of Staff Gen. Charles A. Gabriel, Air Force Secretary Verne Orr, AEF President George D. Hardy, and AEF Board Chairman Sen. Barry M. Goldwater.

But the main event of the evening was to be the presentation of the Doolittle and Eaker Fellowships. After dinner, Foundation President Hardy took the podium and, assisted by Senator Goldwater and Gen. Jimmy Doolittle, presided as seven individuals were invested as Doolittle or Eaker Fellows *(see box)*. Mr. Hardy then called AFA President Harris to the stage.

After introducing retired Army Gen. Lyman L. Lemnitzer, Mr. Harris said, "Tonight, I must tell you a very special story about this senior statesman. . . . Our honoree is undoubtedly the only Army four-star . . . to shoot down a German fighter plane in World War II from a B-17!"

Apparently, General Lemnitzer shot down a Ju-88 in 1942 while aboard a B-17 ferry flight from England to Gibraltar. German fighters jumped his aircraft over the Bay of Biscay and inflicted engine damage. During the attack, General Lemnitzer manned the radio compartment gun and, after firing a long burst, sent down a German plane in flames.

After Mr. Harris presented a Doolittle Fellowship to General Lemnitzer, he warned, "That's not all!" Noted aviation artist Bill Reynolds had, for this occasion, painted an original oil depicting the General's aerial victory, and Mr. Harris asked General Lemnitzer to accept the painting on behalf of artist Bill Reynolds and "all of us."

The ceremonies on stage took place before a large audience of military and civilian luminaries. In addition to the panelists who had participated earlier in the Aerospace Education Center's Roundtable on "Remembering the Past"—Generals Johnson, Smart, Quesada, and LeMay, plus rapporteur General Poe—dinner guests included Supreme Court Justice Sandra Day O'Connor, who was also invested as an Eaker Fellow, National Air and Space Museum Director Walter J. Boyne, retired Maj. Gen. Leigh Wade, the only living pilot who flew on the famed 1924 world circumnavigation, and the leading living American fighter ace, retired Col. Francis "Gabby" Gabreski.

The crowd itself rose to acclaim Mrs. Ruth Spaatz and Mrs. Ruth Eaker and to toast "all Air Force wives." The audience also saluted all the retired Air Force four-star officers who were present and toasted the recent promotions to four-star rank of retired Gens. Jimmy Doolittle and Ira Eaker.

Prominent airmen and Air Force officials in the audience were also honored. They included former CMSAFs Paul W. Airey, Donald L. Harlow, and James M. McCoy; retired USAF Chiefs of Staff General LeMay, Gen. David C. Jones, and Gen. Lew Allen, Jr.; and former Secretaries of the Air Force Eugene M. Zuckert (who was also invested as a Doolittle Fellow), Robert C. Seamans, Jr., and John L. McLucas.

The audience also recognized a group of former AFA Presidents and Board Chairmen: James H. Doolittle, Thomas G. Lanphier, Jr., Harold C. Stuart, John R. Alison, John P. Henebry, Jack B. Gross, Jess Larson, George D. Hardy, George M. Douglas, and Gerald V. Hasler. Past Foundation leaders Dr. L. V. Rasmussen and Dr. Don C. Garrison were also saluted.

The dinner capped a day laden with nostalgia and lessons gleaned from the past. It seemed somehow only appropriate that these two events—the Roundtable and the Salute—take place together forty years after the final days of a war in which many of those participating in the day's events had done much to secure the final victory.

Indeed, there was, and is, much to remember and honor. ■

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(Presented at the Salute to Senior Statesmen)

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An Aerospace Education Center Roundtable explores the question of how to respond to terrorism.

Terror and Its Targets

INTERNATIONAL terrorists seek to change, through acts of violence, the basic ways in which governments conduct their affairs. Terrorist groups are broadly based in their operations and are well armed with modern weapons. More and more, as terrorists step up the level of their activities, they zero in on their ultimate goal—the tearing down of existing international order.

The US—as leader of the Western world and increasingly the target of terrorist groups—must learn how to deal with terrorism. That includes the use of force, according to panelists at a June 24 Aerospace Education Center Roundtable on terrorism. The Roundtable met on the tenth day of the seventeen-day hostage ordeal for the passengers and crew of TWA Flight 847 and five days after the killing of four off-duty US Embassy Marine guards in El Salvador.

Lt. Gen. Eugene E. Tighe, Jr., USAF (Ret.), former Director of the Defense Intelligence Agency, said that terrorism is a violation of the rules of international law by which we bring civilization to the earth. "Terrorists are really carrying out warfare on the cheap against nations with large conventional military forces. We haven't declared war, although we're very much at war," he added.

Col. Andrew F. Whitehead, Assistant Defense Attaché and Chief of Staff of the British Embassy in Washington, D. C., pointed out that our elected leaders have to decide on clear-cut political objectives in combating terrorism. The next step is to translate those political objectives into military missions. He cautioned that military leaders have to make certain that civilian leaders are well aware of the military implications of the course chosen.

In responding to terrorism—and such responses might well include the use of force—Ambassador L. Bruce Laingen, Vice President of the National Defense University and former hostage in Tehran, urged Americans to remember that we are a nation of laws. However we choose to respond to terrorists, we must not tear at the fabric of law and diplomacy. The US has a special obligation to uphold those values, he stressed.

"Terrorism is hardly a new phenomenon on the world scene," said George D. Hardy, President of the Aerospace Education Foundation and moderator of the Roundtable. "What is new is that terrorism has been elevated to a form of recognizable insidious warfare and that much of it is directed against this country and its citizens."

Pointing to a major obstacle in dealing with terrorism, Dr. Peter P. Lejins of the University of Maryland said that even the United Nations' Congress on the Prevention of Crime and Treatment of Offenders could not agree on a definition of terrorism. He recalled the remark that one man's terrorist is often another man's freedom fighter. Dr. Lejins also noted that nearly ninety percent of those who engage actively in terrorism come from the intelligentsia and the middle class.

Terrell E. Arnold, Executive Director of the Institute on Terrorism and Subnational Conflict, noted several major tendencies of present-day terrorist groups. He said they are increasingly violent and media conscious; they are traveling more and seeking common cause with each other; they are increasingly indiscriminate in choosing their victims; and they are receiving support from a number of states, among them Syria, Iran, Libya, Cuba, and North Korea.

Lt. Gen. Herman O. Thomson, Director of Plans and Policy for the Joint Chiefs of Staff, said that terrorism outside the borders of the US is an international problem. He said that we need to be prepared to respond to terrorism by cooperating with the international community—including the international military community. Colonel Whitehead cautioned that only minimum force should be used when conducting counterterrorist operations. He defined minimum force as the application of surgical military force in order to achieve strictly limited objectives.

Citing the increasing incidence of terrorism directed against US businesses abroad, Anthony J. Morphew, President of AIG, Special Services Division, predicted that terrorist attacks will get worse. He explained that businesses are developing programs to help thwart terrorist acts—specifically kidnapping. Mr. Morphew pointed out that terrorists have found kidnapping to be very rewarding. From 1978 to 1980, terrorist groups in El Salvador extorted $45 million from multinational corporations in exchange for kidnap victims.

Stressing that the time to deal with terrorism is now, General Tighe said that government leaders need to tell the public what they're up against. He also voiced the need to reduce the vulnerability of American assets overseas as well as to strengthen intelligence networks to counter terrorism. General Thomson added that all elements of government should exchange information in hopes of learning more about terrorism. "It's going to be a continuing learning experience," said General Thomson. "Unfortunately, we now have developed a large body of learning from which to gain experience."

—By Capt. Napoleon B. Byars, USAF. Captain Byars is assigned to the Civil Affairs Branch, Community Relations Division, Secretary of the Air Force Office of Public Affairs.

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COME SEE US AT THE AFA BOOTH 3222

AFA's active-duty advisory groups, the Enlisted Council and JOAC, arrive independently at the same conclusions about blue-suiters' needs.

Eye to Eye on the Personnel Concerns

BY MARIA A. McDONALD
ADMINISTRATIVE ASSISTANT TO THE DIRECTOR OF MILITARY RELATIONS

WHEN formulating policy on USAF personnel issues, the Air Force Association relies on the counsel of two advisory groups—the Enlisted Council and the Junior Officer Advisory Council (JOAC). Working independently in meetings over the past year, these two councils surfaced—perhaps not too surprisingly—the same top three personnel concerns.

The Top Concerns

- **Retirement.** The troops list a stable retirement system as their top priority.
- **Pay.** Comparability of military pay with that of the private sector should be maintained.
- **PCS Costs.** Full reimbursement of moving expenses should be made for permanent change of station moves.

Each council, in preparing its final report, surveyed thousands of their blue-suit peers. Their reports are thus a valuable resource for Air Force personnel managers as well as AFA.

In other projects for the two advisory groups, the Enlisted Council reviewed the advisability of an information booklet for new NCOs, and the JOAC developed a "white paper" on the relationship between enlisted members and officers.

Enlisted Council

This Council comprises most of the Air Force's Outstanding Airmen for 1984 *(see "Tribute to Excellence," November '84 issue, p. 147).* CMSgt. Richard E. Williamson, Randolph AFB, Tex., is Council Chairman. The Vice Chairman is CMSgt. Paul W. Dupoise, Washington, D. C. SMSgt. Tommy A. Roberts, Gunter AFS, Ala., is Recorder.

Members are Sgt. Russell E. Black, Peterson AFB, Colo.; CMSgt. Charles W. Brown, Washington, D. C.; Sgt. Kevin M. Brown, Wright-Patterson AFB, Ohio; MSgt. David A. Castro, McClellan AFB, Calif.; MSgt. John T. Connell, Eglin AFB, Fla.; SSgt. Deborah M. Dart, Lowry AFB, Colo.; SSgt. Bernard J. Frank, RAF Chicksands, UK; MSgt. Terry L. Lacaillade, Colorado Springs, Colo.; Sgt. James M. Mathis, Wheeler AFB, Hawaii; SSgt. Cecil J. Overmeyer, Little Rock AFB, Ark.; Sgt. Paul Pepino, Swarthmore, Pa.; MSgt. Guadalupe Silva, Vandenberg AFB, Calif.; TSgt. Roger A. Steis, Moody AFB, Ga.; TSgt. Katherine R. Todd, Wheeler AFB, Hawaii; and MSgt. Jack L. Varney, Fairchild AFB, Wash.

Chief Master Sergeant of the Air Force Sam E. Parish is Council Advisor.

Enlisted Council


Williamson


Dupoise


Roberts


Black


Brown, C.


Brown, K.


Castro


Connell


Dart


Frank


Lacaillade


Mathis


Overmeyer


Pepino


Silva


Steis


Todd


Varney


Parish

AFA Policy Advisors


Banes


Beuthe


Biggerstaff


Copeland


Flynn


Freer


Gaylor


Hampton


Moore


Rowe


Williamson

Junior Officer Advisory Council

The JOAC is made up of junior officers representing each Air Force major command and separate operating agency. It meets in Executive Committee throughout the year, with a meeting of the full JOAC taking place at the AFA National Convention this month. Capt. Harrison Freer, Wright-Patterson AFB, Ohio, chairs the Council and its Executive Committee. Capt. Ronald D. Fuchs, Kelly AFB, Tex., is the Vice President. Capt. Pamela A. Mason, USAF Academy, Colo., is Recorder.

Other JOAC Executive Committee members are Capt. John M. Bookas, North Charleston, S. C.; Lt. Gary Brinner, Lincoln, Ill.; Capt. D. Creager Brown, Randolph AFB, Tex.; Capt. Thomas H. Buchanan, Hickam AFB, Hawaii; Capt. Timothy J. Fyda, Langley AFB, Va.; 1st Lt. Karen Giannini, Andrews AFB, Md.; Capt. Lee A. Meador, Scott AFB, Ill.; Capt. Ernest S. Moore, Washington, D. C.; 1st Lt. Deanna J. Reeves, San Antonio, Tex.; Capt. James H. Sebree, Laughlin AFB, Tex.; Capt. Thomas D. Shearer, Offutt AFB, Neb.; Capt. Eugene Stepko, Maxwell AFB, Ala.; Capt. Ronald D. Walker, Monte Vergine, Italy; Capt. William A. Wells, Peterson AFB, Colo.; and Capt. Steven J. Zamparelli, Wright-Patterson AFB, Ohio.

Maj. Gen. Thomas A. Baker, USAF Director of Personnel Plans, is Council Advisor.

AFA Policy Advisors

The Air Force Association also relies on the advice of a third group, the Policy Advisors. These volunteers counsel the National President on policies and developments pertinent to their fields of expertise.

The following Policy Advisors were selected by the National President to serve during 1985 because of their expertise in areas vital to AFA's mission: Warren Banes, Washington, D. C., Civilian Personnel Advisor; Col. Robert A. Beuthe, Jr., Bolling AFB, D. C., Medical Advisor; Col. Dean T. Biggerstaff, Jacksonville, Fla., Air National Guard Advisor; Maj. Gen. William L. Copeland, USAFR, Atlanta, Ga., Air Force Reserve Advisor; Lt. Gen. John P. Flynn, USAF (Ret.), San Antonio, Tex., Veterans Advisor; Capt. Harrison Freer, Wright-Patterson AFB, Ohio, JOAC Chairman; CMSAF Robert D. Gaylor, USAF (Ret.), San Antonio, Tex., Retiree Advisor; Maj. Steve Hampton, Maxwell AFB, Ala., Junior AFROTC Advisor; Col. Charlie B. Moore, Maxwell AFB, Ala., Senior AFROTC Advisor; Kenneth A. Rowe, Richmond, Va., Civil Air Patrol Advisor; and CMSgt. Richard E. Williamson, Randolph AFB, Tex., Enlisted Council Advisor. ■

Junior Officer Advisory Council (Executive Committee)


Freer


Fuchs


Mason


Bookas


Brinner


Brown


Buchanan


Fyda


Giannini


Meador


Moore


Reeves


Sebree


Shearer


Stepko


Walker


Wells


Zamparelli


Baker

THE BULLETIN BOARD

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

MIAs/POWs Not Forgotten

On July 19, designated by President Ronald Reagan as National POW/MIA Recognition Day, AFA, along with thousands of other supporters of this cause, was on hand at the Pentagon for ceremonies marking the occasion. There were also some 800 members of the National League of Families of American Prisoners and Missing in Southeast Asia in town for their annual meeting.

At the Pentagon gathering, Gen. John W. Vessey, Jr., Chairman, JCS, restated the Administration's oft-proclaimed pledge "to get the fullest possible accounting for those still missing." Noting that there are "no simple solutions," the Chairman said that "we are confident that the Vietnamese hold far more information about our missing men than they have provided." Stating that he was "personally frustrated and disgusted" with the slow pace of the negotiations, he did voice pleasure that recent meetings with government representatives of both Vietnam and Laos have generated some "encouraging responses."

Also on hand were other DoD officials. Nine helicopters from the Army aviation company at Fort Belvoir, Va., provided a flyover to end the event.

During the League of Families Convention, Administration spokesman Robert C. McFarlane, Assistant to the President for National Security Affairs, noted that a satisfactory accounting of the missing military members is an item high on the President's personal agenda. He urged patience with the admittedly slow process that has gone on now for several years, but cautioned that precipitous action, as some family members have called for, could only hamper the painstakingly but carefully plotted "government-to-government" action.

At the League meeting, the Air Force Association was honored for its support over the years for the MIA/POW cause. A distinctive plaque was presented, and it will hang in AFA Headquarters.

There are still 2,477 Americans missing or unaccounted for in Indochina. Live sighting reports continue to be received. Since the fall of Saigon in 1975, say officials, more than 3,700 such reports have come in. While not all can be considered valid, the officials say that investigation of live sighting reports will continue to receive the "necessary priority and resources based on the assumption that at least some Americans are still held captive."

The MIA rolls include 706 soldiers, 500 sailors, 291 Marines, one Coast Guardsman, and forty-two civilians. Another 937 airmen are unaccounted for.

O'Malley Award Kickoff

AFA's Board of Directors has approved the establishment of a national AFA award for the reconnaissance crew of the year. It will be named the Gen. Jerome F. O'Malley Award. The charismatic commander of TAC, recently killed in an aircraft accident, was not only associated closely with all aspects of reconnaissance but was a dedicated friend of AFA *(see photo)*.

Nominations for the award came from reconnaissance units in SAC, TAC, USAFE, and PACAF. The winning crew was selected by the Air Force Chief of Staff. The first presentation of the O'Malley Award will take place at AFA's Annual Convention this month in Washington, D. C. *(For more on the O'Malley Award and AFA's other crew awards, see p. 48 of this issue.)*

General O'Malley was the first pilot to fly the SR-71 operationally. He commanded SAC and TAC reconnaissance units, served in Vietnam, and worked extensively with reconnaissance products on staffs at Hq. SAC and the Pentagon.

The award itself is a permanent two-by-three-foot metal plaque, engraved with a picture of General O'Malley and the text "The Best Overall Reconnaissance Crew." There will be room for listing each year's winner, and this permanent plaque will be displayed in the Pentagon. Each recipient will receive a smaller replica of the large plaque, with his or her name engraved on it.

To maintain this award in perpetuity, it is estimated that a fund of $5,000 will be needed. In a departure from the usual procedure of allowing one sponsor to support such an effort, AFA is mounting a grass-roots effort among General O'Malley's friends, associates, and supporters. All are being given an opportunity to contribute whatever amount they deem appropriate.

Tax-deductible donations to AFA's Aerospace Education Foundation are now being accepted. Checks should be made payable to AEF (Attention: O'Malley Award Fund) and sent to Aerospace Education Foundation, AFA Building, 1501 Lee Highway, Arlington, Va. 22209-1198. This effort will ensure an annual memorial to General O'Malley.

Marching to an American Tune

Rep. James M. Quillen (R-Tenn.) recently introduced legislation that

The night before he was killed in a tragic airplane crash, Gen. Jerome F. O'Malley, TAC Commander, spoke at the Snake River Valley Chapter meeting, held at Mountain Home AFB, Idaho. General O'Malley, his wife Diane, and three crew members all died in the crash of a CT-39 at Wilkes-Barre/Scranton International Airport on April 20.

would designate John Philip Sousa's "The Stars and Stripes Forever" as the National March of the United States. This would have no effect on the status of the National Anthem. He told his colleagues in the House that "we have a national anthem and yet no national march. Each one of us can think of public occasions when the performance of a national march would be appropriate." The Congressman believes that "The Stars and Stripes Forever" is unofficially our national march, and his action would make it official.

Meanwhile, Rep. Pete Stark (D-Calif.) wants US airlines to serve only American beer and wine if they want to carry government employees overseas.

His new bill would make it illegal for the government to buy airline tickets for its employees on US carriers serving foreign-made spirits. "All we want," he says, "is our own airlines to give the same attention to helping other Americans as foreign airlines give to their own nation's products. . . . If an American flag carrier does not want to carry our own fine products, then it should not get the business of federal agencies when their employees travel overseas."

At press time, no significant action was pending on either measure.

Paving the Way

The largest single contract ever awarded by an Air Force base on a purely competitive basis to a female-owned business was awarded recently at Dobbins AFB, Ga., to C&S Paving Co., owned and operated by Carolyn Stradley of Marietta, Ga. She submitted the winning bid for a $774,000 contract to repair and pave roads and maintain runway overruns and taxiway shoulders at Dobbins.

Ms. Stradley's firm, which has twenty-three employees, will remove 145 trees and 45,000 cubic yards of roadway shoulder trash and resurface 61,131 square yards of roadway, taxiway, and overruns to a two-inch depth. The project is expected to take just under 150 days to complete.

The winning bidder started working in the asphalt business in the 1960s as a bookkeeper, learned the business as a sales and servicing agent, and started her own company in 1979. "We started C&S at the kitchen table," she says with pride. The Dobbins surfacing contract is the largest project for her company in its six-year history.

Mrs. Geraldine M. McKay, executive for Small Business and Small Disadvantaged Business Utilization at Hq. Air Force Reserve, Robins AFB, Ga., said, "We need more women-owned businesses dealing with the government. Women need to know that opportunities exist for many construction, supply, and service contracts."

Blue-Suit Astronauts

Three Air Force pilots are among thirteen new astronaut candidates selected by the National Aeronautics and Space Administration (NASA) recently. They will join a current astronaut corps of ninety men and women. Thirty-three civilians and 133 military members competed for the thirteen slots.

Selected for training as Space Shuttle pilots are Maj. Terrence T. Henricks, an F-16 test pilot at Edwards AFB, Calif., and Capt. Brian Duffy, Director of F-15 tests at Eglin AFB, Fla. Capt. Carl J. Meade, an experimental test pilot instructor at Edwards, was selected as a mission specialist.

Of the remaining candidates, five are civilians, three are from the Navy, and one each comes from the Army and Marine Corps. Two are women. All must successfully complete a one-year training and evaluation period to become eligible for future Space Shuttle flights.

Meanwhile, NASA has announced that it will change the way it solicits applications to the astronaut corps. Currently, it requests applications at irregular intervals. Starting now, the agency will ask for military candidates once a year and for civilian nominees on a continuing basis.

Officials said that more astronauts will have to be trained as the number of Space Shuttle flights increases. Currently, flights are scheduled about once a month, but NASA expects to double that rate in the future.

From now on, persons selected for training will be announced each spring and report that following summer. To meet minimum qualifications, pilot candidates must have, from an accredited institution, a bachelor's degree in engineering, physical science, biological science, or mathematics. They must also have 1,000 hours of pilot-in-command time in jets, pass the NASA Class I physical, and be between sixty-four and seventy-six inches tall.

Mission specialist candidates must meet the same educational requirements plus have three years of related professional experience or an advanced degree. In addition, they must pass the Class II physical and be between sixty and seventy-six inches tall.

For more information, contact the Astronaut Selection Office at NASA's Johnson Space Center, Houston, Tex. 77058.

New Tradition?

When Lt. Gen. Duane Cassidy, currently DCS/M&P and slated to take over command of MAC, pins on his fourth star this month, he will take the oath of office. If he had his way, all officers being promoted would do the same.

Although the oath is required only during commissioning, General Cassidy, who witnessed the practice at a Marine Corps promotion ceremony, liked the impact it adds to the pinning ritual. He has sent a letter to all major commands and other agencies asking for support in making it part of the Air Force tradition.

He notes that "a periodic restatement of the oath by officers would remind them of their very special commitment to their nation—one that requires loyalty, integrity, and professionalism." He added, "I don't know of any other walk of life where you stand up to take an oath of office. It's an important statement that should be repeated because it reminds us once again that our job is an uncommon job."

Employment Programs for Veterans

The US Department of Labor has announced two new pilot programs to help veterans. Both programs involve cooperation among Labor, DoD, and the Department of Health and Human Services (HHS). Applicable state agencies and veterans groups will also be involved.

All of these agencies, for example, will be working together in Colorado to seek out homeless Vietnam-era veterans and to offer shelter, counseling, and job-placement services. Working with the Colorado Job Service, disabled veterans' outreach program specialists from Labor will survey places where the homeless stay in Colorado and offer them shelter at DoD-donated space at Fitzsimmons Army Hospital.

Using a $99,532 Labor Department grant, a projected 108,000 veterans will receive some kind of assistance, including training, job-search assistance, and aid in securing medical, housing, and other services.

The other test project will focus on pre-separation job counseling at Fort Bragg, N. C., to narrow the gap between military service and civilian employment for men and women leaving the armed services.

A Labor Department staffer has been assigned at Fort Bragg to work with military personnel specialists in

creating a model program to provide expanded employment counseling and job-related assistance to preseparatees. The program is expected to reduce the amount of money the government pays in unemployment compensation to newly separated veterans by shortening the time between military and civilian jobs. Delays in obtaining employment contributed to the $146 million in unemployment compensation paid to ex-service members in 1984. This year, it is anticipated that DoD will kick in some $178 million as its contribution to the unemployment fund.

North Carolina State Employment Commission employees will also work with Labor and DoD representatives on this project.

In related news, the VA has released an evaluation—conducted by an independent research group—of results of the Emergency Veterans Job Training Act. Now ending its first year of operation, the program is given generally good marks by employers. Under the act, the government reimburses an employer for training costs of Korean- and Vietnam-era veterans in an amount not to exceed fifty percent of a veteran's starting wage, up to $10,000.

More than 27,000 veterans have taken part in the program. Training has been mainly in structural occupations, machine trades, and professional, technical, and managerial positions. Clerical sales and service occupations also accounted for a significant amount of training spaces.

The report indicates that those who completed the program earn an average of $33 more per week than those who had applied for the program but dropped out. The report also highlights the tendency of employers—not surprisingly—to select the most employable among the veterans certified for the program. The completion rate for veterans in the program is estimated at forty-four percent. The direct cost of training one participant is pegged at $3,000. Both VA and Labor, with joint responsibility for administering the program, get good grades from the evaluators for their management of the act.

THE BULLETIN BOARD

Short Bursts

Memorial Day would always fall on **May 30** whether or not it's a Monday, if a bill recently introduced by **Rep. Helen D. Bentley (R-Md.)** becomes law.

The services are **replacing the old .45-caliber sidearm** with **9-mm Berettas,** but you won't be able to pick up one of the old pieces for a souvenir. They are all being placed in storage and ruled off limits for public sale.

Get ready, get set—run! President Reagan has declared October 12 **American Running and Fitness Day.** "Run . . . For a Longer and Livelier Life" is the theme. The American Running and Fitness Association says they expect more than a million people to run, walk, bike, or jog to celebrate the day. For more details, send a self-addressed, stamped envelope to the group at 2001 S St., N. W., Suite 540, Washington, D. C. 20009.

In response to customer demand, six Air Force **commissaries are adding Sunday hours.** Andrews AFB, Md., Barksdale AFB, La., Davis-Monthan AFB, Ariz., Kirtland AFB, N. M., McGuire AFB, N. J., and Nellis AFB, Nev., will test the new concept.

CHAMPUS recently honored a **Health Benefits Advisor of the Year** from each service. The **Air Force top advisor is Pauline B. Campbell,** Travis AFB, Calif. CHAMPUS officials called the group among "the most dedicated, hard-working government employees anywhere." They added that the four honorees demonstrate positively that "a complicated program can be made more accessible to thousands of people through the efforts of one person."

The VA reminds veterans that you **don't need wartime service to be buried in a national cemetery.** Honorable service, whether in peace or war, will do.

Happy Birthday to the **Army and Air Force Exchange Service!** The first post exchange opened ninety years ago, replacing early civilian traders known as sutlers. Since then, the service has grown to be the ninth largest retailer in the US. Last year, the AAFES returned more than $118 million to the service morale, welfare, and recreational funds.

Military and DoD civilian visitors this fall to **Walt Disney World** near Orlando, Fla., may qualify for special vacation hotel and Magic Kingdom and Epcot ticket packages. Military veterans also qualify for **special sav-**

Eagle Watch

Watch this space each month for updates on the activities planned for AFA's Gathering of Eagles. The Gathering of Eagles, to be held on April 27–May 1, 1986, in Las Vegas, Nev., will surely be the aerospace event of the decade!

In kicking off these updates this month, we want to make special mention of those "affinity groups" that have decided to hold meetings in conjunction with the GOE. The following groups are already signed up.

Western P-47 Thunderbolt Pilots
Mr. Harvey Victor
Woodland Hills, Calif. 91637
(818) 347-8150

P-51 Mustang Pilots Association
Col. Don Bennett
P. O. Box 552
Newport, N. H. 03773

Association of Pilot Class 43-D
Lt. Col. Eugene W. Causey, President
3914 West Shore Rd.
Edgewater, Md. 21037
(301) 798-0341

44th Heritage Memorial Group
Mr. Charles J. Warth
5709 Walkerton Dr.
Claredon Hills
Cincinnati, Ohio 45938

Crew 7
Mr. Elmo F. Huston
42 Villanova Dr.
Oakland, Calif. 94611
(415) 339-1487

The following groups are ready to go as soon as they hear from some more of their members.

Night Fighters
Col. Roy Atwell
26220 N. Bravo Lane
Rio Verde, Ariz. 85255

438th Troop Carrier Group
Col. Sid Harwell
3131 S. Kentucky Ave.
Sedalia, Mo. 65301

If your group is listed here and you haven't signed up, call the contact listed. On the other hand, if you are a member of any kind of alumni group, we hope that you are giving serious thought to bringing it to Las Vegas for the 1986 meeting and to signing it up for all the GOE events. Remember, eagles don't flock—they gather. We are encouraging all "affinity groups" that want to gather with us to *sign up now!*

If you're interested in how this might be worked out, call Max Keeney, AFA Headquarters, (703) 247-5800, and get all the details.

ings. For details, contact any travel agent or Hotel Royal Plaza, Lake Buena Vista, Fla. 32830. Toll-free number is (800) 327-2990; in Florida, dial (800) 432-2920.

New Air Force **2d Lt. Tom Luna** spent his summer after graduating from AFROTC at the University of Vermont on a 3,000-mile **coast-to-coast bicycle ride.** Called Cancer Trek, the trip aimed at raising funds for the American Cancer Society.

A **new uniform change** allows blue-suiters to **wear fatigues** when eating in fast-food restaurants. The work clothes have also been okayed for short convenience stops to and from work. ■

SENIOR STAFF CHANGES

PROMOTIONS: To be **General:** Duane H. **Cassidy.**

To be **Lieutenant General:** Spence M. **Armstrong;** Harley A. **Hughes;** William L. **Kirk;** Leonard H. **Perroots;** John A. **Shaud;** Robert D. **Springer.**

To be **Brigadier General:** David C. **Morehouse;** Carmelita **Schimmenti.**

RETIREMENTS: L/G Bruce K. **Brown;** M/G Thomas B. **Bruton;** B/G Daniel B. **Geran;** B/G Donald W. **Goodman;** B/G Diann A. **Hale;** B/G Bealer T. **Rogers,** Jr.; Gen. Thomas M. **Ryan,** Jr.; M/G John H. **Storrie;** M/G William R. **Usher.**

CHANGES: B/G Jimmie V. Adams, from Spec. Ass't for Tactical Modernization, DCS/RD&A, Hq. USAF, Washington, D. C., to DCS/Requirements, Hq. TAC, Langley AFB, Va., replacing M/G John M. Loh . . . **M/G (L/G selectee) Spence M. Armstrong,** from Chief, USMTM, Dhahran, Saudi Arabia, to Vice CINC, Hq. MAC, Scott AFB, Ill., replacing retiring L/G Robert F. Coverdale . . . **M/G Schuyler Bissell,** from Dep. Dir., DIA, Washington, D. C., to Ass't C/S for Intelligence, & Cmdr., AFIS, Hq. USAF, Washington, D. C., replacing M/G (L/G selectee) Leonard H. Perroots . . . **B/G Charles P. Cabell, Jr.,** from Dep. Cmdr. for AWACS, ESD, AFSC, Hanscom AFB, Mass., to Cmdt., Def. Systems Mgmt. College, Fort Belvoir, Va. . . . **L/G (Gen. selectee) Duane H. Cassidy,** from DCS/M&P, Hq. USAF, Washington, D. C., to CINC, Hq. MAC, & Exec. Dir. of the Single Mgr. Operating Agency for DoD Airlift Services, Scott AFB, Ill., replacing retiring Gen. Thomas M. Ryan, Jr.

M/G Alexander K. Davidson, from Dep. Dir. of Plans, DCS/P&O, Hq. USAF, Washington, D. C., to Dir. of Plans, DCS/P&O, Hq. USAF, Washington, D. C., replacing M/G (L/G selectee) John A. Shaud . . . **B/G Robert F. Durkin,** from Dep. Dir. of Ops., DCS/P&O, Hq. USAF, Washington, D. C., to Dep. Dir. of Plans, DCS/P&O, Hq. USAF, Washington, D. C., replacing M/G Alexander K. Davidson . . . **M/G David W. Forgan,** from Ass't C/S for Ops., Allied Forces Central Europe, Brunssum, the Netherlands, to DCS/Ops., Hq. USAFE, Ramstein AB, Germany, replacing M/G (L/G selectee) William L. Kirk . . . **B/G William J. Grove, Jr.,** from Cmdt., AFROTC, ATC, Maxwell AFB, Ala., to Cmdr., Chanute TTC, ATC, Chanute AFB, Ill., replacing M/G Joseph D. Moore . . . **M/G Charles R. Hamm,** from Dir. of Ops., DCS/P&O, Hq. USAF, Washington, D. C., to Vice Cmdr., Hq. ATC, Randolph AFB, Tex., replacing M/G James P. Smothermon.

B/G Paul A. Harvey, from Cmdr., 76th Airlift Div., MAC, Andrews AFB, Md., to C/S, Hq. MAC, Scott AFB, Ill., replacing M/G Jack W. Sheppard . . . **B/G Richard E. Hearne,** from DCS/Plans, Hq. ATC, Randolph AFB, Tex., to Cmdt., AFROTC, ATC, Maxwell AFB, Ala., replacing B/G William J. Grove, Jr. . . . **M/G Paul H. Hodges,** from Cmdt., AWC, Hq. AU, Maxwell AFB, Ala., to Dir., Inter-American Def. College, Fort McNair, Washington D. C. . . . **M/G (L/G selectee) Harley A. Hughes,** from Ass't DCS/P&O, Hq. USAF, Washington, D. C., to DCS/P&O, Hq. USAF, Washington, D. C., replacing L/G David L. Nichols . . . **M/G (L/G selectee) William L. Kirk,** from DCS/Ops., Hq. USAFE, Ramstein AB, Germany, to Cmdr., 9th AF, TAC, Shaw AFB, S. C., replacing L/G (Gen. selectee) John L. Piotrowski.

M/G John M. Loh, from DCS/Requirements, Hq. TAC, Langley AFB, Va., to Dir., Operational Requirements, DCS/RD&A, Hq. USAF, Washington, D. C., replacing M/G Harold J. M. Williams . . . **Col. (B/G selectee) Burton R. Moore,** from Ass't DCS/Ops., Hq. PACAF, Hickam AFB, Hawaii, to Dep. Dir., Regional Plans & Policy, DCS/P&O, Hq. USAF, Washington, D. C., replacing B/G Robert B. Plowden, Jr. . . . **M/G Joseph D. Moore,** from Cmdr., Chanute TTC, ATC, Chanute AFB, Ill., to Cmdr., Lowry TTC, ATC, Lowry AFB, Colo., replacing retiring M/G William R. Usher . . . **Col. (B/G selectee) David C. Morehouse,** from Staff Judge Advocate, Hq. TAC, Langley AFB, Va., to Staff Judge Advocate, Hq. SAC, Offutt AFB, Neb., replacing B/G Keithe E. Nelson . . . **B/G Keithe E. Nelson,** from Staff Judge Advocate, Hq. SAC, Offutt AFB, Neb., to Dep. Judge Advocate General, Hq. USAF, Washington, D. C., replacing M/G Robert W. Norris.

L/G David L. Nichols, from DCS/P&O, Hq. USAF, Washington, D. C., to Cmdr., Hq. AAC, Elmendorf AFB, Alaska, replacing retiring L/G Bruce K. Brown . . . **M/G Robert W. Norris,** from Dep. Judge Advocate General, Hq. USAF, Washington, D. C., to Judge Advocate General, Hq. USAF, Washington, D. C, replacing retiring M/G Thomas B. Bruton . . . **B/G Thomas R. Olsen,** from Dep. Dir., J-3, Hq. PACOM, Camp Smith, Hawaii, to Ass't C/S for Ops., Allied Forces Central Europe, Brunssum, the Netherlands, replacing M/G David W. Forgan . . . **M/G (L/G selectee) Leonard H. Perroots,** from Ass't C/S for Intelligence, & Cmdr., AFIS, Hq. USAF, Washington, D. C., to Dir., DIA, Washington, D. C. . . . **B/G Robert B. Plowden, Jr.,** from Dep. Dir., Regional Plans & Policy, DCS/P&O, Hq. USAF, Washington, D. C., to Dep. Dir. of Ops., DCS/P&O, Hq. USAF, Washington, D. C., replacing B/G Robert F. Durkin.

B/G James G. Sanders, from Surgeon, Hq. AFMPC, Randolph AFB, Tex., to Cmdr. Surgeon, Hq. ATC, Randolph AFB, Tex., replacing retired B/G Bealer T. Rogers, Jr. . . . **Col. (B/G selectee) Carmelita Schimmenti,** from Command Nurse, Hq. SAC, Offutt AFB, Neb., to Chief, Air Force Nurse Corps, Office of the Surgeon General, Hq. USAF, Bolling AFB, D. C., replacing retiring B/G Diann A. Hale . . . **M/G (L/G selectee) John A. Shaud,** from Dir. of Plans, DCS/P&O, Hq. USAF, Washington, D. C., to DCS/M&P, Hq. USAF, Washington, D. C., replacing L/G (Gen. selectee) Duane H. Cassidy . . . **M/G Jack W. Sheppard,** from C/S, Hq. MAC, Scott AFB, Ill., to Cmdr., 21st AF, MAC, McGuire AFB, N. J., replacing M/G (L/G selectee) Robert D. Springer . . . **M/G Ralph E. Spraker,** from Cmdr., 1st Space Wing, Hq. SPACECMD, Peterson AFB, Colo., to C/S, Hq. NORAD/ADCOM/SPACECMD, Peterson AFB, Colo.

M/G (L/G selectee) Robert D. Springer, from Cmdr., 21st AF, MAC, McGuire AFB, N. J., to IG, Hq. USAF, Washington, D. C., replacing L/G Monroe W. Hatch, Jr. . . . **B/G David J. Teal,** from Dep. for Recon., Strike, & EW Systems, ASD, AFSC, Wright-Patterson AFB, Ohio, to Dep. for Tactical Systems, ASD, AFSC, Wright-Patterson AFB, Ohio, replacing B/G Gerald C. Schwankl . . . **M/G Harold W. Todd,** from C/S, 4ATAF, Heidelberg, Germany, to Cmdt., AWC, & Vice Cmdr., Hq. AU, Maxwell AFB, Ala., replacing M/G Paul H. Hodges . . . **B/G David H. Williams, Jr.,** from DCS/T&E, Hq. AFSC, Andrews AFB, Md., to IG, Hq. AFSC, Andrews AFB, Md., replacing B/G Charles P. Winters . . . **M/G Harold J. M. Williams,** from Dir., Operational Requirements, DCS/RD&A, Hq. USAF, Washington, D. C., to Dir. of Ops., DCS/P&O, Hq. USAF, Washington, D. C., replacing M/G Charles R. Hamm.

B/G Charles P. Winters, from IG, Hq. AFSC, Andrews AFB, Md., to Dep. Cmdr. for AWACS, ESD, AFSC, Hanscom AFB, Mass., replacing B/G Charles P. Cabell, Jr. . . . **B/G Mark J. Worrick,** from Dep. Dir. of Budget (Ops. Appropriations), Office of the Comptroller, Hq. USAF, Washington, D. C., to Cmdr., Hq. AFAFC, & Ass't Comptroller for Accounting & Finance, Lowry AFB, Colo., replacing retiring B/G Daniel B. Geran.

SENIOR ENLISTED ADVISOR CHANGE: CMSgt. Robert H. Waldrup, to SEA, Hq. AU, Maxwell AFB, Ala., replacing retired CMSgt. Larry E. Fowler. ■

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For the second year in a row, it's the Outstanding Squadron at the Academy.

The Thirtieth—Again

BY JAMES A. McDONNELL, JR.
MILITARY RELATIONS EDITOR

DEDICATION, determination, pride—and good luck (which someone has defined as what happens to prepared people who work hard). These are assuredly qualities that contribute to successful officership. And, just as assuredly, they are the qualities displayed by the Cadets of the 30th Squadron of the USAF Academy who, for the second year in a row, have captured the title of Outstanding Squadron.

The recognition was marked with a dinner salute in Colorado Springs cohosted by the Air Force Association and AFA's Colorado Springs/Lance Sijan Chapter.

What makes an Outstanding Squadron outstanding—the best of the best among the forty squadrons at the Academy? According to Cadet Lt. Col. G. Frederick Ward, Spring Semester Squadron Commander and spokesman at the Dinner for the Squadron, it was setting a goal almost immediately after the 1984 designation to repeat as the Outstanding Squadron. Each year the squadrons are "balanced out" after graduation, and attrition reduces the ranks so that, theoretically, all begin in September as equal entities. Newcomers to the 30th were immediately imbued with the idea that the Squadron would win again.

Academy Superintendent Lt. Gen. W. W. (Skip) Scott, addressing the 600-plus guests at the black-tie dinner, put it in a slightly different perspective. Alluding to the competition encompassing academic, athletic, and military achievement, he said, "The squadron we are honoring this evening has achieved high standards of excellence in all these areas. But even more important, this squadron has provided the entire Cadet wing with an example of teamwork at its best—a quality that predicts great success for its members as they pursue Air Force careers."

Cadets of the 30th Squadron excelled in all three areas. During the academic year, individual members made the "lists"—Dean's, Commandant's, and Superintendent's—more than 150 times. In athletics, the Squadron won intramural honors and nineteen varsity letters in a number of intercollegiate sports and boasted one All-American in track. The Squadron's Fall Semester Commander, Cadet Col. Andrew M. Mueller, exemplified the Squadron's military qualities when he was named the Spring Semester Group Commander for the entire Cadet Corps.

AFA President Martin H. Harris, addressing the dinner, put it succinctly. "Winning this honor is commendable," he said. "Winning it twice in a row tells the world a lot about the character of the men and women of the 30th."

The master of ceremonies for the evening also singled out for praise specific accomplishments of the winning squadron. He was particularly well credentialed to do so. Brig. Gen. Ronald R. Fogelman, now Commander, 876th Air Division, Davis-Monthan AFB, Ariz., was, in his Cadet days at the Academy (Class of '63), three times a member of the Outstanding Squadron.

A highlight of the evening was the appearance of Bill Danoff, entertainer and Grammy Award Winner and songwriter (among his credits is "Take Me Home, Country Roads"). He was backed up by the Moods in Blue of the USAFA Band under the direction of Lt. Col. John McCord.

Then Air Force Vice Chief of Staff (now CINCSAC) Gen. Larry D. Welch, center, talks with Group Commander Cadet Col. Andrew M. Mueller, left, and Squadron Commander Cadet Lt. Col. G. Frederick Ward, right, as Maj. William E. Crowe, Jr., Squadron Air Officer Commander, and Brig. Gen. Ronald R. Fogelman, the evening's master of ceremonies, look on.

The Greatest Gift

The 1926 Air Corps Pan American Goodwill Flight was a story of triumph, tragedy, and unsurpassed heroism on the part of a young captain.

BY JOHN L. FRISBEE
CONTRIBUTING EDITOR

In 1926, the Coolidge Administration, like many that were to follow, was intent on improving US relations with Latin America. Air Corps Chief Maj. Gen. Mason Patrick conceived the idea of dispatching a goodwill flight to twenty-three Central and South American countries—an idea approved immediately by the Secretaries of State and War and by the President.

The Air Corps chose the Loening OA-1 amphibian, a new observation plane, for the flight and Maj. Herbert A. Dargue, one of the early Army pilots, as its commander. Five OA-1s, each named for an American city and crewed by two pilots, one of whom was an engineering officer, were to make the 22,000-mile pioneering flight. Among the pilots were three officers who would retire after World War II as three- and four-star generals—Muir Fairchild, Ennis Whitehead, and Ira Eaker. General Eaker is the only member of the flight who is still living today.

Intensive Training

The expedition, known as the Pan American Goodwill Flight, left San Antonio, Tex., on December 21, 1926, after the pilots had gone through an intensive course in diplomatic niceties, Spanish, meteorology, and geography. They carried whatever maps were available, cruised at eighty-five miles an hour over much uncharted territory and through unpredictable weather without radios or gyroscopic flight instruments, and did their own maintenance between diplomatic receptions and state dinners.

Bert Dargue, who rose to the rank of major general and who was killed in a crash on December 12, 1941, while en route to Hawaii, recounted the flight in the October 1927 issue of *National Geographic*. His fifty-page article sketched enough high adventure, flying exploits, close calls, humor, and tragedy to fill a book.

Tragedy at Buenos Aires

The tragedy occurred at Buenos Aires, at about the halfway point of the first aerial circumnavigation of South America. The flight had crossed the Andes from Valdivia, Chile, to Bahia Blanca on the Argentine coast, navigating with rudimentary instruments through very heavy weather. After a stop at Mar del Plata, they flew on to Buenos Aires, where the formation broke preparatory to landing. Major Dargue in *New York* started a descending turn to the left, his attention on an Argentine escort plane that was passing beneath him.

Capt. C. E. Woolsey and Lt. John Benton in *Detroit,* who had been flying on Dargue's left wing, broke left, then inexplicably turned slowly to the right. The two planes collided and spun down, interlocked. As the spinning planes separated, Dargue and Lieutenant Whitehead were able to bail out of *New York,* but Woolsey and Benton went in with their plane.

In his *Geographic* article, Major Dargue wrote: "No man may ever fully explain how disaster came. It was all over too quickly." Perhaps that was all the Air Corps would allow him to say. Fifty years later, General Eaker, writing for the September 1976 issue of AIR FORCE Magazine, told a story of unsurpassed heroism in his account of the tragedy. He had been flying on Dargue's right wing and had a clear view of the crash.

At Mar del Plata, where the planes had landed on water, Woolsey's OA-1 had broken a cable that raised and lowered the plane's wheels. Since their first landing near Buenos Aires was to be on water for a reception aboard an Argentine battleship, Woolsey decided to proceed with the broken cable and the wheels retracted. After the reception, the plane would take off from water and fly to an Argentine Air Force base near Buenos Aires. At that point, Lieutenant Benton would climb out of the rear seat and go out on the wing to release the wheels—a maneuver all the crews had practiced in preparation for the flight.

When Major Dargue gave the signal to break formation, Benton took off his chute and went out on the wing. With his eyes on Benton, Woolsey apparently let *Detroit* drift to the right on a collision course with *New York,* while Dargue's attention was focused on the Argentine plane below him. *Detroit's* nose struck the left wing of Dargue's plane.

"He Elected to Stay"

"Woolsey was sitting on his chute and could have saved himself," General Eaker wrote. "Instead, he elected to stay with the plane, since Benton was on the wing without his chute. I have never witnessed a more courageous self-sacrifice."

Eight members of the flight, which won the Mackay Trophy, landed at Bolling Field, D. C., on May 2, 1927, 133 days after they had left San Antonio. They were greeted by President Coolidge, who presented each man the new Distinguished Flying Cross, which had just been authorized by Congress. The Air Force Office of History has no record of posthumous awards to Captain Woolsey and his friend, Lieutenant Benton, with whom he shared a great adventure and to whom he had given the greatest of all gifts. ■

Air Force Association's Gathering of Eagles—1986

Las Vegas Convention Center
April 27–May 1, 1986

(All activities will take place in the Las Vegas Convention and Conference Center unless otherwise noted)

Sunday, April 27

6:00–8:00 p.m.

Welcome Aboard Reception
(MGM Grand Hotel)

Monday, April 28

Aerospace Exhibits on Display
Reception

Tuesday, April 29

USAF Tactical Capabilities Exercise
(Indian Springs AF Auxiliary Field)
Aerospace Exhibits on Display
Symposium: "Global Aerospace"
Reception

Wednesday, April 30

Confederate Air Force
Flight Line Static Display/Fly-bys
(McCarran Field)
Workshop:
"Educating for Leadership in Space"
Aerospace Exhibits on Display
Symposium:
"Your Air Force—Today"
Reception and Honors Banquet
(MGM Grand Hotel)
(Note: Banquet is limited to first 3,500 registrants)

Thursday, May 1

Confederate Air Force
Flight Line Static Display/Fly-bys
Aerospace Exhibits on Display
Roundtable:
"Designing Tomorrow's Air Force"
Reception
"Gathering of Eagles"
Gala Stage Show

Registration Form

AFA's Gathering of Eagles 1986
Las Vegas, Nevada, April 27, 1986–May 1, 1986

	Postmark Date Prior to Nov. 1, 1985	Postmark Date Nov. 1, 1985 to February 28, 1986	Postmark Date On and After March 1, 1986 (and on site)
Package #1: *(All activities including Honors Banquet—limited to first 3,500 registrants)*			
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AFA Spouse/Dependent	☐ $195	☐ $205	☐ $250
	☐ $195	☐ $205	☐ $250
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Non-Member	☐ $225	☐ $235	☐ $250
	☐ $225	☐ $235	☐ $250
Package #2: *(All activities except Honors Banquet, Wed., April 30)*			
AFA Member/Patron	☐ $145	☐ $155	☐ $200
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	☐ $145	☐ $155	☐ $200
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Non-Member	☐ $175	☐ $185	☐ $200
	☐ $175	☐ $185	☐ $200

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Air Force Association's Gathering of Eagles—1986

Las Vegas, Nevada, April 27, 1986–May 1, 1986

APPLICATION FOR HOTEL RESERVATIONS

HOTELS	Single	Double	1-Bedroom Suite	2-Bedroom Suite
MGM Grand	$77	$77	$178-up	$260-up
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Flamingo Hilton	60	60	150-up	240-up
Dunes	58	58	180	250
Imperial Palace	60	60	150	210
Maxim	38	38	—	—
Continental	45	45	—	—
Alexis Park (All Suites)	70/90	70/90	—	—
Tropicana	42	42	125	250
Hacienda	55	55	100	165
Marina	42	42	100	150
Sands	55	55	125-up	225-up
Desert Inn	75	75	150-up	225-up
Frontier	54	54	185	225
Riviera	55	55	150	200
Sahara	55	55	90-up	180-up
Landmark	52	52	95-125	—
Las Vegas Hilton	64	64	—	—
Mardi Gras (All Suites)	33	33	—	—

Application for Hotel Reservations

(Please print or type)

Please list three choices of hotels:

1st _____

2nd _____

3rd _____

Room will be occupied by:

_____
Name

_____
Affiliation

_____
Street

_____
City State Zip

Type of Accommodation

____ Single Rate ____

____ Double Rate ____

____ 1 B/R Suite Rate ____

____ 2 B/R Suite Rate ____

Date of Arrival: _____

_____ Hour _____AM-PM

Date of Departure: _____

_____ Hour _____AM-PM

Note:

1. The AFA Housing Bureau will handle all reservations. Do not contact hotels. If changes need to be made after receiving confirmation, contact hotel directly.
2. A deposit of one night's lodging must be sent directly to the hotel once you receive confirmation.
3. Room assignments will be made on a first-come, first-served basis.
4. If a block of rooms is required, attach a list of individuals needing rooms to this form with arrival and departure dates and times.

Fill out this form completely and mail to:

"AFA Housing Bureau"
Las Vegas Convention & Visitors Authority
3150 Paradise Road
Las Vegas, Nevada 89109-9096

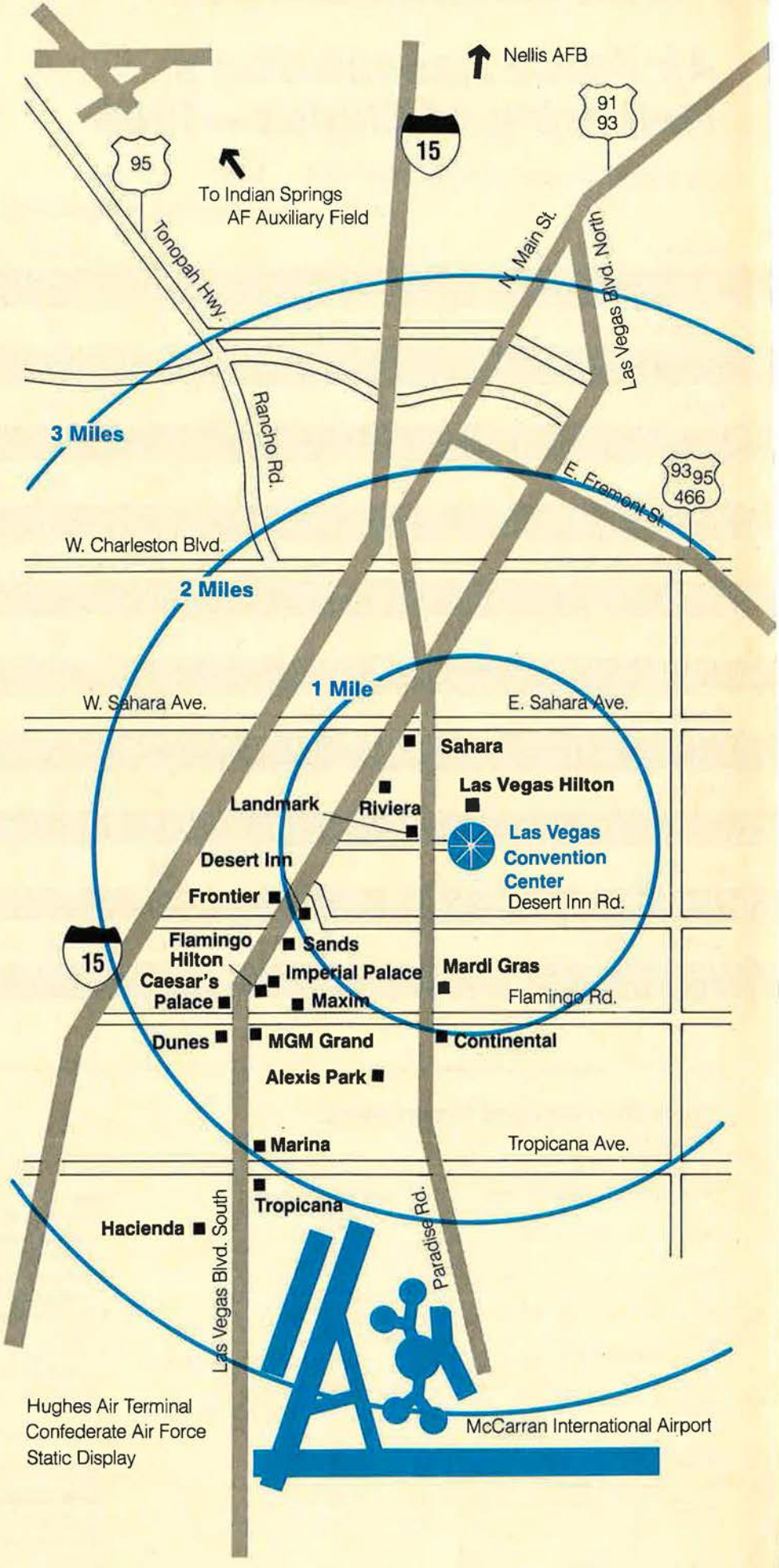
To reserve a room at one of the 19 hotels in which AFA has blocked rooms, fill out the housing form on the previous page and return it to the "AFA Housing Bureau" in Las Vegas at the address indicated on the form. The Housing Bureau will handle all reservations. Do not contact hotels. (However, if you need to make a change after you've received confirmation, contact the hotel directly.) Once you receive confirmation from the hotel, send a deposit of one night's lodging directly to the hotel.

Room assignments are on a first-come, first-served basis.

If a block of rooms is required, attach a list of names with arrival and departure times and dates to the housing form on the previous page.

Remember, this form is not to be mailed to AFA, but must be sent directly to the AFA Housing Bureau in Las Vegas. The cut-off date for reservations is March 25, 1986.

Locations for AFA's "Gathering" hotels are indicated on the map.



AFA INTERCOM

By Robin L. Whittle, AFA DIRECTOR OF COMMUNICATIONS

On the High Road With America's Favorite "Flyboy"

Brig. Gen. Chuck Yeager, USAF (Ret.), got the chance recently to talk to a Honolulu *Star Bulletin* reporter about his thirty-year love affair with flying. The interview took place just prior to General Yeager's appearance before a joint meeting of AFA's Hawaii Chapter and the local Daedalians unit.

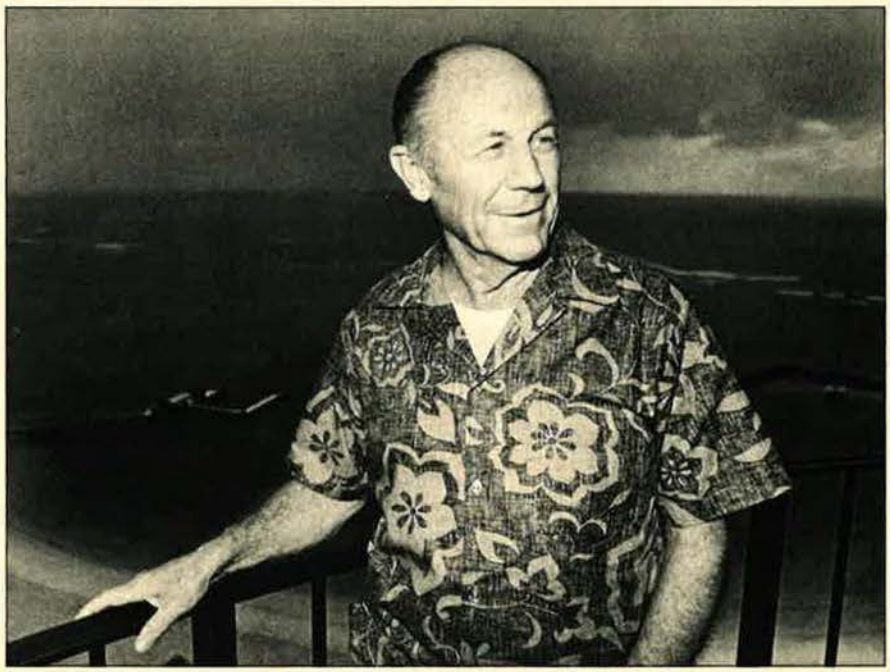
"There's no such thing as seat-of-the-pants flying, 'cause there's no such thing as a natural-born pilot. I've flown with many, many air forces in the world, with many nationalities of pilots. Women pilots, too. It all boils down to the capability of the pilot, depending on their experience level. Like ol' Jackie Cochran—that gal could outfly ninety percent of the guys I know, because she had a lot more experience than they did," he told the reporter.

"Flying's fun, but I wouldn't pay a cent just to ride in an airplane. I've already flown the best there is. I don't even drive fast. And I've got an '85 Corvette. I set the cruise control at fifty-five, 'cause I've been lookin' over my shoulder for the enemy all my life," he said. General Yeager told the reporter a Space Shuttle flight was tempting, if he could *fly* it.

Last spring, President Reagan appointed General Yeager to a space advisory commission that includes astronaut Neil Armstrong, former UN Ambassador Jeane Kirkpatrick, and others. The commission has been tasked to come up with a twenty-year plan for space.

"Part of our mission in space will be military. President Reagan's 'Star Wars' program is the only thing that's gotten the Russians' attention. Violently so. If it's put into effect, it'll negate the whole Soviet offensive missile system," he said.

After the AFA dinner, the *Star Bulletin* reported that generals and kids "alike lined up to shake General Yeager's hand." A few days later, under the headline "Yeager: World's Fastest Good Ol' Boy," *Star Bulletin* reporter Burl Burlingame offered a closer look at the man who has become America's favorite flyboy, thanks to the movie *The Right Stuff* and the recent publication of his autobiography, *Yeager,* a Book-of-the-Month Club selection. *(For a review of General Yeager's autobiography, see "Airman's Bookshelf," p. 208 of this issue.)*



Sporting island attire for his speech to AFA's Hawaii Chapter, Brig. Gen. Chuck Yeager, USAF (Ret.), pauses to take in the Pacific view. General Yeager will deliver the keynote address at the 1985 AFA National Convention in Washington, D. C., this month. (Photo courtesy of the Honolulu* Star Bulletin*)

Regarding the 1947 flight during which, at the age of twenty-four, he broke the sound barrier, he told the reporter that "we really didn't know what we were getting into. To me, research flying—like the X-1—was a lot like combat. You don't think about the outcome. You don't think about what effect this is going to have on your guts. The only thing you concentrate on is what you're doing, so you survive.

"The day we broke Mach 1, obviously, I knew it was very important that we get beyond the speed of sound. We had been sitting there with this so-called barrier, and we couldn't move on unless we found out what our problems were. Fifty percent of the aeronautical engineers at the time said it was impossible to fly an airplane faster than sound. I had confidence in the airplane, sure. Otherwise I wouldn't have been flying it.

"To start with, I didn't know we were going to do it that day. But when it made that sonic boom and, boy, all that buffeting quit on the airplane, I was sort of disappointed it didn't blow up. Hey, I said, this is a piece of cake!"

A few weeks after his Honolulu appearance, General Yeager keynoted the Fresno Chapter's twentieth annual Honors Night at the Hilton Hotel at Fresno, Calif. During the proceedings, Rep. Charles "Chip" Pashayan (R-Calif.) was honored for his "outstanding support of America's armed forces," according to Samuel Boghosian, Chapter communications director.

AFA dignitaries who heard General

Yeager speak included Richard C. Doom, National Vice President for the Far West Region; former AFA National Director Liston "Zack" Taylor; California Membership Chairman and National Membership Committee member Art Littman; Stan Hryn, Fresno Chapter charter member; California State President Dave Graham; and AFA National Director and Executive Committee member Edward A. Stearn, who is, at this writing, a nominee for the post of Chairman of AFA's Board of Directors. Col. William Neville, Commander, 144th Fighter Interceptor Wing, was the military host; master of ceremonies was Arnie Schweer, California State AFA Vice President (North). Fresno Chapter President Ronald H. Markarian said that proceeds from the evening will be donated to the Fresno Metropolitan Museum's Aviation Center.

As for the General's appearance, Mr. Markarian said, "He can really pack them in, and he's a spellbinding speaker. We were delighted to have him!"

General Kelley Joins Fort Worth Chapter In Saluting AFROTC

Lt. Gen. Robert E. Kelley, Vice Commander, Tactical Air Command, addressed the Fort Worth Chapter's "Salute to Air Force ROTC," held May 8 at the Green Oaks Inn in Fort Worth, Tex. His speech "went over in a big way," according to Fort Worth Chapter President Dan Heth.

General Kelley talked about winning and the fact that some people think it just happens or is a matter of luck. He quoted Bobby Knight, the successful Indiana University and 1984 Olympic basketball coach, who said that everyone wants to win, but not everyone is willing to *prepare* to win. Vince Lombardi had another way of putting it, General Kelley said: "You've got to pay the price. Winning is not a sometime thing; it's an all the time thing. You don't win once in a while, you don't do things right once in a while—you do them right all the time. Winning is a habit. Unfortunately, all too often, so is losing."

General Kelley continued by noting that "there is no room for second place. There is only one place in our profession, and that place is first place. It's a reality that life is competitive. Preparing to win equals readiness, and in Tactical Air Command, readiness is our profession."

He emphasized the importance of goals as the key to winning: "You have to have a goal, some idea of where you're going or someone with

INTERCOM

enough vision to say—that's the way." General Kelley discussed TAC's goals and its winning record over the last several years.

During the evening, numerous awards were made to AFJROTC commanders, AFROTC first- and second-semester commanders, the outstanding AFROTC graduate of Texas Christian University, and Angel Flight leaders. Winners of the high school patriotic essay contest were presented monetary awards and AFA citations.

The Fort Worth Chapter honored the 7th Bomb Wing, Carswell AFB, as the outstanding organization of the year, Lt. Col. Richard E. Hill as officer of the year, CMSgt. C. E. Jett as airman of the year, and Garrett A. Guly, Jr., as civilian of the year. In turn, the 7th Bomb Wing presented the Chapter a plaque recognizing the Chapter's support of the Carswell mission. The Chapter was also honored by the Texas Christian University Arnold Air Society for its support of AFROTC and Angel Flight. Cindy Forney, who was named the nation's outstanding "Little Colonel" at the Arnold Air Society/Angel Flight Conclave in Pittsburgh and whose trip was sponsored by the Fort Worth Chapter, made the presentation.

"A stirring message by General Kelley, coupled with the excellent turnout of more than 300, made the event truly successful," Mr. Heth said.

Carl Vinson Chapter Is Front-Page News In Warner Robins

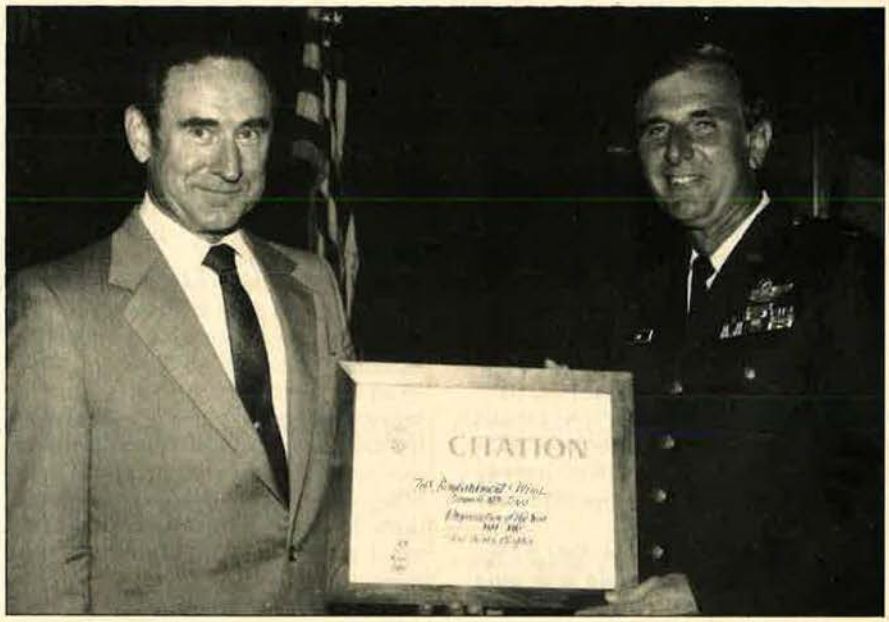
"Area AFA Chapter is a big winner" proclaimed the banner headline in the June 16 Warner Robins, Ga., *Sun* newspaper. *Sun* correspondent Cindy Ycaza reported that it was unofficially "Warner Robins/Robins AFB Day at the Georgia AFA convention in Savannah" on June 15 when "eight awards were presented to Carl Vinson Chapter members" and the Chapter was named "AFA Chapter of the Year" for the state.

Georgia State President Wilbur Keck told the *Sun* that the winning chapter "should exhibit exceptional participation by members and be outstanding in community efforts."

Carl Vinson Memorial Chapter President Joseph Sherrill Stafford said the Chapter "organized its approach this year. We set goals and developed a plan on how to reach those goals. We had regular meetings during which everyone was given a job and encouraged to participate.

"And then we increased the visibility of the Chapter by publishing newsletters, getting involved in the community, having a membership drive. . . . Actually, we had a goal of acquiring 682 new members. We got 724," President Stafford said. Another goal is support for the Robins AFB Museum of Aviation.

Former Carl Vinson Chapter Presi-



Col. O. K. Lewis, Jr., Commander of the 7th Bomb Wing, Carswell AFB, Tex., accepts the Fort Worth Chapter's "Outstanding Organization of the Year" award from Fort Worth Chapter President Dan Heth, left, at the Chapter's "Salute to AFROTC."

Georgia State AFA President Wilbur Keck, left, presents the Georgia "Chapter of the Year" award to Carl Vinson Memorial Chapter President Joseph Sherrill Stafford at the recent state convention. Overall, the chapter at Warner Robins, Ga., won eight state awards and reached 106 percent of its recruiting goal.

H. Thomas Reed, general manager of the Warner Robins **Daily Sun,** *is Vinson Chapter "Member of the Year" and Georgia AFA "Member of the Year."*

dent Dr. Dan Callahan, who served at one time on the AFA national Board of Directors, won the state Exceptional Service Award for his dedication and work as a member of the Chapter. "I pick up the loose ends," Dr. Callahan told the *Sun*. "I have enjoyed my membership and principally have been involved with life membership for AFA." Dr. Callahan is also author of the popular local slogan, "Every day in Middle Georgia is Air Force Appreciation Day."

Another award winner was H. Thomas Reed, general manager and vice president of the daily and Sunday *Sun*, who received two membership awards during the convention banquet. He was honored as the "Carl Vinson Chapter Member of the Year" and as the "Georgia AFA Member of the Year."

"He has achieved excellence in serving the community and contributed largely to the projection of the Association," Georgia President Keck said.

In accepting the award, Mr. Reed said he "believed strongly in AFA, and I think the Carl Vinson Chapter has made some very impressive progress under President Stafford's leadership. I hope the country is becoming more aware of the efforts and actions of the AFA. This is certainly the highlight of my involvement with the Air Force and Robins AFB," he said.

Other award winners from Warner Robins were Maj. Gen. James E. McAdoo, Air Force Reserve Vice Commander at Robins AFB, and Maj. Gen. Cornelius Nugteren, Commander, Warner Robins ALC. They were both honored for outstanding support of AFA. SSgt. Debra Jones, an on-the-job training manager at Robins AFB, won the outstanding NCO award, and Cadet Col. Robert McCormack of Warner Robins High won the AFJROTC award of merit medal. He will be attending Georgia Tech this fall and studying aerospace engineering.

The banquet speaker was Gen. Thomas M. Ryan, Jr., CINCMAC, who retires next month.

Carl Vinson Chapter officials have worked out an arrangement to write a monthly column about the Chapter and AFA for publication in the *Sun*. Written by Chapter officers and members, the columns have covered the Chapter's golf tournament fund-raiser for the Robins AFB Aviation Museum, the Chapter membership drive, and the Georgia state convention. Additional coverage was provided by the newspaper after the convention.

The Georgia AFA convention, considered a resounding success, was hosted by the Savannah Chapter.

On the Scene in AFA's Busy and Active Grass Roots

"Youth + service + educational opportunity = our nation's future" is the formula that **General Robert F. Travis Chapter** officials use to urge people to contribute to their successful scholarship program. The program awards $1,000 to deserving AFJROTC and CAP graduates from area high schools, says President **Bob Hazeleaf.** Recipients for 1985 are **Ernest Scott Drake,** Armijo High School, who plans to major in aerospace engineering and serve as a career USAF officer; **Stephen Frank,** Fairfield High School, who enters Brigham Young University this fall as a mechanical engineering student on a four-year AFROTC scholarship; and **JoAnn Roberts,** Vanden High School, who has been accepted at the University of California/Davis and Sacramento State University and who has applied to the Air Force Academy with hopes of becoming a USAF career officer. The man who made the program happen this year is **Percy Haugen,** Travis Chapter Scholarship Chairman and assistant superintendent of the local school district.

Souvenir photos from a major event may be just the ticket to boost chapter treasuries if the experience of the **Tucson Chapter** in Arizona is any guide. A revamped photo booth and a few willing volunteers—including **Ray Chuvala** of Merrill Lynch Realty, **Ben Boshoven** and his son **Eric, Al Steensland,** Tucson Chapter First Vice President **John Devlyn, Don Adams, John Storie, Pierce Timberlake, Bill Underwood,** Tucson Chapter Treasurer **Carl Beck, Bill Daly, Bill Downey, Jack Sherlock,** and Tucson Chapter President **Bob Munn**—helped net a nice profit from photo sales at the Chapter's recent "Aerospace Days" event. One photo taken in 1970 at the event became a dream come true in 1985 for **Craig Davis,** who sat behind the controls of a fighter as a kid in 1970 and as a full-fledged pilot stationed at Davis-Monthan AFB, Ariz., in 1985. Both photos appeared in the Tucson Chapter newsletter recently. Lieutenant Davis's father, retired Air Force **Col.**

(Continued on p. 237)

"AFA's South Central Region Is Bursting at the Seams!"

From the Alabama and Mississippi Gulf Coast to the Arkansas Ozarks, the Cajun Country of Louisiana, and the Tennessee Smokies, AFA states and chapters are exceeding membership goals by leaps and bounds and are reaching more Americans with AFA's important message. The record books will attest to the outstanding results and untiring efforts by South Central Region state and chapter officers in strengthening their organizations through increased membership. And so will the trophies and plaques that adorn their meeting rooms: 1984 Arthur C. Storz, Sr., membership award to AFA's best region—South Central; Arthur C. Storz, Sr., membership award to AFA's best state—Mississippi; and the 1983 Arthur C. Storz, Sr., membership award to AFA's best chapter—Golden Triangle, Columbus, Miss.

I have taken the liberty to highlight the major winners only to emphasize results. As with any competition, there is a small margin between the winner and runners-up. I commend the fine efforts of all South Central units that have met or exceeded their membership goals.

Increased membership is one of several AFA goals that receives high priority in the South Central Region.

The others:

- Support for aerospace education and our future leaders in AFJROTC, AFROTC, Arnold Air Society, Angel Flight, and CAP.
- Recognition through active awards programs of outstanding performance by active-duty, Reserve, and Guard airmen.

South Central Region AFA units are achieving these objectives in various ways that make me proud to be a part of this expanding region. I want to thank South Central Region officers and members for their outstanding work and loyal devotion to improving this nation's security and its aerospace strength through greater public understanding of the issues and wider public involvement in AFA.

—C. Cliff Ball, National Vice President/South Central Region.

C. Cliff Ball is AFA's National Vice President for the South Central Region.

Alabama

Alabama AFA is led by James F. Patterson and has six chapters: **Birmingham,** Cecil W. Greene, President; **Mobile,** Francis J. Kramer, President; **Montgomery,** Bowen Ballard, President; **Selma,** W. H. Lollar, President; **Tennessee Valley** in Huntsville, Robie Hackworth, President; and **War Eagle** in Auburn, Robert E. Flynn, President.

The state convention, hosted by the **Mobile Chapter,** April 12–13, featured AFA National Director and former CMSAF Jim McCoy and AFA Board Chairman Dave Blankenship as guest speakers. Former US Rep. Jack Edwards was honored for contributions to national defense, and AFA National Director Frank Lugo was named "Alabama Man of the Year." The Mobile Chapter was chosen as the outstanding Alabama chapter. The state convention also included a South Central regional meeting and an all-day Aerospace Education Workshop for eighty-two Army and USAF ROTC cadets and CAP cadets.

Birmingham Chapter officials arranged for the CIA special advisor to the Commander, Air University, to address a meeting on Soviet global activities and their impact on world affairs. In addition to hosting the state convention, **Mobile Chapter** leaders worked closely with AFJROTC and CAP cadets, raffled a King Arthur grandfather clock to raise funds for the annual Brookley air show cosponsored by the Chapter, and honored three local veterans at a dinner meeting that featured speaker Rep. Sonny Callahan (R-Ala.). **Montgomery Chapter** officials are supporting the "Monument to Powered Flight" to be erected at Maxwell AFB and dedicated this month. The Chapter participated in the Maxwell-Gunter enlisted dining-in and worked with the American Fighter Aces on a joint program to be held during their national convention.

AFA's **Selma Chapter** gives cash awards to the outstanding AFJROTC cadet at the local high school. **Tennessee Valley Chapter** leaders sponsored meetings featuring a Boeing Co. official on Boeing operations in Huntsville and an ambassador and State Department advisor to the Commander, Air University. A closer working arrangement with Arnold Air Society and Angel Flight at Auburn University was a goal of the **War Eagle Chapter,** which met its membership goal last year.

Arkansas

Arkansas AFA is led by Aaron E. Dickerson and has four chapters: **Blytheville,** led by B. A. Walters; **David D. Terry, Jr.,** Robert L. Byrd, President; **Fort Smith,** Bobby Dempsey, President; and **Razorback,** led by E. P. Clark.

At this writing, Arkansas AFA is planning a state convention to be hosted by the **Blytheville Chapter** on August 9–10. Blytheville Chapter officials hosted a reception for the Commander of the 109th Tactical Airlift Group, Schenectady Airport, N. Y., who took chapter officials and local news media on an orientation flight in a C-130 the following day. **David D. Terry, Jr., Chapter** officials sponsored a meeting with Lt. Gen. Kenneth L. Peek, Jr., Commander, Eighth Air Force, and presented an AFA Bronze Medal to the Outstanding AFJROTC cadet at Jacksonville High School. The Strategic Defense Initiative was the topic during a Chapter meeting for an address by **Fort Smith Chapter** leader Lt. Col. H. C. Varnadore. **Razorback Chapter** officials, members, and guests received a briefing on "Reducing the Federal Deficit" by AFROTC cadets at the University of Arkansas.

Louisiana

James P. LeBlanc leads Louisiana AFA, overseeing four chapters: **Alexandria,** Paul J. Johnston, President; **Ark-La-Tex,** led by Alfred D. Herring; **Greater Baton Rouge,** Lemos L. Fulmer, President; and **Greater New Orleans,** led by Gerard E. Nistal.

AFA Executive Director Russ Dougherty addressed the Louisiana state convention, which was hosted at Barksdale AFB on May 3–5 by the **Ark-La-Tex Chapter.** Officials of the **Alexandria Chapter** presented AFA Citations and savings bonds to the three top Airmen of the Year at a banquet at the England AFB NCO Club and made plans to man a booth at the England AFB Open House. In addition to hosting the state convention, Ark-La-Tex Chapter officials sponsored a booth at the Barksdale AFB Open House during the "Holiday in Dixie" event, and Chapter President Al Herring spoke about AFA before local civilian service clubs. The Chapter conducts a strong program in support of AFJROTC and AFROTC at five local high schools and two colleges.

The Louisiana Secretary of State addressed a meeting of the **Greater Baton Rouge Chapter.** The Chapter also held a joint meeting with a local unit of the Retired Officers Association to hear a talk by the executive director of the 1985 Sports Festival. **Greater New Orleans Chapter** officials hosted 200 members and guests for a dinner honoring the anniversary of Tactical Air Command. The Chapter also honored outstanding cadets at four area high schools and one local university. One chapter patron, Katherine Beauford, a high school English teacher, was invited to NASA's "Space Camp" in Huntsville, Ala.,

From left, Arkansas State President Aaron Dickerson, Mississippi AFA leader Toulmin Brown, and Louisiana State President Jim LeBlanc break for lunch during a South Central Region workshop held at the Alabama state convention.

H. H. Arnold Memorial Chapter Vice President Al Ritter, left, and Chapter President Bill Kimzey, right, discuss aerobatic flying with Thunderbird pilot Lt. Col. Larry Stellman during a Chapter reception for the Thunderbirds.

One of the featured events during the recent Louisiana state convention was an outing to the Louisiana Downs racetrack in Bossier City. The sixth race, won by Patriot Gloves, was dedicated to "The Air Force Association of Louisiana." In the winner's circle are, from left, Tom Keal, former Louisiana State President; C. Cliff Ball, National Vice President for the South Central Region; AFA National Director Frank Lugo; Louisiana State President Jim LeBlanc; and the horse's trainer, owner, and jockey.

as one of the candidates for the "Teacher-in-Space" program.

Mississippi

Mississippi AFA is led by R. E. Smith and has three chapters: **Golden Triangle,** led by H. Y. Quarles; **Jackson,** Dorothy R. Wittig, President; and **John C. Stennis,** led by Russell D. Thompson.

The state convention was hosted in Biloxi by the **John C. Stennis Chapter** on May 17–18 and featured Gen. Robert T. Herres, Commander, Space Command, as speaker. "Taking America for Granted" is the theme of an address that State President Smith gives to groups around the state. **Golden Triangle Chapter** officials presented plaques to the three top airmen and the junior officer of the year and sponsored a spring banquet at which Lt. Gen. Thomas Richards, Commander, Air University, spoke.

State President Smith addressed the **Jackson Chapter** on the importance of community outreach as an AFA goal. In addition to hosting the state convention, the **John Stennis Chapter** presented awards at the Keesler AFB enlisted awards banquet, honored the top junior officer graduate of this year's class at the PME Leadership School, hosted the semiannual golf tournament, and sponsored travel expenses so that the spouse of the ATC technical writer of the year could attend the award ceremonies.

Tennessee

Jack K. Westbrook leads Tennessee AFA, which has five active chapters: **Chattanooga,** Lewis W. Hall, President; **Everett R. Cook,** Everett E. Stevenson, President; **General Bruce K. Holloway,** Walter J. Bacon, President; **H. H. Arnold Memorial,** led by William F. Kimzey; and **General Frank M. Andrews,** Timothy J. Myers, President.

Chattanooga Chapter officials hosted the state convention, May 17–18, which featured Maj. Gen. Alan G. Sharp, Commander, Fourteenth Air Force; AFA National President Martin H. Harris; a chapter operations workshop; and an update on veterans issues in the state. The Chattanooga Chapter also helped to provide speakers and a reviewing officer for the Armed Forces Day parade. **Everett R. Cook Chapter** leaders hosted a dinner for Gen. B. L. Davis, then CINCSAC, and, with the ANG, cosponsored a reception for the Thunderbirds. David Patterson, President of the Tennessee Technology Foundation, which promotes economic development through high-tech enterprises, addressed the **General Bruce K. Holloway Chapter.** Heritage High AFJROTC cadets, winners of the AFJROTC national contest sponsored by AFA's Aerospace Education Foundation, will be honored by the Holloway Chapter.

AFA's **H. H. Arnold Memorial Chapter** cosponsored a meeting that featured Lt. Gen. Thomas H. McMullen, Aeronautical Systems Division Commander, who discussed 170 programs on the drawing boards at ASD and how they'll affect USAF's future; participated in National Engineer's Week; and cosponsored a reception for the Thunderbirds. Dr. Brent Poulton, executive director, state board of education, addressed the **General Frank M. Andrews Chapter** on the state's educational system, and Dr. Allen Gray, adjutant professor of Metallurgy and Management of Technology, Vanderbilt University, discussed "critical materials" and the implications of a shortage or cutoff of these vital raw materials.

Special Note—For your planning . . . and your calendar

Two more Air Force Association Major National Symposia coming up in 1985 . . .

The US Air Force—Today and Tomorrow

October 24–25, 1985, *Hyatt at Los Angeles Airport, Calif.*

An in-depth report and evaluation of USAF, its commands, and its future aerospace requirements. This symposium will focus on how USAF's capabilities and requirements will affect national security and the defense industry in the years ahead.

Invited participants will include the Secretary and the Chief of Staff of the Air Force, DoD leaders, and Major Air Commanders.

Above and Beyond—The Military Uses of Space

November 14–15, 1985, *at Vandenberg AFB, Calif.*

An in-depth look at the broad spectrum of national security needs in space, from space vehicle and launch requirements to all aspects of the Strategic Defense Initiative.

And coming in January 1986—a broad-based review of tactical air warfare capabilities. A major National AFA Symposium in Orlando, Fla.

January 30–31, 1986

For information and registration for all Symposia, call Jim McDonnell, Dottie Flanagan, or Sara Ciccoli at (703) 247-5800.

Air Force Association

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INTERCOM

Greg Davis of Phoenix, is justifiably proud.

Redwood Empire Chapter President **Jack Briggs** and his entire board of directors recently spearheaded a successful effort to retain the AFJROTC unit at Novato High School in California. The school board was going to terminate the AFJROTC unit until Chapter leaders made calls, testified before the school board, and lined up students and parents to plead for retaining the detachment. They also circulated a flier, mobilizing the community to act. It worked! . . . Elsewhere in California, **San Bernardino Chapter** officials turned out nearly 600 people at back-to-back luncheons to hear guest speaker **Maj. Gen. Aloysius G. Casey,** Commander of the Ballistic Missile Office, and to welcome to Norton AFB **Col. Tom Eggers,** new Commander of the 63d Military Airlift Wing . . . Fifty-four **Doolittle Chapter** members donated $3,000 to support the new USO lounge facility named for General Doolittle at the Los Angeles International Airport.

"You were defeated in Vietnam; you will be defeated again!" So claimed **Col. Pavel Karsnov,** a Soviet Air Force officer who spoke recently during a meeting of the **Wichita Falls Chapter** in Texas. Speaking in broken English and calling private ownership of property "exploitation," the Soviet officer "cooked up a platter of political platitudes designed to get the audience to do a slow burn," reported Wichita Falls *Times* reporter **Carroll Wilson.** In mid-sentence, the broken English became exact and professorial, and the true identity of the speaker—**Paul Holman** of the Naval War College—became known to the restive AFA audience. "What I have given you here is what they give in their own propaganda to their own troops," he explained. During the banquet, **Sydney Gaines,** ninety, was named the first recipient of the Syd Gaines Patriotism Award. He was cited as a prime mover in the late 1940s in keeping Sheppard AFB in Wichita Falls as well as for longtime support of the base and AFA activities. Other honorees included Texoma AG Flying Service; **Robert Arnold,** Civilian of the Year; **SMSgt. Charles M. Thelan,** Airman of the Year; and **Lt. Col. Joseph D. Medlinger,** Officer of the Year.

Ruby Crites, who retired January 1 as senior vice president of Midwest Federal Savings Bank and who is Secretary/Treasurer of AFA's **David C. Jones Chapter** in Minot, N. D., was elected in June to a three-year term on the Minot School Board. Mrs. Crites is president of Companions for Children and treasurer of the Minot-Ward County Centennial Commission and serves on the board of Second Story and the Northern States Power Company Advisory Board. She is also second vice president of the Minot Symphony Association and past chairman of the public affairs committee of the Minot Chamber of Commerce . . . **Ken Robertson**—curator of the Gen. David C. Jones Room at Minot State College, which is General Jones's alma mater—reports that the room is a popular attraction on campus for students, faculty, and the community. General Jones donated memorabilia to the Chapter, which was then led by **Ruth Ziegler,** who worked out an arrangement with the College to display the items on a continuing basis. The latest addition is the transcript from the PBS television series "The Military and the Media," in which General Jones participated.

Attending the recent Arnold Air Society/Angel Flight Conclave in Pittsburgh were, from left, University of Pittsburgh President Wesley W. Posvar, AFA National President Marty Harris, former Clemson University President Bill Atchley, AFA National Director John Brosky, and Pitt Athletic Director Edward Bozik.

University of Pittsburgh Cadets William A. Hall and Lorrie S. Hall served as the Commander and Co-Commander of the Arnold Air Society/Angel Flight Conclave in Pittsburgh. The cadets are joined by Brig. Gen. William J. Grove, Jr., then AFROTC Commandant, left, AFA National President Marty Harris, second from right, and AFA National Director John Brosky, right.

Carl Vinson Memorial Chapter President **Joe Sherrill Stafford** was one of the featured speakers at the retirement banquet for **Brig. Gen. James D. Thurmond,** who was mobilization assistant to the commander of the Warner Robins Air Logistics Center. The banquet was held June 1 and also featured **Brig. Gen. Howard Brainin,** mobilization assistant to the commander, San Antonio ALC; **Maj. Gen. James McAdoo,** Vice Commander, Hq. AFRES; **Maj. Gen. James Taylor,** mobilization assistant to the commander, AFLC; and **Maj. Gen. Cornelius Nugteren,** Com-

INTERCOM

mander of Warner Robins ALC. Special guests included **Maj. Gen. Jerome Waldor,** mobilization assistant to the vice commander, AFLC; **Maj. Gen. S. T. Ayers,** mobilization assistant to the Deputy Chief of Staff for Logistics and Engineering, Hq. USAF; **Brig. Gen. George Eggert,** mobilization assistant at Hq. AFLC; **Brig. Gen. Charles Cargill,** mobilization assistant to the commander, Air University; **Brig. Gen. Tom Pochari,** mobilization assistant to the commander, Sacramento ALC; **Brig. Gen. Boyd Eddins,** mobilization assistant to the commander, Ogden ALC; and **Mr. & Mrs. Butler Brown.** Mr. Brown is a renowned Georgia artist.

"Let it loose and burn up the course" said the flier announcing the **Tacoma Chapter's** eighteenth annual golf tournament. Proceeds from the tournament help fund the Chapter's scholarship program . . . Sedona Chapter Vice President/Secretary **Ed Przybys** reported in the June 15 newsletter that Chapter membership totaled ninety-four. Total membership had reached 100 by month's end . . . **Cadet Col. Paul Castro** of Bedford, Mass., was honored by AFA's Hanscom Chapter at the sixth annual awards banquet at the Hanscom AFB Officers' Club in late May. Cadet Castro was honored as the outstanding senior cadet and will attend Boston University on a four-year AFROTC scholarship this fall, says **Richard M. Stone,** past president of the Hanscom Chapter. Mr. Stone made the presentation to Cadet Castro. Also, in a classroom ceremony, Aerospace Science Instructor **Lt. Col. Edward F. Campbell,** USAF (Ret.), presented AFA's junior medal to **Achintya Goel,** the outstanding junior cadet at Bedford High. Proud parents of the two are **Mr. and Mrs. Mabini Castro** and **Mr. and Mrs. Kanti Prasad.**

Special attendees at the Southern Indiana Chapter meeting on June 18 at the Naval Weapons Support Center, Crane, Ind., were AFA medal award winner **Robert Richmond,** his parents **Mr. and Mrs. William Richmond, Cathy Chin,** and **George Kelley.** Cadets Richmond, Chin, and Kelley are in the AFROTC program at Indiana University in Bloomington. Richmond is a Dean's List student, has soloed, and is a senior at Indiana University, reports **Marcus R. Oliphant,** President of the South Indiana Chapter . . . Jimmy Doolittle Fellowships were presented to **A. F. Jacobson, Willis A. Strauss, Lloyd H. Grimm,** and **Lyle O. Remde** (posthumously) by AFA's Ak-Sar-Ben Chapter at its "Salute to Strategic Forces" military ball held June 28 at the Red Lion Inn in Omaha, Neb. The successful event honored then CINCSAC Gen. B. L. Davis as the Chapter's "Man of the Year."

The Hanscom Chapter recently honored AFJROTC Cadet Col. Paul Castro as the outstanding senior cadet. Pictured are, from left, SMSgt. William Peters, Cadet Castro, Lt. Col. Edward Campbell, and former Hanscom Chapter President Richard Stone.

South Dakota State President John Kittelson, left, and his wife, Marcia, pause to chat with Joe Foss, who spoke at a recent dinner meeting of the Dacotah Chapter. Mr. Foss, a past national president of AFA, a former governor of South Dakota, and a former commissioner of the American Football League, is a recipient of the Medal of Honor.

"Each of us must become part-time salesmen," Pennsylvania State President **Jack Flaig** told his constituency in *The Pennsylvania Flier*—the state's new newsletter. Pennsylvania AFA "must sell [membership] to friends and acquaintances," Flaig said, "and be ready to close such a sale" with a membership application . . . **E. G. Ross,** editor of *Defense Education,* the Eugene, Ore., Defense Education Committee newsletter, said the local daily newspaper devoted "column feet" to a talk by defense analyst **Michael J. Dunn** of the Boeing Co., who discussed the Strategic Defense Initiative at a recent committee meeting. The reporter, however, suggested that Dunn's views might be suspect because his paycheck comes from a SDI contractor. By such reasoning, Mr. Ross observed, "we should not trust firemen because they are paid to put out fires—nor newsmen because they are paid to report the news" . . . Former AFA National President, former Governor of South Dakota, former

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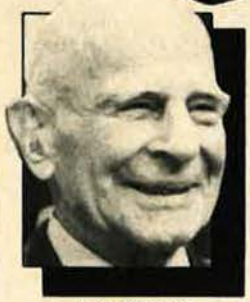

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Commissioner of the American Football League, and Medal of Honor recipient **Joe Foss** addressed AFA's Dacotah Chapter in Sioux Falls recently, reports South Dakota President **John Kittelson,** who was there with his wife, **Marcia.**

The Charles A. Lindbergh Chapter recently presented its highest honor, the Lone Eagle Award, to AFSC Commander Gen. Lawrence A. Skantze. The presentation to General Skantze was made during a dinner celebrating the fifty-eighth anniversary of Lindbergh's solo transatlantic flight.

Gen. Lawrence Skantze, Commander, Air Force Systems Command, was honored with the Charles A. Lindbergh Chapter's Lone Eagle Award during its celebration of the fifty-eighth anniversary of the Lindbergh flight. Lindbergh Chapter President **John Henry Griffin** also presented the General a Cardinal Hayes High School jacket as a memento of General Skantze's alma mater in the Bronx, at which he played basketball . . . Permanent AFA National Director **Jack Gross,** who is Treasurer of the Aerospace Education Foundation, was sitting next to **Gen. Curtis E. LeMay,** USAF (Ret.), at the Foundation's Senior Statesmen Dinner in June when he posed a trivia question. Mr. Gross asked the General if he knew who said that "timely disbursements to prepare for danger frequently prevent much greater disbursements to repel it." The former CINCSAC thought for a long minute and then said, "Was it George Washington?" An astonished Mr. Gross asked General LeMay how in the world he would know that, because it sounded so contemporary. The General replied, "Well, I know that's the way Washington felt, so I guessed it was he who would have said it."

Brandywine Chapter President **Joe Dougherty** led his troops recently to

The Holloman AFB "O" Club was the site for the **Fran Parker Chapter's** membership drive celebration, which was held on June 8 and which featured **Col. Albert C. Piccirillo,** director of the Advanced Tactical Fighter System Program Office at Aeronautical Systems Division, AFSC, Wright-Patterson AFB, Ohio, as speaker. The event was announced over KINN radio and in the Alamogordo, N. M., *News,* says **Frank Gentile** . . . **Margith A. Stipes** of O'Fallon, Ill., was awarded the Air Force Association Vice President's Citation of Excellence by **Hugh Enyart,** AFA National Vice President/Great Lakes Region, at the recent annual AFROTC Detachment 206 awards dinner. The award honors the outstanding General Military Course cadet who has demonstrated an interest in AFA. Stipes, a student majoring in speech communication at Southern Illinois University at Edwardsville, has also received the AFROTC's Recruiting Ribbon, Honors Ribbon, Outstanding Flight Award, Physical Fitness Ribbon, and Distinctive GMC Ribbon and the American Legion Scholarship Award. Said Mr. Enyart, "Cadet Stipes's father and I served together years ago, and I'm happy to report that she will serve on the Scott Memorial Chapter Council."

Brandywine Chapter members recently traveled to Dover AFB, Del., to visit the base and tour a C-5 aircraft. Pictured in the top row from left are Bill Coyle, Frank Otto, Bill Olsen, Chapter President Joe Dougherty, and Henry "Hank" Coffin III. Kneeling in front are, from left, Joe Perlman, Bill Springfield, and tour guide Lieutenant Williamson.

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Dover AFB, Del., to tour a C-5 and visit the B-17 restoration and the avionics section of the base. With him were **Henry "Hank" Coffin, Bill Coyle, Frank Otto, Bill Olsen, Joe Perlman, Bill Springfield,** and **Lieutenant Williamson** . . . **Kenneth J. Weber,** President of AFA's George C. Kenney Chapter in Connecticut, spoke out recently in a well-written editorial that he submitted to *Newsweek* magazine's "My Turn" column. The editorial concerned ABC's "Call to Glory" television show, which had just aired its final two-hour episode in late June. "Why do I care? Why don't I simply hole up with **Chuck Yeager's** book and forget TV entirely? For over thirty years—with few exceptions—I've seen military characters given short shrift on television. This time, however, they did it right. They created a believable group of characters, assembled an excellent cast of actors and actresses, and provided them with sensitive plot lines and firm direction. . . . My friends enjoyed it particularly, because it emphasized character and motivation. Whereas 'Call to Glory' is set within the Air Force lifestyle, it's not about the Air Force. It is about people—a family growing up and apart and within. It's about career choices, the stirrings of women's liberation, the sexual revolution, young people developing, and the elderly fighting to overcome the afflictions of age. It's about responsibility, racial prejudice, the impact of technology, and the beginnings of the slide into Vietnam," Mr. Weber wrote.

Karen Tilley, who worked in AFA's Communications Department as an intern last winter and who graduated from Robinson Secondary School in Fairfax, Va., in June, has been selected to attend the Naval Academy and the Air Force Academy. She has chosen to attend the Air Force Academy and to pursue a promising engineering career. She follows in the footsteps of **Ann Harrison,** another Communications Department intern, who now flies C-9s out of Scott AFB, Ill. . . . AFSC's Foreign Technology Division at Wright-Patterson AFB, Ohio, was awarded an AFA Presidential Citation recently. AFA Board Chairman **David Blankenship** and Wright Memorial Chapter President **Clyde Autio** presented the prestigious honor to **Col. Earl A. Pontius,** Commander, during the Division's twelfth annual awards banquet. The men and women of the Division were honored for "many years of dedicated support to national defense, airpower, public awareness, and community service."

Wright Memorial Chapter President Clyde Autio, left, and AFA Board Chairman David Blankenship, right, join to present an AFA Presidential Citation to the men and women of the Foreign Technology Division. Accepting the Citation is FTD Commander Col. Earl A. Pontius.

John Stennis Chapter member **Hector M. Rosado** has won his fifth honor from the Freedoms Foundation at Valley Forge. The award is his second George Washington Honor Medal, which he won in the reservist category for an essay on "Citizenship: My Rights and Responsibilities." In addition, Mr. Rosado has three George Washington Honors Certificates . . .

Some 1,200 turned out for the Chicago Armed Forces Ball on May 18, which featured **Hon. John O. Marsh, Jr.,** Secretary of the Army, as speaker, reports **Lt. Col. Ben Minardi,** CAP Air Inspector, Illinois Wing. ■

UNIT REUNIONS

Air Weather Service Ass'n
Air Weather Service personnel will hold a reunion on October 11–13, 1985, in Monterey, Calif. **Contact:** Milt Sipple, 2589 Dumbarton Ave., San Jose, Calif. 95124. Phone: (408) 267-2555.

Confederate Air Force
The Confederate Air Force Airsho 85 will be held on October 10–13, 1985, at the Confederate Air Force Flying Museum Headquarters at the Rio Grande Valley International Airport in Texas. **Contact:** Rex Garrett, P. O. Box CAF, Harlingen, Tex. 78551. Phone: (512) 425-1057.

Grim Reapers Ass'n
Members of the 13th Bomb Squadron "Grim Reapers" who served in Korea will hold a reunion on October 3–5, 1985, in Cocoa Beach, Fla. **Contact:** Grim Reapers Association (Korea), 250 E. Hazelwood Lane, #20, Lemoore, Calif. 93245.

Tactical Recon
Tactical reconnaissance units will hold their reunion on October 4–6, 1985, in Las Vegas, Nev. **Contact:** Gene Roberts, 9111 Stephen Ave., Las Vegas, Nev. 89129.

USAFSS/ESC Alumni Ass'n
Members of the US Air Force Security Service/Electronic Security Command (USAFSS/ESC) and the USAFSS/ESC Alumni Association will hold a reunion on October 5–6, 1985, in San Antonio, Tex. **Contact:** USAFSS/ESC Alumni Association, 6960th ESW/CC, San Antonio, Tex. 78243-5000.

36th Fighter Group
The 36th Fighter Group, comprising the 22d, 23d, and 53d Fighter Squadrons, will hold a reunion on October 10–13, 1985, at the Best Western Motel in Denver, Colo. **Contact:** George Brooks, 4710 Marigold Ave., Louisville, Ky. 40213. Phone: (502) 969-7512. Ernest Hess, 1116 S. Chesley Dr., Louisville, Ky. 40219. Phone: (502) 969-6189.

Class 42-A
Members of the Cadet Flying Class 42-A (Brooks Airfield, Tex.) will hold a reunion on October 18–20, 1985, at the Washington Marriott Hotel in Washington, D. C. **Contact:** Lt. Col. Murry Schott, USAF (Ret.), 4960 Sentinel Dr., #103, Bethesda, Md. 20816.

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45th Air Depot Group
The 45th Air Depot Group and attached units will hold a reunion on September 12–15, 1985, at the Sheraton-Springdale in Springdale, Ohio. **Contact:** Charles F. Guemelata, 119 Aigler Blvd., Bellevue, Ohio. Phone: (419) 483-4371.

48th Troop Carrier Squadron
Members of the 48th Troop Carrier Squadron, 313th Troop Carrier Group, will hold a reunion on October 3–6, 1985, at the Sheraton Downtown Hotel in Charleston, S. C. **Contact:** Bob Snider, 7527 Shoup Ave., Canoga Park, Calif. 91307. Phone: (213) 346-7384.

53d Troop Carrier Squadron
The 53d Troop Carrier Squadron will hold its reunion on October 9–12, 1985, in Peoria, Ariz. **Contact:** Bill W. Elliott, 6110 E. 5th St., Apt. 319, Tucson, Ariz. 85711. Phone: (602) 790-0275.

55th Fighter Group
Members of the 55th Fighter Group, comprising the 37th, 38th, 54th, 338th, and 343d Fighter Squadrons, and the 442d Air Service Group will hold a reunion on October 3–6, 1985, at the Antlers Hotel in Colorado Springs, Colo. **Contact:** Michael Alba, 5601 Mosquito Pass Dr., Colorado Springs, Colo. 80917. Dean E. Tracy, 9328 23d N. W., Seattle, Wash. 98117. Phone: (206) 784-5853.

66th Fighter Wing Ass'n
Members of the 66th Fighter Wing who went stationed at Duxford and Sawston Hall, Cambridge, England, during World War II will hold a reunion on October 4–6, 1985, at the Day's Inn Motel at the Philadelphia Airport in Philadelphia, Pa. **Contact:** Carroll M. "Bo" Bowman, 4824 Killdeer Circle, Roanoke, Va. 24014. Phone: (703) 989-1996.

96th Bomb Group
The 96th Bomb Group stationed at Snetterton Heath, England (1943–45), will hold its reunion in conjunction with that of the 8th Air Force Historical Society on October 17–20, 1985, in Wichita, Kan. **Contact:** Thomas L. Thomas, 1607 E. Willow Ave., Wheaton, Ill. 60187.

313th Troop Carrier Group
Members of the 313th Troop Carrier Group, comprising the 29th, 48th, and 49th Troop Carrier Squadrons, will hold a reunion on October 3–5, 1985, at the Sheraton Downtown Hotel in Charleston, S. C. **Contact:** C. R. Hills, 6997 Ellsworth Circle, Fair Oaks, Calif. 95628. Phone: (916) 961-1668. R. F. "Pappy" Laird, 3350 Ben Lomond Dr., Sacramento, Calif. 95821. Phone: (916) 487-3491.

339th Fighter Squadron Ass'n
The 339th Fighter Squadron (World War II and Korea) will hold a reunion on October 17–19, 1985, in San Antonio, Tex. **Contact:** Richard Cowles, 745 Harrison St., Belding, Mich. 48809.

353d Fighter Group
The 353d Fighter Group, comprising the 350th, 351st, and 352d Fighter Squadrons, and the 440th Air Service Group will hold a reunion on October 2–5, 1985, at the Ramada Inn in North Charleston, S. C. **Contact:** Charles Graham, Army and Navy Club, 1625 Eye St., N. W., Suite 123, Washington, D. C. 20006-3098.

370th Bomb Squadron
The 370th Bomb Squadron of the 307th Bomb Group will hold a reunion on September 26–28, 1985, at the Dayton North Holiday Inn in Dayton, Ohio. **Contact:** Ira Anderson, Jr., 1800 Sybil Lane, Tyler, Tex. 95703. Phone: (214) 561-2832.

410th Bomb Group
Former members of the 410th Bomb Group stationed at Gosfield, England, and Coulommiers, France, from 1944–45 will hold a reunion on February 27–March 1, 1986, in Orlando, Fla. **Contact:** Edward D. Dionne, P. O. Box 222, Olympia Fields, Ill. 60461. Phone: (1-312) 747-2211.

421st Night Fighter Squadron
Members of the 421st Fighter Squadron will hold a reunion on September 26–28, 1985, at the Stouffer's Hotel in Dayton, Ohio. **Contact:** Al W. Lockard, 3101 Tigertail Dr., Los Alamitos, Calif. 90720. Phone: (213) 598-9151. Paul Zimmer. Phone: (513) 293-7642.

486th Bomb Group
The 486th Bomb Group will hold its annual reunion on October 17–20, 1985, in Wichita, Kan. **Contact:** Robert H. Nolan, 2676 Augusta Dr., N., Clearwater, Fla. 33519. Phone: (813) 784-9661.

492d Bomb Group
Members of the 492d Bomb Group will rendezvous with the 8th Air Force Historical Society on October 17–20, 1985, in Wichita, Kan. **Contact:** Elmer W. "Bill" Clarey, 2015 Victoria Court, Los Altos, Calif. 94022. Phone: (415) 961-0231.

529th Aircraft Control and Warning
The 529th Aircraft Control and Warning Group and all attached squadrons will hold a reunion on October 9–11, 1985, at Wright-Patterson AFB, Ohio. **Contact:** Col. Nester E. Cole, USAF (Ret.), 2732 Warwick Dr., Bloomfield Hills, Mich. 48013.

560th Signal Aircraft Warning Ass'n
Veterans of the 530th, 560th, 561st, and 562d Signal Aircraft Warning Squadrons organized at Drew Field, Fla. (1941–42), will hold a reunion on October 18–20, 1985, in St. Louis, Mo. **Contact:** M. Lee Cordell, 1909 Kenilworth Ave., Berwyn, Ill. 60402.

4925th Test Group/Wing
The first reunion for members of the 4925th Test Group/Wing will be held on May 8–10, 1986, in Albuquerque, N. M. **Contact:** John "Doc" Hardison, 2556 Chi-

cago St., Apt. 10, San Diego, Calif. 92110. Phone: (619) 276-6899.

Kingman AAF

I would like to hear from anyone who served at Kingman AAF and who would be interested in holding a reunion.

Please contact the address below.

James M. Feeney
4415 N. Henley Court
Westlake Village, Calif. 91361

1st Aeromedical Evacuation Squadron

Members of the 1st Aeromedical Evacuation Squadron (AES) stationed at Pope AFB, N. C., would like to hear from former members of this squadron who would be interested in holding reunions.

Please contact the address below.

Capt. Carolyn A. Shook, USAF
1st AES
Pope AFB, N. C. 28308-5800
Phone: (919) 394-2685
AUTOVON: 486-2685

Class 43-E

I would like hear from pilots of Class 43-E (Williams Airfield, Ariz.) for the purpose of planning a reunion.

Please contact the address below.

A. W. Lockard
3101 Tigertail Dr.
Los Alamitos, Calif. 90720

Classes 1941–45

I am interested in hearing from cadets and instructors from the classes of 1941–45 for the purpose of planning next year's reunion.

Please contact the address below.

Jack Hays
226 Rio Vista Dr.
King City, Calif. 93930

773d Troop Carrier Squadron

I would like to hear from former officers of the 773d Troop Carrier Squadron who were stationed at Ardmore AFB, Okla. We are planning a reunion to be held in 1986.

Please contact the address below.

Brig. Gen. James G. Silliman, USAF (Ret.)
1123 Grey Oak
San Antonio, Tex. 78213

913th Air Refueling Squadron

I would like to hear from former members of the 913th Air Refueling Squadron who would be interested in holding a reunion.

Please contact the address below.

Reg Adams
Bossier Chamber of Commerce
710 Benton Rd.
Bossier City, La. 71111
Phone: (318) 746-0252

1877th Communications Squadron

A reunion is in the planning stages for former members of the 1877th Communications Squadron, stationed in Bien Hoa, Vietnam (1968–70).

Please contact the address below.

Phillip J. Miller
29 Richman Rd.
Hudson, N. H. 03051

AFA CHAMPLUS® .... Strong Protectio

When a Single Accident or Illness Could Cost *You* Thousands of Dollars, You Need AFA CHAMPLUS®. . . for *Strong* Protection against Costs CHAMPUS Doesn't Cover!

For military retirees and their dependents . . . and dependents of active-duty personnel . . . more and more medical care is being provided through the government CHAMPUS program.

And, of course CHAMPUS pays 75% of allowable charges.

But today's soaring hospital costs—nearly $550 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. (There are some exceptions for older age children. See "Exceptions and Limitations".)
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. (There are some exceptions for older age children. See "Exceptions and Limitations".)

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 premiums time, and the master contract remain force, your insurance cannot be c celled.

ADMINISTERED BY YOUR ASSOCIATION . . . UNDERWRITTEN BY MUTUAL OF OMAHA

AFA CHAMPLUS® insurance is adm istered by trained insurance professior on your Association staff. You get pron reliable, courteous service from pec who know your needs and know ev detail of your coverage. Your insuranc underwritten by Mutual of Omaha, largest individual and family health ins ance company in the world.

AFA OFFERS YOU HOSPITAL BENEFITS AFTER AGE 65

Once you reach Age 65 and are cove under Medicare, AFA offers you prot tion against hospital expenses not c ered by Medicare through the *Senior Benefit Plan* of AFA Hospital Indem Insurance. Members enrolled in A CHAMPLUS® will automatically rece full information about AFA's Medicare s plement program upon attainment of A 65 so there will be no lapse in covera However, no Medicare supplement be fits can be issued to residents of state of Georgia.

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 $7.10 per day subsistence fee, not covered by CHAMPUS.	CHAMPLUS® pays the $7.10 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 $7.10 per day, whichever is greater.	CHAMPLUS® pays the greater of $7.10 per day or $25 of the reasonable hospital charges not covered by CHAMPUS
Inpatient military hospital care	The only charge normally made is a $7.10 per day subsistence fee, not covered by CHAMPUS.	CHAMPLUS® pays the $7.10 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, pharmaceuticals and other professional services.

There are some reasonable limitations and exclusions for both inpatient and outpatient coverage. Please note these elsewhere in the plan description.

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®

EXCEPTIONS & LIMITATIONS

Coverage will not be provided for conditions for which treatment has been received during the 12-month period prior to the effective date of insurance until the expiration of 12 consecutive months of insurance coverage without further treatment. *After coverage has been in force for 24 consecutive months, pre-existing* conditions will be covered regardless of prior treatment. Children over age 21 (age 23 if in college) will continue to be eligible if they have been declared incapacitated and if they were insured under CHAMPLUS® on the date so declared. Coverage for these older age children will be provided at slightly higher rates upon notification to AFA.

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

j) 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	$21.88	$27.35	$14.85
50–54	$32.70	$40.88	$14.85
55–59	$39.78	$49.73	$14.85
60–64	$45.80	$57.25	$14.85

Inpatient and Outpatient Benefits

Under 50	$30.82	$36.98	$37.13
50–54	$42.35	$50.82	$37.13
55–59	$56.01	$67.21	$37.13
60–64	$64.48	$77.38	$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 $18 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

Form 6173GH App.

Application must be accompanied by a check or money order. Send remittance to: Air Force Association, Insurance Division, 1501 Lee Highway, Arlington, VA 22209-1198

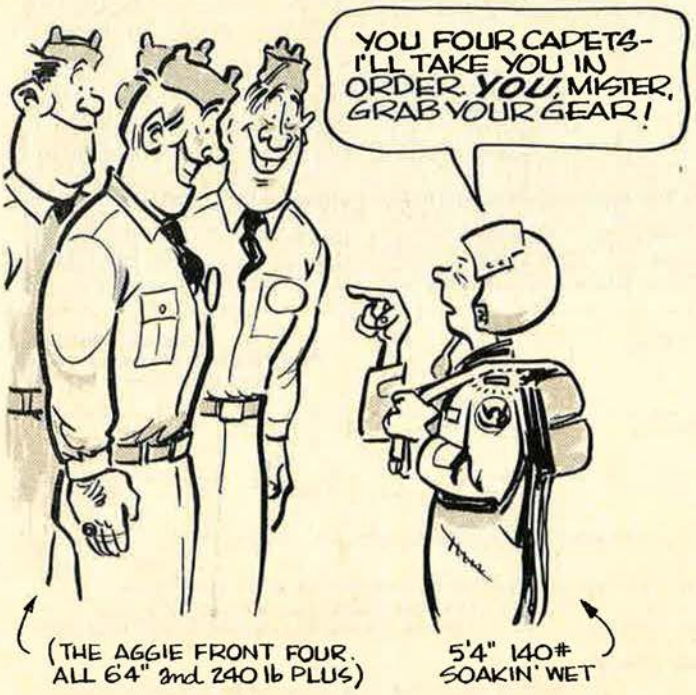
9/85

Bob Stevens'

"There I was..."

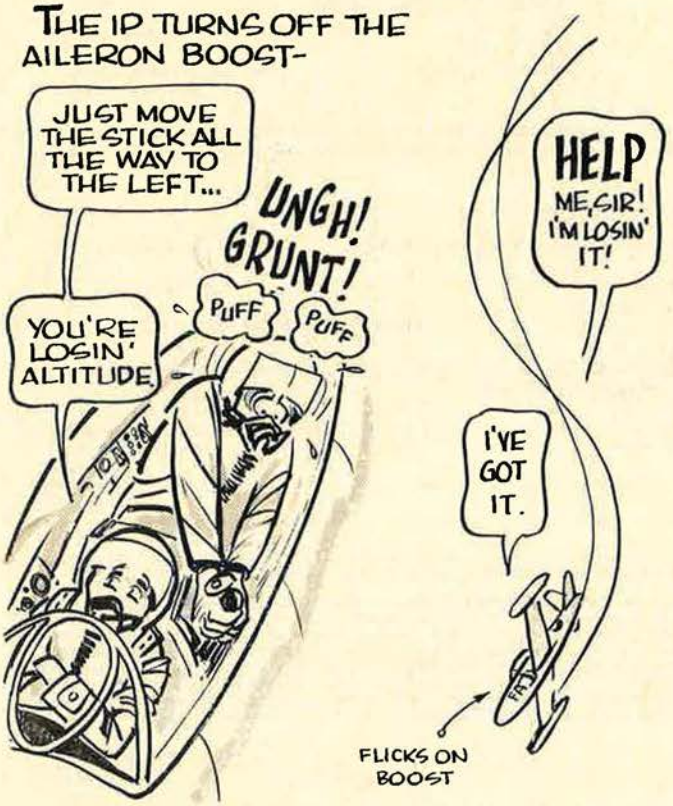
IT'S BACK TO "DIRTY-TRICKS-IN-THE T-33" TIME. THAT GRAND OL' BIRD WAS DESIGNED WITH PRACTICAL JOKERS IN MIND. THIS EPISODE INVOLVING A SMALLISH IP and BEHEMOTH AF R.O.T.C. CADETS ILLUSTRATES THE POINT—

ORIENTATION RIDES - BIG SPRING, TEX.



AS SOON AS ALTITUDE PERMITTED, THE IP WOULD FLICK THROUGH A FAST AILERON ROLL WITH BOOST ON.

THE IP TURNS OFF THE AILERON BOOST-



AND SO IT WENT, CADET AFTER CADET-

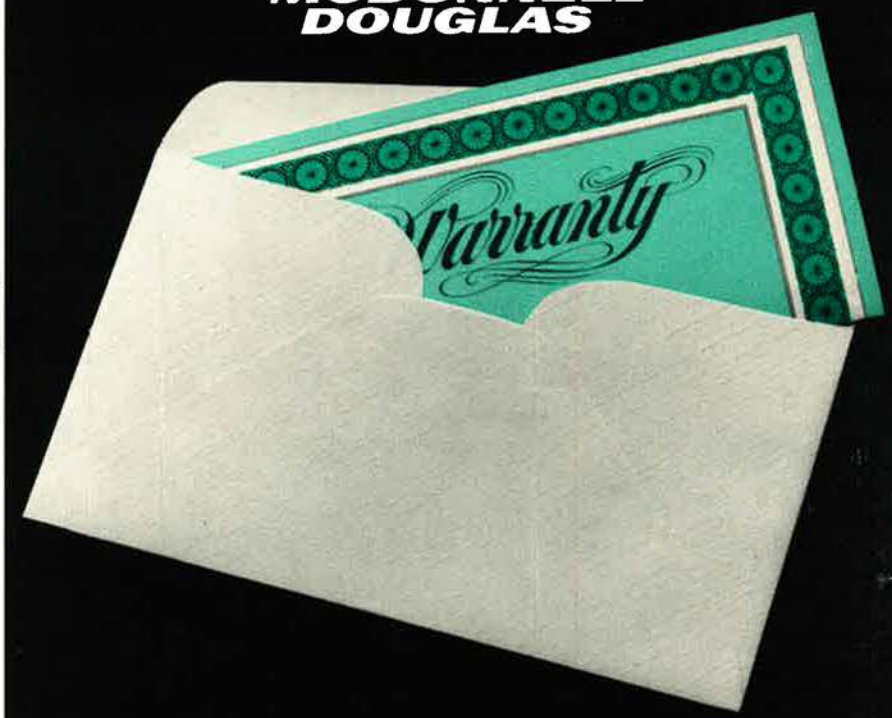
C-17

"C" as in confidence

NEW AIRLIFTER'S WARRANTY IS AN INDUSTRY FIRST.

The C-17, now in development, is scheduled to fly in 1989. Specs for aircraft performance, structural life, reliability, maintainability, and availability will be achieved—or we'll foot the bill for corrections. We're that confident.

MCDONNELL DOUGLAS



PROUDLY WE HAIL.

E-SYSTEMS

The problem solvers.

DALLAS, TEXAS

Buy U.S. Savings Bonds.