NOVEMBER 1983/$1

AIR FORCE MAGAZINE

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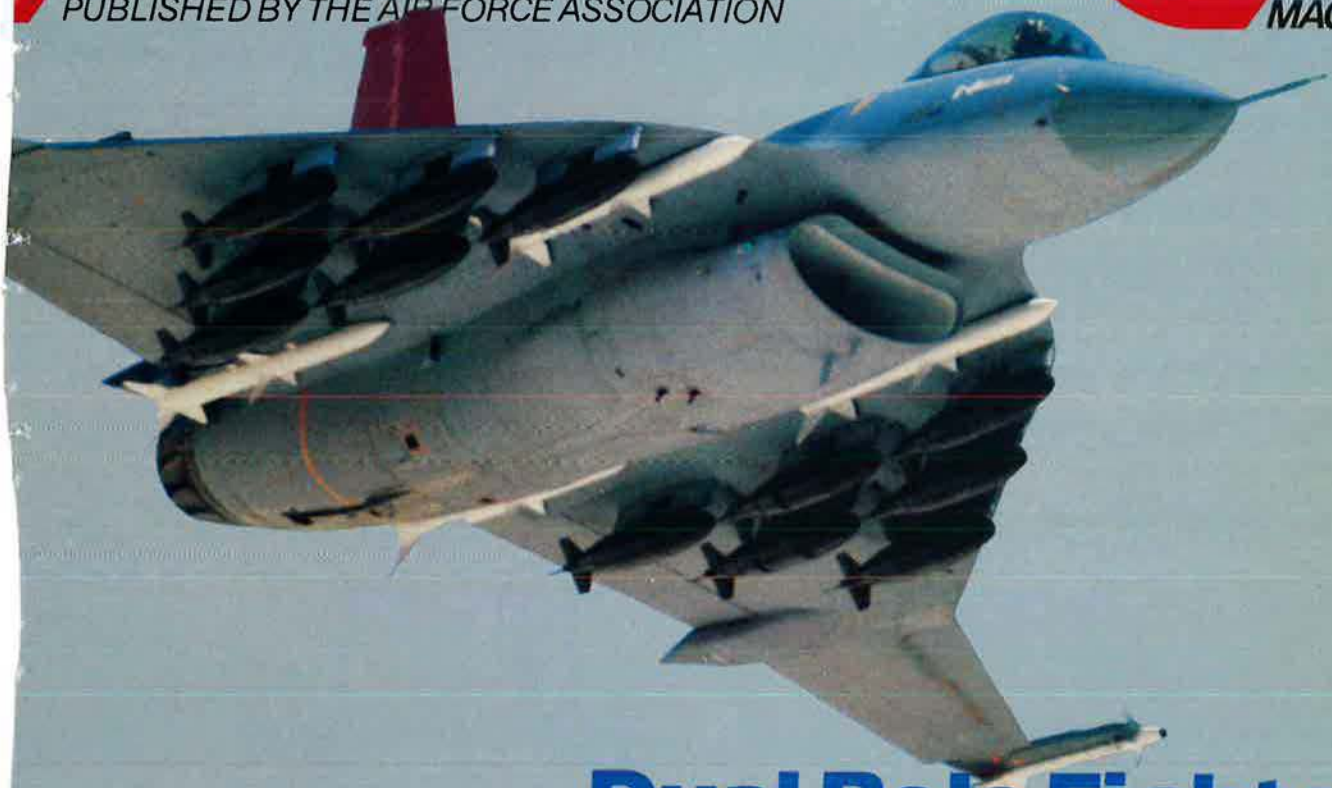
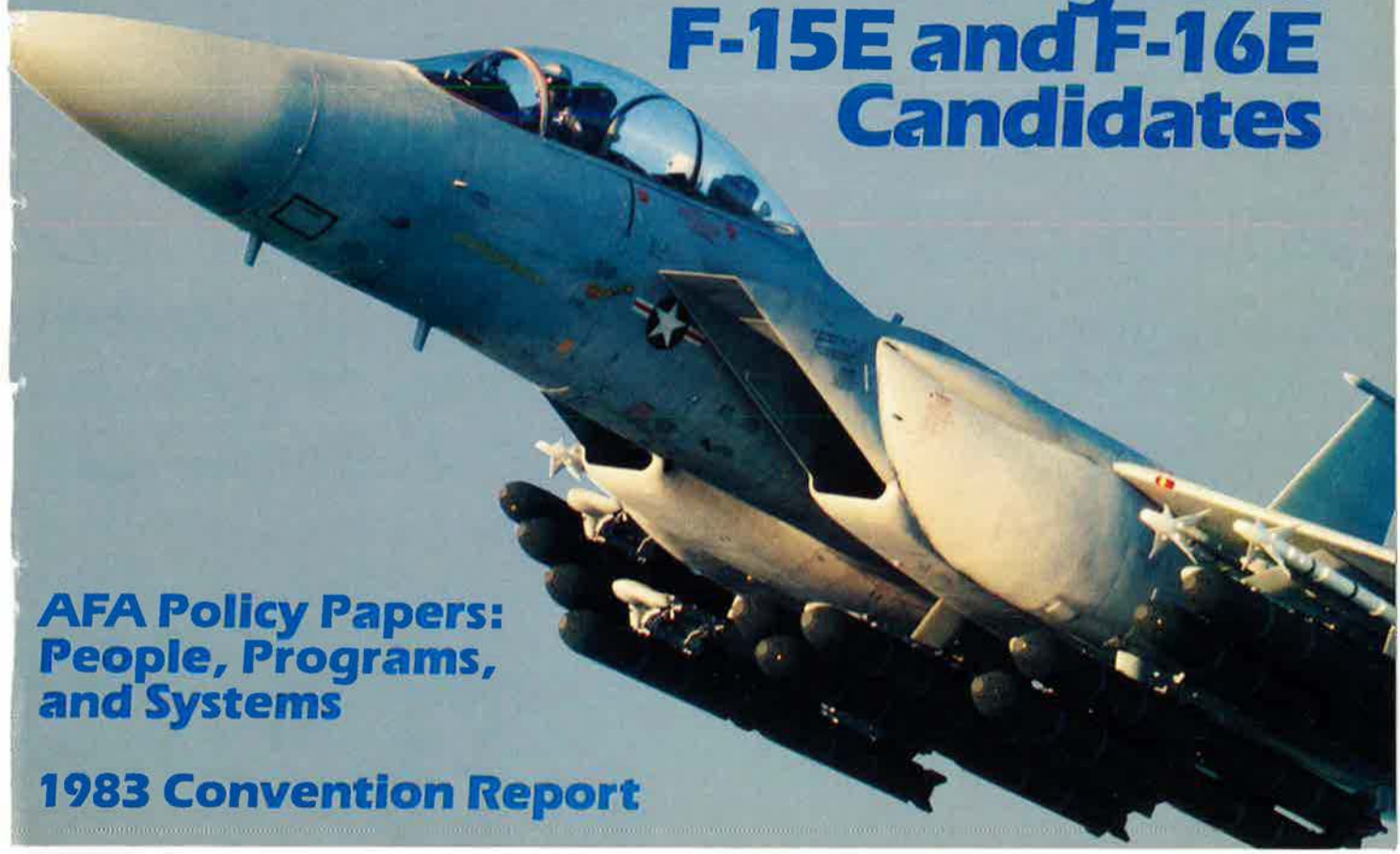


Dual Role Fighter: F-15E and F-16E Candidates



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1983 Convention Report

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In flight testing, the F101 D (now designated F110) has dem strated equally impressive operabil durability and reliability results pow ing the Navy's F-14 Super Tom

Result: a higher state of mi sion readiness.

All this plus lower operating costs

Why? Higher reliability.

nvelope with no throttle
And for good reasons.

Simpler, more durable parts that will keep USAF fighters in the air. Fewer and less expensive maintenance actions. And components that are easily accessible and quickly serviced.

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For lots of good reasons.

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About the cover: Pilot reports on the F-15E and F-16E fighter candidates begin on p. 43. The contender selected will replace F-4s and augment specialized F-111s and F-15s in a dual air-to-air and deep interdiction role.

Special Section: AFA National Convention

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Departments

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AN EDITORIAL
Change and Continuity

NOTHING is more constant than change, and some changes have occurred recently at AIR FORCE Magazine that position it well for the future. Unless you are a devoted reader of the fine print on the masthead to the left of this text, they might have escaped your notice.

First, James W. Canan joined the staff as Senior Editor in mid-September. His many years with McGraw-Hill World News' Washington bureau established Jim in the very top rank of correspondents covering national security affairs. In addition to his solid reporting in the McGraw-Hill magazines (mainly *Business Week*) for seventeen years, Jim wrote two justly acclaimed books on topics of special interest to Air Force Association members. The first is *The Superwarriors,* published in 1975 about defense research and development; the second, published in hardcover in 1982 and in paperback early next year, is *War in Space.* The latter is especially commended to all AFA members as the most objective explanation available of the current and future happenings in space, and how US national security will be affected. Jim's debut in these pages was "Up From Nifty Nugget," in the September issue. He's deep into preparation of a series of feature articles that will add breadth and depth to the understanding of this magazine's readers on matters of Air Force and national security concern.

Three other moves occurred simultaneously on October 1. Russell E. Dougherty, AFA's Executive Director and Publisher of the magazine, assumed the additional role of Editor in Chief. He needs no new introduction to AFA members or the Air Force community at large. His accomplishments are already renowned. The big advantage of his assumption of the Editor in Chief's role is the probability that his unique insights and global perspectives will appear from time to time as editorials. That's a large plus for the Air Force Association, its members, and the nation.

John T. Correll, who has been Senior Editor since August 1982, has been promoted to Executive Editor, and is responsible for the daily operations of the magazine. John's potential was obvious in 1971–72, when he was the first Education With Industry officer to spend a year on the magazine staff. His subsequent Air Force career and his time with the magazine now have justified the expectations he created then. John has been a source of great strength and multiple accomplishments since rejoining the staff, and now, with the plans he has laid for 1984 and beyond, magazine readers will see more evidence of that.

Finally, I have left for a new opportunity in Washington. That's as Executive Vice President of Interavia (USA) and its chief US editor. It is a new US subsidiary of the fifty-year-old Interavia Publishing Group of Geneva. The firm publishes the monthly magazines *Interavia Aerospace Review* and *International Defense Review,* the daily *Interavia Air Letter,* annual directories of aerospace and defense, and a series of specialized data publications. The new job is an exciting prospect indeed. I'm sorry to leave this magazine. But I do so with the knowledge that provisions have been made to keep it moving upward in all ways, and with gratitude for the privilege and honor of serving AFA, its elected leaders, and its executive directors over these last few years. As a Life Member of the Air Force Association, I'll keep involved with AFA and continue to support its important role in the affairs of this great nation.

My heartfelt thanks to all of you.

F. CLIFTON BERRY, JR.

Converting ARC-186 to SINCGARS is little more than putting on a good front.

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

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As aircrews can attest, Sparrow and Sidewinder air-to-air missiles are indeed powerful friends in tight spots. Friends a pilot can count on.

Sparrow AIM-7F, besides proving itself in combat, has continued to demonstrate outstanding launch reliability. Meanwhile the latest version, Sparrow AIM/RIM-7M, has successfully completed the final phase of Operational Test and Evaluation with missile firings from fighter aircraft and naval surface vessels. During this test phase, all reliability goals were met and the newest Sparrow has been approved for service use on the F-4, F-14, F-15, and F-18 aircraft.

The AIM/RIM-7M has a new guidance and control section and is now in full production at Raytheon. It features an advanced monopulse seeker and digital signal processor for improved look-down, shoot-down capability in severe clutter and ECM environments.

Sidewinder, the short-range, heat-seeking missile, has been called man's best friend in a dogfight. And rightly so. The dependable AIM-9L has proved its all-aspect, launch and leave capability. This Navy-designed Sidewinder is on all U.S. first-line fighters and increasing numbers of other free-world aircraft. Sidewinder is also on fixed-wing attack aircraft and helicopters as a self-defense weapon.

For the newest generation Sidewinder, the AIM-9M, Raytheon, as a prime industrial support contractor, is currently delivering the guidance and

Sparrow and Sidewinder. It pays to have reliable

control section. It provides improved seeker acquisition and counter-countermeasure performance.

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AIRMAIL

Flight 007

I feel I must add my voice to the millions across the country and around the world in expressing my sorrow and indignation for the 269 victims of KAL Flight 007.

The motivation for this vicious and cowardly attack will forever remain incomprehensible to the civilized world. No official reaction on the part of the United States could be inappropriate in its severity. It would not be unfair to the Soviets for us to respond by declaring war, or by ending diplomatic relations, or by instituting an economic blockade. These responses will most likely be avoided because of the hardships they would impose on the American people.

The most lasting effect of this tragedy will be on the thinking of the American people themselves. Every one of us is now open to the realization that had we or someone we loved been aboard Flight 007, the Soviet response would have been exactly the same: murder. The Soviets have thrown away the good will of the most generous people in history. They have done more harm to their own cause than they will ever be able to understand; they have shown a divided America not only *who* our enemy is, but *what* it is—contemptible.

The Soviets have sown the wind deep in the minds of the American people. Someday we will see them reap the whirlwind.

Robert F. Mulligan, Jr.
Westbury, N. Y.

Lessons of the Past?

In December 1958, I listened to a West Coast group explain to General Irvine, then DCS/Materiel, the shortfall in logistics support to a missile deployed to Europe. After an hour of platitudes, he commented, "You've insulted me, you haven't even offered any new excuses." There were other more pungent comments, not quotable here. I suspect his comments, had he accompanied [then] Senior Editor John T. Correll on his review of logistics in the September issue of AIR FORCE Magazine, would have been just as pointed.

Most of my thirty-odd years were in USAF logistics, and a great part of those years was spent in AMC/AFLC. I am dismayed at the approaches described in the September 1983 issue. The new breed of logistician (no one mentioned in the articles now in AFLC was to my knowledge in the logistics business nine years ago) seems to be trying to repeat the mistakes of the past. . . .

Let's provide a few examples. Weapon Systems Management under Vol. XX, AFM 67-1, began in late 1957. Numerous studies in the early 1960s characterized it as costly, unresponsive, and unmanageable. It was abandoned. "Everyone has a piece of the action but no one is held responsible for accurate requirements forecasting" is a quotation from the Corona Require report. Yet the AFLC Commander superimposes 585 people in a Logistics Operations Center who "will know everything and devise schemes for . . . getting the job done."

Once again, some supermanager is going to second-guess the item manager at the depot. If the Corona Require team had reviewed the item manager's job description, they would have found clear-cut, unequivocal statements about responsibility.

Your article "AFLC Prepares for War" is highly critical of the DO41 requirements forecasting system, characterizing it as "wheezy," outdated, and unresponsive. I had some very small part in devising this system, which went into production in 1964. At the time it was touted by DoD (including Lloyd Moseman) and [the Bureau of the Budget] as "state of the art." The system has served USAF well, but it can be improved. As a matter of information, I have a copy of the final test run of Process AO-7 developed under ALS that was to replace the DO41 and a number of other systems. My copy is dated May 24, 1974, and is autographed by the AFLC design team. Maybe the original programming of Process AO-7 is still available. As recognized by the Corona Require team, the requirements process is extremely complex. I hope the new breed of logistician understands it.

Comments about the need for new data systems refer to abandonment of the Advanced Logistics System (ALS) in the mid-1970s. Your description of the system and its demise is somewhat inaccurate. Suffice to say that when I retired on May 31, 1974, the ALS had several processes on line and working. One of these was a management information system that provided daily reports on weapon-system readiness by system, theater, base, type, and model within a system, and even down to tail numbers. Why ALS is not running (even though it is at San Antonio for certain classified weapons) is an intriguing question that will probably never be answered. For the record, the Scientific Advisory Board (SAB) advised in April 1974 that it was making satisfactory progress with an excellent outlook.

Even USAFE seems blind to the past. When I read of Hubs and Spokes and EDS in the article "Warfighting in Europe" in the same issue, I felt the sands of Nouasseur, the mud of Châteauroux, and the dreary fogs of Burtonwood. I wonder if anyone at Wiesbaden now remembers those wonderful stations or the European Air Transport Service (EATS). The total scenario is the same, only the players have changed.

Logistics objectives haven't changed over the years—"get there fustest with the mostest" is still fundamental. Logisticians do change, and it seems most unfortunate that most of them seem unwilling to learn the lessons of the past.

Maj. Gen. James A. Bailey,
USAF (Ret.)
Jacksonville, Fla.

Reinforcing NATO

Nifty Nugget *("Up From Nifty Nugget," September '83 issue, p. 82)* improved our myopia but not our tunnel vision. We persist in the delusion that US reinforcement of NATO ground forces in a crisis will matter much. Europe's active and reserve ground forces will still make up ninety-seven

percent of NATO's total there. That ninety-seven percent, if properly equipped, trained, supplied, led, and coordinated, should be more than adequate. Unfortunately, the emphasis seems to be on our three percent.

If the cavalry does ride to the rescue, it will not be in M-1 tanks but in our thousands of combat aircraft and helicopters (we have the lion's share of NATO's totals). Airlift can be critical in keeping the aircraft supplied with spares, ordnance, and crews. Most other pretexts for more airlift should be dropped.

The most disturbing lesson of all this is that it takes a Nifty Nugget or a war to discover the obvious or to get people to admit it.

Paul J. Madden
Seattle, Wash.

Not a Prayer?

In the recent past, much has been written about the overpricing of military spare parts. Now I finally understand why the military pays such exorbitant prices to suppliers for the products it uses.

The reason was fully illustrated on the cover of the September 1983 issue of AIR FORCE Magazine. Shown there almost big as life was a machinist producing a single common hex nut on an engine lathe.

If this is an example of the Air Force's idea of "Tailoring Logistics to Wartime Thinking," this country doesn't have a prayer in the face of war or a balanced budget.

Arthur E. Ball
Salt Lake City, Utah

• *The photo was taken at Bitburg AB, Germany, where resourceful maintenance people fabricated a part they needed—and that was not readily available—in order to get a fighter aircraft back in operation.*—THE EDITORS.

Combat Flying in China

I read with great interest the article "They Said It Couldn't Be Done" by John L. Frisbee in the September '83 issue of AIR FORCE Magazine about John Alison's combat tour with the 75th Fighter Squadron.

I joined the 75th Fighter Squadron in the spring of 1944 as a second lieutenant. This was almost two years after John Alison had joined the 75th. What is so vivid in my memory is the fact that, almost two years after the formation of the China Air Task Force, I was flying P-40Es.

It was during these early days of flying out of Lingling that each of the pilots assisted in the fueling of their aircraft in the revetment areas. Refueling was handled by Chinese labor, in which the gasoline was transferred by tipping over a fifty-five-gallon drum into a five-gallon can, from which it was poured into the fuel tanks through a chamois. You can well imagine the time that it would take to fuel a couple of flights of P-40s. All the time we pilots stood around in some wonderment at this entire procedure.

Finally we were introduced to the bamboo belly tank, which had been fabricated locally by the Chinese. Sometimes these tanks worked, and very often they leaked. We had so few American-made belly tanks during this period of intense activity that we were forbidden to drop the external tank unless actually engaged in aerial combat.

It was on one such mission flying from the Lingling field with one of these homemade bamboo tanks that I was justified in jettisoning the tank during my engagement, during which I shot down a Japanese Val dive bomber.

All of us who experienced a combat tour in China with Fourteenth Air Force continue to be amazed at the stories that emerge after all these years.

Robert S. Peterson
Minneapolis, Minn.

Langley North

I read with interest 2d Lt. Ron Lovas's item "'Langley North'—A Total Success," in the September '83 issue *(p. 39)*.

The Langley-Alpena connection conjured up memories of the summer of 1940 when the 2d Bomb Group and the 25th Bomb Group from Langley ran a joint maneuver with the 1st Pursuit (yes, the 1st existed then) and the 27th Pursuit from Selfridge Field. After gaggling around in the air, all went and landed at Collins Field in Alpena, which was then a little grass strip—little more than a tiny civilian airport. This involved about fifteen B-17s (B-17B and YB-17 models) and two groups of Seversky P-35s.

The P-35 was a nervous little beast on landing, and the bomber boys derived a good deal of entertainment out of watching them come in, while the pursuit types were somewhat overawed watching the -17s squeeze in. The *pièce de résistance,* however, came at the last when Maj. Caleb V. Haynes brought up the rear with the mammoth XB-15, the biggest airplane the Air Corps had. As it came floating in on final, I heard a fighter type fervently murmur, "Christ!"

Those were the days when we had to reach out to four or five bases from coast to coast to scrape up enough airplanes for an aerial review, let alone a maneuver. But, as John L. Frisbee pointed out in his excellent article on the subject *("The GHQ Air Force," p. 161),* the GHQ Air Force accomplished a lot with precious little.

Certainly, we've come a long way, baby!

Lt. Col. Mitchell J. Mulholland,
USAF (Ret.)
Becket, Mass.

Ah, the Basics!

I enjoyed your "There I Was . . . " in the September 1983 issue of AIR FORCE Magazine.

I have a manual of aviation practice—*Learning to Fly in the U.S. Army,* first edition, second impression, printed 1917—that covers the "History of Aviation" (Chapter I) to "Inspection of Airplanes" (Chapter XI).

Much of the manual is similar to your newsletter. For example, in discussion of "Starting Off," the manual states: "Assistance will be had for the start from the mechanics, or, if away from the airdrome, from bystanders," and, further on, "In the case of cross-country flying, the pilot will rise to the height of 2,000 feet, circling over the field rather than flying off in a straight line, so that preparatory to his start he always has the flying field in reach."

Flying, like all else, has changed.

R. A. Reed
Merritt Island, Fla.

Drew's Me 262s

With regard to your article in the August 1983 issue of AIR FORCE Magazine about the award of the Air Force Cross to Urban L. Drew *("World War II Ace Receives Air Force Cross," p. 29):*

While not wishing to detract from his accomplishments or pass over the fact that the military was in error for not awarding his medal earlier, I believe that he was not the first Allied pilot to shoot down an Me 262. I believe this feat was credited to Maj. Joseph Myers and Lt. M. D. Croy of the 82d Fighter Squadron. On August 28, 1944, these two pilots shot down, near Brussels, an Me 262A-2a that was flown by Feldwebel "Ronney" Lauer. . . .

Your remark on the sinking of a six-engine flying boat also deserves comment. The aircraft sunk was the BV 238 V1. It was sunk at its moorings on Lake Schaal in the late summer of 1944.

However, it was not the only six-engine flying boat in with the German forces at the time. There were several BV 222C maritime reconnaissance six-engine flying boats remaining. . . . After Germany's surrender, two air-

craft of these were captured intact and flown to the US, one was captured by British forces and flown to the UK, and four more of the flying boats were destroyed. . . .

Harold W. Arnold, Jr.
Pease AFB, N. H.

• *Reader Arnold is correct. The information we received from the Air Force was incorrect. What should have been reported was that Mr. Drew was the first Allied pilot to shoot down two Me 262s in one day.*—THE EDITORS.

Medicine to the Troops

Reading of the accomplishments of Capt. (Dr.) James G. Mathis, Air Force Flight Surgeon of the Year, brought back memories *("Aerospace World," August '83 issue, p. 35).*

The "miniclinic" concept has been used before. In 1956 and '57, Capt. (Dr.) Charles Billingsley, 513th Fighter-Interceptor Squadron Flight Surgeon, was able to obtain a tent and have it erected in the squadron area of the flight line at RAF Manston, Kent, England. He held sick call there twice a day and would also accept dependents.

Accomplishments by both men are worthy of recognition since they brought the medics to the troops, decreased time away from the job, and increased productivity and morale.

Col. Jud Herriott,
USAF (Ret.)
Lompoc, Calif.

PMC Alumni

The Defense Systems Management College has been instructing members of the Department of Defense and defense industry in the management of systems acquisition for more than a decade. Graduates of the Program Manager's Course (PMC) represent a unique DoD resource who are key to continued improvement of the systems acquisition process within DoD.

The value of this resource has been recognized by the DSMC Commandant. Recent graduates, with his support and backing, have formed the Association of PMC Graduates, a nonprofit alumni association. The success of this new association depends on contacting past graduates of the Program Manager's Course.

PMC alumni are invited to contact the address below for more information.

Association of PMC Graduates
Office of the Registrar
Alumni Section
Defense Systems Management College
Fort Belvoir, Va. 22060

AIRMAIL

Rainbow Corner

I am currently preparing a book designed to interest American visitors to London, and would be particularly pleased to hear from any readers who may have memories to relate regarding the American Red Cross entertainment center known during World War II as "Rainbow Corner," situated in the heart of London's Piccadilly.

Also welcome would be any photographs taken during or since the war. Naturally, I'd take very good care of these photos and would guarantee their safe return.

All letters, which will be gratefully acknowledged, should be sent to the address below.

Malcolm Cheney
60 Barrowgate Rd.
Chiswick
London W.4
England

Operation Chowhound

As part of the preparations to celebrate the fortieth anniversary of the liberation of the Netherlands in World War II, a committee has been formed to commemorate Operations Manna and Chowhound, which were airdrops of food by the Allies to starving Dutch civilians in April and May of 1945.

My task on the committee is to research and write a book describing these missions of mercy. To that end, I am trying to locate American airmen who participated in these missions to obtain their memories and any anecdotes about the Chowhound flights. I would also like to obtain any photographs that any aircrew might have taken while on a Chowhound mission.

Anyone who has any information or materials that might prove useful is asked to contact me at the address below.

J. G. Onderwater
4, Gentiaan
2992VD Barendrecht
The Netherlands

Class 43-A

I am attempting to compile a complete roster of all World War II Class 43-A aviation cadets. In order to do this, I need to contact as many former cadets as possible to fill out a standard questionnaire to help me in assembling the roster.

All former 43-A cadets are asked to contact me at the address below.

Ralph E. Parker
203 King St.
Stratford, Conn. 06497

CAP History

The Civil Air Patrol's National Historical Committee is actively engaged in researching early CAP history. Any readers who have early documents or memorabilia that they are willing to donate to the committee are asked to contact the address below.

Lt. Col. L. E. Hopper, CAP
3530 Mimosa Ct.
New Orleans, La. 70114

Writing Rules

A friend of mine who is in the French Air Force is looking for a booklet or publication on the proper protocol procedures for writing to officers (all ranks) in USAF and the other branches of our military services. Is there such a booklet or publication on rules and regs used for military correspondence?

Please contact the address below if you have any information on such a booklet.

Patricia A. Jackson
8637 S. Kolin Ave.
Chicago, Ill. 60652

Submarine P-38

A friend of mine was sailing his boat from Guadalcanal to the Solomon Islands. He had occasion to anchor his boat in a lagoon in the Straits of Moreva.

Natives told him about an aircraft in the lagoon, and he decided to go diving for it. In about forty feet of water he found a P-38, totally intact except for the canopy. He said also that there appeared to be a small airstrip on a point of land about 200 yards from the plane. The water is very clear, and a current apparently scours the area clean.

Can any readers tell me anything about the field, the plane, or the unit that it belonged to?

Lt. Col. W. P. Sherman,
USAFR (Ret.)
8885 S. W. Canyon Rd.
Portland, Ore. 97225

All Air Force Bases

I am a Naval officer and Air Force brat who is doing an American Aviation Historical Society research project on all Air Force facilities titled "Air Force Base" from 1948 to the present. I would like to borrow or get photocopies of old base guides or the annual Air Force Almanac issues of AIR FORCE Magazine for my research. I particularly need information and

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base guides for closed USAF bases.

All material sent will be carefully handled and returned promptly. Please contact me at the address below.

Lt. Mark L. Morgan, USN
200 S. Glenn Dr., #14A
Camarillo, Calif. 93010
Phone: (805) 987-2786

Shaw AFB Museum

The Shaw AFB, S. C., NCO Professional Military Education Center is in the process of starting a Museum/Memorial Hall. We are looking for items of historical significance to the Air Force and Army Air Corps to be donated or loaned to us by anyone who might be interested (*i.e.*, pictures, uniforms, patches, badges, war artifacts, etc.).

Items will be permanently displayed for all of our students and visitors to see and enjoy. This Museum/Memorial Hall will also generate an atmosphere of pride and *esprit de corps*.

When desired, special recognition will be displayed along with the item for those who participate.

For more information, please contact the address below.

TSgt. Philip C. Parks, USAF
363d CSG/DPN
Shaw AFB, S. C. 29152
AUTOVON: 668-3219/2943

March Field Museum

The March Field Museum is rapidly developing a facility depicting Air Corps and Air Force history from World War I to the present.

The Museum needs additional memorabilia and photographs of aircraft and flight operations, especially if they pertain to March AFB or Fifteenth Air Force units. Hopefully, AIR FORCE Magazine readers will be able to offer items for display. Photographs that are loaned with the request that they be returned will be returned after display copies have been made.

(The March Field Museum Foundation will acknowledge the tax-deductible receipt of all [donated] items.)

Please send items and photographs to the address below.

Maj. Michael A. Freitas, USAF
Director
March Field Museum
March AFB, Calif. 92518

U.S. Postal Service

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F. Clifton Berry, Jr. Editor in Chief

433d Squadron

Effective on the date of September 1, 1983, the 416th Tactical Fighter Training Squadron assigned to the 479th Tactical Training Wing at Holloman AFB, N. M., was inactivated and the unit reactivated as the 433d TFTS. This change will result in consecutive numbers with the wing's other tactical fighter training squadrons.

Upon reactivation, the unit is entitled to all honors and approved emblems belonging to the 433d Fighter Weapons Squadron. Because of the 433d's illustrious history, anyone having any memorabilia from the 433d Fighter Weapons Squadron, Fighter-Interceptor Squadron, Tactical Fighter Squadron, or Fighter Squadron who is interested in donating or loaning items for display at the squadron is invited to contact the address below.

433d TFTS/DA
Attn: TSgt. Jeffrey
Holloman AFB, N. M. 88330
Phone: (505) 479-6511
AUTOVON: 867-3894

72d Liaison Squadron

I would appreciate correspondence with World War II members of USAAF's 72d Liaison Squadron, or anyone who has good information

about the "L" type aircraft the 72d used in the ETO and MTO.

I am one of six people restoring a 1942 Interstate S1A as a WW II L-6 Grasshopper for the Confederate Air Force. The 72d appears to have a colorful combat history. By doing an authentic restoration job and by telling their story, we would like to honor that unit and all the liaison troops who helped perform those dangerous missions.

SMSgt. Robert M. MacMillan, USAF (Ret.)
13202 N. 23d Ave.
Phoenix, Ariz. 85029

314th and 315th TCGs

For some time now, I have been studying the history of the Polish Parachute Brigade in the Second World War.

The only operation this unit was involved in was the ill-fated Operation Market Garden, the attempt to gain access over the Rhine in September 1944. The bulk of the Polish Brigade was to be transported to Driel, Holland, by elements of the 314th (at Saltby) and 315th (at Spandoe) Troop Carrier Groups of the 52d Troop Carrier Wing, Ninth Air Force. This occurred on September 21, 1944, when 114 aircraft took off for Holland. However, forty-one of these aborted, and they flew again on September 23, dropping the remaining Poles at Grave (these were aircraft of the 315th TCG).

I would like to contact veterans of these two troop carrier groups in order to get any impressions, memories, or points of interest these veterans may have.

John R. Grodzinski
325 East 34th St.
Hamilton, Ontario
Canada L8V 3X2

Phantom Phanatics

Plans are now in the works to form a "Phantom Phan Club," and *you* are invited to help. We are looking for all Phanatics who have a love for this big, bad hunk of metal that has meant so much to so many over the last twenty-five years. We are looking to contact as many "Phlyers" and "Phixers" and anyone else who has had connections or affections for this mean machine since it first went into active service.

Plans are to form an international organization with chapters in every country (well, *almost* every country!) where the Phantom has flown. Initially there will be a newsletter to let everyone know how things are progressing with the organization. We hope to develop this into a quality publication featuring stories on the units that have flown the F-4, as well as on individuals and current whereabouts of certain aircraft.

Our main interest at this time is to find as many Phanatics as possible to see if all this work will be worth the effort. If you are interested in being a part of this "Phan" club, please contact the address below.

Paul Collins
Phantom Phanatics Int'l
3381 Apple Tree
Erlanger, Ky. 41018

AIRMAIL

Thunderbirds

I am a great fan of the USAF Thunderbirds. I am trying to put together a series of articles on recent Thunderbirds history, from approximately 1978 to the present.

I would like to ask readers for any information, photographs, or any related material on the Thunderbirds during this time frame. I would be glad to pay postage if necessary. Also, if there are any former Thunderbirds pilots who would like to help in the preparation of these articles, please drop me a line.

I would also like to hear from anyone who may have for donation or sale any Thunderbirds paraphernalia. Also, I'd like to hear from anyone who has fighter, bomber, or MAC patches to give away or for sale.

Please contact me at the address below.

Donald E. Neuberg
2202 Pembroke Dr.
Albany, Ga. 31707

Air War in Vietnam

I am presently putting together an extensive study of the air war in Vietnam, and also a book about aircraft crashes from World War II to the present.

The photographic material I have received thus far is very good, yet I'm only about halfway to having the kind of book that I know everyone will like. I'm hoping that many readers will take an interest in aiding me in my quest. . . .

I will copy and return any work sent to me, as well as giving photo credit to those whose photos I use. If you send material, please include a short note giving an account of the photograph and the date it was taken.

I can also supply photos of many military aircraft types to serious collectors who are looking for extremely rare photographic material. I am not restricted to US Air Force aircraft.

John M. Campbell
1212 Nail Parkway
Moore, Okla. 73160

Mace Missile

I am a scale modeler and am interested in obtaining reference material on the Mace/Teracruzer missile system of the 1960s. Last year a very unusual old kit from that era was reissued, but details of the interior of the Teracruzer, details of the missile and launcher, and markings are not available. Even sketches of interior details would be helpful.

I'm also seeking information on or an address for a former Army ROTC instructor of mine, Capt. H. C. Stephenson, who obtained an interservice transfer to USAF for pilot training in about 1970.

Griffin T. Murphey, D.D.S.
1124 S. Lake St.
Suite D
Fort Worth, Tex. 76104

19th TFS

The 19th Tactical Fighter Squadron was reactivated at Shaw AFB, S. C., on July 1, 1982. We are looking for information about the squadron from its inception to the present. Pictures, memorabilia, etc., are needed to trace the squadron's heritage.

Please send any information to the address below.

Capt. Russ Thompson, USAF
19th TFS
Shaw AFB, S. C. 29152
Phone: (803) 668-2291

Stage Door

In 1944, a B-17G belonging to the 535th Bomb Squadron, 381st Bomb Group, was christened with the name *Stage Door.* The 381st was commanded by Col. Harry P. Leber at the time.

Although nearly forty years have passed, are there any readers who could supply me with a copy of a photograph of that aircraft (or of the christening) or tell me the whereabouts of any surviving crew members?

Gerald Newson
31 Southdown Ave.
Willingdon, Eastbourne
Sussex BN20 9PS
United Kingdom

2d Air Division

The Second Air Division Association of the Eighth Air Force is looking for all B-24 combat crews, ground crews, and all other personnel who served with the 2d Division in England

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Frederick A. Meyer
1317 Cedar Rd.
Ambler, Pa. 19002
Phone: (215) 646-8841

54th Troop Carrier Sqdn.

I am looking for ex-members of the 54th Troop Carrier Squadron stationed in Anchorage, Alaska, in 1949–51. Would anyone know where MSgt. Walter Black is? He was the line chief of the squadron.

Please contact me with any information at the address below.

Lt. Col. Joseph H. Carver, USAF (Ret.)
40 Kendall St.
Clifton Springs, N. Y. 14432

Academy Bound

This fall I am beginning my junior year in high school. My career goal is to become a pilot after attending the Air Force Academy.

Advice and information from any person who is formerly or presently a cadet would be greatly appreciated. Opinions from women are especially important.

Please contact me at the address below.

Tara Tracy
4969 Macy Dr.
Greenwood, Ind. 46142

AIRMAIL

Collectors' Corner

I have just completed thirty years of volunteer service in the Civil Air Patrol. . . .

In the past three years, while serving as commander of the Virginia Wing, CAP, I have become intrigued with the many different metal wings worn by pilots, stewards, flight engineers, etc. I have started an extensive collection of these wings, including their histories whenever possible. They are being properly mounted on velvet and will be my personal collection until my death, at which time they will be donated to the aviation historical group in Virginia.

I would like to receive as many donations of as many types of wings as possible for my collection.

Readers can be assured that the wings will be properly displayed and never used for profit. (If you wish that your donation be displayed in honor of someone, please so indicate.)

Please contact me at the address below.

Floyd B. Callihan
Rte. 4, Box 45
Powhatan, Va. 23139

I collect military uniforms for the purpose of preservation and public display. My major interest is in World War II aviation, but I am having some problems finding some articles. These include flight helmets, gloves, and boots. I would appreciate the opportunity to purchase related items that readers may be willing to part with. I would be interested in any other military items readers may have.

Please send full descriptions and prices to me at the address below.

J. C. Campbell II
3031 Sievers Rd.
Vincennes, Ind. 47591

Communication Concepts from AT&T:

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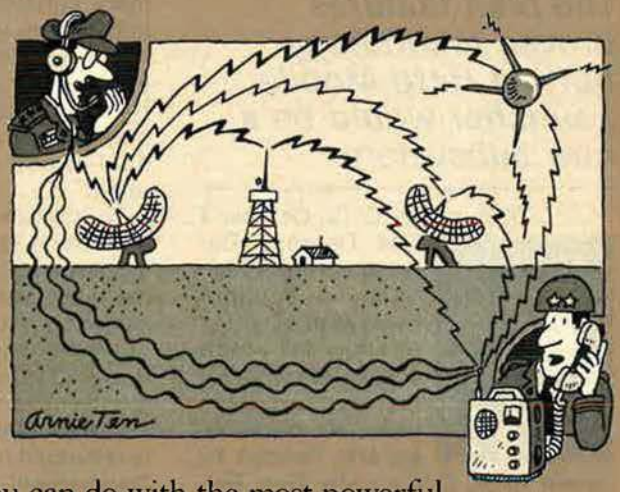
Today, a timeless axiom of warfare is being brought continually to the forefront: that a commanding officer whose communications are lost will become a paralyzed commanding officer. The scientists and engineers of the AT&T Network, however, have developed communication concepts that challenge this axiom by providing commanders with a 'self-regenerating' communication system.



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IN FOCUS...

A Small Missile by 1992

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

The plan features proven technology, but the Hard Mobile Launcher would be a new subsystem.

Washington, D. C., October 4

The Defense Department is about to adopt a comprehensive acquisition strategy for a new small ICBM (SICBM) authored by a high-powered panel of experts headed by former AFSC Commander Gen. Bernard A. Schriever, USAF (Ret.). The central task of this Small Missile Independent Advisory Task Force was to recommend management approaches and acquisition strategies for this new ICBM by reconciling its top national priority status with cost-effectiveness. On that score, the Schriever Commission's conclusion—subsequently endorsed by the Defense Department—was that a crash program is neither desirable nor necessary.

The tenor of the Schriever Commission's report was upbeat, culminating in the conclusion that its recommendations provide high confidence that the SICBM can attain IOC (initial operational capability) by 1992 and incorporate the flexibility needed to respond to future arms-control initiatives and changes in the Soviet threat. Although expressing mild reservations about congressionally-mandated constraints that tie the small missile's development to the MX deployment schedule and saddle the new weapon with a "not-to-exceed" 33,000-pound weight limit, the Commission found no major technological hurdles to meeting the weapon's performance goals.

So far as a basing mode is concerned, the panel identified "hard" mobile launchers—able to withstand overpressures of at least twenty-five pounds per square inch without damage or being overturned—as the primary candidate and design "baseline." There is the acknowledgement that recent developments in silo hardening show considerable promise. Hence, the option for hard-silo deployment as a possible element of a dual-basing mode should be kept open.

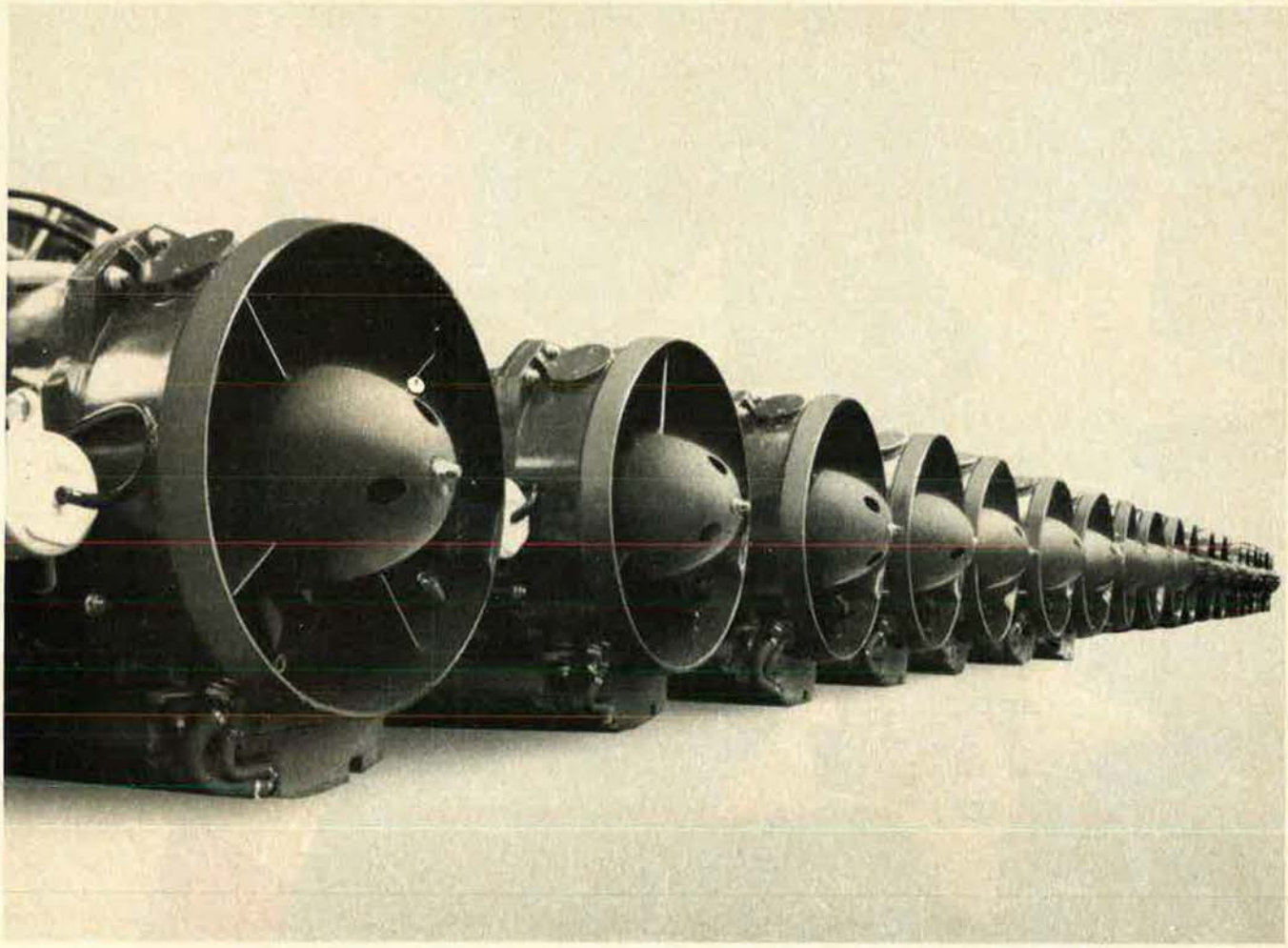
The proposed Hard Mobile Launcher (HML) is identified as the only subsystem that is new to ICBM deployment experience and, therefore, is singled out for special attention. The challenge associated with the HML design is to provide the launcher with sufficient hardness and weight to ensure its survivability while the weapon is restricted to operations on Defense Department-controlled land areas. Yet these traits must not cut into the vehicle's mobility or drive up its cost. As a result, there is the admonition to start at once on the design of test facilities to simulate blast effects on mobile missile launchers.

The Commission listed the SICBM's guidance and control system as the program's toughest technological challenge and recommended the immediate development of a lightweight Advanced Inertial Reference Sphere (AIRS—the guidance system of the MX Peacekeeper ICBM)—as the baseline guidance system for the small missile. With AIRS already developed for Peacekeeper, only redesign is needed to take advantage of weight reductions that become possible since the SICBM carries only one reentry vehicle as opposed to the Peacekeeper's ten. In the main, these weight and cost cuts should capitalize on the elimination of cooling fluids—needed for the extended operations of the MX post-boost vehicle that directs the individual warheads to their targets—and on redesign of the computer.

The Schriever Commission expressed confidence that a modified AIRS will be up to the task, even though there is reason for concern about the cost of such a guidance system. Therefore, the Commission suggested that lower cost alternatives should be considered for use at later phases of the program. Ring laser gyroscopes might eventually achieve the level of accuracy required for the small missile, but there are questions about the vulnerability of such guidance systems to nuclear effects, the Commission warned. If, on the other hand, ring laser gyroscopes are augmented with midcourse correction devices, such as star-trackers, Global Positioning Satellite receivers, or high-performance conventional gyrocompasses, the cost of such a hybrid system may be as high, or higher, than that of the lightweight AIRS, the panel cautioned.

Also in the area of guidance approaches, the Commission recommended against the use of dormant guidance systems—that are activated only under crisis conditions—owing to the long start-up periods required and higher failure rates that mar such designs. The Commission recommended against use of the Mk 6 guidance system of the Trident SLBM on grounds that it is not designed to meet ICBM nuclear hardness standards that by necessity are tougher than those of SLBMs. Naming accuracy as the central factor in determining the SICBM's effectiveness against very hard Soviet targets, the Commission allowed for the option of improving the lightweight AIRS in step with future threat changes by incorporating some form of midcourse guidance update or terminal guidance.

The Schriever Commission found the Mk 21 advanced ballistic RV developed for the MX system compatible with the SICBM, but suggested that options should be developed to back up the weapon with penetration aids. Also, maneuvering reentry vehicles (MaRVs) equipped with terminal guidance should be developed vigorously to counter Soviet superhardening efforts and to provide the capability to evade Soviet ballistic missile defenses. The Mk 21 RV carried by Peacekeeper, the Commission pointed out, is to be a low-yield version in order to save scarce special nuclear materials (SNM, essentially the atomic trigger of thermonuclear weapons). In the case of the small missile it may



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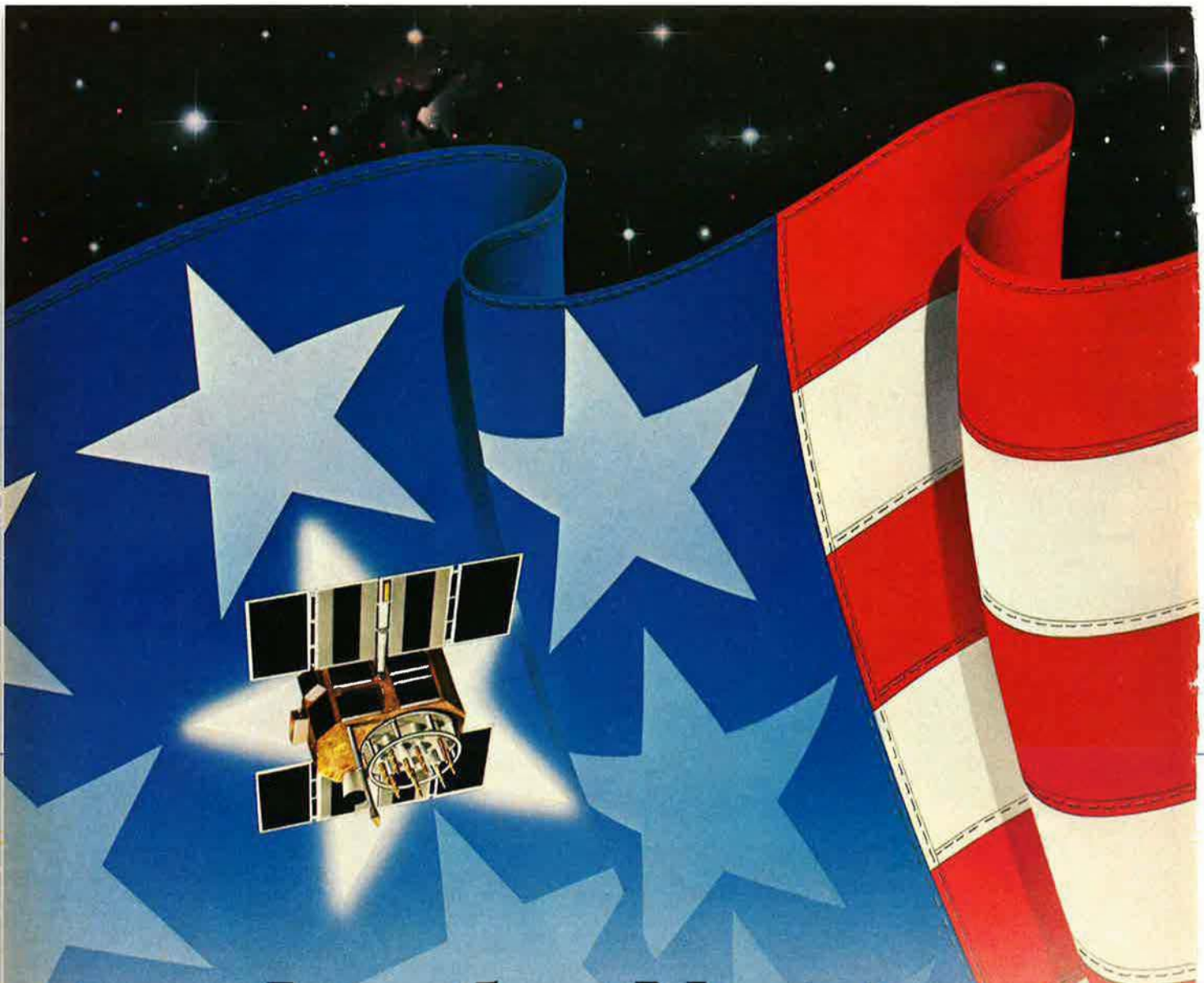


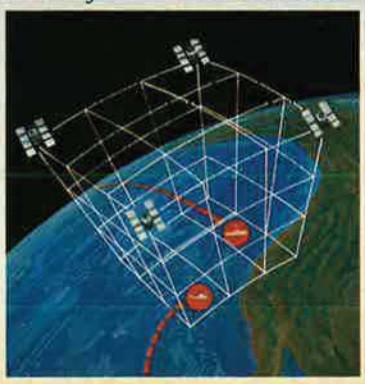
Another Navstar joins the union.

Once again, a Navstar Satellite has been successfully launched into orbit and designated operational—joining America's growing constellation of Global Positioning System satellites.

An advanced navigation and positioning system that provides precision timing and a world-wide common grid, the Navstar GPS has been tested successfully in a variety of operational situations. More than 1000 tests have been conducted including blind aircraft rendezvous for simulated in-flight refueling, ship navigation in crowded harbors, nap-of-the-earth helicopter flights, ship/aircraft ASW simulations, precision landings, manpack maneuvers, coordinated landing operations and transatlantic flight.

When the system becomes fully operational, it will provide 24-hour-a-day coverage to thousands of users. Signals from at least four Navstar satellites will always be accessible worldwide from land, sea, air, and Earth-orbit. Small, compact receivers will process the signals to calculate positions within 15 meters or less, velocities to a fraction of a meter per second and the exact time.

To initiate the operational phase of the GPS system, a contract for 28 production satellites has been awarded to Rockwell International by the U.S. Air Force.



The Navstar Global Positioning System. One of many Rockwell International projects designed to bring the benefits of space down to earth. Shuttle Integration and Satellite Systems Division. North American Space Operations.

Rockwell International

...where science gets down to business

be necessary to use a high-yield version of the Mk 21 RV/warhead.

The Commission asserted with admirable candor that advances in propulsion technology needed for a hardened, small mobile missile have been underestimated and stressed that considerable progress will be required in high-energy propellants, lightweight motor cases, external protection materials, fiber optics, and extendable nozzles. While most of these technologies are being pursued at the component level, the Commission pointed out that they must be integrated into a complete system and must be adequately tested. Recommending that development of an integrated propulsion system should be started as soon as possible, the panel urged that at least two contractors be selected to compete in the design of each missile stage before the program enters full-scale development.

Command and control, the panel finds, does not pose any significant problems for the SICBM system because the arrangements used for Minuteman and MX can easily be adapted. The ratio of ten launchers per launch control center used by both Minuteman and MX probably could be increased to perhaps twenty-five to fifty missiles controlled by one center in the case of the new small ICBM, according to the Commission's report.

There is the caveat, however, that the Air Force should consider the use of special masking techniques in order to minimize the chance of the Soviets detecting the location of individual SICBMs by means of electronic eavesdropping.

Soviet Economic Trends Enigmatic

The Defense Intelligence Agency (DIA), in a recent detailed report on resource allocation in the Soviet Union in 1983, predicted that "if improvements in the economic structure don't occur, the Soviet defense establishment is unlikely to be able to sustain high rates of growth very long without undermining its own economic base. The degree of economic stagnation, the perceived need to rescue the economy in order to support the defense effort in the future, and the extent to which the leadership is willing to decentralize economic management, at least at the lower levels, to improve economic efficiency are factors that will determine the amount of structural and system change Soviet leaders are willing to entertain."

The report, presented by DIA's Deputy Director Maj. Gen. Schuyler Bissell, USAF, to the Subcommittee on International Trade, Finance, and Security Economics of Congress's Joint Economic Committee, sidestepped direct predictions about how the Soviets would try to extract themselves from the dilemma of how to maintain growth in defense spending while the national economy as a whole is stagnating or shrinking.

The DIA believes that it is much too early to forecast what changes might occur over the next few years. Nevertheless, the Pentagon analysis suggests that the accession of President Yuri Andropov appears to have created a "new environment—one in which the leadership is more willing to openly acknowledge the nature and scope of the economic problems—and appears more willing to accept the economic necessity of limited change as a precondition to improved overall economic performance."

The DIA study, at the same time, warned against false hopes about broad relaxation of centralized economic controls on grounds that Andropov would not want to "undermine the Party's authority or forfeit political control in major economic decision-making."

The DIA analysis sees the Soviet leadership facing difficult decisions about the economy because of the brakes put on economic growth by low productivity, thereby endangering the "long-term objective of maintaining a military force capable of providing a base for Soviet international legitimacy." Arguing that unless the economic system is improved, sustained growth in defense spending will be undermined in the long run, General Bissell pointed out that greater economic growth "requires fundamental changes to the economic system."

Warning that past piecemeal approaches to building a viable economic system have not been successful, the DIA analysis finds evidence of trends toward increased responsibility and responsiveness at all levels of the economic infrastructure in order to make better use of available resources.

But change in the Soviet Union is always traumatic. Therefore, it is likely to be resisted and to generate economic management conflict: "Successful implementation [of new economic policies] will require a leadership willing to force the system to change. Despite initial resistance to structural change, military and defense industrial managers could eventually be convinced to promote the implementation of structural changes when it becomes apparent to them that future growth in defense production is dependent on sustained overall economic growth."

The quandary Andropov is in stems from the broad uncertainty and inconsistency that characterize the Kremlin's assessment of the alternatives for bringing about a cure for the Soviet Union's economic malaise. As the DIA study points out, "The investment priority issue divides those who favor continued high growth in defense expenditures and those who appear to consider slower military growth desirable. A policy favoring slower military growth would allow reallocation of investment funds within the economy to promote growth in other sectors. One argument being made in the Soviet Union is that if the defense sector grows more slowly now, to allow the other sectors to catch up, they will be better able to support the defense effort and will allow for even greater growth in the defense sector in the future."

While the military has stayed out of the fray, according to the DIA assessment, Party Chief Andropov seems to be "straddling the fence. Although he has supported heavy industry in the past, his present emphasis appears to be on those areas required to break bottlenecks in the economy, such as transportation, unfinished construction, and retooling and modernization of machinery."

But the longtime former KGB chief knows how to have his cake and eat it too. He is also emphasizing "the need to approach the issues of détente and arms control from a position of military strength." His strong support for the military and of the need to provide adequate defense suggests a continued commitment to these objectives. The DIA analysts find that this "rather balanced approach on investment issues provides Andropov with considerable flexibility by not ruling out, early on, some of the policy options which the leadership can use to approach the problems involved in the stagnating economic situation."

Over the next three to five years, the DIA therefore expects no significant changes in the Soviet Union's economic priorities and policies, especially so far as defense is concerned. Growth in defense spending

will "continue during the rest of the [current Five-Year Plan that runs until 1985] at eight to nine percent in current prices. Any significant alteration or shift in resource allocations will require major changes in the middle of the [plan], and although not without precedent, it would be more typical of Soviet decision-makers to include such changes, if they occur, in the [next Five-Year Plan running from 1986 to 1990]."

Over the mid-term, meaning between 1988 and 1993, the DIA analysts believe that "the required growth in other economic sectors needed to stabilize the economy could mean slightly smaller increases in the defense sector, in order for defense growth to continue to increase in the long term." The DIA's reasoning behind this prediction is that it would take about ten years to overcome bureaucratic inertia and resistance to change as well as to develop new behavioral patterns within the management sector.

Over the long term, ten to twenty years hence, the DIA analysis surmises that the "only real solution to the economic growth problem will be structural changes which allow for sustained economic growth. Such changes would provide for continued and higher growth in defense production in the future."

In the DIA report's statistical section the point is made that in the "defense machinery" sector, a rough equivalent of the US defense industry, employment has grown from about 5,500,000 in 1965 to 8,900,000 in 1981. The Soviet defense industry, the report finds, "has grown steadily and consistently over the past twenty to twenty-five years. Their military industrial base is by far the world's largest in number of facilities and physical size, and it produces more individual military systems in greater quantities than any other nation." Defense production exhibits steadily growing levels, "suggesting that as old weapon programs are phased out, new ones are begun, leaving little downtime or long periods of layoffs and inactivity. The cyclical process, the continuing facility growth, and the high rates of production keep the arms industry in a high state of readiness to meet any contingency."

Soviet military spending has grown at a nominal annual rate of six or seven percent since 1970 and by 1981 absorbed between fourteen and sixteen percent of the Soviet Union's Gross National Product (GNP), according to the DIA analysis. This represents a two percent boost over 1970 when defense investments accounted for between twelve and fourteen percent of GNP.

IN FOCUS...

The DIA report underscores the fact that "since 1980, the USSR has been the world's leading arms exporter." In 1980, the USSR signed military agreements with foreign countries valued at $14.7 billion, compared to $10.7 billion for this country. Between 1978 and 1982, the Soviets delivered about $38 billion worth of military equipment to foreign client states, with Near East and South Asian countries accounting for about seventy-five percent of that total.

The DIA finds that this rapid boost in arms exports stemmed largely from the sale of "more sophisticated and higher priced equipment such as MiG-23 jet fighters, Il-76 transports, Mi-24 combat helicopters, surface-to-air missile systems, and T-62 and T-72 tanks." Included in these military exports were some 22,000 tanks, armored personnel carriers, armored cars, and artillery pieces; more than fifty guided-missile boats; almost 2,400 combat aircraft; and at least 6,300 surface-to-air missiles, according to the DIA analysis.

Washington Observations

★ The House-Senate Conference Report on the FY '84 Defense Authorization Act lets the Air Force spend about $100 million for the Alternate Fighter Engine program, as well as allowing $35 million on efforts to increase the durability of the F100 engine powering the F-15 and F-16. Secretary of the Air Force Verne Orr, in a recent letter to the Chairman of the Defense Appropriations Subcommittee, Rep. Joseph P. Addabbo (D-N. Y.), pointed out that he plans to "continue to pursue the competitive acquisition of high-thrust fighter engines as a major . . . acquisition initiative as long as the Congress continues to recognize competition as an invaluable tool and supports our request."

Expressing surprise over the fact that the Subcommittee's Surveys and Investigations staff questioned the Air Force's decision to open the $10 billion fighter engine market to both Pratt & Whitney and GE on a competitive basis, Secretary Orr emphasized the imperative of getting "the most for the taxpayer's dollar. It must be stressed that we will not only get an improved engine with over twice the life of today's engine, [but] we also have included very substantial initiatives in competitive reprocurement of spare parts up front in this evaluation."

Secretary Orr also took on congressional staff criticism of the Air Force's decision not to go for big increases in thrust in the Alternate Fighter Engine program, explaining that in doing so there would be "a higher risk of again encountering the initial durability and reliability problems of the past. Our approach solves the problem at hand—providing a durable, operable engine for our front-line fighter fleet."

★ Speaking before the United Nations General Assembly, President Reagan charged that this country has "negotiated arms agreements, but the high level of Soviet encoding hides the information needed for their verification. A newly discovered radar facility and a new ICBM raise serious concerns about Soviet compliance with agreements already negotiated."

In a related development, the Senate voted ninety-three to zero in favor of an amendment by Sen. James A. McClure (R-Idaho) that requires the Administration to "prepare and transmit to the Congress a report on the record of Soviet compliance or noncompliance with the letter and spirit of all existing arms-control agreements to which the Soviet Union is party." Senator McClure, in presenting the amendment, said, "The most recent instance of Soviet noncompliance came on the night of the Soviet Union's murderous attack on the Korean airliner [when] the Soviets had planned, but subsequently canceled, a test flight of their SS-25 (PL-5) missile . . . that directly violates the SALT II Treaty limitations on new-type Intercontinental Ballistic Missiles."

Concern within the Administration is reportedly mounting over what are thought to constitute deliberate and flagrant Soviet violations of existing arms-control accords.

★ Under Secretary of Defense for Policy Fred C. Iklé succinctly encapsulated the US policy for Central America when he recently told the Baltimore Council on Foreign Affairs that "we want to prevent the expansion of totalitarian regimes—particularly Leninist ones, since they will import Stalinist police systems, bring in Soviet arms, and even invite Soviet military bases. There are two more reasons why Leninist regimes are particularly dangerous: Once entrenched, they tend to become irreversible, and they usually seek to export their totalitarianism to other nations." ■

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AEROSPACE WORLD
News, Views & Comments

By William P. Schlitz, SENIOR EDITOR

Washington, D. C., Oct. 6

★ Two quick-thinking and courageous Idaho ANG captains have been named recipients of the 1982 Cheney Award.

Capts. Gregory A. Englebreit and Fredric G. Wilson of the 190th Tactical Reconnaissance Squadron, Boise, Idaho, were flying a night terrain-following mission in April 1982 when their RF-4C Phantom struck a large bird.

The aircraft was 1,000 feet above the ground, flying at 480 knots, and the impact shattered the left front windscreen.

Despite a seriously injured left arm, the pilot, Captain Englebreit, repeatedly tried to communicate by intercom with his navigator. Realizing he might become unconscious at any moment, the pilot tried to provide the navigator as many options as possible, including lowering the arresting hook.

Captain Wilson called for help and, with the assistance of another RF-4C sent within minutes by the Air Traffic Control Center, made a night formation landing from the rear cockpit.

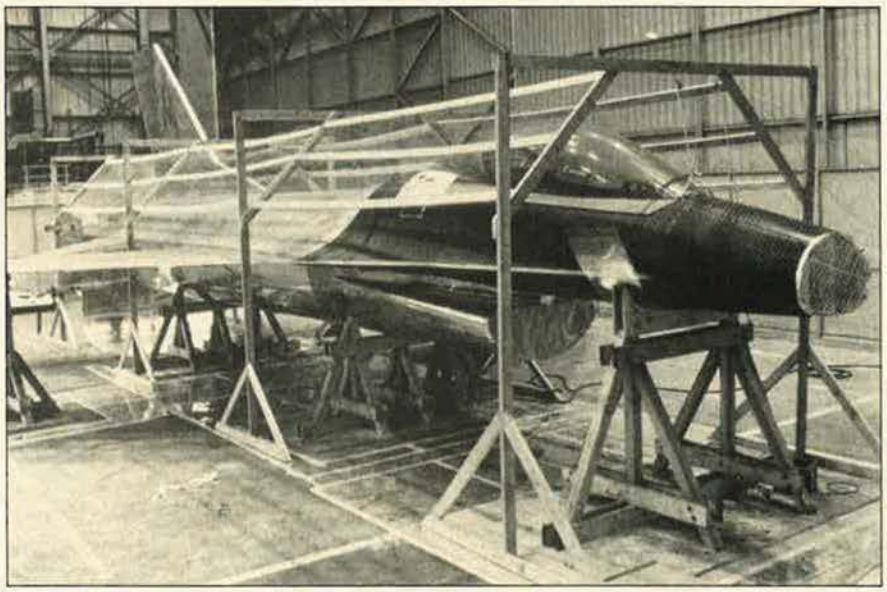
He had never before attempted a landing or been trained for it.

Both crew members kept their composure during the emergency despite severe visibility limitations and a desperate situation, officials noted.

The annual award, established in 1927, is named for 1st Lt. William H. Cheney, killed in 1918 over Foggia, Italy, the first American casualty in Italy in World War I. The award is presented by the Air Force Chief of Staff for an act of valor, extreme fortitude, or self-sacrifice performed in connection with an aircraft.

★ As technicians explain it, today's aluminum aircraft skins act as "lightning rods" in conducting electrical current produced by lightning strikes away from the interior of an aircraft and the sensitive electronic components within.

But with the increased use of composites and such resistive metals as titanium, this may no longer be the case. In the future, lightning strikes could present a major hazard to aircraft, their crews, and such sensitive equipment as on-board computers.



Being subjected to simulated lightning strikes is this F-16 mockup at the Boeing Development Center in Seattle, Wash. Built of a composite forward fuselage and aluminum rear section, the mockup is a key piece of hardware in a program to develop protection for highly vulnerable aircraft components. See item below.

With military and civil aircraft designs tending more and more toward fly-by-wire electronic control, lightning strikes could be especially devastating.

Aeronautical Systems Division's Flight Dynamics Laboratory at Wright-Patterson AFB, Ohio, is looking into the problem.

Under a joint program with the Navy, Army, Defense Nuclear Agency, FAA, and NASA, the laboratory is developing and testing a "balanced protection scheme" for four classes of future aircraft: fighters, bombers and large transports, helicopters, and such smaller aeronautical vehicles as cruise missiles.

Various methods of protection are being considered by Boeing Military Airplane Co., in Seattle, Wash. These include: shielding the entire aircraft, to the extent possible, with a metalized layer that will act as a Faraday cage (a sort of metal box for protecting equipment); shielding specific signal/power conductors and component bays that contain the most sensitive equipment; putting filters, diverters, or other such devices between aircraft wiring and sensitive components to prevent stray impulses from inducing permanent damage or interfering with performance; and eliminating signal wiring to the extent possible and replacing it with fiber optics that would carry information in the form of light rather than electrical impulses.

Preliminary testing, in the form of a vulnerability assessment, is currently being conducted under Phase I of the contract at Boeing's Development Center in Seattle. It involves simulating lightning-strike effects on an F-16 aircraft mockup with composite forward fuselage and aluminum rear fuselage.

Phase II calls for demonstration and testing of the actual protection systems of full-scale test-beds—one fighter and one helicopter. These have been chosen as representing the most diverse types of requirements for protective systems. Unlike most

other aircraft, helicopters are extremely weight-sensitive, and therefore will require systems involving mostly lightweight protective measures, such as fiber optics.

Overall program effort, including support for related NASA, Army, and Navy research, is expected to run about $11 million. Of this, Boeing will receive some $6 million for pulling together the technical base, developing balanced protection methods for the four types of aircraft, and demonstration and testing of these methods. Contract work started in April 1982 and is scheduled to run through mid-1987.

★ Tests of the air-launched target called Firebolt will continue at Eglin AFB, Fla., until next July.

Firebolt, being developed under a $60.2 million Air Force and Navy contract with Teledyne Ryan Aeronautical, San Diego, Calif., performs preprogrammed or radio-commanded maneuvers of up to five Gs and is recoverable either in midair by parachute or in the water. It flies at speeds ranging from Mach 1.2 to Mach 4 at altitudes ranging from 35,000 to 100,000 feet.

Firebolt, powered by a throttleable hybrid rocket engine built by Chemical Systems Div. of United Technologies Corp., simulates enemy aerial threats to test the performance of newly developed weapon systems.

The radar augmentation systems enhance the Firebolt radar cross section to make the seventeen-foot-long target appear as a full-size enemy aircraft on an interceptor's radar. An onboard scoring system detects missile miss distance.

"Each Firebolt unit is designed to be used ten times before major maintenance is required, and that is a cost savings," said Jim Kiedinger, Chief of Firebolt Division at Eglin. "Most targets, like Bomarc, are designed for one-time usage."

Some thirty test flights are to take place before July 1984 when full-scale development is to be completed. At that time, a production decision is likely. Deliveries to the Air Force and Navy would begin in 1986.

★ A number of recent advances in state-of-the-art technology are to be incorporated in the "B" version of the C-5 transport, the first of which is to be delivered to the Air Force late in 1985.

One such improvement will be MADAR II, an advanced Malfunction Detection Analysis and Recording instrument. The original MADAR units were developed in the mid-1960s for the C-5A. MADAR II is a troubleshooter with upgraded maintainability and reliability.

Besides providing a flight crew with essential malfunction data, MADAR II will undertake an analysis of the problem and recommend a solution, according to Lockheed-Georgia engineer William Wall.

A keyboard, along with the CRT (cathode ray tube) display and printout units, permits the operator to perform diagnostic routines and to make on-board decisions based on MADAR II-derived data.

The heart of the device is a modern digital processor with a bubble memory. It serves as the principal unit for system interface and control and acts as the interrogator that monitors selected test points located throughout the aircraft.

Analysis of the information is both printed out and displayed on the CRT. The analysis results are also simultaneously recorded on the system's digital tape recorder with the tapes sent later to a central Air Force facility for logging and further analysis.

MADAR II system components are being produced by Lockheed Electronics Co., Delco Electronics, and Honeywell, Inc. The first unit is to be tested following delivery to Lockheed-Georgia in Marietta this coming December.

★ Skyfox Corp. officials have high hopes for the company's new twin-jet tactical trainer. The Skyfox, derived from the T-33, made its first flight in August.

"A little more than a year ago we set out to design and build a tactical

Skyfox is a new basic and advanced multirole tactical trainer developed with private sector financing. See item.

trainer with significantly improved performance and to offer it at a truly affordable price," noted Russell O'Quinn, Skyfox Corp. President. "We're even more optimistic now about Skyfox's potential as a jet trainer for many countries around the world."

The Skyfox corporate team includes executives, engineers, and test pilots who were key contributors in C. L. "Kelly" Johnson's world-renowned Lockheed "Skunk Works" in California.

Mr. O'Quinn, a veteran test pilot with both US Air Force and civilian experience and with more than 15,000 flight hours logged, including T-33 flight testing, also serves as the company's chief test pilot. He was in the cockpit of Skyfox on its first flight.

Anthony W. "Tony" LeVier, Director of Flight Operations, piloted more than fifty first flights, including those of the T-33; Irven H. Culver, Chief Engineer, was a principal designer on the T-33 and F-104 programs; Robert S. Hanson, Executive Vice President, Marketing, was an F-104 test pilot; Samuel H. Mason, Vice President, Special Projects, was a test pilot in the T-33, among other aircraft; Marshall L. Billups, Production Director, was "Skunk Works" director of manufacturing; and Joseph H. Ware, Jr., Project Director, was supervisor of development flight testing.

Even before the first flight, the company had received a letter of intent for production of twenty Skyfox aircraft by Portugal's aerospace manufacturing company. Thus, the Portuguese Air Force is to be the first international air arm to use the aircraft for operational jet flight training, Skyfox officials declared.

Officials noted that negotiations are under way with more than twelve additional countries to establish in-country Skyfox coproduction. The company is also conducting discussions with two major US manufacturers who could join the international Skyfox manufacturing program to provide worldwide logistics support.

Officials said the new tactical trainer combines innovative design and economical remanufacturing techniques with available and proven T-33 airframes to counter the alarming cost trend of design, development, and manufacture of other trainer aircraft. About 1,500 T-33s are still in existence around the world.

Utilizing about seventy percent of the T-33 structural core—including much of the fuselage, wing, and landing gear—the Skyfox represents a new, advanced-performance tactical trainer. As a result, the new airplane has virtually a zero-hour airframe with unlimited structural life, officials declared.

Twin Garrett TFE 731-3 turbofan engines, Collins Pro-Line II flight instruments and displays, and new Stencil ejection seats—together with advanced aerodynamic design incorporated in the nose, wing fairings, and tail—give the aircraft a "modern look and improved performance" over its reliable ancestor, the venerable T-Bird.

An extensive flight-test program is to be completed at the Mojave test center north of Los Angeles prior to customer demonstrations of aircraft capabilities including maneuverability, reliability, sortie turnaround time, and range.

Skyfox's two seats make it readily available for demonstration flights, Mr. O'Quinn noted.

AEROSPACE WORLD

ABOVE: Recent developments at Andrews AFB, Md., include the addition of USAF's first C-20A to the inventory of the 89th Military Airlift Wing. A military version of the Gulfstream III, the aircraft carries a maximum of fourteen passengers and a crew of five. The Air Force plans to operate eight C-20As in an airlift role from Andrews and three from USAFE's Ramstein AB in Germany. LEFT: New Commander of the 1st Helicopter Squadron, Lt. Col. Mark E. Bridges, discusses operations with Maj. Joseph A. Schmitz, left.

★ This year marks the twenty-fifth anniversary of the adoption of AFRES's Air Reserve Technician (ART) program.

Considered the backbone of the modern Air Force Reserve, the ART program superseded a system under which a relatively large number of active-duty and full-time civilian employees was on hand for the sole purpose of training some 2,000 Reservists. This system was both costly and ineffective.

Thus, the ART program was instituted to train personnel, cut costs, and keep AFRES units at peak operational readiness for mobilization.

The ART program was implemented as an agreement between the Civil Service Commission (now the Office of Personnel Management) and USAF. It features a cadre of dual-status people who during the week work in their respective units as civilians and then put on blue suits for AFRES training periods. Their duties are essentially the same in both roles.

ARTs are found predominantly in aircrews and aircraft maintenance positions.

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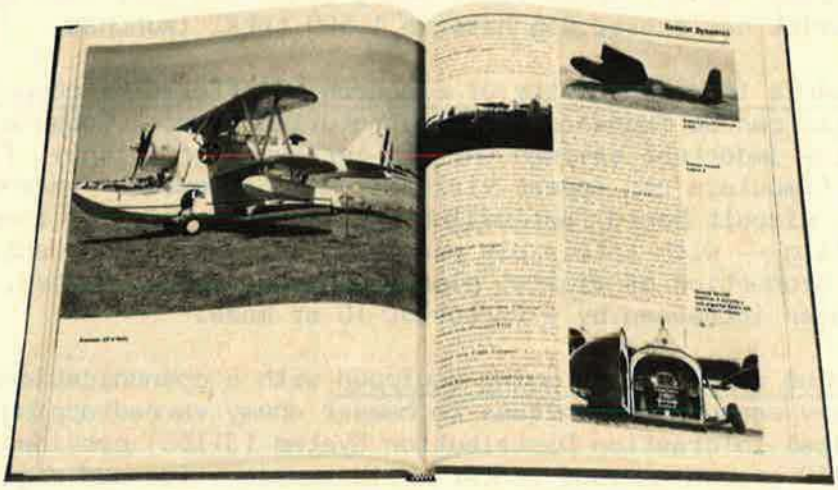

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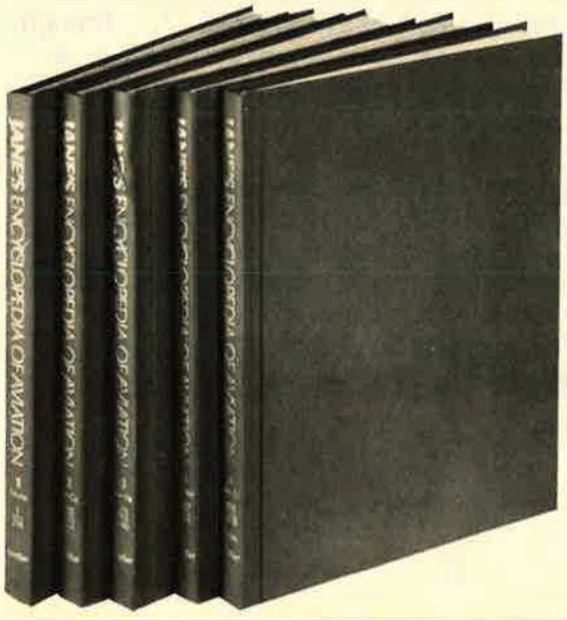

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SCIENCE/SCOPE

The 1,000th Maverick missile to be launched in training exercises destroyed a truck during military maneuvers at Nellis Air Force Base in Nevada. The TV-guided air-to-ground weapon was launched from an A-10 at an altitude of 500 feet and a range of over one mile. It scored a direct hit on the designated target amid a convoy of vehicles. The pilot, launching his first Maverick ever, said he locked the missile on target within two seconds. Maverick scored direct hits in 41 of 43 launches during exercises last year. Of the 1,000 launched in training, 85% have been direct hits. Since first being built in 1972, the Hughes Aircraft Company TV Maverick has scored 85% hits in 1,500 total launches.

Of the improvements in productivity of electronics offered by computers, some of the most dramatic can be found on the manufacturing floor. Computer-controlled automation yields important savings through increased efficiency, flexibility, and accuracy. Computers can repeat virtually all processes -- machining, chemical processing, circuit board fabrication and assembly, quality inspection, and functional testing -- with infallible precision well beyond the abilities of a human. In the production of digital electronics modules at Hughes, productivity sometimes has been increased by a factor of 10 or more.

NATO early-warning aircraft are being equipped with a communications system that uses four primary encoding techniques to hamper enemy eavesdropping or jamming. The Joint Tactical Information Distribution System (JTIDS) provides E3A AWACS aircraft and NATO ground command centers with secure voice and digital communications. One JTIDS encryption technique is spread spectrum, in which a signal is expanded over a large bandwidth. With frequency hopping, a second method, frequencies are changed many times a second. Another technique, time division multiple access, assigns certain users to specific time slots no longer than a fraction of a second. Finally, to verify messages, JTIDS repeats messages automatically. Hughes is supplying JTIDS to NATO and the U.S. Air Force.

Lightweight rocket launchers on U.S. Army attack helicopters are proving to have advantages over previous launchers. The Hughes launchers are made of aluminum and used with 2.75-inch rockets. One model fires 19 rockets, another 7. Though inexpensive enough to be disposable, they can be reused more than 16 times. A combat ordnance load of four 19-tube launchers cuts 260 pounds of gross weight per helicopter and allows an increase in fuel capacity.

A radar used for protecting ships from enemy cruise missiles can double as an air defense surveillance radar. The Mk-23 Target Acquisition System (TAS) tracks sea-skimming or high-diving cruise missiles at a range of more than 20 miles. But when used for surveillance or aircraft control, it has a range of more than 90 miles. TAS operates even with interference from sea, land, bad weather, chaff, or heavy electronic countermeasures. The Hughes-built system is being installed on U.S. Navy aircraft carriers and over 45 other ships.

During the ART program's first year of operation, some $13 million was saved and the need to maintain military housing, commissaries, base exchanges, and recreational and medical facilities at some bases was eliminated entirely.

The day-to-day administration of AFRES units is undertaken by ARTs in forty-four locations in CONUS. A special examining unit in Macon, Ga., processes applications and certifies eligibles for ART assignments nationwide.

"The average experience level of ARTs is from ten to twelve years," noted Troy C. Gay, chief of labor/employee relations and staffing at Hq. AFRES, Robins AFB, Ga. "The stability of the program is outstanding, with an annual turnover rate of 7.5 percent—lower than other civilian employees—and ninety-nine percent of the force is ready to mobilize." Additionally, he added, ARTs provide community services in performing such humanitarian missions as hurricane tracking and emergency rescues.

For a detailed look at how the ART program operates in an AFRES Associate C-5 wing, see "The C-5 Team at Dover," August '83 issue, p. 62.

★ Today, fighters take to the air with bottles of liquid oxygen aboard. The oxygen is mixed with cockpit air to provide crews with a "breathing medium."

In the future, the bottle system may be made obsolete. An Onboard Oxygen Generation System (OBOGS), currently being tested, produces breathable air from the F-16's engine bleed air. (The Air Force has a slightly different system for the B-1B, and the Navy is testing one on the AV-8B Harrier.)

Essentially, OBOGS will work like a water softener. The engine bleed air passes through a molecular sieve where zeolite absorbs nitrogen and other compounds based on molecular size and polarity.

This OBOGS system will provide a side benefit for pilots with a regulator that reduces resistance to breathing. The current regulator mixes liquid oxygen with air to form suitable breathing air. OBOGS will supply breathable air before it reaches the regulator, which necessitates a regulator of different design.

Advantages of a fully functioning OBOGS include elimination of frequent servicing, operational advantages in austere aircraft basing, faster ground turnaround, improved systems safety, and, in some missions, removal of constraints in flying duration, according to Dr. Richard L. Miller. Dr. Miller is Deputy Chief Crew Technology at the USAF School of Aerospace Medicine, Brooks AFB, Tex.

Clifton Precision of Iowa received the original $3 million contract and $500,000 for additional follow-on tests of the F-16 OBOGS system.

The Air Force is encouraging aircraft manufacturers to consider OBOGS in new aircraft designs.

AEROSPACE WORLD

At Beale AFB, Calif., Maj. Maury Rosenberg of the 1st Strategic Reconnaissance Squadron became the third pilot in Air Force history to log 1,000 hours in the SR-71. Most SR-71 crew members average 400 to 600 hours. (USAF photo by SSgt. Daryl E. Green)

INDEX TO ADVERTISERS

★ **NEWS NOTE**—A new lightweight fighter pilot's helmet designed also for protection in a chemical warfare environment is now in use throughout the tactical air forces. The new helmet provides better visibility and, at four ounces lighter than its predecessor, greater comfort.

Died: J. Raymond Bell, AFA's Man of the Year for 1972 and former Iron Gate Chapter President, of cancer in September in Beverly Hills, Calif. His contributions to AFA were recognized by the award of a number of the Association's most prestigious honors. Mr. Bell, an AFA Life Member, also participated in many civic and governmental activities locally and nationally, including service with several Presidential commissions. The attorney and public relations executive was seventy-five.

Died: Maj. Gen. Albert F. Hegenberger, USAF (Ret.), aviation pioneer who was inducted into the Aviation Hall of Fame in 1976, in Winter Park, Fla., in August. He was eighty-seven. General Hegenberger was awarded the Mackay Trophy for the first nonstop flight from the mainland to Hawaii in 1927 and the Collier Trophy for the first official solo blind flight in 1932. During World War II, he served in China with Fourteenth Air Force and later commanded Tenth Air Force. Following the war, he helped develop the US system for worldwide detection of nuclear explosions before his retirement in 1949.

AEROSPACE WORLD

Died: Maj. Gen. Rollin B. Moore, Jr., USAF (Ret.), first Commander of Hq. AFRES who oversaw the transition in concepts and aircraft of USAF's Reserve into the Total Force structure, in Stanford, Calif., in August. Under General Moore's direction, six new types of aircraft entered the Reserve inventory and sixteen airlift groups, an aeromedical evacuation squadron, and three rescue squadrons converted to different aircraft. An AFA member since 1947, General Moore was active locally and nationally and served on AFA's Air Reserve Council. He was sixty-six. ■

Martin M. Ostrow, whose long service to AFA included two terms each as National President and Chairman of the Board, died of a heart attack in October at his home in Los Angeles. He was fifty-eight. An attorney and brigadier general retired from the Air Force Reserve, Mr. Ostrow during twenty-five years as a member of AFA held almost every local and national office offered and served on numerous committees. In recent years, he was also President of Scholarships for Children of American Military Personnel, a nonprofit organization providing for the offspring of those killed in action, missing, or prisoner of war in Southeast Asia.

Henry M. Jackson (1912–1983)

Sen. Henry M. "Scoop" Jackson, whose congressional career spanned forty-two years, had virtues not always found in politicians—consistency, strength, and compassion. One of a rare breed, he was a statesman with strong convictions, unafraid to stand against the popular thinking of the day. He was what a Senator should be, finding that delicate balance between concerns for his own state and the national good.

Senator Jackson was a master consensus-builder. He knew the art of compromise and had a rare knack for forging coalitions on legislation about which he cared most. In an era of slick images created by today's electronic media, Scoop Jackson, described by his own colleagues as a "Senator's Senator," stood out as a unique public servant, a man of integrity, sound experience, and careful thinking. He represented an unusual philosophical blend, a conservative on defense and a liberal on domestic issues. He fought for spending for guns and butter and found no inconsistency therein. That blend of characteristics so distinguished his career that an entire wing of his party took on his name—Jackson Democrat.

Senator Jackson's influence was felt across a broad spectrum of legislation—energy, the environment, social issues, civil rights—but perhaps his most significant mark was made on defense and foreign policy. He was the quintessential advocate of peace through strength. Senate colleagues pointed to Scoop Jackson, who was serving as the ranking minority member of the Armed Services Committee at the time of his death, as the most knowledgeable member of either body on national defense issues. He wanted a strong America and was willing to pay the price for it.

Senator Jackson's views on defense and foreign policy changed little over the years. He believed simply that the world was a dangerous place, rife with threats to our survival as a prosperous, free, independent nation and stabilizing global force. A tireless worker on behalf of national security, Senator Jackson knew the value of preparedness and strength. He said on the Senate floor only recently, "If we do what is necessary to maintain our strength, we need not fear our adversary." Owing to his consistent distrust of the Soviets, he wanted an America strong enough to deter aggression and yet achieve real, lasting arms control. The Reagan Administration could find no better supporter of its efforts to rebuild US defense posture. For Henry Jackson, overcoming partisanship and avoiding division were key to forging a strong defense.

Scoop Jackson viewed defense as the highest of priorities, reportedly having once said that "the true test of a man is where he stands on national defense." He never failed to pass that test. His stand on national security singled him out as a man of courage, deep conviction, and dedicated commitment to peace and freedom. With his inherent distrust of the Soviets, how fitting his final public statement should have been the condemning of the brutal attack on the South Korean airliner as an "act of barbarism."

In a distinguished career, it is not easy to single out only a few major accomplishments. However, it is certainly important to note Senator Jackson's leadership in getting the ABM program through the Senate; prohibiting most favored nation trading status for countries restricting emigration, aimed principally at Soviet restraints on emigration of Jews; his leadership in prohibiting Senate ratification of the SALT II Treaty; strengthening the SALT I accord with a parity amendment ensuring that no treaty would allow the US ICBM level to be inferior to that of the Soviet Union; and his initiation of the concept of a bipartisan commission to examine the problems in Central America and potential solutions.

Every American has benefited from the devotion of Sen. Henry M. Jackson to a career of public service. Although there will be another Senator from the State of Washington, Senator Jackson cannot be replaced. The Senate has lost one of its giants, the Pentagon has lost a friend and supporter, and the country has lost a national asset. His wisdom and counsel will be sorely missed.

—KATHLEEN McAULIFFE


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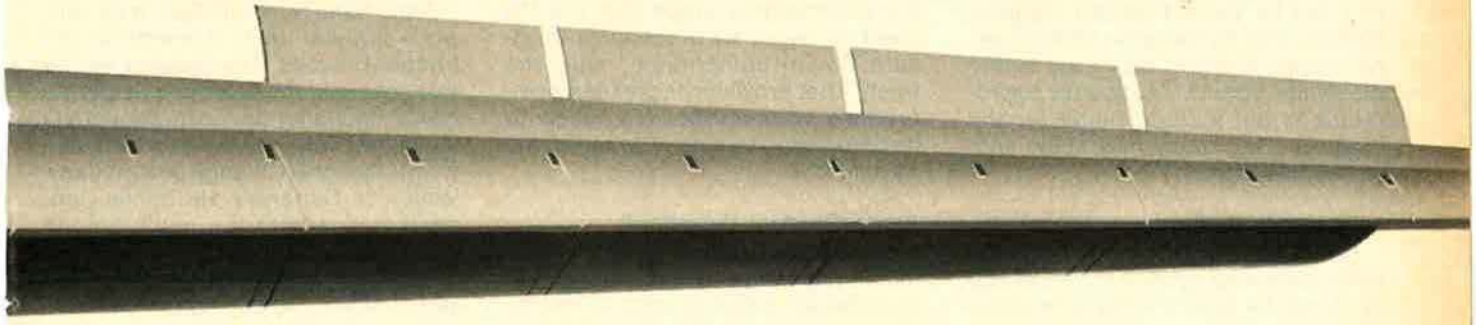

CAPITOL HILL

By Kathleen G. McAuliffe, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., Sept. 23

Authorization Adopted

The Soviet downing of the South Korean airliner probably expedited adoption in the House and Senate of the $187.5 billion FY '84 Defense Authorization. Prior to that tragic incident, it was widely expected that the House would defeat the conference report because of Senate insistence on including authorization for production of binary chemical munitions. The binaries were previously denied in the House by an overriding vote of 256 to 161 and approved in the Senate only after the Vice President broke a tie. The conference report authorizes $115 million for binary munition production and base support, although final assembly of the munitions is prohibited until October 1, 1985. Further, the legislation requires one unitary chemical projectile to be rendered useless for military purposes for each binary munition produced.

Opponents of the chemical weapons, led by Reps. Clement Zablocki (D-Wis.) and Ed Bethune (R-Ark.), expect again to bring their case before the House should the defense appropriations bill include funds for the binaries. The House may again support those efforts.

Interim Spending

Once again, DoD, along with some other executive agencies, almost certainly will be forced to carry on under the constraints of a continuing resolution beginning October 1 while the House and Senate work out an FY '84 defense appropriations bill. The interim funding agreement will probably limit Pentagon spending to FY '83 levels by project, thus eliminating any new starts included in FY '84 plans. Further, the resolution is expected to be limited to forty-five days. This puts pressure on the House and Senate to reach agreement on an FY '84 appropriations bill in that time or else risk sliding into a second interim funding measure. The continuing resolution is not expected to have any appreciably adverse affect on major defense programs.

Meanwhile, House and Senate Appropriations Committees are looking for cuts in the FY '84 defense budget. Some $2 billion alone must be cut simply to jibe with revised economic assumptions. That is expected to be spread out among various programs, but at least $100 million will be taken out of USAF R&D programs to satisfy the changed assumptions.

Compliance on TTBT

Sen. Jesse Helms (R-N. C.) showed fellow Senators declassified DoD data indicating that the Soviets are not complying with the unratified Threshold Test Ban Treaty of 1974, which limits underground nuclear testing to 150 kilotons. Both the US and the USSR agreed to abide by the limits of the treaty.

According to Senator Helms, the Soviets conducted tests above that threshold fifteen times. Some of those tests are believed to have had yields of 300 kilotons and even 600 kilotons. As a result, the Foreign Relations Committee urged that the US "seek to negotiate procedures to assure Soviet compliance" with the treaty. That provision is part of a compromise arms-control resolution to be considered by the full Senate in the near future.

Arms-Control Deadlock

The Senate Foreign Relations Committee was unable to get a majority of its members either to support the nuclear freeze resolution or a compromise resolution that in part supports the objective of real reductions via a guaranteed build-down of forces. A build-down would require a varying number of existing warheads to be dismantled for each new one deployed.

According to sponsors of the build-down, a new formula for its implementation would involve cutting the total number of ballistic missile warheads to about 5,000, as the Administration itself proposed. This could be achieved through modernization programs or, barring that, a guaranteed annual percentage reduction. The concept would also focus on a declining limit on the "overall destructive capacity" of each side's arsenal. This would be measured by totaling warheads and factoring in each side's respective advantages in such areas as throw-weight and accuracy.

Foreign Relations Committee Chairman and build-down sponsor Sen. Charles Percy (R-Ill.) would like to get a two-thirds Senate vote supporting the compromise resolution to signal the Administration that an arms-reduction treaty incorporating the build-down concept could be ratified by the required two-thirds of the Senate.

That kind of support is now in question. With both resolutions being sent to the full Senate for debate and the Foreign Relations Committee "in disagreement" with both, the committee action could be a precursor to the inability of the full Senate to reach any sort of consensus on the arms-control issue.

Changing the Budget Process

Sen. Sam Nunn (D-Ga.) may propose legislation to streamline the budget process. The Senator earlier this year said the Supreme Court decision declaring unconstitutional the legislative veto accelerated the need for fundamental change and modernization in Congress. He thinks Congress now wastes too much time in duplicative hearings.

As the new ranking minority member of the Armed Services Committee and potential future chairman, Senator Nunn undoubtedly has in mind giving that panel total oversight on specific defense programs. He may include in his legislation two-year budget and appropriations cycles; merging the Budget and Appropriations Committees to set overall spending levels; and adding full appropriating authority to the other responsibilities of the authorizing committees.

A spokesman for the Georgia Senator said such legislation could be proposed by the end of the year. Such an attempt at institutional change is sure to draw substantial opposition in both Houses. ■

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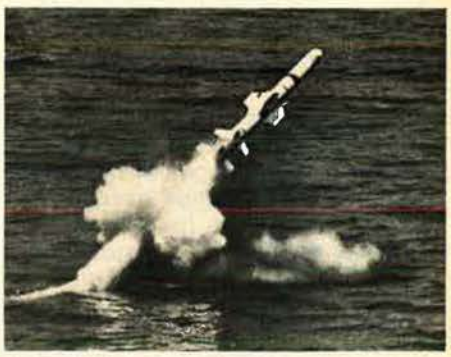


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VIEWPOINT

Crime and Nonpunishment

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

Our allies have seen the true face of the enemy. It would be a good moment for them to look more kindly on a friend.

Save for the families of the victims, the shock of the Soviet action over Sakhalin has by now subsided, as such things do. The Russians have lied transparently in attempting to link KAL 007 to a United States spy mission. Transparent though their story may be, there are those, including, sadly, some Americans, who apparently are ready to believe it. Since these are the same people who are ready to believe anything nasty about the United States, I suppose it doesn't matter, but it is nevertheless depressing to know the Soviets can commit the worst aviation crime in history without being unanimously blackballed by that part of the world outside their clutches. It is almost beyond imagining the public outcry in Europe, Canada, and the United States had the situation been reversed—an Aeroflot transport downed by an F-15. Equally, it is impossible to imagine that such a thing could happen.

Our Air Force and Navy have doubtless lost count of the Soviet aircraft they have intercepted over places that were off limits. The Soviets, together with their foreign-legion hirelings from Cuba, have flown over New England air bases and the New London submarine works. RAF interceptors routinely come up alongside Soviet snoopers near Scotland, and the USAF interceptor outfit in Iceland livens up its days by escorting Bear reconnaissance airplanes away from sensitive facilities on that NATO member's territory. Soviet intelligence trawlers have for years been lurking off Pearl Harbor, Guam, and other important military installations. During the Vietnam War there was reason to believe these intelligence trawlers let their friends in Hanoi know when the B-52s left Guam; certainly, they monitored the communications traffic having to do with that war. All of which, given the Soviet mindset, was more than enough provocation for us to sink them. Of course, we did not.

The destruction of KAL 007 left people with a sense of outrage and perhaps a more lingering feeling of frustration. What can we do to get even? Embargoes don't seem to accomplish much. Pulling out of athletic contests, as President Carter discovered, is somehow akin to a small boy leaving a ball game in pique. The small boy may feel better, but the game goes on. And while urging war on the Soviets, or at least an eye for an eye, may be a good way to work off steam, it really makes no sense.

We will never know the whole story behind this monstrous Soviet overreaction to a peacetime airspace violation. Probably ineptitude played a large part in the affair—ineptitude on the part of the interceptor pilots who never got close enough for a positive identification; and ineptitude at the command levels where a shoot-down order evidently seemed the safest course—what is known in basic American terminology as covering your tail.

Still, 269 people died and their deaths should have some meaning. It may be that the President can come up with imaginative economic reprisals to avenge, in part, those lost souls, but this will mainly hurt the Russian workers. In that failed revolution of the proletariat, the ruling class lives the good life.

Beyond economics, then, and we might as well frame any resolution for all the good it will do, there should be actions that will send a clear message to the Soviet oligarchs, civilian and military, that the downing has increased, not lessened, their security problems. If the destruction of KAL 007 was a paranoid act, then we should remind them that even paranoids can have real enemies. Much of the free world, and thus our putative allies, have behaved this past decade as though the blame for world tension was shared equally by the USSR and the USA. This air-to-air murder should change some minds, although nothing is certain.

In any case, if there is ever going to be any meaning given to those 269 lives, the time is now. For starters, I suggest we set about tightening our slightly frayed alliances. These allies have seen the true face of the enemy. It is a good moment for them to look more kindly on their friend.

What more incentive does Japan need to revise its constitution and get on with the kind of defense structure befitting a great, and democratic, economic power? True, the United States gave the Japanese that pacifist constitution, but that was also in the days when people who should have known better spoke fondly of a leading contender for the title of history's greatest mass murderer as Uncle Joe Stalin.

The Philippines have just held up the United States for $900 million in base rental fees. Clark AB and Subic Bay are important, but not to the United States alone. They are important to the security of all nations wishing to remain free, as opposed to being Communist satellites, and that $900 million bill may face problems in the Congress. With this in mind, it is a good time for President Marcos to back off.

NATO could put on a more resolute face. Taiwan, a most strategic island and one occupied by neglected US friends, might receive a little attention. Here at home, and just for once, the nuclear freezers and the radical chic protestors against all US military action might change sides. That, however, is probably beyond hope.

Maybe our side will do nothing, in which case the disquieting thought comes to mind that the Soviets may even gain by what they did to KAL 007. Violence has traditionally been behind successful gangster behavior, whether a Mussolini reaching for power or a Capone encouraging merchants to pay for protection. If this massacre makes fear a governing factor in those parts of the world where there is doubt of America's resolution, then the Soviets will have gained. Crime, as we all know, sometimes pays. ■

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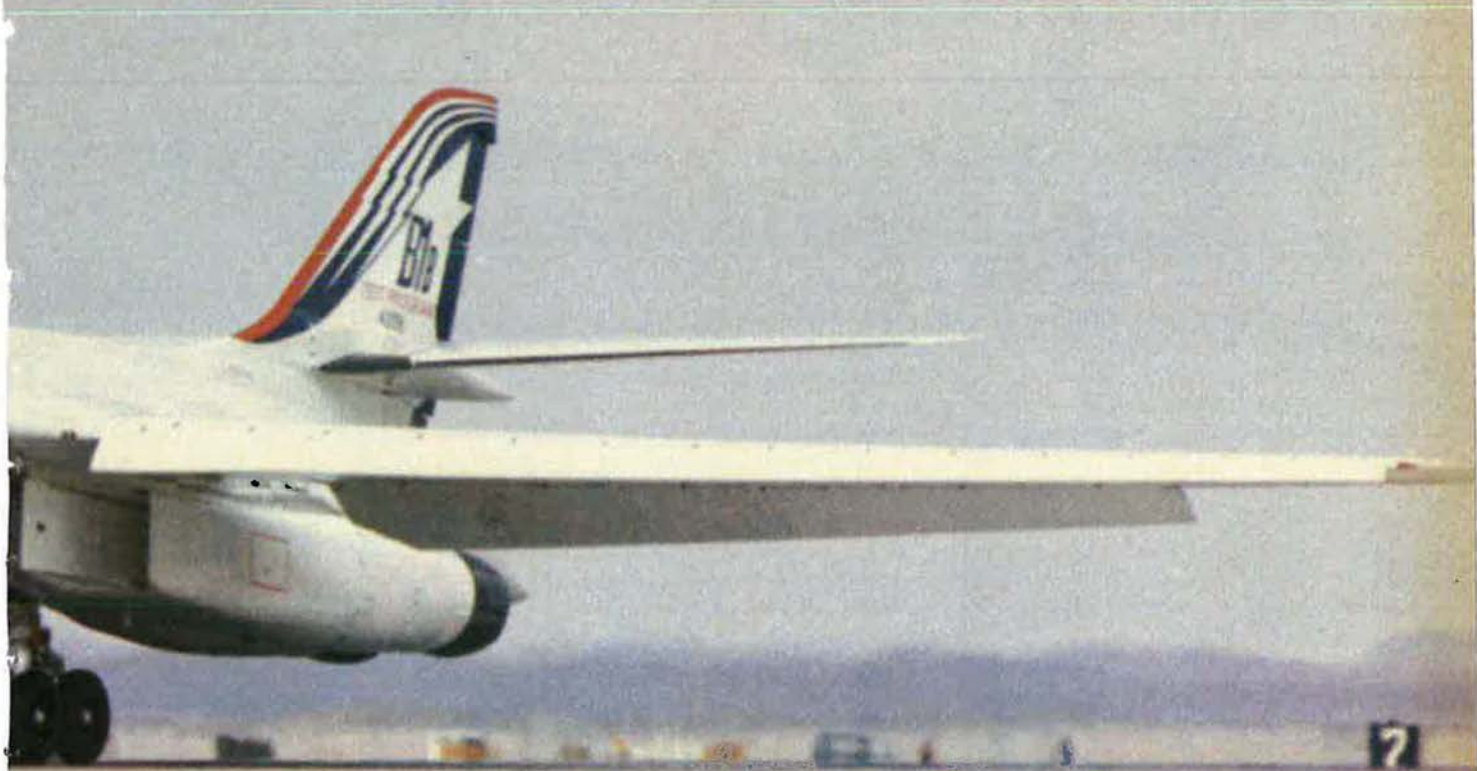

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Ritchie rides out in the McDonnell Douglas F-15 DRFD.

An Eagle for All Arenas

A fighter ace flies the F-15 dual role fighter candidate and reports this bird can do it all.

BY STEVE RITCHIE

THE need for an all-weather, night tactical bombing capability was never more dramatically demonstrated than in March of 1967.

North Vietnam's most advanced industrial plant, the Thai Nguyen steel mill, was finally approved for full-scale attack. The complex, located some thirty miles north of the capital city of Hanoi, was Vietnam's most visible link to the industrial age. This distinction made it even more tempting as a military target. However, because of decisions made at the highest levels of the US government, it had been subjected to only restrained bombing efforts for the previous two years.

Seventh Air Force in Saigon was assigned the task of target destruction, but early efforts were thwarted by adverse weather. Low ceilings and poor visibility persisted for days, so large-scale strikes by numerous Air Force units had to be diverted to second- and third-priority targets.

Resources for this kind of assignment consisted mainly of F-105s and F-4s based in South Vietnam and Thailand. The Thuds and Phantoms had radar bombing systems, but they lacked the accuracy needed to achieve desired objectives.

In a valiant and courageous attempt to reach Thai Nguyen, Col. Robin Olds, Commander of the 8th Tactical Fighter Wing at Ubon, led a flight of F-4s through a blind letdown in mountainous terrain, using time and distance navigation into conditions of less than a 500-foot ceiling and three-fourths of a mile visibility and deteriorating. Colonel Olds filed a report that would daunt even the most daring aviator, calling the flight "the most difficult mission I ever flew!" The intended target was obscured by weather, forcing the Phantoms to hit a secondary target within the steel complex.

The lack of a means to mount an effective attack against such an important target around the clock and during inclement weather was frustrating to commanders, ops planners, and operators at all levels, and led to several high-priority "Quick Reaction Capability" (QRC) efforts to develop a near-term radar bombing enhancement in existing combat aircraft.

Twin-seat F-105F radar and fire-control systems were swiftly modified. The airplanes were quickly deployed to Korat Air Base in Thailand and assigned to a unit known as "Ryan's Raiders." They were flown only at night or in bad weather against important targets north of the seventeenth parallel. Although the F-105's bomb impact error was cut in half, the improved system fell short of the needed accuracy, and the program achieved only limited success at great cost.

McDonnell Douglas test pilot Gary Jennings briefs Steve Ritchie on their flight plan for the F-15 Dual Role Fighter Demonstrator. It called for simulated attacks on a variety of ground targets.

"Combat Bull's-Eye" was another QRC concept that used the B-58 as a radar pathfinder, with fighter-bombers on the wing. It was tested Stateside, but never put into operation.

Seventh Air Force was, therefore, without a credible all-weather, night capability until the last months of the war when F-111As achieved commendable results against major targets in the North.

How ironic it is that on the day we downed the fifth MiG-21—August 28, 1972, almost five and a half years after the first major effort to take out the Thai Nguyen target—I was flying cover for Col. Carl Miller, Commander of the 8th TFW, who led an F-4 laser-guided-bomb, day-VFR strike against none other than the Thai Nguyen steel mill. Result: The complex was finally destroyed!

Our experience in Vietnam clearly reestablished the need to be able to strike on a twenty-four-hour basis, although World War II and Korea were certainly no strangers to this requirement.

The F-111, wanted by Secretary of Defense Robert McNamara in the early '60s as a multimission, multiservice airplane, eventually evolved into filling the low-level, all-weather attack mission for the Air Force, and it has performed admirably. However, the fleet is small, aging, and difficult to maintain. Thus, the void remains. An aircraft that may fill the gap is the F-15E dual-role fighter candidate. I flew that airplane August 23.

The Achievable Task

Flying into St. Louis, I pondered the next day's schedule at McDonnell Douglas. It was interesting to think of the current development of the Dual Role Fighter (DRF), and to recall that this is not the Eagle's first exposure to the air-to-ground role. The airplane has had a visual dive-bomb capability since the F-15A's introduction into USAF's operational fighter force in the mid-'70s. The weapons delivery computer had air-to-ground logic, and the cockpit head-up display (HUD) presented delivery parameters symbology. Bomb racks were developed and tested. A dual air-to-air, air-to-ground role was originally intended for the F-15. However, to the delight of many of us who had pressed for specialization for several years, Air Force leadership, faced with initial low aircraft sortie rates and other considerations, wisely directed that the F-15 be dedicated to the air-superiority role.

Eagle pilots, therefore, were given an achievable task—namely, to become highly proficient in a critical mission area even though they would be provided a limited number of training sorties in which to prepare for combat.

The F-15 is now a mature weapon system with excellent logistics support and a high-quality maintenance force that resulted in a 70.9 percent fully mission capable (FMC) rate in 1982—better than any other fighter in the inventory.

Many of the persistent problems of the late '70s, such as severe parts shortages, engine troubles, long lead times for radars and engines, technicians leaving the service, and subcontractors failing to deliver or going out of business under the pressure of high interest rates and other demands, have eased.

Having flown the F-15B three years ago with Lt. Col. Murray Sloan in an air-to-air environment at Holloman AFB, N. M., and now having flown the F-15E candidate with McDonnell Douglas test pilot Gary Jennings in St. Louis, I find it almost impossible to believe the incredible advances that have occurred in fighter aircraft in less than ten years. Today's operational F-15, when judged throughout the spectrum of performance and range of tactical requirements, is probably the world's finest fighter. It's a tested combat veteran with no combat losses. And while proving itself a winner time and again during the intense demands of William Tell, Red Flag, and other highly realistic competitive arenas, it has established the best safety record of any fighter in history (4.7 accidents per 100,000 hours flying time).

What one who has been away

Why USAF Needs A Dual Role Fighter

The present fighter force has two significant deficiencies: limited capability to carry large payloads long distances and a limited ability to operate at night and in adverse weather. Currently, only the fully committed and aging F-111—which accounts for eight percent of the force—can perform the long-range, high-payload mission. In addition, it provides the only night and adverse weather capability.

Derivatives of the F-15 and F-16, performing in a dual air-to-air and deep interdiction role, appear to have the inherent capability to correct this force imbalance while maintaining their proven air-to-air capabilities.

The Air Force has been evaluating F-15E and F-16E candidates, leading toward selection of a derivative aircraft to be the dual role fighter.

Before takeoff, Ritchie inspects the high-thrust engines that give the F-15 its "muscle factor." He emphasized the importance of "brute power" to carrying heavy payloads in the air-to-ground mode.

from the day-to-day operational business for awhile realizes immediately is that advancing technology enables the operator to do much more—and do it more quickly, and with greater efficiency, thus easing the pilot's mental work load and allowing better combat judgments and quicker decisions. So much information is now available through the head-up display and so much can be done with the array of switches and buttons on the stick and throttle that the heretofore unhappy necessity of looking down in the cockpit has virtually been eliminated. Advances in aircraft handling, engine performance, radar, avionics, cockpit design, and all-important rear quadrant visibility represent a quantum leap forward.

So, the basic F-15 has, for some time now, been doing many things better than they've ever been done. Moreover, it has always had the capability to be an excellent air-to-ground machine. The addition of a high-resolution radar (HRR), a major new development demonstrated convincingly on my flight in the F-15E candidate, includes air-to-ground radar and computational improvements that enable previously unknown capabilities in range, acquisition, resolution, grazing angles, inertial navigation system (INS) update, and terminal guidance. The sheer size of the radar dish and the power that drives it (simple physics), plus the latest in digital science, provide range and resolution in the upgraded APG-63 that is not elsewhere available in a tactical system—another quantum leap!

Jim Caldwell at McDonnell Aircraft Co. (MCAIR) describes the process as "number crunching" radar returns at a high rate over a given distance and combining them to make a picture. He says, "In order to produce the kind of imagery we're seeing with this radar we needed to significantly increase processing capacity. Hughes Aircraft and MCAIR have expended some $50 million of company funds in the effort. And we've had it flying for several years. The bottom line is improving survivability in that end game by getting accurate pictures with the radar at long ranges, driving into the target area, then being able to see the picture more precisely for system update and final delivery. Plus we make our airplane fully compatible with the newest standards of digital electronics and armament."

High-resolution radar mapping is actually not new, but packaging it in a lightweight, low-volume system for use in a high-performance fighter is.

Leaving the Air Patch

My August 23 mission in the Dual Role Fighter Demonstrator (DRFD), to be flown without ordnance, was planned for about one hour, fifteen minutes, launching from St. Louis's Lambert Field via the Viking I departure. The primary objective was to look at various features of the greater St. Louis landscape as if they were targets, and evaluate the improved APG-63 radar perfor-

Wayne K. Wight, MCAIR's Chief Systems Operator (left) and John J. Sheehan, lead technician, take Ritchie through F-15 DRFD rear-cockpit checkout. Judging the cockpit as "plenty spacious," the author was impressed with its "amount of internal cube . . . for additional mission tasking."

mance while executing simulated attacks under a variety of conditions.

It's obviously impossible to appreciate fully all the capability of a new system in just one flight (and even less possible to describe it all in one article). But listening to a short segment of the airborne explanation by Gary Jennings will give the reader a glimpse of the latest in fighter air-to-ground radar ability as designed for this role.

JENNINGS: Neat way to leave an air patch *[12,500 feet above ground level by the end of the runway].*
RITCHIE: Foxtrot Bravo!
JENNINGS: We are within limits of the radar, so I'm going to command electronic map. Turn the records on, please.
RITCHIE: Records on.
JENNINGS: There's Scott AFB in the middle of the cursors—twenty-six miles away. There is the next map up. We have auto gain circuits in the radar that look at all the returns of the previous maps and determine what the gain should be for the next map. We are now looking thirty-one degrees left. There is the runway and all the ramps. That was forty-two-foot resolution. *[Individual targets can be distinguished when at least forty-two-feet apart.]* Here comes the seventeen-footer, and I'm going to concentrate on the ramp area. You can see the terrain, the plow lines, and some trees. From nineteen miles away we can now see airplanes on the ramp. I'm going to freeze it there for a second and if you would, Steve, on that left-hand control, cycle the zoom switch.
RITCHIE: There's zoom.
JENNINGS: It's a little grainy, but that definitely tells me that there is one big airplane, and probably another here, and another down there. I'll call back the original map. I'm going to command one map from freeze and we'll look down at this end of the ramp. The next map will be recentered on the cursor position. And there are more airplanes down at this end. I'll now go back to the original end of the runway and we'll get ready for an eight-and-a-half-foot resolution. Nice crisp map there. Here comes an eight-and-a-half resolution map from thirteen miles away. What you are seeing now are returns from the tail and the nose of the airplane and a little bit of wing. So that's what the best radar in the world can do. Turn records off, please.
RITCHIE: Records off.

During the preflight, I couldn't help but think that the amount of internal cube (physically available growth space for new black boxes, etc.) is a primary asset when considering an existing airframe for additional mission tasking. The F-15 has a bunch! The cockpit is plenty spacious. There's room not only for five- and six-inch CRT screens, but also area for additional dials, indicators, gauges, and controls, as well as space to move various components until the optimum arrangement is found, a luxury never previously available in a fighter cockpit. Chief Systems Operator Wayne Wight gave a complete rear cockpit checkout and made sure everything was ready.

It was comforting to learn that the UHF radio, the single most important piece of equipment in the air battle arena, is a vast improvement over the F-4 transceiver. In November 1972, Gen. William Momyer, TAC Commander, asked me to describe the most serious problem in air combat over North Vietnam during Linebacker I. "General Momyer," I said, "We shouldn't build another airplane, another missile, another gun, another radar, another engine, another EW pod, or anything else until we build a UHF radio that works!" There were many phone calls that afternoon from people in the communications business. The F-15 is equipped with two jam-resistant UHF radios that allow flexibility for inter- and intraflight communications.

JENNINGS: Now we're going to execute a blind bomb delivery on the railroad intersection near the town of Prairie du Rocher, and we'll do this one from low altitude. It is currently nineteen miles away so the only thing I have to do is select air-to-ground master, and get another precision velocity update. In the production airplane, this mode would be interleaved automatically between the normal mapping modes. There is the drainage ditch, and the long black streaks that you see on the ground are shadows from the trees. Right over in this area you start seeing quite a few trees and little dots. That's the town. The thin line coming into the town from the north is the railroad track. The intersection I want is right there. It's fourteen miles away, fifty degrees right and we are only about 1,500 feet above ground. You can see that the radar takes that video from a low grazing angle and presents it to us from a vertical position or "God's-eye view." So a circle doesn't look flattened on the horizon; it looks like a circle. We are ten miles away. There is eight-and-half-foot resolution. I'll let it give me one more map. That's good enough. I'm going to freeze and we'll turn for the attack, and I'll select cursor designate. Bingo. There we are—we're designated. You take it from here, Steve, would you?

RITCHIE: I've got it.

JENNINGS: We are 6.2 miles out. About ten seconds prior to weapons release we have to turn the radar transmitter back on for air-to-ground ranging to give us the delta height for the bomb module that determines when the bomb comes off the airplane. We are thirty seconds out from weapons release. There is air-to-ground ranging. And there are the numbers. There is weapons release!

One of the most impressive capabilities of the radar is its ability to operate at low grazing angles, meaning target acquisition at long distances and low altitudes.

The final radar target of the day was the Wood River oil refinery tank farm, acquired from seventy-five miles out at approximately 7,500 feet above ground level using a ten-nautical-mile patch map. At seventy miles, Gary switched to the 4.7-nm map (fifty-nine-foot resolution) and we were able to distinguish individual oil tanks! We then drove in to thirty-eight miles, descending to about 1,000 feet above ground level or approximately one-tenth of a degree grazing angle. Even though the horizon was now coming between the radar and the target, vertical structures were still visible on the scope.

Again, the name of the game is to acquire and map targets at long distances, drive in using minimum radar transmission (it takes four to six seconds to generate a new picture), and update as necessary for a more precise position. More accurate target information is then available for use with electro-optical (EO) or infrared (IR) devices for final delivery.

Most sensors, such as the Forward Looking Infrared (FLIR), have a narrow field of view. Consequently, the high-resolution radar provides an excellent complement because of its extremely accurate cueing. Essentially, it enhances quick target acquisition by "pointing" the narrow focus sensors at the target. At three miles out, for example, the FLIR takes in the target and a 360-foot distance on either side.

It is important to remember, however, that IR does not work in bad weather or under certain moisture conditions. Radar or visual options can be used if weather conditions do not permit EO or IR.

We also checked stall characteristics, sustained seven-G-level turn ability, and tested the ride at 500 feet and 600 knots. There was even time for loops, rolls, Immelmanns, and minimum-altitude-loss split Ss in order to get the feel of the F-15 again! It's too bad that young aviators, having not flown the F-4 or any of the lesser-performing Century Series fighters, will probably never really appreciate how great this airplane flies.

An increase in combat time needn't mean loss in maneuverability.

The much-discussed rough ride at "high-Q" (low altitude, high speed) was no problem. It would be a little different out west on a hot afternoon in mountainous terrain because the big wing of the Eagle jet has lots of lift! But a full combat load would smooth things out significantly.

Air Force Maj. Dick Banholzer, TAC's test pilot for the F-15E candidate, says, "The high-Q ride is good to very good, similar to that of an F-4. The CFTs [conformal fuel tanks] provide some airflow smoothing across the tail and the added gross weight inherent with air-to-surface stores and additional fuel increases the wing loading at portions of the mission where high-Q flight would be required."

Thus, I consider the "rough ride" criticism a nonfactor. Also, the nine-G envelope would be expanded in the F-15E by machining a little less metal from key structural members at a cost of only about thirty-four pounds of added weight.

The two-seat fighter concept has often been a subject of debate, especially among F-100 and F-105 jocks. Being fortunate enough to have helped develop the high-speed forward air control or "Fast FAC" program in the F-4 based out of Da Nang in 1968, I came to understand early on the advantages of dual cockpit capability that proved to be invaluable in this highly successful operation.

Gary and I brought the F-15 DRFD home to Lambert Field via our own radar approach, which is a

Over Edwards AFB, an F-15C sports its new "tangential carriage" of air-to-ground ordnance. Placing bombs front-to-rear on conformal fuel tank pylons increases the range and greatly cuts the drag of the aircraft, McDonnell Douglas claims.

real plus, considering how important that ability could be under certain combat and weather conditions.

Two Key Points

After two days at MCAIR including personal equipment and escape system update by Jack Sheehan, the flight with Gary Jennings, plus almost two hours in the Manned Air Combat Simulator (MACS V) with Jerry Cummings, Chuck Huebner and others, and many discussions with such people as Jack Krings, Director of Flight Operations, Don Gardner, Lead Electronics Engineer, Clarence Conley, Electronics Section Chief, Gill Ballard and Jake Bryant of Pratt & Whitney, as well as Air Force experts who have flown the "E" model, several observations emerged.

It seems that two key points about this airplane have been overshadowed by all the attention given the air-to-ground, high-resolution radar, night, in-the-weather, and under-the-weather ability of this aircraft.

The first point is that the F-15E candidate has maintained air-to-air capability, retaining all of its original features. In fact, the improved radar actually enhances its beyond-visual-range (BVR) air-to-air ability, and in the relatively short-range arena of guns and AIM-9s, the increased persistence or staying power is a desirable trait. We can now engage the enemy at greater distances from home base and/or stay on CAP (combat air patrol) approximately twice as long.

On missions in Southeast Asia, I would have traded some maneuverability in the F-4 for a significant increase in real combat time. This would have given the MiG-21 an even greater turning advantage, but under the circumstances of hit-and-run tactics used during Linebacker by an adversary without all-aspect weapons, fuel was such an important and worrisome consideration that the offset would have been an overall plus. However, today and in the future, the sophistication of the threat requires more maneuverability. In the F-15E, we would have the best of both worlds.

If one can double combat time, or even increase it by fifty percent, this can ultimately be a very important tool to gain the advantage; *i.e.*, during low altitude, maximum power, high-G combat, the lighter, less persistent airplane's fuel asset is consumed rapidly. So by neutralizing an adversary's initial advantage (if it exists), you become the stronger.

At first glance, most of us would choose a clean F-15 over one with CFTs for an ACM (air combat maneuvering) duel. However, after considering all the variables, and having no guarantees of exactly where and how the fight will take place or end up, the airplane with more fuel will likely be chosen. If you feel good about being able to defend yourself during the first couple of turns or series of maneuvers, fuel quickly becomes an extremely significant asset; for example, I had little worry about being downed by a MiG-21 as long as visual contact could be maintained, and felt confident regarding the chances of victory. Fighting fuel, therefore, became more and more precious with each passing second, as we had only about two minutes' worth in the Hanoi area. Then, when it does come time to disengage, fuel is the *most* important factor to a successful escape.

Plus, it is notable that an Eagle with CFTs actually has the ability to attain a higher angle of attack than one without, at the same gross

weight, due to lift generated by the shape of the tanks. Also, CFTs are removable using normal maintenance procedures in a few hours.

The second key point has to do with utilization of the advanced APG-63 mapping during a daytime VFR attack when defenses are likely to be most intense.

High-resolution radar takes advantage of the current explosion in digital technology. The ability of this radar to process large quantities of information at extremely high rates is the real difference in participating at the leading edge or forefront of today's science. In other words, the more data available and the faster it can be processed into useful information, the better the chances for success. This simply means more maps at higher resolution and greater ranges in shorter periods of time. This combination is most desirable in a ground-attack problem. The key is to have a high-resolution map that is very young and, therefore, with intelligence on it that is very good! So the requirements of this type of sensor are precisely coincident with advancing technology. This is not necessarily true with other sensors such as the eyeball, IR, and EO, which become quite distorted at low angles and long distances.

Almost everyone assumes that for purposes of discussing the various merits, requirements, deficiencies, etc., of the DRF, the attack will be made at night or in the weather. But what if it becomes necessary to attack on an afternoon with good visibility and just enough high cloud cover to diminish the sun's effect on everybody and his brother who will be lined up to take a shot? Under such conditions, the old "pop-up" maneuver for final target acquisition is dangerous! Thus, the ability to accomplish, in day-VFR conditions, what so many have been discussing and debating as a night or bad-weather function, seems to have great relevance. It's a reverse benefit that is overlooked in most scenarios.

Size and Muscle

I haven't mentioned size, which almost everyone says is the F-15's biggest drawback; and frankly, it was my first reaction after the first flight and fight in 1980. However, in the BVR and night/all-weather roles, it is obviously much less a factor. True, the Eagle presents a larger radar return depending on the detection angle; but if the Soviets can't tell the difference between an RC-135 and a 747, then maybe we worry too much.

Besides, there's a price to pay for anything in life, and for the DRF to do all we're asking of it, size is necessary.

Terribly important to the entire concept of the DRF is what's referred to as "muscle factor." This simply means the load-carrying ability for both fuel and weapons and the brute power to push such heavy payloads through thick air at high speed and low altitude for many miles.

Over the years, some fighter airplanes have accepted external loads better than others. The F-105 did it well; the F-86 and the F-100, not well at all. And while performance obviously deteriorates at higher weights and drag numbers, the F-15 has a thrust-to-weight and aerodynamic margin that allows it to carry heavy loads gracefully and retain very respectable performance. For example, takeoff distance, under the same conditions, for a max gross weight F-15, 68,000 pounds, is only 1,400 feet longer than for a clean bird at 42,000 pounds (3,500 feet vs. 2,100 feet). Major Banholzer has demonstrated the airplane at 75,000 pounds under standard day conditions resulting in a takeoff roll of approximately 4,100 feet!

Ritchie alights after a "highly successful" flight. He praised the aircraft's radar for its "ability to operate at low grazing angles."

A typical F-15E tangential carriage load would be twelve Mk 82 500-pound bombs, four AMRAAMs (Advanced Medium-Range Air-to-Air Missiles), a LANTIRN pod, and three fuel tanks. With this load on a Hi-Lo-Lo-Hi mission, using a 100-nautical-mile dash and retaining tanks, combat radius would be an impressive 684 nautical miles.

Competition for new systems is almost always beneficial in that, like anywhere else in the marketplace, it forces time lines, deadlines, claims, and budgets to be met. It normally results in technological advances, more creativity, a more cost-effective operation, and a better end product. The people at MCAIR generally agree that competition for the DRF contract has resulted in a better Eagle.

And when searching for the best way to begin to fill the void described earlier via the quickest, easiest, and most cost-effective route, the new Eagle presents a very strong case. Plus, it is definitely time for a decision and a production schedule ASAP in order to meet this longstanding requirement.

Never again should we send our very best pilots into such miserable conditions with so little chance of success, as we did in 1967 during the attempt to destroy Thai Nguyen. ■

Steve Ritchie is the only American pilot ever to have downed five MiG-21s. As a member of the famed 555th "Triple Nickel" TFS and the 432d TRW, commanded by then-Col. Charles A. Gabriel, he was the Air Force's only pilot ace in the Vietnam War. He is a 1964 graduate of the Air Force Academy and was a starting halfback for the Falcon Gator Bowl football team. Volunteering for two tours in Southeast Asia, he flew 339 combat missions. He was presented the Mackay Trophy for the most significant Air Force mission of the year in 1972, and won the Colonel James Jabara Award for Airmanship the same year. He is past president of the Combat Pilots Association of America and a former National Director of the Air Force Association. Currently a lieutenant colonel in the Air National Guard, he is president of Steve Ritchie Associates, Inc.

THE REVOLUTIONARY EVOLUTION OF THE F-16XL

This dual role fighter candidate has one foot in the present and one foot in the future.

BY F. CLIFTON BERRY, JR.

WHEN Lt. Gen. Lawrence A. Skantze spoke at the rollout of the first F-16XL on July 2, 1982, he was speaking in his then-role as Commander of Aeronautical Systems Division. He characterized ASD's perspective as having "one foot in the present and one foot in the future."

For the present, he noted on that July day that the General Dynamics F-16 program "has been one of the singular, outstanding successes that we have had in acquisition management during my tour in the Air Force." It is being produced ahead of schedule, on cost, and meeting all its performance objectives, General Skantze said, and furthermore, the aircraft had acquitted itself well in combat. He cited General Dynamics' receipt of an award for $6.8 million for proving that F-16 reliability and maintenance "far exceed the specifications that we laid down in the contract."

Looking to the future, General Skantze said that "somewhere out there there is a new and advanced technology fighter," and that sometime soon, USAF's present exploratory work would lead to the definition of that new aircraft. Meantime, he said, it's "our responsibility to take the fighter craft we have today and evolve those into higher performers, better performers, and improve their margin and hone the edge of their cutting abilities as the future goes before us."

That has been accomplished in the F-16XL. In a cooperative program, General Dynamics and the Air Force have demonstrated that, at rather modest cost, the F-16XL delivers double the range or payload of the current impressive F-16 performance.

That is revolutionary evolution indeed. The story of how it came to pass is an excellent illustration of industry initiative and risk-taking being applied to US Air Force needs, with USAF taking a share of the costs in order to capitalize on the advances created. The result, if the aircraft is chosen for production of up to 400 copies for USAF, will be a low-risk, high-payoff for the taxpayers.

D. Randall Kent is Vice President and Program Director for the General Dynamics F-16XL program that involved a team of more than 600 specialists. He summarizes the XL program this way:

"The F-16XL flight-test program has conclusively demonstrated that the XL performs as predicted. This performance level represents a significant increase in mission capability for USAF. Coupling this with the affordability and low risk of the F-16XL presents USAF with a viable way to increase mission capability while simultaneously growing to a forty-wing TAC force structure."

In addition to its potential as USAF's derivative fighter, the F-16XL is reportedly being considered by the Japanese Air Self-Defense Force as a replacement for its current ground-attack aircraft. Also, because of its extended range, payload, and suitability for both ground-attack and air-to-air roles, the F-16XL is a prime candidate for US maritime defense operations. That option is now being studied by defense officials and is yet another

F-16XL in gray camouflage colors shows distinctive cranked-arrow shaped wing design and the deceptive "cockpit" painted on underside.

example of blending USAF and US Navy capabilities to enhance defense performance.

Genesis of the F-16XL

Above a hangar door at the Air Force Flight Test Center at Edwards AFB, Calif., is a white sign with faded blue lettering. It reads "Lightweight Fighter Program." The LWF program was a competition between Northrop's YF-17 and the General Dynamics YF-16. GD won the USAF competition in 1974, and then in 1975 won the international competition to provide fighters for four NATO countries. The F-16 has since been sold to the air forces of six more foreign countries in addition to USAF and its original partners of Belgium, Denmark, the Netherlands, and Norway. The other foreign buyers of the F-16 are Egypt, Israel, Korea, Pakistan, Venezuela, and, most recently, Turkey. Turkey ordered 160 F-16C and D models in early September.

The LWF sign still hangs at Edwards, and, more than ten years later, another General Dynamics fighter is being evaluated from the same flight line and in the same airspace as the YF-16.

When General Dynamics won the LWF competition with the YF-16, David Lewis, the company's Chairman and Chief Executive Officer, looked ahead. Among other decisions, Lewis set GD's designers to work to develop derivatives of the F-16.

Harry J. Hillaker was chief project engineer for the advanced versions of the F-16. Harry has been involved in the advanced design of every major aircraft produced at Fort Worth since 1942. He served as YF-16 deputy chief engineer and director of F-16 marketing before turning to leading the F-16XL design effort. The advanced designs that led to the F-16XL were undertaken with company funds and with the cooperation of the National Aeronautics and Space Administration (NASA) and USAF.

Hillaker said that the objective of the F-16XL program was to achieve a logical evolution from the basic F-16 that would provide significant improvements in all mission performance elements. At the same time, it would retain the fundamental F-16 advantage of low procurement and operating costs. Although the principal improvements were to be in range and payload capabilities, simultaneous improvements in all other mission elements were to be given equal emphasis. For example, survivability was to be a prerequisite to longer range. Higher military power (nonafterburning) penetration speed, lower observables, increased maneuver agility, and reduced vulnerable area increased the survival rate so as to be consistent with a longer-range/deeper-penetration capability. Many of the improvements resulted from the design team's innovative approach to integrating the weapons and airframe rather than hanging weapons on in the conventional high-drag, destabilizing manner.

To say that Hillaker's design team achieved its objectives is an understatement. Example: For an air-to-surface mission, the F-16XL can carry twice the payload of the F-16A up to forty-four percent farther, and do it without external fuel tanks while carrying four AMRAAM (Advanced Medium-Range Air-to-Air Missiles) and two Sidewinder AIM-9 infrared missiles. With equal payload/weapons and external fuel, the mission radius can be nearly doubled. When configured for a pure air-to-air mission, an F-16XL with four AMRAAMs and two AIM-9s can go forty-five percent farther than an F-16A and can do so while conducting a combat action that is equal to thirty percent of its internal fuel.

As for penetration and survivability, the F-16XL can dash supersonically with a load of bombs at either high or low altitude. It can climb at high rates with the bombs aboard. And it has a speed advantage of up to eighty-three knots over the F-16A at sea level at military power setting and 311 knots on afterburner at altitude while carrying a bomb load.

The two-seat version of the F-16XL carrying four Mk 84 2,000-pound training bombs, two AIM-9 Sidewinders, and four AMRAAM missiles.

Two additional capabilities of the F-16XL contribute to survivability. First is improved instantaneous maneuver ability coupled with greatly expanded flight operating limits (with bombs), and second is reduced radar signature resulting from the configuration shaping.

Importance of High Turn Rate

For a decade and a half, many fighter tacticians have stressed the paramount importance of being able to sustain a high turn rate at high Gs. The rationale was that with such a capability, enemy aircraft that cannot equal or better the sustained turn rate at high Gs could not get off a killing shot with guns or missiles.

With developments in missiles that can engage at all aspects, and as a result of having evaluated Israeli successes in combat, the tacticians are now leaning toward the driving need for quick, high-G turns to get a "first-shot, quick-kill" capability before the adversary is able to

launch his missiles. This the F-16XL can do. Harry Hillaker says it can attain five Gs in 0.8 seconds, on the way to nine Gs in just a bit more time. That's half the time required for the F-16A, which in turn is less than half the time required for the F-4. The speed loss to achieve five Gs is likewise half that of the F-16A.

All of these apparent miracles seem to violate the laws of aerodynamics by achieving greater range, payload, maneuverability, and survivability. Instead, they are achieved by inspired design, much wind-tunnel testing of shapes, exploitation of advanced technologies, and freedom from the normal contract constraints.

The inspired design mates a "cranked-arrow" wing to a fifty-six-inch longer fuselage. The cranked-arrow design retains the advantages of delta wings for high-speed flight, but overcomes all of the disadvantages by having its aft portion less highly swept than the forward section. It thus retains excellent low-speed characteristics and minimizes the trim drag penalties of a tailless delta.

Although the wing area is more than double that of the standard F-16 (633 square feet vs. 300 square feet), the drag is actually reduced. The skin friction drag that is a function of the increased wetted (skin surface) area is increased, but the other components of drag (wave, interference, and trim) that are a function of the configuration shape and arrangement are lower so that the "clean airplane" drag is slightly lower during level flight, and forty percent lower when bombs and missiles are added. And although the thrust-to-weight (T/W) ratio is lower due to the increased weight, the excess thrust is greater because the drag is lower—and excess thrust is what counts.

The larger yet more efficient wing provides a larger area for external stores carriage. At the same time, the wing's internal volume and the lengthened fuselage enable the XL to carry more than eighty percent more fuel internally. That permits an advantageous tradeoff between weapons carried and external fuel tanks.

Through cooperation with NASA, more than 3,600 hours of wind-tunnel testing refined the shapes that Harry Hillaker and his designers conceived. More than 150 shapes were tried, with the optimum design now flying on the two aircraft at Edwards.

As an additional technology, the XL's wing skins are composed of an advanced graphite composite material that has a better strength-to-weight ratio than aluminum, is easier to form to the compound wing contours, and has higher stiffness to reduce undesirable flexibility effects.

Two features of the basic F-16 played an important part in readily accommodating what appears to be a drastic change in configuration. First, the modular construction of the airframe allows major component changes with local modification only. And second, the redundant quadriplex fly-by-wire flight control system has the inherent ability (one of its strongest features) to accommodate configuration changes readily.

The modular component construction permitted the addition of a twenty-six-inch "plug" between the center and aft fuselage components to carry the additional wing loads, and a thirty-inch "plug" between the cockpit and inlet component to accommodate the increased wing chord (length). Each "plug" is added at an existing manufacturing splice or mating point.

Finally, since the design and fabrication was entirely a company project, the design team was not constrained by irrelevant requirements and specifications. As Harry Hillaker puts it: "Every piece on this aircraft earned its way on." That design freedom kept the team concentrating on achieving "performance objectives" in this derivative of the F-16.

Late in 1980, General Dynamics approached the Air Force's Aeronautical Systems Division for cooperation and support in flight-testing the design. USAF supplied the two test aircraft to be modified to the F-16XL configuration, two turbofan engines, a new two-place cockpit, and funding for the flight testing. A Pratt & Whitney F100 engine powers the single-seat F-16XL; its sister two-place aircraft is powered by a General Electric F110 derivative fighter engine.

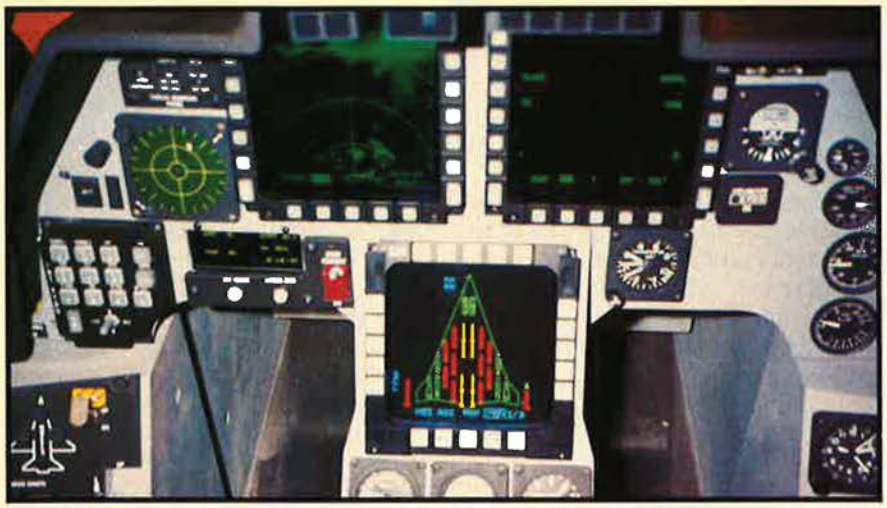
Proof Is in the Flying

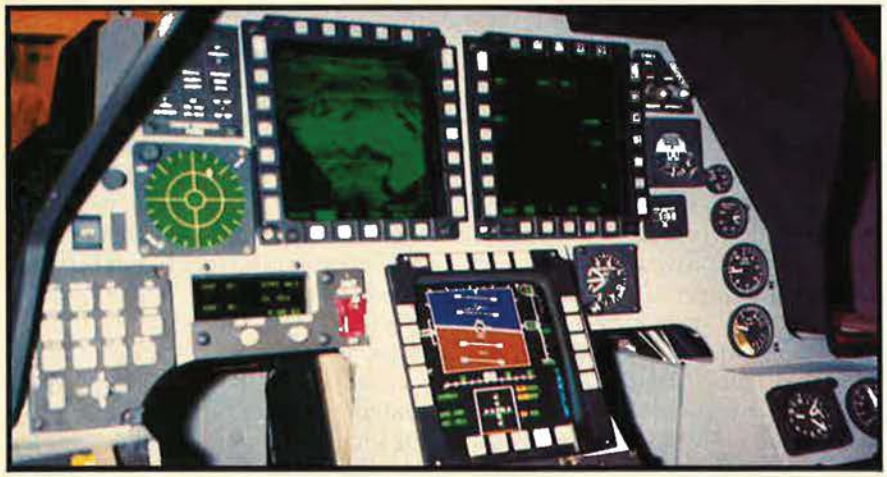
At the Air Force Flight Test Center, I was privileged to fly in the F-16XL with Experimental Test Pilot Jim McKinney of General Dynamics. Jim flew the maiden flight of the F-16XL on July 3, 1982. That was accomplished twenty months after GD, having received Air Force assurance of support, decided to turn their design concepts into a flying aircraft. Also, I was able to discuss with Jim and Harry Hillaker, who is now GD's Vice President and Deputy Program Director for the F-16XL, the derivative fighter evaluation program the aircraft has been undergoing for more than a year. For that purpose, we joined Lt. Col. Marty Bushnell, USAF, who commands the Combined Test Force (CTF) on the F-16XL evaluation, and Lt. Col. Joe Bill Dryden, USAF, the chief Tactical Air Command member on the CTF.

Under the derivative fighter evaluation program, 240 F-16XL flights were planned to be completed by May 15, 1983, by two aircraft: a single seater and a dual seater. In fact, within the time and funding provided, 369 test flights were accomplished. Colonel Bushnell said that the reliability and maintainability of the F-16XL appear to be the same as that of the operational F-16. These features should support XL sortie rates in service similar to those of the F-16. About thirty-six sorties per month were averaged in the basic test period through May 15. Among other results of the tests was validation of the predicted improved performance of the aircraft. An extended test plan called for an additional seventy-two flights, but more than that will be achieved by year's end, the CTF people believe.

Our flight was in aircraft 75-0747. It was the third F-16 full-scale development aircraft. Its sister ship is single-seater 75-0749, which was the fifth full-scale development aircraft. First, we discussed characteristics of the aircraft and specific plans for this flight. Jim McKinney explained that we would explore the four corners of the F-16XL's performance envelope: high altitude/low speed, high altitude/high speed, low altitude/low speed, and low altitude/high speed.

The aircraft was loaded with twelve Mk 82 500-pound general-





Rear cockpit mockup of F-16XL dual role fighter candidate highlights three five-inch-square multifunction displays. On the top two screens, the F-16XL weapon system officer (WSO) can display and control video and descriptive text from radar, FLIR, and other sensors as well as stores management, navigation, and other functional information. The lower color multifunction display can show Color Moving Map with superimposed navigation data, color-coded flight information (top photo), and color-coded external configuration information (bottom photo). Complete sets of hands-on system controls, backup flight instruments, integrated left-hand operated communication, navigation, and identification controls and displays, along with a selectable flight-control capability, round out the WSO's cockpit capabilities. (AIR FORCE Magazine photos)

purpose bombs, four dummy AMRAAM missiles, and two AIM-9 Sidewinder missiles. Internal fuel was 10,200 pounds (full fuel for the prototype is 10,600 pounds). Allowing for fuel consumption for engine start and taxi, gross takeoff weight was 43,500 pounds. Jim estimated the takeoff roll at a bit more than 3,000 feet.

The aft cockpit of the F-16XL test aircraft is configured with the current avionics and sensors that are in production standard F-16C and D aircraft. Should the derivative fighter evaluation result in the F-16XL's becoming USAF's dual-role fighter, the avionics suite will be the same as that being developed under the Multi-Stage Improvement Program (MSIP) for the F-16C/D, which will start being delivered, with initial core systems, in 1984.

When fully implemented, MSIP will provide the desired night/under-weather, navigation/weapon-delivery and beyond-visual-range (BVR) missile capabilities. The back seat in the Dual-Role Fighter version would have the controls and displays, including a color moving map, added to provide the independent or interactive task coordination required to fulfill the dual-role missions. If additional, or future, avionics are needed, the MIL-STD-1553 avionics multiplex bus will be able to accommodate virtually anything by a simple reprogramming of its software.

Jim McKinney refamiliarized me with the rear cockpit controls and emergency procedures. Then we put on personal equipment and walked to the aircraft for preflight.

The F-16 design has always impressed me. It looked functional yet appealing, a design already in the classic category. Approaching the F-16XL with an F-16 alongside reinforced the appeal. Just parked on the ramp, the airplane looked efficient, and you wanted to get in and fly to see what it will do. The walk-around inspection reinforced the feeling, and verified features of the XL design discussed earlier.

Of particular interest were the control surfaces on the aft edge of the cranked-arrow wing. The F-16XL does not have a horizontal tail. Thus, the control surfaces for both pitch and roll are on the rear edge of the wing. The inboard surfaces are mainly for pitch control, while the outboard surfaces take care of roll control. However, thanks to the automatic flight control system, when performance requires it, all four surfaces can act in either pitch or roll.

The drag chute is another difference noted on the walkaround. Except for the Norwegian configuration, standard F-16s do not have a drag chute. It was installed on the F-16XL for operational advantages. It enables the aircraft to recover at airfields whose runways have been shortened through enemy action, as is the threat in Europe. With the drag chute, the F-16XL can recover on runways shorter than 2,000 feet, and it can attain higher-gross-weight takeoffs for the short, critical field lengths of NATO runways. The drag chute allows aborts on a wet runway under hot day conditions at the maximum gross takeoff weight of 48,000 pounds.

Also on the walkaround, we could see close up how the designers mated external payload to the new wing. The method is called "semi-conformal mounting." The normal method uses a pylon protruding from the wing, with a bomb rack that contains multiple ejectors, and then the bombs. That approach imposes high drag and weight penalties.

With the F-16XL method, only the ejectors protrude from the wing and the bombs are thus snugged up close. Their arrangement conforms

Evolution of F-16XL design from basic F-16 is apparent. The current test aircraft retain gray camouflage paint scheme, but white tail numbers are gone.

to the wing shape. Also, the wingspan is large enough to permit staggered placement from centerline outboard, and in line from fore to aft. With one bomb behind the other (in line) the second bomb has half the drag of the first one and the third bomb has half the drag of the second one.

By staggering each row of bombs inboard to outboard, the interference drag is also reduced. Thus, the total drag of this innovative carriage concept is sixty percent lower than the conventional concept. The result is another performance bonus: supersonic flight with a full bomb load. While up to sixteen Mk 82 bombs can be hung from the F-16XL's big wing, twelve were on 75-0747 for our flight.

Supersonic in Seconds

Takeoff from Edwards AFB's Runway 22 with maximum power at gross weight of 43,500 pounds was achieved in less than 3,000 feet. Jim eased back the power to climb away from the Edwards traffic pattern and take up a northerly heading for the test airspace assigned to us.

Cleared to climb to 30,000 feet, Jim applied afterburner and back pressure. Our weight was diminished only by the fuel used for takeoff and the brief excursion out of the pattern. We climbed at more than 20,000 feet per minute, leaping from 4,000 to 27,000 feet in sixty-seven seconds. Jim eased the power back while turning into the supersonic corridor and getting cleared by Edwards Control to begin a supersonic run. Jim applied afterburner and the aircraft accelerated smoothly from Mach 0.95 through 1.0 and to 1.2 in seconds. Even with the heavy bomb load aboard, the aircraft went supersonic without a tremble. Handling characteristics at Mach 1.2 with the heavy ordnance load were remarkably similar to those of the standard F-16 without bombs.

Jim pulled the throttle back to military power. The aircraft continued to coast supersonically for a long period before the Mach meter showed that we were once again subsonic at 0.97.

Next, we maneuvered at slow flight speeds and high angles of attack, demonstrating the F-16XL's agile handling in that corner of the performance envelope. With airspeed below 150 knots, Jim invited me to try a roll to the left. Pressure on the sidestick controller resulted in a fast roll, with no sensation of lagging because of the heavy payload. Release of pressure stopped the roll immediately. I tended to "ratchet," and tried to end the roll with opposite pressure. That's unnecessary with the F-16XL's system, as Jim demonstrated. I tried it again, more smoothly this time.

We accelerated back to more than 400 knots and I tried more 360° rolls. Once I was accustomed to the correct control stick pressures, the roll rate was fast and the controls crisp. The same feelings were apparent at 500 knots—quick, sure response, with no feeling of carrying the heavy bomb load.

Next, Jim demonstrated the F110 engine's ability to accelerate from idle to max afterburner by slamming the throttle forward. Engine response was smooth with no coughing or stalling, thanks to General Electric's advanced electronic engine controls.

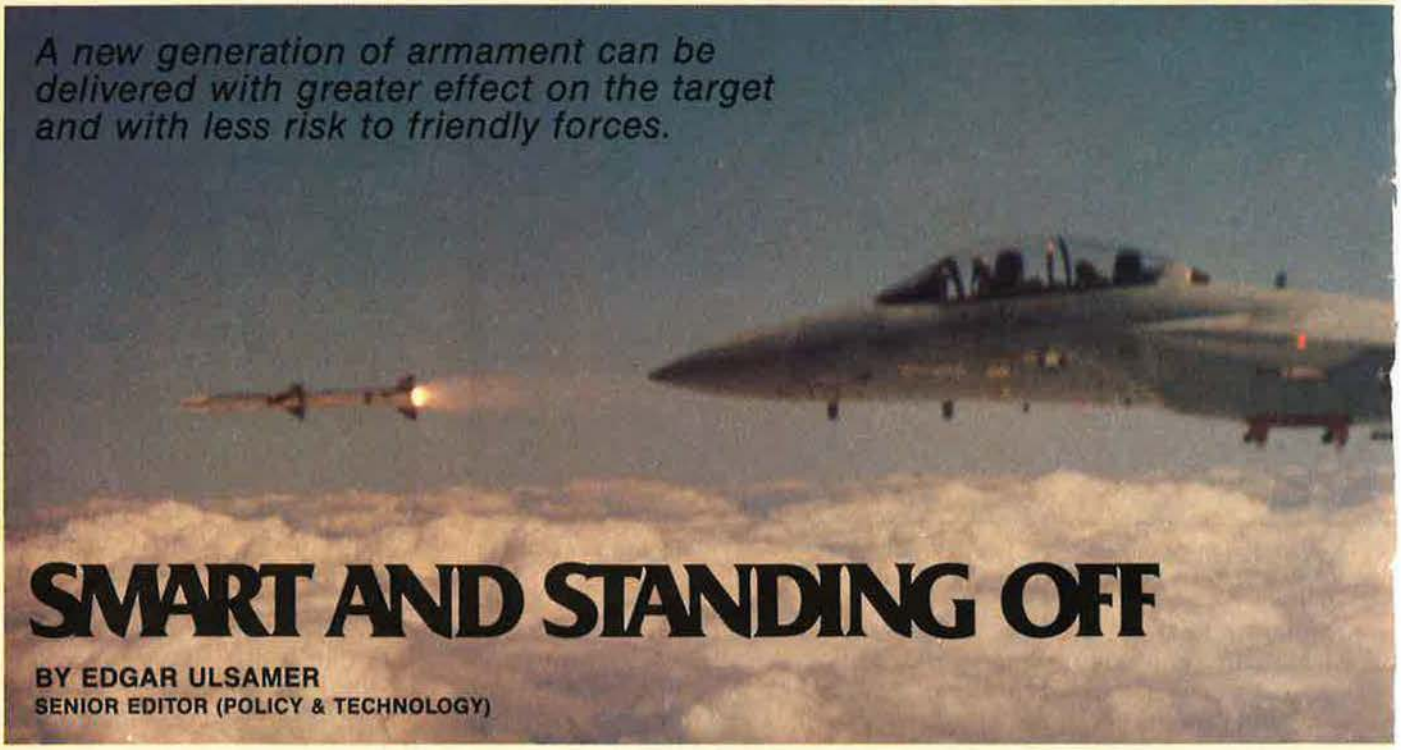
Then we descended to low level for penetration at high speed. Jim set up the aircraft at 600 knots indicated airspeed at 100 feet above ground level. The ride quality on a very hot day was smooth. The G-indicator on the head-up display (HUD) showed excursions of less than 0.2 above and below 1.0, but they were undetectable in the body. On similar flights with an F-4 as the chase aircraft, its G excursions were as high as 2.0, making for an uncomfortable ride and heavy concentration on flight controls.

In the loaded configuration, the F-16XL can penetrate at low level at airspeeds fifty to ninety knots faster than the basic F-16 when similarly configured. In fact, at every corner of the performance envelope, the aircraft has power in reserve, according to members of the Combined Test Force at Edwards.

Next, we conducted simulated weapons passes on a ground target, using the continuously computed impact point system (CCIP) displayed on the HUD. With this system, even this novice pilot, who has difficulty with a noncomputing gunsight, achieved on-target results. Attack maneuvers resulted in G forces ranging to +7.0. With the heavy bomb load aboard, the F-16XL is cleared for maneuvers up to +7.2 Gs, compared with 5.58 Gs in the F-16A. This demonstrates how the designers were able to increase the aircraft weight while maintaining structural integrity and mission performance.

We returned to Edwards to land on Runway 22. Touchdown speed was 170 knots. When Jim deployed the drag chute, its effect was instantaneous, slowing us to less than eighty knots in less than 1,000 feet.

With the F-16XL, the US Air Force has the option to gain markedly improved range, payload, and survivability performance over current fighters. According to its designers, the F-16XL in production would have a unit flyaway cost of about fifteen to twenty percent more than the F-16C and D. ■



A new generation of armament can be delivered with greater effect on the target and with less risk to friendly forces.

SMART AND STANDING OFF

BY EDGAR ULSAMER
SENIOR EDITOR (POLICY & TECHNOLOGY)

THE men and women who work there call it the "armament center of excellence" and take quite seriously their gung-ho slogan that "without armament the Air Force would be just another unscheduled airline."

There is no argument that the Armament Division of Air Force Systems Command at Eglin AFB, Fla., designs and builds the munitions and submunitions that are the "business end" of the Air Force's conventional warfighting capability. There is also little doubt that the Armament Division has to struggle mightily to keep its mission—and funding—in the mainstream of congressional and Pentagon concern, living at times in the shadow of the higher profile of the builders of aircraft, spacecraft, and large missiles.

But several major programs of the Armament Division that are about to come to fruition, along with a fertile technology base, will probably ensure the Division's place in the sun securely and permanently.

The revolution in armament that started with the first "smart bombs" of the Vietnam War pivots on two principal factors: the transition from unguided to guided and in other ways "smart" weapons and munitions, and the complementary ability to guide armament from platforms that stand off from the target rather than having to penetrate to it. Amplifying this chance for pervasive change in tactical air warfare is the cornucopia of new electronic sensors and miniprocessors that filter, process, and compute information on the spot, that are shrinking in size and weight, and that keep coming down in price. There is the additional bonanza that these components keep growing in terms of capacity and capability.

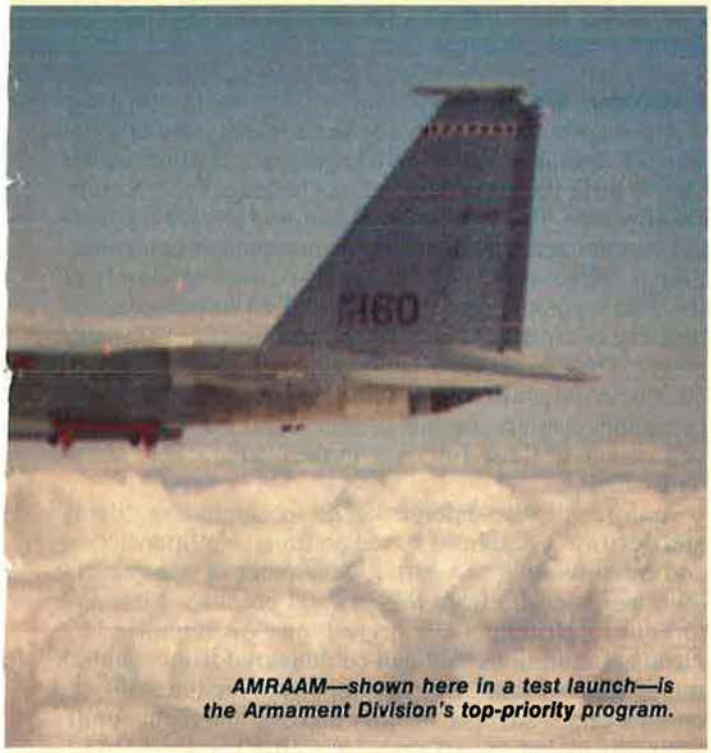
The payoff from this technological fecundity is a broad advance in operational capabilities evidenced in multiple kills per pass, the ability of one aircraft to engage a number of adversaries simultaneously, and the knack of "smart" armament for functioning autonomously under night and adverse-weather conditions. The latter trait includes the weapon's capability to be released or launched before it or the weapons controller has selected any specific target as well as its ability to identify targets using infrared, millimeter wave, or other methods of "signature" detection.

Rounding out the opportunity to boost the lethality of tactical weapons while reducing the attrition of both manned and unmanned platforms are advances in midcourse guidance and increased resistance to electronic countermeasures. These gains result from the autonomy of these new armaments, which curtails or eliminates the need to communicate with them as they engage their targets.

The AMRAAM Program

After a hiatus of almost twenty years, the Air Force is back in the business of building an air-to-air missile. The Advanced Medium-Range Air-to-Air Missile (AMRAAM), officially designated the AIM-120A, is an all-environment missile whose active radar seeker gives it a "launch-and-leave capability." As USAF Vice Chief of Staff Gen. Lawrence A. Skantze (while still Deputy Chief of Staff for Research, Development and Acquisition) told Congress recently, the AIM-120A missile will "enhance our combat effectiveness while reducing aircrew vulnerability." These benefits, he explained, stem from the fact that AMRAAM, compared to the AIM-7 that it replaces, provides "a significantly improved performance envelope, increased average velocity, and a launch and maneuver capability that will help our aircrews avoid the close-in dogfight. AMRAAM is an all-weather, all-aspect missile that is smaller, lighter, and faster than the AIM-7. The missile's active radar guidance makes it possible for the pilot to attack multiple targets on a single intercept," he pointed out.

AMRAAM, according to General Skantze, "is compatible with the F-14, F-15, F-16, F/A-18, and appropriate NATO air defense and air-superiority aircraft." Ex-



AMRAAM—shown here in a test launch—is the Armament Division's top-priority program.

plaining that the F-16 will be used for AMRAAM's initial development, test, and evaluation and initial operational test and evaluation (DT&E/IOT&E) test firings, he told Congress that "production is planned for a FY '85 start."

The Armament Division's Deputy for Counterair and AMRAAM Program Manager, Col. Leon Redenbacher, told this writer that the Air Force and the Navy together will probably acquire about 20,000 AIM-120 missiles by the mid-1990s at a cost of about $6 billion (expressed in FY '83 dollars). The Navy's share of that buy is about 7,000 missiles.

The range of the missile is classified but "less than that" of the US Navy's Phoenix missile carried by the F-14. AMRAAM's "track-while-scan" feature makes it possible to "engage" up to eight targets in near real-time fashion by launching that many missiles in a rapid sequence, according to Colonel Redenbacher. AMRAAM can be launched against enemy aircraft from beyond visual range, with the missile receiving its initial guidance from its inertial reference unit and microcomputer. The latter uses target coordinates provided by the avionics system of launching aircraft. In the terminal phase of flight, the missile's active radar seeker takes over and guides it to the target. When launched within its radar range, AIM-120's "launch-and-leave" feature comes into play, permitting the pilot to break away immediately after launch and to engage up to seven additional targets sequentially.

At the behest of the Navy, the AMRAAM Joint Program Office has expanded the capabilities of the missile system to include engagement of such low radar-cross-section targets as cruise missiles. The Navy, quite understandably, is concerned about the threat that Soviet—and eventually other potentially hostile—cruise missiles pose to its battle groups and other surface ships. Still, AMRAAM's ability to go after low-cross-section targets is probably well below the threshold required for coping with maximized Stealth designs that at the very least would require millimeter wave terminal guidance techniques.

AMRAAM packs significantly higher performance into an airframe that is only two-thirds the weight of the AIM-7 Sparrow and, at the same time, minimizes life-cycle costs through greater reliability and maintainability. The missile can handle any aspect and its "G" capabilities exceed—within reasonable technological bounds—those of even the most agile targets imaginable. The missile's low-smoke, high-impulse rocket motor makes it next to impossible for target aircraft to notice either AMRAAM's launch or approach, thus virtually precluding evasive action.

Just as the AIM-7 Sparrow eventually acquired the ancillary role of surface-to-air interception, so probably will the AIM-120, in Colonel Redenbacher's view. There is significant growth potential in the system, extending from "tweaking" its rocket motor to improving its electronic countermeasures and adding VHSIC (very-high-speed integrated circuits) technology to its avionics. There is also the possibility that at some time in the future the system's traveling wave tube radar technology might be upgraded to a solid-state design. At this time, however, Colonel Redenbacher pointed out that solid-state radar designs do not yet provide the efficiency AMRAAM requires.

From a technical point of view, AMRAAM's range could be boosted significantly over present levels. But the Air Force has no compelling reason to do so. At the same time, the Navy, which is able to operate more freely, is interested only in sharp range increases that are beyond the ken of the AIM-120. Naval aviators, therefore, require a new air-to-air missile, in addition to AMRAAM, with a range greater than that of the Phoenix missile system. Such a new, long-range, air-to-air missile will be needed eventually to replace the AIM-54C

"We Are Going to Give Him the Weapons"

Maj. Gen. William T. Twinting took over as Commander of the Armament Division after this article was written. In a brief telephone conversation with AIR FORCE Magazine, he set forth his basic goals for the Division:

"There is no doubt that we have to push our technology in conventional armaments. In almost any scenario, we are faced with using quality to offset quantity. That is an accepted fact. Gen. Bernard Rogers, the Commander in Chief of the US European Command, has said on several occasions that he needs conventional weapons not just for the sake of having the firepower but to avert a nuclear conflict for lack of them.

"To that end, Armament Division has fielded some excellent force multipliers in the past year, and, with the 30-mm gun pod and Combined Effects Munitions now in initial production, we have two more solid systems. AMRAAM is in full-scale development with great promise for the future. We are excited about several other systems we are exploring and will push these for early fielding to the tactical air forces.

"No one is more aware than we that the pilot has to get to the target area and back out safely and, in the meantime, do a heck of a lot of damage. We are going to give him the weapons to do that."

The Wasp minimissile uses millimeter wave guidance that enables the weapon to operate in adverse weather and fog. This "smart" missile has a reliable standoff capability.

Phoenix system that dates back to the late 1960s. The range of the AIM-54C is in excess of sixty miles.

The AMRAAM program is now in full-scale development—a fifty-month phase that follows on the heels of a thirty-three-month systems validation phase. Full-scale development is being carried out by the Missile Systems Group of Hughes Aircraft Co. During this phase Hughes is producing ninety-four test missiles that will be test-fired at Eglin AFB, Fla., Holloman AFB, N. M., and the Pacific Missile Test Center at Point Mugu, Calif. The contract with Hughes contains prepriced options for 924 operational missiles and future options for developing second-source or follow-on missiles.

Modifications of the launching aircraft that are required to provide AMRAAM with a multiple firing feature are not extensive and are patterned on the F-14's AWG-9 fire control system used in conjunction with the Phoenix missile. Eventually, the AIM-120 system may be linked to the Combat Identification System, currently under joint service development and keyed toward beyond-visual-range identification.

From the outset of the AMRAAM program there existed a mutual understanding that this system would be made available to other NATO nations and that in turn the Europeans would, on a *quid pro quo* basis, allow for US participation in their Advanced Short-Range Air-to-Air Missile (ASRAAM) under development principally by Germany's Bodenseewerk Geraetetechnik GmbH. In August 1980, the defense ministries of Germany and England and the US Defense Department signed a Memorandum of Understanding (MOU) for development and production of air-to-air missiles in line with NATO's "family-of-weapons" policy. AMRAAM was designated as the US contribution and ASRAAM as the European one to NATO-wide requirements in the air-to-air field. Bottom line of this joint approach is to provide improved air-to-air missiles and cross-servicing of armaments within the European theater, enhance interoperability among aircraft of various member nations, and substantially reduce procurement cost on both sides of the Atlantic.

While planned as a multiyear procurement program, AMRAAM has not been authorized as yet for such a cost-saving procurement approach by the Defense Department and Congress.

Antiarmor Weapons

Although it probably is the least likely conventional warfare scenario, a NATO/Warsaw Pact conflict would clearly pose the most demanding challenge for US tactical airpower. Two fundamental factors set such a potential conflict apart from any other nonnuclear confrontation: a "target-rich" environment—consisting mainly of the Pact's concentrated armor—and an unprecedented massing of air defenses designed to thwart NATO's airpower. The "target-rich" environment consists of about 30,000 Soviet tanks, along with vast numbers of armored personnel carriers, mobile artillery, and trucks. A large percentage of these forces is in the Warsaw Pact's second echelon.

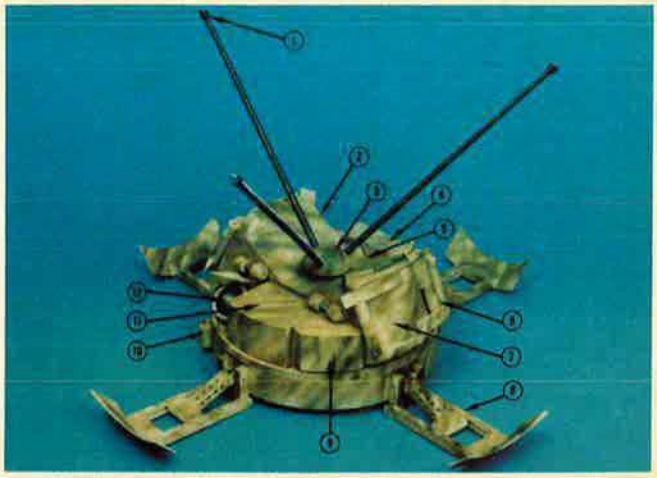
As a result, the defense needs to emphasize "delay and destroy" operations based on timely air interdiction and multiple kills per sortie. A number of specific requirements ensue from this general premise. First and foremost, attrition of US aircraft must be minimized by means of munitions that can be delivered from standoff range or at low level. Equally important are the ability to operate under adverse weather and day and night conditions, the means to lock on targets after launch (LOAL), and the capability of "smart" standoff weapons to go after their targets autonomously without requiring the pilot to establish visual contact.

The Armament Division's answer to this broad challenge is an umbrella program known as WAAM, for Wide Area Antiarmor Munitions, whose effectiveness and lethality, according to General Skantze, "will allow us to interdict second echelon forces before they can reinforce the first echelon." These traits should improve significantly the survivability of tactical air forces in the dense defensive environment of Central Europe by reducing sharply the number of sorties and passes that have to be flown against the Warsaw Pact's second echelon. Ancillary gains include more kills per unit of flying time—which is doubly beneficial because of the constrained airspace above Central Europe—greater operational economy, and more flexible strike capabilities. Lastly, WAAM is a pivotal element of ambitious efforts on both sides of the Atlantic to raise the nuclear threshold by boosting the efficiencies and scope of autonomous standoff weapons, especially in terms of mobile and imprecisely located targets.

Plagued by lackluster support in the past and cancellation of two out of its seven original components—the sensor-warhead combination called Cyclops in 1979 and the Antiarmor Cluster Munition (ACM) in 1982—the antiarmor weapons program at long last seems to be getting under way in earnest.

The Wasp Minimissile

The 135-pound Wasp minimissile is a subsonic weapon that is equipped with automatic target recognition and that incorporates a lock-on-after-launch/hit-to-kill feature. Wasp uses millimeter wave (MMW) guidance that operates without degradation not only in adverse weather and at night but also in fog. Air Force armament experts rate millimeter wave guidance ahead of infrared technologies because it can be made to work more eco-



The Extended Range Antiarmor Munition is a "smart" cluster weapon designed for attack against armored and wheeled vehicles as well as against taxiing aircraft. ERAM integrates nine air-delivered target-activated submunitions with the standard Tactical Munitions Dispenser. Once dropped, the weapon waits in ambush until a suitable target approaches, then launches a sophisticated warhead over it that then fires a self-forging fragment into the target.

nomically and reliably and can do everything IR can do, "plus a great deal more." The Wasp system launches eight missiles singly or in selective salvos, meaning two to sixteen missiles at the same time from one pod launcher. The system is designed for both low- and high-altitude delivery.

In the low-altitude application—meaning down to 200 feet—the Wasp minimissile is fired toward the target area and seeks out a predetermined search altitude using its small MMW radar. Once it detects and identifies either stationary or mobile targets it has been instructed to go after, it picks out one, homes in, and destroys the target with its shaped-charge warhead. The pilot of the launching aircraft will be "miles away" from the heavily defended terminal area throughout the operation and does not need to acquire targets visually or overfly the target area. The minimissile can be delivered up to ninety degrees off boresight and requires no "pop-up" by the pilot when launched at low altitude.

Rated as highly cost-effective by the Armament Division's experts, the Wasp weapon is thought to increase "kills per pass" tenfold over presently used weapons. Wasp was to have entered full-scale development in FY '84, but the latest Air Force Program Objectives Memorandum (POM) deferred Wasp's funding. As a result, James E. Burda, the Division's Deputy for Antiarmor Weapons, told this writer "we are treading water" and examining the possibility of expanding the program's scope to "multirole capabilities," beyond just mobile targets. "We have a radar [on Wasp] that can find a lot of other targets, depending on how you set the algorithms" of the missile's computer.

Gator and ERAM

The Gator mine system (CBU-89/B) is another example of the Pentagon's deleterious approach to munitions development. Scheduled initially to be operational in 1979, it is now at best three years away from entering the operational inventory. This small, air-deliverable, surface-emplaced antitank/antipersonnel munition is suitable for air support of ground forces in combat and for deployment by tactical air forces operating independently over enemy territory. When carried by the Air Force's standard 1,000-pound Tactical Munition Dispenser (TMD), seventy-two antiarmor and twenty-two antipersonnel Gator mines would be intermixed to permit the creation of "instant minefields" to disrupt, demoralize, and destroy enemy forces passing through them.

Both the antiarmor and the antipersonnel variants of the Gator munition are "target-activated," meaning they either go off when ground troops pass by or when a tank or other vehicles roll over them. Gator is being developed by the Air Force on its own behalf, as well as that of the Army and Navy. Equipped with a special aerodynamic case that causes the individual mines to scatter over the area to be seeded, the Gator munition can be delivered from both low and high altitudes. Gator is sufficiently "smart" to differentiate between valid and false targets and to detonate its warhead when the target comes within lethal range. Once seeded, the Gator mine remains fully effective regardless of weather or light conditions until its self-destruct feature comes into play on the basis of preselected timing.

Perhaps the most ingenious and flexible approach for

The Combined Effects Munition consists of three types of specialized bomblets to cover a wide spectrum of mobile targets, ranging from personnel to armor. The individual bomblets are equipped with small inflatable sleeves to provide stabilization.

coping with the Warsaw Pact's numerically superior armored forces is embodied in a weapons concept with the improbable name of Extended Range Antiarmor Munition, or ERAM. ERAM's sophisticated computational and sensor features make it a truly "smart" munition. Entered into concept-validation more than four years ago, ERAM is a cluster weapon that integrates nine air-delivered target-activated submunitions with the standard Tactical Munition Dispenser. ERAM is tailored for attack against armored and wheeled vehicles as well as against taxiing aircraft. This submunition, in essence a sophisticated mine, does not require the target to pass over it. Equipped with a sensor/classifier that uses seismic and acoustic means, ERAM waits in ambush until a suitable target approaches. Once it picks up and identifies an approaching target, ERAM orients itself in that direction, establishing both bearing and range.

It then attacks in a uniquely lethal manner by launching a warhead of advanced design over the target. An airborne sensor mounted on the warhead detects passage over the target and triggers the kill mechanism, a self-forging fragment that penetrates the top of the tank.

Self-forging fragments are directed, high-energy slugs that, unlike shaped-charge penetrators, don't require physical contact with the target for detonation and are effective over greater distances. The self-forging warhead technology is a spinoff from sophisticated computer analyses required to probe the kinetic and other processes that go on inside a detonating nuclear warhead.

In oversimplified form, a self-forging warhead releases concentrated energy in a precise, precalculated manner. This process, in turn, causes the warhead's copper liner, a concave disk, to forge itself at great velocity into solid slugs. These slugs attain speeds faster than a high-velocity rifle bullet, which, combined with their mass, is sufficient to tear through armor. As a result, these self-forging fragments can destroy tanks over extended ranges. ERAM, while waiting in ambush on the ground, is protected from mine-clearing vehicles or personnel by special covering mines. Also, this munition is highly resistant to countermeasures since it can be deployed off to the sides of roads and does not require passover or direct contact by the target to detonate. The near-term funding of this program is in some doubt, with full-scale development planned in about two years.

Other Advanced Munitions

One of the Armament Division's most versatile munitions programs is a cluster weapon known as the Combined Effects Munition (CBU-87/B), which consists of 202 Combined Effects Bomblet submunitions packed into the TMD. Three types of bomblets are used under this arrangement to cover a wide spectrum of mobile targets, ranging from personnel to armor. They encompass incendiary, shaped-charge, and fragmenting-case kill mechanisms. The SUU-65/B Tactical Munition Dispenser carrying the combined effects bomblets can be released from altitudes as low as 200 feet and at various speeds, including supersonic. The dispenser can be made to spin at various rates by means of the cant of its fins. The spin rate can be set from zero to 2,500 rotations per minute depending on the size and shape of the area over which the bomblets are to be dispersed.

The individual bomblets are equipped with little air-inflatable sleeves that pop open following their release to provide stabilization and to keep them from being buried in snow, sand, or water. The basic advantages of the Combined Effects Munition, according to Armament Division spokesmen, are its near-term availability—with first deliveries scheduled for FY '85—the potential for multiple target kills per pass, broad flexibility in terms of both area to be covered and different categories of targets that can be dealt with, and its cost-effectiveness.

The Armament Division's Sensor Fuzed Weapon (CBU-97/B) is another munition using self-forging fragments and the Tactical Munition Dispenser. The CBU-97/B consists of ten submunitions, each of which in turn consists of four so-called "skeet" warheads. Under this concept the TMD is released by a tactical air-

craft over the general target area and the dispenser releases the submunitions. The submunitions are decelerated and kept in a vertical position by a small parachute. Upon reaching a preset, optimum warhead search altitude, the submunition spins up, regains altitude, and disperses the four skeet warheads in different directions.

Each skeet then descends in a spiral pattern and looks for targets using its infrared sensor. Once a skeet detects a target, it fires a self-forging fragment against it. Each skeet weighs about eight pounds, carries about two pounds of explosives, and is equipped with its own processing electronics. The Sensor Fuzed Weapon is to enter full-scale development next year and enter initial production in FY '87, according to present plans.

Durandal and BKEP

Specialized munitions that can interdict the Warsaw Pact's airfields by cratering runways or damaging other key facilities are one of the Armament Division's top priorities. At present, the Air Force lacks munitions that can attack enemy airfields efficiently from standoff range.

General Skantze recently told Congress that over the "near term" the Air Force plans to rely on the French Matra Durandal rocket-assisted, runway-cratering munition to "give us an effective runway-attack weapon that can be delivered at low altitudes and high speeds." The Armament Division over the past four years has examined and tested Durandal as part of the Defense Department's foreign weapons evaluation program, and plans to put this weapon into the Air Force's inventory beginning in January 1984.

The Tactical Air Command has designated the F-111 as the primary delivery system for this parachute-retarded, rocket-boosted, runway-attack bomb. The aircraft can carry up to twelve of these 480-pound bombs. The Air Force version of Durandal can be dropped from altitudes as low as 250 feet. Two parachutes, a drogue chute first and then the main chute, stabilize and retard the descending munition. As it approaches the runway, Durandal's rocket motor ignites and accelerates the bomb to a terminal velocity of about 850 feet per second. Detonation of the 220-pound warhead is delayed one second after impact to let it penetrate the concrete surface of the runway and come to rest at maximum depth.

Acquisition of Durandal is an interim solution that cuts in half the normal development and deployment cycle of such weapon systems. Cost of the weapon is about $25,000. Initially, the Air Force plans to buy about 350 of these French-made bombs, but there are options for the acquisition of larger quantities in subsequent years.

The Armament Division recently entered another airfield demolition bomb, the BLU-106/B BKEP (for Bomb, Kinetic Penetrator), into full-scale engineering. This program was originated by the Air Force Armament Laboratory. Subsequently, the munition was adapted for use by the low-flying Medium-Range Air-to-Surface Missile (MRASM). The Strategic Air Command may use this conventional standoff weapon as part of its Strategic Projection Force.

MRASM can carry twenty-eight of these submunitions and distribute them over the runways under attack.

The GBU-15 Modular Guided Weapon will be given greater range when a rocket motor is added. The new version will be equipped with terrain-avoidance features and an altimeter.

MRASM, or possibly other unmanned delivery platforms, can release as many as four of these submunitions at the same time. The BLU-106/B's rocket motor then accelerates the weapon to a terminal impact speed of 1,100 feet per second. The bomb detonates about six milliseconds after impact, and even though its warhead is significantly smaller than that of Durandal, the US design causes about the same amount of damage. The BLU-106/B can be released at low altitudes. The specialized bomb uses retractable fins for initial stabilization and then deploys a parachute to retard its descent. Finally, the rocket motor ignites at a preset time, causing the parachute to jettison and accelerating the warhead to its full impact speed. Flight testing of the BLU-106/B is scheduled to start early next year.

The GBU-15 Modular Guided Weapon

One of the Armament Division's major product improvement programs centers on the GBU-15 Cruciform Wing Weapon, an unpowered, guided glide bomb. Using a cruciform wing, this 2,000-pound flying bomb has pinpoint accuracy from release altitudes below 200 feet and standoff ranges greater than five miles. The weapon can be equipped with either electro-optical or infrared seekers and is thus suitable for day, night, or adverse-weather use.

Two basic trajectories can be flown by the GBU-15. For direct trajectories, the weapon is locked on before launch and flies a near line-of-sight profile to impact. The indirect profile includes a midcourse glide phase that extends the weapon's range. When operated in the indirect mode, the seeker can be locked on the target after launch, or the operator can fly the weapon manually to impact using guidance updates provided through a data link.

According to the AFSC Commander, Gen. Robert T. Marsh, the Air Force plans on a product improvement of the GBU-15 by "adding a rocket motor that will provide increased standoff capability. The initial version will be a unitary [single, large] warhead with downstream options to include dispensers with cluster submunitions for better efficiency against area targets."

Since the weapon is to fly at low altitude over relatively long distances, it will require terrain-avoidance capabilities as well as an altimeter to ensure detonation

at specific, optimum altitudes. With cost a key factor in the GBU-15 improvement program, both of these features will require special, low-cost approaches. Combined Effects Bomblets are under consideration for rocket-boosted GBU-15 versions dispensing cluster munitions. Over the longer term, the Armament Division plans to move the GBU-15 and similar standoff weapons toward advanced "smart" features, such as pattern recognition and autonomous guidance capabilities.

The Launch-and-Leave Guided Bomb Program

Munitions that can strike targets autonomously and unimpeded by weather or time of day represent a major challenge for the Armament Division. A family of launch-and-leave guided bombs capable of near real-time target acquisition is being developed for this purpose. These guided weapons, using such standard warheads as the Mk 82 500-pound and the Mk 84 2,000-pound munitions or various submunitions carried by dispensers, can be tailored to a range of targets that extends from hangars and hangarettes to runways, aprons, power plants, and industrial complexes.

Possibly the most interesting approach to launch-and-leave guided bombs (LLGB) is represented by the proposed new infrared version. This weapon is designed to attack high-value fixed targets without the need for a designator or data link as required by contemporary electro-optical, IR, or laser seekers. This new technique seeks to reduce aircraft attrition by cutting back on loiter time and line-of-sight approaches to the target. Also, there are other payoffs because of the munition's multiple launch and day/night employment options. This version of the LLGB family, designated as Paveway IV, represents a preplanned product improvement of the Low-Level Laser-Guided Bomb (LLLGB, or Paveway III) that received production approval in July 1983.

The program emphasizes low costs by mating existing hardware with emerging processor technology. The LLGB is to be compatible with all aircraft capable of carrying the Mk 82 and Mk 84 bombs and requires no interface with the launching aircraft. The weapon is "prebriefed" with the release conditions, target description, and aimpoint information prior to loading. The aircraft then flies to the prebriefed launch point using available inertial navigation system (INS) update information. The LLGB then flies a programmed trajectory, acquires the target, and tracks to the designated aimpoint.

Launching aircraft need not pop up to release the LLGB, a trait that should reduce attrition. Growth options of the Paveway IV guided bomb include the use of precision-guided, air-to-surface munitions and the addition of terminal guidance systems. The LLGB's progenitor, the LLLGB that just now is coming into the inventory, will, according to General Marsh, "pay dividends in the interdiction and close air support missions. LLLGB offers our pilots improved survivability at increased ranges and at low altitudes because of its improved aerodynamics and guidance capability. With two warhead options, the LLLGB will provide us with the capability to put a large amount of explosives on a desired target with superb accuracy." Like the LLLGB, the launch-and-leave bomb is designed for multiple carriage by the launching aircraft.

Airfield Defense

As General Marsh points out, "A crucial element of the counterair equation is defense of our airfields. To continually generate sorties for sustained combat, we must be able to protect our airfields in order to recover our aircraft and turn them quickly and safely. Toward that end, the Air Force is procuring the Rapier missile to defend our bases in the United Kingdom and will soon field the Stinger missile system for our Korean bases. We also have a major activity under way to define the best balance of defensive measures necessary to protect our operating bases worldwide from the broad range of potential threats. . . ."

The Air Force and the US Army are in the midst of high-level discussions concerning air base defense, and the US and Germany are examining joint approaches to this challenge. The payoff from these and other related measures under examination by the Armament Division is greater sortie generation.

A mobile air base defense weapon is under study at this time and the Air Force recently awarded a contract to GE to demonstrate a single test system. What is involved is bolting a 30-mm Gatling gun, the GAU-5, four Stinger missiles, and a flare system on a standard US Army/US Marine Light Armor Vehicle and to test this demonstration system for both surface-to-surface and surface-to-air defense missions.

Rapid runway repair techniques and quick removal of unexploded ordnance are also being stressed to maintain a high sortie rate while under attack. At the same time, the Armament Division is exploring a host of innovative concepts that range from tank track-like wrappers placed around aircraft wheels to get them over damaged ramp and runway areas to the use of catapult launchers and mobile arresting barriers.

One of the Armament Division's most interesting programs is the AFX-400 explosives development effort. Drawing on the recondite field of inner molecular explosives that dates back to efforts by German chemists during World War II—that later were carried forward by the US Army—the idea behind the AFX-400 program is to come up with low-cost explosives that are extremely insensitive to accidental detonation, meaning that they don't go off in aircraft or shipboard fires. These explosives differ from the standard designs by not keeping the fuel and oxydizer in one molecule but by separating them in discrete crystals.

The real trick is to find chemicals that can do that yet be brought together rapidly enough to detonate and release their destructive energy efficiently. Explosives of this type can obviously be stored closely together without undue risk, a trait of great importance especially in Europe where storage space is at a premium. Initial research by the Armament Division in conjunction with the Department of Energy's Los Alamos and Lawrence Livermore Laboratories indicates that such inner molecular explosives could be produced at half the cost of TNT, using chemicals common to the fertilizer industry.

Qualification tests of these new explosives are scheduled for FY '85. If these tests are successful, a production decision could follow shortly thereafter. If it works, it will be yet one more quiet accomplishment of the Armament Division, the "business end of the Air Force." ■

Myth and Reality In El Salvador

A political solution in Central America is unlikely until one side or the other has a clear military advantage.

BY GEN. T. R. MILTON, USAF (RET.)
CONTRIBUTING EDITOR

It is more than twenty years since the United States decided to do something about Vietnam beyond the usual military assistance program. Gen. Maxwell Taylor, then retired and serving as a White House advisor, came back from a survey trip to Southeast Asia in 1961 with recommendations for President Kennedy. All in all, his advice was sound, and the President took it. If the problem in Southeast Asia had simply been one of counterinsurgency, perhaps everything would have ended happily. But as we all know, there was more to that struggle than suppressing home-grown guerrillas, although the United States pretended otherwise for too many years.

Now it is 1983, and there is new trouble, this time in Central America. The similarities with Vietnam are superficial ones, but they are admittedly there: El Salvador has guerrillas, the government has been accused of a disregard for human rights, and the United States has provided military advisors—all reminiscent, for those who want it to be, of Vietnam.

There is another similarity that is not so often discussed, and never by the opponents of Salvadoran aid. That one has to do with strategy. It is now embarrassingly clear that Ho Chi Minh had a grand strategy for Southeast Asia while we were homed in on South Vietnam's insurgency. When the Viet Minh guerrillas began to lose, Ho simply upped the ante, confident we would not call his bet.

Fidel Castro has a similar strategy for Central America and the Caribbean basin, a statement that is backed by a considerable amount of persuasive evidence. El Salvador is the immediate objective, for perfectly sound reasons. It is next door to Nicaragua, allowing the FMLN a convenient sanctuary, and it is a prize worth seeking. If El Salvador were firmly in the Cuban camp, Honduras and Guatemala would then become the targets. All very orderly and well conceived.

The problem from Castro's viewpoint is that Nicaragua is a long way, militarily, from being a North Vietnam, and is beset by internal problems. The war in El Salvador, then, is essentially a true counterinsurgency. There are no big formations ready to come across the border if the guerrilla situation becomes desperate.

Nicaragua has acquired, on paper, a rather formidable army since the Sandinista revolution turned Marxist. But judging from the success the anti-Sandinistas are having, the Nicaraguan military is no immediate threat to its neighbors. Operating from Honduras, the FDN, or *contras,* have penetrated well into Nicaragua and are now established within fifty miles or so of Managua, the capital. A leader of the FDN told me his forces are welcomed in the Nicaraguan countryside. Their main problem is not Sandinista opposition but logistic support. Nicaragua, then, would appear to have enough to worry about these days without taking on foreign adventures.

A New Ball Game

Despite its sponsor's problems, the Farabundo Marti National Liberation Front, or FMLN—the holding company for the various Salvadoran dissident groups—looked as though it were on a winning course six months ago. The Salvadoran Army was beginning to show signs of demoralization. Soldiers huddled in their *cuarteles,* or quarters, when darkness came, effectively turning over the countryside to the guerrillas. Even in daylight, the Salvadoran Army went out in large formations almost as though it hoped the enemy, warned by the clatter, would move aside and not cause trouble. When there were fights, Salvadoran soldiers surrendered in discouraging numbers, victims, perhaps, of a growing myth about the guerrillas' invincibility.

It was an exasperating time for the handful of US military advisors—or "trainers," as they must be called to avoid Vietnam connotations. Salvadoran soldiers were good enough; it was the leadership and, worst of all, the tactics. Then, last winter, the Minister of Defense, Gen. José Guillermo Garcia, was persuaded to step down. A near mutiny by his most successful province chief, Lt. Col. Sigifredo Ochoa, and, when Garcia procrastinated, by the fiery Air Force commander, Col. Juan Rafael Bustillo, forced his hand. Once Garcia was out of the way, it was a new ball game.

Gen. Carlos Eugenio Vides Casanova, Garcia's successor, was open to change, and the changes came rapidly. A new National Campaign was announced, beginning last June, with an emphasis on small-unit action. To accomplish this, the army had to be reorganized, a process that should be completed by December. Now the army goes out after the guerrillas and stays there after dark, an unsettling development for guerrillas who had become accustomed to peace and quiet in the evening.

The National Campaign calls for pacification of areas so that normal life may be resumed. Once an area is pacified, permanent garrisons will be left in place in order to maintain security. All very reminiscent once again of Vietnam but always with that big difference: Nicaragua is not North Vietnam. The Campaign also has an amnesty program, something promised in the elections

a year ago but somehow put aside. In the first two months about 280 guerrillas sought amnesty—not an impressive number, but still probably four percent of the armed guerrilla force. From all accounts, these defectors were a bedraggled and sorry-looking lot, thus further damaging the eight-foot-tall myth.

Cautious Optimism

In spite of the summer lull and the apparent successes of the new tactics, it is far too early to be more than guardedly optimistic. The FMLN is still intact, the command and control apparatus continues to operate from its safe haven in Nicaragua, and the guerrillas remain strong in northeastern El Salvador. Still, there is always the danger that a concentration of government forces in one area will give the guerrillas a free hand in another.

Counterinsurgency warfare is a slow business, and there is more to it than captured rifles and body counts. Unlike the amateur Pentagon Follies of the 1960s, the American effort this time appears to be firmly in professional hands. Only the self-imposed limit of fifty-five trainers, a figure now apparently chiseled in marble, serves as a reminder that there is always an element of irrationality in government policy. In all fairness, however, the training in Honduras, where there is no limit on US instructors, is a fairly satisfactory way to compensate.

If the FMLN looks to Cuba for its logistic and moral support, Panama is the headquarters for our side. The remaining bases on the isthmus—Fort Gulick on the Atlantic side; Fort Clayton, Albrook AS, and Howard AFB on the Pacific—have scarcely ever been busier, or with more purpose.

Panama is one of the Contadora nations, so named after a Panamanian resort island that served as the meeting place for representatives of Mexico, Venezuela, Colombia, and Panama in a joint effort to concoct a Central American policy. The Contadora nations have taken a public stand against outside interference in Central American affairs, the United States included. It came as a shock, therefore, to one of the leftish Democratic US presidential aspirants to hear the president of a Contadora nation praise the United States show of force. According to reliable reports, the candidate, on a ticket-punching junket designed to lend credibility to his Latin American position, was plainly disconcerted. That was not what he had come south to hear.

The fact is that no one will hear what he wants to hear in this explosive region between Mexico and the Isthmus. Former Spanish colonies all seem to share a common inheritance: a small and wealthy landholding upper class, little middle class as it has come to be known in North America, and the majority of the population living out their lives in degrading poverty. According to generally accepted theory, this is the perfect situation for a Communist revolution. The facts seem to argue otherwise, for the *campesinos,* Marxism's poor and downtrodden, appear generally indifferent to the revolutionary call to arms. Indeed, if last year's elections in El Salvador and the FMLN's continuing difficulties can be accepted as evidence, the peasants go along to the extent they do more out of fear than conviction. The Salvadoran revolution, despite the stupid and brutal mistakes the government has made in the past several years, is not, so far, catching on.

America's Growing Role

Whether it does catch on and thus advances the Cuban strategy depends on a number of things, US policy being chief among them. On its present course, US policy is reassuring to Central Americans, or at least to those whose fear of a spreading Marxist revolution exceeds their worries about Yankee imperialism. The worry one hears has to do with a possible wavering of that policy in an election year or, worse yet, the policy that might follow the election of certain candidates. And while it is not clear to everyone what special US envoy to Central America Richard B. Stone, a former US Senator from Florida, is up to, his energetic schedule provides a certain reassurance that Washington is interested, as does the creation of the Kissinger Commission. The Contadora nations may wring their hands in public over this new US focus on Central America, but their private views, as the liberal presidential hopeful learned, may be different.

With America's growing role in

the affairs of its southern neighbors, the US military occupies an important and sensitive position. And, it may be added, that position is a dangerous one. The few trainers are a conspicuous and marked group in El Salvador. The murder of US Navy Lt. Cmdr. Albert Schaufelberger last spring was a grim warning to the rest of the advisory group not to give the FMLN an easy chance.

Commander Schaufelberger was killed on the campus of Central American University, a respected Jesuit school with a faculty reputed to be somewhat leftist. Since it is usually worthwhile to hear both sides of an argument, I dropped in on one of these professors. His sympathies are plainly with the FMLN, though he disavowed their methods, at least to me. In his view, the people of El Salvador fear the Army more than they fear the guerrillas. When questioned how this jibed with the election turnout in 1982, he was at a loss. Nevertheless, the professor apparently feels that social reform is needed and that only a revolution can bring it about. When asked if the Nicaraguan model might not be a discouraging forecast of what would be in store for El Salvador if the FMLN were to win, he was silent. His views, I gathered, are shared by a substantial number of the faculty.

The interesting question, however, was the next one. "Suppose," I asked, "we were to take a poll in the student cafeteria. Would the FMLN win by a large margin?" He answered that I would be surprised. The university had recently taken such a poll, and the radical left had come in dead last. The conservative Christian Democrats led, followed by Roberto D'Aubuisson's rightist Arena Party—an ironic contrast to the pro-guerrilla sentiment that prevails on certain American campuses.

University professors like my acquaintance occupy one end of the political spectrum—short of being involved in the revolution but sympathetic to its aims. No doubt they live in some fear of the extreme rightist death squads, but the fact that they can openly hold these anti-government opinions says something for the tolerance of the Salvadoran administration.

From the Central American University to Ilopango Air Base, headquarters of the Salvadoran Air Force, is a few miles by car but light-years away in political philosophy. Colonel Bustillo, commander of the Air Force, is a human dynamo whose feelings toward the FMLN are plainly hostile. Bustillo flies missions in one of his air force's old French Ouragans, deals with all papers, interviews all new officers, decides who does what, and hates the guerrillas. Or rather, he hates the grief they are causing his country. He is, nevertheless, profoundly concerned about civilian casualties, an encouraging and enlightened view. Airplanes carelessly used, as Colonel Bustillo knows, can create more enemies than they subdue. The Salvadoran Air Force is well drilled in this matter of avoiding noncombatant targets.

The Salvadoran Air Force

The Air Force is a small one, although it has an inventory that would drive USAF supply and maintenance types to drink. Besides the half dozen A-37s, straightforward enough, there are World War II C-47s, Ouragans of the F-84 vintage, UH-1s, Alouettes, Israeli Arava transports, a few C-123s, various puddlejumpers, and several O-2s, a most useful airplane in this kind of war. An old C-54, doubtless a veteran of the Berlin Airlift, has found a final resting place at Ilopango. Its propellers turn slowly in the tropical breeze, as though someone were still trying to start the engines. This flight-line museum is an interesting trip back through the last few decades, but it is a burden to a composite squadron-sized air force trying to fight a war.

Actually, the air effort, in spite of the equipment handicaps, seems to be effective and responsive. The Air Force is, of course, wholly committed to Army support, and the liaison apparatus, while primitive by US standards, seems to work. What needs to be remembered before anyone begins to suggest TACS and other sophisticated arrangements is that this is a small war, and a small-unit war, for all its casualties and geopolitical implications. Salvadorans are intelligent and literate people, at least those in the Air Force, and the kind of help they need is easy to give. If they could concentrate on a few aircraft types, instead of doing ingenious things to keep their museum pieces flying, they would be a lot more efficient. And if they had a few more helicopters for evacuation of the wounded, there is no telling what that might do for the morale and efficiency of the Salvadoran Army.

Except for the brief attack on San Miguel in early September, doubtless staged in answer to US Defense Secretary Caspar Weinberger's visit a few days earlier, the insurgents have been so quiet that the Air Force has had little to do lately. The lull comes at a good time, for the debate in Congress about Salvadoran military aid has had its effect on munitions, spares, and other essentials. The respite has also provided an opportunity for standardization training in A-37s.

(As evidence that the Total Force concept is not just USAF propaganda, the A-37 instructor pilots are from the Air National Guard. The C-130s that ply the routes from Panama to El Salvador, Honduras, and Guatemala are flown by Reserve crews, and, for that matter, the A-7s on the ramp at Howard AFB in Panama are National Guard airplanes. The Total Force in Central America these days is, it would appear, almost totally from the reserve side.)

Honduras—Next Target?

Across the border in Honduras, Castro's insurgency has not yet arrived. If things continue to go well in El Salvador for the government side, insurgency may never arrive. This Central American insurgency is, one must remember, a cohesive strategy, not a series of isolated assaults on individual countries. Still, Castro has made a tentative beginning in Honduras, one that should give encouragement to those who support President Reagan's policies.

A few years ago, a group of gullible Honduran peasants, 100 or so, was approached by some fast-talking strangers with a proposition. Land reform was just down the road in Honduras and with it would come a need for agricultural experts. If these men would only come along for training, they could go back to Honduras as key figures in the new regime.

Well, they went on a journey of disillusionment. The training in Cuba was not in agriculture but in such things as demolition, hand-to-hand combat, and small arms. These would-be agricultural experts were not paid, they were kept isolated, they worked in the cane fields, and they saw little of such pleasures as Castro's Cuba may offer. Then they were exported to Nicaragua and infiltrated across the Honduran border with a muddled plan for revolution. After a few weeks of hardship and hunger—their political commissar evidently died of starvation—these wretches began to give up. Clearly, their fellow peasants had failed to rally round.

Honduras is, in the Marxist way of thinking, an ideal target for revolution. Poverty is the normal state of most Hondurans, and pregnancy seems to be the state of a considerable number of Honduran women. The birth rate in Honduras is, in fact, approaching the biological limit, and more than sixty percent of the births are illegitimate, to use a word now doubtless archaic. The streets of Tegucigalpa, the capital, are populated with children out on their own at age seven. All in all, it seems a situation made for revolution.

For whatever reason, Hondurans, like their neighbors in El Salvador, seem indifferent to revolutionary rhetoric. Honduras may be the second poorest Caribbean nation—Haiti is the first—but poverty, being widely shared, does not stand in such sharp contrast as it does, for instance, in places like Caracas or Rio de Janeiro. Nor is there a figure to revolt against, as there was in the case of Somoza in Nicaragua. Honduran leaders tend to be inconspicuous, and if there is any corruption, it is on a modest scale. As in El Salvador, there is no visible evidence of officials, military or civilian, being on the take.

Perhaps the fact that Honduras is, like most of Central America, a Catholic nation may have something to do with its resistance to communism, but only perhaps. Hondurans are nominally more than ninety percent Roman Catholic, but the Church no longer appears to be a powerful force, as witness the high percentage of unwed mothers. According to figures given me, there are only 220 priests to serve all of Honduras with its population of more than 4,000,000. Of these 220, only fifty or so are native Hondurans. Whatever influence the Church has, then, must of necessity be thinly spread.

The so-called Football War with El Salvador in July 1969, indecisive though it was, resulted in two military conclusions: The Honduran Air Force beat the Salvadoran Air Force handily, but the Salvadoran Army was stopped only by running out of supplies. While El Salvador and Honduras now cooperate closely against the common threat from Nicaragua, the Football War results still worry the Hondurans.

The Honduran Air Force remains a good one by Central American standards, but what if Nicaragua gets MiG-23s? And what will Honduras do if Nicaragua comes across the border with its fifty Soviet tanks, apparently a terrifying prospect to a Honduran military without tanks or the means to deal with them?

At that point, the answer must surely lie in the use of US forces. It would take too many years to re-equip and train Central American air forces with modern fighters. Nicaragua has trained MiG pilots in Cuba. It would be little more than an overnight proposition to go operational in Managua with MiG-23s.

The US Military Presence

The specter of MiG-23s in Nicaragua accounts in large measure for the low-profile, if very useful, role played by USAF in Central America. Introduction of F-15s or F-16s in Panama or Honduras would trigger the deployment of MiG-23s to Nicaragua, or so goes our diplomatic reasoning. Equally, if we don't, they don't.

By the same reasoning, F-14s on carriers off the Honduran coast are not apt to provoke a MiG deployment. It is an expensive use of limited carrier assets, but, so far, the results have been satisfactory. Contrails and an occasional sonic boom are the modern way of showing the flag. The airplanes can come from land or sea; it doesn't matter. But if the need for a show of airpower stretches into a long-term commitment, the diplomats should be challenged on their theory. A few fighters at Howard, or in Honduras, supported by the tankers already in Panama, could produce some very convincing condensation trails over the region.

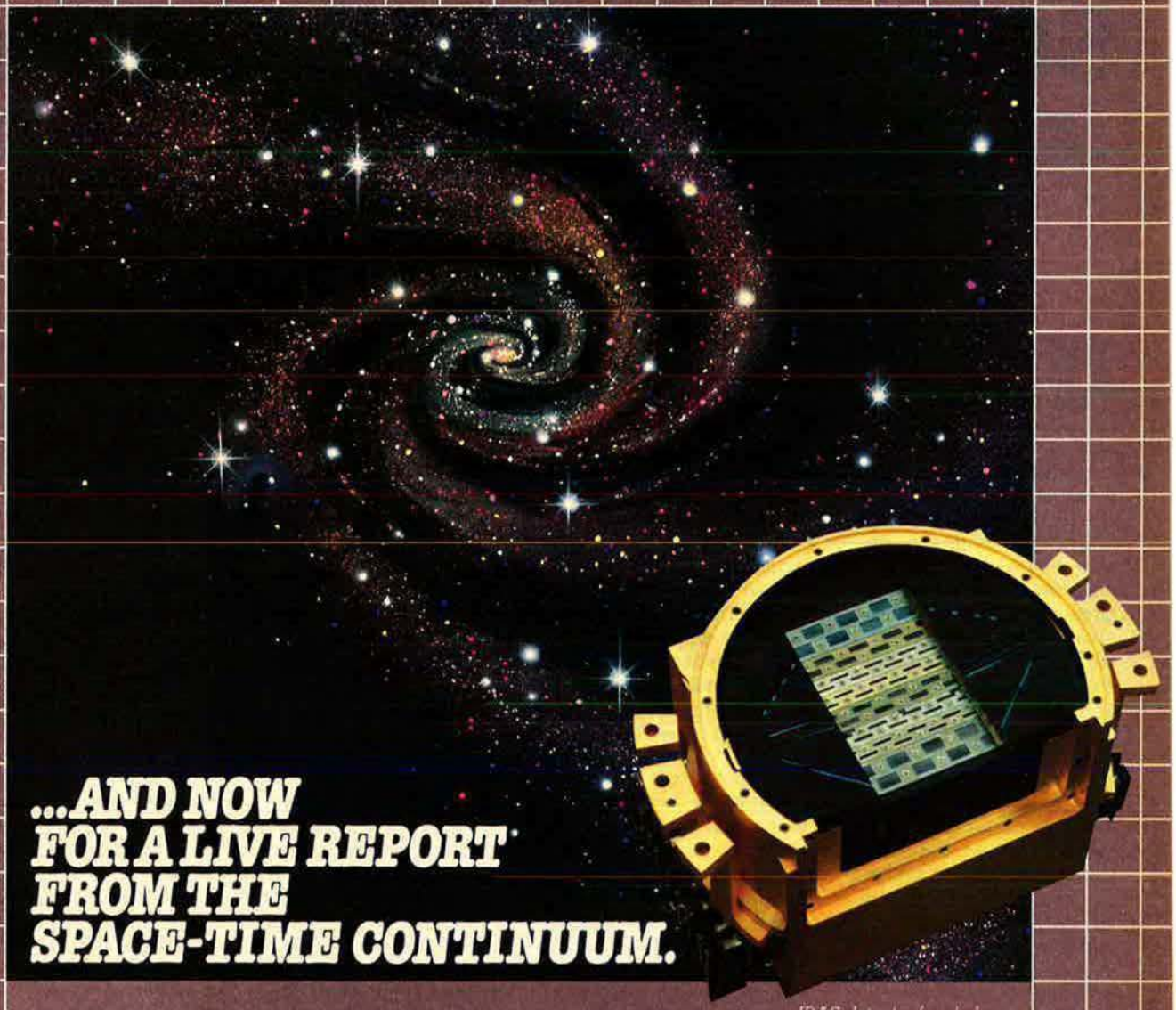
Big Pine II, the exercise begun in September, will lay the groundwork for a Honduran deployment if it ever becomes necessary. Seabees are improving the airstrip at Trujillo on the Caribbean coast so that C-130s can use it comfortably. A Corps of Engineers battalion is building a 3,500-foot strip at San Lorenzo on the Gulf of Fonseca, the bay shared by El Salvador, Nicaragua, and Honduras. Tiger Island—a name reminiscent of Vietnam—in the Gulf of Fonseca, will be the site of a radar with the obvious mission of surveying traffic in the region.

Big Pine II is not a normal exercise, one where there is a beginning, a scenario, and a scheduled end. It is really a familiarization deployment, and there is no precise date for it to end. While there will be a brief involvement of combat troops—2,000 Marines making an amphibious landing—the main effort of Big Pine II was, and is, logistic. That and the training of Honduran troops.

When it is all over, the regional training center near Trujillo will be on a firm basis, initially concentrating on Salvadoran troops but later, perhaps, on soldiers of other Central American nations. The air base at Comayagua will benefit from a $13 million program, one that will allow it to take modern fighters, and the United States will have established a small but definite presence in the area.

All this has been taken in by Cuba and Nicaragua with what seems to be, so far at least, sobering results. The US program for Central America on its present course bears more resemblance to Teddy Roosevelt's dictum of speaking softly and carrying a big stick than to our Vietnam misadventure. It is clearly designed as dissuasion, and to give the forces on our side a chance to bargain with the stronger hand.

Whatever the vocal opposition to this tougher stand may say, a political decision can only be arrived at when one side or the other has a clear military advantage. ■



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Statecraft and Strategy in the Nuclear Shadow

Here is the text of AFA's 1983–84 Statement of Policy, adopted unanimously by delegates to AFA's annual National Convention on September 12, 1983.

UNITED States military policy is, and throughout history has been, defensive. Our armed forces, and the doctrines that guide them, are structured accordingly. We don't create huge military arsenals to conquer or coerce. Our forces exist to keep others from using force against us and our allies. We seek to deter rather than fight wars. But hollow deterrence based on bluff weakens rather than strengthens peace; reliable deterrence is achieved only if potential aggressors know clearly that they would confront determined, combat-ready forces they cannot defeat. Our overriding concern obviously must be deterrence of the most destructive form of conflict, nuclear war. The world today lives in the shadow of nuclear weapons; we cannot wish them away or disinvent them even though the abhorrence of nuclear war and the desire to prevent holocaust are shared by rational people. And yet, we must remember the last conventional global war cost 40,000,000 to 50,000,000 lives, and that this nuclear shadow has prevented conventional war between major nations for thirty-eight years, the longest period in modern history.

If we want to lower the risk of nuclear war, we must build and maintain the forces that prevent it. This logic may not be comfortable but it is sound, for the principle of deterrence is as old as the history of warfare and has not been changed by the advent of nuclear weapons. What has changed is that the stakes of deterrence have increased in step with the deadliness of nuclear arsenals. The central requirement of effective nuclear deterrence is for the Soviet leadership to remain convinced that we have the capability and will to respond to aggression by denying Moscow its political and military objectives and impose on the USSR costs that outweigh any potential gain. In turn, this requires that we have the capability to hold at risk that which the Soviet leadership itself values most—military and political control, military forces, both nuclear and conventional, and that critical industrial capability which sustains war. Moreover, we must maintain this capability, at appropriate countervailing levels, whether the Soviet Union consents to equitable arms reduction or not.

This Association's long-standing contention that the US can no more negotiate from a position of weakness than it can deter through inferiority is as valid as ever. Arms-control objectives and strategic capabilities must be shaped for mutual support and serve the common goal of a stable military balance and, hence, peace. Effective arms control can and should be an essential tool for lessening the danger of nuclear war. But no negotiations can change the fact that this country and the Soviet Union are ideological and geopolitical adversaries.

The Soviet Union regards arms control as a competitive process which serves both political and military objectives. Politically, the Soviet Union poses as a champion of peace and frequently advances propagandistic arms-control initiatives. Many of these are one-sided, impractical, unverifiable, and not really intended to control armaments or even to be adopted in practice.

At the same time, the Soviet Union also advances proposals that are aimed at achieving military as well as political benefits. The Soviets seek to place constraints on US technological advantages while protecting their own military advantages.

It follows that arms-control agreements with a highly secretive adversary like the Soviet Union cannot be based simply on trust. There must be effective means of verification that enable the US to know with confidence whether the terms of agreements are being honored. In practice, this means the US must be able to monitor activities in the areas covered by these treaties in order to detect any violations at a very early stage. Arms-control agreements that cannot be verified and enforced effectively are worse than no accords at all.

This Association believes also that US arms-control policies must not focus on the threat of nuclear war to the exclusion of the threat of totalitarian imperialism. We must prevent the former while containing the latter. At the same time, arms-control policies must not become entangled in domestic partisan politics. The formulation of this nation's arms-control policy is not a contest between supporters of peace and sup-

The principle of deterrence, old as the history of warfare, has not changed.

porters of war, but an issue of statecraft that preserves both liberty and peace. There is reason to fear that the national discourse over arms control is being subverted into sloganeering exercises by those who favor arms control at any price. Arms-control accords that do not lessen the danger of war and undermine further the strategic balance—or especially a unilateral nuclear freeze—may serve temporarily the propagandists of the peace movement. But they do not serve the cause of peace. In fact, they increase the risk of nuclear war.

The positions taken by this Association previously on this issue are worth repeating: Domestic and international groups promoting simplistically an immediate nuclear freeze are achieving ends diametrically opposed to their own professed goals of nuclear stability and arms reduction. Such a freeze would leave us with a permanently weakened deterrent posture and perpetuate the very vulnerabilities and inadequacies we are making great efforts to correct.

A nuclear freeze would decrease strategic stability and grant the Soviets, without incentive to reciprocate, their major objectives in the START (Strategic Arms Reduction Talks) and INF (Intermediate-range Nuclear Force) negotiations. Concurrent with the nuclear freeze movement is a campaign against the first use of nuclear weapons, especially so far as NATO is concerned. The claimed Soviet "no-first-use" policy is deceptive. The North Atlantic Treaty Organization is a defensive alliance, with a long-standing policy that no NATO weapon of any kind will ever be used for aggressive purposes. NATO's doctrine of deterrence and flexible response links the US strategic forces with NATO's conventional and nuclear forces in Europe to deter aggression of any kind.

The Soviets continue to maneuver toward a joint pledge of no first use of nuclear weapons, an idea that is finding a sympathetic echo in the US and other NATO countries. A no-first-nuclear-use policy would undermine the Alliance's strategy of flexible response, necessitate large increases in expenditures for conventional forces, foster the impression that the US commitment to NATO has been reduced, and leave entirely to the Soviets the initiative and timing of conflict escalation. This Association believes that NATO's policy of no first use of military force is more effective, credible, and workable than a promise not to use nuclear weapons after an attack has begun.

Therefore, deployment of the full complement of US Pershing II and ground-launched cruise missiles must proceed on schedule to offset the destabilizing, one-sided Soviet advantage in intermediate-range nuclear forces in Europe. There is no inconsistency in deploying these weapons while the US and the Soviet Union engage in negotiations that seek balanced, equitable, and verifiable reductions in the two sides' arsenals.

The central harsh lesson of past arms negotiations with the Soviets is that they have yet to give up an advantage that they did not have to give up. The way to peace is through painstaking negotiations from a position of US strength. In the strategic nuclear sector, recommendations by the President's Commission on Strategic Forces, adopted in full by the Administration, provide the formula for rebuilding this strength. This plan provides for an integrated, mutually reinforcing approach to modernizing the nation's strategic forces consonant with our arms-reduction policy. We urge Congress to adopt the Administration's recommendations in their entirety and provide the long-term funding needed to bring these vitally needed forces and weapons into being. Deletion of any one element of this integrated modernization proposal could cause its unraveling. The consequences to the nation's ability to deter nuclear conflict could be grave. The Administration's five-pronged strategic force modernization program—consisting of ICBMs, strategic bombers, the Trident force, improved, survivable command and control systems, and revitalized strategic defenses—will ensure that the nation's nuclear forces could survive a Soviet first strike and retaliate. At the same time, this program provides essential leverage for equitable arms reduction; it does not move the world toward nuclear war but away from it.

Modernization of US military capabilities, this Association believes, is imperative because of the scope and tempo of the Soviet weapons programs that outdistance this country's efforts in vital areas. The Soviets, over the past year, have begun testing new models in almost every class of nuclear weapons. They are dramatically expanding their Navy and Air Force. Their ground forces are being trained and equipped for preemptive attack. And they are using their military power to extend their influence and enforce their will—directly or with the help of

Arms-control agreements must be verified and enforced. Policy must not focus on the threat of nuclear war to the exclusion of the threat of totalitarian imperialism.

surrogates—in every corner of the globe.

Exacerbating the problem is Soviet progress in narrowing or eliminating the technological gap between us and them. A key reason for this advance is that the Soviets have the world's largest R&D manpower—estimated at more than 900,000 scientists and engineers—compared to fewer than 700,000 on the part of the United States. The percentage of Soviet R&D manpower engaged in defense-related work is between fifty and seventy-five percent of the total number.

Supporting this force is the world's largest military-industrial base that includes more than 150 major plants located throughout the USSR. In turn, these key facilities are supported by a network of thousands of feeder plants. In recent years, the military has absorbed about fifteen percent of the Gross National Product of the USSR, compared to less than seven percent for the US, and, if current trends continue, the Soviet military share of the GNP will approach twenty percent by the late 1980s. Soviet military investments over the past decade were eighty percent higher than US investments; in terms of R&D spending, the Soviets topped the US investment by about seventy percent over the same period.

The main role of the Soviet war machine clearly is to undergird the step-by-step extension of Soviet influence and control by instilling fear and promoting paralysis, by sapping the vitality of collective security arrangements, by subversion, and by coercive political actions of every kind.

The latest manifestation of Soviet power politics is the crisis they and their surrogates are fanning in Central America. Enlightened self-interest—including our own national security requirements and those of our allies and friends—necessitates that the United States counter by diplomatic, economic, and other means Soviet, or Soviet-aided, efforts to set up Marxist governments anywhere, but especially at our doorstep. Military assistance, including training of anti-Communist forces, must be intensified to keep Moscow and its surrogates from toppling non-Marxist governments in that area and transforming these countries into Soviet satellites.

Our national security policy seeks to deter war at any level and of any kind. It follows that our military forces must be structured to provide an umbrella of military power that extends from strategic nuclear war and deterrence of space combat through conventional combat to special operations. In this context, this Association has, and continues to advocate, vigorous and prudent tapping of technological opportunities to provide our armed forces with the most potent tools and capabilities for deterring or, if need be, for winning wars. But the pursuit of technology must not become a substitute for sustainable, field-proven capabilities. Theoretical technological feasibilities at some uncertain future date are no substitute for forces in being and prudent development of technology that fills requirements established and formulated by combat-tested military professionals. Shunting aside technological evolution that builds on sound military doctrines and experience in favor of speculative approaches of uncertain military validity is likely to yield both poor defense and poor technology. The nation can afford neither.

The overriding national security requirement is continuation of a steadfast commitment to rebuild and maintain essential defense capabilities.

The cause of deterrence is served best by increasing the warfighting capabilities of the armed forces. There is need for continued improvements in the readiness and staying power as well as modernization of the general-purpose forces, enhancement of mobility and airlift capabilities, and expansion and modernization of tactical forces. In turn, these capabilities must be built on the bedrock of readiness and sustainability, top-notch, realistic training, and, first and foremost, the dedication, motivation, and professionalism of the men and women serving in the Air Force and the other services. The nation must safeguard the central advantage that underlies our defense posture—the well-trained, experienced professionals of its armed forces.

The Air Force Association applauds increased recognition of the total, joint character of national defense and concerted efforts to avoid separate, narrow approaches that duplicate capabilities. No service fights alone. They must plan and exercise together just as they would fight—shoulder to shoulder.

This Association sees, as the overriding national security requirement, continuation of a steadfast national commitment to rebuild and maintain essential defense capabilities. The progress that is being made must continue through steady growth in defense funding levels in line with sound, long-term planning strategies. The preservation of America's heritage of freedom and liberty is well worth this price, for, in the words of President Eisenhower, "in the final choice, a soldier's pack is not so heavy a burden as a prisoner's chains." ■

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Where Technological Innovation Becomes Reality

Time, Momentum, and the Margin of Technology

A policy paper titled "Force Modernization and R&D," adopted unanimously by delegates to AFA's annual National Convention on September 13, 1983.

As a nation, we can take pride in the fact that America has made a solid start toward restoring the credibility of its defenses. This new-found momentum must be maintained in step with the growing threats we and our allies face around the world.

The Air Force Association believes the American people must not let rhetoric and fabricated anxieties cloud our vision. There are those who seek to sway public opinion and keep America from doing what needs to be done by playing up the fears of an arms race.

The facts tell a different story: The US has today, deployed worldwide, some 8,000 fewer nuclear weapons than it did fifteen years ago. While this nation has a slim lead in the number of nuclear warheads, the combined yield, or megatonnage, of all deployed US nuclear weapons has been reduced by about seventy-five percent over the last two decades. In short, the arms race has been one-sided. As the Soviets raced forward, we in this country sat on our hands. As a result, the Soviets now possess forty percent more nuclear delivery systems than does the US and they surpass this country in missile throw-weight, an important measure of nuclear punch, by a factor significantly greater than two and a half to one.

The second half of the arms-race myth is the alleged incompatibility between a strong defense and a strong economy. Defense spending in FY '84 amounts to a smaller share of the federal budget than it did during the 1950s and 1960s, even though the threat is greater than at any time in our history. While any federal spending affects the size of the budget deficits, it is the non-defense sector that has grown by about eighty-five percent over the past decade. Contrary to popular perception, defense spending as a share of the Gross National Product has declined to 6.8 percent from a high of 10.1 percent during the Vietnam War. In 1978 and 1979 it even plummeted to 5.0 percent.

Some critics claim that increased defense spending causes inflation. Defense spending grew by about six percent annually in the past two years, yet the inflation rate came down by more than half, with the economy obviously capable of accommodating increased defense production because of the sizable unused industrial capability.

These factors aside, this Association remains convinced that peace and America's freedom and survival are worth whatever the price. At the same time, there is an equally ironclad responsibility that the Air Force and all other components of the Defense Department provide the American taxpayers with the greatest possible return on their investment in national defense by managing the funds appropriated by Congress with meticulous care.

Nuclear Force Imperatives

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

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

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

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

Improvements and further developments are needed in ground- and space-based radars for our C^3I network to control all phases of nuclear conflict. Current deficiencies are

America's freedom and survival are worth whatever the price.

such that C³I systems' survival from a first strike, let alone endurance through a prolonged nuclear conflict, is not assured. Congressional action to support the upgrading of our warning and communications network is essential. Costs for needed improvements are substantial, but not out of line with other planned strategic force modernization costs. The triad's ability to perform its mission ultimately depends on reliable and survivable command and control, thereby justifying the costs of such upgrade programs.

Specific needs center on improving the survivability and performance of many critical control networks through systems upgrades, the use of nuclear hardening techniques, higher power transmitters, redundancy and proliferation of critical C³ nodes, and employment of new satellite and air- and ground-based systems. Key requirements include:

- The Worldwide Airborne Command Post (WWABNCP) C³ systems must be upgraded and hardened against nuclear effects.
- The Air Force's worldwide high-frequency (HF) radio stations need upgrading to provide improved coverage and higher power. Airborne HF radio equipment should be replaced with modern equipment.
- Existing tactical warning and attack assessment systems require extensive upgrading.
- The very-low-frequency/low-frequency (VLF/LF) systems require modification with a new processor to improve transmission in a stressed environment. The Air Force Satellite Communications System must be deployed expeditiously in bombers, missile launch control centers, and airborne command posts, as well as installing VLF/LF receivers in bombers.
- The Ground Wave Emergency Network (GWEN), a low-frequency, overlapping radio relay network supporting critical two-way data communications in a nuclear environment, should be fielded expeditiously. Electromagnetic pulse (EMP) protection for critical communications equipment must be provided through the Aircraft Alerting Communications EMP program, including screened enclosures for selected equipment at SAC main operating bases.
- Over the long term, the need is for improved satellite capabilities at frequency ranges that sustain communications in a nuclear-disturbed atmosphere. The MILSTAR Satellite Communications Program needs to be developed and deployed to provide highly jam-resistant and survivable satellite communications for the command and control of our strategic and tactical forces.

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

The US ICBM modernization program is vital to offset the unilateral Soviet growth in counterforce capability, and ultimately is to provide assured credibility of US retaliatory forces. These challenges can best be met by a broad, flexible approach to ICBM modernization, incorporating the best of our modern technology and responding to the imbalances in throw-weight caused by Soviet ICBM deployments. We must provide this nation with a highly accurate, capable, and responsive ICBM force.

A threefold approach to ICBM modernization, as recommended by the President's Commission on Strategic Forces and approved by the President, will provide such a force. This Association endorses this approach.

First, 100 Peacekeeper (MX) missiles should be deployed in existing Minuteman silos. The Peacekeeper is needed to redress the significant and growing asymmetry between US and Soviet strategic forces and to restore essential equivalence in the late 1980s. The decision to deploy the MX missile recognizes the importance of retaining the unique characteristics of the land-based ICBM: quick, flexible response; high alert rate; dependable, proven command control and communications; high accuracy; and low operating cost.

Second, this Association supports furtherance of these characteristics through the development of a small, single-warhead ICBM that could be deployed in a variety of basing modes. This missile and its wide range of deployment options, in conjunction with the deployed Peacekeeper and Minuteman forces, could provide a diversification of forces that are planned to confound Soviet war plans.

Third, these programs should be augmented through a vigorous research and development program including new hardening techniques for silos and shelters that may be used for deployment of Peacekeeper or small missiles and different types of land-based vehicles or launchers, particularly hardened vehicles for mobile deployment of small ICBMs. Engineering design of such a missile should begin now with a view toward initial deployment in the early 1990s. The underlying objective of this comprehensive approach to ICBM modernization is to provide stability through deterrence and more effective arms control. The small missile enhances this objective by permitting the US, and encouraging the Soviet Union, to move toward weapon systems that can be less threatening and have inherently reduced value as targets themselves. On the other hand, Peacekeeper provides the leverage needed to persuade the Soviet Union to negotiate seriously in this direction while providing a critical counterbalance to the capabilities of their existing systems.

Deployment of MX does not detract from the need to continue qualitative improvements to our Minuteman force. Improvements to propulsion, guidance, and reentry systems are needed to redress growing support problems with these aging systems and to provide flexibility to counter continuing Soviet advances in strategic capability.

In the area of sea-based deterrence, development and deployment of the US Navy's Trident II (D-5) submarine-launched ballistic missile (SLBM) are required to counter growing Soviet capabilities.

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

European locations.

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

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

Air-Breathing Leg

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

As a pivotal part of the strategic modernization program, the United States urgently needs production of 100 B-1B bombers, with an initial operational capability in 1986. The bomber element of the triad of strategic forces can be launched prior to a final decision to employ these weapons, permitting the crew to take action and accept responsibilities that cannot be anticipated or preprogrammed.

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

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

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

The B-1B, which relies on a combination of reduced radar observability and highly effective reprogrammed electronic countermeasures, will be fully capable of penetrating the Soviet Union well into the 1990s. This will allow designated B-52s to be employed for the cruise missile carriage mission. To keep the B-52s as a viable penetrating weapon system over the next decade and beyond would require numerous expensive modifications. Should the B-1B's capability to penetrate decline in the face of growing Soviet defensive efforts, the B-1B will be able to function as a very effective cruise missile carrier and conventional weapon system. In view of developing Stealth technology, the acquisition of penetrating advanced technology bombers should start in the 1990s. The B-1B would be even more important if current expectations in regard to advanced technology bombers don't materialize.

In the meantime, the air-launched cruise missile (ALCM) and avionics modification program for the B-52 force must continue to keep these aircraft viable through the 1980s. This modification program will transform the B-52 from a pure penetration to a shoot-then-penetrate role and finally assign it to a standoff role. The ALCM, which achieved an initial operational capability on the B-52 in December 1982, will provide greater accuracy, flexible routing and targeting, and saturation of Soviet air defenses. The advent of the Advanced Cruise Missile (ACM), which takes advantage of new developments in cruise missile technologies, will further ensure that our force of cruise missiles will maintain their flexibility and effectiveness well into the future. The ALCM and ACM, deployed in conjunction with Short-Range Attack Missiles (SRAM) and gravity weapons, improve the overall capability of the air-breathing leg of the strategic triad. To optimize future bomber weapon loads, development should proceed immediately on a SRAM replacement (Advanced Air-to-Surface Missile, or AASM).

Strategic Defense

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

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

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

With the bulk of the United States air defense fighter force more than twenty years old and only marginally effective against Soviet capabilities, modernization of these fighters is one of the Air Force's most pressing needs. Active and Air National Guard F-106 squadrons should continue to be converted to F-15s and F-16s.

The USAF/FAA Joint Sur-

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

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

Also, two additional phased-array submarine-launched ballistic missile warning sites (PAVE PAWS) in the southeast and southwest United States must be built. These new PAVE PAWS sites will provide a substantial improvement in SLBM tactical warning capability and will allow USAF to close two old sites that are becoming increasingly costly to maintain.

This Association supports the President's plea for major scientific and technical efforts to improve our nation's ballistic missile defense (BMD). Therefore, research and development efforts focused on promising BMD technologies must be intensified.

Space Operations

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

The Air Force's role in space is to be prepared to conduct three types of space operations:

- **Space support**—launch and recovery activities and on-orbit support.
- **Force enhancement**—global surveillance and communications capabilities, worldwide command and control systems, precise positioning and navigational data, and current, detailed, timely meteorological data.
- **Space defense operations**—detecting, tracking, and identifying all objects in space, timely warning to the NCA of hostile actions to the United States and our allies, developing the capability to deny or nullify hostile actions committed in or through aerospace, and conducting sustained operations to detect and analyze aerospace threats.

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

Development of the Consolidated Space Operations Center (CSOC) is essential for future US space operations. For management, operational, and economic efficiencies, CSOC will combine satellite control capabilities and DoD Shuttle flight planning, readiness, and command and control in a single facility, thereby providing increased capacity and redundant control. CSOC will enhance operational capabilities by providing greater mission flexibility and increased survivability of the satellite control network. For the Shuttle role, CSOC is vital to directly control military missions and to enhance protection of national security information.

Full funding of a vigorous program to enhance the survivability of our space systems is essential. Steps must be taken to improve the survivability of critical space systems, such as the Defense Support Program (DSP). Equally essential are a satellite-based relay system, the Survivable Control System (SCS), and mobile telemetry tracking and control capability in order to provide survivable satellite command and control.

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

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

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

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

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

The Air Force's development and flight demonstration of this country's first nonnuclear space defense weapon, the antisatellite (ASAT) system, must be fully funded.

Tactical Airpower

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

US tactical forces must be continually modernized and expanded to cope with the growing Soviet threat during day and night and all weather conditions. The potential for attrition in modern warfare is dramatic; our vital, reusable aerial delivery systems must not be exposed unnecessarily—standoff weapons with all-weather capability must be developed and produced. Continued improvements in the density, quantity, and complexity of the Soviet air defenses force USAF and the allied air forces to pursue carefully selected tactical programs that will enhance the flexibility, deployability, firepower, and quick-response capability of their tactical forces. Further, since it is unlikely the US will ever match the numerically superior Soviet force on a one-for-one basis, the Air Force has to maintain an effective tactical air arm by exploiting the US technological edge. This requires emphasizing systems that achieve higher effectiveness through accuracy and lethality while reducing aircraft attrition.

The Soviets are outproducing the US in tactical fighters by more than two and a half to one. Their sustained rate of investment and production translates into an increasingly sophisticated offensive force.

Two-thirds of their 4,500 fighters are new "third-generation" aircraft, and they will begin producing their fourth-generation aircraft before completion of the third-generation buy. The result is that the average age of their force is one-half that of the US tactical force.

US tactical air forces cannot offer as credible a deterrent without acquiring highly capable aircraft in sufficient numbers. Quality and quantity are relative virtues in a tactical fighter. Neither approach alone can satisfy the requirements for the force. National need demands both technological improvements and adequate numbers to meet the threat. With a goal of forty tactical fighter wings (consisting of approximately twenty-seven active-duty and thirteen Reserve and Guard units) by 1988 and an average aircraft age of ten years, 250 to 270 fighters must be procured annually to offset attrition and aging. Additional procurement is necessary to increase force size. The programmed buy in 1984 was held to only 168 fighters.

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

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

The growth potential of the new multipurpose versions of the F-15 and F-16, as evidenced by the manufacturers' demonstrations, provides a solid foundation for continuing force modernization. An important next step in USAF's fighter force must be the evolutionary improvement of both aircraft while continuing the focus on readiness and sustainability. A dual-role fighter evolving from the F-15 or the F-16 and providing extended range and payload should be expedited. The F-15/F-16 variant is needed to replace F-4s and to augment the specialized F-111s and F-15s.

By the 1990s, current fighter designs will be twenty years old, and modifications will no longer be as cost-effective. The performance edge today of these aircraft will be narrowed significantly or be gone by the mid-1990s.

Thus, to meet the threat in the '90s and beyond, the Air Force must now begin work on a new fighter. The Advanced Tactical Fighter program, coupled with associated efforts in engine technology, needs to be carried forward expeditiously to reach a planned Initial Operational Capability (IOC) in the mid-1990s.

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

Particular emphasis on building up Air Force stocks of air-to-air missiles through procurement of air intercept (AIM-9) infrared-guided missiles, and development of the Advanced Medium-Range Air-to-Air Missile (AMRAAM) to cope with Soviet force improvements, is imperative. AMRAAM will give fighters the capability to engage multiple targets more effectively and will increase aircraft survivability because of its high speed, range, and lock-on after launch potential. Research and development efforts must be stepped up for follow-on munitions such as Low-Level, Laser-Guided Bombs; GBU-15; 30-mm gun pod and ammunition; the Combined Effects Munition (CEM), a new cluster munition; and Gator, an antiarmor mine, as well as to improve the effectiveness of such guided air-to-ground weapons as the Imaging Infrared (IIR) Maverick. Currently, US forces do not have the munitions to attack enemy airfields efficiently. Acquisition by the Air Force of Durandal, a French-built, rocket-assisted, runway-cratering munition, should be followed by development of a new generation of weapons and submunitions, and studying various means of airfield attack.

Realizing the importance of realistic training for readiness, AFA fully supports the continuation and broadening of the current family of tactical "Flag" exercises as invaluable, on-going tests and demonstrations of tactics, doctrine, and technology—involving allied air forces—to enhance the effective response capability of the free world's tactical airpower. We advocate additional specific training exercises, focused on possible areas of engagement, to evaluate US capability to conduct joint and combined military operations and to practice existing contingency plans.

Electronic Combat Needs

Electronic combat (EC) is one of the fastest developing and changing elements of air warfare. It is frequently the one element

that tips the scales of victory, as has been shown in recent battles around the world. Combat commanders must be provided viable EC options for aircraft self-protection to jam, exploit, deceive, or destroy combatant elements of the enemy air defense and command and control systems. A major requirement is continued, expeditious development and deployment of an integrated mix of self-protection, destructive, and disruptive systems to suppress enemy defenses and to protect penetrating US forces.

To conduct air operations throughout a campaign and reduce the attrition of our numerically inferior forces, the enemy air defense system must be countered quickly and effectively. Each aircraft should be given the means to survive individual engagements. This must be complemented by dedicated EC assets that reduce engagement opportunities by attacking the overall air defense system, preventing them from carrying out their mission. Protection capabilities need to ensure that aircraft avionics and ground- and space-based weapon system control support and sustaining capabilities ought to be available to ensure the effectiveness of our overall electronic combat effort in an extended conflict. Development of airborne self-protection jammers, updated existing radar warning receivers, procurement of low-smoke engines, and continued installation of new flare and chaff dispensers must receive high priority. Protection for our aircraft electronic equipment against jamming and nuclear disturbance is vital to maintaining weapon system effectiveness. Jam-resistant radios such as HAVE QUICK and jam-resistant data communications systems such as Enhanced Joint Tactical Information Distribution System (JTIDS) must be developed and continually improved to provide near-term protection for voice and data communications systems.

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

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

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

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

Airlift Needs

The ability to project forces early and to keep them resupplied is essential to deterrence and critical to the outcome of conflict. Success in battle depends on having the right forces in the right place at the right time, and with the right supplies. This requires the movement of critical cargo to a theater of operations and then within that theater. Airlift, sealift, and prepositioning play vital roles in the mobility equation, but only airlift, the most flexible component of today's mobility forces, can provide the timely reinforcement and supply of forward deployed forces and can support rapid force projection. Even though airlift was supported by budgeted enhancements during 1983, mobility assets remain inadequate to meet the deployment requirements of US combat forces.

In all contingencies, airlift provides the means for rapid deployment, and in many contingencies, airlift—with its flexibility, speed, and long range—is the only answer, either because of geographic location or the swiftness with which a threat arises. Hence, the importance of adequate and responsive airlift cannot be overstated. The global character of US interests and commitments makes it imperative that we have the capability of quickly deploying and providing initial support for combat forces anywhere in the world. Improved Soviet offensive capability has reduced warning and mobilization time, placing a premium on bringing US power to bear rapidly.

The military airlift capacity needs to be increased significantly over the next few years. Both intertheater and intratheater airlift requirements exceed the capability of the airlift system. The full potential of existing resources—seventy-seven C-5As, 268 C-141s, and fifteen KC-10s (with ten more on order)—should be realized as quickly as possible. The C-5A wing modification, adding some 30,000 hours to its service life as well as range and payload im-

Airlift: the most flexible component of today's mobility forces.

provements, must continue expeditiously. The C-141 modification program has added refueling capability and a thirty percent increase in cargo space through a fuselage stretch. The capability of these existing aircraft must be maximized by increasing spare parts stocks to permit higher sortie rates. Due to the growth in requirements for airlift peacetime operating stocks (POS) and war readiness spares kits (WRSK)/ base-level self-sufficiency spares (BLSS), recent improvements in funding have been diluted. Shortages of spare part sources seriously restrict the ability to meet projected wartime utilization rates. To increase spares levels, long lead times can be expected; therefore, funding must not be delayed. Also, the importance of the Reserve Forces to strategic airlift—they contribute about fifty percent of the crews—can't be overemphasized.

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

The programmed acquisition of the fifty C-5Bs and forty-four KC-10s is needed to help correct today's insufficient capacity and meet near-term requirements dictated by national policy.

The C-5B is uniquely designed for the military airlift mission. The fifty C-5Bs requested by the Administration will add 7,500,000 ton-miles per day and provide a sixty percent increase in outsize cargo capability.

The KC-10, a combined cargo and tanker aircraft, will provide both a new dimension in long-range aerial refueling capability and the capability of transporting large amounts of bulk and oversize supplies.

The Administration's C-5B and KC-10 plans will add some 12,000,000 ton-miles per day—7,500,000 of which are specifically for outsize cargo—to the mobility force. While they provide an important and welcome step in the right direction, they will not satisfy completely the Congressionally Mandated Mobility Study's call for an intertheater airlift capability of 66,000,000 ton-miles per day. Further, they do not alleviate serious shortfalls in intratheater airlift capability.

There is a continuing need for intratheater mobility and resupply. The C-130 is the backbone of the current force—the only airlifter with intratheater capability. Just as the C-141 and C-5A have been upgraded to improve their capability and extend their service life, the C-130 also requires enhancement. This aircraft is showing the results of twenty-plus years of hard service as experienced in Southeast Asia. Replacement of the outer wing, installation of adverse weather airdrop equipment, and a new Doppler radar will improve and extend its mission ability and the radar homing and warning system will aid in protecting it against hostile fire in combat. Preservation of the C-130 is mandatory as it is the only aircraft currently capable of performing intratheater airlift. These modifications must go forward, but a replacement for it and the C-141 will be needed in the 1990s. Continued R&D on the C-17 is essential to augment the C-5 and KC-10 forces and to provide the remainder of the capability to reach the recommended level in the mobility study. The C-17 also will be needed as a supplement to intratheater forces and as a future replacement of the C-130 and C-141. For our long-term needs, the C-17's versatility as an outsize cargo carrier in the intertheater and intratheater roles and its ability to operate under austere field conditions must be realized expeditiously through adequate funding of a vigorous R&D program to assure operational status by the early 1990s.

The new European Distribution System (small, off-the-shelf commercial cargo aircraft) requires continued funding to assure the airlift capability for rapid delivery of fighter aircraft spare parts in Europe and improvement of their warfighting ability. This new concept promises to be an inexpensive process to enhance readiness in NATO.

The Civil Reserve Air Fleet (CRAF) provides approximately half of the intertheater airlift—passengers and cargo combined—available under crisis conditions. Still more capacity is needed. Approximately 3,000,000 ton-miles of added cargo capability must be made available through a program of modification of civil wide-body passenger aircraft. Award of contracts for CRAF enhancement is expected by the end of the fiscal year. Only if fully funded will the twenty-two Boeing 747 or thirty-eight Douglas DC-10 aircraft be modified as required. The CRAF enhancement program promises to be the most inexpensive method to augment bulk and oversize airlift capabilities.

Rescue and Special Operations

The USSR and its surrogates seek to promote revolutions and insurgencies around the world. This factor, combined with the potential for low-level conflict within and among Third World countries, makes it essential that the US maintain special operations forces capable of conducting missions in every region of the world where the US has vital interests. In peacetime, these forces must be able to assist friendly nations that confront externally supported low-level subversion or insurgency. In war, special operations forces must be capable of conducting various missions, including special strategic operations and the destruction of military targets. It is essential, therefore, to modernize as well as to expand the fixed-wing aircraft fleet—especially the MC-130H Combat Talon II aircraft—and to build up the HH-60D force.

Air Force responsibility for combat rescue and recovery far behind enemy lines and special operations needs added assets. The Air Force decision to replace helicopters of limited payload, range, and cruise speed with a version of the UH-60, superior to any helicopter in the inventory, warrants full Defense Department and congressional support.

Procurement of nine UH-60A helicopters provides lead-in experience for the future replacement of rescue and special operations helicopters with the HH-60D Night Hawk. Support for this replacement program is necessary to assure that the best low-level, night, adverse-weather operational capability exists.

Aerial Refueling

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

other missions would be seriously degraded because of tanker deficiencies.

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

In addition to the KC-135 reengining, additional air refueling capability must be provided through KC-10 procurement. These two programs must be funded in sufficient quantities to help satisfy growing refueling requirements and to provide a flexible tanker force to satisfy a wide range of strategic and general-purpose missions. Each aircraft in the tanker role is ideally suited to a specific mission: the KC-10A to a long-range deployment of aircraft and cargo, and the KC-135R to the SIOP, mid-range deployment, or employment scenarios. A mixed force of KC-10As and KC-135Rs takes advantage of the unique capabilities of each aircraft and each must be procured.

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

Readiness and Sustainability

The United States Air Force's investments in force structure and modern weapon systems need to be translated into warfighting capability by near-term investments in readiness and sustainability programs. The proper mix of modern equipment and well-trained, dedicated people who have at their disposal effective repair facilities, sufficient spare parts inventories, adequate munitions, and fuel is essential. The Air Force has made the readiness and sustainability of existing forces the number-one priority for conventional forces.

Readiness is the ability of force units, weapon systems, or equipment to accomplish their assigned mission. It is achieved through realistic operational training, maintaining the elements of the force at a high proficiency level, and ensuring that each unit is equipped with sufficient trained personnel, spare parts, and consumables. Sustainability is staying power—the ability of our forces to fight beyond the initial period of combat—and is achieved largely by having adequate stocks of spares, supplies, munitions, and fuel.

Recent devotion of resources to readiness and sustainability initiatives—spares, maintenance, training, personnel, munitions, and fuel—has begun to pay off. The downward trend is being reversed. Flying time for tactical aircrews has increased by fifty percent since 1978, and the 1982 mission capable rates for the F-15, F-111, and F-4 are at the highest levels in five years. This, however, is not enough. Funding for readiness and sustainability must continue to receive the highest funding priority. Efforts to increase operational flying, expand stocks of spare and repair parts and munitions, decrease the depot maintenance backlog, and other steps to provide near-term combat capability need to be continued vigorously.

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

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

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

Air Reserve Forces

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

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

As the Air Reserve Forces' contribution to the Total Force grows, the need for continuing modernization becomes increasingly important. The air defense capability of the Guard and Reserve forces should not be allowed to diminish due to increasing obsolescence and budget restrictions. Current line aircraft of the Guard and Reserve must be upgraded so as to provide maximum air defense capability by utilizing later model F-4 aircraft, engine modifications, and updating of radars and weapon systems. The antiquated C-130A is not sustainable in support of Army and Air Force fighting forces in the field. Obsolescent Guard and Reserve aircraft and mission support equipment should be replaced or modernized on a timely schedule. Acquisition of first-line aircraft, with their more economical operation and advanced technology, also adds to the efficiencies of the Reserve and Guard. The equipment must be upgraded so as to be logistically and opera-

tionally interoperable with that of the active force. Operations and maintenance records demonstrate that the Reserve and Guard can maintain weapon systems as well as the active-duty force due to the high expertise and experience level of the maintenance personnel.

Research and Development

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

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

The United States relies on technological, rather than numerical, advantage to maintain superiority of its weapons over those of the Soviet Union. This Association firmly believes that loss of the qualitative edge is the most ominous long-term threat facing this country. Today's qualitative lead over the Soviets is a direct consequence of the investments in technology made ten to twenty years ago.

We must maintain this edge, for living off past investments is no longer a viable answer for this country's defense needs. Over the past decade, the Soviets invested some $135 billion more than the United States in military R&D; because of the effects of inflation, the buying power of our investments in basic research and exploratory development declined by some forty percent since 1966; over this same period, the Soviets graduated four to five times more engineers and scientists than the United States; and through overt and covert means, the Soviets have been exploiting Western technology for use in their expanding military forces. Recent trends show alarming gains by the USSR in an increasing number of basic technologies, such as the application of charged particle beams and high-energy lasers, chemical warfare, antisatellite, and others. The Soviets already have the quantitative advantage; the US must not allow them to gain the qualitative edge.

Several steps are required to counter this shift and to regain the qualitative lead. Most importantly, this country needs to maintain steady, adequate, annual real growth in the technology base over the next several years. Continuity of effort at a moderately increasing level is more productive and far more economical than crash programs conceived and executed in haste. AFA believes that, at the very minimum, the United States should advance the technology base in real terms at a rate of ten percent a year. Steady annual growth in those basic research and exploratory development programs that generate innovative concepts and demonstrate their theoretical soundness and technical promise will translate into real capabilities for the future. The technology base lays the foundation for advances that will be incorporated into the next generation of military equipment or that may be retained as options to be developed as new military requirements are identified. Failure to push forward the frontiers of science and technology energetically and with the combined dynamics of government, industry, and academia is tantamount to mortgaging the nation's future in a national security as well as economic context. Science and technology are political neutrals that willingly serve any nation or ideology that can pay the price for exploring and exploiting them.

High-payoff technologies that the United States needs to exploit include: electronics, weaponry, propulsion, flight vehicles, and materials.

Integrated circuit technology is the keystone of modern military electronics. The Very High Speed Integrated Circuits (VHSIC) triservice program is imperative to provide the technology for coming generations of integrated circuits. Payoffs will include enhanced performance and reliability and reduced life-cycle costs. The emerging discipline of artificial intelligence promises to benefit many mission areas and, therefore, also needs to be exploited. The same is true for solid-state phased-array radar which, with improved performance, higher reliability, and reduced size and weight, will provide aircraft with a significant avionics upgrade. Technology advancements in infrared imaging sensors that increase the range and resolution over current sensors and provide significant improvement in the day/night/adverse-weather reconnaissance and strike capability are essential R&D objectives.

High-energy laser weapons, the first of the new class of potentially revolutionary directed-energy weapons, require increased emphasis. The Advanced Radiation Technology program should proceed expeditiously to exploit laser technology for applications in the airborne and space-based role.

The Conventional Weapons Technology program and related efforts are essential to provide the capability to deliver submunitions to close runways, defeat armored columns, and accomplish defense suppression missions.

In the area of propulsion, turbine engine technology must be advanced to obtain improved durability. The complementary Advanced Turbine Engine Gas Generator and the Aircraft Propulsion Subsystem Integration programs deserve highest R&D priority and promise engines that will be smaller, more powerful, more efficient, more durable, and lower in life-cycle cost. The Air Force Rocket Propulsion program is needed for advanced air-launched tactical and strategic missiles, space launch systems, satellites, and ballistic missiles.

An essential R&D goal is improved aircraft performance. Short Takeoff and Landing technology is crucial to reduce dependence on conventional runways. Greatly reduced takeoff and landing distances without degrading aircraft range, payload, or speed are essential for future generations of combat aircraft. So are enhanced flight control and weapons delivery systems, and systems for increased aircraft survivability and safety.

Materials programs are driven by the need for

lighter, stronger, cheaper, more durable materials, by the increasing uncertainty of supply for many strategic materials, and by a shrinking industrial production base. New and improved materials are required to meet the increased performance and reliability demands of future aerospace systems.

US technology programs make available a range of technical options to support whatever roles and systems our national decision-makers choose for the military in space. Space systems must have a higher degree of autonomy on orbit and less dependence on ground control. Work must continue on technologies needed for the next generation of space missions. New technologies are needed to increase survivability, permit weight reduction, improve both spatial and thermal control, permit greater orbital changes, and improve defensive hardness against nuclear and laser threats.

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

Cooperative efforts in research and development need to be continued to capitalize on the technological advantage and combined superiority of the free world's industrial base. Such cooperative programs can benefit the readiness, sustainability, and interoperability of US and allied forces.

One of the key objectives in all military research and development efforts, in the view of this Association, must be to maximize return on investment. This means that in developing new systems, care must be taken that they are logistically supportable and affordable. The most technically advanced system, unless supported by a sound logistics base, cannot take full advantage of the technology designed into it.

Overall, a robust technology base is an absolute requirement in this era of deterrence that involves cycles of moves and countermoves. The US not only must be able to understand and correctly forecast Soviet weapon developments but be prepared to start implementing a technological counter before Moscow has fielded new systems.

The Air Force Association remains convinced that this nation's technological superiority is its most important advantage in the long-term political, economic, and military competition with the USSR. We can and must retain that lead. But the scope, magnitude, and determination of the Soviet technological effort represent a significant challenge that cannot be underestimated; it has already produced adverse trends in the military technology balance which we must reverse promptly. Sustained investment growth and cost-effective management are the most immediate requirements facing us. We urge that priority attention be given to meeting this central need in the next Five-Year Defense Plan. Neither time nor momentum is on our side.

Productivity

Key to the rebuilding of US defense forces is the improvement in industrial responsiveness and productivity, for only when American industry has the capability to modernize and expand production to meet increased demands for weapons and supplies during times of crisis can the US face with confidence the world's constantly changing conditions. A climate favorable to capital investment by the private sector must be created to strengthen the defense industrial base and make it possible to surge rapidly in time of emergency. The problems in today's defense sector of industry are a part of the problems faced by the entire industrial sector.

We must continue to foster increased efficiencies and productivity throughout US industry. Long-range planning to achieve productivity increases in the defense sector is essential; initial efforts must focus on more cost-effective acquisition policies and strategies.

The nation's increasing dependence on foreign sources—often unstable Third World countries—for critical raw materials as well as the dwindling stockpile of strategic materials is of fundamental importance to the defense industrial base and the national economy. This Association is fully committed to programs that will free the nation from the constraints of dependence on foreign sources and the subsequent potential for foreign coercion.

The nation's stockpile of critical raw materials must be built up to ensure that vital national security needs may be met in time of crisis. The Strategic Petroleum Reserve must be filled and maintained. The executive and legislative branches of government must provide reasonable access to public lands for early, comprehensive scientific evaluation and use of the potential resources they might contain.

This Association supports efforts to develop an industrial base capability to produce and deliver a five-year peacetime procurement program efficiently and effectively, to provide surge responsiveness for selected critical systems and items, to permit accelerating the attainment of programmed sustainability levels for selected critical systems, and to increase funding for industrial preparedness planning.

While some steps have been taken to improve industrial responsiveness to defense needs, more must be done in the individual services to weave industrial base considerations into the acquisition process, revitalize industrial preparedness planning, and show industry that such preparedness is an integral part of acquisition.

The Defense Department must take the lead in encouraging increased investment in productivity-enhancing equipment by the aerospace industry. The defense-related marketplace must be provided with greater stability. Multiyear contracting and economic production rates are essential means to improve stability. Less reliance should be placed on sole source contractors; second source or dual source qualification for weapon system development and acquisition must be emphasized. Equally urgent are steps that free operating capital for investment in productivity-enhancing technology. Further, in developing new systems, care must be taken that they are logistically supportable and affordable. The most technically advanced system, unless supported by a sound logistics base, cannot take full advantage of the technology designed into it.

In summary, the preservation of peace and freedom depends on more than rhetoric and one side's good intentions. Peace does not happen; it must be earned at a price. That price is military preparedness. This Association believes that we have made great strides toward building the military forces that guarantee peace. But a great deal more remains to be done. ■


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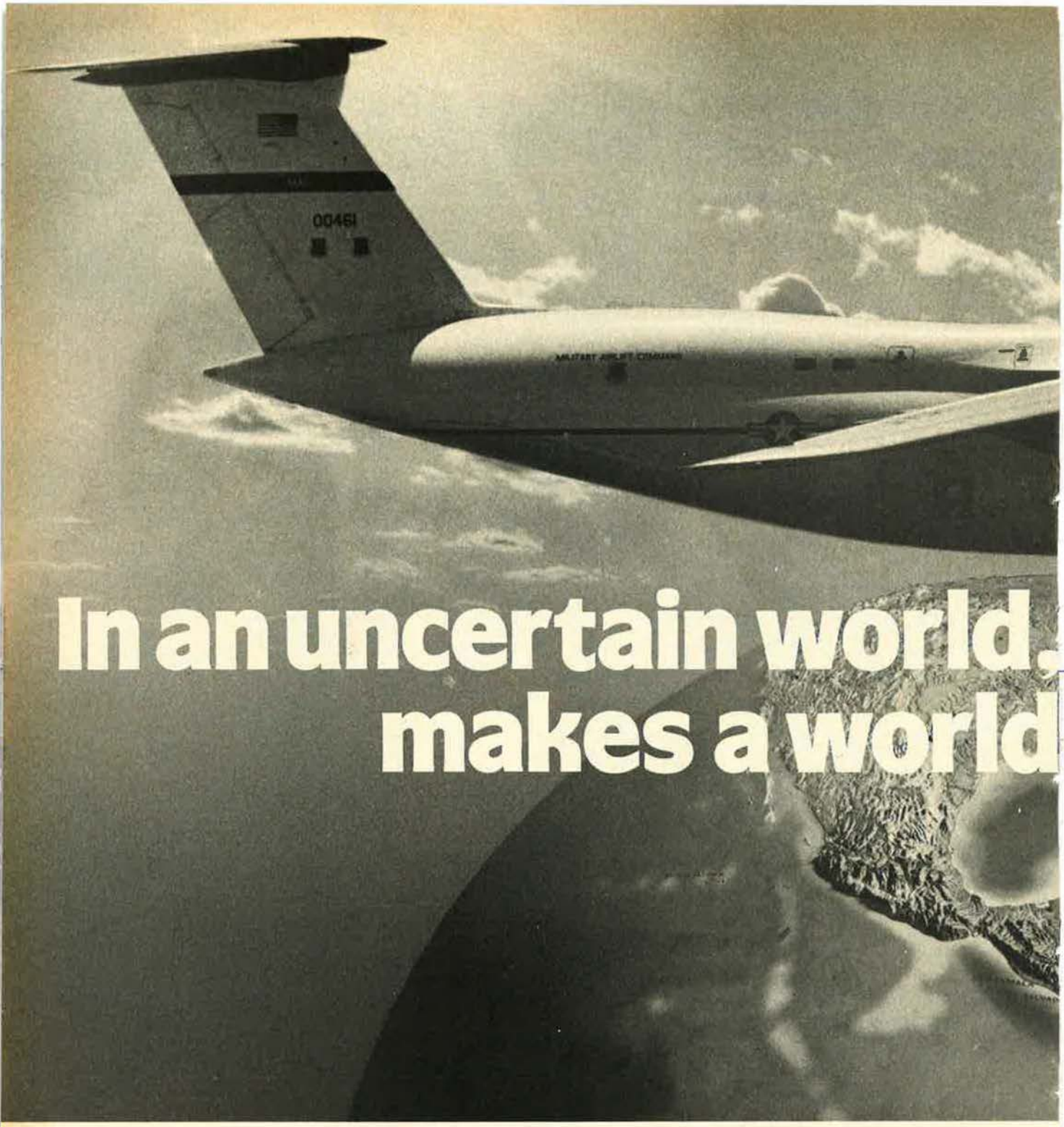

In an uncertain world, makes a world

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Off-loading the C-5 goes fast. In actual crisis situations, more than 200,000 pounds of desperately needed cargo have been off-loaded in less than 30 minutes.

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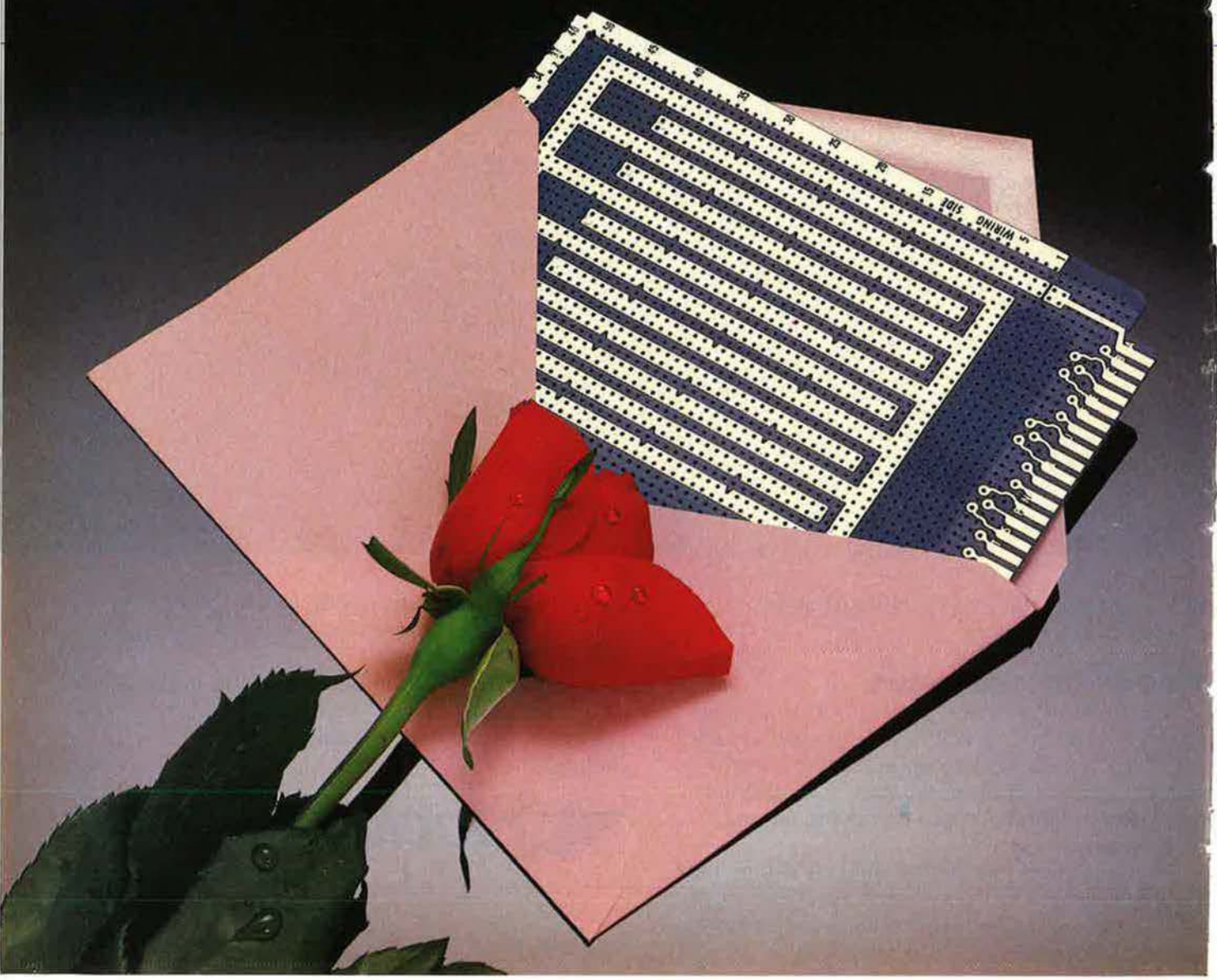

The 'Magic Weapon' Is People

A policy paper titled "Defense Manpower Issues," adopted unanimously by delegates to AFA's annual National Convention on September 13, 1983.

PEOPLE are important. In fact, the attraction and the retention of high-quality, well-trained, and experienced people is the key to readiness and must remain the Air Force's top priority. In any future crisis, America cannot rely on having time to get ready—we must *be* ready. The current military retirement system, pay comparability, compensation initiatives, and quality of life have been key to the recruitment and retention of quality people. AFA declares that this is *not* the time to cut back on these and other important commitments for military men and women.

In sum, as stated by Air Force Secretary Verne Orr and Air Force Chief of Staff Gen. Charles A. Gabriel in their recent joint posture statement: "Ultimately, our capability as an Air Force depends on our people. Recent combat has shown that well-trained, well-led, motivated people win battles. When a pilot resigns, when a crew chief hangs up his or her uniform, years of irreplaceable experience are lost. The best equipment that money can buy will not carry the day without the right people."

The recruiters across the nation are to be congratulated for bringing into the Air Force the best group of young people ever. Almost all of the new recruits—ninety-eight percent—are high school graduates. Last year was the best recruiting year in the history of the All-Volunteer Force. However, soon we'll see a declining number of age-qualified young people available for duty in the armed forces. This is because the birth rate in the United States started to decline about twenty years ago. In addition to smaller numbers of eligible young people, the Air Force can also expect to face an improved economy and stiff competition from industry and colleges—not to mention the needs of the Army, Navy, and Marine Corps.

On the other hand, pervasive attacks on traditional benefits needed to attract and retain dedicated people for a professional career in the military are increasing. AFA refutes all such attempts.

Certainly it is true that there have been successes in the past few years in both recruiting and retention, thanks to internal leadership efforts, adequate recruiting resources, significant pay increases in Fiscal Years 1981 and 1982, and a growing public appreciation for the men and women in uniform. And, no doubt, the economic climate has also been a major factor. But these successes cannot be taken for granted. We must not ignore the lessons of the past or we are bound to repeat them.

AFA remembers well the 1974–76 time frame when all the services were doing well in both recruiting and retention. During this period, the national economy was in recession, but beginning to recover, and unemployment was high. Because it was believed "economical," military pay was capped or reallocated, and there was strong political/public pressure to reduce defense spending. What resulted is well known. In 1979, all services failed to meet their recruiting goals, and more importantly, they experienced severe losses of well-trained careerists.

The exodus of experienced pilots, navigators, and skilled NCOs in critical skills had a severe impact on the Air Force mission. In fact, shortages and low experience levels in certain skills still exist. There are not enough engineers, physicians in critical specialties, and noncommissioned officers in particular skills.

Today, Air Force manning forecasts are promising. Yet the recruiting and retention environment remains fragile because of the uncertainty of the impact of a stronger economy, falling unemployment rates, the pay cap now proposed for Fiscal Year 1984, and continuing attacks on the retirement system.

National economic indicators are showing signs of recovery. As the economy improves, the high technology industries will be the first to bounce back. Additionally, the national shortage of engineers and aircraft maintenance technicians, together with the growing demand for people in telecommunications, computers, and robotics, will create a lucrative private sector job market. This could drain the Air Force of many of the high-quality, experienced people needed to operate and maintain existing equipment as well as new, high-technology weapons systems. The Air Force has more than 6,000 computer technicians, 27,000 avionics specialists, 30,000 electronics specialists, 4,000 electrical/mechanical engineers, and 83,000 aircraft mechanics. In an improved economy, or if the pay cap continues, it would be no surprise to see these technicians and specialists the first to leave the Air Force—and in greater numbers than others.

Extraordinary retention will be needed to meet new requirements and to close the experience gap that resulted from our losses in the late 1970s. The Air Force can ill afford the long-term replacement training costs and readiness impacts that personnel losses engender. For that reason, it is important the Air Force continue to rebuild and expand its experience base by sustaining the momentum of the past three years. We cannot afford to "coast" on yesterday's successes.

In the Air Force, Total Force is not just a concept but the here-and-now reality of active duty, Guard, Reserve, and civilians working as a team to keep the peace but ready to meet contingencies and win wars should the need arise. Active-duty personnel are ready to respond instantly to crisis or conflict. Likewise, the Air National Guard and Air Force Reserve, partners in defense, with approximately fifteen percent of Total Force people, contribute to a significant part of all Air Force flying and support

missions and in some areas provide more than half the total mission capability.

Air Force civilians make up approximately twenty percent of the Total Force and, as the corporate memory of the Air Force, provide solid expertise, stability, and continuity. Total Force is working; it will continue to work as long as we continue to adequately compensate and recognize all elements of that force—and ensure that the gain of one group is not at the expense of another.

The Air Force's auxiliary, the Civil Air Patrol (CAP), provides search, rescue, and other emergency services and, along with the Air Force Reserve Officer Training Corps (ROTC), trains our young people.

People are the foundation of the Air Force's mobility and readiness capability. People give life to systems, programs, and hardware. To quote Secretary Orr and General Gabriel again: "All too often we are conditioned to wait for the 'magic weapon' that is right around the corner. In reality, our 'magic weapon' is our people—people who are well-trained, who seek and practice innovative tactics, and who apply our country's technological advantages."

With this as the backdrop, AFA proposes and supports the following agenda of crucial issues needed to attract and retain high-quality people in the Air Force:

Compensation

AFA supports:

- Restoration of pay comparability in FY '85 to include a "catch-up" increase.
- Provision for a more stable, predictable pay adjustment mechanism by severing the current indirect linkage to the private sector and replacing it with a direct occupational wage index which is more representative of the armed forces.
- Efforts to eliminate the pay ceiling for senior military and civilian personnel.
- Retention of the pay and allowances system as the fundamental form of military compensation.
- Authority to pay Basic Allowance for Subsistence to E-5s and above as an initial step; then, as our ultimate goal, expanding the criteria to all careerists (E-4 with more than four years of service).
- Restoration of the Variable Housing Allowance with the increases that were denied in FY '83.
- Preservation of the current level of separation pay for officers involuntarily separated for failure of selection for promotion.
- Permanent authorization for enlisted flight pay.
- A permanent system of flight pay for flight nurses, similar to that authorized for flight surgeons.

AFA opposes:

- The reallocation of pay increases to other than basic pay.
- The VHA freeze which results in a "double pay cap" policy when combined with other caps on pay and allowances.

Retirement System

AFA supports:

- Retention of the present military retirement system.
- A thoughtful, deliberate, and thorough study of the military retirement system that takes into account the impact of changes on military force effectiveness.
- Honoring current commitments to retirees and those on active duty by "grandfathering" individuals against adverse effects of changes.
- Restoration of the "look back" provision in computing retired pay.
- Retirees becoming active in the Air Force retiree programs at the various Air Force bases.
- The Air Force Enlisted Men's Widows and Dependents Home Foundation and Air Force Village.
- Lifetime coverage under CHAMPUS for military retirees, without regard to Social Security, Medicare, or service-connected disability treatment by the VA.
- Removal of the dual-compensation limitations for retired officers.
- Recomputation of retired pay to reflect changing military pay structure, especially for pre-1968 retirees.
- A three-year grace period for government-paid moves to the home of choice upon retirement.
- Repeal of the legislation that authorizes deductions of military retiree COLA from Civil Service pay.

AFA opposes:

- The fifty percent cap on CPI adjustments to retirees' pay for those under sixty-two.
- Any further erosion of the real purchasing power of retiree pay, including pay caps and freeze proposals.
- Any action that penalizes retired service members working for the government by curtailing either their retired military pay or Civil Service salary.
- Any offset of military retirement pay by Social Security benefits.

Medical Program

AFA supports:

- Ongoing DoD CHAMPUS cost containment initiatives.
- Developing a CHAMPUS dependent dental-care program for active-duty dependents and retirees.
- Establishing an individual and family out-of-pocket liability limit ("catastrophic cap") of $1,000 during each calendar year for all CHAMPUS beneficiaries.
- Continuing CHAMPUS coverage after age sixty-five as second payer to Medicare rather than termination at age sixty-five.
- Authorization of CHAMPUS to provide eye exams to check for diseases and visual acuity for active-duty dependents.

AFA opposes:

- Establishment of a Defense Health Agency.
- Imposition of a copayment for outpatient visits to Military Treatment Facilities.

Travel Allowances

AFA supports:

- Increased PCS reimbursements to cover the total cost of PCS moves.
- Provision for Temporary Lodging Allowance for PCS moves within the continental United States.
- Provision for one round-trip per year for dependents of members assigned overseas to attend secondary school or undergraduate college.
- Provision for a second dislocation allowance to offset the cost of moving household effects twice incident to a single PCS order.
- Increased PCS mileage allowance for members.
- Increased PCS mileage allowance for dependents.
- Increased weight allowances for E-7 and higher grades.
- Provision for adequate travel reimbursement to junior enlisted members being reassigned in the continental United States.
- The cost of moving furniture and appliances in travel entitlement for junior enlisted members.
- Implementation of locality-based flat rate per diem system.
- Return to Per Diem Equity by increasing enlisted per diem entitlements.

Commissaries

AFA supports:

- Continuation of the present commissary system.

AFA opposes:

- Efforts to contract out the management and control of commissary operations.

Enlistment/ Reenlistment Bonus Payments

AFA supports:

- Legislation that would give the services permanent authority to pay Selective Reenlistment Bonuses and Enlistment Bonuses.
- Payment of Selective

Reenlistment Bonus in lump sum.

Air Force Engineers and Scientists

AFA supports:

- Continued funding to pay engineering and scientific continuation bonus.
- Continuation of the College Senior Engineering Program (CSEP) and Undergraduate Engineering Commission Program (UECP).

Aviation Career Incentive Pay (ACIP)

AFA supports:

- Continuation of the present ACIP system, inasmuch as this system is designed to maximize retention, preserve experience levels, and reduce extremely high training costs.

AFA opposes:

- "Fly-for-pay" system or payment of ACIP only to operational flyers.

Hazardous Duty Incentive Pay (HDIP)

AFA supports:

- Increasing HDIP by fifty percent.

Commissioned Officer Accessions

AFA continues to support all officer accession programs, *i.e.*, Academy, ROTC, OTS, etc.

AFA supports:

- An increase in ROTC subsistence allowance for contract cadets.
- One additional year of scholarship entitlements for AFROTC cadets in technical disciplines that require more than four academic years to complete.
- Action to assure accreditation of AFROTC courses toward degree requirements at those colleges and universities that do not grant such credit or grant limited credit.
- A total of 7,500 funded AFROTC scholarships for FY '84 and 8,000 for FY '85 and beyond.
- Continued funding at the 450 entry level for the Airman Education and Commissioning Program through the Five-Year Defense Plan.
- Continued opportunities for highly qualified enlisted members to become commissioned officers.

Recruiter Special Pay

AFA supports:

- Adequate recruiting resources.
- Increased Special Duty Assignment Proficiency Pay.
- Definition of "recruiting duty" to be determined by service Secretary and rates payable regardless of level of assignment.

Air Force Junior ROTC

AFA supports:

- An increase in the number of funded AFJROTC units to the authorized level of 335.

Air Force End Strength

AFA supports:

- Increases in military manpower in support of required force structure, force modernization, and enhanced readiness.
- Removal of the military and civilian end strength ceilings to enable the service to manage the size of the force within fiscal constraints consistent with overall service priorities.

New Education Assistance Program

AFA supports:

- A new educational assistance program to replace Veteran's Educational Assistance Program (VEAP) and extension of the Vietnam Era GI Bill past the December 31, 1989, expiration date.
- Features of a new educational assistance program to include as a minimum: (1) noncontributory basic entitlement to enhance recruitment; (2) noncontributory supplemented entitlement to enhance retention; and (3) transferability of unused entitlements to immediate family members after ten years of active duty.

Training

AFA supports:

- Project Warrior.
- Project Technology 2000 as a low-cost awareness program to motivate America's youth to aspire to math and science careers.
- "Exchange Programs" between the private and military sectors to capitalize on the vast engineering and technical expertise in these areas.
- Aggressive and realistic training—such as the "Flag" exercises.
- Free transcript service from the Extension Course Institute (ECI).
- Legislation to provide for a Skilled Enlisted Reserve Training program.

Air Force Reserve and Air National Guard

AFA supports:

- Continuation of the Full-Time Management program for the Air Force Reserve and Air National Guard.
- Enactment of Reserve Officer Personnel Management Act (ROPMA).
- Continuation of current military leave policies for federal employees who are also members of the Reserve Forces.
- The President's National Committee for Employer Support of the Guard and Reserve.
- An equitable military leave policy by employers that does not interfere with regular vacations for Reservists.
- A study of the feasibility of a change to the Reserve nondisability plan to allow payment of an actuarially reduced annuity before age sixty.
- Increased ceiling of sixty creditable retirement points for Air Force Reservists and Air Guardsmen.
- Legislation that would permit receipt of immediate retirement pay to totally disabled Reservists who have otherwise qualified for Reserve retirement.
- Continuation of enlistment and reenlistment bonuses for Air Force Reservists and Air National Guardsmen. .
- Legislation to provide authorization for special pay programs for Air Force Reserve and Air National Guard physicians and dentists.
- Legislation that would totally eliminate the Social Security offset from the benefits received from the Reserve Forces Survivor Benefit Plan (RFSBP).

POWs/MIAs

AFA supports:

- The United States government's current efforts to resolve the POW/MIA issue and urges that resolution of this tragedy continue to receive the highest national priority until such time as the government has obtained the return of all US personnel who may still be held captive, the fullest possible accounting for those still missing, and the repatriation of the remains of those who died serving our nation.
- Resumption of US government sponsorship of exploration of the US crash sites in Laos.
- The dedicated efforts of the Advisory Committee on Prisoners of War to the Veterans Administration who have developed a significant report now being studied by Congress.
- Establishment of a permanent National POW/MIA Recognition Day.

Morale, Welfare, and Recreation Programs

AFA supports:

- Construction of new people support facilities, such as: child-care centers, libraries, recreation centers, gymnasiums, arts and crafts centers, and youth centers.

Recognition of the Role of the Family

AFA supports:

- Expansion of support functions and developing new programs responsive to changing needs of the Air Force family of the 1980s.
- Establishment of fully

funded, installation-level Family Support Centers throughout the Air Force.

- Expansion of relocation programs to address the needs of the entire family, to provide help in obtaining temporary lodging before departure and, at the new station, to provide help in locating new housing, and to assist in settling at the new location.
- Improvement in the quality of household goods shipment.
- Increased quality and quantity of military housing units.
- Appropriation of funds for the construction and operation of child-care facilities.
- Employment and education programs to assist family members in locating and preparing for employment.
- Current Air Force Join Spouse assignment concept.

Unique Conditions of Overseas Service

AFA supports:

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

Civilian Personnel

The Air Force civilian employees provide special skills necessary to perform the Air Force mission, and they provide continuity allowing Air Force members mobility and flexibility. The erosion of civilian employee benefits over the long run will make it even more difficult to attract the high-quality, motivated employees that are vital to the accomplishment of the Air Force mission, and the Air Force will face a problem of retaining such employees.

AFA supports:

- Legislation to change the tax law regarding taxes on reimbursement for relocation expenses.
- Legislation to increase the allowance for federal employees transferred in the interest of the government.
- Legislation to increase the uniform allowance for federal employees.
- Legislation to permit transportation of deceased employees, and/or his/her dependents, to home of record.
- Legislation to permit transportation of dependents and personal effects when an employee dies en route to, or within three months after reporting to, a new duty station.
- The principle of comparability with the nonfederal sector in establishing civilian pay.
- Increases to executive pay by the same annual percentage as the average General Schedule increase.
- Legislation to permit reimbursement for expenses for sale of a residence at an employee's former duty station (in US and nonforeign areas) upon completion of an overseas tour of duty in a foreign area. New duty station must differ from the duty station assigned to just prior to the overseas tour.
- Legislation to increase health-care coverage for civilian personnel while lowering premium costs.

AFA opposes:

- The fifty percent cap on CPI adjustments to retired pay imposed on retirees under age sixty-two by the FY '83 Omnibus Reconciliation Act.
- The Administration's proposal to impose a five percent reduction in annuity for each year an employee retires before age sixty-five (*i.e.*, fifty percent reduction for someone who retires at fifty-five).
- The Administration's proposed "free market voucher system" approach to health care.
- The Administration's proposal to change the annuity computation formula to a "high five" average salary from the present "high three."

Survivor Benefit Program (SBP)

AFA supports:

- Legislation that would discontinue Social Security offset to SBP annuities.

Civil Air Patrol (CAP)

AFA supports:

- Continued federal funding of Air Force authorized missions to include actual emergency services activities as well as training.
- The Civil Air Patrol (CAP) Cadet Program and its aerospace education mission.
- Legislation authorizing the Secretary of the Air Force to: (1) allow CAP to acquire excess items of equipment and supplies from all federal departments and agencies; (2) allow CAP the use of facilities and services of all federal departments and agencies; (3) expend appropriated funds to provide major items of equipment, particularly light aircraft, to assist CAP in fulfilling its emergency services mission; and (4) issue a complete service blue uniform to each CAP cadet to make the program more affordable and, therefore, available to a broader spectrum of American youth.
- Legislation increasing Federal Workman's Compensation disability and death benefits for CAP members and expanding that coverage to include all CAP flying activities.

Veterans

AFA supports:

- Continued medical treatment of veterans with nonservice-connected disabilities, and construction and resources needed to treat the nonservice-connected disabled veteran.
- Extension of time restrictions on eligibility for earned veterans' education benefits beyond December 31, 1989.
- Expansion of national cemeteries in number and size.
- Restoration of the $300 burial allowance to all veterans, regardless of the cause of death.

AFA opposes:

- Any reduction to veteran's compensation, pension programs, and to the VA medical care system.
- Reductions in VA medical care facilities, hospitals, domiciliary care, or reimbursable travel funds for disabled veterans.
- Capping the cost-of-living increases for disabled veterans.

Addition to United States Education Curriculums

A nation's ability to influence other nations and survive in freedom depends on the integration of its economic, political, social, and military powers in a purposeful design. In democracies, this design, and the roles and capabilities of its major elements, are determined by the populace. In the United States, where the military is civilian controlled, the makeup and activity of the military are set by the people through their legislative and executive representatives. Since knowledge is better than ignorance in sound decision-making, military studies should be included along with economic, political, and social studies. Therefore, to enhance public understanding of the importance of national defense to our nation's freedom and survival, AFA advocates a deliberate program of education in military history and science in American schools and colleges. ■

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HF-380 Series			X	X	X	
HF-80 Series			X	X	X	
HF-121/122 Series			X	X	X	X
ARC-190 Series						X
Voice Encryption		X	X	X	X	X
Adaptive Appliques			X	X		X
System Accessories	X	X	X	X	X	X

* International Defense Review 8/1981, pg 1039.
** Reprinted from Communications International, June 1982, pg. 59.

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"Like Cutting a Porthole Through the Fog"

Sept. 24, 1929, NEW YORK, N.Y. Dense fog hung over Mitchel Field. Zero-zero conditions, the kind of a day when "even the birds walk."

But not all the aircraft remained in hangars that morning.

A Consolidated NY-2 training plane was pushed out and warmed up. Two men climbed in: Lt. Ben Kelsey as "spotter," and, under the canvas covering the rear cockpit, completely hidden from view, Army Lieutenant James H. Doolittle. Fifteen minutes later, he had made aviation history.

"Man's greatest enemy in the air, fog, was conquered yesterday," began the New York Times story, "when Lt. James H. Doolittle took off, flew over a fifteen-mile course and landed again without seeing the ground or any part of his plane but the illuminated instrument board... Aviation has perhaps taken its greatest single step in safety."

Today, safety and efficiency are still the primary concerns of the aviation industry. Every day, thousands of aircraft criss-cross the skies in a delicate ballet, each flying in its own pattern, choreographed by a networked ground system of man and technology.

The FAA has embarked on an extensive upgrade of the air traffic control system. They need the latest, most up-to-date technology. Software. Hardware. Displays. Safety is the prime concern. Reliability a must. Efficiency is the goal. For these, you go to the experts.

TRW is proud to be a member of the Sperry team. Already working on the first phase of this upgrade, the team, including Amdahl, Magnavox and Arcon, has begun the HOST program. We are "rehosting" existing software in a new central computer system. All with no delay or "down time" for the busy air traffic controllers.

The Sperry/TRW team is also working on the next step, the Advanced Automated System, which will upgrade the traffic controllers' work stations with new communications equipment and new software, complete with computer assists.

Future FAA plans include an air-to-ground digital data link, a voice switching and control system, and a new weather data processing system. Finally, the FAA's Advanced Enroute Automation System will include such features as data analysis, projection of where present traffic will be (given time and direction) and increased efficiency in air routing, "gate holds," and traffic separation.

TRW's exceptional skills in the development of complex, real-time software are an outgrowth of more than 30 years experience. Our specialists developed the guidance equations for the Apollo missions and have played a central role in the software and systems engineering that enable missiles to land within yards of targets that are thousands of miles away.

Space Shuttle and other NASA spacecraft are now all controlled through a single, TRW-built ground station in New Mexico, via TRW-built Tracking and Data Relay Satellites. The TDRS ground station is the largest, most sophisticated ever built. The software includes more than a million machine-language instructions, which drive 11 computers, 300 racks of electronic equipment, and an array of antennas that includes three sixty-foot dishes.

Technology and know-how brought aviation into a new era. "Seat of the pants" flying was ended that foggy September day with the help of three key elements. Two specially designed instruments: the Sperry artificial horizon and the Sperry directional gyroscope and one young Army Lieutenant: Jimmy Doolittle.

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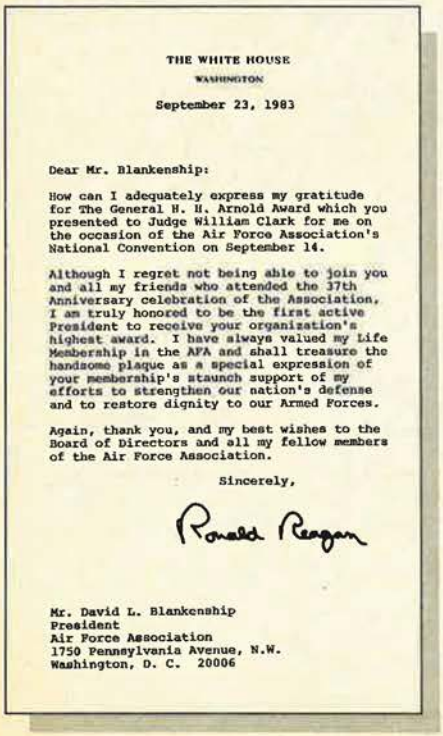
Again, The Big Lie

Some seem ready to believe the Soviets and their apologists in the wake of the KAL massacre.

BY THE HON. WILLIAM P. CLARK
ASSISTANT TO THE PRESIDENT FOR NATIONAL SECURITY AFFAIRS

THE danger of nuclear war gives a particular urgency and responsibility to our era.

Despite many sincere attempts to control the growth of nuclear arsenals, those arsenals have continued to grow. Time and time again, the Soviet Union has used the facade of negotiations while continuing their relentless military buildup. It has made for a very troubled world. The President has consistently expressed his concern directly and without equivocation. That concern is particularly acute because the President does recognize and has characterized the Soviet Union as a state with no respect for traditional moral values and ethical norms. Some commentators pointedly criticized the President for having the courage to express this reality to the American people. What do those commentators say now?



THE WHITE HOUSE
WASHINGTON

September 23, 1983

Dear Mr. Blankenship:

How can I adequately express my gratitude for The General H. H. Arnold Award which you presented to Judge William Clark for me on the occasion of the Air Force Association's National Convention on September 14.

Although I regret not being able to join you and all my friends who attended the 37th Anniversary celebration of the Association, I am truly honored to be the first active President to receive your organization's highest award. I have always valued my Life Membership in the AFA and shall treasure the handsome plaque as a special expression of your membership's staunch support of my efforts to strengthen our nation's defense and to restore dignity to our Armed Forces.

Again, thank you, and my best wishes to the Board of Directors and all my fellow members of the Air Force Association.

Sincerely,

Ronald Reagan

Mr. David L. Blankenship
President
Air Force Association
1750 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

The sickening display of Soviet barbarism in the Korean Air Lines massacre shocked all of us. But at the same time, this dramatically brutal act must be deemed consistent with the behavior of a Soviet government that continues to terrorize and murder the Afghan people, using chemical weapons on Afghan villages, and a Soviet government that sponsors the repression of the entire Polish nation. You see, one of the real tragedies of the KAL atrocity is that it is not, as some suggest, an unexplainable or unusual departure from Soviet attitude, Soviet policy, and Soviet strategy. In fact, the Soviet leadership has stated publicly that they would commit another massacre if another civilian airliner entered their airspace. And this despite the outrage expressed by the entire civilized world. They appear unaffected.

No Fig Leaf

The Soviet massacre of 269 innocent people is sufficient evidence of their true behavior. But their follow-up to this extraordinary crime only compounds it.

The Soviet strategy in the aftermath of the incident was—and is—gross intimidation and falsehood.

The sad thing is that, in some quarters, their very crudity has been effective. People have questioned clear evidence, or have been diverted from it. Some have been seduced or intimidated by Soviet attempts to mislead, as if desperately searching for a fig leaf in order to cover Soviet nakedness.

Meanwhile, the Soviets feel no need for a fig leaf. They have brazened it out, without remorse or apology, without any humility whatsoever. The Soviets ask the world to believe the unbelievable: that an innocent stray plane was on a spy mission in the dark of night above Soviet Union islands. The absolute and incontrovertible fact is that KAL 007 was *not* on an intelligence-gathering mission of any kind. On the other hand, the Soviets and their surrogates *do* use passenger aircraft for espionage purposes and have overflown the United States on spying missions. Neither our nor any government that holds life precious would consider mass murder as a response.

But the Soviets have asked the world to believe the big lie—and some seem to have done so. Let there be no mistake: We and the Koreans reject this gross Soviet accusation. We are disturbed but not surprised that the accusation has been made—it is but further evidence of the twisted mentality of the Soviet regime.

In the past when the Soviets have committed their most egregious crimes, they and their apologists, both here and abroad, have attempted to turn such incidents somehow into the blame of the United States or its allies. In this case they are well embarked on just such a mission and, we believe, they will take further initiatives to cover up.

First, we must anticipate the Soviets will fabricate so-called "newly discovered evidence" to prove the spy-plane thesis.

They are already stating and will further spread the word that the airliner massacre was the result of strained US-Soviet relations. They will, of course, blame that relationship on our government's actions and suggest that a summit is called for to reach a "greater understanding."

No Remorse

Also, they are trying to convince apologists that the completely unintentional flight error of the Korean airliner was a "provocative act"—an act that forced their military to take "appropriate action."

We are also seeing disinformation about Soviet paranoia—as if their fears of nonexistent external threats are either rational and legitimate on

the one hand, or irrational on the other, and therefore somehow beyond their responsibility. I heard those arguments many times during my years on the bench. We should not allow the "self-defense" or the "insanity" plea to exonerate them.

We know better. Let us keep to the essential facts: The Soviet military government, with no concern for human life, tracked an unarmed, innocent civilian airliner with 269 innocent people on board for two and one-half hours. Then, as it was leaving or had just left Soviet airspace—there is a sixty-second question mark there—they mortally wounded that airplane and its precious cargo. They show no remorse, make no restitution, and threaten similar action in the future in the most intimidating manner.

No wonder US-Soviet relations are not good. No wonder we reject their assertions of provocation. No wonder we expect new falsehoods, more intimidation.

It is against this background, this unmistakable reality, that the President confronts the greatest challenge of our time—the urgent task of rebuilding our national defense and pursuing a lasting peace in the nuclear age. Our national security purposes are straightforward—to protect our country, to reduce the risk of war, and, ultimately, to reduce dramatically the level of nuclear weapons.

The importance of these objectives demands that we stay on the course we have set despite the profound tragedy above the Sea of Japan. It means that our critical negotiations with the Soviet Union must proceed. A response motivated by revenge would not bring about a safer world. In fact, it has been asked what penalty would realistically fit this most recent Soviet crime. It also means we must vigorously pursue the three interdependent keys to our country's present and future security: modernization to maintain state-of-the-art readiness for our entire triad of nuclear forces, deterrence to continue to make clear to the Soviet Union that aggression would never pay, and progress in arms reductions to move from a balance of terror toward a stable nuclear posture at reduced, verifiable levels.

Forging a Consensus

Progress in each of these areas has not been easy. In fact, it has been painfully slow. Nevertheless, an important and encouraging development has taken place during the past six months. Our political process has finally forged a bipartisan consensus, albeit still tender, that has united us in our common search for peace and security. And this consensus, which must be strengthened and then sustained, is an essential component of the President's vision of a safer America and a more peaceful world. For too many years, contending groups and individuals staked out claims for a particular approach to modernization and arms control. And it brought less security, not more.

The Scowcroft Commission, the Congress, and the President have now turned that disappointing record around. Two congressional votes have affirmed the bipartisan consensus. The third vote, the MX appropriations vote, is now right before us. There is no reasonable alternative but to get on with the MX and small missile programs and to provide the vital negotiating incentives and leverage for our Geneva negotiators, Paul Nitze and Gen. [Edward L.] Rowny, [USA (Ret.)].

Oh yes, there are still some voices saying a bipartisan consensus is fine so long as it is defined the way they want it. That would be a return to the failed policies of the past. It would ignore the legacy of the past and the lessons of purpose and vision.

Too many people have worked too long and too hard—and with a genuine spirit of compromise—to turn back now. No longer can the skeptics of the President's national security program—indeed, America's program—justify their position on the hope that continued American self-restraint will bring about fair, equitable, and verifiable arms-reduction agreements. No, it won't happen that way. But if we display determination and willingness to pay the price to ensure our safety and freedom now and for future generations, then there is a solid chance for success.

Twenty-five years ago, America had a vision to conquer space and to land a man on the moon. I am sure that many of you helped turn that vision into reality. Just as we grasped the vision then, we can grasp it now. We can keep America strong. We can reduce the risk of war and the level of nuclear arsenals. And we can move solidly ahead in aerospace technology—whether it be in communications, strategic defense, or tactical aircraft.

But it is up to you to make it happen. Your active support is needed to make permanent the bipartisan consensus that has given America a sound, rational national security program. Your expertise is needed to make today's vision tomorrow's reality. ■

Judge Clark, President Reagan's Assistant for National Security Affairs, accepted the H. H. Arnold Trophy on Mr. Reagan's behalf at the AFA Convention.

Imagination Shapes The Future

The nay-sayers have not changed their tune much since the day of the Wrights and Foulois.

BY THE HON. CASPAR W. WEINBERGER
SECRETARY OF DEFENSE

JUST a little over seventy-five years ago, the US Army Signal Corps received a windfall from the President of the United States. Congress had given Teddy Roosevelt a special discretionary fund, and he decided that the money should be used to buy the US Army one of those bully new flying machines.

In 1907, the Army Signal Corps opened the bidding for a "flying machine," specifying that it had to be easily assembled and disassembled

Secretary of Defense Weinberger made these remarks at the AFA Convention's first Business Session, on Monday, September 12.

—in less than one hour—and capable of carrying two persons 125 miles at forty miles per hour.

Wilbur and Orville Wright won the bid, promising to deliver a flying machine to the Army within 200 days—for $25,000. And in September 1908, seventy-five years ago, they began test flights of America's first military airplane.

It failed the test. On September 17, 1908, after two weeks of flawless flights, the wooden propeller on the Wrights' Flyer 3 cracked and the plane went into a nosedive. Orville Wright broke his leg and several ribs; the Army lieutenant [Lt. Thomas E. Selfridge] who was riding with him became our nation's first military aircraft fatality.

A year later, his broken bones healed and his plane rebuilt, Orville Wright successfully completed the flight tests, and the United States Army had its first military airplane. But I think it is significant—and I also think it is right—that the Air Force Association this year is celebrating the Diamond Anniversary of that first test, a test some would, and did, call a failure.

No doubt many of those who watched the Flyer 3 crash into the dirt shook their heads and muttered that man, after all, had not been given wings. We hear a similar chorus each time we test a new system and uncover some remaining bugs, each time we venture past a technological frontier and encounter obstacles. The story of our first military flight test—and all that have come since—should remind us that while we may meet with many failures, the failure we should fear most is the failure of will.

The Very Beginning

American military airpower began with just a handful of Signal Corps officers, one small biplane, and one big dream. Or, to look at it from another perspective, from the very beginning all the critical elements were there: talented and dedicated people, state-of-the-art technology, and a boundless imagination.

Of these three elements, the most important has always been our people. The seventy-five-year history of American military airpower is really biography: it is the history of pioneers like Billy Mitchell and Hap Arnold, the history of pilots who risked their lives to test these uncertain new machines, and the ground crews who used every ounce of American ingenuity to keep them flying. Many of you helped make that history, and are still making it today.

It took extraordinary courage for those first military aviators to go up in flimsy, experimental, and often deadly machines. But then we have always asked extraordinary things of the men and women who defend our freedom, and we ask extraordinary things of them today. We ask them to be prepared to fight halfway around the world on little notice. We ask them to confront a potential adversary who outnumbers them, often dramatically, in almost every measure of military power. We ask them to accept the danger, hardship, and discipline of military life, the family separations and long hours without overtime pay, the jungle, the desert, the heat, and the bone-chilling cold—all for pay and benefits that for years were shamefully low.

By the time this Administration took office in 1981, the United States was paying a steep price for neglecting our men and women in uniform. As inflation eroded pay and benefits, as training was cut back and equipment grew obsolete, morale in our armed forces plummeted and we began to lose our most experienced and talented people.

Just two and a half years later, we have turned this around. If Fiscal Year 1979 trends had continued, we

would have lost nearly three out of every four pilots after their initial tours; today three out of four pilots are staying on. Overall Air Force reenlistment rates have almost doubled in the past three years. We are more than meeting our recruitment quotas; so far this fiscal year ninety-eight percent of our new Air Force recruits are high school graduates, compared to eighty-three percent in FY '80.

This improvement reflects the better pay and benefits that were enacted when President Reagan took office. But our men and women in uniform are also responding to better equipment and better training opportunities. For example, our tactical aircrews now fly an average of about nineteen hours per month, up nearly fifty percent from the FY '78 low of thirteen hours.

Finally—and this is something you cannot measure in price tags or percentages—young people who are considering a career in the armed forces, or experienced personnel who are deciding whether or not to stay, can sense our nation's renewed respect for their sacrifice and dedication. Gone, I hope forever, are the days when an ROTC uniform brought jeers on campus. Today, Air Force ROTC enrollments are at their post-Vietnam War high. It is, as President Reagan has said, once again an honor to wear the uniform.

A few generations have passed between today's new ROTC recruits and the aviation pioneers who first tested military aircraft seventy-five years ago, and even more generations have passed between today's jet aircraft and the Wright B Flyer. But the importance of human ingenuity has not diminished. Neither has skepticism about the product of that ingenuity: our modern technology.

A Cavalry officer observing Orville Wright's first military test flights commented that Wright, and I quote, "fussed and fumed over the engine and the controls, much like a trapeze artist at the circus." The officer was hardly alone in thinking that flying machines belonged under the big tent. Lt. Ben Foulois, in 1910 the military's only aviator, had to spend $300 out of his own pocket to keep the Army's single flying machine repaired—and when he complained, the Army posted him off to build semaphores in rural Texas.

Today I think most of the military is reconciled to airplanes. But we still hear complaints from critics who believe we are pushing the frontiers of technology too far, that we should return to simpler, cheaper weapons and equipment that, it is casually said, will do just as well.

Do just as well in what circumstances? What our critics are failing to acknowledge is that the threat that our Air Force must deter—and counter—has increased dramatically in the last decade. Since 1978 the Soviets have introduced two new fighters and three new versions of reconnaissance/ground attack aircraft. These aircraft have greater range, more sophisticated avionics, and better all-weather capabilities than previous Soviet aircraft. In addition, the Soviets have developed an impressive air defense network that threatens the ability of our own forces to survive and penetrate Soviet airspace. Overall, the Soviets outnumber us two to one in tactical aircraft; yet the United States, faced by a potential adversary with far larger ground forces, relies heavily on high-quality air support to redress the military balance.

Attacks on New Technology

Those of you who have defended your country from the air sometimes feel puzzled at the attacks on new technology. We hear from critics that our planes do not really need the capability to fight at night and in bad weather. But you may remember that during World War II the weather over Japan permitted our planes to fly only four to seven days a month, and that winter storms canceled air support during the first crucial days of the Battle of the Bulge. We hear from critics that our planes are too heavy because the range we insist on requires them to carry too much fuel. But you may remember that more than 4,500 Marines died capturing the island of Iwo Jima so that our planes would then be in range of an airfield where they could land safely after bombing Japan.

Even leaving aside the question of whether a greater number of far simpler planes would really be better off in battle—especially fighting at great distances or in bad weather and against very good Soviet aircraft—what about the cost of the additional pilots? What about the additional lives put at risk?

Technology, it turns out, is not only a great force multiplier—it also saves lives. For example, on October 14, 1943, the Allies set out to bomb the ball-bearing factories at Schweinfurt, Germany. A total of 291 B-17s flew in the raid, and they destroyed about two-thirds of the factory's productive capability. But sixty B-17s, with 600 crew members, did not return. Today you could deliver the same tonnage on target with only six F-111 bombers, risking the lives of only twelve crew members. What is more, the F-111's electronic countermeasures and penetration tactics would give those aircraft a far better chance of survival.

Those critics who would have us do without this modern equipment and make do with cheaper, less-sophisticated models have failed to add one thing to their calculations—the value of human life. It is perhaps easier for them to use their bookkeeper arguments. But I have a responsibility that does not permit that luxury—and I do not want to send our men out to fight with equipment we know is inferior to that of the Soviets.

I have noted the first two crucial elements of America's military airpower: our people and our technology. The third is more difficult to measure, even more difficult to describe. But we never could have taken to the air without the element of *imagination*.

In 1912 a group of Army aviators, on their own initiative, experimented with firing machine guns from the air. The War Department told them to stop these foolish activities immediately. "The dream of aerial combat," the aviators were informed, "is merely the product of fertile imaginations, a malady often encountered in younger men."

It is fortunate that nature gives us a steady supply of younger men, because we cannot get along without imagination. It was imagination that made Leonardo da Vinci cry, "There shall be wings." It was imagination that made Wilbur and Orville Wright build them. And it is imagination that we will need as we try to create a safer, more pros-

perous, more peaceful world for ourselves and our children.

A Chance on New Ideas

We must not lose the ability to take a chance on new ideas. For example, this year the President's Commission on Strategic Forces has helped us to think more creatively about the future of arms control by proposing that we move forward with development of a small, single-warhead missile. This Administration has wanted to move away from such limited measures of strategic capability as launchers and missiles, and to emphasize instead those elements of strategic capability that threaten stability. The small missile may give us a new opportunity to achieve this goal—if we have the imagination to seize the opportunity.

Earlier this year President Reagan urged us to take a chance on another new idea. He announced that the United States would take a new look at emerging technologies to see whether we could at some point in the future develop a defensive system that could intercept and destroy strategic ballistic missiles before they reach our own soil or that of our allies.

The nay-sayers have already proclaimed that we will never have such technology, or that we should never try to acquire it. Their arguments are hardly new. Back in 1910 [the French] General Ferdinand Foch said of the airplane, "That's good sport, but for the Army the airplane is no use." In 1945 President Truman's Chief of Staff, Adm. William Leahy, said of the atomic bomb: "That's the biggest fool thing we've ever done. The bomb will never go off, and I speak as an expert in explosives." In 1946 Dr. Vannevar Bush, Director of the Office of Scientific Research and Development, said of intercontinental ballistic missiles, "I say technically I don't think anybody in the world knows how to do such a thing, and I feel confident it will not be done for a very long period of time to come." These critics were proved wrong; what is more, they were proved wrong quickly.

To those who say we should not pursue this new technology, I say we have no choice. The United States and the Soviet Union have deterred war so far by promising instant retaliation to the side that strikes first. This strategy has worked in the past, and we have every confidence that it will continue to work as long as we maintain a nuclear balance. But it is an uncomfortable way to keep the peace.

In calling for an intensive effort to find a way to protect us from ballistic missile attack, the President was fully aware that this effort may take many years and may depend ultimately on technologies we have not yet developed. We do not know now what this system would be or when it would be ready. We do not yet know the many problems—in diplomacy, technology, or in policy—we will encounter in trying to develop such a program.

This is why the President has asked for high-level studies of all the implications of ballistic missile defense. We are putting our best minds—in government and outside of it—to work on exploring this new road to peace. And we are keeping our own minds open as we await their reports.

There will still be those who close their minds to the dream of a world where fear of nuclear weapons is wiped away. It is possible that in this dangerous world we actually fear to look upon a vista of greater safety, that we fear mankind will once again be disappointed in the quest for a lasting peace. But just as those first aviators had the imagination to look into the future, and the courage to help shape it, let us also bring imagination and courage to the future it is our responsibility to shape. ■

Facts the Headlines Don't Tell

Recruiting and retention are strong, the B-1B is ahead of schedule and under cost, and there are plenty of hero stories to balance the horror tales.

BY THE HON. VERNE ORR
SECRETARY OF THE AIR FORCE

THE Air Force has been too much in the news these past several weeks with articles and commentary on parts and overpricing. You and I know we would rather stay off the front pages. One of the interesting things is that many of those stories look as if they were uncovered by creative investigative journalism. They were not. They are examples of where the Air Force has discovered problems and where our people are trying to correct those problems.

For example, the original breakthrough and subsequent publicity resulted from a letter one of our employees wrote finding thirty-four parts he felt were overpriced. The point that an Air Force member had asked that it be looked into was pretty much overlooked. Also, news stories seldom noted that the infamous caps on navigator's stools, for which the Air Force paid more than $1,000 each, were discovered by one of our sergeants in the normal course of his duties and brought to our attention for the express purpose of making sure we did not continue that kind of purchasing.

In addition, we have made a fundamental change. Sometimes in the past, employees finding this sort of inconsistency were reluctant to bring it forward for fear of reprisal.

Today we are trying to reward those who are helping us find problems. That first employee I mentioned has received a letter of commendation, and in the near future should receive something far more substantial. The sergeant has received an $1,100 bonus. We are trying very hard to encourage people within the system to help us help ourselves.

Room for Improvement

I am trying diligently to keep our accusations of industry and industry's rightful self-accusations, or reaccusations of us, off the front pages. I do not think it furthers our interests to call each other names in the public press, on radio, or on television. We in the Air Force have lots of room to improve the way we do business, and we are trying to do that, not point fingers at others. If, after a reasonable time, industry doesn't make improvements in its pricing, then, and only then, will we find it necessary to make public accusations.

Napoleon once said: "If you start to take Vienna, take Vienna." As far as the Air Force is concerned, right now parts overpricing is our Vienna, and I am here to tell you we are going to take it!

We have started actions in four areas. One is called Zero Overpricing. That is a program we started several years ago, in which the price of an object is shown on the receipt when the item is drawn for use. This helps our people know how expensive those parts are, and we think that helps cut down on abuse. It also offers people, such as the sergeant mentioned earlier, the opportunity to say: "Wait a minute. That costs too much. Why does it cost that much?"

We have also started something we call PACER PRICE in which a group of seven or eight experts examine parts brought to their attention by either the buyer or by a user who says the price is too high. This group estimates what it should cost, and we go back to the manufacturer and say, "Sorry, we can't pay your asking price; either renegotiate a better price, or we'll go somewhere else to buy." In fact, the PACER PRICE team at one logistics center has already recommended that sixty-two percent of the sole source items we are buying or plan to buy this coming year be broken out and competed.

These actions are ones we are taking after the fact, when we have already bought an item. We need to do more. We have put Competition Advocates in every logistics center. These agencies will be amply staffed with people trying to get us more competition where it is appropriate.

We have stocked an Air Force van with samples of parts we buy and pamphlets that show the small manufacturer how to do business with us. That van will go to places where manufacturers meet, such as conventions, so they can learn that it is not hard to do business with the Air Force.

Long-Term Solutions

Those actions are of the short-term variety. In the longer term we are doing two things. We are still paying proprietary prices on at least one item for the B-52, the last of which was produced more than twenty years ago. Now, since we do not think proprietary rights should last that long, we are going to write our manufacturers and say that in our older weapon systems, we will consider that proprietary rights end on December 31 of this year. If they object, we will discuss with them the reasons why proprietary prices should still apply. I believe many manufacturers will be quite anxious to remove from their books parts that it is no longer worthwhile for

Secretary Orr made these remarks at the AFA Convention at the luncheon in his honor on Tuesday, September 13. This was the third year he had addressed the AFA gathering.

them to manufacture. Two companies, Boeing and Lockheed, have already said, "We are losing money. We are wasting time filling tiny orders for little parts; let's get it out to the people who can do it better." We think other companies will join in.

In future contracts, we are also going to put in phrases like "proprietary rights to all items under this contract that will be competitively bid will end five years from the date the contract is signed." Five years is an arbitrary figure. It may not be the right figure. Maybe it should be four years, maybe it should be six years. We'll work with industry to find the right figure. But I do not think the United States taxpayer should be paying proprietary prices for items that have been manufactured for twenty years, their engineering and scientific development costs long since amortized.

In the longer range, we have been guilty of encouraging our procurement people to buy in volume with less than necessary emphasis on competition and cost. Job descriptions will be rewritten so that they are more carefully balanced between volume and attention to cost. Also, because job descriptions often have a way of being filed in the bottom drawer once you hire a person, we will change our yearly evaluation to give credit to those employees who are able to help us bring down prices.

I went out to Hill AFB recently, and I had the pleasant experience of giving a $500 check to a young woman, a GS-5 with one year in the Air Force. It was her job to buy what we could call a "shower curtain," a huge covering that surrounds an airplane when it is painted to keep the spray from spreading. When making the purchase, she noticed it was sole source and wondered why. She went to work and found another qualified source and her ingenuity saved us $38,000. When you consider this individual was new to the Air Force with less than a year's experience, that's remarkable. This is the type of ingenuity we are anxious to encourage.

Pride in Our People

With the unpleasant publicity cited earlier and a rather substantial cut in what we hope to get out of the Armed Services Committees, some might say this year has not been a vintage one for the Air Force. But let me suggest that if, five or seven years ago, any Air Force Secretary had said that he was having accessions of 98.5 percent high school graduates, seventy-one percent first-term reenlistments, a job bank of 32,000 of the greatest young people you ever saw waiting to get into this Air Force, seventy-five percent of the pilots in the critical six to eleventh year continuing to serve, and a substantial real increase in last year's allocation. . . . If anyone in those years told you that it was less than a vintage year you would have carried them out to the psychiatric unit. It has been a great year!

Another area of interest is women in the Air Force. They are continuing to do an outstanding job for us. One year ago we opened up the AWACS program to women for both flight and mission crew members, and today I am proud to report there are seven women in flight crews and thirty-six women in mission crews. The Air Force overall has more than 350 women either on duty or in training as pilots or navigators. Women are taking on ever-increasing responsibility, and they are moving in ever-increasing numbers into more responsible assignments and higher ranks.

Last year I said with pride that the B-1B was on schedule and on cost. This year, with even greater pride, I want to tell you that is *ahead* of schedule and *under* cost. When we meet next year for the AFA convention, we will be within thirty days of rolling out the B-1B.

A Different Kind of Threat

I want to turn now to the threat. Some are going to say, "Well, there he goes again: The Soviets are building 1,300 fighters and fighter-bombers each year, and the United States Air Force is going to get less than 200 this year. Or they put up well over 100 space launches last year, and we put up thirteen, or some other factors like that." But that is *not* the threat I'm going to describe. That kind of a threat could be more easily overcome by simply turning up the burner and producing more rapidly.

What I want to talk about is that while we will graduate 60,000 engineers this year, the Soviet Union will graduate 300,000. Of ours, a small portion will go into defense. Of theirs, nearly all will go into defense.

In the United States this year, one-half of all of the students who receive doctorates in engineering will be foreign-born. The number of patents going to foreign nationals has gone up twenty-five percent in the last sixteen years. Between 1963 and 1980 the scholastic aptitude scores in math went down thirty-six points. Two-thirds of all the high schools in this country do not offer enough math and science to allow a graduate to enter an accredited engineering school. We estimate today that a typical Soviet student takes from one to two years more algebra than do our students. That typical Soviet student also takes eight years more geometry, one to two years more calculus, four years more physics, and three years more chemistry. Obviously, the technological advantage that has been ours is rapidly disappearing.

One reason is that teaching has for a long time been a low-paid profession. In the past, however, that low pay was made up for by higher prestige and job satisfaction. Today, any who know high school teachers realize that there is not very much prestige and that not too many are finding real job satisfaction.

The Defense Budget

These are rather somber times. We are all familiar with the downing of the Korean airliner, but there are other disturbing trends. The Armed Services Committees in the House and Senate found it necessary to cut the President's request for the armed services budget by one-half of the requested real growth—from ten percent to five percent. Remember that the Armed Services Committees are considered our friends, and when they make those cuts they are listening to their constituents. These actions indicate that the defense coalition, the defense consensus we were so proud of the last several years when it brought us significant gains, is not as strong as it was.

If we were straining the American people with an impossible budget, one could perhaps understand why that consensus is slipping. But this budget is not a backbreaker. It rep-

resents a commitment of 6.5 percent of the Gross National Product, compared to eight percent under Kennedy, and ten to eleven percent under Eisenhower. The request would take twenty-eight percent of the federal budget, compared to fifty percent only twenty years ago. It is not something the American public cannot afford provided they understand the need. And why may they not understand? Well, let me give you some suggestions.

In one of our major newspapers I recently read a review of five new movies—two critical of American business, the third pro-Sandinista, a fourth pro-Palestinian. Only one of the five supported our current sociological concepts. Why is the defense consensus slipping? If I were to ask if you think we get a fair, balanced viewpoint from nationally televised shows covering defense issues, would you say, "Yes, we do"? If I asked whether in the last two or three weeks you had read a column or an editorial that said this budget is not backbreaking, but below the average the United States has spent over the past thirty or forty years, could you say yes? I would guess very few of you have seen that kind of column.

Almost every executive who heard me speak at the AFA convention works for a corporation that places multicolor ads in magazines and periodicals stating that their planes fly higher, their missiles shoot more accurately, their avionics listen out farther than anyone else's. What good are those advertisements if the United States public has lost its enthusiasm to buy those planes, those missiles, and those avionics? How much better it would be if a small portion of that advertisement budget were dedicated to explaining the threat to the United States public so they would better understand. My observation is that advertising agents and representatives of major corporations whom I know tend to buy programs based on the size of the listener audience and with little attention to that program's message. To me, a firm commits corporate suicide when it advertises in media that denigrate or criticize national defense policies, thereby presenting an unbalanced, inaccurate view of the product that firm is trying to sell.

We need bold steps. English Prime Minister David Lloyd George once said: "You can't cross a chasm in two small jumps."

All of us working together need to make sure the effective Air Force we have today does not become ineffective because it is no longer based upon public understanding, public acceptance, and public approval. ■

Standing Tall

The Air Force is in much better shape than it was in the 1970s. And the Soviets make it obvious that we can't slacken our efforts now.

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

THIS year marks the eightieth anniversary of the Wright brothers' historic flight at Kitty Hawk and the bicentennial of manned flight. And 200 years ago this month, the Montgolfier brothers' balloon soared above the crowd at Versailles—carrying a sheep, a duck, and a rooster. Even though the rooster got a broken wing when the sheep kicked him, the King was convinced that the flight was safe enough to allow a man to try it a short time later. Because of the danger, the King first decided that two criminals should make the flight—but was later persuaded that the event was too important to be left to criminals.

These are happy thoughts about man's noble achievements in the air—far different from the brutal murder of 269 people on Korean Flight 007. This barbarism and the Soviet lies to cover up their crime have clearly proven to the world what the Soviet leadership stands for. There are always those who try to explain away Soviet actions by trying to shift blame to this country. But the truth is plain. We are dealing with a totalitarian regime that does not respect human life—an evil empire, as President Reagan described it. The threat the Soviets present to this country and to the world is real, immediate, and growing.

But you already know that. And you understand the need to keep our guard up. To be honest with you, we *were* in bad shape in the late 1970s—so bad, in fact, that the American people became concerned about it, and we have seen a dramatic turnaround in the last few years. Because of the support of the Administration, Congress, the public, and groups like the Air Force Association, your Air Force is strong today and getting stronger.

We have the very best people in uniform today and, better yet, they're staying in. As President Reagan recently said: "Our military forces are back on their feet and standing tall. . . . Once again, young Americans wear their uniforms and serve their flag with pride." It's a far cry from conditions in the 1970s when pay and entitlements did not keep up with inflation. We should never make that mistake again. Even though things look good now, we know that a combination of pay caps, erosion of entitlements (like retirement), a declining youth population, and greater competition for skilled people can quickly erase the gains we've made. It's false economy when we let pay and entitlements lag behind. In the end, we have to pay much more for recruiting and training—and our forces are never as experi-

enced and ready as they should be.

We're working hard to put better-quality weapons in the hands of our quality people. The first comprehensive modernization of our strategic forces since they were built in the 1950s and 1960s is moving out smartly. Despite our progress, though, some misleading and downright false stories keep popping up. Frankly, I'm damned tired of it. We have to spend too much valuable time setting the record straight.

Increasing Survivability

For example, the public is told that we're not supporting the new small ICBM. Such stories make headlines, but they're flat wrong. The Air Force fully supports *all* the recommendations of the Scowcroft Commission. Thanks to their work, we're finally on the road toward strengthening land-based ICBMs. By deploying 100 Peacekeepers, we will be able to hold at risk those targets the Soviets value most, strengthen deterrence, and give Moscow the incentive to negotiate seriously. By adding the new small missile, we will increase the survivability of our ICBM force. We have a good program, and we're going to stick to it.

Our two-part ICBM program has bipartisan support and is tied closely with the President's objective of reaching agreement with the Soviets on deep, equitable, and verifiable reductions in nuclear arms.

You also hear tales that the B-1B is a bomb—that it's too heavy, too slow, is over cost, and won't penetrate. Bull! The B-1B is a success story—it will fly like a charm, it's ahead of schedule, and within budget. In fact, we'll be saving the taxpayer about $1 billion through multiyear procurement. With the B-1B, we will keep our lead in strategic bombers and be able to get through anything the Soviet air defenses can throw at us for the next decade or more.

The ALCM program is right on track too. Our second squadron of ALCM-equipped B-52s will be operational by the time this appears in print, and we'll equip three more squadrons during the coming year. The operational test shots have been impressive.

Keeping the Nuclear Threshold High

We're also making substantial improvements in our conventional forces—gains that will help keep the nuclear threshold high. Our emphasis here is to upgrade readiness—to get the most out of what we've got. During the last two years, we've doubled the funding for readiness and sustainability, and we're seeing positive results. Our crews are flying more—training more effectively—and our stocks of munitions and spare parts are increasing. Our tactical aircrews now fly fifty percent more than they did a few years ago.

We train as we intend to fight. Worldwide deployments and frequent exercises with our sister services and allies improve our ability to work as a team.

We're also very proud of the continuing accomplishments of the Guard and Reserve. They do a great job! They're a very capable force, and they're flying modern first-line equipment, such as F-16 and A-10 fighters and the new KC-10 tankers. Guard and Reserve units are participating in exercises in Europe, Canada, and Central America.

For the tactical forces, we're continuing to buy the best fighters in the world—the F-15 and F-16—but we don't have the funds to buy the numbers we need. We're also beginning to reduce shortages we've had for a long time in our capability to move forces quickly to defend American interests anywhere in the world. With modification of the current airlift fleet, more spare parts, and the buy of C-5Bs and KC-10s, we will more than double our ability to deliver combat units by the end of the decade. And with the C-17s, we'll be able to deploy forces directly to the battle area. We have to be able to meet the global responsibilities of our nation. Force projection is our business, we do it routinely, and we do it well.

Even with the rigors of tough, realistic exercises and increased training, 1982 was the safest year on record—with 2.33 major accidents per 100,000 flying hours. And the F-15 had the lowest peacetime accident rate of any US fighter aircraft in history.

In the past year, we've also taken important steps to deal with the increased defense role of space systems and to meet the challenge posed by Soviet space activities. Space Command, just a year old, will integrate research and development efforts with operational requirements. The Space Technology Center has been activated, and construction began this May on the Consolidated Space Operations Center in Colorado Springs.

Historic Initiative

Last March President Reagan introduced his historic initiative to develop a defense against strategic ballistic missiles, with a goal of eliminating that threat from our world. We are making a long-term commitment that may take decades to achieve. It challenges the very best of American ingenuity and technical brilliance. We are beginning a journey no less formidable than the Apollo program—it offers the hope of removing a terrible threat we have lived under for more than two decades. We share the task of developing the technology for this initiative. We're taking part in the initial studies to scope out the dimensions of the President's initiative, helping to prepare a road map of policies and promising technologies.

This has also been a significant year for the JCS. We're doing business in new and better ways. The members are a cohesive group under General Vessey and have excellent rapport with Secretary Weinberger and the President. We meet with the President regularly. The primary responsibility of the JCS is to give the President and the Secretary of Defense the best military advice possible and to have that advice ready before it's asked for. I believe we're doing a good job of that.

The Chiefs are also focusing their efforts on another important area—thinking and planning how best to fight a war if it ever becomes necessary. Over the past year, all the CINCs have come in to discuss their war plans—force capabilities and shortfalls. This process helps us in manning, equipping, and training our forces to serve the CINCs better. The commanders also gain a

General Gabriel became USAF Chief of Staff in July 1982. His address to the AFA Convention was made at the luncheon in his honor on Wednesday, September 14.

greater appreciation of the competing demands for limited resources.

I spend at least half of my time on JCS matters—that's just one measure of the importance of the JCS in national security. There's a necessary linkage between joint planning and the service Chiefs' responsibility for equipping and training the forces in our operational commands. In short, you're a better Chief because you're a member of the JCS and a better member of the JCS because of your service responsibilities.

So we're making good progress, but we're not inhibited by lack of opportunities to improve things. We're going to keep plugging away to complete programs on time and within expected costs. But we may not have the money to pay all the bills. Congress has made big cuts in the funds the President requested for FY '84 and beyond. The five percent real growth in the Congressional Budget Resolution is still far better than the twenty percent reduction—even larger for the Air Force—in defense budgets in the 1970s. However, five percent is far less than we need. Without the full ten percent the President asked for, we will not be able to make all the improvements needed—we will have to make painful cuts.

The Right Perceptions

Last year, Secretary Orr and I asked Gen. Tom Marsh at Air Force Systems Command to look at weapon systems acquisition. We wanted to determine whether or not our perceptions were right that fielding new systems takes longer and is more expensive than it used to be—and if so, we wanted recommendations on what we could do about it. The study—"Affordable Acquisition Approach"—confirmed that we used to buy systems faster and cheaper. It showed that the major cause of program cost growth and schedule changes has been program instability. We're holding down technical changes, but inadequate funding remains the basic cause of this instability.

In the past, we stretched programs because of budget pressures in the hope that we'd get the money back in the longer term. That's like believing in the tooth fairy. These funds never show up, and the result is a bow wave of requirements we can't afford. We're determined not to let this happen again. We'll avoid the past practice of reducing and stretching out programs. It costs you more, it takes longer, and you get less. Instead, we'll cancel or defer programs as necessary—whole programs, not nickel-and-dime cuts across the board that only end up hurting the readiness of our combat forces. That's not smart. We'll fully support the systems we buy. Our combat units will have the spares, munitions, and support they need.

Another area we'll continue to watch closely is spares procurement. You've all read the horror stories such as the cap for the leg of a navigator's stool that would have cost many times its fair price if one of our alert sergeants had not questioned the price.

We're proud it's our people who are discovering these excessive prices and we're determined to get this situation corrected. We cannot lose the trust of the American people. In addition, we cannot handle this problem alone. Industry has to help. We're in this together. National security belongs to all the citizens of our nation. Together, the Air Force and industry have to ensure the American taxpayers are getting what they're paying for. We'll pay fair prices, but no more. We have to correct our procedures that lead to payment of excessive prices for parts. I ask you in industry to help us. I'm aware that industry is already taking some commonsense steps to correct these problems.

Despite these challenges we face, we're on the right road to ensure America's armed forces are strong enough to deter aggression and keep the peace.

Maybe the slaughter of the innocent passengers on Korean Flight 007 will cause second thoughts among those who claim the Soviet government is just misunderstood and is eager for world peace.

The Soviets have shown their true colors to the world—it should be obvious to all that we can't slacken our efforts to keep our forces strong and ready. That's what the American people want, and that's what we are committed to give them.

AFA has done a great job of telling it like it is and being our strongest supporter in these efforts. ■

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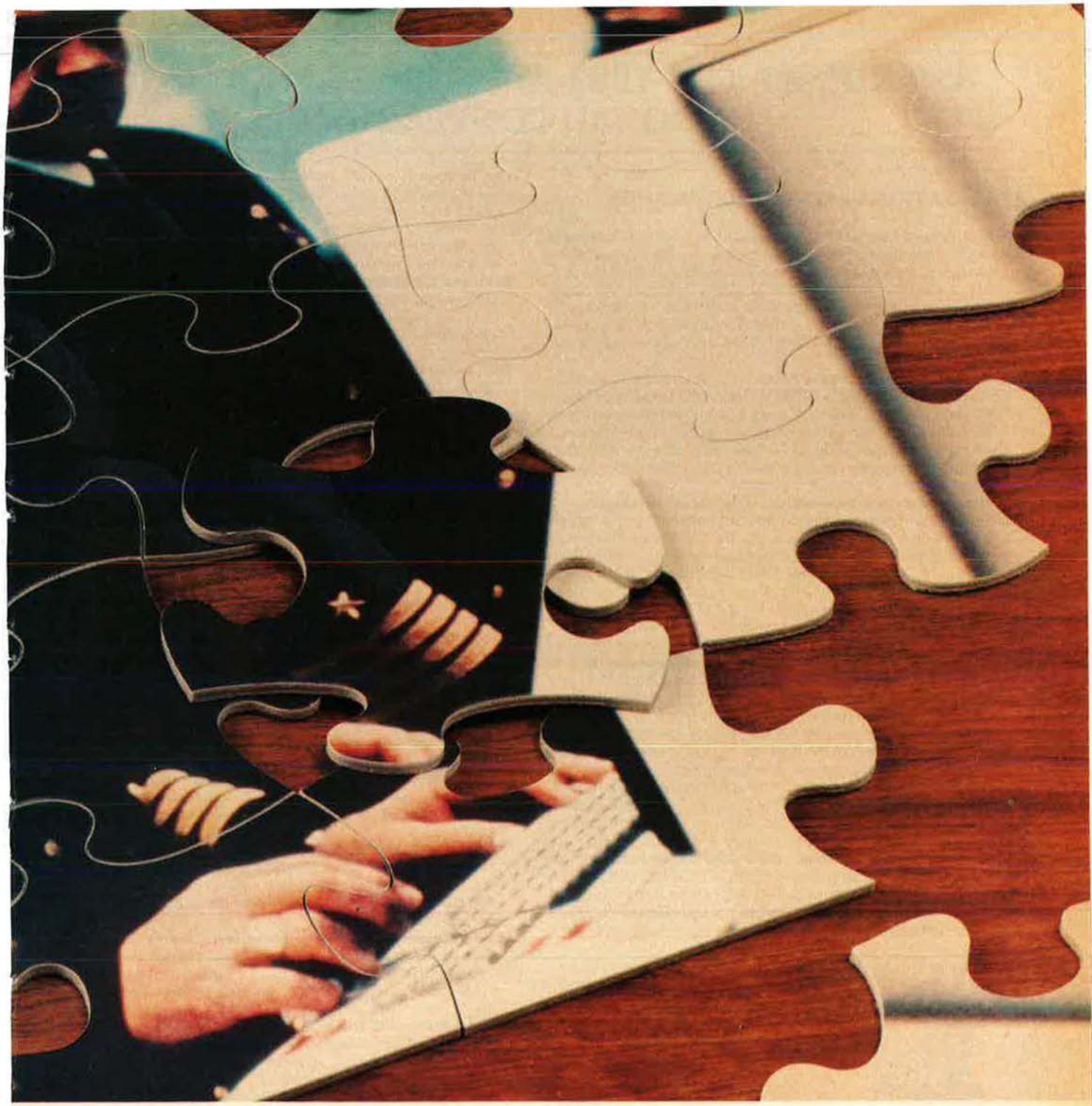

right pieces.

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AWARDS AT THE 1983 AIR FORCE ASSOCIATION NATIONAL CONVENTION

AFA'S NATIONAL AEROSPACE AWARDS

The H. H. Arnold Award (AFA's highest annual award)—To **Ronald Reagan,** President of the United States, for having taken the high road of statesmanship in committing the nation to the twin goals of maintaining an effective strategic deterrent and negotiating equitable and verifiable arms reductions with the Soviet Union, and for his commitment as Commander in Chief to restore the dignity and self-respect of the men and women of our armed forces.

The David C. Schilling Award ("The most outstanding contribution in the field of Flight")—To **Maj. Robert S. Frank,** Point Mugu NAS, Calif., and **Maj. Frank B. Gray,** 6510th Test Wing, Edwards AFB, Calif., for their airmanship and technical competence while serving, respectively, as F-15 test pilot and test navigator, resulting in invaluable contributions to the continuing development of this primary weapon system.

The Theodore von Kármán Award ("The most outstanding contribution in the field of Science and Engineering")—To **Space Division,** Los Angeles AFS, Calif., for its brilliant and sustained performance in managing the development, acquisition, launch, and on-orbit command and control of military space systems, and for providing vital communications, weather, navigation, and surveillance support for the US armed forces. *(Accepted by Lt. Gen. Forrest S. McCartney, Commander.)*

The Gill Robb Wilson Award ("The most outstanding contribution in the field of Arts and Letters")—To **Marvin Stone,** Editor, and the **staff of *U.S. News and World Report,*** Washington, D. C., for their professional competence in providing millions of Americans with comprehensive, balanced coverage and unbiased analysis of national security issues, thereby fostering a clearer public understanding of the need for a strong national defense. *(Accepted by Joseph Fromm, Assistant Editor.)*

The Hoyt S. Vandenberg Award ("The most outstanding contribution in the field of Aerospace Education")—To the **Inter-American Air Forces Academy,** Howard AFB, Panama, for providing comprehensive technical and military aerospace training annually to people from more than a dozen Latin American air forces, and for the excellence of their representation of the professional characteristics of the US Air Force to our important hemispheric neighbors. *(Accepted by Col. Danilo B. Medigovich, Commander.)*

AFA's Theodore von Kármán Award for Science and Engineering went this year to Space Division of the Air Force Systems Command for brilliant and sustained performance in managing all aspects of military space systems. Here Space Division's current Commander, Lt. Gen. Forrest S. McCartney, accepts the award. Also recognized was the previous Commander, retired Lt. Gen. Richard C. Henry. (Photo by Steve Adams)

The Thomas P. Gerrity Award ("The most outstanding contribution in the field of Logistics")—To **Col. Harry L. Brewer,** USAF (Ret.), for his contributions to the increased readiness and sustainability of our tactical air forces and for his leadership and managerial innovations while serving as Assistant Deputy Chief of Staff for Logistics, Hq. TAC.

Veterans Administration Employee of the Year—To **Fredrick Downs, Jr.,** Department of Medicine and Surgery, Washington, D. C., for leadership and compassionate service to our nation's veterans as Director of VA's Prosthetic and Sensory Aids Services.

The Juanita Redmond Award for Nursing—To **Capt. Carol P. Major,** USAF Regional Hospital, Carswell AFB, Tex., for her knowledge, initiative, and competence, complemented by her sensitivity and compassion.

The General Edwin W. Rawlings Award for Energy Conservation—To **Maj. Adrian S. Curtis,** New Hampshire ANG, Pease AFB, Manager, and **SMSgt. Heck Thomas, Jr.,** Technician, Osan AB, Korea, for significant achievements in energy conservation.

AFA CITATIONS OF HONOR

B-1 Test Team, 6510th Test Wing, Edwards AFB, Calif., and its Director, **Lt. Col. LeRoy Schroeder; Lt. Col. Thomas W. Alexander;** and Rockwell Corp.'s **Tommy D. Benefield** and **James A. Leasure** for their continuing professionalism as exemplified throughout the first overseas deployment of the advanced strategic aircraft to the Farnborough International Air Show last summer.

Col. Carl T. Case, Ballistic Missile Office, Norton AFB, Calif., for leadership and expertise during the many studies conducted in the search for a suitable basing mode for the MX ICBM.

Capt. Richard L. Cline, 479th Tactical Training Wing, Holloman AFB, N. M., for artistic contributions that have enriched the lives of Air Force people and enhanced the public perception of the Air Force.

MSgt. Court G. Ehrhardt, 3340th TCHTG, Chanute AFB, Ill., for his contributions in technical training dealing with the structural repair of composites. His ability to train and motivate instructors and students in the field of airframe repair has garnered worldwide attention.

Lt. Col. Robert C. Helt, Chief, Flight Test Division, Edwards AFB, Calif., for his exceptional aerial performance and initiatives throughout the design, testing, and operational introduction of the Digital Automatic Flight and Inlet Control Systems on the SR-71.

Lt. Gen. Richard C. Henry, USAF (Ret.), for his leadership during his last Air Force assignment as Commander of Space Division, Los Angeles AFS, Calif., and his unfailing support of the people and objectives of the Air Force Association. *(Presented at a preretirement function in Los Angeles on April 21, 1983.)*

Capt. Robert R. Jensik, 24th SRS, Eielson AFB, Alaska, for leadership, courage, and aerial skill in the collection of reconnaissance data vital to the national security.

1st Lt. Lindley N. Johnson, Space Command, Cheyenne Mountain Complex, Colo., for contributions in the field of space in organizing NORAD support for all Space Shuttle missions and for developing a program for clearing all DoD laser illuminations into space that could hamper satellite operations.

Lt. Col. Stephen Kosnik, 1st Test Squadron, Clark AB, Philippines, for superb logistics management in the development of procedures for PACAF's Remotely Piloted Vehicle program.

SSgt. Charlene G. McMillan, USAF Clinic, McClellan AFB, Calif., for instituting and implementing a range of active environmental medicine programs that have been beneficial to all preventive medicine programs at McClellan AFB.

Maj. Donald E. Rogers, Armed Forces Staff College, Norfolk, Va., for innovative USAFE energy conservation programs, including a reduction in aviation fuel expenditures despite increased aircraft inventory and an accelerated sortie/flying hour program throughout the command.

SMSgt. Donald E. Whisler, USAF (Ret.), who, during his final assignment at Aeronautical Systems Division, Wright-Patterson AFB, Ohio, introduced programs to counter chafing in the F-16's wire flight control system, thus improving the reliability and safety of F-16 operations.

USAF School of Health Care Sciences, Sheppard AFB, Tex., for its efforts in making a war-readiness medical service a reality. *(Accepted by Col. Harold H. Biddle, Commander.)*

58th Military Airlift Squadron, Ramstein AB, Germany, for essential airlift support during the Middle East shuttle diplomacy efforts. *(Accepted by Lt. Col. Robert J. Boots, Commander.)*

134th Security Police Flight, Tennessee ANG, McGhee Tyson Airport, in recognition of being chosen as both ANG and AFRES Security Police Unit of the Year and for its efforts during a visit by President Reagan to the 1982 World's Fair. *(Accepted by Maj. Doug Cossentine, Commander.)*

416th Bombardment Wing, Griffiss AFB, N. Y., for its efforts in the initial activation and combat readiness certification of the ALCM with the unit's B-52Gs. *(Accepted by Col. Walter E. Webb III, Commander.)*

552d Airborne Warning and Control Wing, Tinker AFB, Okla., for pioneering the force-projection aspects of the E-3A AWACS that have enhanced deterrence. The unit has acted as vanguard of US military power projection to trouble spots throughout the world. *(Accepted by Brig. Gen. William K. James, Commander.)*

1931st Communications Group, Elmendorf AFB, Alaska, for achievements in aerospace communications including the construction of a mobile Alternate Command Post for Alaskan Air Command that enhances survivability and readiness. *(Accepted by Col. Phillip K. Heacock, Commander.)*

Carma Whiting, Ogden Air Logistics Center, Hill AFB, Utah, for exceptional ability as Chief, Systems Development Group, Directorate of Distribution. AFA honors her as Air Force Civilian of the Year.

Shirley A. Johnson, Hq. AFSC, Andrews AFB, Md., for unique and effective management of personnel programs while assigned as Assistant Chief, Force Management Division, Directorate of Personnel Programs, Deputy Chief of Staff for Manpower and Personnel. AFA honors her as Air Force Personnel Manager of the Year.

AFA MANAGEMENT AWARDS FOR LOGISTICS

AFA Executive Management Award—To **Joseph F. D'Alexander,** for performance as Deputy Chief, Acquisition Division, Sacramento Air Logistics Center, McClellan AFB, Calif., in enhancing employee motivation and human relations resulting in improved Air Force logistics support.

AFA Middle Management Award—To **Lt. Col. Joseph R. Szwarc,** for achievements as Director of Americas/Mid-East/African Programs, International Logistics Center, Hq. AFLC, Wright-Patterson AFB, Ohio. Through his efforts, twenty friendly and allied air forces on three continents are using their logistics resources more effectively.

AFA Junior Management Award—To **Capt. Thomas B. Miller,** Hill AFB, Utah, for service as Integrated Logistics Support Manager on the C-17 Program and as Deputy Program Manager for Logistics on the T-46A Program.

SSgt. Charlene G. McMillan of the USAF Clinic, McClellan AFB, Calif., receives a Citation of Honor for her exceptional skills and distinctive success in instituting an active environmental medical program. (Photo by Steve Adams)

AFA MANAGEMENT AWARDS FOR SYSTEMS

AFA Distinguished Award for Management—To **Col. James E. Foster,** Wright-Patterson AFB, Ohio, for service as Deputy for Strategic Systems, ASD. His leadership of ALCM and Offensive Avionics Systems acquisition resulted in achieving first alert capability in one-third the normal acquisition time.

AFA Meritorious Award for Program Management—To **Col. John P. Porter,** Wright-Patterson AFB, Ohio, for service with AFSC's Space Division, Los Angeles AFS, Calif. He was instrumental in achieving the launch of an Atlas and six Titan space booster missions of the highest national priority.

AFA Meritorious Award for Support Management—To **Col. Charles R. Dunn,** for service as Commander of the 6594th Test Group, Air Force Satellite Control Facility, Hickam AFB, Hawaii, during which he contributed to the Honolulu Joint Rescue Coordination Center, many other DoD activities, and a DoD R&D program of the highest national order.

AIR NATIONAL GUARD AND AIR FORCE RESERVE AWARDS

The Earl T. Ricks Memorial Award—To **Capt. Mark M. Ely,** 159th Fighter-Interceptor Squadron, Jacksonville IAP, Fla., for successfully recovering from an in-flight emergency that included aircraft damage and bodily injury.

The Air National Guard Outstanding Unit Award for 1983—To the **157th Air Refueling Group,** Pease AFB, N. H. *(Accepted by Col. John Glenn, Operations Officer, Hq. New Hampshire ANG.)*

The Air Force Reserve Outstanding Unit Award for 1983—To the **452d Air Refueling Wing,** March AFB, Calif. *(Accepted by Brig. Gen. William B. McDaniel, Commander.)*

The President's Award for the Air Force Reserve—To a crew of the **709th Military Airlift Squadron, 512th MAW (Associate),** Dover AFB, Del. *(Accepted by Lt. Col. Ralph H. Oates, C-5A Aircraft Commander.)*

SPECIAL CITATION

Mather AFB, Calif., for outstanding support of the Air Force Recruiter Assistance Program. *(Accepted by Lt. Col. James Baker, Director of Personnel, 323d Air Base Group.)*

Stuart Reichart Award for Lawyers—To **LeRoy C. Brown,** Hq. AFLC, Wright-Patterson AFB, Ohio, for achievements in the field of law within the Air Force.

Paul W. Myers Award for Physicians—To **Lt. Col. Gary P. Romberg,** US Air Force Academy Hospital, for innovative study of sickle-cell traits and his personal commitment as Chairman of the Department of Medicine, Chief of Internal Medicine Services.

The General Curtis E. LeMay Strategic Aircrew Award—To **Crew S-12,** 60th Heavy Bombardment Squadron, 43d Strategic Wing, Andersen AFB, Guam, as SAC's best overall aircrew. *(Accepted by Capt. Michael S. Reese, B-52 Aircraft Commander.)*

The General Thomas S. Power Strategic Combat Missile Crew Award—To **Crew S-200,** 381st Strategic Missile Wing, McConnell AFB, Kan., as SAC's best overall combat missile crew. *(Accepted by Capt. John R. Fraser, Missile Combat Crew Commander.)*

The Lieutenant General William H. Tunner Aircrew Award—To the **709th Military Airlift Squadron, 512th MAW (Associate),** Dover AFB, Del., as MAC's best overall aircrew. *(Accepted by Lt. Col. Ralph H. Oates, C-5A Aircraft Commander.)*

The Lieutenant General Claire Lee Chennault Award—To **Lt. Col. Jere T. Wallace,** Commander, 67th Tactical Fighter Squadron, 18th TFW, Kadena AB, Japan, designated the outstanding aerial warfare tactician.

Solid Systems For Troubled Times

The emphasis at AFA's Aerospace Briefings and Displays was on maturing technology and P³I upgrades.

BY JAMES W. CANAN, SENIOR EDITOR

Over the Sea of Japan, the Soviets had just shot down a Korean Air Lines 747 with 269 crew and passengers, including sixty-two Americans, aboard. In Lebanon, US Marines were under fire and shooting back, supported by shelling from US warships offshore. Central America was heating up.

These timely reminders of the need for a strong, stoutly equipped US military force gave special meaning to the panoply of aerospace industry exhibits at this September's AFA 1983 National Convention in Washington. Although sobered and frustrated by world events, the throngs of convention participants and visitors seemed reassured by what they saw and heard.

They had good reason. Taken altogether, the exhibits and briefings conveyed an impression of suitably sophisticated weapons and other systems now at hand, not on the horizon—of solid starts rather than false ones.

Moreover, such systems on display covered a widening range of combat mission areas, strategic and tactical, with up-to-date electronic devices for C³I, target acquisition, fire control, EW, and the like firmly in place. In the military-supporting arena of space, the spectacular had become the taken-for-granted, with the Space Shuttle Orbiter and the Navstar Global Positioning System (GPS) satellites, among others, standing for success.

To be sure, the exhibiting companies gave full play to examples of their newly creative arts. The halls were replete with high-tech weapons and other systems, pervaded by digital microelectronics, still blossoming in research and development. But this year—more so than in the recent past—the hallmarks of the show were major weapon systems that had finally passed securely into production through technical or political minefields, or that, having performed well in the field, were being made more capable and versatile by Pre-Planned Product Improvement (P³I).

Upgrading the Triad

In the first of those categories, the main message was confirmation of the long-awaited modernization of USAF's two legs of the strategic triad. The B-1B bomber and the Peacekeeper ICBM were presented as being firmly in place. Scores of companies proudly displayed and explained airframe, armament, propulsion, and electronics products organic to either or both. Fortuitously, Congress, during AFA convention week, passed a fiscal 1984 military authorization bill that just about cinched long-term B-1B and Peacekeeper production.

That vote of confidence was due, in large measure, to congressional fury over the Korean airliner tragedy. But even before, Peacekeeper's way had been smoothed on Capitol Hill by the bipartisan Scowcroft Commission's strong endorsement of it last March.

The Commission had also urged the development of a small, single-warhead ICBM that has gained favor with USAF and the Defense Department. As a result, such companies as General Dynamics, Boeing, and Martin Marietta, which has a major role in Peacekeeper, surfaced "Midgetman" missile displays or promotions at the convention.

At AFA convention time last year, the Defense Department and USAF had just selected Lockheed's C-5B Galaxy as the near-term, new-production airlifter. But because of opposition in Congress, the C-5B's future was uncertain. Now the C-5B is a going concern, and Lockheed played it big at the Sheraton Washington. McDonnell Douglas, however, maintained its drumbeat for its C-17 direct-delivery intertheater and intratheater airlifter, still marking time in development. The company also spotlighted its USAF KC-10 tanker.

The increasingly prevalent emphasis on P³I for proven weapon systems showed up in a host of aircraft and missile exhibits. Indeed, the B-1B and C-5B are examples of it. But it was most strikingly exemplified in the transformation of USAF fighter aircraft.

General Dynamics and McDonnell Douglas made strong cases for P³I, depicting its role in the evolution of their respective F-16 Fighting Falcon and F-15 Eagle into dual-role fighters. So did Pratt & Whitney and General Electric through their presentations of digitally controlled, updated engines that each company hopes will be chosen to power future variants of USAF and Navy fighters.

Panoply of Systems

There was much more. In a remarkably uncluttered layout, the exhibits of 103 US and foreign aerospace companies and divisions spread over one and a third acres of Sheraton Washington Hotel floor space from September 13 through 15. More than half of the companies also conducted near-continuous briefings each morning, many in conjunction with day-long audiovisual minidocumentaries of their systems in action. Studded with mockups, models, multicolored "light panels," and outsized posters, the exhibit halls had the look of

a vast art gallery of systems and subsystems galore. GD's life-size mockup of the F-16XL two-seater cockpit was one of many big draws.

More than 7,000 people coursed through the hallways and packed the booths. They included conventioneers, tour-guided phalanxes of USAF personnel from the Pentagon and Washington-area bases, officers from the other services and foreign nations, civilian officials from the Pentagon and other government agencies, and members and staffers of Congress.

All got a cram course in the latest and best in aerospace systems and technologies—for example, futuristic flight and space stations, Remotely Piloted Vehicles (RPVs), flight simulators so realistic as to induce airsickness, fiber optics, ring-laser gyroscopes, manufacturing robotics, millimeter-wave and mosaic infrared sensors, superswift microprocessors, high-energy lasers, and advanced aerodynamics and propulsion.

This year, in order to expand the number of participants, the AFA exhibits also went, as it were, on the road. Via audio/video satellite, the displays and briefings of eight companies—Avco, British Aerospace, Ford Aerospace & Communications, GE, McDonnell Douglas, UTC-P&W, Rockwell, and Singer-Kearfott—were transmitted to ten USAF sites across the US. Technical problems made this first try at spreading the word, while a good one, less than perfect.

Among companies taking part in the teleconference, Avco struck a note that seemed especially in tune with one theme of this year's show: the improving balance between USAF strategic and tactical weapons.

Submunitions

Avco devoted half of its presentation to its Advanced Ballistic Reentry Vehicle (ABRV) for Peacekeeper. But the other half dealt with the company's prime conventional weapon—its Skeet system for delivering small, "smart" armor-penetrating submunitions by aircraft or artillery in a variety of dispenser modes. Avco's message was that the eventual deployment of such Skeet-type nonnuclear weapons, now being tested at AFSC's Armament

At the 1983 AFA National Convention. TOP: Air Force Secretary Verne Orr inspects Boeing's Pave Tiger RPV. ABOVE: Chief of Staff Gen. Charles A. Gabriel is briefed on Boeing's Inertial Upper Stage (IUS). RIGHT: Tidal W. McCoy, Air Force Assistant Secretary for MRA&I, takes in a model of the Hughes AMRAAM. BOTTOM: Boeing displays a model of its air-launched, space-sortie vehicle mounted on a 747.

Division, Eglin AFB, Fla., could, as the briefer put it, "raise the nuclear threshold in Europe."

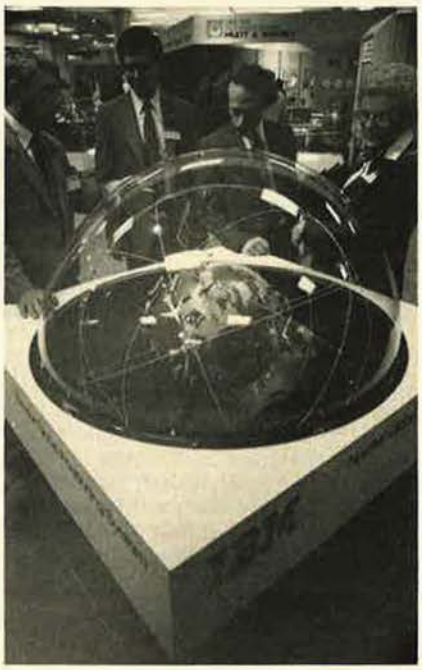
Another Eglin-tested weapon attracting great interest at the convention was Messerschmitt-Bölkow-Blohm's STABO, a runway-cratering bomb being marketed in the US by Avco. Designed for aircraft launch in MBB's MW-1 dispenser, STABO is scheduled for European NATO deployment aboard Panavia Tornado strike aircraft in 1986. MBB officials also briefed on the company's line of antitank and anti-matériel bomblets.

Over the past few years, the Pentagon's attention to munitions and submunitions for attacking enemy runways and rear-echelon armor in Europe has greatly intensified. USAF and the Army are heavily into development of a wide variety of weapons for such purposes and are working to resolve issues of which service will do what with the assortment of so-called "Assault Breaker" missiles and submunitions. Thus, these weapons have become very competitive, and their displays were in high fashion at the Sheraton Washington.

Among them were Vought's Hypervelocity Missile (HVM) system, using laser guidance and kinetic-energy warheads to pierce everything from multiplate armor on down. Being developed for USAF, the HVM is designed for delivery by aircraft, artillery, or such land-based missiles as Vought's long-range Lance.

Dispensers for tactical, air-delivered submunitions were also featured by Honeywell and Brunswick Corp.'s Defense Division. Hughes made much of its pod-carried Wasp minimissiles. And Martin Marietta featured its Joint Tactical Missile System (JTACM), being developed by USAF and the Army mainly as a weapon to destroy tanks and to pock runways. Powered by a Patriot rocket motor and guided by a Patriot control system, JTACM can be employed from tactical and strategic aircraft, Martin Marietta claims.

All through the halls, industry's (and the Pentagon's) fascination with standoff-range, precision-guided munitions (PGMs) was starkly evident. The Boeing ALCM, the GD GLCM, and the McDonnell Douglas Harpoon were examples of long-



TOP: Contingent of USAF officers examines GE's GPU-5/A gun pod and Gatling gun mockup. LEFT: IBM briefer explains intricacies of the Navstar Global Positioning System (GPS) as modeled. ABOVE: Lt. Gen. James H. Doolittle, USAF (Ret.), checks out the General Dynamics F-16XL two-seater cockpit mockup. BELOW: Israeli Ambassador Meir Rosenne takes in the Israeli Aircraft Industries exhibit.

to medium-range varieties. Shorter-range, air-to-ground PGMs—and their associated sensors, signal processors, and data-link devices—also abounded. Included were the Hughes IR Maverick and the Texas Instruments radar-homing HARM and laser-guided Paveway III. Raytheon chipped in as second-source contractor on the IR Maverick and on the Advanced Medium-Range Air-to-Air Missile (AMRAAM) as well.

Rockwell and Hughes joined in making an emphatic case for their TV-guided GBU-15 bomb, accentuating a string of successful USAF tests. The bomb's potential as an all-glide or rocket-boosted weapon—or both at once—was noted by both companies as a prime example of missile versatility. Both also emphasized its adaptability for a variety of missions through modular selection of warheads and guidance units.

For the GBU-15, Hughes makes the data link pod, and Rockwell makes everything else. Given its versatility, this so-called "launch and bank" weapon should be capable of striking from altitudes of 200 to 30,000 feet at ranges that the companies describe as "significant standoff." An IR variant is in the offing.

As yet another example of industry teamwork (a phenomenon ever more prevalent), Westinghouse and Lockheed exhibited their Joint Surveillance Target Attack Radar System (Joint STARS), designed for second-echelon target location and interdiction. The system uses airborne radars to transmit targeting data to multiple fire-control ground stations via secure data links. It combines features of USAF's Pave Mover system and the Army's Battlefield Data and Standoff Target Acquisition System. Lockheed is also applying technology from its USAF Precision Location Strike System (PLSS) and—since Joint STARS radars can be carried by unmanned aircraft—from its Aquila RPV program for the Army.

Missiles

Among air-to-air missiles, Raytheon featured its AIM-9M lightweight IR Sidewinder, now deployed on F-15s, and its radar-guided AIM-7M, the latest in a long line of Sparrow missiles. Outfitted with a monopulse seeker for look-down/shoot-down prowess, the AIM-7M, when deployed on F-15s, is expected to underline the "S" in the Eagle's air-superiority designation.

Looking sleek and lethal, like an elongated stiletto, a model of the AMRAAM stood out among air-to-air weapons on display. Exhibited (but not briefed) by Hughes, the radar-guided AMRAAM is billed as the first such weapon truly deserving of the descriptions "launch and leave" or "fire and forget." Within certain classified ranges, its own radar should be able to do the whole job of acquiring targets and homing on them. Ballyhooed as being much swifter, too, than the Sparrow, AMRAAM is expected to be deployed on the gamut of USAF and Navy fighters and interceptors through the latter half of this decade.

AMRAAM's capabilities notwithstanding, the day of the fully autonomous, all-weather, all-mission, "omniscient" missile is still a long way off. Given that, many electronics houses exhibited a wide range of aircraft-mounted sensors and signal processors designed to give tactical missiles a running start in target acquisition and ranging.

For example, TI described its advances in high-resolution, forward-looking-infrared (FLIR) imagery; Rockwell, its high-performance IR focal plane array featuring such circuitry innovations as wire bonding, photolithography, and ion implantation; and Bendix, its digital display and control system.

Electronics

The exhibit halls were the domain of the electron. Thrusting at the sensibilities of onlookers were electronics-dependent air defense and traffic control systems, search-and-surveillance systems, missile guidance packages, integrated avionics for bombers and fighters, data evaluation displays, radar warning receivers, radar altimeters, acousto-optical processors, jammers—all and much more.

Some companies, such as IBM and Honeywell, provided insights into the very large scale integrated (VLSI) circuits and very high speed integrated circuits (VHSIC) that are expected to make the battlefield ever more electronic in years ahead. Among Pentagon technology programs, the VHSIC project has been given top priority. But its six contractors have been instructed to safeguard its details. In consequence, they went easy on it at the AFA convention.

It will always take aircraft and missiles to make electronics truly fly. Accordingly, convention spectators showed surpassing interest not only in portrayals of USAF tactical aircraft and missile developments, but also in such developments by allies.

In a tastefully appointed sector of the exhibit halls, British Aerospace showed off its airplanes—the trinational (Panavia) Tornado and the Agile Combat Aircraft (ACA), the advanced Harrier, and the Hawk strike-trainer jet. McDonnell Douglas is teamed with BAe in building Harriers and Hawks for the US Marines and Navy, respectively.

BAe also showed and explained several missiles, notably the anti-aircraft Rapier of Falklands fame, the air-to-air Sky Flash, the Short-Range Air-to-Air Missile (SRAAM) and, with special emphasis, the Advanced Short-Range Air-to-Air Missile (ASRAAM) being developed jointly by BAe and West Germany's Bodenseewerk Geraetetechnik. Just as the Pentagon hopes that NATO allies will eventually buy AMRAAM, the British and West German companies aspire to an ASRAAM market in the US.

Tomorrow's Fighters

Meanwhile, here come the future fighters. Even as Grumman and Rockwell were giving exhibit-watchers a peek at their Advanced Tactical Fighter (ATF) program designs, AFSC's Aeronautical Systems Division, on September 13, announced contract awards to both companies—plus Boeing, GD, Lockheed, McDonnell Douglas, and Northrop—for conceptual designs of the ATF. The designs are due in next spring for what ASD describes as "the Air Force's air-superiority fighter for the 1990s and beyond."

Thus it appears that next September's AFA convention—with ATF competition at full bore—should sparkle all the more with displays of ATF models.

For a look at what the advanced

fighters' pilots—and those of existing fighters—may well be wearing, Honeywell showed its helmet-mounted sight. It works something like this: A small transmitter on the cockpit frame signals magnetic-field vectors to a receiver mounted on the helmet. A tiny computer marries the signals to the pilot's line of sight and to the guidance systems of his missiles. Wherever he looks, the missiles will head.

Pilotless Vehicles

Pilotless aircraft—not very romantic but demonstrably effective for a plethora of missions—got long looks, too, in the halls. E-Systems described its family of pusher-engine RPVs developed for communications relay, jamming, and, as an "expendable round," air strikes. Ranging from ninety to 200 pounds, the E-Systems RPVs can be launched by rockets or pneumatic catapults, and can be recovered by parachute, parafoil, arresting hooks, or nets.

Spectators lingered by the dozens at Boeing's model and TV display of its Pave Tiger RPV, funded through four years of development by USAF. To be used on reconnaissance or strike missions, Pave Tiger—looking like a plump ladybug with strangely shaped wings—can be manufactured on an automated line at the rate of one every twenty minutes, Boeing claims.

Not far from the Pave Tiger display, Lockheed unveiled, for the first time, an RPV to end all RPVs. This one, shown in the form of a small but full-scale model, is to be a spy plane in the Lockheed tradition of manned U-2s, SR-71s (depicted in an attention-getting film, "Blackbird Is Boss"), and TR-1s. Called a "long-endurance aircraft," the Lockheed RPV, of reed-like fuselage and whopping 267-foot wingspan, is designed for around-the-clock loitering at altitudes exceeding 90,000 feet. Its two twin-blade propellers measure forty-seven feet tip to tip, the better to keep it flying where the air is exceedingly thin.

In last year's AFA assemblage of industry hardware, Israeli Aircraft's Scout RPV was a top attraction because it had just been employed to telling effect—for surveillance and weapons targeting—over the Bekaa Valley scene of combat with the Soviet-equipped Syrians. This year, IAI played down the Scout, concentrating instead on its line of black-box battlefield SIGINT and surveillance devices, and on aircraft engines.

Among the many exhibiting companies engaged in developing high-energy lasers and their optical and electronic subsystems, only TRW made much of them. Given President Reagan's push to expedite the development of technologies for ballistic missile defense—emphasizing such directed-energy weapons as lasers—the industry's relative inattention to exhibiting lasers seemed anomalous. Observers speculated that the companies were lying low until they determine exactly where the Pentagon wants to go in BMD. Moreover, much of laser R&D is highly classified.

TRW gave lasers a big play, however. It emphasized its role as prime contractor in the USAF-Defense Advanced Research Projects Agency "Alpha" project to develop a chemical laser weapon that may be deployed in space against enemy ASATs or ballistic missiles.

The USAF ASAT development program, featuring Vought's Miniature Vehicle (MV), was not depicted. Vought officials discussed it only informally. At convention time, the ASAT weapon was believed ready for initial testing at Edwards AFB aboard an F-15.

TRW also told of its role as prime systems engineering contractor for the Consolidated Space Operations Center (CSOC) to be situated at Colorado Springs. A USAF version of NASA's Mission Control Center at Houston, CSOC will plan, control, and monitor all military Space Shuttle and satellite missions for USAF. Its satellite complex is scheduled to open in 1986, its Shuttle complex in 1987. By 1990, it should be operating full blast.

Ford Aerospace highlighted its part, too, in CSOC, as well as its leading role in fashioning the Space Defense Operations Center (SPADOC) in NORAD's Cheyenne Mountain Complex. TRW is systems engineer for SPADOC, and is building the Ground-Based Electro-Optical Deep Space Surveillance System (GEODSS) for AFSC's Electronic Systems Division. GEODSS stations are in operation at Vandenberg AFB, Calif.; at Taegu, Korea; and on Maui, Hawaii. Two more are planned, on Diego Garcia in the Indian Ocean and somewhere in the Atlantic. ■

Rockewell International briefer tells AFA convention spectators about the B-1B Long-Range Combat Aircraft (LRCA) now entering production. A flight-test film added spice.

Aerospace Industry Roll of Honor

Companies Represented at the 1983 Aerospace Development Briefings and Displays

Aerojet General Corp.
Advances in Tactical/Ordnance/Delivery, Remote Sensing, Liquid and Solid Rocket Propulsion

Aikan U.S.A., Inc.
Advanced Pylon Ejector Units for USAF Aircraft

Avco Systems Div.
Peacekeeper Reentry System and "Skeet," the Smart Antiarmor Warhead

Bendix Corp.
Capabilities and Features of Selected Advanced Electronics Equipment

Boeing Co.
Military and Commercial Space Programs in Development at Boeing

British Aerospace
Blindfire Rapier, ASRAAM, Tornado, European Agile Combat Aircraft (ACA), V/STOL Harrier II, and the Hawk Trainer

Canadair Ltd.
Multimission Challenger 600 and 601

Control Data Corp.
Current Control Data CYBER Computer Application in the Areas of Range, Radar, Logistics, and Laboratories

E-Systems, Inc.
Electronic Battle Management as a Force Multiplier

Eaton Corp., AIL Div.
Electronic Warfare System for the EF-111, B-1B, E-3A, and Air Traffic Control System

Fairchild Industries Inc.
T-46A—Tomorrow's Free World Trainer

Ford Aerospace & Communications Corp.
Tactical Missiles and Electro-Optical Systems

Garrett Corp.
USAF/Navy Standard Air Data Computer (SCADC) Program

Gates Learjet Corp.
Latest Aircraft Developments from Learjet

General Dynamics
USAF's F-16 Fighting Falcon

General Electric Co., Aerospace Group
Gun Systems and AC Control Systems on Military Aircraft

Gould Inc.
Complete Defense Systems for the US and the Free World

Grumman Aerospace Corp.
History of X-Series Aircraft, featuring the Grumman X-29

GTE, Strategic Systems Div.
C^3 Systems Architecture and Integration—A Mission to Excel

Gulfstream Aerospace Corp.
USAF's Newest Aircraft, the Special Air Mission C-20A

Honeywell Inc.
Honeywell Ring-Laser Gyro for the USAF F^3 Standard Navigator

IBM Corp.
IBM's Activities in USAF Space Programs

Israel Aircraft Industries Ltd.
Single-Site Maintenance Support

ITT Gilfillan
Advanced Technology for Tomorrow's Air Defense

Lear Siegler, Inc.
Tactical and Strategic Avionics and Controls—Integrated Flight Management Systems

Litton Industries
- **Applied Technology**
  The Spectrum of Threat Warning and Threat Simulation
- **Data Systems Div.**
  C^3 Interoperability
- **Guidance and Control Systems Div.**
  Ring-Laser Gyro (RLG) Technology for Inertial Systems
- **Itek Optical Systems**
  Collateral Information Display Station

Lockheed Corp.
Premier Showings of SR-71 Operational Footage and a Report on the Progress of the C-5B

Loral Corp.
AN/ALR-56 Computer Controlled Radar Warning Receiver, EW-1017 Airborne Electronic Surveillance System

Martin Marietta Aerospace
Peacekeeper Missile Engineering and Launch Facility Development, LANTIRN, AASM and JTACM

MBB Messerschmitt-Bölkow-Blohm
Air-Launched Weapon Systems

McDonnell Douglas Corp.
- **Douglas Aircraft Co.**
  C-17 Total Airlift Mission
- **Douglas Aircraft Co.**
  KC-10 Multirole Flexibility
- **McDonnell Aircraft Co.**
  F-101, F-4, F-15 Eagle
- **McDonnell Douglas Astronautics Co.**
  Harpoon and Tomahawk Cruise Missile Programs
- **McDonnell Douglas Astronautics Co.—Huntington Beach**
  Payload Assist Module (PAM)

Northrop Corp.
F-20 Tigershark at the 1983 Paris Air Show

Raytheon Co.
TRC-170 Troposcatter Radio Set

Rockwell International
- **Autonetics Strategic Systems Div.**
  Peacekeeper Guidance and Control, B-1B Electronics, Electro-Optical Sensors, Space Shuttle Electronics
- **Missile Systems Div.**
  GBU-15 Guided Weapon System
- **North American Aircraft Operations**
  B-1B Aircraft Capabilities and Program Status
- **North American Space Operations**
  DoD Navstar GPS Satellite Program and the Space Shuttle Program
- **Rocketdyne**
  Peacekeeper—Stage IV Development and Laser Programs

Rolls-Royce, Inc.
Runway Denial and Advanced Training Programs

Sierra Research Corp.
Advanced Radar and Stationkeeping Systems

The Singer Co.
- **Kearfott Div.**
  Joint Tactical Information Distribution System (JTIDS)
- **Link Flight Simulation Div.**
  US Air Force Simulation Update

Teledyne CAE
Turbine Engine Power: Today, Tomorrow

Texas Instruments Inc.
Terrain-Following Radar, HARM Missile, Paveway III, and FLIR Common Module Concept

Thomson-CSF, Inc.
Air Base Air Defense

TRW Electronics & Defense
- **Defense Systems Group**
  Consolidated Space Operations Center
- **Space and Technology Group**
  High-Energy Laser Systems

United Technologies Corp.
- **Norden Systems**
  Advanced Electronics for the Air Force
- **Pratt & Whitney, Government Products Div.**
  High-Technology Engine Products for Strategic, Tactical, and Utility Aircraft
- **Sikorsky Aircraft**
  The Bicentennial of Human Flight

Westinghouse Defense
Emerging Defense Systems and Technology for USAF

Williams International
Small Gas Turbine Engines

The following companies displayed but did not hold briefings

Advanced Technology, Div. of Tritronics
High Speed Stop-Motion Video Cameras

Astronautics Corp. of America
Complete Line of Military Avionics Products

Beech Aircraft Corp.
Air Force C-12 and MQM-107 Training Target

Bell Helicopter Textron, Inc.
TiltRotor Technology and Its Application to Air Force Missions

Brunswick Defense, Defense Div.
Broad-Based Defense Capabilities from Brunswick

Delco Systems Operations, GMC
Systems Capabilities for Air Force Programs

EDO Corp., Government Systems Div.
High-Technology, High-Performance Aircraft and Helicopter Ejection Release Units

Euromissile
Roland, All-Weather Short-Range Air Defense System

General Electric Co., Aircraft Engine Business Group
F110 and F404 Supersonic Turbofans, F101, CF6-50, TF39, and CFM56 High-Bypass Turbofans

Hazeltine Corp., Government Products Div.
Micro TICCIT Computer-Based Training System

Hughes Aircraft Co.
Guided Missiles and Advanced Avionics Equipment

Intermetrics, Inc.
Real-Time Aerospace Software

Jane's Publishing Inc.
Jane's Yearbooks

Kaiser Electronics
Operational Multifunction Display and Static HUD and Display System Mockups

King Radio Corp.
Advanced Avionics Equipment

Lista International Corp.
Modular Storage Cabinet

Litton Industries, Clifton Precision, Instruments & Life Support Div.
Pressure Swing Adsorption (PSA), On-Board Oxygen-Generating System (OBOGS), On-Board Inert Gas-Generating System (OBIGGS)

Lucas Aerospace Ltd.
System and Equipment Suppliers to the World Aerospace and Defense Industries

M.A.N. Truck & Bus Corp.
Wheeled Vehicle Products

Magnavox Government and Industrial Electronics Co.
Electronic Systems for Communications, Countermeasures, Position Location, and Navigation

Marconi Avionics Ltd.
Advanced Avionics Equipment

McDonnell Douglas Electronics Co.
Developments in Ground-Based Training and Simulation Systems

Motorola Inc., Government Electronics Group Radar Operations
High-Resolution Color Intelligent Terminals for C^3I Applications

Odetics, Inc.
ODEX 1, a Multifunctional Robot

Olympus Corp., Industrial Fiberoptics Department
Fiberscopes, Borescopes, and Accessories

Over-Lowe Co.
Self-Contained Trailer-Mounted, Electric Floodlight Set with Four 1,000-Watt Luminaries, Model IPMG-5A4-DC

Pace Inc.
Portable Equipment for Nondestructive Repair of Printed-Circuit Board

Panavia Aircraft GmbH
Tornado, the European All-Weather Strike Attack Aircraft

The Protectowire Co.
Coded and Noncoded Fire-Alarm Control Panels and Transmitters

RCA Corp., Government Systems Div.
Products and Services Provided to the United States Air Force

Rockwell International, Collins Government Avionics Div.
Collins' Range of Avionics Systems and Equipment for the Air Force

Rolm Corp.
Mil-Spec Computer Products including 16- and 32-bit Processors

Sanders Associates, Inc.
The Evolution of Electronic Warfare

Science Applications Inc.
System Engineering and Integration Capabilities in C^3

Simmonds Precision
Computerized Fuel Management and Center-of-Gravity Control Systems

Smith's Industries, Aerospace & Defense Systems
Heads-Up Multifunction and Cockpit Management CRT Displays and Processor

Stanley-Vidmar
Deployment Cabinets: Control Tool Kit Cabinets (CTK)

Sundstrand Corp., Advanced Technology Group
Engine-Starting Equipment and Flight-Control Actuation Equipment

Systron Donner, Safety Systems Div.
Pneumatic-Type Aircraft Engine Fire/Overheat Detectors

Systems Control Technology, Inc.
Autopath and CEMS, SCT's Comprehensive Engine Management System

Turbomach Div. of Solar Turbines Inc.
Titan II Gas Turbine

United Technologies Corp., Hamilton Standard
Central Aircraft Support Systems and Diagnostic Test Equipment

Vega Precision Labs, Div. of General Indicator Corp.
AN/FPQ-18 Drone Tracking Control System

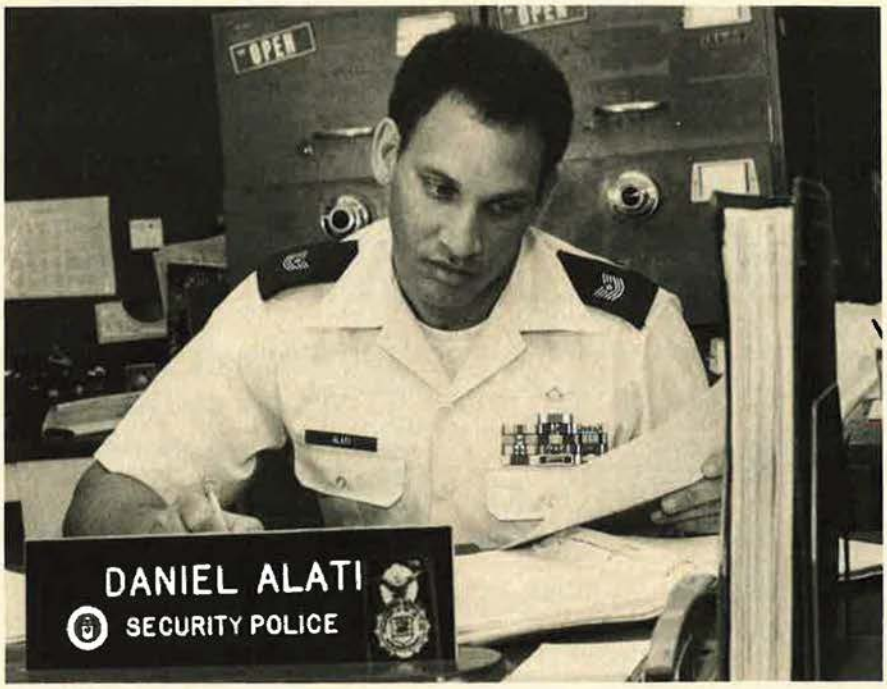
Vought Corp. (LTV/Vought)
HVM-Hypervelocity Missile, JTACMS-Joint Tactical Missile System

At September's National Convention in Washington, D. C., AFA continued its tradition of paying homage to the blue-suit enlisted force during . . .

An Outstanding Week for the Outstanding Airmen

BY WILLIAM P. SCHLITZ, SENIOR EDITOR

HONORED guests during the week of AFA's annual convention were the twelve Outstanding Airmen, who, after the convention, become the nucleus of AFA's Enlisted Council for the coming year.



MSgt. Daniel Alati *is chief of personnel security at Hq. SAC, Offutt AFB, Neb. During his sixteen-year career as an Air Force security policeman, Sergeant Alati has served three tours in South Korea and one in South Vietnam besides assignments at bases in the US. He is a graduate of the DoD Information Security Course and the SAC NCO Academy. Among military awards, Sergeant Alati holds the Meritorious Service Medal and the Air Force Commendation Medal. Off duty, he and his wife Yong are active in church concerns. They have two sons, Daniel, Jr. and David. (USAF photo by SSgt. Robert C. Simons)*

TSgt. Frank M. Anderson *is currently assigned to the 91st Field Missile Maintenance Squadron, Minot AFB, N. D. Since joining the Air Force in March 1973, Sergeant Anderson has earned the Master Missile Badge and the Intercontinental Ballistic Missile Master Team Chief, Master Technician, and Master Instructor Awards. Among his military decorations, he has earned the Air Force Commendation Medal. Among off-duty civic activities, Sergeant Anderson is on the board of directors established to develop a park designed specifically for handicapped and disabled children. He and his wife Terry also hold offices in church and school youth groups. They have five children: twins Lorissa and Melissa, Michael, Troy, and Trevor. Here the couple helps Michael prepare for a bike race. (USAF photo by SSgt. Robert C. Simons)*

SSgt. Harriett W. Bordenave *joined the Air Force in August 1975 and is currently a medical administration specialist in charge of the Hulburt Clinic at Eglin AFB, Fla. Among an assortment of duties, she is responsible for the outpatient records of 8,000 military and civilian users. Sergeant Bordenave has developed a job performance and evaluation system that has increased the productivity and effectiveness of the military and civilian personnel she supervises. Among her decorations are the Meritorious Service Medal. During her off-duty time, the Sergeant tutors educationally underprivileged children and is a church leader. She is also working toward a master's degree in business administration. (USAF photo by Sgt. Charles Newkirk)*

SMSgt. Marvin L. Kennedy *is first sergeant of the 81st Equipment Maintenance Squadron at RAF Bentwaters, UK. During an Air Force career that began in January 1964, the Sergeant has not only consistently distinguished himself in his chosen field of avionics but elsewhere as well. For example, he was awarded the Humanitarian Service Medal for his role in organizing disaster relief during the mud slides in California early in 1980. Sergeant Kennedy's other decorations also reflect his devotion to duty—the Meritorious Service Medal, Air Force Commendation Medal with oak leaf cluster, Vietnam Service Medal with three stars, and Air Force Noncommissioned Officer Professional Military Graduate Ribbon with oak leaf cluster. Off duty in England, he is involved in a variety of civic activities including aid to the handicapped and service as a Boy Scout counselor. He and his wife Mary have three daughters: Vicky, a senior airman at Grissom AFB, Ind., Natalie, and Lisa. (USAF photo)*

MSgt. Thomas Merrick III *is consolidated open mess complex manager for John Hay AS in the Republic of the Philippines. Enlisting in May 1966, he served first as a personnel specialist and then retrained in club management. Besides assignments in CONUS, the Sergeant has also served in Pakistan, Taiwan, and South Korea and has managed operations totaling more than $2.2 million in assets. Among his decorations is the Air Force Commendation Medal with oak leaf cluster. He has been named USO's Outstanding Air Force Enlisted Person in the Philippines. Off duty, Sergeant Merrick supports a number of local civic action programs. Here, with wife Priscilla and their children Timothy and Kimberly. (USAF photo by TSgt. Dave Craft)*

TSgt. Mark A. Smith *is chief loadmaster for special operations for the 437th Military Airlift Wing, Charleston AFB, S. C. He entered the Air Force in August 1977. Sergeant Smith was involved in the C-141B airdrop testing program that evaluated delivery procedures never before attempted by MAC. He also served in the initial cadre of the C-141B special operations program. He has logged more than 2,800 flying hours in C-141s. The Sergeant's decorations include the Air Force Commendation Medal, Combat Readiness Medal, and Humanitarian Service Medal. He is enrolled in the Community College of the Air Force and has completed more than half the requirements for an associate degree in transportation management. (USAF photo by SSgt. Phil Schmitten)*

TSgt. Carol L. Santos *is NCOIC of the supply branch, 2951st Combat Logistics Support Squadron, McClellan AFB, Calif. She entered the Air Force in May 1976. In her current assignment, Sergeant Santos is responsible for scheduling mission readiness training and ensuring that tasks enhance wartime skills. She also trains others in up-to-date supply procedures. Sergeant Santos's decorations include the Air Force Commendation Medal. She is pursuing a degree in business administration and is active in squadron advisory council and community activities. The Sergeant has been commended for her volunteer work at the Sacramento Children's Receiving Home, pictured at right. (USAF photo)*

***SMSgt. Robert E. Jacques** is training superintendent for the Operations Training Division, Hq. US Air Force Recruiting Service, Randolph AFB, Tex. He was selected as Top Flight Supervisor for 1980, 1981, and 1982, a record unprecedented in Recruiting Service history. Among the Sergeant's decorations are the Meritorious Service Medal with three oak leaf clusters, Air Force Commendation Medal with five oak leaf clusters, and Humanitarian Service Medal. In 1982, he was selected to testify on the GI Bill before a House subcommittee. Here, a family discussion with wife Bobbie and their children, Robert and Natalie. (USAF photo by Walt Weible)*

***MSgt. Harold O. Overton** is NCOIC of defensive command control communications and countermeasures operations, Hq. Electronic Security, Pacific, Hickam AFB, Hawaii. A veteran of almost sixteen years in the Air Force, Sergeant Overton has earned both an associate of arts degree in communications processing and a BS in criminal justice. Besides assignments in CONUS, he has served in Thailand, the Philippines, and Japan. The Sergeant has been credited to a large measure for the success of the first US/Australian/New Zealand C³CM security exercise. Among his decorations are the Meritorious Service Medal with oak leaf cluster, Air Force Commendation Medal with three oak leaf clusters, and Air Force Achievement Medal. Sergeant Overton and his wife Sueko are both active in church and school groups. They have two daughters, Jenifer and Gina. Here, Sergeant Overton coaches a girls' softball team. (USAF photo by A1C Manuel I. Ruiz)*

***SrA. Steven A. Dubron** is a personnel specialist with the Consolidated Base Personnel Office, Luke AFB, Ariz. Entering the Air Force in October 1980, he was selected a Basic Military Training Honor Graduate and concluded his technical training at the top of his class. Airman Dubron is a volunteer member of the Luke Honor Guard. Off duty, he is pursuing a bachelor's degree and plans to apply for OTS. Active in the Big Brothers, he is pictured here with one of his charges. (USAF photo by TSgt. Robert Marshall)*

***SSgt. Christopher Menna** is a pararescue specialist with the 102d Aerospace Rescue and Recovery Squadron at Suffolk County ANGB, N. Y. Enlisting in the ANG in October 1979, Sergeant Menna has since participated in day and night rescue operations from both fixed- and rotary-wing aircraft for which he has been recommended for the Air Medal. Among other decorations, he also holds the Combat Readiness Medal. Sergeant Menna continues his lifelong appreciation of athletics and has participated in such community projects as the Bronx River cleanup campaign and rock-climbing techniques in the Outward Bound program. In 1982, he was the recipient of the Sikorsky Helicopter Rescue Award for his lifesaving achievements. With the support of his wife Nancy, the Sergeant is also pursuing a bachelor's degree in fine arts. (USAF photo)*

***Sgt. Mary L. Young** is a missile radio technician with the 2152d Communications Squadron, Grand Forks AFB, N. D. She entered the Air Force in January 1981. Through her extensive knowledge of the radio field, Sergeant Young has eliminated excessive down time to ensure maximum circuit availability to users. As training monitor for her section, she is responsible for the upgrade training procedures that resulted in her section's receiving a certificate of recognition. Sergeant Young is active in community affairs and is a Girl Scout leader. Here she returns from a fishing trip with her husband, Sgt. Douglas Young. (USAF photo by SSgt. Paul G. Robinson)*

The US Air Force Today and Tomorrow: The New Priorities

An Air Force Association Major National Symposium
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Gen. Robert T. Marsh
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Air Force Systems Command

Gen. James P. Mullins
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and others to be announced

Whether you are in aerospace industry, in defense-oriented science and engineering fields, or are a civic leader concerned about our nation's defense posture, you should not miss this uniquely illuminating Symposium.

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FILLING IN THE EDUCATIONAL POTHOLES

BY LT. COL. HAROLD E. RAFUSE, USAF
RESEARCH ASSOCIATE

A special symposium addresses the problem of scientific and technological illiteracy among America's young people.

THE Aerospace Education Foundation conducted its Third National Laboratory for the Advancement of Education last September in conjunction with the Air Force Association National Convention. The one-day, results-oriented symposium—entitled "Improving the Scientific and Technological Literacy of America's Youth"—centered on an ambitious and extensive program that featured distinguished speakers and attracted a wide cross section of participants.

The symposium audience included executives from twelve industrial firms; representatives from the various levels of the educational community, including secondary schools, community and junior colleges, technical institutes, and public and private four-year colleges and universities; representatives from local, state, and federal governments; senior military officers; educational consultants; and representatives from various industrial and educational associations.

The symposium stressed that a continuing and action-oriented awareness among Americans of the scientific and technical opportunities and challenges confronting our nation is crucial to our security and continued economic vitality. The program also included a survey of America's current educational situation as reported by a number of recent prestigious national task forces and study groups.

Various speakers addressed proposed solutions to the noted problems from national, state, and local perspectives. Also considered were the roles that Congress, the military, the educational community, professional associations, and business and industry can and should play in meeting America's educational crisis. Presenters included highly qualified authorities in the fields of education, industry, government, and the military.

Opening Session

Russell E. Dougherty, Executive Director of the Air Force Association and its affiliate, the Aerospace Education Foundation, offered brief opening remarks and introduced Dr. Don C. Garrison, President of the Aerospace Education Foundation and master of ceremonies for the symposium.

Dr. Garrison, who is also President of the Tri-County Technical College, Pendleton, S. C., welcomed the symposium attendees and spoke briefly on how the nation's educational performance may affect national security and the future economic stability of our country.

Dr. Garrison then introduced the symposium's keynote speaker, Dr. Donald J. Senese, Assistant Secretary, Office of Educational Research and Improvement in the Department of Education. Dr. Senese covered the role that our national government plays in solving technical and scientific literacy problems in America.

Presentations on the role of the states and local communities followed. Regent Emlyn I. Griffith of the Board of Regents of the University of the State of New York and former President of the National Association of State Boards of Education presented the states' roles. Mrs. Yvonne W. Larsen, Vice Chair of the Department of Education's National Commission on Excellence in Education, presented thoughts on the role of local communities in solving technical and scientific educational needs. The Commission recently published an eighteen-month study entitled "A

Dr. Don C. Garrison, President of the Aerospace Education Foundation, presented opening remarks to the symposium. He is flanked by the morning session speakers (left to right): Mrs. Yvonne W. Larsen, Vice Chair, National Commission on Excellence in Education; Dr. Donald J. Senese, Assistant Secretary, Office of Educational Research and Improvement, US Department of Education, who was the keynote speaker; Dr. Helen D. Wise, Executive Director, Delaware State Education Association; and Regent Emlyn I. Griffith, the Board of Regents of the University of the State of New York.

Nation at Risk: The Imperative for Educational Reform."

A presentation on the role of education associations by Dr. Helen D. Wise, Executive Director of the Delaware Education Association, and a question-and-answer session concluded the formal portion of the morning's agenda.

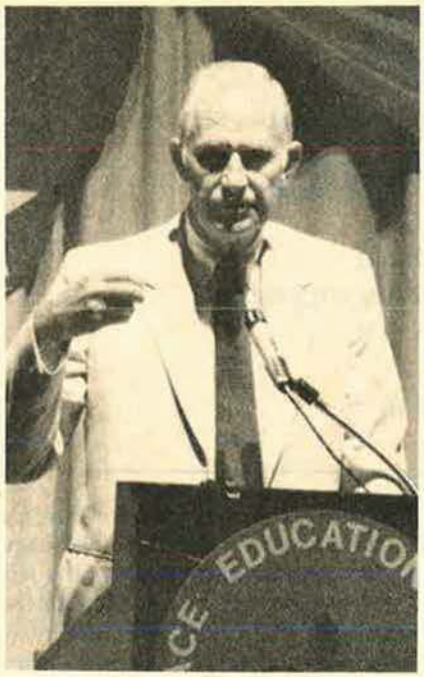
Symposium attendees and guest speakers then visited the Aerospace Development Briefings and Displays and viewed the high-technology exhibits presented by more than 100 aerospace companies.

Attendees had a special treat during the luncheon portion of the symposium. They heard three outstanding presentations on the role of industry, the educational community, and the military by Norman R. Augustine, President of Martin Marietta Denver Aerospace; Dr. Leon M. Lessinger, Superintendent of the California Beverly Hills Unified School District and former President of the Aerospace Education Foundation; and the Secretary of the Air Force, the Hon. Verne Orr.

Afternoon Sessions

The afternoon sessions began with a presentation on the role of Congress in educational policy by Congressman Don Fuqua (D-Fla.), Chairman of the House Science and Technology Committee. This was followed by a presentation on the role of the military services by Lt. Gen. John S. Pustay, USAF, outgoing President of the National Defense University, Washington, D. C.

After a short break, the symposium resumed with Dr. Seymour Eskow, Director of the "Putting America Back to Work Project" of the American Association of Community and Junior Colleges and recently retired President of Rockland Community College in New York, who discussed the role of junior colleges, community colleges, and technical institutes. Dr. John B. Slaughter, Chancellor of the University of Maryland and recently Director of the National Science Foundation, followed with his thoughts on the role that four-year colleges and universities can play in improving the scientific and mathematics content of our educational curriculums.



Air Force Secretary Verne Orr, during the symposium luncheon, presented his concerns about our declining technological literacy and his thoughts on methods for improving America's scientific educational programs.

The afternoon formal presentations concluded with William C. Missimer, Jr., Executive Vice President of the Pratt & Whitney Group, United Technologies Corp., who spoke on the continuing role that industry must play in solving America's technological literacy problems. A final question-and-answer session followed, along with summarizing comments by Dr. Garrison.

The content of the symposium and each of the speaker's presentations were well received by the attendees. The audience learned of methods from every feasible vantage point for improving the scientific and technological literacy of America's youth. The symposium program promoted the formation of a coalition of educators, industry representatives, legislators, and the military that would work together to implement solutions discussed throughout the day.

Reference Guide

A draft reference guide distributed by the Aerospace Education Foundation was included in the symposium packets furnished to each attendee. The guide cited the most notable studies by several recent national task forces and commissions that focused a considerable amount of attention and criticism on the declining quality of America's scientific educational programs. The guide also presented summaries of the problems cited in the studies and listed solutions that have been proposed. Local action plans and example questions to ask educators, parents, school administrators, and elected officials were included. The guide was used throughout the symposium, and is designed to be used upon return to local areas as a stimulus and reference in solving the problems discussed by symposium attendees.

An exhibit and materials area included resource guides on programs that have proven effective in dealing with scientific literacy problems. Attendees were encouraged to pick up these materials for possible use in their local areas.

Results of the symposium will be incorporated into a revised and updated version of the reference guide to be distributed nationally by the Aerospace Education Foundation. The Foundation also plans to conduct follow-on regional workshops and symposia designed to implement solutions tailored to localized needs and to facilitate greater public awareness and information exchange on the nature and impact of America's declining technological literacy.

The Aerospace Education Foundation had previously sponsored two other National Laboratories. The first, entitled "Individualized Learning in the Inner City," was conducted in 1968. In 1970, the second Laboratory—"Educating for the World of Work"—was held. ■

Lt. Col. Harold E. Rafuse, USAF, recently joined the staff of the Aerospace Education Foundation for a one-year assignment as Research Associate. He will assist AEF in organizing and implementing programs to help alleviate the problem of scientific and technological illiteracy in America. Experienced in the management of AFSC's space and ballistic missile R&D programs and in the operation of USAF's SPACETRACK system, Colonel Rafuse was an AFROTC and OTS instructor and holds undergraduate degrees in chemical technology and chemistry and a master's in engineering management.

THE IDEA EXCHANGE

AFA's blue-suit advisory councils hear briefings on key issues and formulate suggestions for a better Air Force.

BY CAPT. PATRICIA R. ROGERS, USAF
CONTRIBUTING EDITOR

THEY were charged with advising the Air Force Association and the Air Force on a wide range of topics, and they took their responsibilities seriously. Meeting during this year's AFA National Convention, the junior officers, senior enlisted advisors, and enlisted people wasted no time by starting their deliberations on Sunday in their respective groups on issues affecting themselves, their peers, and the Air Force.

"The Air Force and AFA consider this a great opportunity to learn what you're thinking about various issues," said AFA President David L. Blankenship during Monday's official opening joint session for the three advisory groups.

"You present the Air Force with fresh thoughts and ideas," said Maj. Gen. Robert C. Oaks, Director of Personnel Plans for the Deputy Chief of Staff for Manpower and Personnel, and keynoter of the joint conference. "Please give us some in-depth analysis of a particular problem or problems."

The Councils and SEAs

The Junior Officer Advisory Council (JOAC), chaired by Capt. John Loucks of the Air Force Academy, marked out an agenda that would deal with four main issues: Project Technology 2000, a Junior Officer Advisory Council charter, the career concerns of company grade officers, and ways to promote company grade officer involvement with AFA.

The Enlisted Council, composed primarily of last year's Twelve Outstanding Airmen of the Year, concentrated mainly on recommendations for Project Technology 2000. The project is part of the Air Force's push to counter scientific illiteracy and to attract more people to the Air Force who are technologically qualified. The Enlisted Council was chaired by CMSgt. James C. Binnicker from Randolph AFB, Tex.

The Senior Enlisted Advisors discussed a variety of "people" issues that included NCO leadership, NCO open messes, dormitories, family housing, and the quality and appearance of Air Force uniforms.

"Some of the most innovative ideas for the enlisted force have originated as a result of past AFA senior enlisted advisor conferences," said Chief Master Sergeant of the Air Force Sam E. Parish, who chairs the group. The SEA conference includes all of the senior enlisted advisors from the major commands, separate operating agencies, and direct reporting units.

"This year we discussed the whole spectrum of people items that will benefit the Air Force and the enlisted force," said Chief Parish. "And I'm very, very happy with the results."

The JOAC also discussed people issues, and found that the Air Force spouse—especially the working wife—was a special concern.

"Leaders wonder why dedicated people get out of the Air Force," said Capt. Lynn M. Scott, a personnel systems analyst with the Manpower and Personnel Center at Randolph AFB, Tex. "Nowadays, a spouse determines in large part an Air Force member's career decisions."

The junior officers suggested that AFA chapters across the country might help by starting a job-referral system for officer and enlisted spouses who must give up their jobs to accompany the Air Force member.

Company grade housing—or the lack of it, on many bases—was also a concern for junior officers.

"Company grade housing is absent on many bases," said Captain Scott. "Some people are hit hard economically."

The JOAC also discussed professional military education. The junior officers noted that Guard and Reserve officers can rarely get away from their full-time jobs for the two-month residence needed to attend Squadron Officer School. They suggested that a seminar approach be used for SOS to alleviate this problem.

Other topics discussed by the JOAC included the perceived absence of solid career counseling, retention, professionalism, development of regional company grade officer networks, and family support.

In addition, the JOAC, Enlisted Council, and the SEAs examined the problem of the shrinking pool of qualified scientists and other technically trained people. The groups made many recommendations to the Air Force for possible inclusion in Project Technology 2000.

Professional Update Seminar

Though the three groups spent most of their time discussing issues and formulating advice, they also listened as a group to several Air Force leaders during a Professional Update Seminar.

Brig. Gen. Richard F. Abel, Air Force Director of Public Affairs, asked the groups to take every opportunity to project the Air Force in a positive way.

"Because you wear the suit, people look to you as the expert on the Air Force," General Abel said.

Current Air Force legislative priorities were briefed by Maj. Gen. James P. McCarthy, Air Force Director of Legislative Liaison, during the Seminar. General McCarthy said that funding priorities encompass four different areas: improvements in strategic programs, readiness and sustainability, airlift improvements, and conventional force modernization. He said that the strategic modernization push centered on the MX ICBM, the

Senior Enlisted Advisors (above) discussed issues that affect the enlisted corps. Maj. Gen. Robert C. Oaks (left) addressed the Junior Officer Advisory Council during the AFA convention. General Oaks is the Director of Personnel Plans for the Deputy Chief of Staff for Manpower and Personnel, Hq. USAF, and the JOAC advisor.

Enlisted Council members (right) listened intently during discussions on Project Technology 2000. The Council exchanged ideas on how to counter scientific illiteracy in the Air Force and the nation.

B-1B, and the Air-Launched Cruise Missile program.

As far as readiness and sustainability are concerned, the General told the councils that the major priorities are adequate spare parts funding, increased flying time for pilots, and emphasis on realistic training. Airlift efforts include purchase of the C-5B and a continuing research and development program for the C-17.

In the conventional force modernization effort, he noted that the Air Force would like to buy more F-15s and F-16s. Operating under current budget constraints, Congress has approved increased F-16 purchases but recommended cutting back the F-15 program. (For FY '84, the Air Force requested 120 F-16s and forty-eight F-15s. Congress authorized 144 F-16s and thirty-six F-15s.)

Personnel issues were addressed by General Oaks, who noted that "the quality of the Air Force recruit is up. I think there is a more favorable attitude in the country today toward the military."

General Oaks displayed charts that illustrated the current high retention rates for the officer and enlisted corps. He added that the few areas in which retention still needed some work are in avionics and some maintenance specialties in the enlisted corps. On the bright side, however, the Air Force recruited its goal in general physicians last year. This is a category in which the Air Force has chronically fallen short for years.

"There are continual pressures on retirement," General Oaks told the councils. "The retirement system is not a pension system. Rather, it ensures us of a manpower resource for mobilization, gives us a partial offset for the demands of military life, such as going on remote tours, and gives us some pay comparability with the civilian sector for similar work."

General Oaks said Air Force members stationed on a remote tour—in Turkey, for instance—do not receive the same monetary compensation for similar work performed by, say, American civilians in Saudi Arabia.

Leaders All

Spare parts, a topic much in the national news, surfaced when Gen. Jerome F. O'Malley, then Air Force Vice Chief of Staff, spoke at the Professional Update Seminar.

Estimating spare parts requirements is one of the biggest problems the Air Force has right now, according to General O'Malley. He told the Seminar participants that he thought the peacetime operating stocks would be fully funded in 1984 and 1985.

Other speakers at the Seminar included Rep. Thomas R. Carper (D-Del.); Lt. Gen. John T. Chain, Jr., Deputy Chief of Staff for Plans and Operations; and Col. Ronald Sable, an Air Force officer assigned to the White House.

Congressman Carper told the group about some of his duties as a lawmaker and commended military people for their service to the country.

General Chain explained his perception of several current trouble spots in the world—Chad, Central America, and Lebanon. He finished his talk by asking the council members to help keep their fellow officers and NCOs informed on Air Force issues.

"You are the leaders," he told the group. "Please be carriers and take back this good information you learn at the Convention to the people in your command and at your base." ■

Jimmy Doolittle becomes the first military aviator to receive the prestigious Sylvanus Thayer Award.

BY JAMES W. CANAN, SENIOR EDITOR

ON A bright September day befitting the occasion, West Point's finest fell out on the Plains of the Hudson to honor Jimmy Doolittle. The Association of Graduates of the US Military Academy presented Lt. Gen. James H. Doolittle, USAF (Ret.), its 1983 Sylvanus Thayer Award, given annually to an outstanding US citizen whose life and career exemplify the USMA motto, "Duty, Honor, Country."

On the parade ground, Doolittle trooped the "Long Gray Line" in a jeep. Having marched in his honor, the Corps of Cadets presented the General its Leadership Sword. Moreover, the cadets, in a spontaneous tribute that may have been the most touching of all, lined up after Doolittle's acceptance speech and filed by to shake his hand, keeping him on for nearly an hour.

Doolittle, an aviation pioneer and the first President of the Air Force Association, was honored for his lifelong military and civilian contributions to national defense and aeronautics. Holder of the Medal of Honor for planning and leading a one-way attack of sixteen B-25 bombers against Japan in April 1942, he now joins company with twenty-five former Thayer Award recipients such as President Eisenhower, Generals of the Army Omar Bradley and Douglas MacArthur, Neil Armstrong, John McCloy, and David Packard, last year's winner.

The award is named after Col. Sylvanus Thayer, an 1808 West Point graduate who served as the Academy's fifth superintendent, from 1818 to 1833. Described in New York University's Hall of Fame of Great Americans as the "Father of Technology in the United States," Thayer made the Academy the first engineering school in the US.

Doolittle, who began his military and aviation career as a flying cadet in 1917, returned to active duty from the reserves at the outset of World War II. He went on to command the Twelfth Air Force in North Africa and the Eighth Air Force in Europe and the Pacific. Later, he joined Shell Oil Co. as a vice president.

Following are excerpts of his speech on accepting the Sylvanus Thayer Award on September 29:

As an engineer, I greatly admire and envy the fame and achievements Sylvanus Thayer brought to the engineering history of the US.

As a pilot, I am delightfully surprised to think that I may be the first military aviator to be recognized by this Award.

For, as is well known, the US Military Academy has spawned many of the greatest, most illustrious of the crusaders for military aerospace achievements. If I am the first military aviator so honored, I am humbly grateful for the chance to break through this "Mach barrier."

Also, I have the greatest respect for the quality of education and discipline engendered in the cadets of West Point—a consistent pattern of quality and competence, evident in more than fifty years of close association with your graduates. The depth of this respect for the Long Gray Line makes me doubly grateful for this recognition by my military peers and associates.

Finally, I think it worthy of attention to note that you have given the 1983 Thayer Award to an American militiaman, not a regular professional soldier who spent an entire career in uniform. Though I trained with the regular Air Force and served for many years in uniform, I am not a professional warrior. I suppose I am best described as an American militiaman—fighting when I was needed, called back to active duty in a time of emergency and national peril, leaving active duty for civilian pursuits at the end of hostilities—a classic pattern of military service by one of our nation's militiamen. Thank you for the recognition this award gives our Reserve Forces . . . and the American militia tradition.

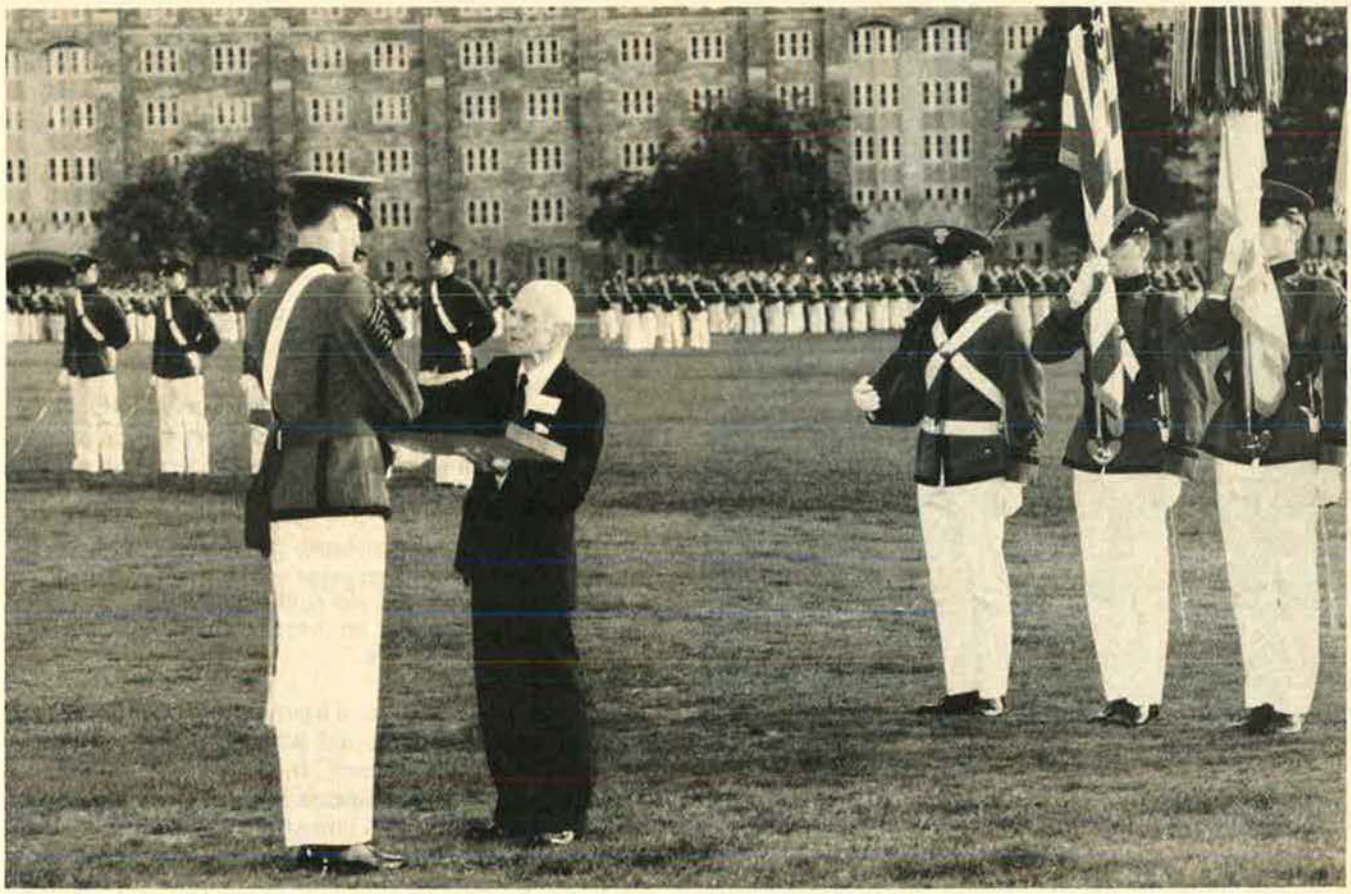
Graduates of the US Military Academy have contributed greatly to this nation's development and progress in many fields—engineering, construction, production, diplomacy, and even politics. But that's not why you're here—and that's not why West Point is here. This institution has just one primary purpose. That is to prepare its graduates to serve as this nation's military leaders in deterring war; or, if we must, fight our nation's battles—and win. If we're forced to fight, we will again find that there is no second place in war. You win or you lose. And when the chips are down, if we don't have the capability to fight and win, we can't expect to deter.

It is of special interest to me that the US Air Force has an active program today, which the Air Force Chief of Staff (a graduate of West Point, I might add) calls Project Warrior. It's a program designed to remind Air Force personnel of their heritage and why they're in uniform—to point up that their single overriding purpose is to be ready to serve this nation in both peace and war—and, if they must fight, to fight and win. I'm proud of that program. It's right on target for our nation's military—most of which have not had the experience of an Academy education, with its constant examples of "duty, honor, country" placed before them.

The theme of Project Warrior applies to all the military services; for it has been my observation that, as a soldier, sailor, or airman, you need all the extra effort you can muster to come out on top time and time again . . . as you must! I know that you are gearing your lives to putting out that additional effort, and it is a constant source of inspiration to learn that you are not alone in this constant pursuit of excellence.

The tradition of West Point is inspiring and challenging. You've got a lot to measure up to—but you can, and

An American Militia



Backdropped by the US Military Academy's Washington Hall and the Corps of Cadets at parade rest, Cadet First Captain William Rapp presents the Corps' Leadership Sword to Jimmy Doolittle, who trooped the Long Gray Line. General Doolittle was accompanied at West Point by his wife Joe. Their son, John, is a 1946 USMA graduate.

you must. You've got to have what it takes to excel—and you must excel. Our nation deserves your best, as do the generations of brave patriots who have built these great traditions of dedication and devotion. . . .

I have fought beside your fathers, and your grandfathers—even some of you, my peers in this audience today. You're brave, patriotic, skillful, and honorable. I am proud to have had the experience of fighting beside you of the Long Gray Line, and prouder still of the loyal, diligent ways in which you have worked for peace.

I have seen your key roles well played to achieve a lessening of tensions in hot spots around the world. I have seen you support principles of freedom and human dignity with uncommon effect, at home and abroad. I have marveled at the total selflessness of the professional military officer in fulfilling duties "in the interests of the military service" throughout the world.

I have seen your military families thrive and grow stronger, even in the face of privations and separations that would destroy lesser personalities. The families of our professional military officers take on the tempering of fine steel—to their eternal credit.

Throughout my life, I have often been labeled as a risk taker. I don't think that's quite accurate. I tried not just to take "risks," as such, but to analyze everything I knew or could learn about the hazards, the constraints, the knowns, and the unknowns—and then size up the odds of success against those of failure.

I may have *been* a damn fool in a few instances, but I wasn't just trying to be a damn fool! I was trying to succeed without destroying myself in the doing. And so must you! As professional officers you must prepare yourselves by constantly studying what Professor John Keegan has labeled the "faces of battle."

Sacrifice is noble—but it's not logistically sound. General Patton said it well when he advised his command not to sacrifice themselves; but rather, to get the other guy "to die for *his* country." Learn how to assess risks; get to know well the face of battles you may be required to fight . . . avoid needless risk and sacrifice. For, as Keegan says (and I believe), a serious assessment of the various faces of battle will help avert the onset of disabling fear and panic—and help you succeed, even in the most difficult and terrifying circumstances.

Who knows—someday somebody may refer to *you* at age eighty-six as the master of the "calculated risk"!

ian at West Point

Doolittle and USMA Superintendent Maj. Gen. Willard W. Scott share an anecdote at the reception prior to the Sylvanus Thayer Award ceremony. In his introduction, Scott recalled the legendary Doolittle raid.

Never sell short the importance of first-class equipment. Élan is important—but it will not long sustain a second-class force. You must have good equipment—well designed, well maintained, and reliably supported. It is a sham and a delusion to think you can do your job with low-cost, low-quality equipment that is no match for the modern equipment you may have to face.

Technology is running ahead at unbelievable speed—our space programs have spawned incredible advances; our communication capabilities are expanding by leaps and bounds; our computational ability is phenomenal. You must stay abreast of change and opportunity—you cannot leave the technology of weapons development to others.

You must not only master the use and application of your weapons—you must contribute wisely to their selection. Know well the lessons of history—and how to exploit effectively the achievements of our science and technology. Develop well your skills in selecting, recommending, and advocating future force structures and capabilities that will keep our nation "second to none."

And, through it all, I urge you to respect and honor the unique democratic imperatives of our magnificent political structure—to accept the considered decisions and policy directions of our national command authorities—to obey, to honor, to serve. To keep faith with the 150-year-legacy of Sylvanus Thayer, the "Father of the Military Academy," whose name and achievements have been memorialized by this Award that you have so generously given me today.

Joe Doolittle and I are proud that our son, John, is one of you, for you of West Point's Long Gray Line are timeless. You are fellow adventurers in a noble profession that is without age, without season, without wither.

You are of the committed few—invaluable, indispensable—the nucleus of America's fighting forces, constantly preparing to be better at your profession, more proficient with your equipment, than anyone who would challenge you.

Yours is the enviable opportunity to inherit the stirring creed, so poignantly expressed on this occasion, twenty-one years ago, by General of the Army Douglas MacArthur:

> Duty, Honor, Country . . . dictating what you ought to be . . . can be . . . will be.

As I face you today, I see only the current links in the unbroken chain of professional integrity and loyal service to our nation—I can see neither the first link nor the last one. A fellow pilot, Richard Bach, has said it well:

> You have no birthday, because you have always lived; you were never born, and never will die. You are not the child of the people you call mother and father . . . but their fellow-adventurer on a bright journey to understand the things that are.

I envy you the prospect of a generation of unparalleled discovery, development, and achievement . . . it promises to be a "bright journey" indeed!

I envy the exciting prospects I foresee in your generation to achieve real, meaningful arms limitation and reduction agreements. I hope that you can help create stable circumstances that will ameliorate nuclear tensions—and avoid serious threats to our volatile world peace.

I envy your youth—and the exciting opportunities you have for your journey into the twenty-first century.

I thank you for this great professional honor you of West Point have given me—a militiaman!

I salute you of the Corps.

And I ask God to bless you and keep his hand on you throughout your march in the Long Gray Line. ■

Captivated by Doolittle, the cadets queued up to shake his hand and get his autograph. Here he poses proudly with, left to right, Chris Smith, Susan DeBenedictis, Jeff Erickson, and Cathy Kulpa.

One-Man Air Force

The odds against fighter pilot Jim Howard were thirty to one when he took on the Luftwaffe's best—and won.

BY JOHN L. FRISBEE

WHEN James H. Howard arrived in China with Claire Chennault's American Volunteer Group (AVG), it was a homecoming of sorts. He had been born in China, where his father was an eye surgeon with the Rockefeller Foundation's hospital at Peking. Young Jim's fourteen youthful years in the Far East were climaxed by an encounter with bandits while on a hunting trip with his father. Dr. Howard was captured and held prisoner for ten weeks, but Jim, riding in another car, escaped.

Back in the States, young Howard graduated from Pomona College in California, became a Naval aviator assigned to Fighting Squadron 6 aboard the USS *Enterprise*, then resigned his commission in late 1941 to join Chennault. During the AVG's brief existence, Howard shot down six Japanese planes and was himself downed once by ground fire, again escaping capture by the skin of his teeth.

Lt. Col. James Howard is shown here with his crew chief and his P-51B, Ding Hao!, *at Boxted Aerodrome, England, in March 1944.*

The AVG was disbanded in July 1942 to be succeeded by the Fourteenth Air Force, and Jim Howard returned to the States to recuperate from dengue fever. A few months later, he was back in uniform, a captain in the AAF, assigned to the 354th Fighter Group as one of its two combat veterans. In the fall of 1943, the group moved to Boxted, England, and became the first AAF unit in the European theater to be equipped with long-range P-51 Mustangs. Although the 354th belonged to Ninth Air Force, it was under the operational control of VIII Fighter Command. Its job: long-range escort of Eighth Air Force B-17s and B-24s.

Less than two months after the 354th started flying escort, Jim Howard put on what retired Gen. T. R. Milton, then a lieutenant colonel assigned to the 91st Bombardment Group, describes as the greatest display of combat flying he witnessed during two tours in Eighth Air Force B-17s.

On January 11, 1944, the Eighth sent three bombardment divisions against aircraft factories in the Brunswick area. While they were climbing up through 25,000 feet of solid overcast, the weather turned sour in England and the mission was recalled. The 1st Division, however, continued on toward its target at Oschersleben, about 100 miles southwest of Berlin, escorted by fifty of the 354th Fighter Group's P-51s, led by Maj. Jim Howard.

As the division, now in clear weather, approached its target, it came under exceptionally heavy attack by crack Luftwaffe day and night fighters concentrated for the defense of Berlin. Major Howard released squadrons and flights of his P-51s to defend the bomber stream while he climbed to meet attacks against the lead box of bombers. He immediately shot down a twin-engine Messerschmitt Bf 110 night fighter. After that initial engagement, he found himself alone, confronted by some thirty Luftwaffe fighters whose attacks were centered on the 401st Bombardment Group.

Rather than waiting to reassemble some of his P-51s, Major Howard took on the swarm of Bf 109s, Fw 190s, and Bf 110s single-handed. In a violent, exhausting, climbing-diving melee that lasted for thirty minutes, he shot down three enemy aircraft, scored one probable, and damaged at least two others. Howard continued the fight until he was out of ammunition, then broke up enemy attacks on the bombers by diving at incoming fighters until his fuel was dangerously low and there were no more bandits in sight. By that time, the 401st had bombed its target successfully and had begun the long return flight to England. Not one of the group's B-17s was lost during Jim Howard's epic battle against overwhelming odds.

When Howard landed at Boxted, there was one bullet hole in the wing of *Ding Hao!*, his P-51, and that a stray .50-caliber from one of the B-17s.

The 401st Bombardment Group, whose crews were astounded by the skill and heroism of the "One-Man Air Force" who had defended them, finally ran down his identity and sent to Washington a recommendation for award of the Medal of Honor. Gen. "Tooey" Spaatz, Commander of US Strategic Air Forces in Europe, presented the medal to Jim Howard, the only fighter pilot in the European theater to be so honored.

Howard, an ace in China and again in Europe, later commanded the 354th, which led all fighter groups in the ETO with 701 aerial victories. After the war, the tall, quiet double ace formed his own research organization, later merged with Control Data. He remained in the Air Force Reserve, retiring as a brigadier general in 1966, and now lives in Florida. ■

THE BULLETIN BOARD

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

Role of Military Women Reaffirmed

Recent media reports have, in some instances, contributed to a false impression that the role of women in today's military is being diminished. Defense Secretary Caspar Weinberger emphatically denied this recently.

"It is the policy of this department," he said, "that women will be provided full and equal opportunity with men to pursue appropriate careers in the military services for which they can qualify. This means that military women can and should be utilized in all roles except those explicitly prohibited by combat exclusion statutes and related policy." In a clarifying memo he stressed that the "combat exclusion" rules should be "interpreted so as to keep as many career opportunities as possible open for women."

Since 1972 the percentage of women on active duty has risen steadily from 1.9 percent of the total force to today's almost nine percent. The Air Force is far and away the largest contributor to this—just over eleven percent of the total Air Force is female. The Marine Corps lags furthest in this regard, with but 4.4 percent of its force women. The Navy is just a little under the DoD-wide average, although it is quick to point out that it plans to double the opportunity for its enlisted women to serve at sea in the next two years.

Selective Service System Seeks Awareness

The degree of compliance by new eighteen-year-olds with the law requiring that they register with the Selective Service System is heartening to officials who note that more than 10,000,000 have registered since the program began in 1980.

Concurrently, however, there is mounting concern that because almost 2,000,000 eligibles turn eighteen each year there may be a tendency, over time, to lose awareness.

Consequently, Selective Service System officials are taking action on a broad front to ensure that public awareness of this law remains high. For starters, they have prepared a wealth of posters, flyers (suitable for insertion by companies in bill mailings), informational brochures, public service ads available to groups with newsletters or magazines, and speakers-bureau support for groups holding meetings.

The whole idea is to get parents, teachers, relatives, and, in fact, anyone who knows a young man about to turn eighteen to be aware and to pass on the knowledge that the law does require registration. As an added bit of information, Selective Service notes that everyone concerned should also be aware that registration is not a draft. Only Congress can institute a return to the draft.

In the meantime, registration, as a measure of preparedness, is a law that all who are affected must obey. Any person or group who would like information on how to obtain awareness material is encouraged to write to Selective Service System Headquarters, Washington, D. C. 20435.

Col. Philip F. Sears, USAF (Ret.), President of the National Association of Former OSI Special Agents, recently presented a $700 check to the Air Force Assistance Fund to be used to support the Enlisted Men's Widows Home at Fort Walton Beach, Fla. The donation was accepted on behalf of the Air Force by Maj. Gen. Robert D. Springer, left, Commander of the Air Force Manpower and Personnel Center, Randolph AFB, Tex. (USAF photo by George Harlan)

Quality of Air Force Life Evaluated

In the latest of a continuing series of surveys on quality of life conducted at worldwide Air Force locations since 1975, the troops have voted the accounting and finance function as the highest rated "satisfaction area."

This is the first time the pay people have ranked this high, and they are understandably proud of the distinction. Brig. Gen. D. Lynn Rans, Commander of the Air Force Accounting and Finance Center, said, "I'm especially proud of the fact that we not only scored the highest in the states but also overseas. We know some installations in remote areas around the world have a tough time dealing with pay problems."

Twenty-four service areas were rated, including exchanges, commis-

saries, on- and off-base educational facilities, legal services, and others that make up support for the Air Force "community" and contribute to the perception of quality of life. Members were asked to rate what they like and dislike about Air Force life. Just over 24,000 responses went into this year's evaluation.

General Rans summed up the AFAFC satisfaction rating by remarking that "it has been a top priority within the last few years to stop the problems here at the Center before they're exported to the field. The hard work is paying off."

CCAF Now the Largest

Air Training Command's Community College of the Air Force is now the largest multicampus junior, technical, or community college in the nation. A multicampus college is defined as a single college with college-wide accreditation but operating from more than one major campus. CCAF is accredited by the College Commission of the Southern Association of Colleges and Schools. Latest available statistics show that CCAF has a student body of 156,776, far and away ahead of the second such organization, which has a student head count of only 37,246.

The CCAF will award its 25,000th associate in applied science degree this month in ceremonies that virtually span the globe. One-third of the active-duty enlisted members in the Air Force and an increasing number of reservists are students or graduates of CCAF. The school has been a pioneer in efficiently focusing results of students' past academic and life experiences, along with current academic results and military technical training completion, into an integrated, accredited academic record.

Emergency Veterans Job Training Backed

President Reagan, with a public and enthusiastic endorsement given live coverage by all major television networks, has signed into law the Emergency Veterans Job Training Act of 1983, which will provide incentives to employers to hire and train veterans by providing subsidies to defray part of the cost of training. Eligibles under the program are Korean War or Vietnam veterans with at least six months of service who were discharged for a service-connected disability and who have been unemployed for at least fifteen of the twenty weeks immediately preceding application. Up to nine months of training are possible under the program. Employers participating must certify that they would employ the veteran after training, that wages paid during training would be comparable to existing practice, and that no current employee would be displaced. The VA would reimburse the employer fifty percent of the veteran's starting wage, up to a limit of $10,000.

Congressman G. V. "Sonny" Montgomery (D-Miss.), Chairman of the House Committee on Veterans Affairs, praised both the President for signing the legislation and Rep. Marvin Leath (D-Tex.), who originally introduced the bill. Mr. Montgomery went on to urge his colleagues to move speedily to provide the $150 million needed to fund the program in its first year. He said it would be "tragic if the full implementation of this bill is delayed. Therefore, I am asking the President for his continued support as we show our nation's veterans that we are serious about putting them back to work." Noting that the Administration must ask for the funds in a supplemental request, the Chairman said, "I want to make sure the money is there when this program is ready to roll."

Any veteran or employer interested in participating in the job-training program should contact the nearest VA office or local Public Job Service Office.

New Florida Veterans Cemetery

The Withlacoochee State Forest in Central Florida will be the site of a new National Cemetery, VA officials have announced. A 400-acre tract within the state forest, forty miles equidistant from Orlando, Ocala, and Tampa, has been donated by the state of Florida and is expected to provide grave space for some 250,000 eligibles. Planning has already begun on design and a 1988 opening is scheduled.

Currently there are 108 national cemeteries. Recently, Congress asked the VA for an update on the status of this 121-year-old tradition of providing grave space for those who served in the armed forces. VA's reply contained these key points:

- Some 230,000 gravesites are currently available in developed cemeteries; another 3,500,000 are potentially available.
- Fifty-six of the 108 are open to new interments, and forty-three are

USAFA Cadet Research Pays Off

Cadet 1st Class Stephen J. Wacker, a USAFA senior, spent six weeks this past summer with the 1843d Engineering Installation Group, Wheeler AFB, Hawaii. Each summer the Academy picks its top students for a six-week TDY to work on a summer research project specializing in their major. Cadet Wacker, an electrical engineering major, carries a 3.89 grade point average and is a member of the Air Force Academy's Dean's List. Cadet Wacker accomplished several radio frequency interference studies. In particular, he measured and recorded the power levels and radio frequencies on top of Mt. Kaala, Hawaii, 4,019 feet above sea level. His research resulted in various changes to existing data maintained by the PACAF frequency manager at Hickam AFB, Hawaii. The new information will add immensely in planning future systems and will ensure that present radio operations do not cause mutual interference.

Cadet Wacker tracks radio interference. (USAF photo by Sgt. Douglas Harriman)

expected to remain open for burials beyond the year 2000.

- Last year, 41,422 veterans used this benefit.
- The VA has achieved its objective of providing one large open national cemetery in each of the ten standard federal regions, plus one for Washington, D. C.
- State cemetery designation of veterans areas—financed in part by matching federal funds—is a growing program and will serve admirably to complement the national cemeteries. Six states have made significant advances in this area.

Interment in a national cemetery is available to veterans discharged under conditions other than dishonorable. Also eligible, under certain guidelines, are a veteran's spouse and minor children. The VA also furnishes headstones and markers, an American flag, and a memorial certificate bearing the signature of the President.

Airmen Become Movie Stars

For four days recently, a commercial film crew changed Air Force technicians at Scott AFB, Ill., and the Lambert-St. Louis ANG Base into movie stars.

The movie is about Air Force communications, air traffic control, and data automation services. The technicians used in the scenes were active-duty and ANG members of the Air Force Communications Command just doing their jobs *(see photo).*

Titled "Reins of Command," the film is being produced by the Defense Audiovisual Agency and will be distributed early next year. Viewers of the twenty-five-minute film will see Air Force communications from the "customer's" perspective. The film examines AFCC services in supporting aircraft operations, supply and logistics, and the multitude of organizations served by base telecommunications centers, telephone systems, and the automatic voice and digital networks.

THE BULLETIN BOARD

Safer in the Armed Forces

In an unusual study, a private research firm—the Metropolitan Life Foundation—has concluded that wearing Air Force blue, Army green, or Navy blue may color one's chances of living longer.

With the obvious exception of combat situations, the study concluded that the medical screening afforded military applicants and the high standard of physical fitness required in service make the male military population measurably likelier to live longer than a comparable civilian group.

During the time period of the study, for example, the overall death rate among men in the US armed services was about three-fifths the death rate among males in the general population. Air Force types enjoyed even more favorable mortality rates. These findings were sustained across several different age ranges. One exception—military mortalities from accidents—were generally somewhat higher than the rates for men in the general population. Accident mortality was highest under age thirty with a subsequent decline until age fifty when an upturn occurred.

While women were included in the study, the relatively small proportion of them in the services precluded drawing any valid conclusions.

Short Bursts

Out of the 2,099,000 active-duty military men and women, a little more than half are **married.** These families have a total of about 1,500,000 children. Any of these military families interested in receiving a **newsletter written specifically for them** can get a free copy and more information by writing Armed Services Department, YMCA, 101 N. Wacker Dr., Chicago, Ill. 60606. Ask for *Military Family Life.*

The VA notes that it takes two years of active duty, for those entering service after 1980, to **qualify for veterans benefits.** Exceptions are made for those discharged because of service-connected disabilities. In that regard, there is no deadline for filing a claim for a service-related illness or injury, if such connection can be proven. Best bet is to file upon discharge if you believe there is any possibility at all of later trouble.

Cadet James A. Kelly of MIT was recently named by Hq. AFROTC as the **most outstanding AFROTC pilot candidate** in the nation. The designation was in connection with an annual award by a civilian organization. In other AFROTC news, the Air Force is urging qualified colonels to sign up for an ROTC instructor tour beginning in summer of 1984. Openings are nationwide. CBPOs have details.

Air Force **Secretary Verne Orr** is talking up the Air Force **suggestion program.** He enjoined all supervisors recently to keep "an open mind" in reviewing suggestions. He emphasized that "the interest and support of managers and supervisors sets the climate that either encourages or discourages individuals with money-saving ideas." The Secretary wants aggressive support of the program, he noted, since "more than $200 million was saved in the last two years by adoption of Air Force suggestions."

The Air Force has racked up 100 percent of its 1983 **physician recruiting goal,** the first time this has happened since 1972. The total number required—fifty—while small, is critical to the success of the Air Force health-care program.

US Education Secretary T. H. Bell is asking his fellow Cabinet members to help him recover more than $65 million in **defaulted student loans** by dunning active and retired federal employees. For example, he notes, some 17,000 Civil Service employees still owe about $24 million; just over 500 CS retirees owe about $745,000; almost 15,000 active military members owe more than $17 million; and 4,690 military retirees are behind about $5 million.

President Reagan minced no words recently in addressing the MIA/POW issue. He said, "We are determined to

A commercial film crew catches in action members of the 239th Combat Communications Squadron, Missouri Air National Guard, while they make adjustments to their TRN-26 Tactical Air Navigation System as the C-140 facility checking aircraft of the 1866th Facility Checking Squadron at Scott AFB, Ill., passes over to monitor the transmissions. See item. (USAF photo by Maj. Carl F. Freeman)



Lt. Gen. Lawrence A. Skantze, left, DCS/RD&A, Hq. USAF, has been nominated for promotion to general and will succeed Gen. Jerome F. O'Malley, center, as the Vice Chief of Staff of the Air Force. General O'Malley has been assigned as Commander in Chief of Pacific Air Forces, replacing retired Lt. Gen. Arnold W. Braswell. Lt. Gen. Robert D. Russ, right, who has been serving as special assistant to General O'Malley, will succeed General Skantze as DCS/RD&A.

account for every serviceman who wore America's uniform in Southeast Asia. This Administration will not forget their sacrifice, and we will not rest until their families can rest."

Speaking of POWs, the VA sends a reminder that any POW who was interned for at least six months, in any war, is **entitled to dental benefits.** See any VA office for details.

A recent survey points up that fifty-eight percent of all civilian employees now make up the **difference between military and civilian pay** to reservists who take military training. Encouragingly, this is a rising trend. ■

SENIOR STAFF CHANGES

RETIREMENTS: B/G Jerome R. **Barnes,** Jr.; M/G Philip J. **Conley,** Jr.; B/G Melbourne **Kimsey;** B/G John R. **Lasater;** B/G William M. **Shaw,** Jr.

CHANGES: B/G Philippe O. Bouchard, from Cmdr., Rome ADC, AFSC, Griffiss AFB, N. Y., to DCS/Science & Technology, Hq. AFSC, Andrews AFB, Md., replacing M/G Brien D. Ward . . . **B/G Milford E. Davis,** from Cmdr., USAF Air Def. Weapons Ctr., TAC, Tyndall AFB, Fla., to Dep. Cmdr., Canadian NORAD Region, North Bay, Ont., Canada, replacing B/G David H. Williams, Jr. . . . **B/G Donald R. Delauter,** from DCS/Support, 4ATAF, Heidelberg, Germany, to Cmdr., 23d AD, TAC, Tyndall AFB, Fla., replacing B/G Charles A. Horner . . . **B/G Winfield S. Harpe,** from Cmdr., USAF Recruiting Service, & DCS for Recruiting, Hq. ATC, Randolph AFB, Tex., to DCS/Tech. Training, Hq. ATC, Randolph AFB, Tex., replacing M/G Thomas J. Hickey.

M/G Thomas J. Hickey, from DCS/Tech. Training, Hq. ATC, Randolph AFB, Tex., to Cmdr., Keesler TTC, ATC, Keesler AFB, Miss., replacing M/G Thomas C. Richards . . . **B/G Charles A. Horner,** from Cmdr., 23d AD, TAC, Tyndall AFB, Fla., to Cmdr., USAF Air Def. Weapons Ctr., TAC, Tyndall AFB, Fla., replacing B/G Milford E. Davis . . . **Col. (B/G selectee) Willard L. Meader,** from Command Surgeon, Hq. PACAF, Hickam AFB, Hawaii, to Command Surgeon, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **B/G Donald C. Metz,** from DCS/Personnel, Hq. ATC, Randolph AFB, Tex., to DCS/Personnel, Hq. AFLC, Wright-Patterson AFB, Ohio.

M/G Milton R. Peterson, from Dep. Dir., DLA, Cameron Station, Va., to Ass't DCS/L&E, Hq. USAF, Washington, D. C., replacing retired M/G Theodore D. Broadwater . . . **Col. (B/G selectee) Robert R. Rankine, Jr.,** from Dep. Dir., Space Sys. & C^3, DCS/RD&A, Hq. USAF, Washington, D. C., to Dep. & Ass't for Directed Energy Weapons, OSD, Washington, D. C., replacing M/G Donald L. Lamberson . . . **M/G Thomas C. Richards,** from Cmdr., Keesler TTC, ATC, Keesler AFB, Miss., to Vice Cmdr., 8th AF, SAC, Barksdale AFB, La., replacing M/G Walter C. Schrupp . . . **B/G Robert L. Rutherford,** from Vice Cmdr., Hq. AFMPC, & Dep. Ass't DCS/M&P for Mil. Personnel, Randolph AFB, Tex., to Cmdr., USAF Recruiting Service, & DCS/Recruiting, Hq. ATC, Randolph AFB, Tex., replacing B/G Winfield S. Harpe.

M/G Walter C. Schrupp, from Vice Cmdr., 8th AF, SAC, Barksdale AFB, La., to DCS, Hq. PACOM, Camp Smith, Hawaii, replacing M/G Robert E. Messerli . . . **B/G Thomas G. Tobin,** from Cmdr., 45th AD, SAC, Pease AFB, N. H., to US DCS/LIVE OAK, SHAPE, Mons, Belgium, replacing retired B/G Jerome R. Barnes, Jr. . . . **M/G Brien D. Ward,** from DCS/Science & Technology, Hq. AFSC, Andrews AFB, Md., to Vice Cmdr., ESD, AFSC, Hanscom AFB, Mass., replacing retired M/G Philip J. Conley, Jr. . . . **B/G David H. Williams, Jr.,** from Dep. Cmdr., Canadian NORAD Region, North Bay, Ont., Canada, to DCS/T&E, Hq. AFSC, Andrews AFB, Md., replacing M/G William T. Twinting. ■

This Is AFA

The Air Force Association is an independent, nonprofit, aerospace organization serving no personal, political, or commercial interests; established January 26, 1946; incorporated February 4, 1946.

OBJECTIVES: The Association provides an organization through which free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principle of freedom and equal rights for all mankind.

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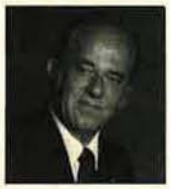

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AFA Intercom

Lt. Col. Gerald S. Venanzi, USAF, Principal Advisor for POW/MIA Affairs, OSD, addressed AFA's first Business Session.

The 1983 AFA National Convention—Celebrating Four Milestones

The 200th anniversary of manned flight, the seventy-fifth anniversary of military aircraft, the thirty-sixth anniversary of the US Air Force as a separate service, and AFA's thirty-seventh birthday—together, these made up the theme of the 1983 Air Force Association National Convention.

The planned appearance of the Wright "B" Flyer look-alike at AFA's National Convention had to be canceled because of transportation problems encountered by Wright "B" Flyer Inc., owner of the experimental craft. The truck that was to bring the disassembled Flyer from Dayton, Ohio, to Washington, D. C., required modifications to protect the fragile craft en route. In August, AFA learned that the work could not be completed in time.

Membership Awards

Other milestones were celebrated as well. Following preconvention meetings of AFA's Executive Committee and National Board of Directors, Sunday evening saw the first official convention event—the Membership Awards and Delegate Reception, held in the Cotillion Room of the Sheraton Washington Hotel.

During opening remarks, AFA National President David L. Blankenship and Membership Committee Chairman James M. McCoy alluded to AFA's having passed the 200,000-member mark. Also, earlier in the year, the 10,000th Life Member had signed up. In fact, with National Vice President Thomas J. Hanlon of AFA's Northeast Region handing in his application and check at the Board meeting, there were 12,556 Life Members of the Association.

Membership awards, earned under

AFA President David L. Blankenship, right, presented a Special Award to Arthur L. Littman in recognition of his distinguished leadership at the chapter, state, and national levels.

new, two-phase criteria designed to emphasize both new member recruitment and retention, were presented to two regions, fifteen state organizations, and seventy-nine chapters. *(See box, p. 138.)*

Opening Ceremonies

It was obvious that Convention attendance was up across the board during the Monday morning Opening Ceremonies and Award presentations. Sheraton Hall was filled to standing-room-only capacity for this stellar event. The invocation and memorial tribute *(see box, p. 135)* were rendered by the Rev. Richard Carr, AFA National Chaplain and the retired Chief of Air Force Chaplains. Featuring a prayer approved by Gen. H. H. "Hap" Arnold in 1943, the memorial saluted aerospace and AFA leaders who died during the past year. The memorial also included a multi-media presentation titled "Why an American Warrior?", introduced by Maj. Gen. Harold J. M. "Mac" Williams, USAF. This Strategic Air Command contribution to the Air Force's Project Warrior was rewarded by a standing ovation.

National President David L. Blankenship, aided by Chairman of the Board Judge John G. Brosky and several senior Air Force officials, presented sixty-

Spouse Activity Program

With deep gratitude AFA acknowledges the support of the following companies who participated in the Spouse Activity Program.

Avco Corp.
Beech Aircraft Corp.
Bendix Corp.
E-Systems, Inc.
Fairchild Republic Co.
Ford Aerospace & Communications Corp.
General Dynamics Corp.
Hughes Aircraft Co.
Lockheed Corp.
Magnavox Government & Industrial Co.
Martin Marietta Aerospace
McDonnell Douglas Corp.
Motorola Inc.
United Technologies
Vought Corp.
Westinghouse Corp.
Williams International

THE WHITE HOUSE

WASHINGTON

September 9, 1983

I welcome the opportunity to extend my warm greetings to members of the Air Force Association as you gather in the Nation's Capital for your National Convention.

Your efforts at the grass roots level of our national life and your constant encouragement of the fine men and women who serve this country in uniform have contributed in important ways to an ever-increasing belief among the American people that our precious freedoms, values, traditions, institutions, and, indeed, our very future are worth insuring through a strong, credible military capability.

As a charter member of the Association, I can appreciate the nostalgia your convention themes evoke, celebrating as they do the Diamond Anniversary of military aircraft, the bicentennial of manned flight, and the Thirty-sixth Anniversary of the United States Air Force.

I am very familiar with the "early birds" -- beginning with the Wright B Flyer -- which served us so gallantly during the World Wars and the pioneer strategists and aviators who helped us span the difficult years in the early development of America's aerospace progress. When we think of how far we have come since Orville Wright's test flights in Fort Myer, Virginia, in 1908, we can be immensely proud of the vision, ingenuity, and creativity of the people of this nation as well as their amazing accomplishments in support of peace and freedom throughout the past seventy-five years.

As Commander-in-Chief, I realize that the decisions we make today will have a vital bearing on the security of the United States in the years ahead. I know I can rely on the Air Force Association to help me do what must be done to secure our future.

You have my best wishes for a most enjoyable and successful convention.

Ronald Reagan

Illinois State AFA President Richard H. Becker was named AFA's Man of the Year for 1983. Mr. Becker, center, accepted congratulations from Lt. Gen. Jimmy Doolittle, USAF (Ret.), left, as AFA President David L. Blankenship presented the Man of the Year plaque.

Connecticut's Charles A. Lindbergh Chapter received AFA's Donald W. Steele, Sr., Memorial Award as the AFA Unit of the Year. Chapter President Alton G. Hudson, center, accepted the award plaque from AFA President David L. Blankenship, right, and congratulations from Lt. Gen. Jimmy Doolittle, USAF (Ret.).

four awards to individuals and units of the Air Force Association and the Air Force *(see box p. 137).* Past AFA Man of the Year honorees and this year's Exceptional Service Award and Medal of Merit winners were recognized, as were AFA's 200,000th member, SMSgt. Walter M. Kail, USAF (Ret.), of Fort Wayne, Ind., and 10,000th Life Member, SMSgt. Donald R. Pennington, USAF (Ret.), of Upper Marlboro, Mass. Sergeants Kail and Pennington were guests of honor at the convention.

An AFA Special Award went to Arthur L. Littman in recognition of long-term service to AFA in a variety of local, state, and national positions. AFA's two top activity awards, the Donald W. Steele, Sr., Unit of the Year Memorial Award and the Man of the Year Award, were presented—with the assistance of Lt. Gen. James H. "Jimmy" Doolittle, USAF (Ret.)—to Connecticut's Charles A. Lindbergh Chapter and Richard H. Becker, respectively *(see photos).*

Business Sessions

Three hundred and seventy-six registered delegates representing forty-four states, the District of Columbia, and the Territory of Guam—the largest convention delegation ever—unanimously adopted AFA's 1983–84 Statement of Policy *(see p. 68),* and two position papers: "Force Modernization and R&D" *(see p. 75),* and "Defense Manpower Issues" *(see p. 89).* These documents set the direction for AFA support and action for the year ahead.

The convention delegates, advisory councils, and many others who joined the group had a special treat when Secretary of Defense Caspar W. Weinberger addressed the business session. *(See p. 98 for coverage of the Secretary's presentation.)*

Delegates amended AFA's National Constitution and By-Laws in several significant areas and thereby endorsed previous adoptive actions of the Board of Directors. Included in these actions were an expansion from four to six Under-40 National Directors to serve on the National Board; a change in the structure of the Nominating Committee, adjusting its size to twenty-nine members from the previous 122; and approval of increased dues, effective January 1, 1984, to $42 for a three-year membership and $250 for a Life Membership.

Election of Officers

The incumbent National Officers were unanimously reelected. They in-

Named in Memorial Tribute

These are the names of the USAF and AFA leaders and supporters and aviation pioneers who died during the last year: Maj. Gen. Harry G. **Armstrong,** USAF (Ret.); J. Raymond **Bell;** Casper S. **Bierman;** Tallmadge L. **Boyd;** Maj. Gen. Richard F. **Carmichael,** USAF (Ret.); Mrs. Charles **Church;** Maj. Gen. Cecil E. **Combs,** USAF (Ret.); Brig. Gen. John R. **Copenhaver,** USAF (Ret.); Col. James **Craig,** USAF (Ret.); Geoffrey Russell **Dimmick;** Boyd **Edwards;** Arthur **Godfrey;** James P. **Goode;** Brig. Gen. John S. **Gulledge,** USAF (Ret.); Maj. Gen. Albert F. **Hegenberger,** USAF (Ret.); William **Hollochek;** Brig. Gen. Joseph S. **Hoover,** USAF (Ret.); Mrs. Lucille T. **Johnson;** CMSgt. Richard J. **Kapitz,** USAF; Larry A. **Kocher;** 2d Lt. Thomas C. **Lennep,** Jr., USAF; CMSgt. Elmer H. **Long,** USAF; Brig. Gen. Monro **MacCloskey,** USAF (Ret.); Ed **McElhenny,** Sr.; Robert T. **McLean;** Maj. Gen. Rollin B. **Moore, Jr.,** USAF (Ret.); Col. F. Clarke **Newlon,** USAF (Ret.); CMSgt. Chester J. **Pepek,** Jr., USAF; Maj. Gen. James F. **Powell,** USAF (Ret.); Gen. Maurice A. **Preston,** USAF (Ret.); Col. Vincent **Puglisi,** USAF (Ret.); Mrs. Muriel **Rawlings;** John H. **Richardson;** Mrs. Louise **Roth;** CMSgt. Leroy W. **Strickland,** USAF; Maj. Gen. Kingston E. **Tibbetts,** USAF (Ret.); Lt. Gen. William H. **Tunner,** USAF (Ret.); Brig. Gen. Felix L. **Vidal,** USAF (Ret.); Orland "Jack" **Wages;** Maj. Gen. Beverly H. **Warren,** USAF (Ret.); Dr. George L. **Washington;** Brig. Gen. James V. G. **Wilson,** USAF (Ret.); CMSgt. John P. **Woodcock,** USAF; Brig. Gen. Don Z. **Zimmerman,** USAF (Ret.).

Air Force Association's 1983 Activity Awards

UNIT RECIPIENTS

Donald W. Steele, Sr., Memorial Award
AFA Unit of the Year

Charles A. Lindbergh Chapter, Connecticut

Outstanding State Organization

Florida State Organization

Outstanding Chapters

Chicagoland-O'Hare Chapter, Illinois (more than 900 members)
Anchorage Chapter, Alaska (401–900 members)
Cleveland Chapter, Ohio (151–400 members)

Exceptional Service Awards

San Bernardino Area Chapter, California (Aerospace Education)
Eglin Chapter, Florida (Best Single Program)
General Robert F. Travis Chapter, California (Communications)
Tacoma Chapter, Washington (Community Relations)
Scott Memorial Chapter, Illinois (Overall Programming)

clude President David L. Blankenship, Chairman of the Board John G. Brosky, Secretary Sherman W. Wilkins, and Treasurer George H. Chabbott.

President Blankenship is an aerospace industry executive who received his bachelor's degree in economics from the University of Tulsa in 1955, where he also did graduate work in industrial psychology. Following college, he was commissioned in USAF, serving four years as a pilot with assignments in TAC, SAC, and ATC.

Mr. Blankenship's civic activities have included service on the Board of Directors of the Oklahoma Chamber of Commerce; Board of Directors, National Conference of Christians and Jews; Advisory Board of the Tulsa Urban League's Business Development Center; Tulsa Public School's Vocational Advisory Council; and the Executive Board of the Indian Nations Council of Boy Scouts of America. In 1967, he was selected as one of the Outstanding Young Men in America.

In addition to serving AFA as National President, Mr. Blankenship has served as Chairman of the Association's Executive Committee and as a Trustee of the Aerospace Education Foundation. He has served as a member of the Board of Directors, as Chairman of the Association's Membership Committee, as a member of the Organizational Advisory Council, and as a State and Chapter President. He is an AFA Life Member.

Chairman of the Board John G. Brosky lives in Pittsburgh, Pa., where he is a judge on the Superior Court of Pennsylvania. During World War II he served in the South Pacific as an artillery captain. He retired from the Air Force as a brigadier general, and is now a retired major general of the Pennsylvania Air National Guard. He is a graduate of the University of Pittsburgh and its law school and is an Outstanding Letterman of Distinction at the university.

A Past President of the Pennsylvania National Guard Association, Judge Brosky has also served as President of the Pennsylvania Disabled American Veterans and as Scholarship Chairman for the National Football Hall of Fame. A former aviation writer, he has also been active in many other national and civic organizations.

Judge Brosky, in addition to serving AFA as Chairman of the Board, has served as Vice Chairman of the Executive Committee. Besides service as National President and as a member of the Board of Directors, he has served as National Vice President (Northeast Region), State President, and President, Vice President, and Secretary at the Chapter level. He was honored as Pennsylvania State Man of the Year in 1972. He is a Trustee of the Aerospace Education Foundation, a Jimmy Doolittle Fellow, and an Ira C. Eaker Fellow. He is a Life Member of AFA.

AFA National Secretary Sherman W. Wilkins is a retired aerospace industry executive from Bellevue, Wash. An alumnus of the University of Connecticut and George Washington University, he is a graduate of the Army Command and Staff College and the Air War College. His active-duty career spanned nearly twenty-eight years before his retirement in 1968 as a colonel. He served during World War II, the Korean War, and the Vietnam War. He has received decorations including the Legion of Merit, the Distinguished Flying Cross, and the Air Medal.

Mr. Wilkins is an active participant in civic affairs. He has served on the Seattle Chamber of Commerce, worked with the Pacific Air Museum, and is currently serving as a Trustee of the Air Force Historical Foundation.

In addition to serving as National Secretary, Mr. Wilkins has served as a member of the Executive Committee and Chairman of the Resolutions Committee. He has also served AFA as a member of the Board of Directors, National Vice President (Northwest Region), and Chapter President. He is a Trustee of the Aerospace Education Foundation, a Jimmy Doolittle Fellow, and a Life Member of AFA.

AFA National Treasurer George H. Chabbott of Dover, Del., is a management consultant and real estate counselor. He served in the Air Force for twenty-three years, retiring as a colonel in 1973. He participated in fifty combat missions, flying B-26s in Korea, and flew 100 combat missions as a Forward Air Controller during the Vietnam War. A graduate of Utah State University, he attended senior-level finance courses at the Columbia School of Bank Administration and Management, and has been awarded the designation of Certified Commercial Investment Member (CCIM) by the National Real Estate Marketing Institute.

Mr. Chabbott has served as Chairman of the Finance Committee and as a member of the Executive Committee. He has also held the elective offices of National Director, National Vice President (Central East Region), and State President. This will be his third term as National Treasurer. Mr. Chabbott is an officer of the Aerospace Education Foundation's Finance Committee, and is an AFA Life Member.

National Vice Presidents

Twelve National Vice Presidents were elected by the delegates representing their respective regions. Five are serving in this capacity for the first time.

Air Force Association's 1983 Activity Awards

INDIVIDUAL RECIPIENTS

AFA Man of the Year

Richard H. Becker, Illinois

Special Award

Arthur L. Littman, California

Presidential Citations

Hugh L. Enyart, Illinois
James P. Grazioso, New Jersey
H. B. Henderson, Virginia
Alton G. Hudson, Connecticut
Gene Moneymaker, California
Gen. Edwin W. Rawlings, USAF (Ret.), Minnesota
Lyle O. Remde, Nebraska
John Sparks, Texas
George R. Weinbrenner, Texas
Dr. Gene Wood, Texas

Exceptional Service Awards

William J. Becker, Nevada
Jack Certain, Utah
Marion I. Chadwick, Florida
William S. Chairsell, Nevada
P. Kevin Clary, Illinois
Edward Dvorak, California
Ivan R. Frey, Virginia
Dan D. Fulgham, Texas
David Graham, California
Thomas J. Hanlon, New York
Col. Richard R. Hefton, USAF, Oklahoma
Thomas W. Henderson, Arizona
Mary V. Holub, Texas
Joseph W. Kellogg, Texas
Donald L. Krekelberg, Alabama
Arthur MacFadden, Tennessee
Robert G. McCullough, Texas
Maj. Gen. Edward L. McFarland, USAFR, Oklahoma
Peggy Mohler, Utah
Samuel B. Moody, Florida
Scott Norwood, California
Lester J. Rose, Virginia
William L. Ryon, Jr., Maryland
Nuel E. Sanders, Utah
Arnie Schweer, California
Joseph H. Turner, New Mexico
Morgan S. Tyler, Jr., Florida

Medals of Merit

Charles J. Adams, California
G. Douglas Adamson, Utah
George Aguirre, Jr., Virginia
Eric W. Alexander, Missouri
Joseph H. Allen, Jr., Delaware
Clarence Ball, Jr., Mississippi
Donald T. Beck, Florida
Clarence E. Becker, Nevada
Arthur F. Beyer, Texas
CMSgt. James Binnicker, USAF, Texas
Carl D. Black, Kentucky
Orville R. Blair, Missouri
Leo J. Bolster, Tennessee
Jo Brendel, Kentucky
Charles D. Briggs, Jr., Florida
David Broxterman, Nevada
David L. Bush, West Virginia
Elaine Y. Casteel, Texas
Danette Casey, Utah
Gerald S. Chapman, California
William T. Coleman, Florida
C. Gus Collis, Kentucky
Horace W. Cook, Delaware
Phillip J. Copeland, California
Leo L. Craig, Jr., Illinois
Col. Robert H. Custer, USAF, California
Don J. Daley, Hawaii
Frank H. Dawson, Jr., Tennessee
Robert L. Dodge, California
Col. Robert E. Dotson, USAFR (Ret.), California
L. Keith Dumas, Utah
Lt. Col. Ramon L. Echevarria, USAF (Ret.), New York
Joseph F. Ector, Jr., Texas
Robert H. Edwards, Jr., Virginia
George Estrella, California
Jack L. Fisher, California
James A. Flood, Sr., Delaware
Lt. Gen. John P. Flynn, USAF (Ret.), Texas
Robert R. Foster, Maryland
Thomas R. Fowler, Virginia
Raymond Francis, Virginia
Jerry Franklin, Utah
Billy K. Gaedke, Jr., New Mexico
Frank Gallagher, Texas
Robert W. Gates, Florida
Alfred J. Gillis, Delaware
Robert L. Gore, Nevada
Lt. Gen. Jack I. Gregory, USAF, Texas
Robert L. Griffin, California
Ronald W. Grobes, Connecticut
Joe Gyulavics, Guam
Bruce Hampel, Utah
Jim Haptonstall, Texas
Lee B. Harrington, Florida
Frederick W. Hassett, California
Roger M. Hayes, Colorado
Thomas Hilquist, Illinois
F. Thomas Hissem, Indiana
Charles E. Hoffman, Arkansas
George W. Jenson, Utah
Lt. Robert A. Kasprzak, USAF, New York
James S. Kendall, Louisiana
James M. Kennedy, Maryland
Louis C. Kriebel, Florida
Frank Kula, New Jersey
Curtis N. Lancaster, Utah
Shirley L. Lionberger, Texas
William Loomis, Florida
Capt. John Loucks, USAF, Colorado
John T. McCarthy, California
T. D. McCord, Jr., Indiana
Lt. Col. Russell C. Michelson, USAF, Nevada
Chester J. Milczarek, Texas
Carrol J. Moore, Illinois
Clement P. Moore, Virginia
Jack P. Murrell, Virginia
CMSgt. B. J. Nilsen, USAF, California
Wendell S. Norman, Tennessee
Bridget Porter, Florida
Maj. Diane Potter, USAF, Oklahoma
J. Edward Przybys, Arizona
Howard Rau, California
Dr. Bruce A. Reese, Tennessee
Boone Rose, Jr., Florida
John G. Rose, Florida
Janet A. Schenk, Tennessee
Jean P. Schobert, Illinois
CMSgt. Walter Scott, USAF (Ret.), California
Mary Ann Seibel, Missouri
Robert S. Seidel, Texas
Chaplain Joseph C. Sides, Florida
Richard P. Slabinski, Massachusetts
Maj. Edmund Slymen, USAF, California
Dale O. Smith, Nevada
William A. Solemene, Texas
Richard A. Staley, California
Herb Stone, California
William L. Stone, Michigan
Ann Marie Super, Connecticut
Carl Swing, California
Dr. Richard E. Thomas, Texas
Maj. Gen. James L. Tucker, Jr., USAFR, Texas
U. C. Urton, Nevada
Col. Charles A. Vickery, USAF, California
Ray S. Villareal, California
Charles E. White, Texas
Lee P. Webber, Guam
Harry H. Winning, Jr., Florida

Special Citations

Col. Donald R. Arnaiz, USAF, Virginia
Earl D. Clark, Jr., Kansas
Dr. James E. Crane, Connecticut
Capt. Terrence G. Crossey, USAF, California
Capt. William T. DeGroff, USAF, California
Jon R. Donnelly, Virginia
George M. Douglas, Colorado
John B. Flaig, Pennsylvania
James E. Hollopeter, California
Tillie Metzger, Pennsylvania
Nation's Capital Chapter, Washington, D.C.
122d Tactical Fighter Wing, Indiana ANG
Jack C. Price, Utah
Henry Reis El-Bara, Florida
Kenneth A. Rowe, Virginia
Hugh W. Stewart, Arizona
Joseph B. Tarlton, California

Storz Awards

North Dakota State AFA
Golden Triangle Chapter
James M. McCoy, Nebraska

They are Charles H. Church, Jr., Midwest Region; Victor R. Davis, Northwest Region; Richard C. Doom, Far West Region; Charles E. "Chuck" Hoffman, South Central Region; and Arley McQueen, New England Region.

Seven National Vice Presidents were reelected. They are Thomas J. Hanlon, Northeast Region; H. B. "Buzz" Henderson, Central East Region; Karen Kyritz, Rocky Mountain Region; Jan Laitos, North Central Region; Lee C. Lingelbach, Southeast Region; Howard C. Strand, Great Lakes Region; and Joseph H. Turner, Southwest Region.

Directors

Six new names were added to the Board of Directors. They are Richard H. Becker, Oak Brook, Ill.; R. L. Devoucoux, Portsmouth, N. H.; Frank M. Lugo, Mobile, Ala.; James M. McCoy, Bellevue, Neb.; Edward J. Monaghan, Anchorage, Alaska; and Edward A. Stearn, Redlands, Calif.

Twelve Board Members who were returned for an additional term are Thomas O. Bigger, Tullahoma, Tenn.; Jon R. Donnelly, Richmond, Va.; Joseph R. Falcone, Rockville, Conn.; E. F. "Sandy" Faust, San Antonio, Tex.; James P. Grazioso, West New York, N. J.; Francis L. Jones, Wichita Falls, Tex.; William V. McBride, San Antonio, Tex.; Ellis T. Nottingham, Jr., Arlington, Va.; William C. Rapp, Buffalo, N. Y.; J. Deane Sterrett, Beaver Falls, Pa.; James H. Taylor, Farmington, Utah; and Liston T. Taylor, Lompoc, Calif.

1983 AFA Membership Achievement Awards

AFA Membership Achievement Awards are presented to those AFA chapters, states, and regions that achieve certain new member and total membership goals as established by AFA's Membership Committee. The following units achieved these objectives for the year ending June 30, 1983. AFA salutes them as pacesetters in the important work to enlarge and strengthen the Association.

REGIONS

North Central
Southwest

STATE WINNERS

Arizona
Delaware
Idaho
Illinois
Indiana
Kansas
Maine
Maryland
Mississippi
Nebraska
New Jersey
New Mexico
North Dakota
Oklahoma
South Carolina

CHAPTER WINNERS

Abilene (Texas)
Air Capital (Kansas)
Airport Number One (Pennsylvania)
Ak-Sar-Ben (Nebraska)
Alamo (Texas)
Albuquerque (New Mexico)
Alexandria (Louisiana)
Andrews Area (Maryland)
Arc Light (Guam)
Austin (Texas)
Blytheville (Arkansas)
Big Sky (Montana)
Blue Barons (Colorado)
Carl Vinson Memorial (Georgia)
Central Oklahoma (Oklahoma)
Charles A. Lindbergh (Connecticut)
Charleston (South Carolina)
Chattanooga (Tennessee)
Chautauqua (New York)
Cheyenne (Wyoming)
Chicagoland-O'Hare (Illinois)
Chicopee (Massachusetts)
Cleveland (Ohio)
Colorado Springs/Lance Sijan (Colorado)
Concho (Texas)
Concrete Mixers (North Dakota)
David J. Price/Beale (California)
Delaware Galaxy (Delaware)
Enid (Oklahoma)
Eugene (Oregon)
Fairbanks Midnight Sun (Alaska)
Flatirons (Colorado)
Fort Wayne-Baer Field (Indiana)
Fran Parker (New Mexico)
Front Range (Colorado)
General David C. Jones (North Dakota)
General E. W. Rawlings (Minnesota)
General Robert E. Huyser (Colorado)
General Robert F. Travis (California)
Gold Card (Utah)
Golden Triangle (Mississippi)
Greater Amarillo (Texas)
Greater Los Angeles Airpower (California)
Grissom Memorial (Indiana)
Gus Grissom (Indiana)
H. H. Arnold (New York)
H. H. Arnold Memorial (Tennessee)
High Desert (California)
Homestead (Florida)
Huron (Michigan)
John C. Stennis (Mississippi)
Lake Superior Northland (Michigan)
Land of Lincoln (Illinois)
Lawrence D. Bell (New York)
Lincoln (Nebraska)
Llano Estacado (New Mexico)
Long's Peak (Colorado)
New Jersey Wing CAP/AFA (New Jersey)
Panama City (Florida)
Pease (New Hampshire)
Red River Valley (North Dakota)
Robert H. Goddard (California)
Rocky Mountain (Utah)
Savannah (Georgia)
Scott-Berkeley (North Carolina)
Snake River Valley (Indiana)
South Georgia (Georgia)
Southern Indiana (Indiana)
Spokane (Washington)
Spudland (Maine)
Swamp Fox (South Carolina)
Tennessee Ernie Ford (California)
Teterboro-Bendix (New Jersey)
Thomas B. McGuire, Jr. (New Jersey)
Tucson (Arizona)
Ute (Utah)
Wasatch (Utah)
West Suburban (Illinois)
Wichita Falls (Texas)

VICE PRESIDENT

Jan Laitos
Joseph Turner

PRESIDENTS

Tom Henderson
Joseph Allen, Jr.
John Logan
Richard Becker
John Kagel
Cletus Pottebaum
Arley McQueen, Jr.
William L. Ryon, Jr.
Clarence Bell, Jr.
Edward Crouchley
Frank Kula
Louie Evers
Maurice Rothkopf
Aaron Burleson
William Gemmill

PRESIDENTS

John Russell
Cletus Pottebaum
Lee Niehaus

Donald Adams
Dan Fulgham
Valin Woodward
Paul Johnston
Jim Kennedy
Lee Webber
O. R. Crawford
Whitney Morgan
Al Lovington
Roger Hayes
Homer Childs

Dale Lewis

Alton Hudson

Burton Kellogg
George Young
Richard Barkstrom
Al Guidotti
Kevin Clary
Andrew W. Trushaw, Jr.
John Boeman
Thomas Ratterree

R. F. Durso
Thomas Charbonneau

Carl Estes

Horace Cook
Terry Little
Harry Hance
Raymond Karns

John Thaxton, Jr.
Dale Smiley

Bill Lask
James Clark
Henry Meijer

Paul Markgraf

James Hall

Robert Hazeleaf

Harry Cleveland
R. E. Smith
Anthony Salazar, Jr.
Fred Tschopp, Jr.

Don McKellar
William Overton
Del Casino

Wendell Morgan

Robert Graves
William Susser
William Stone
Kirby Bernich
Lloyd Fairbanks

Dan Brintlinger
Paul Elwell
Lloyd Johnson
Eddie Bigelow
Daniel J. Livinghouse
George Bochenek

Loren Evenson
Robert McChesney
Al Bartolomei

Chic Adams

June Wallin
Larry Oliver
James Smith

Chester Walborn
Dale Parrish
Leroy Sherrill
Andrew Kelly
Alban Cyr, Sr.
Robert Jaxtheimer
Frederick Hassett

Jack Carnicelli

Marvin Jones

Meryll Frost
Jack Certain
George Jenson
Kenneth Richards
Charles White

In addition, six Under-40 Directors joined the board for the coming year. Serving for the second consecutive year is Michael Winslow of Yakima, Wash. The five new Under-40 directors are Nancy I. Campbell, Nashville, Tenn.; Robert L. Gore, Las Vegas, Nev.; David L. Jannetta, Altoona, Pa.; Larry O. Oliver, Savannah, Ga.; and Mary Ann Seibel, St. Louis, Mo.

AFA's tenth annual Salute to Congress was held on Tuesday, September 13, at the Longworth House Office Building on Capitol Hill. The Salute, which affords AFA Convention delegates an opportunity to meet with members of Congress, congressional staffers, and Pentagon officials, attracted more than 600 guests, including Rep. Jim Wright (D-Tex.), Rep. Robert H. Michel (R-Ill.), Sen. Sam Nunn (D-Ga.), Sen. Charles H. Percy (R-Ill.), Air Force Chief of Staff Gen. Charles A. Gabriel, and then-Vice Chief of Staff Gen. Jerome F. O'Malley. Pictured above are, from left, Aerospace Education Foundation Trustee and AFA Special Citation recipient Jack Flaig, AFA President and Mrs. David L. Blankenship, and Rep. William F. Clinger, Jr. (R-Pa.).

Other members of the National Board of Directors are the permanent National Directors, the National Officers, the National Vice Presidents, the immediate past Air Force Chairman of the Joint Chiefs of Staff, the immediate past Air Force Chief of Staff, the immediate past Chief Master Sergeant of the Air Force, the National Chaplain, the National Commander of the Arnold Air Society, the Chairman of AFA's Junior Officer Advisory Council, the Chairman of AFA's Enlisted Council, and the AFA Executive Director.

The full list of all National Officers, National Vice Presidents, and National Directors appears in "This Is AFA" on p. 132.

Acknowledgements

Aaron L. Burleson, Oklahoma State President, served as Convention Sergeant at Arms. Constitution Committee Chairman and National Director Jack C. Price served as Parliamentarian. Credentials Committee members were National Vice President of the Northeast Region Thomas J. Hanlon, Chairman; Nuel Sanders, Utah State President; and Robert E. Holland, New York State President. The Inspectors of Election were Texas State President Bryan L.

Murphy, Jr., Chairman; John Kagel, Indiana State President; and William N. Webb, a member of AFA's Finance Committee.

With heartfelt gratitude, AFA salutes the tremendous volunteer contributions by the following individuals: Jayne Belanger, Cecil Brendle, Dave Dingley, Evie Dunn, Ron Flowers, Jeanne Isaacs, Helen Jeffrey, Shannon Kingsley, Chuck and Mary Lucas, Dan Marrs, Steve McPherson, C. Ann Monti, Betty Nelson, Pat Rafuse, Irene Robertson, Dana Spears, Kerry Spears, Wanni Spence, Mike Underwood, and Ken Wilson.

AFA wants to express its appreciation to all leaders, delegates, and spouses who attended the Convention and whose dedication and consistent, diligent efforts contributed to the success of the 1983 Convention. Your ongoing, year-round efforts in the field assure the viability of our Air Force Association. Your willingness to expend personal time—and, yes, personal finances as well—in support of this Association and its goals is the strength and promise of AFA. To all our members—our deepest, heartfelt thanks.

The 1984 National Convention will be held at the Sheraton Washington Hotel in Washington, D. C., on September 17–20. See you there!

—By Dave C. Noerr

Aerospace Education Foundation Luncheon Held During Convention

More than 600 people attended the annual Aerospace Education Foundation Luncheon on Monday of Convention week. The luncheon honors supporters of the Foundation and is the occasion for the presentation of AFA's highest aerospace education award, the Hoyt S. Vandenberg Award, and several AFA Citations of Honor. In addition, the winning unit of the annual Foundation-sponsored Air Force Junior ROTC contest is recognized and presented with a plaque and cash award.

Several special groups are also recognized at the luncheon—AFA's Enlisted and Junior Officer Advisory Councils, AFJROTC Instructors, the Executive Boards of Arnold Air Society and Angel Flight, and Tuskegee Airmen, Inc.

Presiding as master of ceremonies for the luncheon, Foundation President Dr. Don C. Garrison welcomed two special guests: Foundation trustee and first AFA National President Jimmy Doolittle, and Foundation Chairman of the Board Sen. Barry M. Goldwater (R-Ariz.). General Doolittle and Senator Goldwater assisted President Garrison in presenting corporate and individual Jimmy Doolittle and Ira Eaker Fellowships during the luncheon.

Other special guests at the luncheon included Col. Charles E. McGee, USAF (Ret.), National President, Tuskegee Airmen, Inc.; CMSAF Sam E. Parish; Lt. Gen. Kenneth L. Peek, Jr., Deputy Chief of Staff for Manpower and Personnel, Hq. USAF; Lt. Gen. Charles G. Cleveland, Air University Commander; Gen. Thomas M. Ryan, Jr., Commander in Chief of Military Airlift Command; Hon. Tidal W. McCoy, Assistant Secretary of the Air Force for Manpower, Reserve Affairs and Installations; Walter Boyne, Director of the National Air and Space Museum; Scott Crossfield, famed X-15 test pilot; Ivonette Wright Miller, the

Aerospace Education Foundation Fellowships

(Presented at September 12 Luncheon)

Corporate Jimmy Doolittle Fellows	**Recipient**
Ford Aerospace & Communications Corporation	Mr. Robert K. Beach, Vice President
Loral Corporation	Mr. Bernard L. Schwartz, Chairman of the Board
Hughes Helicopter	Mr. Jack Real, President
Reader's Digest Foundation	Mr. Kent Rhodes, Chairman
The Harry Frank Guggenheim Foundation	Lt. Gen. Jimmy Doolittle, USAF (Ret.), Member, Board of Directors
Individual Jimmy Doolittle Fellows	**Sponsor**
Mr. Robert A. Cox	Self
Mr. James R. Bugley	Self
Lt. Col. Arthur R. MacFadden, USAF (Ret.)	Self
Mr. Gerard Van Poll	Self
Mr. Orval Hansen	Self
Charles A. Lindbergh *(In memoriam) (Accepted by Alton Hudson)*	Charles A. Lindbergh Chapter
2d Lt. John O'Farrell Copeland, USAF	Brig. Gen. William L. Copeland, USAFR
Mr. Robert A. Hoover	Sen. Barry M. Goldwater
Strategic Air Command Non-commissioned Officers Academy *(Accepted by CMSgt. Joseph P. Marlow, Commandant)*	CMSgt. James M. McCoy, USAF (Ret.)
Lt. Col. Wayne L. Schultz, USAF, Commander, 120th Tactical Fighter Squadron	Brig. Gen. William W. Spruance, USAF (Ret.)
Gen. James R. Allen, USAF (Ret.)	Air Force Ball of Mid-America
Nation's Capital Chapter *(Accepted by A. B. Outlaw)*	Rockwell International Corp.—DEO
Wright Memorial Chapter *(Accepted by Robert D. Eisenhart)*	Rockwell International Corp.—DEO
Eglin Chapter *(Accepted by Richard H. Schoeneman)*	Rockwell International Corp.—DEO
Mr. Martin M. Blatt	AEF Board of Trustees
Corporate Ira Eaker Fellows	**Recipient**
Pratt & Whitney Corporation	Mr. Frank W. McAbee, Jr., President, Government Products Division
Individual Ira Eaker Fellows	**Sponsor**
Col. Fred V. Cherry, USAF (Ret.)	Mr. Robert Beatson
Maj. Gen. Leigh Wade, USAF (Ret.)	Bob Hope AFA Charity Golf Tournament
Mr. Joe Higgins	Sen. Barry M. Goldwater
George L. Washington *(In memoriam) (Accepted by sponsor)*	Col. Ernest J. Davis, Jr., USAF (Ret.)
Nation's Capital Chapter *(Accepted by A. B. Outlaw)*	Rockwell International Corp.—DEO

Lt. Gen. Jimmy Doolittle, USAF (Ret.), chats with several special guests at the reception preceding the Aerospace Education Foundation's annual Luncheon. Pictured are, from left, Horace Wright, nephew of Orville Wright; 2d Lt. John O'Farrell Copeland, USAF, recipient of a Jimmy Doolittle Fellowship; Ivonette Wright Miller, niece of Orville Wright; General Doolittle; Harold Miller, Ivonette's husband and a World War I combat pilot; and Sue Wright, Horace's wife. See item.

niece of Orville Wright, and her husband Harold, a World War I combat pilot; Horace Wright, the nephew of Orville Wright, and his wife Sue; Mrs. Ruth Eaker; Rep. Matthew J. Rinaldo (R-N. J.); Ms. Nancy Van Duyne, representing Sen. Bill Bradley (D-N. J.); and Mr. Doug Koelemay, representing Sen. Frank R. Lautenberg (D-N. J.).

AFA National President David L. Blankenship presented two special presidential citations during the luncheon. One went to Sen. Barry Goldwater (R-Ariz.), cited "for his key role in the enactment of legislation that will enable members or former members of the armed forces of the US to enjoy and benefit from membership in our nation's veterans' organizations, and for his understanding and support of the morale and well being of all American military veterans." The other citation went to Gen. Edwin W. Rawlings, USAF (Ret.), "in grateful recognition of exceptional service to the cause of aerospace power and in special appreciation of outstanding support of the mission and objectives of the Air Force Association".

President Blankenship then awarded AFA Citations of Honor to the USAF School of Health Care Sciences (represented by its Commander, Col. Harold H. Biddle, USAF), for providing realistic training in its war-readiness-oriented medical service; MSgt. Court G. Ehrhardt, for outstanding contributions in the field of aerospace technical training regarding the structural repair of composites; and Lt. Col. Stephen Kosnik, for superior technical skills in developing innovative methods relating to Remotely Piloted Vehicles (RPVs).

One of AFA's most prestigious awards, the Hoyt S. Vandenberg Award for the most outstanding contribution in aerospace education, was presented by President Blankenship to the Inter-American Air Forces Academy (represented by its Commander, Col. Dan Medigovich, USAF) for providing comprehensive and valuable technical and military aerospace training to some 1,000 members of various Latin American air forces.

The next event on the program was the presentation of the Foundation's corporate and individual Jimmy Doolittle Educational and Ira Eaker Historical Fellowships *(see box, p. 139).*

Proceeds from the Doolittle Educational Fellowship program are used to apply aerospace technology to the advancement of education by making Air Force courses available to the civilian educational community, and for other educational projects. Resources from the Eaker Historical Fellowship program allow the Foundation to make available to the nation's community leaders, opinion-makers, and government officials dynamic and extensive aerospace educational and historical training materials and programs.

To date, there are twenty-three corporate and 321 individual Jimmy Doolittle Fellows, while the Ira Eaker Fellowship program has a total of two corporate

and fifty-three individual Fellows.

The final major event of the luncheon was the presentation of the plaque and cash award to the overall winner of the Foundation's annual AFJROTC contest. This year's contest called for a presentation on leadership.

The overall winner was the AFJROTC unit at Scotch Plains-Fanwood High School, Scotch Plains, N. J. The unit produced a color videotape on the theme of the contest: "How We Prepare Ourselves for Leadership in America's Future." Representatives from the high school were special guests at the Convention and included Lt. Col. Leon D. Gordon, USAF (Ret.), the Aerospace Educational Instructor for the unit; CMSgt. Robert Rybitski, USAF (Ret.), Colonel Gordon's assistant; Dr. Terry Reigel, school principal; and three of the AFJROTC cadets who were instrumental in producing the winning entry—Cadet 2d Lt. Christopher Evans, Cadet 1st Lt. Randall Mazzullo, and Cadet Sgt. Andy Gibbs. Senator Goldwater presented the winning plaque and the $1,500 first-place prize to Colonel Gordon.

In a related matter, Foundation Board Chairman Sen. Barry M. Goldwater (R-Ariz.) was reelected unanimously by the Foundation's Board of Trustees during its annual meeting. Also reelected unanimously were Dr. Don C. Garrison, President of the Tri-County Technical College in Pendleton, S. C., as Foundation President; Emlyn I. Griffith, member of the New York State Board of Regents, as Secretary; and George D. Hardy, AFA National Director, as Treasurer. In addition, five new members were elected to the Foundation's Board of Trustees, joining the twenty-eight incumbent Trustees who were reelected.

—By Michael J. Nisos

Coming Events

November 17–18, **AFA National Defense Symposium,** Hyatt House Airport Hotel, Los Angeles, Calif. . . . November 18, **Los Angeles Air Force Ball,** Los Angeles, Calif. . . . December 6, **Lieutenant General Jimmy Doolittle Salute Dinner,** National Air and Space Museum, Washington, D. C.

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—*up to $500 a day* in some major metropolitan medical centers—can run up a $20,000 bill for even a moderately serious accident or illness.

Your 25% of $20,000 is no joke!

AFA CHAMPLUS® protects you against that kind of financial catastrophe *and* covers most of your share of routine medical expenses as well.

HOW AFA CHAMPLUS® WORKS FOR YOU!

WHO IS ELIGIBLE?

1) All AFA members under 65 years of age who are currently receiving military retired pay and are eligible for benefits under Public Law 89-614 (CHAMPUS), their spouses under age 65 and their unmarried dependent children under age 21 (or age 23 if in college).
2) All eligible dependents of AFA members on active duty. Eligible dependents are spouses under age 65 and unmarried dependent children under age 21 (or age 23 if in college).

EXCEPTIONAL BENEFIT PLAN

(See chart at right)

FOUR YEAR BASIC BENEFIT. Benefits for most injuries or illnesses may be paid for up to a four-year period.

PLUS THESE SPECIAL BENEFITS . . .

1) Up to 45 consecutive days of in-hospital care for mental, nervous, or emotional disorders. Outpatient care may include up to 20 visits of a physician or $500 per insured person each year.
2) Up to 30 days care per insured per year in a Skilled Nursing Facility.
3) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Residential Treatment Center.
4) Up to 30 days care per insured per year and up to 60 days lifetime in a CHAMPUS-approved Special Treatment Facility.
5) Up to 5 visits per insured per year to Marriage and Family Counselors under conditions defined by CHAMPUS.

YOUR INSURANCE IS NON-CANCELLABLE

As long as you are a member of the A Force Association, pay your premiums c time, and the master contract remains i force, your insurance cannot be car celled.

ADMINISTERED BY YOUR ASSOCIATION . . . UNDERWRITTEN BY MUTUAL OF OMAHA

AFA CHAMPLUS® insurance is admi istered by trained insurance professiona on your Association staff. You get prom reliable, courteous service from peop who know your needs and know eve detail of your coverage. Your insurance underwritten by Mutual of Omaha, t largest individual and family health insu ance company in the world.

AFA OFFERS YOU HOSPITAL BENEFITS AFTER AGE 65

Once you reach Age 65 and are covere under Medicare, AFA offers you prote tion against hospital expenses not co ered by Medicare through the *Senior Ac Benefit Plan* of AFA Hospital Indemni Insurance. Members enrolled in AF CHAMPLUS® will automatically recei full information about AFA's Medicare su plement program upon attainment of A 65 so there will be no lapse in coverag

AFA CHAMPLUS® BENEFIT SCHEDULE

Care	*CHAMPUS Pays*	*AFA CHAMPLUS® Pays*
	For Military Retirees Under Age 65 and Their Dependents	
Inpatient civilian hospital care	CHAMPUS pays 75% of allowable charges.	CHAMPLUS® pays the 25% of allowable charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $6.55 per day subsistence fee, not covered by CHAMPUS.	CHAMPLUS® pays the $6.55 per day subsistence fee.
Outpatient care	CHAMPUS COVERS 75% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 25% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.
	For Dependents of Active-Duty Military Personnel	
Inpatient civilian hospital care	CHAMPUS pays all covered services and supplies furnished by a hospital less $25 or $6.55 per day, whichever is greater.	CHAMPLUS® pays the greater of $6.55 per day or $25 of the reasonable hospital charges not covered by CHAMPUS.
Inpatient military hospital care	The only charge normally made is a $6.55 per day fee, not covered by CHAMPUS.	CHAMPLUS® pays the $6.55 per day subsistence fee.
Outpatient care	CHAMPUS covers 80% of outpatient care fees after an annual deductible of $50 per person ($100 maximum per family) is satisfied.	CHAMPLUS® pays the 20% of allowable charges not covered by CHAMPUS after the deductible has been satisfied.

NOTE: Outpatient benefits cover emergency room treatment, doctor bills, 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®

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 4 consecutive months, pre-existing* conditions will be covered regardless of prior treatment.

EXCLUSIONS

This plan does not cover and no payment shall be made for:

a) routine physical examinations or immunizations

b) domiciliary or custodial care

c) dental care (except as required as a necessary adjunct to medical or surgical treatment)

d) routine care of the newborn or well-baby care

injuries or sickness resulting from declared or undeclared war or any act thereof

injuries or sickness due to acts of intentional self-destruction or attempted suicide, while sane or insane

treatment for prevention or cure of alcoholism or drug addiction

eye refraction examinations

Prosthetic devices (other than artificial limbs and artificial eyes), hearing aids, orthopedic footwear, eyeglasses and contact lenses

expenses for which benefits are or may be payable under Public Law 89-614 (CHAMPUS)

PREMIUM SCHEDULE

Plan 1—For military retirees and dependents (Quarterly Premiums)

Inpatient Benefits

Member's Attained Age	Member	Spouse	Each Child
Under 50	$19.03	$23.30	$14.85
50–54	$26.16	$32.01	$14.85
55–59	$36.16	$44.28	$14.85
60–64	$43.62	$53.41	$14.85

Inpatient and Outpatient Benefits

Under 50	$26.80	$31.05	$37.13
50–54	$36.83	$42.68	$37.13
55–59	$50.92	$59.02	$37.13
60–64	$61.41	$71.20	$37.13

Plan 2—For dependents of active-duty personnel (Annual Premiums)

Inpatient Only	None	$ 9.68	$ 5.94
Inpatient and Outpatient	None	$38.72	$29.70

APPLICATION FOR AFA CHAMPLUS®

Group Policy GMG-FC70
Mutual of Omaha Insurance Company
Home Office: Omaha, Nebraska

Full name of Member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

Date of Birth _____ Current Age _____ Height _____ Weight _____ Soc. Sec. No. _____
Month/Day/Year

This insurance coverage may only be issued to AFA members. Please check the appropriate box below:

☐ I am currently an AFA Member.

☐ I enclose $15 for annual AFA membership dues (includes subscription ($14) to AIR FORCE Magazine).

PLAN & TYPE OF COVERAGE REQUESTED

Plan Requested (Check One)
☐ AFA CHAMPLUS® PLAN I (for military retirees & dependents)
☐ AFA CHAMPLUS® PLAN II (for dependents of active-duty personnel)

Coverage Requested (Check One)
☐ Inpatient Benefits Only
☐ Inpatient and Outpatient Benefits

Person(s) to be insured (Check One)
☐ Member Only
☐ Spouse Only
☐ Member & Spouse
☐ Member & Children
☐ Spouse & Children
☐ Member, Spouse & Children

PREMIUM CALCULATION

All premiums are based on the attained age of the AFA member applying for this coverage. Plan I premium payments are normally paid on a quarterly basis but, if desired, they may be made on either a semi-annual (multiply by 2), or annual (multiply by 4) basis.

Quarterly (annual) premium for member (age ____) $_____

Quarterly (annual) premium for spouse (based on member's age) $_____

Quarterly (annual) premium for ____ children @ $ $_____

Total premium enclosed $_____

If this application requests coverage for your spouse and/or eligible children, please complete the following information for each person for whom you are requesting coverage.

Names of Dependents to be Insured	Relationship to Member	Date of Birth (Month/Day/Year)

(To list additional dependents, please use a separate sheet.)

In applying for this coverage, I understand and agree that (a) coverage shall become effective on the last day of the calendar month during which my application together with the proper amount is mailed to AFA, (b) only hospital confinements (both inpatient and outpatient) or other CHAMPUS-approved services commencing after the effective date of insurance are covered and (c) any conditions for which I or my eligible dependents received medical treatment or advice or have taken prescribed drugs or medicine within 12 months prior to the effective date of this insurance coverage will not be covered until the expiration of 12 consecutive months of insurance coverage without medical treatment or advice or having taken prescribed drugs or medicine for such conditions. I also understand and agree that all such pre-existing conditions will be covered after this insurance has been in effect for 24 consecutive months.

Date _____, 19 ____ _____
Member's Signature

11/83

NOTE: Application must be accompanied by check or money order.
Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Ave., NW, Washington, D.C. 20006.

Form 6173GH App.

Bob Stevens'

"There I was..."

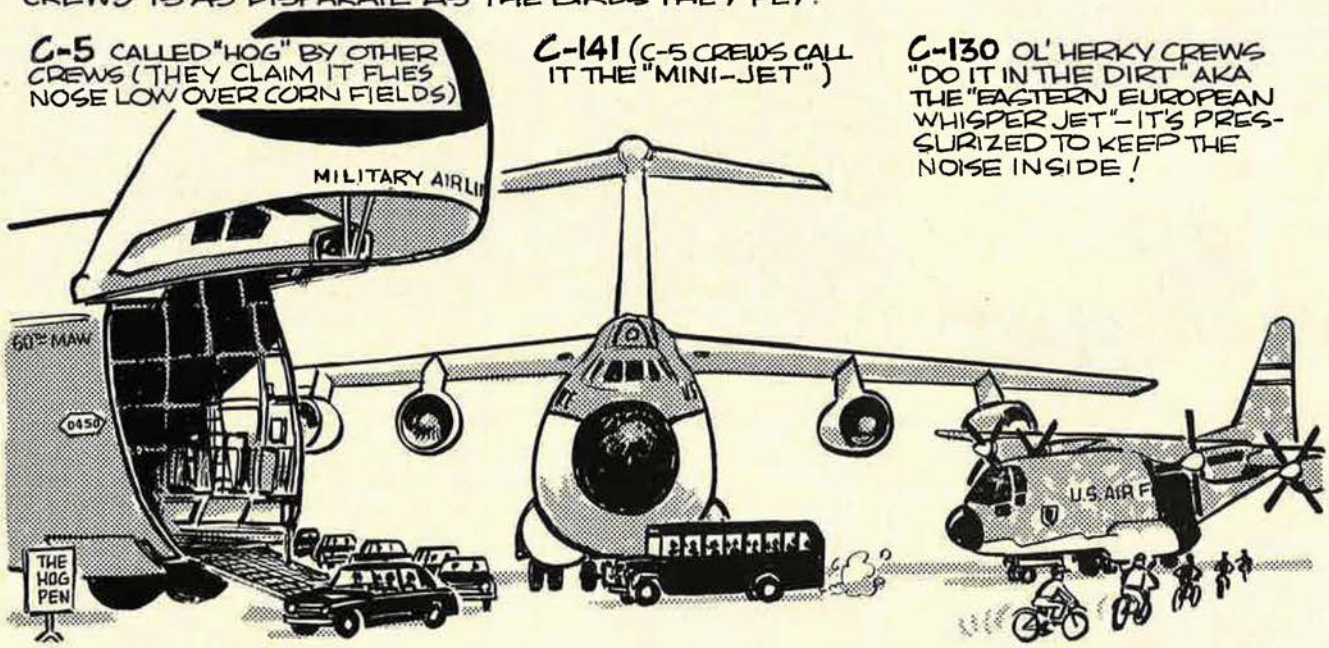
...AT TRAVIS AFB, CALIF., MAC'S BIG JUMPING-OFF SPOT FOR THE PACIFIC- HOME OF THE 22ᴰ AF and THE 60TH MAW (MILITARY AIRLIFT WING). THIS IS JUST ONE OF MAC's 14 Z.I. BASES. MAC IS THE BACK-BONE OF MOBILITY FOR US FIGHTING FORCES & HAS NEARLY 150,000 PEOPLE PLUS 1,400 AIRCRAFT TO DO THE JOB- FRIENDS and ENEMIES TAKE NOTE!

C-5s, C-141s, and C-130s MAKE UP THE BIG LIFT FORCES. THE RELATIONSHIP BETWEEN CREWS IS AS DISPARATE AS THE BIRDS THEY FLY.

C-5 CALLED "HOG" BY OTHER CREWS (THEY CLAIM IT FLIES NOSE LOW OVER CORN FIELDS)

C-141 (C-5 CREWS CALL IT THE "MINI-JET")

C-130 OL' HERKY CREWS "DO IT IN THE DIRT" AKA THE "EASTERN EUROPEAN WHISPER JET"- IT'S PRES-SURIZED TO KEEP THE NOISE INSIDE!



CREWS ARRIVE IN STAFF CARS

CREWS ARRIVE BY BUS

CREWS BICYCLE TO BIRD

"THE C-5 BAG DRAG"- A RITUAL ALL AIRCREWS GO THROUGH INVOLVES A DAISY-CHAIN TO LOAD PERSONAL BAGS WAY UP TO THE FLIGHT DECK.

THIS GUY'S BAG BECOMES A WHEEL CHOCK NEXT TRIP!

ON LEAVING THE BASE WE EXPERIENCED SOMETHING EVERY LIGHTPLANE PILOT DREAMS OF...

P.S. IF THEY HADN'T HELD, BLOW WASH WOULD HAVE PUT US IN THE NEXT CO.!

HIGHER READINESS AT LOWER COST...

BECAUSE SPERRY KNOWS HOW TO LISTEN.

Maintaining mission capability requires support programs for military systems, personnel and hardware that begin in the equipment development and training stages, and continue to the takeoff point.

Sperry's unique engineering, software, and integration resources are being applied to increasing the readiness factor while holding down the costs of testing and maintaining advanced equipment.

With the U.S. Air Force, we are developing the Modular Automatic Test Equipment (MATE) System, which will be applied to future test system acquisitions. Through the use of standards for hardware and software modules, and a standardized architecture, it is expected that the annual billion-dollar USAF budget for avionics support equipment will be cut significantly.

Right now, we're also defining an integrated system for the testing of Navy shipboard and airborne electronics at the intermediate, depot and factory levels. Our support systems go directly to the flight line as well, checking and troubleshooting aircraft subsystems.

In the classroom, we use advanced, programmed instruction to train personnel in high-technology support. And in the warehouse, our automated matériel handling systems are integrated for computer-controlled inventory and acquisition of military parts and supplies nationwide.

To learn more of what we're doing in the field of logistics support, talk to us...we listen.

Write to Sperry Corporation, Electronic Systems, Great Neck, NY 11020. Attention: Marketing Department.

SPERRY

THE C-17. IT'S THE ONLY AIRLIFTER THAT CAN ELIMINATE THE MIDDLEMAN.

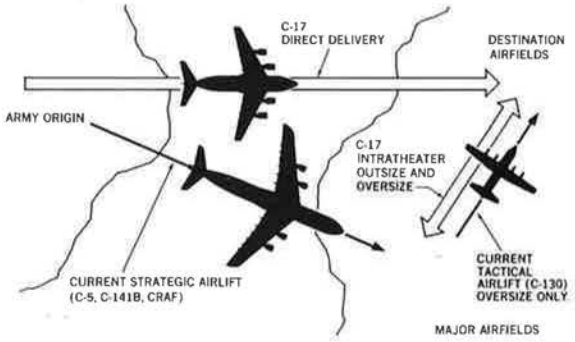
Right now, military airlift is primarily a two-step operation. Large airlifters move cargo from our shores to a base near the forward area. As near, that is, as the nearest runway long enough to accommodate them. Smaller aircraft must complete the haul into small airfields. Combat equipment too large for the small planes must move forward by surface transportation.

The new C-17 will end the need for transfers en route. The C-17 will make direct deliveries from the U.S. to forward areas anywhere in the world.

What makes this possible? The proven combination of a new wing design and an innovative propulsive-lift system that lets the C-17 land on very short runways. Only 850 runways in the world are able to accommodate current strategic airlifters; the C-17 can land on more than 10,000.

The ability to land and take off from minimum length facilities lets the C-17 double as a shuttle transport within a theater of operations. This means the C-17 will carry critical cargo to our forces when needed, where needed, and lose no precious time in transfer.

The new C-17 from McDonnell Douglas. It will move the U.S. Air Force and the U.S. Army into the twenty-first century.



MCDONNELL DOUGLAS