

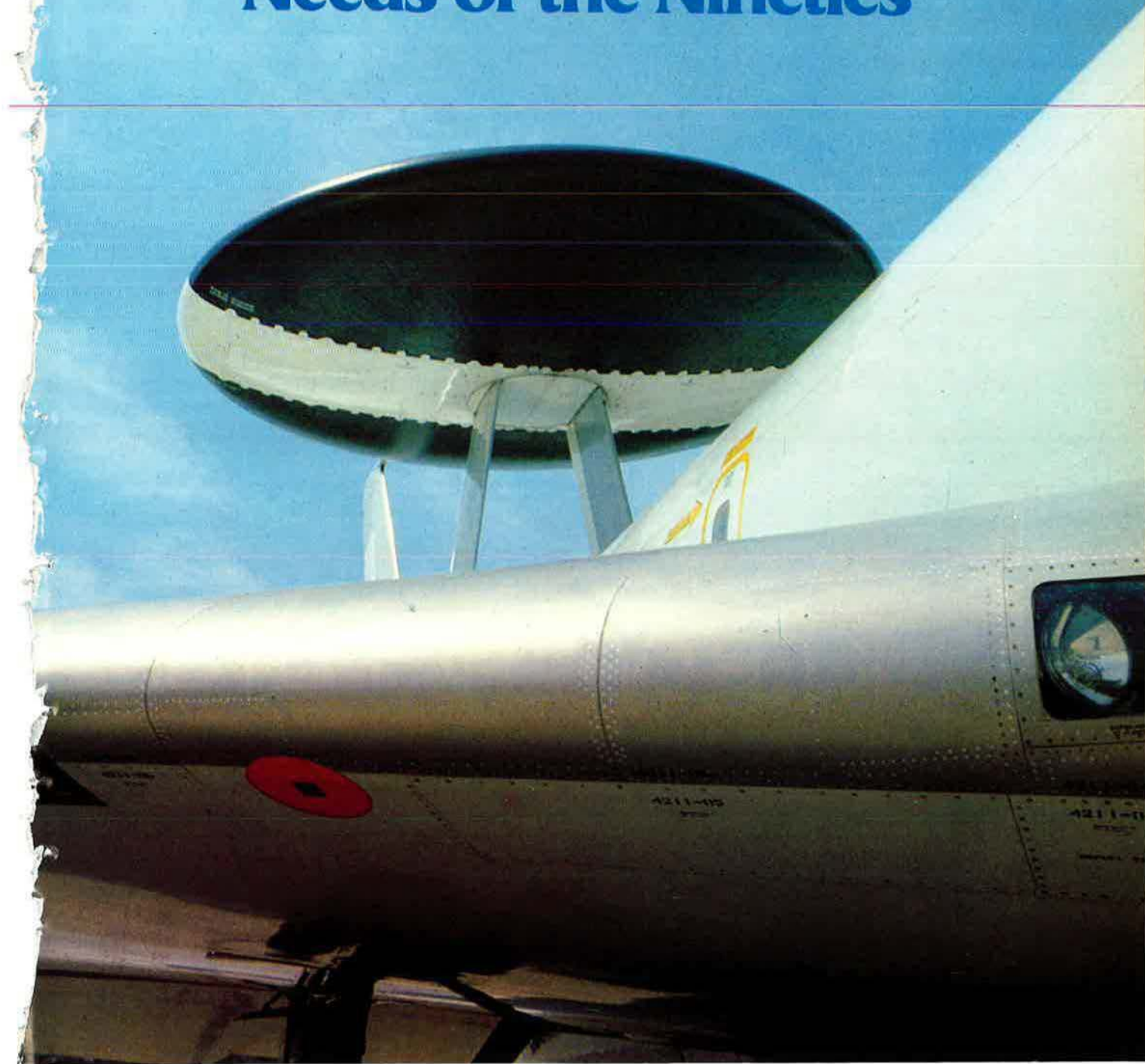
OCTOBER 1980/\$1

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

Aeronautical Systems Division Looks to the Needs of the Nineties



SABREBAT



SWEEP OF THE FUTURE

Named after nature's most efficient flying machine, Sabrebat is an awesome new design for manned flight. The concept? Forward Swept Wings. The advantages?

- A revolutionary concept to reduce weight and cost.
- An all-new integrated research vehicle to demonstrate FSW synergistic benefits.
- The latest subsystems to enhance demonstration of FSW flying qualities.
- A way to achieve STOL performance — without weight/cost penalty.

And Sabrebat can broaden tomorrow's aircraft design options. It takes off from HIMAT's proven

technology base in advanced composite structures and aerodynamics.

North American Aircraft Division of Rockwell International heads up the development team ready to confirm the exciting FSW concept for the Department of Defense.

Now watch our team take off.



Rockwell International

... where science gets down to business

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION MAGAZINE

Executive Director: James H. Straubel

Publisher and Editor in Chief: John F. Loosbrock

Associate Publishers:
Charles E. Cruze, Richard M. Skinner

Special Assistant to the Publisher: Nellie M. Law

Editor: F. Clifton Berry, Jr.

Senior Editor (Policy & Technology):
Edgar Ulsamer

Senior Editor: William P. Schiltz

Military Relations Editor:
James A. McDonnell, Jr.

Contributing Editors:
Ed Gates, Vic Powell, John W. R. Taylor ("Jane's Supplement"), Maj. Thomas L. Sack, USAF

Managing Editor: Richard M. Skinner

Director of Design and Production:
Robert T. Shaughness

Art Director: William A. Ford

Associate Editor: Hugh Winkler

Editorial Assistants:
Nellie M. Law, Pearlite M. Draughn,
Grace Lizzio

Assistant for Editorial Promotion: Robin Whittle

Advertising Director:
Charles E. Cruze
1750 Pennsylvania Ave., N.W.
Washington, D.C. 20006
Tel: (202) 637-3330

Advertising Service Manager: Patricia Teevan

Area Advertising Managers:
Bayard Nicholas, Stamford, Conn.
Tel: (203) 357-7781

William J. Farrell, Chicago, Ill.
Tel: (312) 446-4304

Harold L. Keeler, Los Angeles, Calif.
Tel: (213) 879-2447

William Coughlin, San Francisco, Calif.
Tel: (415) 546-1234

UK, Benelux, France, and Scandinavia

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

Italy and Switzerland

Dr. Vittorio F. Negrone, Ediconsult
Internationale S.A.S. Piazzo Fontane Marose 3
16123 Genova, Italy
Tel: (010) 543659

Germany and Austria

Fritz Thimm
645 Hanau am Main
Friedrichstrasse 15
W. Germany
Tel: (06181) 32118

AIR FORCE Magazine (including SPACE DIGEST) is published monthly by the Air Force Association, Suite 400, 1750 Pennsylvania Ave., N.W., Washington, D.C. 20006. **Phone:** (202) 637-3300. Second-class postage paid at Washington, D.C., and additional mailing offices. **Membership rate:** \$13 per year (includes \$9 for one-year subscription); \$30 for three-year membership (includes \$21 per subscription). **Life Membership:** \$200. **Subscription rate:** \$13 per year; \$12 additional for foreign postage. Regular issues \$1 each. Special issues (Soviet Aerospace Almanac, USAF Almanac issue, Anniversary issue, and "Military Balance" issue) \$3 each. **Change of address** requires four weeks' notice. Please include mailing label. Publisher assumes no responsibility for unsolicited material. Trademark registered by Air Force Association. Copyright 1980 by Air Force Association. All rights reserved. Pan-American Copyright Convention.

(USPS 010-280)

BPA Circulation audited by
Business Publication Audit

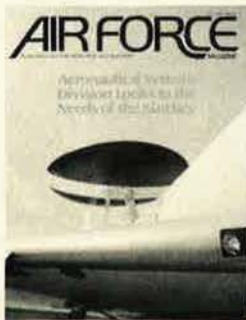
AIR FORCE Magazine / October 1980

This Month

OCTOBER 1980 VOLUME 63, NUMBER 10

- 4 **The Priorities Are Skewed**
An Editorial by F. Clifton Berry, Jr.
- 17 **The "Invisible" Airplane Issue**
By Edgar Ulsamer
- 32 **AFA Welcomes Its New Executive Director . . .**
By F. Clifton Berry, Jr.
- 32 **And Says Farewell to Its Editor in Chief and Publisher**
By James H. Straubel
- 37 **How ASD Is Meeting the Needs of the Nineties**
By Lt. Gen. Lawrence A. Skantze, USAF
- 44 **Restoring Dignity to Military Careers**
By Gen. T. R. Milton, USAF (Ret.)
- 45 **Jane's All the World's Aircraft Supplement**
Compiled by John W. R. Taylor
- 53 **"Dear Voter"—An Open Letter to the American Electorate**
By Colin S. Gray
- 57 **The Key to Readiness: O&M**
By Lt. Gen. Hans H. Driessnack, USAF
- 64 **Tomorrow's War Today**
By Brig. Gen. Jerry Max Bunyard, USA
- 69 **Engineering a Response to the S&T Shortfall**
By Ed Gates
- 72 **Fox Able One—The First Transatlantic Jet Deployment**
By Col. Frank W. Klibbe, USAF (Ret.)

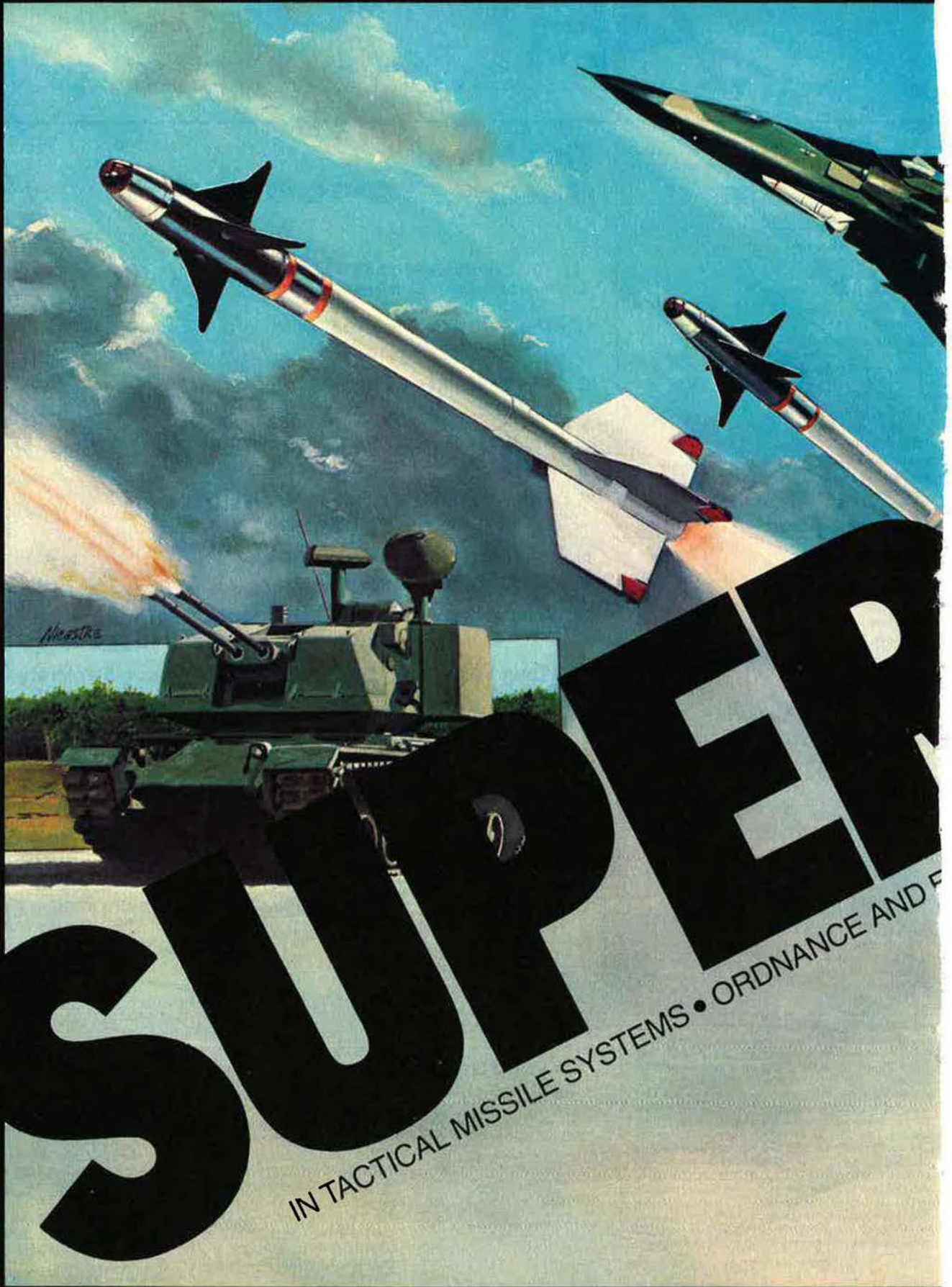
ABOUT THE COVER



The E-3A Sentry's look-down radar makes surveillance over land and water possible at any altitude. This angle of the TAC aircraft was captured by Art Director William A. Ford and introduces Lt. Gen. Lawrence A. Skantze's article about the Aeronautical Systems Division, beginning on p. 37.

Departments

- 6 **Airmail**
10 **Unit Reunions**
17 **In Focus . . .**
24 **Aerospace World**
28 **Index to Advertisers**
30 **Capitol Hill**
69 **Speaking of People**
70 **Airman's Bookshelf**
82 **The Bulletin Board**
85 **Senior Staff Changes**
88 **AFA News**
92 **AFA State Contacts**
96 **There I Was . . .**



HUSTRE

SUPER

IN TACTICAL MISSILE SYSTEMS • ORDNANCE AND E



CONTROL

• ELECTRO-OPTICAL SYSTEMS • GUIDANCE AND CONTROL

- Ford Aerospace & Communications Corporation is dedicated to meeting the needs of the U.S. Armed Forces and our allies in the design, production and support of advanced defense systems.
 - Produced or modified more Sidewinder guidance and control systems than all other suppliers combined—over 80,000!
 - Prime contractor for the Chaparral Air Defense System—now being extended to forward aspect and 24-hour capability.
 - Pioneered precision airborne laser designation with the Pave Knife system for laser guided weapons that revolutionized air-to-ground weapon delivery.
 - Prime contractor for Pave Tack laser designator pod which provides day/night adverse weather precision targeting capability and navigation enhancement to the F-4 and F-11 aircraft.
- Developer and manufacturer of 25mm ammunition. Developer of 40mm ammunition. Developer of the 40mm Division Air Defense (DIVAD) gun system under contract to the United States Army.
- Our demonstrated quality excellence resulted in our being the first West Coast contractor selected for participation in the Defense Department's Contractor Assessment Program (CAP).



Ford Aerospace & Communications Corporation
Aeronutronic Division
Commanding Respect Worldwide.

AN EDITORIAL

The Priorities Are Skewed

THE numbers in the newspaper article did not exactly leap from the gray page. They were buried in a UPI dispatch from Miami. Indeed, at first reading the significance of the numbers did not sink in. On the second pass, however, their import told just how skewed are current national priorities regarding people in our armed forces.

The UPI account dealt with the fact that the Coast Guard's attempted blockade of the Florida Straits to halt the flow of Cuban refugees is the most expensive peacetime operation since the Coast Guard's founding in 1790. It is costing about \$600,000 per week. At that high price, it has still proved impossible to construct an impenetrable barrier across those waters, even though up to eighteen cutters have been assigned to the task.

The cost in time, money, steaming days, and unmet needs elsewhere is most expensive for the Coast Guard in this case. But it is yet another example of the now too-familiar symptoms plaguing all our armed forces: saddled with ancient equipment, expanded missions, and sinking retention of skilled people. But the cost of handling the flow of Cubans fleeing Castro's Communist "paradise" has been heavy for all services. One Pentagon official told AIR FORCE Magazine that the cost of opening and operating the refugee centers (and policing them) now has passed \$500 million. At one time, upwards of 7,000 military men and women were committed to the effort. It would have failed without their talents and dedication because other federal agencies could not cope. Even when the number of refugees awaiting resettlement had dwindled to about 15,000 persons, on White House orders the Army committed a battalion of soldiers from the 101st Airborne Division to maintain order among known troublemakers who were terrorizing others at Fort McCoy, Wis.

That's where the new numbers come in. Buried in the next-to-last paragraph of the Coast Guard story was a federal government estimate on the cost of feeding 1,600 Cuban troublemakers held in detention centers: \$35 per person per day, or about \$57,600 daily. Feeding the rest of the Cubans awaiting resettlement costs the US government about \$9 per person per day. Think about that for a minute.

Then contrast those numbers with the separate rations allowances of our military. The Air Force, Army, Navy, Marines, and Coast Guard people coping with the refugee tide are granted a Basic Allowance for Subsistence (BAS) of \$3.21 per day. The average person being helped gets fed at a rate about three times as expensive. And the troublemakers eat on a Lucullan tab twelve times greater.

Something is skewed here, and it is not the troops.

How in the world can officials of this government expect young men and women to stay in service when faced with such a disparity? It simply compounds the

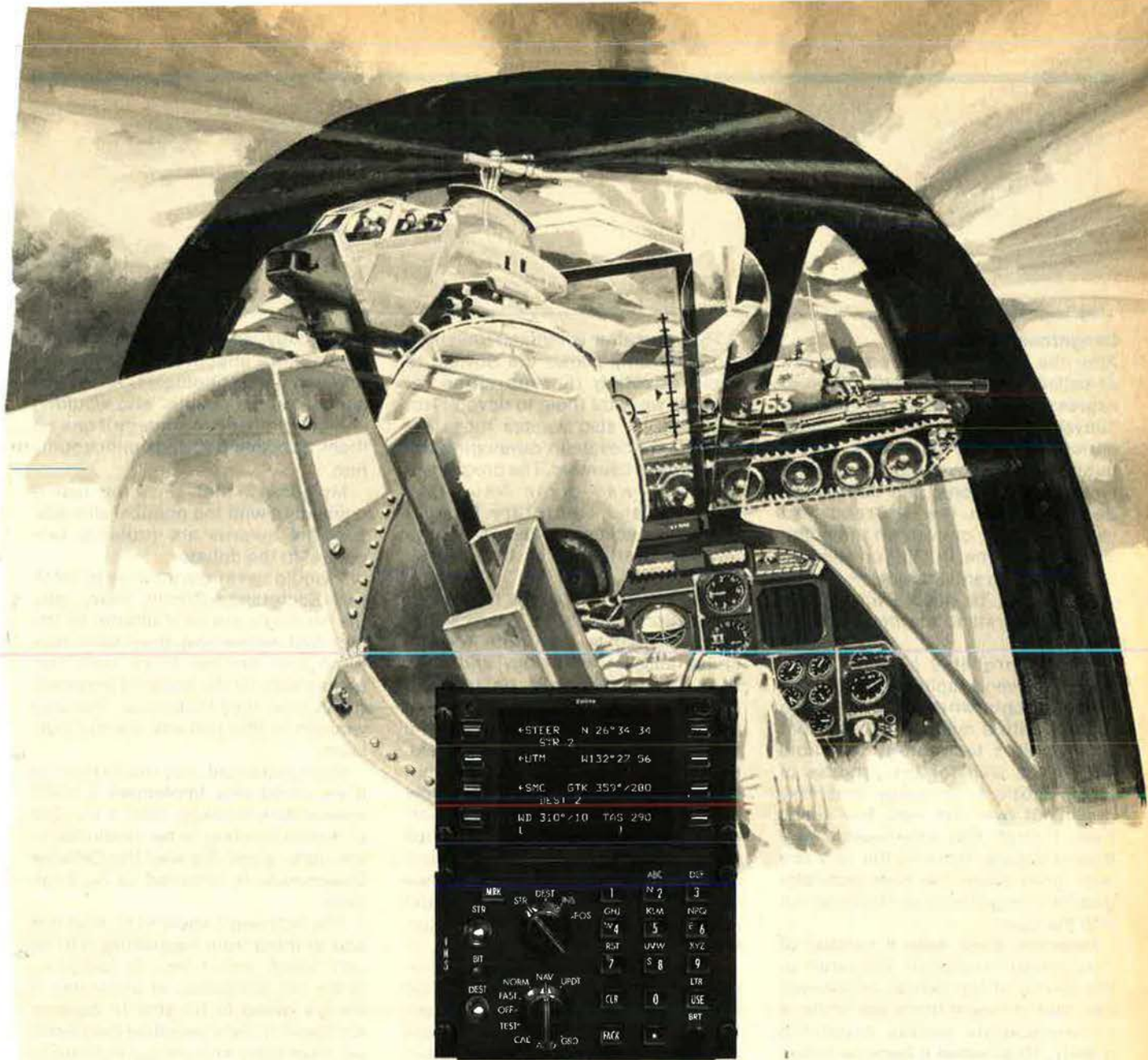
combined frustrations of low pay, inadequate housing, long separations, and public (and governmental) apathy that are driving out so many good people from the Air Force and its sister services.

The Policy Statement adopted by delegates at AFA's Convention in mid-September makes the point clearly: "The nation is losing too many experienced military professionals—in both enlisted and officer ranks—to cost fast. They are walking out on their chosen careers because their patriotism can only be stretched so far. And they are walking out—one enlisted Air Force professional every six minutes—many because of lagging compensation, a decline in the quality of military life, and constant assaults on the dignity of their calling."

The Policy Statement notes that 100,000 military families qualifying for food stamps "is a national disgrace." So is the diminution of respect and dignity of the military calling. Gen. T. R. Milton's column this month (p. 44) deals with that aspect. The need for operations and maintenance (O&M) funds to cope with deteriorated living spaces and scanty training accounts, among others, is fully addressed by Lt. Gen. H. H. Driessnack, Comptroller of the Air Force, in his comprehensive article beginning on p. 57. Their contributions help us understand some dimensions of the problems impeding the nation's possession of a fully ready, up-to-strength, professional military force in being.

The recent enactment into law of the Nunn-Warner compensation initiatives is evidence that the climate is changing insofar as military pay and benefits are concerned. Even the President, who opposed the bill at first, eventually did a 180-degree turn when the magnitude of its bipartisan support in Congress and the nation became obvious. The October 1 pay raise helps, though it is about sixteen percent below the amount recommended by the comparability panel. But more is needed—in compensation, in benefits, in policies, and in clear actions that show to the men and women in the Air Force (and those who might choose to serve) that the nation and its elected officials truly care to have a dedicated force in being all the time, not just pre-election. If not, when the crunch comes somewhere, sometime, soon, the people will not be there. And then it will be too late. We had better heed the AFA Policy Statement just adopted, and its final paragraph quoting President George Washington to Congress 203 years ago: "If we desire to avoid insult, we must repel it; if we desire to secure peace . . . it must be known that we are at all times ready for war."

Being ready for war means having enough of the right kinds of people on hand before the event. Feeding foreign troublemakers at \$36 per day while controlling them with servicemen whose families are fed with food stamps is the wrong way. —F. CLIFTON BERRY, JR.



Think fast. Collins avionics management products let pilots do exactly that.

Pilot attention to the battle environment is one thing. Attention to the cockpit is another. Careful utilization of inherently compact panel space in attack aircraft facilitates both. And that's where Collins Avionics Management Systems can help.

These versatile systems provide compact control display units for helping busy pilots manage mission information. Radio, navigation, stores management — it's all there in a way that's easy to understand, easy to control, and therefore, easy to manage.

And it isn't just integrated control and display. It's integrated processing, too. TACAN talks to inertial. Laser talks to Doppler. Navigation talks to fire control

— all in MIL-STD-1553 — in microseconds.

Collins avionics management products. Versatile enough to do the managing and integrating so pilots can do the thinking.

For more information, contact Collins Government Avionics Division, Rockwell International, Cedar Rapids, Iowa 52406. Or call (319) 395-4412.



Rockwell International

...where science gets down to business

AIRMAIL

Dangerous Leaks

After the recent publicity about the so-called "Stealth" aircraft, I want to express my thoughts as to why this "unveiling" is so significantly more harmful than the usual leak. Going public about something the Soviets have, or have done, can be harmful depending on the sources and methods issue, or even on the political damage done. But this unveiling is of a very different character—done, I would guess, by people who simply do not understand the nature of the issue.

As you probably already know, there has been a raging debate within Defense about whether or not to go forward with a manned bomber that incorporates technology available now, or to wait for the promise of some exotic technology that may prove out over the next few years. Even though this has been a very heated debate, none of the very few who knew about the new technologies felt compelled to spring them out into the open.

However, there were a number of "marketing" materials prepared in the course of the debate for internal use, and in recent times the circle of knowledgeable people expanded greatly. Thus, when it became public knowledge, there was much that could be leaked.

This is background. The real issue is that this program had far-reaching implications. In a time of very restricted resources, it has become clear to those who deal with defense economics that the United States simply cannot match the Soviets dollar for dollar. If we are to be at all successful in the long-term competition, the logic goes, we will have to make investments in ways that gain multiplier effects over the Soviets.

One way to do this is to invest in technologies that will obsolesce major Soviet investments—*i.e.*, find areas where, by virtue of culture, etc., the Soviets are compelled to make major investments of resources, and then develop offensive systems that are designed to exploit these defenses after the Soviets have deployed them.

The word *after* is critical! Unveiling too early only allows the Soviets to avoid devoting the enormous resources we want them to devote! Not only that, it also wastes those resources we devote in developing the competitive counters. The program in question was given Secretary Brown's and Secretary Perry's blessings because it was one of the few that were part of this overall strategy.

The Soviets are about to go into production with those systems that are designed to deal with today's cruise missile technology and what they thought would be today's bomber technology. People tend to forget that, because their strategic defense posture is so large, it will take them years to convert their present defenses. The strategy was to allow them to go forward devoting enormous resources to defensive systems rather than to more offensive systems. At an appropriate point, we wanted to go forward with the next generation cruise missiles and aircraft. But, *not now!*

Anyone who was part of this process understood full well that you had to be smart about how you went about implementing it. I fear that people who aren't smart enough, or who believe that politics overrides everything, have gotten into the act and have blown a really good element of a competitive strategy. The "costs" are rather large. First, there are the simple costs associated with the R&D for the technologies—simple in that we can assess them rather well. Second, there are the costs associated with letting the Soviets know *now* that we are, or may be, ready to field technologies that could obsolesce their new defensive systems. The fear is that they will be able to reduce their reaction time by some considerable amount, and thereby save considerable resources. Third, there are the opportunity costs associated with not having developed some other technologies, tactics, or doctrine to do the same thing.

We now find ourselves in the position where we have no bombers being produced that incorporate today's

technology, and we may have blown the potential effectiveness of some of tomorrow's technologies. All of this because some people, who wouldn't know a competitive strategy if one bit them, have decided that politics come first.

My guess is that, since this leak is coincident with the political silly season, the culprits are probably tangential to the debate.

It would seem reasonable to think that Secretaries Brown, Perry, and the Air Force are all shattered by the fact that something they have nurtured over the last three years has been blown by the political amateurs with whom they must deal. The only winners in this debacle are the Russians.

More important, one has to wonder if we could ever implement a really competitive strategy, with a number of moves needing to be developed in the dark, given the way the Defense Department is required to do business.

The only way I know of to stop this sort of thing from happening is to be very tough about who is told—*i.e.*, fence the programs. In particular, "we are going to be able to develop successfully very sensitive programs, we must deny knowledge of them to the staff levels in places like OSD, State, ACDA, the White House, and the Congress. There must be some things which only "principals" are allowed to know.

Barry Goldwater
United States Senate
Washington, D. C.

Now It's the Great Granddaddy

I enjoyed F. Clifton Berry's excellent article on "European Consortia: Evolving Cooperation at Work" [August issue]. However, I am afraid he omitted the *real* "granddaddy" of the European consortia aircraft. It was not the Transall C-160, but rather the Breguet 1150 "Atlantic" NATO Maritime Patrol Aircraft. The project was initiated by a NATO group of experts in Paris, in April 1957. First flight of the aircraft occurred on October 21, 1961 (about a year and a half before Transall's first flight). The initial

production run was for sixty aircraft—forty for the French Navy and twenty for the German Navy. It is still in service in several NATO countries. The original consortium was made up of France, the Federal Republic of Germany, the United States, Belgium, and the Netherlands.

While assigned to Naval Armaments Division, USNATO, I served on the Technical Subcommittee and the Comité Directeur (Board of Directors) for the project. I also logged test-pilot time in Atlantic Prototype No. 4, at Nîmes-Garons Naval Air Station in Southern France. The Atlantic is an excellent aircraft for maritime patrol and ASW missions, being designed from the wheels up for this purpose. Its closest US counterpart, by contrast, started as a modified airliner, the Lockheed Electra. As a result, the Atlantic has some unique features not available in the P-3 Orion. One is the hemispherical plexiglass nose bubble, which gives one a positively eerie feeling along with outstanding visibility in almost every direction, including down and aft. Another feature is an aft walkway, whereby the tail boom-mounted MAD equipment is accessible in flight.

I am certain that many of the engineers who worked on the Atlantic have gone on to work on the Concorde, the Jaguar, and the Tornado. The lessons learned on both the Atlantic and the Transall programs paid off handsomely on these later programs, and proved that components manufactured in different countries can indeed be assembled into a militarily effective aircraft.

Capt. John E. Draim, USN (Ret.)
Vienna, Va.

• *Many thanks to Captain Draim for bringing this up, and providing the background on Atlantic. A new-generation Atlantic has recently been ordered for the French Navy maritime patrol service. So the Atlantic is the "great-granddaddy" of European consortia aircraft, and the Transall the "granddaddy."*—THE EDITORS

International Cooperation

I would like to take the opportunity of thanking you for the excellent job you made of the presentation of the Tornado article in the June issue of your magazine ["Flying an 800-Knot Tornado," by John David Eagles].

It is very refreshing to see such an open approach to a European-built product in an American domestic magazine, and your treatment of the article has received widespread praise throughout the industry and service circles here in Europe.

This kind of attitude is so important in creating the right climate for some meaningful progress in the joint international development of systems, which would enable us all to make so much more out of our defense budgets, but which is so often lacking on both sides of the Atlantic. . . .

John Weston
Regional Marketing Manager
Panavia Aircraft GmbH
Munich, Germany

Down With the Two-Year Commitment

Reference your June '80 "Speaking of People" and the subject of "USAF's Proposed Educational Incentives," by Ed Gates, I would like to express some thought on this matter that may contribute to the initiation of a more effective and equitable education program for military personnel, and the commissioned officer in particular.

The listed item referred to as "Eliminate the two-year commitment for officers to receive TA" is supported fully by the majority of the Air Force officers whom I serve as an educational counselor. By far the majority of the officers using the Air Force Tuition Assistance (TA) monies are those whose date of separation or retirement is well beyond the two-year commitment date specified upon signing for a college-level course and its completion.

A cadet at the US Air Force Academy, in his four-year trek through some fifty college-level courses, costs the US taxpayer approximately \$200,000 each (\$4,000 per course). Upon graduation, he/she receives a commission and is called to active duty. For this cost a nonrated officer has only a five-year commitment. A rated officer, upon satisfactory completion of pilot or navigator service school, incurs a six-year commitment with the Air Force.

A commissioned officer on active duty at present must commit himself/herself to a two-year commitment after completion of one or more college-level courses if that person requests and receives tuition assistance from the Air Force. For example, tuition for a college-level course may cost \$100. Therefore, the officer pays one-fourth of the tuition (\$25) and the Air Force pays three-fourths (\$75) of the tuition.

It is difficult to understand how

We suggest that readers keep their letters to a maximum of 500 words. The Editors reserve the right to excerpt or condense as required in the interest of space or good taste. Names will be withheld on request, but unsigned letters are not acceptable.

some fifty courses at the Air Force Academy costing approximately \$200,000 requires the officer to be committed to only five years of active duty, whereas, the officer on active duty who "voluntarily" takes a graduate-level college course for only \$75 of Uncle Sam's money in TA has two full years of service tied to his breeches after completion of the course.

The word "voluntary," in defining the Air Force graduate-level academic program, is certainly grossly misleading. As long as the promotion boards consider possession of the graduate-level degree as a requirement for promotion to any of the field-grade ranks of officers, the program is definitely *not* voluntary.

Active-duty airmen, NCOs, and supergrade NCOs continuously use tuition assistance without receiving any service commitment. At this base, an Air Logistics Center, approximately forty percent of the civilians attending college courses receive fifty percent tuition assistance without any commitment. Under conditions of the two-year commitment, the commissioned officer feels that he is being penalized for being commissioned.

The extremely limited selection of available graduate-level programs that are forced on the officers at most on-base education programs is far from the choice of most officers as individuals. No matter what baccalaureate degree or major discipline of study an officer has acquired to qualify for the commission, he/she has very little or no choice in the selection of a master's degree program once on active duty. The officer is forced by uncontrolled circumstances of time, place, and rank to enroll in whatever advanced degree program is available at that assignment location. A promising university graduate with a Bachelor of Science Degree in Biology or Engineering with such honors as summa cum laude is usually forced by circumstances to take whatever graduate degree program is currently and locally being presented. (That program is usually business-oriented or another liberal arts program.) When does the individual in the armed forces relinquish his rights to develop himself as he desires to prepare academically for the primary career of his choice?

The bulk of the officers are fully convinced that the present armed forces involvement in advanced degrees in on-base education programs is designed and operated not nearly as much for the academic advance-

ment of the individual officer as it is designed and operated for the aggrandizement of those responsible for the initiation and continuation of this highly controversial program.

The attempt to control and manage the forms, record entries, signature slips, and changing regulations pursuant to the officer's TA commitment for the two years in the future surely costs more than the three-quarters tuition costs of the college course for which he/she received the commitment. For most education counselors and CBPO records specialists, it is an unnecessary and unwelcome administrative headache.

Request that all concerned, including Air Force staffers and congressmen, be made aware that the Air Force officers throughout are seeking elimination of the two-year commitment for officers who receive TA. They would consider the elimination of the two-year commitment a minor benefit and equal treatment with airmen, NCOs, and civilians, and no longer a penalty for being commissioned.

Lt. Col. Stephen M. Knowles,
USAF (Ret.)
Warner Robins, Ga.

AFA's Support of the Vets

As an old "ground-pounder," it doesn't come easy saying nice things about the "Air Corps."

Yet, this new Air Force is tough to ignore and the Air Force Association has to be one of its best salesmen.

All in the Veterans Administration continue to be impressed by the support of AFA in helping us provide maximum service to the veteran population—even non-USAF vets.

Specifically, your VA subjects in "The Bulletin Board" in each issue of AIR FORCE is another extension of our outreach efforts.

Your special handling of our fiftieth anniversary in the August issue ["The Veterans Administration: Fifty Years of Caring," by James A. McDonnell] along with Ed Gates's handling of "VA's Agent Orange Dilemma," have been brought to the attention of all concerned.

Thanks again for helping us serve your membership.

Dorothy L. Starbuck
Chief Benefits Director
Veterans Administration
Washington, D. C.

The 72d in Primary Role

Regarding William P. Schlitz's column "Aerospace World" (July '80), I would like to correct a misleading statement. When detailing the Eagle Thrust exercise conducted by the 1st

AIRMAIL

Tactical Fighter Wing at Langley AFB, Va., it appeared that the E-3A AWACS controlled the entire event.

In fact, the 72d Tactical Control Flight was the primary controlling agency, and conducted the great majority of sorties. The unit works on a daily basis with the Wing, and always plays a major role in its local exercises.

We enjoy your magazine, and keep up the great articles.

2d Lt. Nathan G. Toth, USAF
72d Tactical Control Flight
Fort Monroe, Va.

Peace Pharaoh Program

Regarding Gen. T. Ross Milton's article "Mideast Survey: Problems and Prospects," several hundred dedicated personnel take exception to the reference that the F-16 program for Egypt "will truly start our Egyptian military relationship."

The relationship truly started last summer with the Peace Pharaoh Program. Peace Pharaoh was one of the most accelerated programs in USAF Foreign Military Sales history—the delivery of thirty-five F-4E aircraft and all required spares and support equipment in a period of less than ten months. Normal programs call for a minimum of twenty-four months, and yet the first sixteen aircraft were delivered four months after program activation.

Since the F-16 program only involves five more aircraft (forty F-16s), please do not refer to the F-16 program as "the real program." Too many people worked too hard, for too long, on this \$500 million program to take a back seat to anyone.

Maj. Norval D. Martin, USAF
Peace Pharaoh Program Director
AFLC International Logistics
Center
Wright-Patterson AFB, Ohio

Mottled Schmottled

As a long-time scale modeler interested in camouflage, I enjoyed the articles in the August issue of AIR FORCE Magazine. However, I do have a small quibble.

The article by Capt. Wayne C. Edwards on the F-16 (p. 34 and following) describes the operational colors of the F-16 as "mottled gray." My Funk and Wagnalls Standard College Dictionary defines the term "mottled"

as "Marked with spots of different color or shade; blotched; spotted." From the photographs accompanying the article, it appears that there is one splotch of dark blue-gray over a base color of a light to medium blue-gray. Except for the port side of 007's fin (p. 35) the rest of the plane appears to be devoid of spots.

I am not aware of the current service terminology for aircraft camouflage, but the F-16 colors appear to be a simple two-tone dark-on-top/light-on-bottom scheme with an unusual dividing line location. It certainly seems that there is only one spot instead of the plural spots required to be mottled.

This letter is not meant to be critical. Perhaps an article on the newer "warpaint" schemes, with historical background, would be appropriate. It could help restrain overenthusiastic squadron painters who use such bright squadron motifs that any camouflage effect is lost.

Gordon J. Douglas, Jr.
Fullerton, Calif.

• A camouflage feature article and photo spread is in preparation. Watch for *Lizard*; *Air Superiority Blue*, and others, perhaps including mottled gray.—THE EDITORS

007 Flies Again

One look at your August cover and the memories came roaring back. The tail number (007) computes, but the players were different.

Tyndall AFB, Fla., 1952: A polished F-94C with the nose marked FA 007; the young two-striper quizzing the pilot was yours truly.

But the pilots wore khaki (summer) flying fatigues with bright yellow Mae Wests; and they had names like Capt. Daniel "Chappie" James (he called the Starfire "Balls Seven") and Lt. Felix "Doc" Blanchard (or was Doc an RO?).

In those days nobody wore muffs. The Air Force had no ear-defender program at all except for empty shell cases and bring-your-own cotton. The Starfire's J48 turned out less than 7,000 pounds of thrust, but it was sufficient to play hell with the auditory nerves. Sure enough, ten years after Tyndall I was fitted with a hearing aid.

Keep all the fine articles coming.

Lt. Col. James L. Delaney, USAF
Chief, Office of ANG History
Alcoa, Tenn.

Twilight of a Career

I believe we have overlooked many of the reasons why our pilots, engineers, and younger officers are leaving the Air Force. Dealing with junior officers

GRUMMAN DELIVERS REAL-TIME TEST SYSTEMS ON TIME, ON BUDGET

If you want your real-time test system installed on time and on budget, you need a company with experience and a track record. That's precisely why you should speak to Grumman Data Systems. We are experienced in developing and delivering test data processing systems under tight schedules. We understand the needs of both real-time facility support and the real-time user community because we operate daily in both environments.

Grumman Data Systems' years of real-time testing experience has provided us with a broad scope of technology and expertise in:

- Signal acquisition, conditioning, and formatting
- Data handling, processing, and analysis
- Output display and system control
- Software operating systems and compilers
- Engineering management and control

For any test system requirement, we can deliver real-time systems on time, on budget.

Proof of our ability to handle the big ones right is our record on a recently completed multi-million dollar installation. Customer scheduling and requirements commitments were met...within budgetary limits.

Grumman Data Systems has delivered real-time test systems in support of major NASA, NAVY, and AIR FORCE projects.

We provide TOTAL TEST SYSTEMS, both military and commercial, on time, on budget. Call Stu Voorhies at Grumman Data Systems Corporation, (703) 528-5900.



50 years



daily in my position, they are very much aware of economics today, more so than when I joined the Air Force. My reasons were based upon dedication to God and Country, and I considered a commission as a military officer one of my highest, if not the highest, accomplishments of my lifetime. Since I wanted to serve as an officer in the US military as long as I can remember, I have conscientiously fulfilled that dream and taken great satisfaction in having reached my goal. However, as I reach the twilight of my military career, I, too, have been hit with the economic realities of my decision.

In the sixties and early seventies, I was not preoccupied with the cost of living. I felt I was making a good salary, receiving good training and experience, furthering my education, and was very content. But in the past years, with a growing family, the realities of the economy have begun to wear away. I have looked at the pay difference between O-5 and O-6, at \$250 per month before taxes, which would yield about \$150 a month for promotion, not counting allowances. Housing allowance difference is only \$37 per month. Coupled with a promotion is the chance of a remote assignment or assignment to a high-cost area. Thus, the decision to retire becomes a very profitable consideration. However, when one confronts the job market, the salary offers range from \$22,000 to \$35,000 a year. Many companies feel you are overqualified, or many make an offer that they feel is adequate because they know you are

AIRMAIL

receiving military retirement. So the outlook for employment at a decent salary where one does not have to subsidize his existence from retirement pay becomes a problem. At age forty-two, with two children in college and two at home, on a lieutenant colonel's salary, maintenance of one's existence and provisions for the future become paramount. We must also realize that our younger officers are looking at officers such as myself and asking, "If this guy is having problems making ends meet after twenty years, where does it leave me?"

Surely many of us who raised our hands twenty years ago need our retirement pay to live. Many of us have been precluded, due to low quarters allowance in the sixties, from acquiring a home, or due to remote assignments, from speculating in the housing market. Our savings for college funds or to replace old tired automobiles worn out by traveling thousands of miles back home to maintain contact with our families have been depleted with every PCS move. Certainly, our junior officers look to us for guidance and want to be reassured they are making the right decisions. They are not blind; they are astute, refined, intelligent people. Many say,

"Well, I see the long-term contribution does not leave me any better off." Unfortunately duty, honor, country rings hollow when one cannot at least plan or be assured of financial security after a twenty-year career.

Lt. Col. Raymond T. Cwikowski,
USAF
Dayton, Ohio

Arnold Air Society Alumni

The following Arnold Air Society AFROTC detachments are trying to update their records of past members. Please respond with your present military or civilian status, short personal history, and current address to:

Alumni Project Officer, AAS
AFROTC Det. 150
University of Florida
Gainesville, Fla. 32601

Special Projects Officer, AAS
Charles A. Lindbergh Squadron
AFROTC Det. 207
Parks College
Cahokia, Ill. 62206

Alumni Project Officer, AAS
Gen. Lauris Norstad Squadron
AFROTC Det. 415
University of Minnesota
Minneapolis, Minn. 55455

Arnold Air Society
Emory Bass Squadron
AFROTC Det. 172
Valdosta State College
Valdosta, Ga. 31601

Arnold Air Society
Christman Squadron
AFROTC Det. 090
Colorado State University
Fort Collins, Colo. 80521

Chief of History, AAS
AFROTC Det. 665
University of Cincinnati
Cincinnati, Ohio 45221

Alumni Chairman, AAS
JBS Squadron
AFROTC Det. 5—331 Brown Hall
Auburn University, Ala. 36849

Morbid But Useful Information

I don't claim to have made a statistically significant survey, but I have asked possibly 100 of my military compatriots the following question: "If you are KIA in a foreign land, do you wish to be brought home at added cost to the government and with added pain for your loved ones? Or would you prefer to be buried there with the savings going to your insurance designee?" Of the many fighting men queried, only one (who considered himself a shoo-in for Arlington)

UNIT REUNIONS

Northway, Alaska

Reunion middle 1981. Send names, addresses you have. For details and plans, **contact:** Lt. Col. Sid F. Spear, USAF (Ret.), 8914 Royal Birkdale Lane, Orlando, Fla. 32811. Phone: (305) 876-3597.

1st ALC Augmentation Squadron

October 25, Moultrie, Ga. **Contact:** Maj. Thomas H. Lokey, 2 Bigby Court, Columbus, Ga. 31904.

18th Weather Squadron

Planning 40th anniversary reunion in 1981. **Contact:** Arthur W. Gulliver, 5119 S. 81st St., Omaha, Neb. 68127.

Class 40-G

Flying cadets' 40th annual reunion, Sheraton Motor Inn, San Antonio, Tex. November 13-15. Class members not already reached **contact:** R. L. Delashaw, 5815 Royal Bend, San Antonio, Tex. 78239. Phone: (512) 653-9360.

73d Bomb Wing Association

Superfort 497th, 498th, 499th, and 500th Groups plus attached units on Saipan during WW II, March 18-25, 1981, Intercontinental Hotel, Saipan, Northern Mariana Islands. **Contact:** 73d Bomb Wing Association, 105 Circle Dr., Universal City, Tex. 78148.

335th Tac Fighter Squadron

"Chiefs" stationed at Seymour Johnson AFB, N. C., planning Christmas reunion December 5-6 for all former members. **Contact:** Maj. Howard Sharpe, 404 Woodview Dr., Goldsboro, N. C. 27530. Phone: (919) 734-0749 or AUTOVON 488-5611.

339th Fighter Group, 8th AF

Desire to organize reunion of the former members of the Mustang fighter group stationed at Falmer near Cambridge, England. **Contact:** Art "Nellie" Nelson, P. O. Box 4542, Long Beach, Calif. 90804. Phone: (213) 434-1376.

SCIENCE/SCOPE

Advanced computer software will be used to test the guidance system of the U.S. Air Force's new MX intercontinental ballistic missile. The software is an IEEE standard ATLAS test language compiler similar to the one Hughes created for the U.S. Navy. It will be used to prepare test programs for the guidance system's performance during manufacture and maintenance. Hughes is under contract to Northrop, integrator of the MX guidance system production test equipment.

Increased productivity is one major benefit enjoyed by the electronics business since the advent of employee Quality Circles. Quality Circles are groups of volunteers from a single area doing the same or similar work who meet regularly to explore work-related problems and possible solutions. Besides solving problems, the circles help improve morale because employees have a voice in how their work can best be done. Since Quality Circles began four years ago at Hughes, about 160 groups have been formed, involving some 1400 persons.

A laser device called a Laser Target Designator, which will let ground troops pinpoint targets for laser-guided and conventional weapons, has been introduced into the arsenal of U.S. armed forces. The unit resembles a short-barreled rifle, and, at less than 16 pounds, is the lightest ground designator in the world. The LTD directs an invisible beam of laser pulses at any target the operator can see. The coded pulses are reflected from the target and detected by special sensors in aircraft or laser-homing weapons. Hughes has delivered the first 15 production units under contracts with the U.S. Army Missile Command.

The radar on the F/A-18 Hornet has passed a critical test with the firing of the strike fighter's 20-mm gun at the Naval Air Test Center in Maryland. Tests proved that the radar, which due to size constraints in the aircraft's nose is located below the gun barrel, is well protected from hazards of gun gas and vibration. In the ground tests, more than two 570-round drums were fired, with one long burst each at 4000 and 6000 rounds per minute. In the airborne test, rounds were fired in six bursts while the radar was in its search and tracking modes. Hughes builds the AN/APG-65 radar under contract to McDonnell Douglas Corporation for the U.S. Navy and Marine Corps.

Microelectronic chips that contain nearly a half million circuit elements and are hundreds of times faster than currently available devices are being developed at Hughes for a wide range of military uses. The first VHSICs (very high-speed integrated circuits) will be made using photolithography and have device geometries (jargon for the smallest dimension on the chip) as small as 1.25 micrometers. Chips in the mid-1980s will be made with electron-beam lithography and will boast device geometries with submicron dimensions. Applications for VHSIC chips include processors for multimode radars, communication systems, sonars, electro-optical systems, and advanced multimode "fire-and-forget" missiles. The major program goal is to develop common military chips and to limit the number of custom-built and special circuits used.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
CULVER CITY, CALIFORNIA 90230



Super Sabre, super target. Sperry breathes new life into 24-year-old F-100.

It takes a supersonic, afterburning, highly maneuverable full-sized target to give Air Force fighter crews realistic air combat training.

That target will be the QF-100 drone. The converted F-100 Super Sabre by Sperry Flight Systems.

Able to pull more g's than a *manned* F-100, it will be a truly challenging adversary for both operational training and evaluation of new air-to-air and ground to air missiles. It's the latest in a long line of Sperry aircraft drone conversions: QB-17, QB-47, QF-80, QF-86, QF-104 and, currently, PQM-102.

Sperry has delivered more than 130 PQM-102s (formerly F-102s) with more than 75 to go. The QF-100 will succeed it as the primary Air Force full-sized target.

Both QF-100s and PQM-102s are coming out of our conversion center now. For more details on the world's most cost-effective full-scale targets, contact Sperry Flight Systems Defense and Space Systems Division, Box 29222, Phoenix, Arizona 85038. Phone (602) 869-2765. *We understand how important it is to listen.*



AIRMAIL

said he wanted to be brought back.

I suggest that each member of the armed services be asked that question and a suitable notation, revocable only by the principal, be made in his or her records.

Let your Congressman know how you feel.

Col. Gilmour C. MacDonald,
USAF (Ret.)
Shalimar, Fla.

TSgt. Ernest Kolln

I am looking for anyone who was connected with the 885th Bomb Squadron, Fifteenth Air Force, from around July 1 through September 30, 1944. On September 10, 1944, my uncle, TSgt. Ernest G. Kolln, was on a B-17 mission out of Algeria, North Africa. The plane was shot down and all crew members were lost. His crew mates were: 2d Lts. John R. Meyers, Darl Heffelbower, Ian Raeburn, and Raymond Wilson; TSgt. Donald Pullis; SSGts. Louis Simpson and Walter Bildstein; and Cpl. Robert Lloyd.

If anyone has any information on this mission, the aircraft (markings, colors), pictures taken of the crew, etc., please contact me.

A1C Jeff L. Kolln
6620 E. Golf Links Rd., Apt. 117
Tucson, Ariz. 85730

509th Tac Fighter Squadron

In June 1980, the 509th Tactical Fighter Squadron was reactivated here at RAF Bentwaters. The 509th has a proud and distinguished past that dates back to the World War II era. That pride is ever present today as the 509th develops into a front-line A-10 squadron.

Those of us in the new 509th wish to initiate and maintain contact with past members of the squadron. We wish to update and compile an accurate squadron history. Additionally, we wish to collect mementos, trophies, and artifacts from the squadron's past for permanent display.

Any past members of the 509th who wish to participate in our endeavor may contact the squadron at the following address:

Capt. W. C. Hampton
509th TFS
RAF Bentwaters
APO New York 09755

CTVS is...

*tactical
readiness*

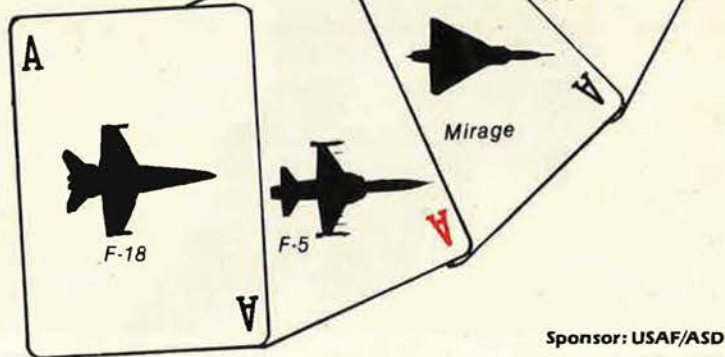
and

*more
flying
ACES!*



AN/AXQ-16(V)

**COCKPIT
TV
SENSOR
(CTVS)**



Sponsor: USAF/ASD

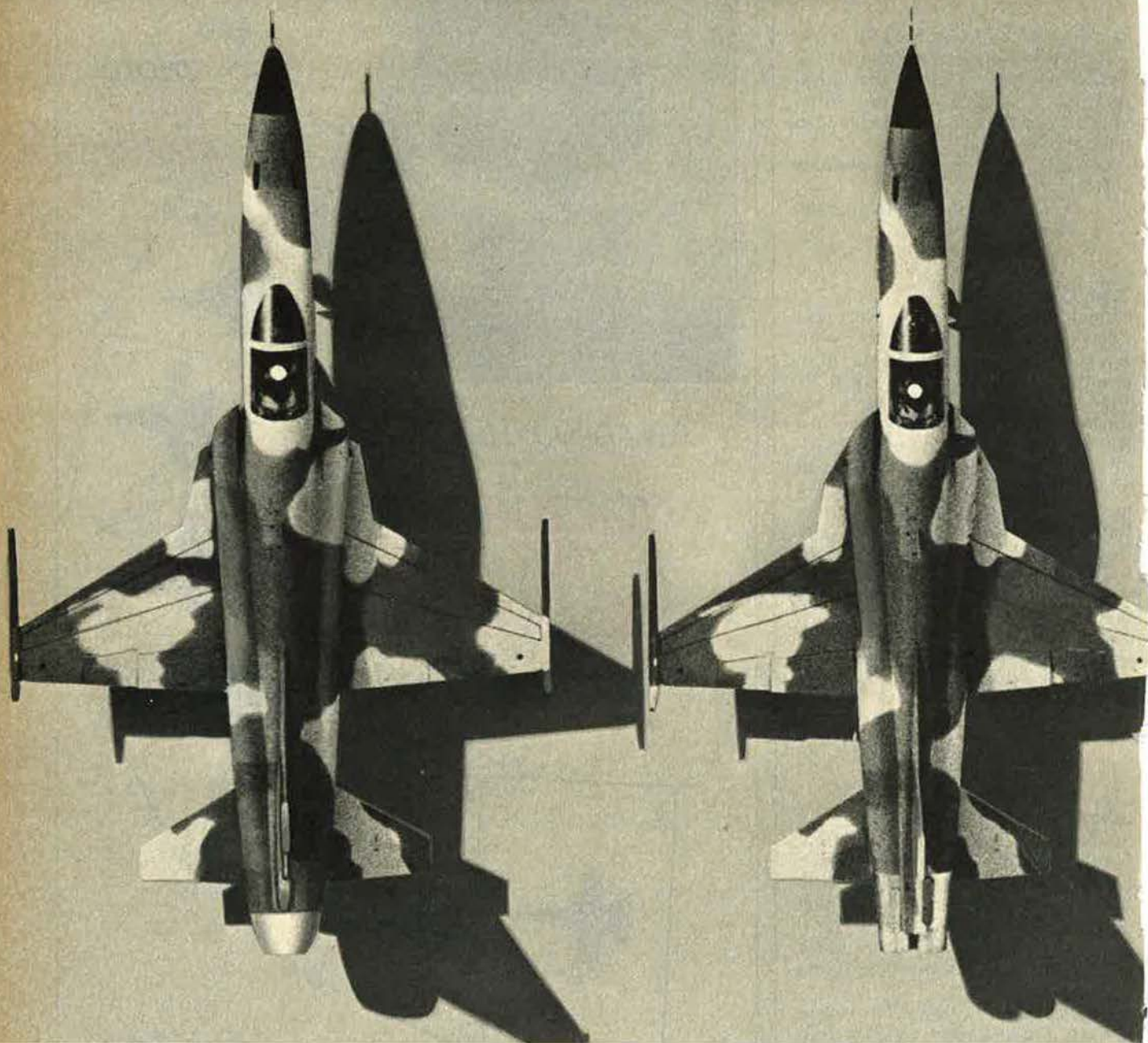
CTVS provides a capability for airborne video recording of HUD and real world image data for combat and training missions. Flight proven, qualified and now in production for military aircraft, worldwide, the all solid-state TV camera incorporates a Fairchild CCD sensor.

FAIRCHILD WESTON SYSTEMS INC.

300 Robbins Lane, Syosset, New York 11791 Tel: (516) 931-4500 TWX: 510-221-1836

**FAIRCHILD WESTON
Schlumberger**

A FAMILY

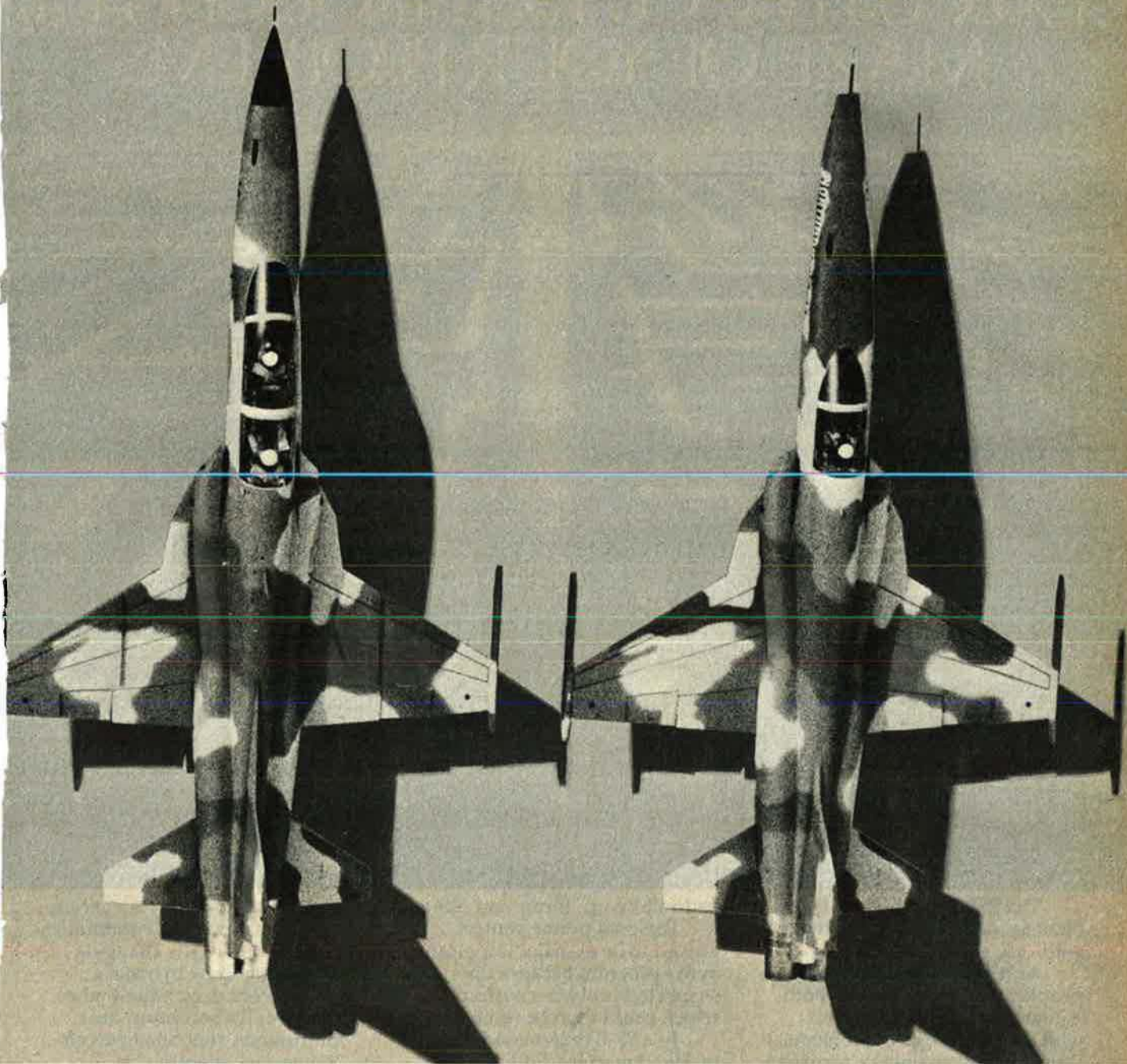


F-5G Newest member of F-5 family of tactical fighters and trainers. Designed to meet emerging worldwide needs for defense through the turn of the century.

A single General Electric F-404 engine replaces twin J-85 engines of earlier F-5s. Result: 60 percent increase in available thrust. Mach 2 class.

F-5E Air-to-air combat superiority over anticipated threats. Air-to-ground capability fulfilling user needs. Easy maintenance. Rapid turnaround. All at affordable cost

OF FIGHTERS



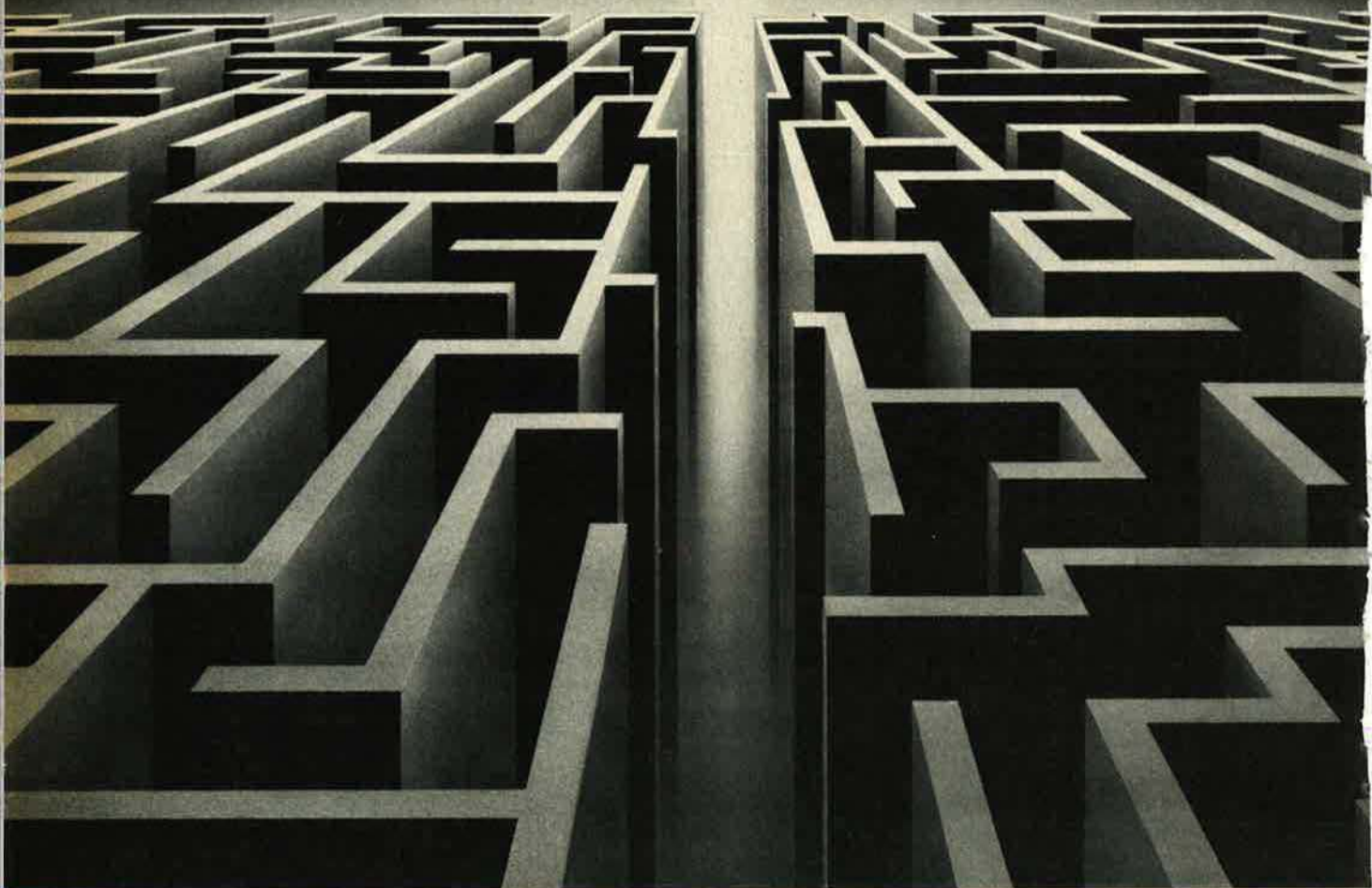
F-5F Fighter/trainer with two cockpits, dual controls for advanced pilot training. Retains full tactical capability.

RF-5E Dedicated reconnaissance version of F-5E. Retains air-to-air and air-to-ground capabilities.

Northrop's F-5/T-38 family. Operational flexibility. Logistics commonality. Established worldwide support system. More than 3,400 aircraft in service or on order for 28 nations.

NORTHROP
Making advanced technology work.

HOW A BELL ACCOUNT EXECUTIVE CUTS THROUGH THE MAZE OF YOUR PROBLEMS.



The Bell System has all sorts of ideas to lower costs and make your operation more productive.

And Bell System account people stand ready to help both military and civilian agencies with a whole range of problems. Everything from energy management to increasing your mission effectiveness.

For instance, Bell System Account Executives helped the Army design a program to increase re-enlistment of Reservists.

Army personnel were taught how to use the phone to catch the ear of Reservists who were close to discharge. They learned how to identify and handle objections to re-enlistment.

They were also trained in overall procedures that included pre-call planning, tracking

and follow-up, forms and filing.

Personal phone contact proved to be of major importance in the program because unsuspected problems surfaced, which could then be resolved.

In a 90-day test conducted by Headquarters, Fifth United States Army, the objective of increasing the retention rate of first term Reservists was reached and exceeded.

As a result, the program was expanded throughout the Fifth Army.

The program also showed that it can pay for itself many times over by eliminating training costs for new Reservists.

Bell account people, trained to help in specific government areas, have access to the knowledge and resources of the Bell

System. And are at your service.

Bell's advanced communications technology is changing ideas about how to make a government department more effective. It's becoming clear, for instance, that what we call "personnel retention" is one of the many aspects of information management and communications.

And that's our business—the knowledge business.

Come see us at the Association of the United States Army annual meeting Oct. 13, 14, 15; Booth C-435 at the Sheraton Washington Hotel in Washington, D.C.

The knowledge business



IN FOCUS...

By Edgar Ulsamer, SENIOR EDITOR (POLICY & TECHNOLOGY)

Washington, D. C., Sept. 2

The "Invisible" Airplane Issue

Following a series of news reports about a startling technology program that apparently makes possible "invisible" aircraft, cruise missiles, drones, RPVs, and perhaps even ground vehicles as well as ICBMs, the Defense Department not only acknowledged its existence but ascribed to it near magic power. Both the timing of the leaks and the gushing enthusiasm and confidence with which the Administration marketed the amalgam of technologies known as "low observables" or "stealth" are worthy of scrutiny.

Dr. William J. Perry, Under Secretary of Defense for Research and Engineering, in late spring widened the circle of members and officials of Congress with access to the information to more than one hundred. Until then only a very small number of key personnel on Capitol Hill had been briefed on the program under extremely tight security control. Informal USAF reaction to Dr. Perry's expansion of access was one of apprehension. In the Congress, the reaction tended toward suspicion that the Administration was overstating the revolutionary nature of the technologies and the certainty and rapidity with which they could be brought into the operational inventory. Similarly, there was widespread concern that the real purpose of the briefing blitz was to derail inchoate moves in Congress to authorize development and deployment of a new strategic bomber using conventional technologies.

On August 22, Secretary Brown, Dr. Perry, and Lt. Gen. Kelly Burke, USAF's Deputy Chief of Staff for Research, Development, and Acquisition, announced at a Pentagon press conference that because of a series of leaks "it is not appropriate or credible for us to deny the existence" of the program. Terming the program a major technical advance of great military significance, Secretary Brown explained that the stealth technology "enables the United States to build manned and unmanned aircraft that

cannot be successfully intercepted with existing air defense systems. We have demonstrated to our satisfaction that the technology works."

Dr. Perry described the stealth technology as not involving "a single technical approach, a single gimmick, but . . . rather a complex synthesis of many." Theoretically at least, he added, the technologies could be applied to "any military vehicle which can be attacked by radar-directed fire."

Work on stealth technology has been going on for the last two decades and by 1977 led to the conclusion that it "could be considerably extended in its effectiveness and could be applied to a wide class of vehicles, including manned aircraft." Current annual funding, according to Dr. Perry, is 100 times greater than when the Carter Administration decided to accelerate the program in 1977. The implication that the current Administration is responsible for bringing the program to fruition while the previous ones lacked the will and foresight to do so, drew heated Republican responses. Sen. John Tower (R-Tex.) convened a special press conference to charge that "the timing of the Administration's revelation of the stealth technology is politically motivated and does not coincide with either a new breakthrough or a new commitment. Stealth technology is not new, but it does offer promise for the future. While the technology may work, it is reckless grandstanding on the part of the Secretary of Defense to insinuate that his stealthy bomber is to be deployed in the 1980s."

Governor Reagan's principal defense advisor, William R. Van Cleave, charged that the Administration "grossly exaggerates what we know of the effectiveness of this technology and distorts the time factors involved in any eventual application of the technology."

Even members of the President's own party hinted darkly that the Administration was using the stealth technology issue as a ruse for thwarting a congressional mandate to have a new manned bomber in

production by 1987. Sen. John Glenn (D-Ohio), who, along with Sen. Alan Cranston (D-Calif.), sponsored an amendment to the FY '81 defense authorization bill to that effect, complained that Secretary Brown is "thwarting the will of the Congress" by not committing the Defense Department to the development and deployment of a multirole bomber.

"It is our intent," he said, for "this plane to begin appearing on our runways—not in a study . . . as soon as practicable but not later than in 1987." Senator Cranston termed Dr. Brown's statement that "whether we will need a new penetrating bomber is not clear" a disappointment to those who thought that the Pentagon's announcement about the stealth program "meant that Secretary Brown had endorsed development and production of a new bomber." In announcing the stealth program to the press, Secretary Brown continued to hedge on the bomber question, saying whether or not a penetrating bomber—a follow-on to the B-52—will be needed is "an open question in my mind."

In marked contrast with this relative uncertainty about the need for a follow-on bomber is the certainty with which the Administration presents the stealth program. Dr. Perry, for instance, talked about having achieved "excellent success on the program, including flight tests of a number of different vehicles." Dr. Brown rhapsodized that "in sum, we have developed a new technology of extraordinary military significance. We are vigorously applying this technology to develop a number of military aircraft, and these programs are showing very great promise. . . . It can contribute to the maintenance of peace by posing a new and significant offset to the Soviet Union's attempt to gain military ascendancy by weight of numbers."

Under questioning by the press, Dr. Brown predicted that the stealth technology would be effective against existing as well as foreseeable Soviet air defense systems, including "the ones that are now in de-

velopment and could be deployed during the rest of the decade." Acknowledging that the Soviets are bound to come up eventually with countermeasures that will have to be met with countercountermeasures, he claimed nevertheless that "the balance is strongly tilted in the direction of penetration by this technology."

He conceded, however, that, although stealth was an important characteristic in aircraft performance, there are other features that determine capability. Elaborating on this subtle point, General Burke suggested that "you can only prioritize one design goal at a time, and obviously you don't get any desirable features without giving up some other desirable features." Asked whether he was certain that the stealth technologies would be ready by 1987 to enter the operational inventory or whether the congressional deadline for having a new multirole bomber should be extended and the void filled by a stopgap design, General Burke answered that "it's premature to try and answer this."

He added that the Air Force is trying to have definite answers ready by the congressional deadline of March 15, 1981, but warned that "there is an enormous amount of work to be done between now and then, not just quantitative analysis but a lot of engineering evaluation." At this point Secretary Brown interjected the comment that "it's too soon to say what the precise mix of our capabilities in the 1990s will be, but it is not too soon to say that by making existing air defenses essentially ineffective, this alters the military balance significantly."

Under further questioning, Dr. Brown conceded, however, that in the strict sense of the word, these stealth technologies don't result in an "invisible airplane," adding that the Soviets would be able to know that it was coming, "but too late to intercept you." There would be enough time for the Soviets to retaliate, using their nuclear forces against the US, because once the aircraft is "close enough," hostile air defense radars will be able to "see it."

In the view of Capitol Hill analysts, this trait of the stealth technologies generates some doubt about their long-term viability. Most of these experts believe that a manned strategic system using the full range of stealth technologies can't be brought into the inventory before the mid-1990s. By that time, they argue, airborne or even spaceborne laser weapon systems could well be operational. Laser

IN FOCUS...

weapons deliver lethal thermal energy with the speed of light. Hence, these experts fear that such weapon systems might be able to intercept stealth aircraft in spite of the very limited period of time between the latter's detection and acquisition and the former's ability to act.

While the degree of purely "eyeball visibility" of the stealth technologies is not clear, it can be adduced that sufficient "camouflage" has been incorporated to prevent timely detection by present-generation electro-optical sensors, especially since strategic aircraft using stealth technologies probably would penetrate at night.

While some of the technologies associated with stealth can be used to modify and retrofit existing aircraft, according to Dr. Perry, "in their entirety they [cannot]. They require a design from the ground up." He also speculated that on a "dollar per pound basis," aircraft using this combination of technologies probably will cost about the same as conventional designs.

In acknowledging publicly the existence of this technology, the Administration spokesmen promised that "we will be drawing a new security line to protect that information about the program which could facilitate Soviet countermeasures." It is possible to question the validity of this claim since obviously the best protection against Soviet countermeasures would have been continued abstention by the Administration from leaking the information to a widening circle of members of Congress and the press.

A House subcommittee is considering demands for criminal prosecution of those Administration officials responsible for the release of this sensitive national security information.

PD 59: Much Ado About Nothing

During the lull between the Republican and Democratic National Conventions, a well-orchestrated news leak livened up Washington's August dog days and garnered headlines and prime-time coverage well beyond the significance of the event. The issue that was built up to larger-than-life-size stature by a selective leak to

prestigious newspapers—reportedly by "high Administration officials"—is a Presidential Decision known as PD 59.

PD 59 codifies and refines what had been acknowledged by at least three administrations: The importance of providing mechanisms and means for flexible, limited strategic responses below the level of a total reprisal attack on the Soviet population, both to deter or to respond to limited Soviet first strikes. First formulated brilliantly and articulately in 1974 by former Defense Secretary James R. Schlesinger, the concept of flexible strategic options—except for some rudimentary capabilities and unthinkable preemptive attack stratagems—remains an elusive goal for the US.

Thus, even senior officials within the Administration familiar with the topic were startled when the White House decided to elevate what had been a systematic, long-term cataloging of SIOP (single integrated operational plan) adjustments and hardware requirements emanating from a flexible options policy to a full-blown Presidential Decision and media event. There was, these officials point out, no specific development or reason to expose this highly sensitive issue at this time, in the middle of an election campaign.

Political posturing and the sensitive nature of this issue aside, there are potentially positive aspects to PD 59. By committing itself formally to the attainment of such a posture, the Administration presumably will soon be forced to fish or cut bait. Either it takes the steps needed to carry out a policy of flexible options or failure to do so, assuming reelection, could lead to a loss of public faith in its rectitude. Coincidentally, the Republican Party's platform embraced essentially the same policies and doctrines that were codified by PD 59.

Genesis of PD 59 was PD 18, a comprehensive directive issued in the early days of the Carter Administration. PD 18 asked for a sweeping review of all US strategic war planning and spawned a series of subsequent presidential directives that run the gamut from comprehensive mobilization planning and means for assuring continuity of government in nuclear war to improved civil defense and more survivable communications netting.

The lineage of PD 59 can be traced back further in time to a so-called National Security Decision Memorandum of the Ford Administration, known as NSDM 242, that spelled out Dr. Schlesinger's selective strategic

RF COMMUNICATIONS

The Harris AN/GRC-193. Built for punishing duty on the ground, ready in 6 seconds to go on the air.

With the Harris AN/GRC-193, you get the power of a field-proven 400 watt SSB tactical transceiver system that offers considerable advantages.

Consider its automatic tuning feature which makes it exceptionally simple to use and ready to operate within 6 seconds.

And consider its superior efficiency. It not only consumes less power than competitive models, we've made it at least 20% lighter and 25% smaller—without sacrificing toughness. Its submersible, rugged design meets full military specifications for reliability in the most punishing tactical applications.

For tactical security, the antenna and coupler may be deployed up to 250 feet away from the covered and concealed radio site. Along with providing full voice and teletype capabilities, the AN/GRC-193 is qualified to be used with the latest United States military HF secure voice equipment.

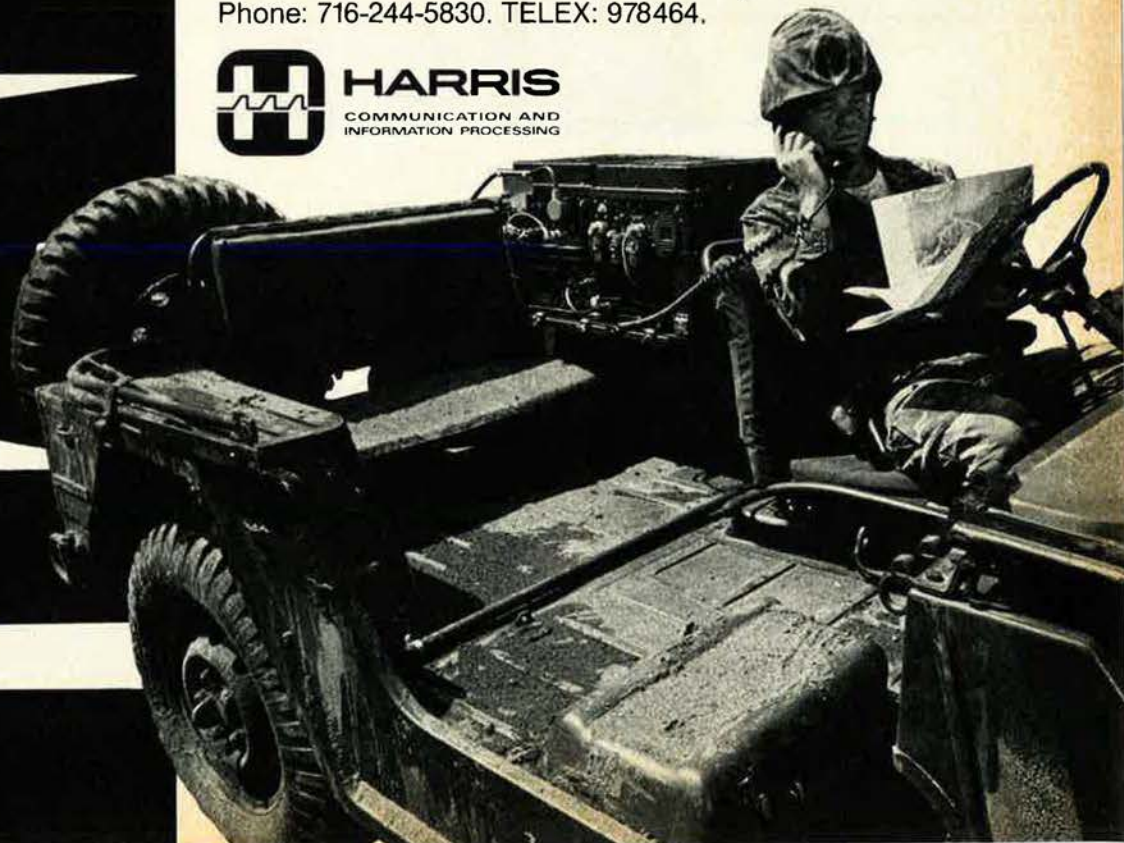
The Harris AN/GRC-193 is in production and logistically supportable. It is designed to deliver a continuous 400 watt output from a standard 60 ampere vehicular power supply. It can be used in fixed stations or installed in any vehicle (with rack or sponson mounting).

The Harris AN/GRC-193. The tactical radio with all the advantages.

For complete details, please contact: HARRIS CORPORATION, RF Communications Division, Government Marketing Department, 1680 University Avenue, Rochester, N.Y. 14610. Phone: 716-244-5830. TELEX: 978464.



HARRIS
COMMUNICATION AND
INFORMATION PROCESSING



PORTABLE C³

Satellite • Line-of-Sight • Manpack/Portable Radio



The PRT-250, now the AN/URC-100 operationally proven for voice, data, UHF/VHF, AM/FM, secure, and satellite communications.

Satcom Terminal

Satellite communications with line-of-sight benefits. Also, the latest options for our "ready radios" make them securable in the AM and FM mode for your critical messages. All in one very portable package.

Fully Synthesized For Flexibility

The Motorola PRT-250 (AN/URC-100) portable transceiver combines broad frequency selection... 8360 fully synthesized channels... with modulation methods to accommodate rapid mission changes in command and control networks including air, mobile, and ground units.

Installs Almost Anywhere

This advanced, rugged portable radio can be easily mounted in helicopters, jeeps, armored personnel carriers, ships, aircraft, and manpacks, or communications centers. The multimode operation includes a scanning function that makes it easy to set up back-to-back translator/repeater links. Frequency coverage from 116-150 MHz and 225-400 MHz.

More Exciting Details

If you'd like to learn more about the PRT-250 (AN/URC-100) and how its new frequency option of 30-88 MHz, now being developed, lets you set up command post communications almost anywhere, call 602/949-2798. Or write Motorola's Government Electronics Division, P.O. Box 2606, Scottsdale, AZ 85252. Our new brochure will give you the exciting details on its lightweight versatility.



MOTOROLA

Making electronics history

options doctrine. But PD 59 unquestionably is broader, more mature, and more in step with evolving technology than the older NSDM 242. Where the former was limited essentially to coming up with sets of targets prior to the outbreak of war and being ready to pick from a number of preprogrammed SIOPs, PD 59 calls for a two-pronged approach: Preplanned SIOPs as well as flexible, near-real-time targeting intelligence to permit application of forces in response to existing conditions rather than pre-war assumptions.

Secretary Brown described the purpose of PD 59 to the NATO Defense Ministers not as a break with past policies that for some time now included effective and comprehensive coverage of Soviet military and control targets, but "as an evolutionary development of our doctrine." US capabilities in terms of flexible coverage of the Soviet target system, he said, "will continue to be improved and made more flexible as we implement the countervailing strategy. For it is crucial that the Soviet leadership recognize that by aggression they would risk not only a general US retaliation on the full range of targets; they must also understand that if they choose some intermediate level of escalation, the US could by more limited responses impose on the Soviets an unacceptably high cost in terms of what the Soviet leadership values most—political and military control, military power, both nuclear and conventional, and the industrial capacity to sustain military operations."

Under the new directive, Dr. Brown suggested, US strategic forces also must deter nuclear attacks "on smaller sets of targets in the US or on US military forces and be a wall against nuclear coercion of, or attack on, our friends and allies. And strategic forces, in conjunction with theater nuclear forces, must contribute to deterrence of conventional aggression as well."

The underlying reason for the new directive, Dr. Brown said, is that the Soviet leadership "appears to contemplate at least the possibility of a relatively prolonged exchange if war comes, and, in some circles at least, they seem to take seriously theoretical possibility of victory in such a war. We cannot afford to ignore these views—even if we think differently, as I do. We need to have, and we do have a posture—both forces and doctrines—that makes it clear to the Soviets and to the world that any notion of victory in nuclear war is unrealistic."

IN FOCUS...

The belated conversion of the Carter Administration to nuclear Realpolitik is laudable, especially in light of the fact that many of its members assumed office fully persuaded that by practicing a minimum assured destruction policy the US could coax the Soviets into reciprocating. Yet, as this column was told, the subsequent, relentless Soviet arms buildup has caused these members of the Administration to change their outlook—"although grudgingly"—from totally euphoric détente to PD 59.

But changes in outlook don't translate immediately into changes in capabilities. Gen. Richard H. Ellis, Commander in Chief of the Strategic Air Command, in a letter of April 1979 to Dr. Brown, observed that the demonstrated and projected growth of Soviet capabilities will continue to erode our relative strength until sufficient numbers of ALCM, Trident, and MX are deployed in the mid- to late-1980s. In the interim, the survivability and quality of our forces supporting the SIOP will cause a shift in our deterrent posture from one capable of fulfilling a countervailing strategy toward one much less capable.

Transforming PD 59 from a piece of paper into strategic reality clearly will take several years and the combined, sustained support by the Executive Branch and Congress. At this time it would be premature to wager on the outcome.

Washington Observations

★ The likelihood of Congress failing to make the October 1 deadline on the FY '81 Defense Budget appropriations—which starts that day—is approaching certainty. What is not yet clear is how long it will take Congress to agree on a so-called continuing resolution—a procedure that permits continued spending at the current, in this case, FY '80 level. Last year, the Defense Department and the Air Force carried on "business as usual" for about two weeks before Congress passed a continuing resolution. This may not be possible this year without senior civilian and military Pentagon leaders running the risk of criminal prosecution if they authorize further funds.

In response to a request by President Carter, Attorney General Benja-

min R. Civiletti informed executive branch agencies that "it is my opinion that, during periods of 'lapsed appropriations,' no funds may be expended except as necessary to bring about the orderly termination of an agency's functions, and that the obligation of funds for any purpose not otherwise authorized by law would be a violation of the Antideficiency Act."

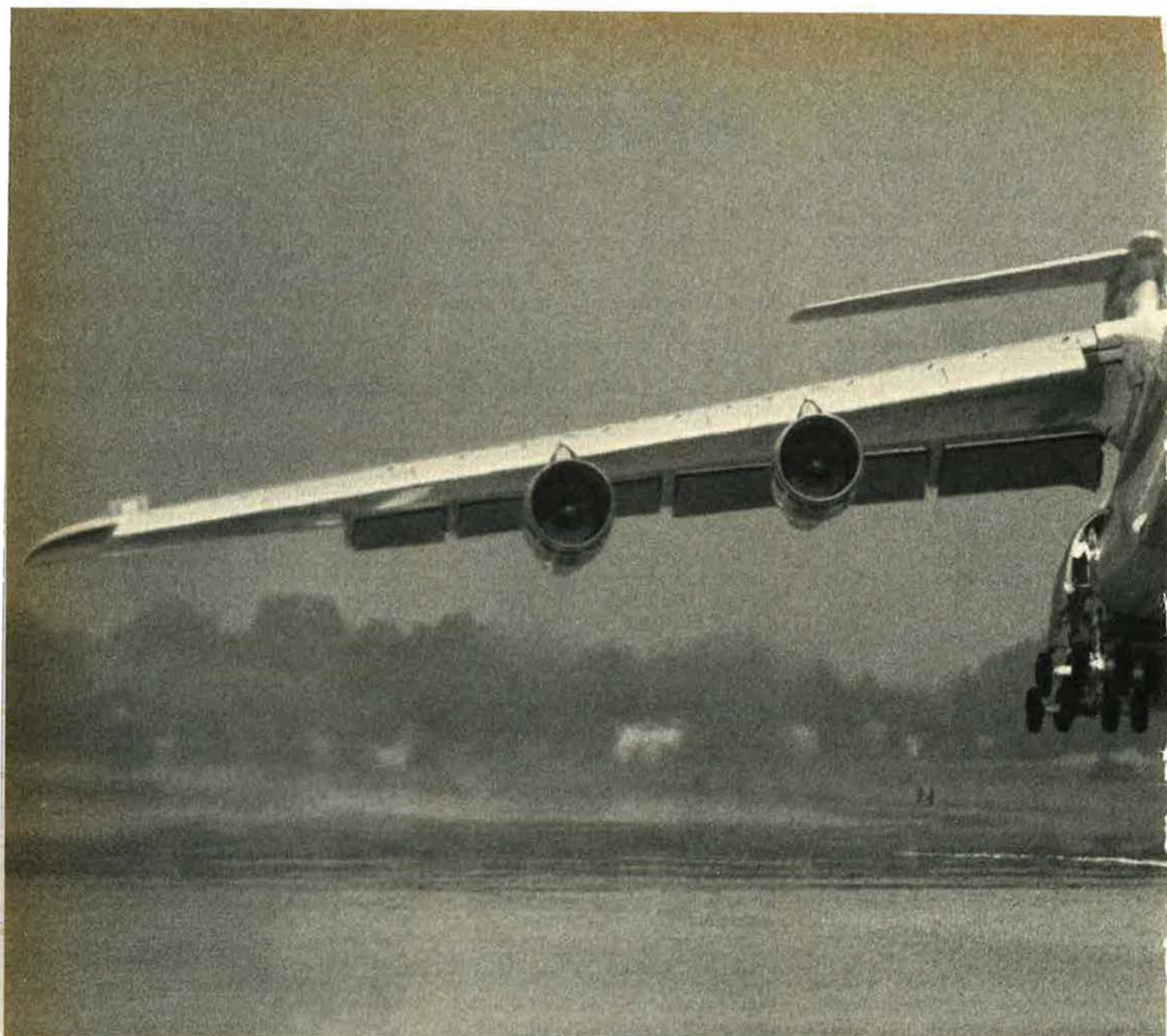
★ Under the heading of "win some/lose some," the Air Force succeeded in persuading OSD to keep the F-15 production line open during FY '82, but failed to achieve production status for the KC-135 reengining program. In the case of the former, OSD had sought to close down the F-15 line and fill the inventory with austere-equipped F-16s. The Air Force's argument in behalf of versatile, high-performance aircraft prevailed. But the service failed in its attempt to elevate the KC-135 reengining program from an R&D to production status.

★ Latest intelligence reports indicate that large numbers of Soviet troops, including massive contingents of KGB forces, are poised for action along the USSR's borders with Iran. The underlying intent is not entirely clear to US intelligence analysts.

★ While the Air Force, along with the other services, is allocating a large portion of its FY '82 funding request to improve Operations and Maintenance as well as spares, it will take at least until FY '84 before the most woeful deficiencies can be cured. Reason is the long lead time between ordering spares and other materiel and its production and delivery to the users.

★ The postmortem of the aborted, failed rescue mission that sought to snatch the American hostages from their Iranian captors last April led to a series of recommendations and constructive criticism of the operation. The so-called Special Operations Review Group, headed up by Adm. James L. Holloway, USN (Ret.), a past Chief of Naval Operations, found excessive security kept vital information from reaching the rescue party and that the number of helicopters probably was too small.

Among the review group's key recommendations were the setting up of a Counter-Terrorist Joint Task Force as a field agency of the Joint Chiefs of Staff and the formation of a JCS Special Operations Advisory Panel, comprised of senior experts on special operations. ■



America's airlift strength takes

America's airlift capability is getting stronger. The world's largest airlifter, the C-5, has begun its flight verification program with new wings ahead of schedule and within budget.

Developed under the direction of the Air Force Systems Command, the new wings will give the giant C-5 more than 30,000 flight hours of additional service. They are the product of the most advanced manufacturing and quality control techniques, including new aluminum alloys that provide greater toughness and corrosion resistance.

The flight program has been preceded by another part of the test program in which the C-5 wings have successfully endured well over 30,000 hours of rigorous fatigue tests on the ground. These tests simulate typical conditions that the wings will encounter in 30 years of rugged flying with the Military Airlift Command.

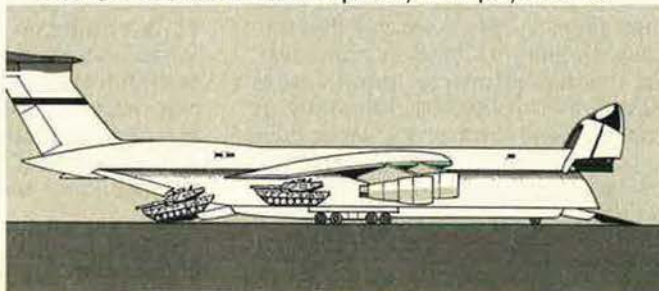
That 30,000-hour milestone also was accomplished

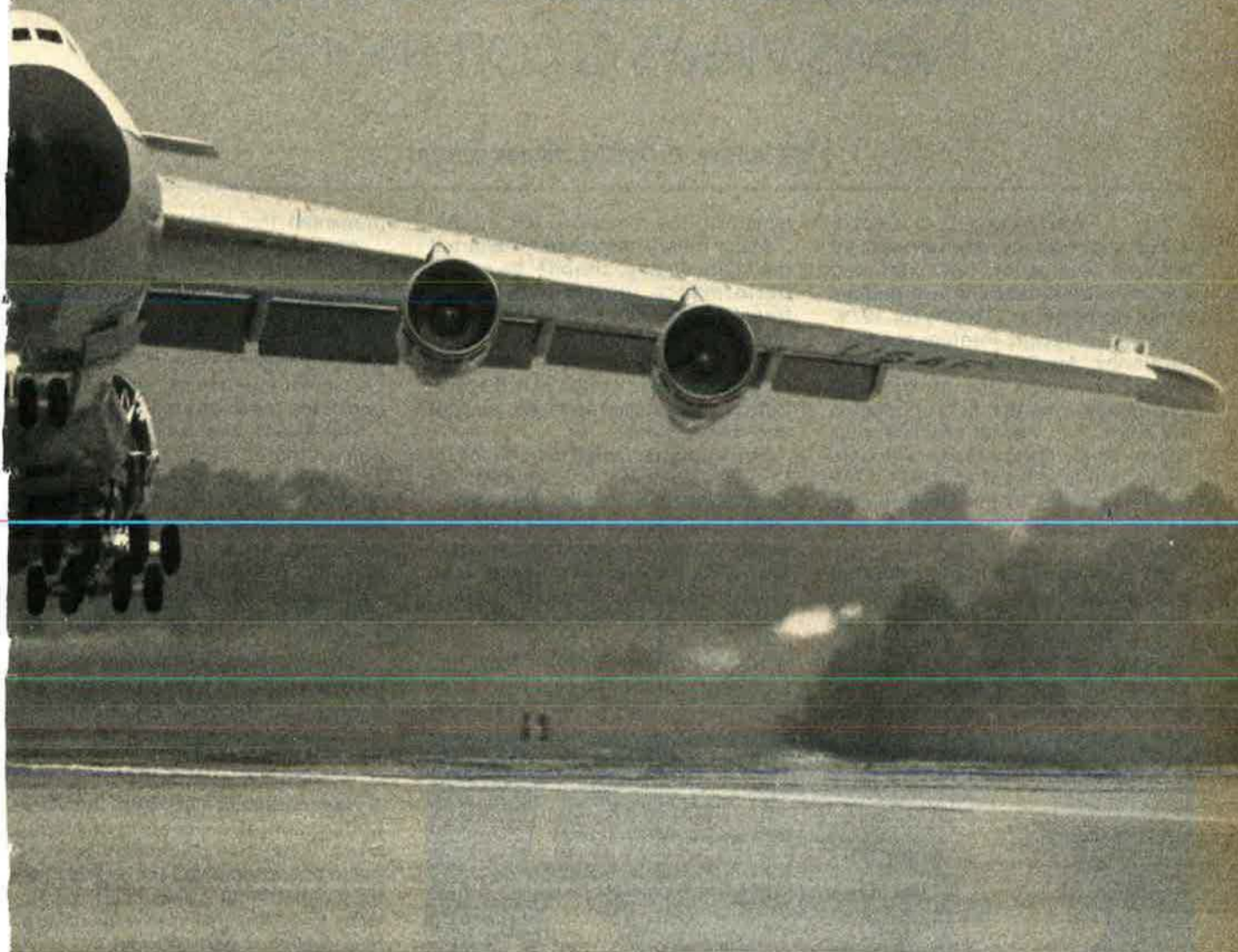
ahead of schedule and within budget.

The entire test program has been approved by an Air Force Scientific Advisory Board, composed of nationally recognized structural engineering experts from industry and the academic world. Production of the new wings is now underway.

The only operational aircraft able to carry Main Battle Tanks.

The C-5 has enormous capacity and payload as





wing... well into the 21st century.

well as worldwide range. It is the only operational aircraft able to carry two 60-ton XM-1 Main Battle Tanks or equivalent loads of the Army's heavy firepower. Moreover, the C-5 can load and unload its payloads with remarkable speed. In actual operations, it has unloaded more than 200,000 pounds of cargo in under 30 minutes. Its ability to "kneel" on its landing gear so that the cargo deck is only five feet above ground gives it drive on-drive off capability and truckbed height loading.

Strengthening America's airlift capability: The C-141 story.

Adding years to the life of an airlifter or adding to its capability is a familiar story at Lockheed-Georgia. There, the airlift experts are stretching fuselages of C-141 StarLifters at a peak production rate of 10 a month. This increases cargo capacity volume by 33%. They also are adding inflight refueling capability to the StarLifters to give them worldwide range.



The world of airlifters. It's a far different world from that of jetliners or other types of aircraft, and the engineers and craftsmen at Lockheed-Georgia have more experience in it, by far, than anyone else.

When it comes to airlifters, Lockheed knows how.

Lockheed-Georgia

AEROSPACE WORLD

News, Views & Comments

By William P. Schlitz, SENIOR EDITOR

Washington, D. C., Sept. 5
★ For successfully coping with an airborne emergency, SAC pilot Maj. David M. Peters has been awarded the Koren Kolligian, Jr., Trophy for 1979.

During a recent Pentagon award ceremony, Air Force Chief of Staff Gen. Lew Allen, Jr., termed the emergency "one that sort of boggles the mind. . . . For all practical purposes, Major Peters made a double engine-out landing in an SR-71." Peters is assigned to the 9th Strategic Reconnaissance Wing, Beale AFB, Calif.

On April 28, 1979, during descent from an operational mission, Peters shut down his malfunctioning right engine. On requesting an emergency recovery and reaching traffic-pattern altitude, he noted oil pressure prob-

lems with the remaining left engine.

Major Peters immediately restarted the right engine, despite its erratic performance that provided little thrust. He then shut down the left engine completely.

Major Peters and his reconnaissance systems operator, Maj. Edgar J. Bethart, Jr., stayed with the aircraft and landed safely.

The trophy is named in honor of 1st Lt. Koren Kolligian, Jr., presumed lost on a flight off the California coast in 1953. Established by the Kolligian family in 1957, it is presented yearly to the Air Force aircrew member who most successfully deals with an extraordinary in-flight emergency.

★ USAF Capt. Kenneth R. Rees, Jr., and TSgt. John L. Pighini have been

presented the 1979 Cheney Award.

While serving in Spain, the helicopter pilot and pararescueman performed a dangerous rescue mission on July 12, 1979, when the country's largest hotel, the Corona de Aragon in Zaragoza, caught fire and people were trapped in the upper stories, above the reach of firefighters.

The award was presented by Air Force Chief of Staff Gen. Lew Allen, Jr., at Pentagon ceremonies in August. It is named for Lt. William A. Cheney, the first US casualty in Italy in World War II, and recognizes "an act of valor, extreme fortitude, or self-sacrifice in a humanitarian interest performed in connection with aircraft."

Captain Rees, an AFA member, is now serving with the 40th Aerospace Rescue and Recovery Squadron, Hill AFB, Utah, and Sergeant Pighini with Hq. ARRS, Scott AFB, Ill.

★ Responding to a call from the State Department, the Department of Defense dispatched US military personnel to assess damage and provide initial humanitarian relief to St. Lucia, Haiti, and Jamaica in the wake of Hurricane Allen in early August.

People and equipment from all the US armed forces and the ANG and AFRES were involved. On rotation with USAF's Southern Air Division, a Reserve C-130 of the 440th TAW, Gen. Billy Mitchell Field, Wis., moved relief supplies from Howard AFB, Panama, to St. Lucia, and then foodstuffs from stocks in Barbados to Haiti.

The same day, a fifteen-man Disaster Assistance Survey Team from the Army's 193d Infantry Brigade, US Southern Command, Panama, arrived in Port-au-Prince, Haiti. Transporting the DAST and its two OH-58 helicopters was a MAC C-141 from the 437th MAW, Charleston AFB, S. C. Supporting the airlift activity was MAC's 1300th MAS at Howard AFB, Panama. An ANG C-130 from Greater Wilmington Airport, Del., was also diverted from a routine channel mission to the relief mission.

Three RF-4C aircraft from the ANG 117th TRS, Birmingham, Ala., were



Maj. David M. Peters accepts Kolligian Trophy from Air Force Chief of Staff Gen. Lew Allen, Jr. Peters safely landed a malfunctioning SR-71. See item above.

tasked to assess damage over Jamaica's southeast and northern coasts.

For its part, the Navy assigned a P-3 Orion to overfly St. Lucia to assess damage, and ordered the frigate USS *Patterson* to stand by off the city of Castries. Ship personnel helped clear debris, repair power, water, and telephone lines, and restore radio communications.

A C-5 from the 436th MAW, Dover AFB, Del., and a C-141 from the 438th MAW, McGuire AFB, N. J., ferried US Marines, five of their UH-1N utility helicopters, and water-purification equipment from the Marine Corps AS, Cherry Point, N. C., to Les Cayes, Haiti. From there, the Marines used their choppers to haul drinking water to heavily damaged Ile de Vache, seven miles off the southern coast.

★ USAF has awarded Lockheed-Georgia of Marietta a \$68 million-plus contract to retrofit the C-5 Galaxy fleet with new wings.

The C-5s are scheduled to begin entering the Lockheed-Georgia facility in early 1982 and the last of the seventy-seven transports is expected to be refitted by mid-1987. The refit program will increase the service life of the C-5 wings from about 7,100

mission-profile hours to more than 30,000.

The program to rewing the C-5 fleet got under way in 1977 and when concluded is expected to cost a total of \$1.5 billion in then-year dollars.

Wing sections, of heat-treated and corrosion-resistant aluminum, will be supplied by subcontractor Avco Aerostructures of Nashville, Tenn. They'll be assembled at Marietta.

One set of wings mounted on a vibration rig has already surpassed 35,000 cyclical test hours and a second on a C-5 is undergoing flight testing.

★ The US, UK, and West Germany have signed a memorandum of understanding to develop and produce two new air-to-air missile types.

The action is unique since it is one of the first major programs in the NATO "Family of Weapons" concept—a move to avoid duplicative development costs.

Under the program, the US is to develop and produce the Advanced Medium Range Air-to-Air Missile (AMRAAM), while a European consortium will develop and produce the Advanced Short Range Air-to-Air Missile (ASRAAM). In this France has special status as a signatory with the

option of becoming a full partner later if the missiles meet its requirements.

Eventually, the missiles will be built on both sides of the Atlantic through coproduction licenses.

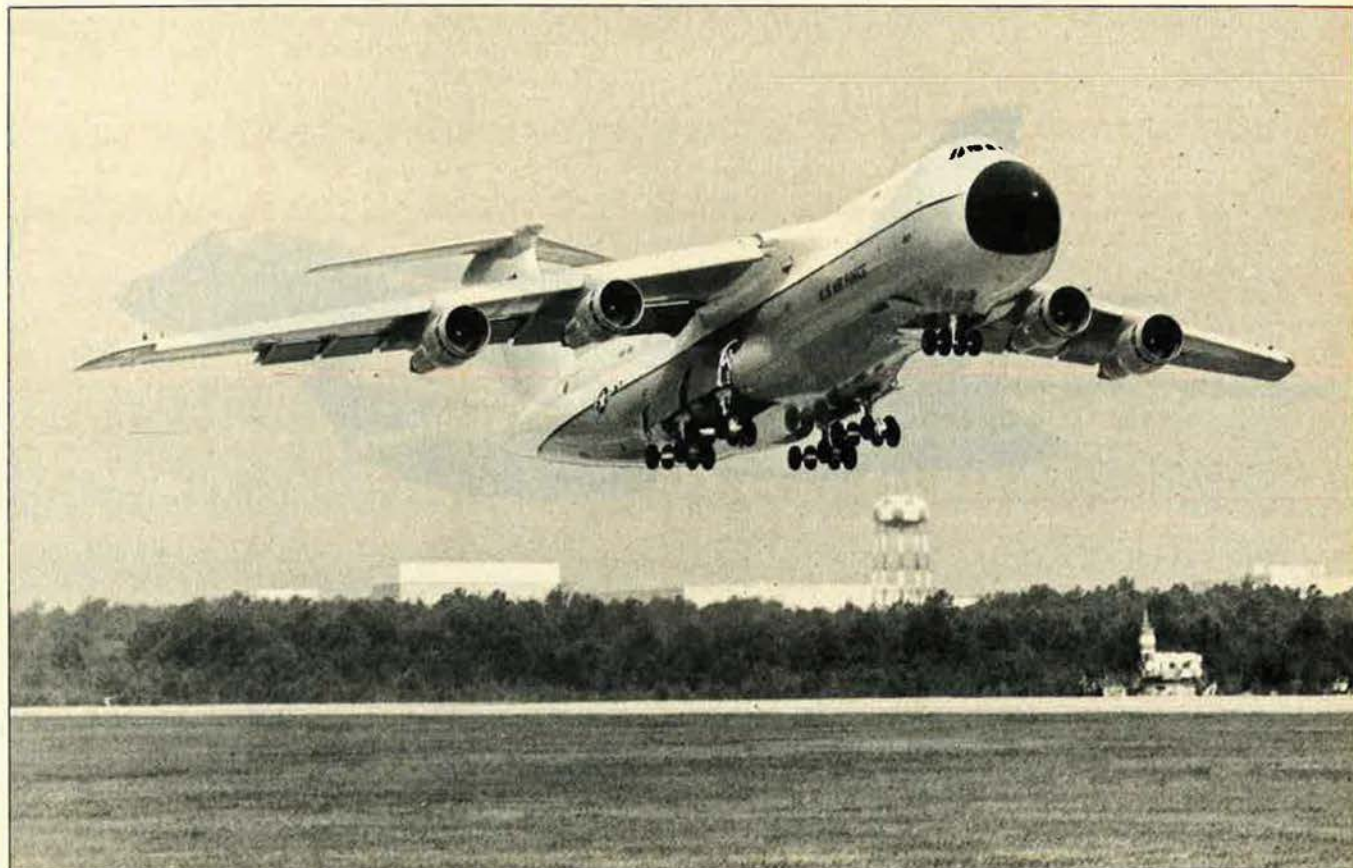
Program benefits anticipated: a saving of \$200 million in US development costs; enhanced interoperability; substantially reduced logistics costs.

Other weapon systems are being considered for the Family of Weapons treatment.

★ A new agency, the Joint Strategic Connectivity Staff (JSCS), has been activated at Hq. SAC, Offutt AFB, Neb. JSCS will be responsible directly to the Joint Chiefs.

According to officials, "The JSCS will analyze strategic connectivity systems and procedures, and make recommendations to the JCS concerning enhancement of strategic offensive and defensive operational capabilities." CINCSAC Gen. Richard H. Ellis is Director of the new agency and named Vice Director is Rear Adm. Paul D. Tomb, a veteran submarine officer.

Aim of the JSCS is to ensure compatibility and commonality of strategic command, control and communications (C³) systems that



A Military Airlift Command C-5 flight-tests the aluminum alloy wing designed to extend its operational life by 30,000 hours. USAF awarded Lockheed-Georgia the contract to refit the Galaxies with new wings beginning in 1982. See item.

link the National Military Command System, nuclear-tasked commanders in chief, executing forces, and the National Command Authorities. All four military services will be represented in the JSCS, which will have a staff of twenty.

★ The Air Force Ballistic Missile Office, Norton AFB, Calif., has filed for the appropriation of water necessary for the proposed MX missile system in Nevada and Utah, a legal and procedural action required by law in the two states.

In effect, USAF is asking for the right to use a portion of the unappropriated water in twenty-nine Nevada and Utah valleys, should they be selected for MX deployment.

The Utah valleys include Snake, Pine, Tule, Fish Springs Flat, Wah Wah, Whirlwind, Dugway, and Sevier. In Nevada, Dry Lake, Delamar, White River, Reveille, Hot Creek, Little Smoky, Antelope, Railroad, Garden, Coal, Pahroc, Muleshoe, Cave, Spring, Hamlin, Stone Cabin, Ralston, Big Sand Springs, Penoyer, Lake, and Big Smoky. (Snake and Hamlin are in both states.)

Not a firm commitment to drill for water, the action is merely procedural

AEROSPACE WORLD

to comply with the states' water laws.

Water engineers of both states have indicated they may call for public hearings on the Air Force move, however. Also controversial will be USAF's environmental impact statement, which will discuss the MX's water needs at length.

★ USAF has begun a study to identify the early physiological changes in people that signal the onslaught of stress and fatigue.

Under a contract, scientists of Midwest Research Institute, Kansas City, Mo., will attempt to identify chemical compounds that are created in the metabolism at certain levels of stress and fatigue.

MRI researchers plan to use urinalysis since past studies have verified that many components in urine change markedly under stress. Various elements are to be analyzed while

test subjects undergo heavy work loads, loss of sleep, and abnormal work schedules that simulate actual flight missions and command and control activities.

The researchers hope to single out three to five key indicators that can be taken to on-base hospitals or nearby laboratories for easy analysis.

Identifying the indicators of fatigue and stress is merely the first phase. Ultimately, USAF would like a simple test that aircrew members and others could apply themselves.

If realized, the tests could find uses in a wide range of civil stress-producing occupations, officials said.

★ USAF and Army units worldwide will soon have new weather information communications equipment that will produce sharper, clearer weather maps around the clock.

Air Force Communications Command, charged with supplying weather data to the Air Force Global Weather Central, Offutt AFB, Neb., is bringing on line a new facsimile network for the digital transmission of weather charts.

Global Weather Central transmits about 300 weather maps daily to sites



This B-1 made the prototype bomber's longest test flight on a round trip between Edwards AFB, Calif., and Florida. The nonstop flight lasted more than eleven hours and included four hours of testing over the range at Eglin AFB, Fla. The four crew members included two from USAF and two from Rockwell International, the aircraft's builder.

around the world—more than 160 in CONUS, more than sixty-five in Europe, and some twenty in the Pacific and other locales.

The new AFDIGS, said to be much more reliable than equipment previously in use, will also transmit much quicker, cutting map production time from eight or ten minutes to two and a half minutes. This will allow the elimination of a second circuit at locations receiving maps from the National Weather Service. The NWS maps will now be received by Global Weather Central for transmission over AFDIGS.

Installation of the new equipment is to take place in CONUS by October 1 and overseas before the end of the year.

★ NASA's Goddard Space Flight Center, Greenbelt, Md., has picked Canadian Astronautics, Ltd., of Ottawa, Canada, to supply the Local User Terminals to process signals from search and rescue instruments aboard orbiting satellites. A contract in the \$3 million range is being negotiated.

The first terminal is to be installed at Kodiak, Alaska, with the option of additional units at Scott AFB, Ill., and the US Coast Guard Station at San Francisco, Calif.

The contract will probably also provide for post-installation maintenance.

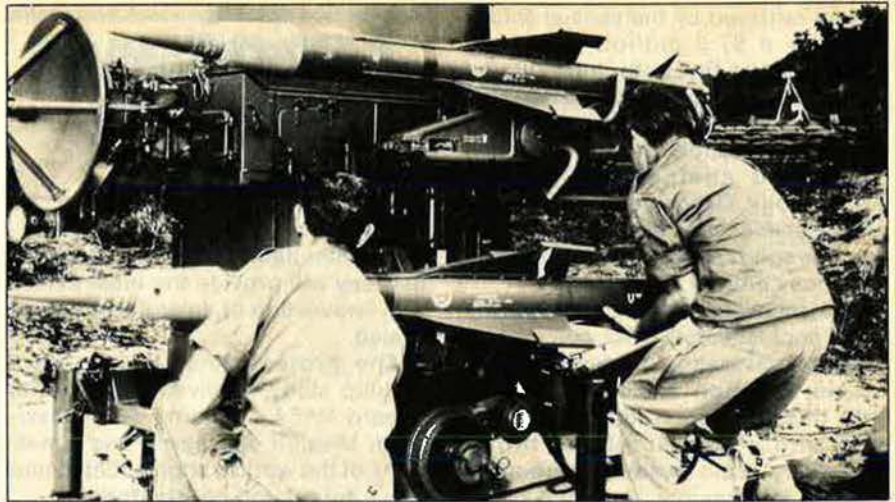
Search and rescue equipment will fly aboard the NOAA-E, F, and G weather satellites, to be launched in the early 1980s.

Essentially, the instruments will relay signals from distressed ships and aircraft to the terminals to determine whereabouts and thus facilitate rescue operations. During a trial period, search and rescue capability using the satellite system is to be demonstrated by the US, Canada, France, and the USSR in a cooperative program.

★ The Defense Department has approved a number of items on the "Munitions List" for export to China.

Included are tactical air defense radar sets, transport helicopters, pressure transducers used in testing jet engines, truck tractors, an antenna for an early warning radar, tropospheric communications equipment, tactical radio equipment, transport aircraft, and passive countermeasure devices. Also approved for sale are secure communications equipment for use in Chinese Embassy and consulates in the US.

In most cases, said DoD officials, the export license applications for the



Two members of the Australian Army prepare to fire the Rapier low-level anti-aircraft defense system at a target drone above the Beecroft Naval Firing Range. The August firing signaled entry of the Rapier into operational service with the Australian Army. Rapier is built by the British Aerospace Dynamics Group. The lightweight mobile weapon system is operational in five countries.

above were submitted "by US companies, requesting permission to make sales presentations to the Chinese. Another export license application must be submitted" if a contract is reached between the Chinese and a US company. The items and the names of the companies are proprietary information and cannot be released without consent.

Also approved for export are certain dual-use technology items for the establishment in China of facilities to assemble integrated circuits and to build commercial transport helicopters. Authorized also: peripheral equipment for use with existing computers in China's petrochemical industry and sale of computers for use in metal refining.

★ NASA's Viking-1 orbiting Mars was shut down in early August.

The craft had run out of the attitude-control gas that kept its solar panels pointed toward the sun and its antenna aimed at earth. Controllers at NASA's Jet Propulsion Laboratory, Pasadena, Calif., then sent it a signal to close down and end four years of highly productive transmissions from the Red Planet.

Meanwhile, its counterpart on the Martian surface is expected to operate through 1990 and perhaps until 1994.

Viking-1 orbiter was launched from Cape Canaveral, Fla., on August 20, 1975, and reached Mars on June 19, 1976. It now has begun a silent orbit expected to last for decades.

The lander version touched down on Mars in July 1976 with a ninety-day mission expectancy. It will continue

to transmit photos and weather data from the Martian surface on a weekly basis, as commanded from earth.

Orbiting Viking-2 exhausted its attitude-control gas and was ordered to turn off on July 24, 1978. The Viking-2 lander version closed down after a final transmission April 11, 1980.

Closer to home, earth-orbiting Landsat-2 has been restored to service by NASA engineers after having been out of commission for six months.

The craft, designed to survey earth resources from space, stopped functioning late last year. Without getting too technical, it was the victim of a breakdown in its positioning mechanism, which technicians at NASA's Goddard Space Flight Center, Greenbelt, Md., were able to generally overcome.

Landsat-2 is now operating at close to its previous capacity, although limited to a direct readout mode since its tape recorders are inoperable. Nevertheless, revival of the spacecraft is significant because its principal earth imaging device—the multispectral scanner—is once again providing data to three US and nine foreign sites, thus supplementing Landsat-3 capabilities.

★ NASA plans a two-ship recovery force to salvage the solid-fuel rockets used to help boost the Space Shuttle into orbit.

When a Shuttle is launched from Cape Canaveral, Fla., the boosters on either side will be jettisoned at an altitude of about twenty-eight miles and be parachuted into the Atlantic Ocean, where they and their parachutes

will be retrieved by the special ships.

Under a \$7.2 million contract, United Space Boosters, Inc., Huntsville, Ala., will outfit and operate the ships, with an option extending the firm's participation through February 1995. The company, a United Technology Corp. subsidiary, has also been picked to assemble and deliver the solid rocket boosters under a previous contract.

The recovery vessels will feature such sophisticated electronics as a satellite navigation system, search radars, collision avoidance sonars with transponders, radars, Loran C, VHF and single-sideband high-frequency radio systems, direction finders, fathometers, and gyro compasses.

Once retrieved, the boosters will be returned to Cape Canaveral for disassembly and cleaning before being shipped to Utah for reloading. NASA plans to use each casing for up to twenty missions.

★ An experimental wind turbine that under optimum conditions can produce enough power for 100 average homes has gone into operation on the north shore of Oahu, Hawaii, where strong, consistent winds provide some of the best surfing in the world.

The wind turbine was designed by NASA's Lewis Research Center, Cleveland, Ohio, for the Department of Energy. It was built by Westinghouse Electric Corp. and will be operated by Hawaiian Electric Co., which will acquire test data on its performance.

Oahu's turbine system has two rotor blades spanning 125 feet (thirty-eight m) and produces 200 kw at wind speeds up to thirty-four mph (sixty-three km/hr). An automatic control system aligns it with the wind. With winds above thirty-four mph, the control system shuts down the turbine and a conventional power plant then comes on line.

Hawaii is ninety-five percent dependent on imported oil and is eagerly investigating alternate energy sources like the Oahu turbine.

The Hawaiian installation is the fourth such federally sponsored 200-kw wind machine to be tested. Others are located at Clayton, N. M., Culebra, P. R., and Block Island, R. I. A 2,000-kw experimental wind turbine is at Boone, N. C. The first of a cluster of three 2,500-kw turbines is scheduled for Goodnoe Hills, Wash., late this year on the Bonneville Power System.

★ A worldwide effort that was two years in the planning has resulted in

AEROSPACE WORLD

the accumulation of data that scientists say will provide the most extensive knowledge of solar flares yet revealed.

The project, known as a flare buildup study, involved experiments aboard NASA's orbiting Solar Maximum Mission spacecraft and a network of the world's sophisticated and powerful ground observatories.

The 5,100-pound (2,313 kg) solar observatory was orbited last February and the seven special instruments on board worked continuously to give scientists insight into what triggers solar flares and new evidence about the sun's total energy output.

Detection of even the slightest change in the amount of light and heat energy emitted by the sun is important because "if a trend were to continue for several years it could produce major alterations in earth's climate." What's more, measuring such trends might "enable scientists to predict future climate changes," officials said.

A decrease in the sun's radiation output of merely six percent would shroud the earth in ice. Scientists say

the earth is getting colder and believe the average global temperature may drop ten or more degrees—in the next several million years.

★ The British Ministry of Defence has given the nod for the development of an improved version of the Sky Flash Mk 1 all-weather monopulse radar air-to-air missile.

The Sky Flash Mk 1, with its snap-up and lookdown/shootdown capability, now arms RAF Phantoms and is considered one of the most effective medium-range air-to-air weapons currently operational in NATO. It can engage adversary aircraft at ranges in excess of twenty-five miles (forty km) at high and very low altitudes.

The Sky Flash Mk 2, to be produced by British Aerospace Dynamics Group under a \$165 million contract, will incorporate a number of improvements: greater all-around coverage, increased range, better performance against maneuvering targets, and greater resistance to electronic countermeasures. It will also arm Britain's new Tornado air defense variant aircraft.

Sky Flash Mk 1s are being sold to arm Sweden's Viggen JA37 and has been successfully fired from the General Dynamics F-16.

★ NEWS NOTES—USAF's School of Aerospace Medicine, Brooks AFB, Tex., has begun operation of the new

INDEX TO ADVERTISERS

Aerospace Historian	91
American Cystoscope Makers, Inc.	29
American Telephone & Telegraph Co.	16
E-A-R Corp.	31
Fairchild Weston Systems Inc.	13
Ford Aerospace	2, 3, and 87
Grumman Aerospace Corp.	68
Grumman Data Systems	9
Harris RF Communications	19
Honeywell Test Instrument Div.	36
Hughes Aircraft Co.	11
Jesse Jones Box Corp.	91
Lockheed Corp., The	22 and 23
McDonnell Douglas Corp.	Cover IV
Motorola Inc., Government Electronics Div.	20
Northrop Corp.	14 and 15
Rockwell International, Collins Avionics Div.	5
Rockwell International, No. American Aircraft Div.	Cover II
Singer Co., Kearfott Products Div.	81
Sperry Rand Corp., Sperry Flight Systems	12
Sperry Rand Corp., Sperry Gyroscope Div.	Cover III
William Morrow and Co.	85

AFA Insurance	94 and 95
AFA Symposium	86



James S. McDonnell, pioneer aircraft builder, shown here with a model of his firm's F-15, died in August at age eighty-one.

Aerospace Chemical Defense Program Office to act as focal point for "international, interagency, and interservice activities pertinent to" chemical defense research and technology development.

Despite developmental and other setbacks (see *September '80 issue*), NASA has now **scheduled the first Space Shuttle flight for March 1981**. Shuttle Orbiter *Columbia* is to leave the Orbiter Processing Facility at the Kennedy Space Center in Florida in late November for the Center's Vehicle Assembly Building, where it will be mated with its solid rocket boosters and external tank. **A flight readiness firing** at Launch Complex 39 Pad A is to take place in February to validate system readiness and constitute a full dress rehearsal of the countdown.

Two European scientists have joined the **Space Shuttle mission specialist training program** at the Johnson Space Center in Houston: Swiss astronomer Claude **Nicollier** and physicist Wubbo **Ockels** of the Netherlands.

Shemya AFB, Alaska, was among the corporate, transport, and other organizations and entities that received the first twenty-five **President's Awards for Energy Efficiency**, the single air base to be thus honored. The base, on Shemya Island, was cited for **cutting gasoline consumption by nearly twenty-five percent** between April 1, 1979, and March 31, 1980.

Flight tests of **TAC's F-16 Fighting Falcon** conducted under representative scenarios at Hill AFB, Utah, and

Now ACMI high-performance borescopes add the convenience of

KITS

Rigid and flexible fiberoptic borescopes by ACMI have long been relied on for clear, bright, routine visual inspection inside gas turbine engines...without disassembly. Now for your convenience and protection ACMI has developed kits containing all the equipment needed for specific engine models. All in sturdy light-weight fitted cases. Three are illustrated here. Find out more. Call or write

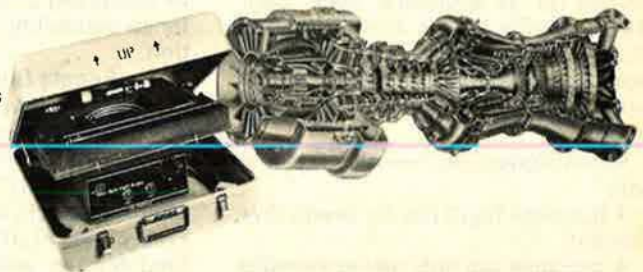
ACMI, Industrial Division, 300 Stillwater Avenue, Stamford, CT 06902. (203) 357-8300
Telex: 996466

ACMI

INDUSTRIAL DIVISION

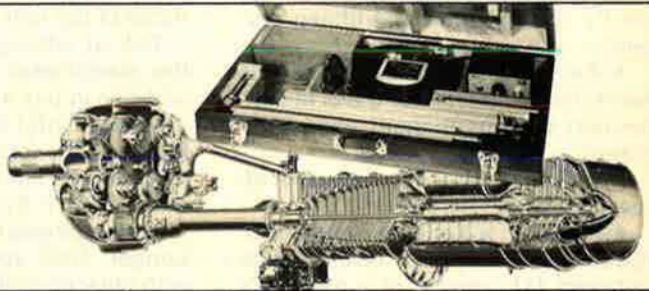
T-700

201003079-00
Two rigid borescopes with light supply and adapter plug for operation on ground or aircraft power.



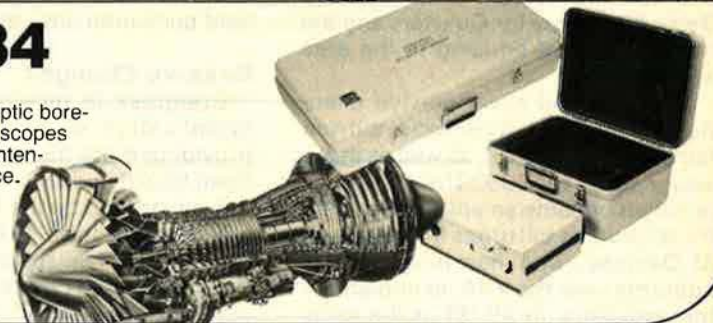
T-56

BK-7540
Rigid borescope plus extension with right angle optical section, power supply and accessories. (220 volt power supply optional)



TF-34

BKGE-100
Flexible fiberoptic borescope, 3 rigid scopes and the high intensity light source.



McChord AFB, Wash., **indicated no clear advantages** for either the production-gray paint scheme or the proposed lizard-green color, so the aircraft will stay production gray.

McClellan AFB, Calif., has been named as winner of the **1979 Secretary of Defense Environmental Quality Award**. Cited were the base's comprehensive environmental program, industrial waste treatment, toxic and hazardous materials management, noise pollution control, and

development of a polychlorinated biphenyl (PCB) incineration site.

Died: James S. McDonnell, founder and board chairman of McDonnell Douglas Corp., one of the world's major manufacturers of commercial jetliners, military aircraft, spacecraft, and missiles, of the aftereffects of a stroke at his home in St. Louis County, Mo., in August. The aviation and aerospace pioneer was eighty-one. ■

CAPITOL HILL

By Kathleen G. McAuliffe, AFA DIRECTOR OF LEGISLATIVE RESEARCH

Washington, D. C., August 26 Nunn-Warner Passed

The House and Senate have cleared the way for the President to sign Nunn-Warner, an amendment to an annual personnel bill that takes aim at the retention problem by increasing selected benefits. The amendment, named for its sponsors, Sens. Sam Nunn (D-Ga.) and John Warner (R-Va.), received belated support from the President on Memorial Day while he was aboard the supercarrier *Nimitz*.

When signed into law, the measure will:

- Increase flight pay by twenty-five percent;
- Increase sea duty pay to the rates for FY '82 and then add fifteen percent;
- Remove the ten-cent-a-mile reimbursement limit for travel in connection with permanent change of station;
- Increase the subsistence allowance by ten percent;
- Establish a Variable Housing Allowance (VHA) equal to the difference between 115 percent of a member's Basic Allowance for Quarters and the average cost of housing in the area assigned.

The VHA will cover service members assigned overseas whose families are in the US, as well as those assigned to CONUS. The allowance does not become an entitlement until FY '82, but the bill urges the Secretary of Defense, who has discretionary authority over the VHA, to implement the allowance in FY '81 at the same level of funding as is required for ensuing years.

All provisions were to become effective on September 1 of this year.

Budget Again

The Second Budget Resolution was due in September. However, it probably will not see daylight until well after the October 4 adjournment target. This leaves an out for incumbents to campaign on a balanced budget and further increases in defense spending, neither of which is likely. It also means that Congress will

return in November for a "lame-duck" session to finish work on the budget.

The Administration's recent mid-year reestimate found its defense figure of \$164.5 billion short about \$7 billion because of inflation, fuel costs, and pay raises. Therefore, this indicates that much of the funding added by Congress in June to buy more defense capability will be lost to inflation.

The Senate Budget Committee has voted in preliminary sessions to add \$3 billion to defense budget authority and \$5.6 billion in outlays, resulting in new totals of \$173.5 billion and \$159.3 billion respectively. However, budget committee staff members say that final figures will not stray far from those of the first resolution.

Talk of adding \$8 billion to cover the reestimates and congressional add-ons in pay and weaponry is considered wishful thinking. Attempts to increase spending will be held down in order to limit the already rising deficit for FY '81.

Until agreement is reached on the budget, DoD appropriations, along with other spending measures, will be held back until after the election.

Reserve Changes

Congress is moving to improve mobilization of Reserve units by providing more flexibility in ordering them to active duty.

A bill passed by the House would:

- Increase from 50,000 to 100,000 the number of Selected Reservists the President could call up for active duty without declaration of a national emergency;
- Allow each service Secretary authority to determine the amount of time a Reservist has between notification and actual reporting for active duty;
- Eliminate the requirement that a Reserve officer serve at least three months when ordered to active duty after ROTC completion;
- Repeal a requirement that the Director of Selective Service determine that a member of the Standby Reserve is available for duty in time of war or national emergency.

Removal of Test Data

Several members of the Senate subcommittee on Manpower and Personnel, headed by Sen. Sam Nunn (D-Ga.), sent a letter to Secretary of Defense Harold Brown questioning removal by the Army of mental category data and Armed Forces Qualification Test (AFQT) scores from all recruit records. According to the order, unit commanders will no longer have the mental ability information on their troops. This came after reports that forty-six percent of Army recruits were in mental Category IV and subsequent congressional action to limit the number of Category IVs.

The Senators expressed concern that commanders need this data to assign and supervise personnel better. They question whether this action will affect security clearances, fraudulent enlistments, and whether the other branches of service are following the Army's lead.

Earlier this year, Secretary of the Army Clifford Alexander testified during a hearing before the House Armed Services Committee that the AFQT scores and the system of mental categories do not fairly estimate a soldier's performance level or aid in placing an individual in a particular skill.

Democrats' Defense Platform

At their 1980 National Convention, Democrats pledged a steady growth in defense of at least three percent a year. The defense platform, which stressed wise use of funds to develop "practical weapons," set high priority of defense funds for: correction of manpower shortages; combat training; an effective Guard and Reserve; and adequate supplies, spares, and fuel.

In the strategic arena, the Democrats pledged continued support for MX, the cruise missile, and the Trident submarine. Also included is support for SALT II. That plank states the treaty is in our interest and that the US is "ready to pursue good-faith negotiations with the Soviet Union at every opportunity on a wide range of issues." ■

"Ears, Right!"



SEAR corporation
(a subsidiary of cabot corporation)
 7911 zionsville road • indianapolis, ind 46268

YES, I want to set my ears right. Send me free samples of E-A-R Plugs.

Name _____

Address _____

City _____ State _____ Zip _____

With E-A-R™ hearing protection. These unique ear-plugs fit almost any size ear canal. They've been so successful in attenuating noise that they've become *the* standard in industrial hearing protection. Perfect for reducing noise on submarines, trucks, helicopters, armored vehicles, airplanes, the firing range, etc.

Clip the coupon and send for free samples. E-A-R Plugs are available through Military Procurement under National Stock Number 6515-00-137-6345.

Description for ordering from military stock:
 NSN 6515-00-137-6345
 PLUGS, EAR, HEARING PROTECTION,
 UNIVERSAL SIZE, YELLOW, 400's.

SEAR™ corporation
(a subsidiary of cabot corporation)
 7911 zionsville road • indianapolis, ind 46268
 telephone 317/293-1111

AFA Welcomes Its New Executive Director

On October 1, retired USAF General Russell E. Dougherty, former head of the Strategic Air Command, took over from AFA's longtime leader Jim Straubel.

**BY F. CLIFTON BERRY, JR.,
EDITOR**

THE Board of Directors of the Air Force Association has approved the selection and appointment of Gen. Russell E. Dougherty, USAF (Ret.), as Executive Director, to succeed James H. Straubel, who is retiring after a thirty-three-year career as the head of AFA. General Dougherty's appointment is effective on October 1. In announcing the action, Board Chairman Dan F. Callahan said, "With the high regard in which Russ Dougherty is held by all and the overwhelming concurrence accorded his selection as Executive Director, AFA is bound to continue to move steadily forward."

Russell E. Dougherty's active Air Force career culminated in his service as Commander in Chief of the



Gen. Russell E. Dougherty retired from the Air Force in 1977 after a thirty-four-year career, including duty as CINCSAC.

And Says Farewell to Its Editor and Publisher

After a distinguished career of more than twenty-nine years, John F. Loosbrock, Editor in Chief and Publisher of this magazine and Deputy Executive Director of the Association, has left AFA.

**BY JAMES H. STRAUBEL,
EXECUTIVE DIRECTOR**

THE frosting on the cake, literally, conveyed the message:

"We love you . . .

Jack LOOSEBRA

Jack LOOSEROCK

Jack LOOSBROCK."

It was the AFA staff's farewell party for Jack Loosbrock, held early last month, and the message came from the hearts of the staff.

The "Loosebra" and "Looserock" were for real—just two of the many misspellings of his name by devoted readers of AIR FORCE Magazine over the years.

And then there was Jack's phone call, some years back, answered by a secretary. The ensuing dialogue went like this:

SECRETARY: "Good morning—Mr. So-and-So's office . . ."

JACK: "Is he in? This is Mr. Loosbrock."

SECRETARY: "How do you spell it?"

JACK: "I haven't a clue."

(Result: Loud silence from the Secretary.)

So, what's in a name?

Jack Loosbrock is the brand name for a top-quality product—



John F. (Jack) Loosbrock, who retired from AFA last month.

essentially low key but with hidden power—representing high intellectualism without the arrogance that too often goes with it—philosophic in nature but balanced by good judgment and down-to-earth common sense—a master of the written word, for himself as a

Strategic Air Command, from August 1, 1974, to October 1, 1977. He retired from active duty in the grade of general, having been promoted to four-star rank when assigned as Chief of Staff, Supreme Headquarters Allied Powers Europe (SHAPE) in May 1972.

He has a daughter, Diane (Mrs. James Streicker of Wilmette, Ill.), and twin sons, Mark and Bryant, who are both captains in the US Air Force. Both Mark and Bryant are F-4 fighter pilots. His first wife of thirty-five years, Geralee Shaaber of Louisville, Ky., died on January 14, 1978. General Dougherty was married on September 1, 1978, to the former Barbara Brooks Lake of Birmingham, Ala. The Doughertys live in Arlington, Va.

Russell Dougherty is a lawyer and command pilot whose career has included service in the FBI, duty as an ~~Air Force staff judge advocate, and~~ combat crew duty as a bomber pilot. His later active-duty service in-

cluded several USAF operations and planning assignments, as well as four assignments in joint and international duties. His command assignments range from bombardment squadrons through numbered air force (SAC's Second Air Force), to the Strategic Air Command, the nation's major nuclear deterrent force.

General Dougherty was born in Glasgow, Ky., on November 15, 1920, and graduated from Western Kentucky University and the law school of the University of Louis-

ville. He is a member of the Kentucky bar and the Bar Association of the US Supreme Court.

General Dougherty earned his commission and pilot wings through the Aviation Cadet program in March 1943. Among the many noteworthy aviation events he planned were the B-52 round-the-world flight in 1957 (Operation Power Flite) and the successful US-Belgian rescue operation at Stanleyville in the Congo, in November 1964. Since 1977, he has been active as a corporate director, business consultant, and member of several boards and scientific advisory groups of the US government. ■

writer, and for the benefit of others as an editor—innovative, even an artist of sorts, but with an uncommon flair for figures and dollar signs—and, as his "I haven't a clue" telephone response suggests, a man blessed with a wry but penetrating sense of humor.

On September 5, Jack Loosbrock retired as the Deputy Executive Director of the Air Force Association and as Publisher and Editor in Chief of AIR FORCE Magazine. On September 8, he became Vice President for Public Affairs of the Aerospace Industries Association.

Jack came to AFA and its magazine as a graduate of the Marquette University's College of Journalism who had worked from the bottom up first as a cub reporter for the *Oskaloosa, Iowa, Daily Herald*, and then as a reporter for the *Milwaukee Journal*.

He came to Washington in 1945 as Associate Editor of *Infantry Journal Magazine* (now *Army Magazine*), then served as Washington Editor of *Popular Science Monthly*. He held the latter position when I first met him in April of 1951.

The Air Force Association was five years old—and broke. AIR FORCE Magazine was stumbling along, living from one month to the next. Moreover, we had just lost our Managing Editor. The May issue deadline was pressing us, and we were short on copy as well as on advertising and staff.

While being spared all the dirty details of the situation, Jack Loosbrock was being courted to bail us out of an emergency—to get us over the May issue hump—no more, no less. After many hours of glass tinkling negotiations in a makeshift conference room, an oasis known as the Robin Hood near AFA's office in downtown Washington, Jack agreed to a temporary stint—for one issue only—on AIR FORCE Magazine.

Now, more than 350 issues and twenty-nine years later, Jack Loosbrock has retired from AFA after serving, in sequence, as Managing Editor and Assistant Publisher, as Editor and Publisher, and as Editor in Chief and Publisher—and, since the early 1960s, as Deputy Executive Director.

During his career as Editor of the magazine, which started in 1957, readers liked to refer to Jack as the "flyboy editor." From his editorials, which demonstrated broad and intimate knowledge of the Air Force, it was natural to assume that Jack had moved from the cockpit to the Editor's chair. Nothing could be further from the truth.

Jack began military service as an Infantry private in 1940 and left service, after being wounded in combat, as an Infantry captain in 1945. His combat duty was with the 1st Infantry Division—the Big Red One—during the North African invasion, the Tunisian campaign, and the Sicilian campaign. His decorations include the Silver Star, the Bronze Star with one Oak Leaf Cluster, and the Purple Heart.

During the early days of the campaign in North Africa, including the debacle at Kasserine Pass, US Army troops experienced a rarity in American military history—combat with an enemy who had control of the air.

Jack Loosbrock, as fate would have it, was one of the rare ones

who shared this experience. Under questioning, he talked about it in general terms during our first meeting. Then, after agreeing to work, however temporarily, for AIR FORCE Magazine, he asked: "What the devil can an old ground slogger write about airpower?" The answer: "About airpower as you saw it, from the ground up." Jack's first article for the magazine, titled "Start Digging, Brother!", appeared in the May 1951 issue. With all of the great writing Jack has done for AFA since that time, I have always felt this was one of his best efforts.

In the article, Jack offered this—for openers:

"If you wonder why this ex-infantryman of comparatively ancient vintage feels called upon to register his views on airpower, you won't wait long for an answer.

"First, a doughfoot, by the nature of his trade, has a deep and abiding interest in who controls the air over the given segment of earth that he has been commanded to 'seize and hold.' Second, there are comparatively few, and that includes the thousands of battle-scarred veterans of World War II, who have any conception of what it means to eat, to sleep, to dig, to fight, and to die literally under the guns of enemy aircraft."

And, a few more excerpts from the article:

. . . we were too weak to do any more than dig in nervously on the defensive and wait for the enemy to decide where, and when, and how he would strike. Here the Luftwaffe called the tune and we danced—our eating, our sleeping, our responses to nature all subjugated to the whims of the German pilots. . . .

Your stomach tightens and your nerves twang like banjo strings when the circling Stukas go into their shallow, gliding dives. As the bombs scream down you claw the ground and feel it rise to meet you as the TNT churns the dirt. . . .

Never since then have American soldiers known what it is to fight without a comforting umbrella of wings, and guys, and bombs, and machine guns. . . .

With his physical, emotional, and



Jack Loosbrock was an Army lieutenant when this picture was taken back in late 1943 or early 1944.

intellectual introduction to airpower—the airpower of the enemy, that is—Jack Loosbrock was a natural for the role of guiding AIR FORCE Magazine to new heights. I have always believed his unique airpower experience—with his ability to intellectually assess the issue at hand without "flyboy" bias—overcame his lack of Air Force experience—and was a real plus for our cause.

Beyond that, Jack Loosbrock has led the growth of AIR FORCE Magazine in scope, quality, size, and impact. His legacy will center in this growth—against heavy odds—and in the innovative features he has been responsible for introducing in AIR FORCE. They include:

- The "Air Force Almanac," published annually in May and providing a source of organized reference information and data on the US Air Force;

- The first, and to date the only, definitive "History of the United States Air Force." Published in cooperation with the Office of Air Force History, the work appeared as the entire contents of the August 1957 issue of the magazine and later was published commercially in a hard-cover edition by D. Van Nostrand.

- The bimonthly "Supplement to Jane's All the World's Aircraft," published under an exclusive arrangement with Jane's, whose editor, John W. R. Taylor, is a

Contributing Editor to AIR FORCE Magazine.

- Publication annually of "The Military Balance" under an exclusive arrangement with The International Institute for Strategic Studies, London, which compiles this unique and authoritative reference work on the strength and composition of the national armed forces of the world.

In addition, Jack Loosbrock has served as:

- Coeditor of an AIR FORCE Magazine anthology, *The Wild Blue*, a book published by E. P. Putnam's Sons.

- Editor of *Space Weapons*, a book published by Frederick Praeger.

- Member of the Public Relations Advisory Council at Marquette University. (In 1962, he received the "Byline Award" of Marquette's College of Journalism, awarded annually to outstanding alumni.)

- A member of the Public Affairs Advisory Council, US Air Force Academy.

- Chairman of the Freedom of Information Committee of the Aviation/Space Writers Association.

- A member of the White House "Task Force for National Aviation Goals," which prepared a report on national aviation policy, entitled "Project Horizon," for President John F. Kennedy. (Jack was in charge of writing the report.)

- A consultant to the Administrator of the Federal Aviation Agency. (In 1965, he received an FAA Award for Distinguished Public Service.)

- Editorial consultant to Robert Nathan Associates, an economic research firm, which prepared, in 1962, a study of United States international air transport policies for the Bureau of the Budget at the request of the White House.

In addition, Jack has lectured at the Air University, and at civilian universities, and has participated regularly in seminars and symposia on defense, space, air transport, disarmament, and related subjects. In 1965, he was a visiting lecturer for the Department of History, University of Colorado.

With all this, Jack Loosbrock's most vital contribution to the Air

Force Association may be in a completely different area, primarily because the first law of nature is survival.

In the late '60s and early '70s, AFA's survival was in question—not the first time in AFA's history, but, it is to be hoped, the last. Back then I was forced to drop twenty-one people from the staff over a twelve-month period. But even that was just a stopgap measure. We needed innovative thinking in the areas of fiscal and operational management.

With this requirement facing us, I said to Jack one day in early 1972: "Effective at 9:00 o'clock tomorrow morning, in addition to your current duties as Deputy Executive Director, you will assume general responsibility for all of the income-producing activities handled by our staff."

"This Talented and Creative Man . . ."

The following letter was received on September 8. It is from the man who was Editor of AIR FORCE Magazine for several years prior to his own retirement on July 1 (see p. 27, July '80 AIR FORCE):

I have known Jack Loosbrock for nearly twenty years and had the privilege of working under his wise and patient guidance for more than ten years.

As AFA's Executive Director, Jim Straubel, pointed out in the announcement of Jack's retirement, he is one of the nation's outstanding aerospace writers. Had Jack not devoted nearly three decades of his life to AFA, he could have had a successful career in the military, business, finance, teaching, public relations, or politics.

It is impossible to calculate the contribution to national defense and to the management of AFA that Jack Loosbrock has made in the past twenty-nine years, or his impact on the lives of those who worked for and with him. It can be said with certainty that AFA is fortunate to have had the services of this talented and creative man. People as widely gifted as Jack Loosbrock are rare indeed.

John L. Frisbee
Leesburg, Va.

Jack's answer: "You're out of your mind!"

Perhaps I was. It was a high risk. By all that's holy, I should have gone out and hired a seasoned fiscal manager. But I didn't. And it was the best management decision I've ever made. But that's unimportant. Starting in 1972, our Comptroller, our Director of Industrial Relations, Exhibits and Advertising, and our Membership Director all have reported to Jack Loosbrock. And he has personally led the way to growth in all the income-producing areas they represent.

Since 1972, AFA's net worth has gone from a negative figure of \$220,000 to an end-of-year 1979 total of \$3.9 million. Over the same period, annual insurance sales have risen from \$3.8 million to \$5.7 million, and life insurance in force has risen from \$346 million to \$1.041 billion.

Essential to this growth was Jack's decision to move the *situs* of AFA life insurance programs from the District of Columbia to Minneapolis, under a trust arrangement with the First National Bank of Minnesota. The move permitted the expansion of benefits beyond the limits imposed by D. C. law and resulted in the increased sales as noted.

In addition, Jack instituted and led negotiations with the underwriter that resulted in the transfer of title to AFA of certain reserves that now form a substantial part of AFA's net worth. The original value of these reserves was \$395,000, and the figure has since increased to \$879,000. These funds provide annual yields that are indispensable to AFA's financial stability.

Over the same period, membership has risen from 97,000 in 1972 to the current figure of 154,000. Part of this gain is attributable to the innovative Salute Program, which Jack designed.

In our relations with industry, so important in terms of income and the success of AFA's special events such as seminars, symposia, and national fund-raising social functions, consider this: In 1972, magazine advertising income was \$403,000. In 1979, it was \$1.1 million. Gross income from the Aerospace Briefings and Displays rose

from \$83,000 in 1972 to \$310,000 in 1979, with 1980 income budgeted at \$425,000.

But, with all this, Jack Loosbrock quite likely will be remembered most for his contributions as a communicator, and specifically as an editorial writer who wisely led our leaders and members, often with uncanny vision, in pursuit of AFA's goals.

An example is suggested by the current controversy over President Carter's recent announcement that the priority target for our strategic weapon systems would be an enemy's military installations rather than his cities.

Targeting the enemy cities, known as "minimum deterrence," was the subject of a Jack Loosbrock editorial in October of 1960. It was titled "Minimum Deterrence Is a Phony." Thus, exactly twenty years ago, Jack was cautioning his readers against what he called "a cheap and easy answer to an expensive and complicated problem. To follow it is to take the nation down a blind trail to inevitable disaster."

Jack's continued exposure of the growing military threat posed by the Soviet Union has not gone unnoticed in the Soviet press. Back in 1963, even before the frightful scope of the threat became apparent, *Sovetskaya Rossiya* published an article titled "Loosbrock Is Ready to Leap Out of His Skin!"

This Soviet publication lashed out at Loosbrock for warning US citizens, in an editorial, that "a comparatively small number of intercontinental ballistic missiles with nuclear warheads could literally smash to pieces the heart of our [US] highly developed society."

For some strange reason, warning Americans of the dangers inherent in Russia's bold and unprecedented arms buildup earned Loosbrock such Russian epithets as "an inveterate warmonger . . . a cunning scribbler . . . an insolent cynic . . . an unleashed fire-eater."

Considering the source, it was probably the most favorable review our favorite editor has ever had.

But even as an unleashed fire-eater, "We love you, Jack Loosbrock." At least the Russians spelled your name right. ■

NOW, HALF-WAVELENGTH RECORDING FOR GREATER PACKING DENSITY.

Half-wavelength recording to 120 ips—it's a new option for the Model Ninety-Six that lets you pack your digital data well above 33 kbp. And you achieve these densities with no significant increase in error rate. Frequency response is 4 MHz at 120 ips. The payoff is impressive savings in system utilization, tape logistics and tape consumption.

If your applications are primarily analog, you'll also appreciate the new extended bandwidth capability of the Model Ninety-Six, 4 MHz at 240 ips. This frequency response lets you produce Wideband Group II compatible recordings.

Quite frankly, few users of the Model Ninety-Six really need the full 4 MHz bandwidth

at 120 or 240 ips. They buy the system because it gives them good solid data at *any* record or reproduce speed, standard or half-wavelength. Because every system comes with high-performance solid-ferrite heads; a capstan servosystem that holds flutter and TBE to extremely low levels; and an adjustment-free tape path for gentle, consistent tape handling and minimum skew.

For complete information on the Model Ninety-Six, just call Ed Haines at (303) 771-4700. Or write for a free illustrated brochure that describes all our magnetic tape systems and other instrumentation products. Honeywell Test Instruments Division, Dept. AF, Box 5227, Denver, Colorado 80217.

WE'LL SHOW YOU A BETTER WAY.

Honeywell

If someone hadn't been looking ahead and planning new weapon systems, wars still might be fought with rocks and clubs. Aeronautical Systems Division has the job of building the Air Force weapons of the future, and of bringing them into service when needed. In this feature, ASD's Commander sketches his views of the challenges ASD faces in this decade . . .



How ASD Is Meeting the Needs of the Nineties

BY LT. GEN. LAWRENCE A. SKANTZE, USAF

WITH the advent of the 1980s, I am convinced that there are few more stimulating challenges than those faced by the Aeronautical Systems Division (ASD) of the Air Force Systems Command. We are at the forefront of the Air Force's efforts to mold new and existing technologies into superior weapon systems for our operational forces. We must meet this challenge in an era of tremendous budget pressures, where inflation and shrinking real dollar value limit us to fewer systems and smaller quan-

ties. Our research and development (R&D) efforts must be innovative to develop systems, subsystems, and techniques that provide significant force enhancements. Our goal is to produce both mission-effective and cost-effective aeronautical systems. Our efforts at ASD are directed to meeting the continually changing threat. That threat is no longer measured only by its numerical superiority, but also by its qualitative improvements in capability.

I will explore the particular chal-

lenges to the Air Force R&D effort in the light of a diminishing resource pool of scientific and engineering talent. I will also discuss some of ASD's current programs to respond to the Air Force's operational needs in the face of the massive Soviet military buildup, and, finally, discuss the recent realignment of the ASD management organization to meet

Above: Even as production of the General Dynamics F-16 and McDonnell Douglas F-15 continues, ASD is managing the development of systems that will enhance their tactical fighting capabilities.

the changes we foresee to our business base.

Scientist-Engineer Shortfall

Historically, the US Air Force has relied upon technological superiority, not numbers, to accomplish its demanding mission. This technologically intensive environment still exists, and any lack of technological advance would be a step backward.

The Air Force is short about 1,200 officer-engineers out of our authorizations for roughly 8,000. While the rated officer shortage is largely a

For too long
we've been tagged
with the label
of a day-VFR
air force.

matter of retention of trained personnel, the engineer shortage is a problem of recruitment as well as retention. The fundamental problem is that the total number of engineers this nation produces is not increasing sufficiently, and the percentage coming into the military, specifically the Air Force, is diminishing. Throughout the Air Force Systems Command, manning is down to eighty-six percent in critical engineering skills. People with ten, twelve, and fifteen years of experience are being replaced with inexperienced, though eager, youngsters. The military simply cannot compete with industry in the area of pay for either newly graduated or experienced military or civilian engineers.

But we can compete—and compete very well—in the areas of job satisfaction and responsibility. The future of our R&D efforts and the hardware and systems that are made available to the operating commands will be based on the skills and talents of the people who design, test, and acquire those systems. We must attract scientists and engineers to the Air Force from an already diminishing resource pool, and, equally important, keep them in the employ of the Air Force.

One measure the Air Force can pursue to partially alleviate this increasingly severe engineering shortage is to expand the production of engineers at both the baccalaureate and graduate level through the Air Force Institute of Technology (AFIT). The AFIT education program is fundamentally essential to the development of the high-quality people necessary to sustain the technological superiority of the US Air Force. So far the declining levels of experience have not had an ill-effect on ASD's mission accomplishment. However, the long-term ramifications of this situation, if not redressed, will have significant implications for our national security.

ASD Program Activity Highlights

Our mission at the Aeronautical Systems Division is to plan and manage the acquisition of aeronautical systems, subsystems, and equipments. ASD is at the leading edge of technology, molding existing and new technologies into highly mission-effective and cost-effective fighting weapon systems for our operational Air Force. ASD is responsible for managing research development test and evaluation funding of more than \$2 billion a year and procurement funds that amount to more than \$6 billion for each of the next several years.

Our current and planned management efforts are directed to the reequipping of the general-purpose tactical aircraft forces, the modernization and enhancement of the strategic forces, and improvements in airlift and trainer capabilities.

Tactical Force Modernization

A large portion of the production money that ASD manages is going toward the purchase of new tactical weapon systems—the A-10 Thunderbolt II, the F-15 Eagle, and the F-16 Fighting Falcon. The F-16 program will be in production in the mid-1980s, whereas the A-10 and the F-15 programs will complete their production runs by 1984 or shortly thereafter. The acquisition of these new systems is in response to the crises we faced in the late 1960s and early 1970s—the need to update the capability of our tactical air forces. These three weapon systems have provided our National

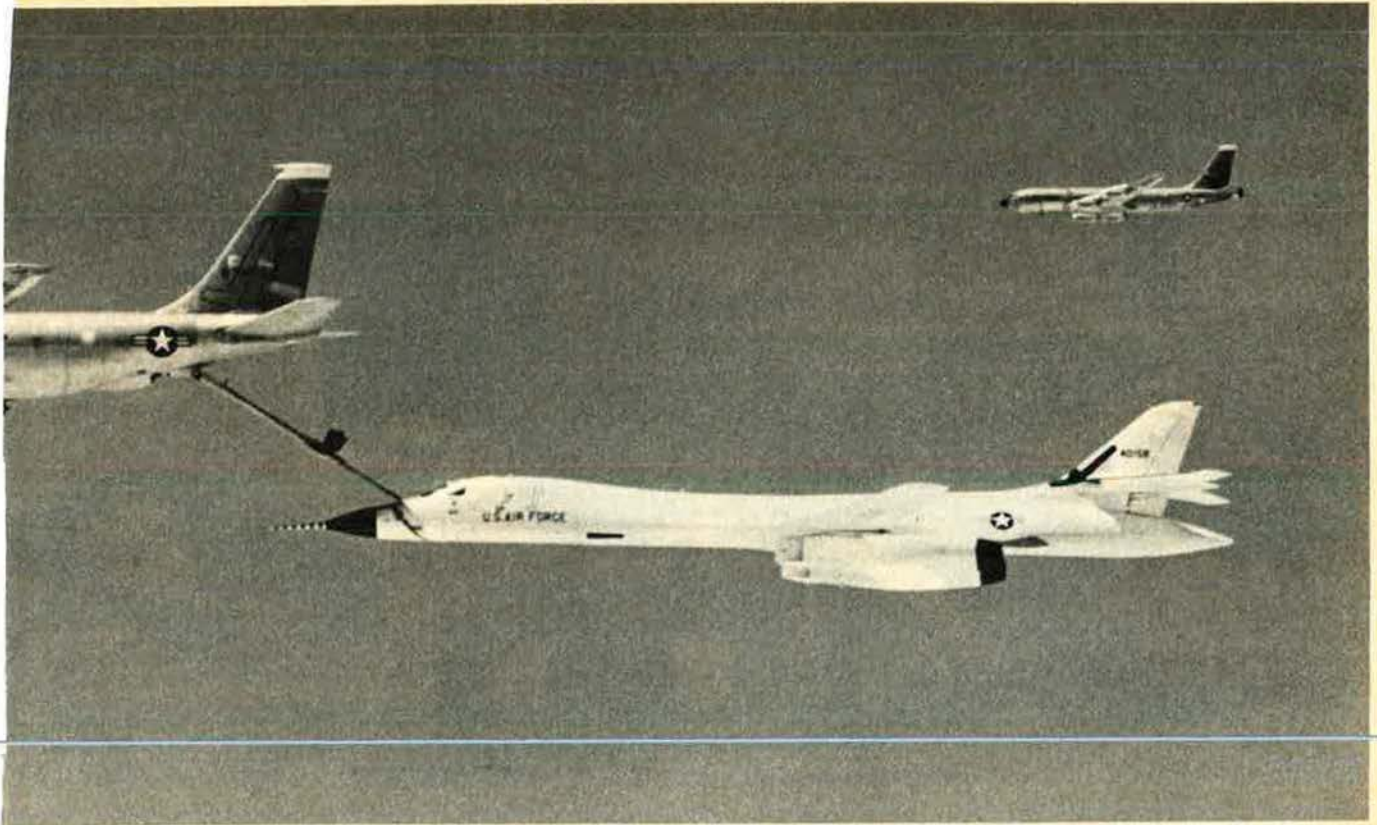


A SAC KC-135 refuels a B-1. Production plans for the bomber were canceled in 1977, but two models are still being test-flown. The B-1 continues to be mentioned as a possible replacement for the aging B-52 or as a cruise missile carrier.

Command Authorities added conventional warfare capability and "punch."

These systems will certainly change as required to meet the evolving threat. As the Air Force's center for aeronautical systems engineering excellence, ASD is extensively involved in the development and management of major modifications and enhancements to make current airframes endure and give our aeronautical systems added capability. Development of the EF-111A Tactical Jamming System and the F-4G "Wild Weasel" are good examples of the major conversions to existing systems the Air Force is undertaking to maintain that vital technological superiority.

The requirement to enhance the capability of existing aircraft systems for the changing tactical operating environment is a challenge, but the operational and support benefits from improved reliability and greater availability of standardized items will result in sig-



nificant life cycle cost savings to the Air Force.

Other tactical force capability enhancements designated for integration into aircraft types are:

- Joint Tactical Information Distribution System (JTIDS), a time division multiple-access, jam-resistant, secure digital information distribution system for the F-15, F-16, and E-3A AWACS. The JTIDS program is managed by AFSC's Electronic Systems Division, Hanscom AFB, Mass.

- Advanced Medium-Range Air-to-Air Missile (AMRAAM), an all-weather, all-aspect radar missile to replace the AIM-7F/M. It will significantly improve air-to-air combat capabilities of the F-15 and F-16. The AMRAAM program is a joint Air Force/Navy development managed by the Armament Division (AFSC), Eglin AFB, Fla.

- Other advances are under development for improving air-to-air and air-to-ground weapons delivery capability.

The task for integrating these advanced subsystems and equipments into the designated aircraft is a formidable one. There is quite a different set of development challenges associated with major modifications and enhancements to

existing aircraft as compared to changing a "paper design" of a new system. Thorough planning and extensive coordination with the operating and supporting commands is essential to minimize the installation and testing downtime to aircraft of our operationally ready forces.

Low Altitude Navigation Targeting Infrared for Night system, or LANTIRN, is a long overdue system to give the tactical air forces an improved capability to acquire, track, and destroy ground targets at night, and also permit target acquisition and weapons delivery with a minimum work load for the pilot. I personally think this is one of the most significant steps that we have taken to improve our tactical operations. For too long we've been tagged with the label of a day-VFR air force. The LANTIRN system, together with our force of F-111 deep-interdiction fighters, will give our tactical capability new significance.

Another aspect of the tactical mission that affects the success of all other operations is the suppression of the enemy's air defenses. The 1973 Yom Kippur War confirmed that a key prerequisite for successful air operations is the deg-

radation or elimination of the enemy's air defense system.

The Air Force's approach to defense suppression includes three main systems—the EF-111A, F-4G "Wild Weasel" aircraft, and the Precision Location Strike System (PLSS). ASD will modify forty-two F-111A aircraft for the defense suppression role to provide for an electronic warfare capability presently lacking. The primary role of the EF-111A will be to screen strike aircraft from detection by surveillance radars.

The F-4G "Wild Weasel" is an autonomous, lethal defense suppression system, with advanced avionics enabling it to locate and neutralize a wider range of enemy fire control systems than the F-105G it replaces.

PLSS will further expand our defense suppression capability. The PLSS is an all-weather tactical system designed to accurately locate and attack threat radars and attack nonradiating targets (airfields, bridges) using location information from other sources. When integrated with such other systems as EF-111A, "Wild Weasel," Army artillery, and attack helicopters, it will destroy and degrade enemy air defense systems. The TR-1 (a var-



SAC's B-52G is the only manned bomber able to carry the Air-Launched Cruise Missile, twelve externally and eight internally. One ALCM squadron may be operational by 1982.

iant of the U-2 airframe) will be used as an Airborne Relay Vehicle to carry the PLSS equipment.

In addition, we are pursuing a promising concept for small, pilotless aircraft that seek out, harass, and destroy ground radars. The low-cost expendable minidrone, called Locust, will carry a sensor to automatically acquire and attack hostile radio frequency emitting targets. Locust is a joint development program with the Federal Republic of Germany.

All of these programs have the same objectives—to give our tactical forces the capabilities to handle any and all conflict circumstances. We are looking even further into the future with such things as new radars, new wing designs, and more efficient engines to power our forces. We're studying composite materials for future aircraft, to

make them lighter and more fuel efficient.

The addition of these systems and the flight-line results of our extensive modernization effort over the past decade give us great confidence in the health of our general-purpose forces. However, new initiatives to cope with changing threat scenarios and employment concepts are necessary.

Strategic Forces Posture

Ten years ago, our strategic forces were clearly superior to those of the Soviet Union. But now, a crisis is near. I believe the balance of nuclear strategic forces is one of rough parity, the product of a massive military investment by the Soviet Union over the past fifteen years.

We are now making major improvements to the B-52, the mainstay of our manned bomber force. The aim is to make it a viable weapon system for the next ten years or so. We are modifying the B-52G and H models with updated avionics to maintain a satisfactory

level of reliability and, in the case of the G model, provide for future compatibility with the Air-Launched Cruise Missile (ALCM). We believe that these modified B-52s can serve as effective cruise missile carriers well into the 1990s.

The ALCM program is the only currently funded initiative that provides a near-term counter to the growing expansion of the Soviet strategic capability. This highly accurate missile will increase bomber routing and targeting flexibility, thereby reducing exposure to enemy defenses. It will become a major part of our strategic deterrent force because it will complicate the Soviets' problem of defending their territory.

The ALCM is so important, however, that we need to allow for the possibility of unforeseen problems with the aging B-52s, as well as for the possibility that we might need a larger force of ALCMs than can be carried on the B-52s. We are, therefore, pursuing a possible new Cruise Missile Carrier Aircraft (CMCA). Initially, we are looking at

The Air-Launched Cruise Missile program is the only currently funded initiative that provides a near-term counter to the growing expansion of the Soviet strategic capability.

evaluating a B-1 derivative, termed the Strategic ALCM Launcher, or SAL. Funding has been programmed for a flight demonstration in FY '82 to convert B-1 test aircraft No. 3 to a cruise missile carriage configuration and launch cruise missiles from both internal and external launch points.

The B-52 is entering its third decade of service. Over that time we have asked much of that bomber. We flew it as a conventional weapon system in combat during the Southeast Asia conflict, and it held up well. We have continued to add new systems and equipments to it and, so far, it continues to hold up well. But how much more can we ask of that airplane and still expect it to perform? To find a suitable replacement for the B-52, we'd better start now.

The near-term requirement must be satisfied by either committing part of the current B-52 force in an obvious and visible way, or obtaining approval for a stretched FB-111 force or a B-1 force. Approval of one of these near-term variants would allow a more studied look at a follow-on aircraft—giving us time to optimize its performance and incorporate technological improvements that best meet the fundamental requirements in the far term. Without a near-term solution, additional pressure will be placed on initiating a follow-on aircraft as soon as possible, which may not allow us to optimize on technologies. I am strongly convinced that the Air

Force has an enduring requirement for a strategic long-range, large-payload aircraft, capable of rapidly projecting force anywhere in the world; to demonstrate resolve, conduct surveillance and reconnaissance, or strike fixed and non-fixed targets using a variety of sensors and weapons. I submit that a strategic long-range, large-payload aircraft is the *only* military system capable of rapidly projecting demonstrable force worldwide in response to national authority.

The modernization of our strategic forces in the 1980s is as important as the tactical force modernizations we undertook in the 1970s.

Airlift and Trainer Systems Posture

The CX aircraft is a program I consider to be the most significant new start in the current field of aeronautical weapon systems. The CX will be a transport aircraft designed to correct the shortages in our ability to rapidly reinforce Europe, enhance our ability to move a significant-size force to any spot on the globe, and modernize our ability to move forces within a theater—to the flanks of NATO, for example.

This aircraft will use existing technology. Our goal is to have source selection completed and a full-scale development contract awarded by mid-1981, looking toward an initial operating capability in 1986 or 1987.

The C-5 Wing Modification Program is an example of the major modifications to existing aircraft cited earlier. ASD is developing improved wing life for the C-5 Galaxy, extending the safe life of the transport and ensuring its availability beyond the year 2000.

The KC-135 Stratotanker is the primary strategic tanker asset of the Air Force. A KC-135 Reengining Program is under way to incorporate the new-technology General Electric/SNECMA (CFMI) CFM56 turbofan engine into this aircraft. These engines will increase operational capability and flexibility, and reduce fuel consumption as well as noise and pollution.

Another interesting initiative is the Companion Trainer Aircraft (CTA) Program, a modified off-

the-shelf business jet for realistic flying training of Strategic Air Command B-52 combat crews at a fraction of the fuel and flying hour cost of equivalent training in the B-52. The CTA will also contribute to the goal of extending the service life of the B-52 fleet.

Conceptual studies have been undertaken for a Next Generation Trainer (NGT) aircraft to replace the current T-37B trainer. NGT requirements call for development of either a new primary trainer, modernization of the T-37B, or use of an existing domestic or foreign aircraft.

The foregoing has been only the highlights of our major programs at ASD. Space does not permit coverage of all the other programs and projects in work to improve the Air Force's capability to accomplish its mission. Few of the other programs get the attention of the large, glamorous system programs discussed previously. However, these varied subsystem and equipment programs are crucial to the maintenance and enhancement of the Air Force's war-fighting capabilities. The life-support programs, simulator programs, chemical defense for personnel and equipment, and advanced avionics and automated support equipment development efforts are vital to the effective operation of the Air Force.

Acquisition Management Challenges

The development and acquisition environment presents certain perpetual challenges to which we must continuously adapt. Dealing with the unknowns and the unexpected in the development of a technically advanced system program has become integral to ASD's business operation. Added to this is the unavoidable disruption to well-laid "planning" occasioned by directed shifts in priorities as a consequence of changed perceptions of defense needs.

The new decade presents us with new dimensions and challenges. The nature of the threat is changing continuously and becoming more diverse and complex. The tense geopolitical environment can only place more demands on the readiness and responsiveness of the operating commands and their sys-

tems and equipment. The requirement for global force projection on a sufficient scale and speed can only be achieved with the extensive use of airpower. Perhaps the most immediate and far-reaching impediment to our freedom to operate and defend our nation's vital interests is our dependence on dwindling and insecure supplies of energy resources. These factors condition the environment in which we manage acquisition, and are not within my control as Commander, or in the control of any of my program managers. We must, however, face up to the reality of these influences and we must strive continuously to account for them in our planning and managing.

Consequently, I have placed considerable emphasis on "corporate planning" for ASD. Corporate planning has a future orientation and is based on my conviction that meaningful organizational goals and strategies can only be developed from examination of where we are and where we appear to be headed. My expectations for corporate planning at ASD are to:

- Anticipate problems and opportunities by understanding changes in the business environment.
- Evaluate major policy issues on an ASD-wide basis.
- Communicate a sense of direction for all levels.
- Establish a basis for measurement of progress.

A small, talented Corporate Planning Office assists me and my key managers by facilitating and monitoring the planning process and providing special analyses when needed. With the increasing complexity of the challenges in the acquisition business, the critical resource situation, and the inestimable consequences of being headed in the wrong direction, sound corporate planning is essential.

ASD Organizational Assessment

Perceiving a change in the late 1970s in the character and dimensions of the ASD work load, our corporate planning effort focused on the business base we could anticipate in the 1980s. It is important that our organization be suited to the conditions we reasonably anticipate. The program management

organization structure at ASD at the end of 1979 was a legacy of the earlier 1970s. This organizational form was characterized by large weapon system programs (C-5, F-111, F-15, A-10, F-16, and, prior to its cancellation, the B-1). For each of these major systems there was a System Program Office (SPO), headed by a single manager with the authority and responsibility to achieve the

The tense geopolitical environment can only place more demands on the readiness and responsiveness of the operating commands. . . . Global force projection on a sufficient scale and speed can only be achieved with the extensive use of airpower.

program objectives. The SPO is a dedicated resource group of project personnel for managing a program. The SPO concept was pioneered by the Air Force and is the proven effective approach for managing the acquisition of major weapon systems.

But ASD's business base is changing with the advent of the 1980s. The activity associated with the A-10 and F-15 major system programs is stabilizing. In concert with the Air Force Logistics Command, we have identified the parameters for completion of the development tasks and the timing for the orderly and complete Program Management Responsibility Transfer (PMRT) for these systems. As soon as practical, following AFLC's assumption of program management responsibility, the ASD SPOs for these programs will

"go out of business." The highly skilled and experienced people from these program offices will be available to redress partially some of the more severe manning shortfalls faced by ASD for new system and subsystem development.

In place of the major single-aircraft development programs that characterized the 1970s will be new programs that will exploit existing technology or modify existing equipment. These programs will require a heavy investment of personnel, but they do not appear practical for management as separate, single-project organizations.

The deliberations on how to organize management of the CX Development Program crystallized our thinking on this question. It makes great sense and offers practical personnel economies to group together, under a single senior manager, programs having related military objectives, common users, and significant development and deployment interactions. The CX Program could benefit from interaction with related airlift and trainer system programs such as the C-5 Wing Modification, KC-135 Reengining Program, and the Companion Trainer Aircraft (CTA) Program.

The existing Deputy for Strategic Systems, the successor organization to the B-1 SPO on the cancellation of that program in 1977, was a precursor model of the type of mission-area organization that is better suited to ASD's emerging business base. Under a single, effective manager are all of the Air Force's strategic aircraft enhancement programs. This mission-area oriented organization has proven itself flexible and responsive to change as when, in July of this year, the management of the ALCM was efficiently assumed from the Joint Cruise Missile Project Office we operated in Washington, D. C., with the Navy.

We considered variants of the Strategic Systems Program Office and decided to realign the current ASD programs into a mission-area management structure, effective April 15, 1980 (see chart). Supplementing the Deputy for Strategic Systems are the Deputy for Tactical Systems, Deputy for Reconnaissance and Electronic Warfare Systems, and the Deputy for Airlift and

Trainer Systems. This aggregation of related programs will improve cross-program visibility and create opportunities for integrated solutions to mission-area problems.

To supplement the mission-area program management structure we elected to continue to provide specialized management attention for critical subsystems by the existing Deputy for Propulsion, the Deputy for Simulators, and a realigned Deputy for Aeronautical Equipment.

I chose to preserve the F-16 System Program Office as a separate SPO for at least another year or two because of the unique international cooperative aspects of that program. (This program is the largest defense coproduction effort ever attempted, with more than \$1.4 billion in contracts placed in Europe. Also, the ASD staff organization did not require adjustment and was not affected by the realignment of the program management structure.

In our new alignment, the Deputies are responsible for providing executive policy and supervision for the mission programs and for

Lt. Gen. Lawrence A. Skantze, a 1952 graduate of the US Naval Academy, is Commander of AFSC's Aeronautical Systems Division at Wright-Patterson AFB, Ohio. He won his wings in 1953 and served with a B-26 squadron in Korea. Since that time his career has been largely in research and development. He has served as Director of System Engineering and Advanced Planning in the Air Force Manned Orbiting Laboratory Program, as Deputy to the Commander of ASD for the SRAM program, as Systems Program Director for the E-3 AWACS, as Deputy Chief of Staff for Systems at Hq. AFSC, and has a master's degree in nuclear engineering from the Air Force Institute of Technology. His byline last appeared in AIR FORCE in the July '79 issue with the article "Electronic Warfare Initiatives."

offering guidance and assistance on issues that cut across program lines. Complete authority is delegated to the individual program directors for the management of their assigned programs. The stature of our program directors and the integrity of the single manager concept continues as a fundamental element for the success of ASD's mission.

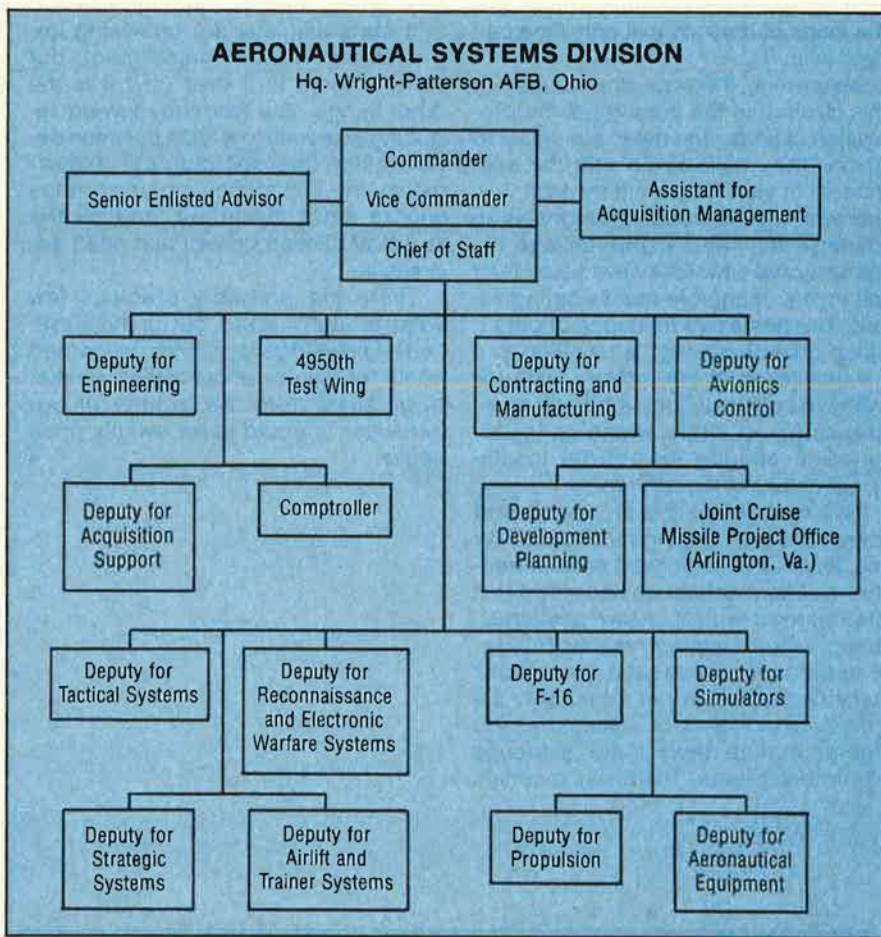
The new program management structure for ASD, with the mix of mission-area and specialized hardware management elements, will result in a more balanced organization with a set of Deputates having greater consistency in size and potential stability than our previous organization. Most impor-

tant, the new structure will certainly lead to more effective use of our most important and fundamental resource—people. I anticipate an improved development and utilization of specialized skills, background, and experience to address the new challenges we face in each area.

The resulting organization will carry ASD well into the 1980s with many benefits. This mission-area orientation is more aligned with the DoD Program Planning and Budgeting System structure and the AFSC Vanguard planning system. Vanguard is perhaps the most important advance in our quest to accurately assess future requirements and match the technology to these requirements. In all mission areas, the development of an entirely new system or a major enhancement to an existing system will be the result of critical technologies fusing together to create a technological opportunity.

This organizational alignment provides for improved mission-area trade-off analyses and mission-area problem solving. Our managers will be able to provide our higher headquarters decision-makers with better, more comprehensive, and cost-effective alternatives to mission objectives and requirements.

We will continue to assess the suitability of this organizational alignment to our future work load. Embodied in the mission-area structure is the capability to "spin-off" a project team as the nucleus for a full-blown, single-product SPO of the type common to our past organization. I am confident of our ability to step up to the challenge of managing a high-priority major system program on an accelerated schedule, should that be necessary. With corporate planning at ASD, we have the process for dealing with change in a coherent manner. ■



It is easy to become mesmerized with the promise of wonderful things to be wrought through technology, and in the process forget that its application depends on esprit and the dignity of those in the military professions. It is time to hear national leaders address the issue of . . .

Restoring Dignity to Military Careers

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

FOR those who have been worried about our defense posture, this has been, by and large, an interesting summer. Our serious presidential candidates, as distinct from such perennial oddities as the Communist Party nominee, have said encouraging things about strengthening our military. Senators who have been identified in previous years as defense budget opponents are either running for cover or are in deep trouble. In a year when the world seems to be drifting toward some inevitable showdown, no sensible politician can be against preparedness. And yet, with all the rhetoric, the platform planks, the promises for MX, new ships, and even more pay, it seems to me something basic is still lacking in this revival of interest in our security. It has to do with restoring dignity and pride to the military profession.

The last time the world approached its present parlous state was, at least arguably, during the late thirties. It was a time when the United States was emerging from the Great Depression and had neither aspirations toward nor illusions about being a world power. The Army, then as now volunteer, was about the size of Mexico's. Our Army Air Corps was far smaller and more poorly equipped than Britain's Royal Air Force, to say nothing of the Luftwaffe. All in all, we didn't amount to much on the world scene as a military power, and yet, there was something very respectable about the military profession. A second lieutenant making one hundred and twenty-five dollars a month could walk into the Waldorf and cash a check on the strength of his reg-

ular commission. That he couldn't afford to stay at the Waldorf was beside the point. Those were, admittedly, more informal and less harried times, but the fact remains that a commission in the military nowadays, whether second lieutenant or lieutenant general, does not carry with it the sort of cordial acceptance and regard that people in the thirties accorded our career officers.

There are a lot of reasons for this diminished respect: the size of the forces; the familiarity, beginning with World War II, of great numbers of our citizens with the military, and we all know what familiarity breeds; and, finally, of course, the Vietnam War, in which the military somehow emerged as the scapegoat. However unfair, these are the kinds of reasons that only time can deal with.

Meanwhile, there are other causes for this decline in the prestige of the profession of arms, and these are closer to home. They have to do with the self-esteem of the career military itself. It is increasingly clear that the emphasis on management and computer-age organizational concepts have taken their toll in that intangible quality called esprit. The pervasive influence of our civilian control concept is resulting in a civilianization of our military, with too many people in uniform adopting an increasingly civilian, which is to say cavalier, attitude toward the institutional nature of the service.

Getting back to the old days—and there were a lot of things wrong with the old days—the attainment of rank merited a certain deference and respect. It also carried with it a few privileges, along with increased responsibilities. A senior noncom was supposed to have benefits the two-striper could only aspire to. Junior officers looked ahead to the eminence their major's leaves would bring them. There was a certain

mystique about the higher ranks, as well as the top three grades, and getting into those exalted circles was very much part of the careerist's dream. Maybe it still is, but not because there is much mystique left. That, along with the little privileges traditionally accorded rank, have pretty much gone by the boards, and the young people take that into account when weighing the prospects of a career commitment.

It would be fun, then, to hear one of the candidates get away from the big issues for a moment. Never mind the strategic balance, NATO, or how many new ships and airplanes he is in favor of buying. Instead, let him address the need to rejuvenate the status of a military career. Pay is certainly a factor, and the politicians are promising improvements in that department, but there is more to it than pay. It is the other things, this tendency toward reducing everyone to a least common denominator, the sociological experiments, the impediments placed in the way of strict discipline, and all the layers of civilian control that need addressing.

There are probably precious few votes in such a stand, but for those citizens knowledgeable and concerned about the quality of our forces, as distinguished from the quality of our hardware, it would make awfully good sense. ■

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT

OCTOBER 1980



Although not the most handsome of the RAF's future aircraft, the AEW Nimrod will form a key element of NATO's defences in Europe

BAe

**BRITISH AEROSPACE AIRCRAFT GROUP,
MANCHESTER DIVISION; Address: Greengate,
Middleton, Manchester M24 1SA, UK**

BAe HS NIMROD AEW. Mk 3

Hawker Siddeley Aviation designed an airborne early warning (AEW) version of the Nimrod, which was developed from the maritime reconnaissance/ASW Nimrod that had first entered service with the RAF in late 1969. On 31 March 1977 it was announced by the British Defence Secretary that it was the government's intention to proceed with the procurement of eleven of these aircraft, which would carry the designation AEW. Mk 3. When they enter service in 1982 they will be compatible with the USAF's Boeing E-3A Sentry AWACS, and with the E-3As that will be operated directly by NATO, the first of which is due to enter service in 1982. However, they will not be fully interoperable within the NATO air defence system, linking aircraft, ground stations, and ships, until such time as the JTIDS (joint tactical information distribution system), which is intended to provide a secure,

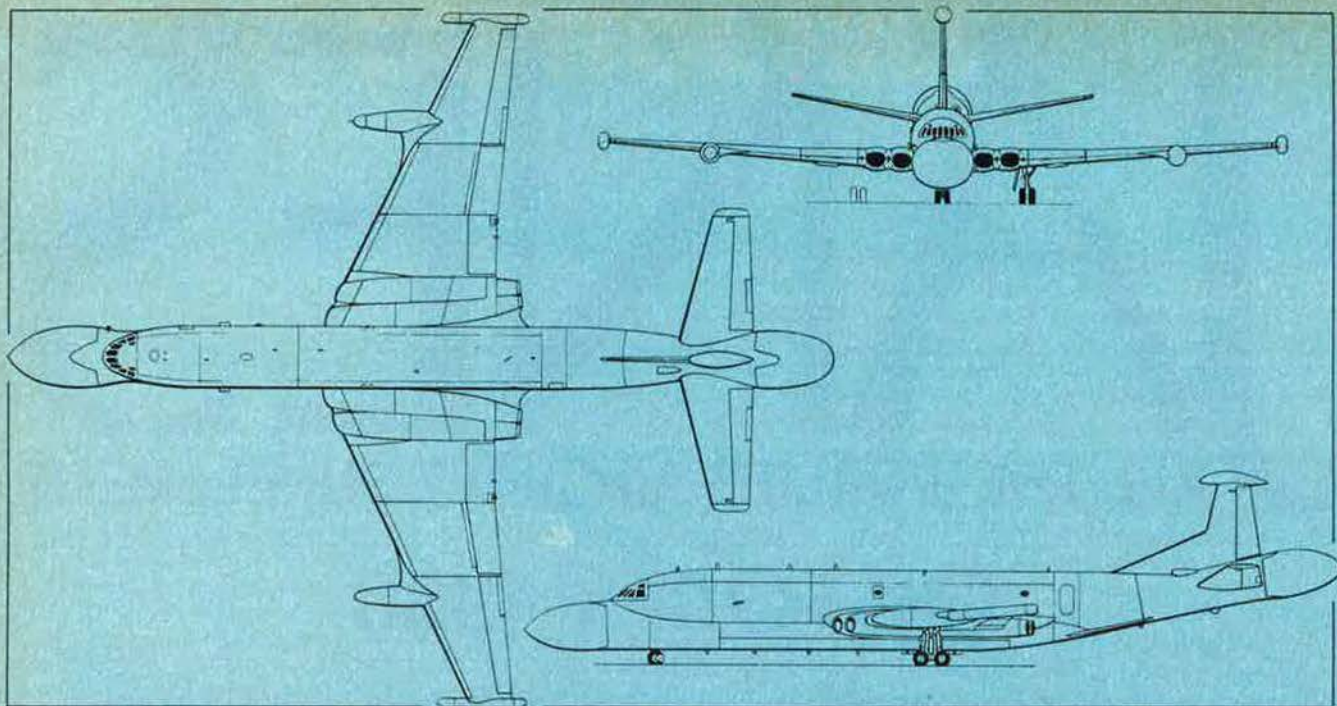
ECM-resistant data link, comes into service. Until then, the AEW Nimrod will have an interim data link, of the type used in the E-3 AWACS aircraft.

The design concept accepts the potentially large volume of air traffic in the European theatre, and the system is therefore automatic in detection and tracking and can resist electronic jamming. Designed specifically for this modified version of the maritime reconnaissance Nimrod, the radar requires modification to the nose and tail to permit installation of the newly developed and identically shaped scanners. The aircraft's performance is affected only marginally by the structural changes, and a reduction in directional stability is compensated for by an 0.91 m (3 ft 0 in) increase in fin height.

Mounting the scanners at the extremities of the airframe ensures a good all-round coverage, and they do not suffer from airframe obscuration effects. Designed for very low sidelobe level, each sweeps through 180° in azimuth, and phased switching of these scanners, or antennae, provides a full 360° coverage.

The equipments which are integrated to provide

the overall airborne warning and control capability are called collectively the Mission System Avionics (MSA) and have been developed by Marconi Avionics. Each Nimrod AEW. Mk 3 will have three sensors to detect and classify targets: they comprise a multi-mode radar, a passive radio and radar detection system (EWSM), and an IFF system to identify friendly targets. This last system shares the same antennae as the radar. The radar passes target plots, in terms of range, azimuth, radial velocity, and height, to the data handling system. There the information is collated and co-ordinated with data from the aircraft navigation system, and with further target data from the IFF interrogator, and the EWSM (electronic warfare support measures) detection subsystems. All the information held by the central data processing system can be selected as required by the six tactical operators, each provided with a range and azimuth display, showing plots and tracks, and a tabular display which provides the more detailed target information available from the central data processor. Each operator has a functionally arranged keyboard, allowing him interface with the system to carry out system con-



British Aerospace Nimrod AEW Mk 3 airborne early warning aircraft (*Pilot Press*)

trol, track classification, fighter control, and data link management.

The radar is a multi-mode pulse Doppler system, which utilises the changed frequency of reflections from moving targets (the Doppler effect) to enable low-flying aircraft to be detected even in the presence of strong ground or sea returns. The rate at which pulses are transmitted and received can be varied to maximise detection, and by interleaving the available modes the system can simultaneously plot surface ships and detect both high- and low-flying aircraft. The chosen radar frequencies ensure good long-range performance and freedom from interference with other existing defence systems and, to cater for modern electronic warfare techniques, the system has highly sophisticated anti-jamming features.

To achieve its task successfully, an airborne early warning station needs the ability to receive, store, co-ordinate, and transmit a large amount of data. This data flow has to be handled in real time and, moreover, the several functions have to be completed within time brackets which are matched to the varying operational situations. Throughout the execution of all the AEW roles the operators require continuously an ability to monitor, control, and direct the system. This capability is provided by the mission system software, which benefits from a long heritage of participation in the development of automatic assistance for European air defence. The AEW Nimrod incorporates the latest advances in software techniques, and adequate provision has been made for future growth requirements.

The effectiveness of airborne early warning depends not only on the technical efficiency of the onboard equipment, but equally on the ability of the AEW aircraft to merge with and complement existing elements of national air and sea defences. This requires high standards of communications and navigation, and for communications the AEW Nimrod carries tactical UHF transceivers, SIMOP HF transceivers, pilot's U/VHF, RATT, secure voice com, LF receiver, and data links. Primary navigation avionics consist of dual inertial navigation systems (INS), plus a gyro magnetic compass, air data computer, twin VOR/ILS, ADF, Tacan, autopilot, and a flight director system. EWSM equipment is housed in the two pods at the aircraft's wingtips. Other features of the Nimrod which have special significance for the AEW role are the spacious cabin for the avionics and crew, high transit speed, and good low-speed characteristics. A new

high-capacity cooling system has been developed for these aircraft to ensure suitable ambient conditions for all onboard equipment.

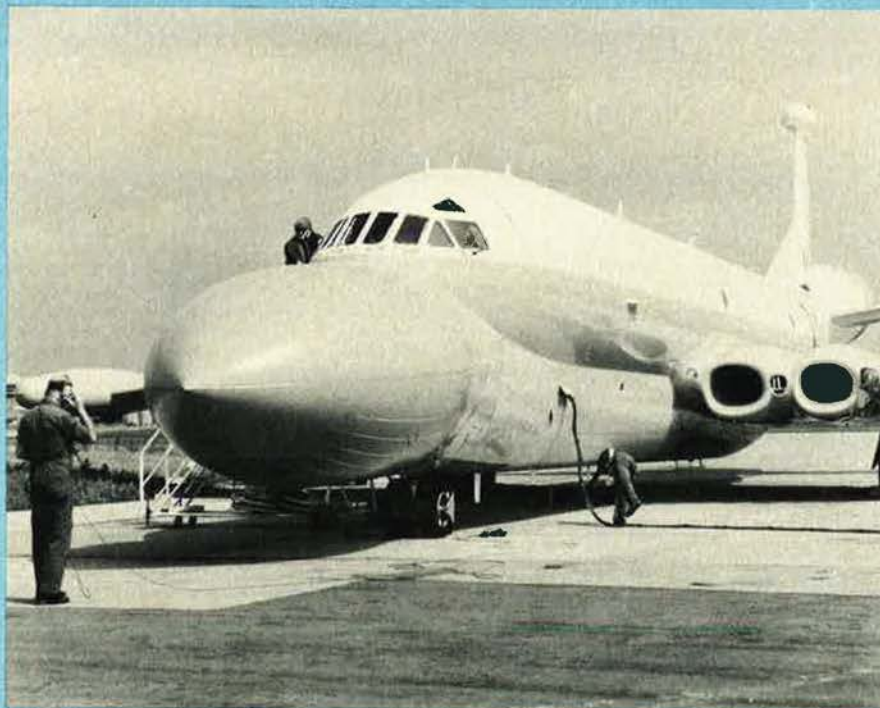
The first AEW Mk 3 (XZ286) was rolled out at Woodford, Cheshire, on 30 April 1980, and after completion of its preparation programme was flown for the first time on 16 July 1980, remaining airborne for 3½ hours. Also on that date Air Chief Marshal Sir Douglas Lowe, Controller of Aircraft at the UK Ministry of Defence, ceremonially switched on the Marconi Avionics MSA systems proving rig at Radlett, Hertfordshire, which duplicates the layout and equipment which will be installed in the AEW Mk 3, the first full system being scheduled to fly in 1981.

The eleven aircraft which are to be acquired by the RAF will be based at Waddington, Lincoln-

shire, with delivery scheduled between 1982 and 1985. Designed to detect low-flying aircraft at ranges of up to 261 nm (483 km; 300 miles), the fleet size of 11 aircraft has been based on the requirement for two aircraft to be on station for 24 hours of every day, one at 261 nm (483 km; 300 miles) and the other 608 nm (1,127 km; 700 miles) from base.

TYPE: Four-turbofan AEW aircraft.

WINGS: Cantilever low/mid-wing monoplane, of metal construction. Sweepback 20° at quarter-chord. All metal two-spar structure, comprising a centre-section, two stub-wings, and two outer panels. All-metal ailerons, operated through duplicated hydraulic and mechanical units. Trim tab in each aileron. Hydraulically-actuated plain flaps outboard of engines. Hot-air anti-icing system.



Identical radars at nose and tail give the Nimrod AEW.3 a distinctive configuration

FUSELAGE: All-metal semi-monocoque structure. The circular-section cabin space is fully pressurised. Below this is an unpressurised pannier to house operational equipment. Segments of this pannier are free to move relative to each other, so that structural loads are not transmitted to the pressure-cell. Glassfibre nose and tail radomes each contain a Marconi dual-frequency twisted cassegrain antenna.

TAIL UNIT: Cantilever all-metal structure. Rudder and elevators operated through duplicated hydraulic and mechanical units. A glassfibre pod on top of the fin houses ECM equipment. Trim tab in each elevator. Hot-air anti-icing system.

LANDING GEAR: Retractable tricycle type. Four-wheel tandem-bogie main units, with tyres size 36 x 10-18. Twin-wheel nose unit, with tyres size 30 x 9-15.

POWER PLANT: Four Rolls-Royce RB. 168-20 Spey Mk 250 turbofan engines, each rated at 54 kN (12,140 lb st). Reverse thrust fitted on two outer engines. Fuel in fuselage keel tanks, integral wing tanks, and permanent external tank on each wing leading-edge, with total capacity of 48,780 litres (10,730 Imp gallons), equivalent to a fuel weight of 38,940 kg (85,840 lb). Provision for extra fuel tanks to be carried in the lower fuselage pannier.

ACCOMMODATION: Normal crew of ten, comprising a flight crew of four, and six tactical operators. Two normal doors, starboard forward and port aft, and two overwing emergency exits.

SYSTEMS: Air-conditioning by engine bleed air; Smith-Kollsman pressurisation system with max differential of 0.603 bars (8.75 lb/sq in). Anti-icing by engine bleed air. Lockheed hydraulic system, pressure 172 bars (2,500 lb/sq in), for duplicated flying control power units, self-sealing couplings for water charging, ground test, engine bay, and ancillary services. Lucas APU provides high-pressure air for engine starting. Large-capacity electrical system. High-capacity cooling system for avionics equipment.

AVIONICS: Marconi Mission System Avionics (MSA) including multi-mode radar, a passive radio and radar detection system (EWSM) in wingtip pods, and an IFF system, including Cosor Jubilee Guardsman interrogator. ECM in pod on tail fin. Com avionics include tactical UHF, SIMOP HF, U/VHF, RATT, secure voice, LF receiver, and data links. Nav avionics include dual INS, dual VOR/ILS, ADF, Tacan, autopilot, FDS, and air data computer.

DIMENSIONS, EXTERNAL:

Wing span	35.08 m (115 ft 1 in)
Length overall	41.97 m (137 ft 8½ in)



First operated in a forward air control role in Vietnam, the Cessna 337 serves with several air forces in its latest military form, as the Summit Sentry O2-337

SUMMIT

SUMMIT AVIATION INC; Address: Middletown, Delaware 19709, USA

SUMMIT SENTRY O2-337

Summit Aviation is producing for sale to military customers a version of the Cessna Model T337 which is suitable for a wide range of missions. These include forward air control, helicopter escort, light air-to-ground attack, convoy protection, maritime patrol, six-seat personnel carrier, light cargo transport, aerial photography, psychological warfare, and airborne discharge. Special configurations are available for VIP transport, medevac, and high-altitude missions. In all configurations day or night capability can be provided.

Summit's modifications, to fit this aircraft for the specific role required by the customer, begin with the purchase of a new Model T337 from the Cessna Aircraft Company. Power plant of this version comprises two 168 kW (225 hp) Continental TSIO-360 turbocharged flat-six engines, and details of the basic airframe can be found in the 1979-80 *Jane's*.

With four standard NATO MALL-4A pylons mounted beneath the wings, each able to carry a max load of 159 kg (350 lb), the Summit Sentry can carry weapons which include SUU-11A/A 7.62 mm

32A/A, 32B/A, 59A, 68A, and 68B/A rocket launchers; CBU-14, SUU-14/A containers and bombs; LUU-1B, 5B, and Mod 6 Mk 3 markers; Mk 24 flares; ADSID; and a combined search radar and speaker system.

Summit Aviation has received an order for the supply of six Sentry O2-337s for service with the Royal Thai Navy Air Arm, and delivery of these was in progress in the early Summer of 1980. Other reported operators include the air forces of Haiti, Honduras, Nicaragua, and Senegal.

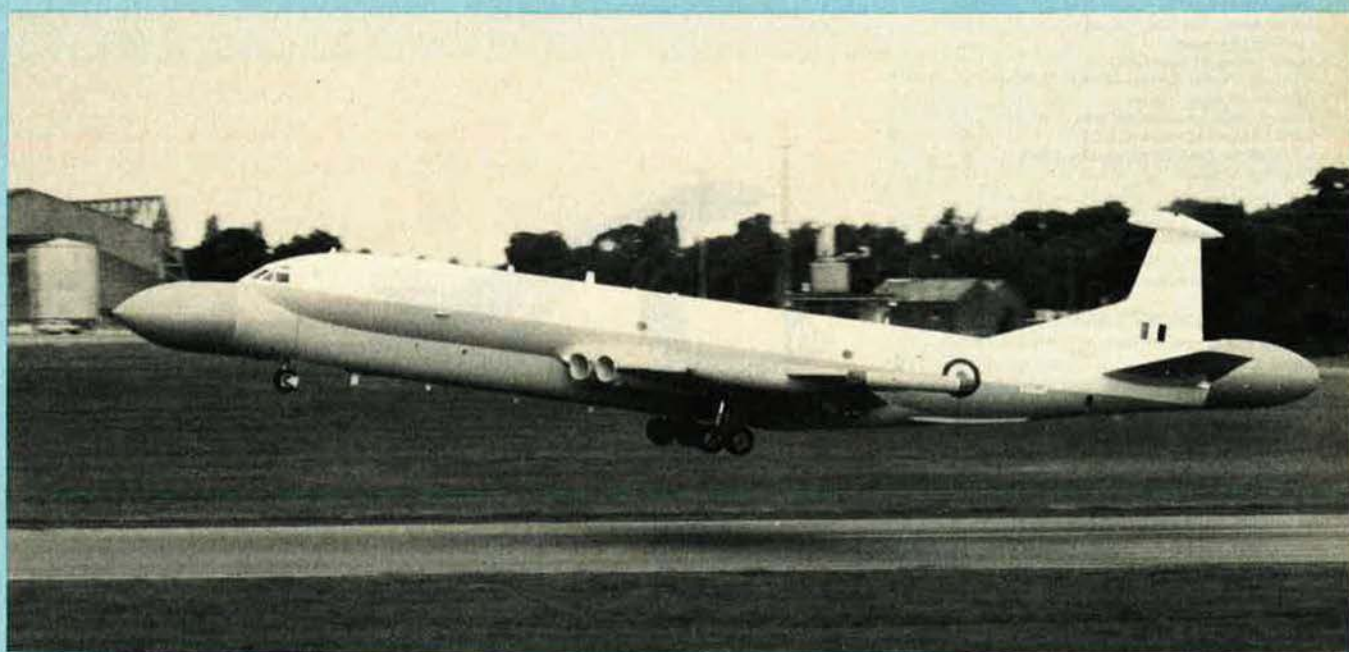
Available specification and performance details are as follows:

WEIGHTS:

Weight empty, approx	1,433 kg (3,160 lb)
Max T-O weight	2,359 kg (5,200 lb)
Max landing weight	2,200 kg (4,850 lb)

PERFORMANCE (at max T-O weight):

Max level speed at S/L	163 knots (302 km/h; 188 mph)
Max level speed at 3,050 m (10,000 ft)	179 knots (332 km/h; 206 mph)
Max cruising speed at S/L	150 knots (278 km/h; 173 mph)
Max cruising speed at 1,525 m (5,000 ft)	155 knots (287 km/h; 178 mph)
Max cruising speed at 3,050 m (10,000 ft)	



AEW Nimrod XZ286, first flown on 16 July 1980



For counter-insurgency operations, the Sentry carries an underwing armament of gun pods and rocket launchers

Max rate of climb at S/L	335 m (1,100 ft)/min
Service ceiling	8,690 m (28,500 ft)
T-O run	164 m (538 ft)
Landing run	137 m (449 ft)
Range, at 75% power with 560 litres (148 US gallons) usable fuel	955 nm (1,770 km; 1,100 miles)
Max range, long range cruise power, fuel as above	1,175 nm (2,177 km; 1,353 miles)

SHORTS

SHORT BROTHERS LIMITED: Head Office, Works and Aerodrome: PO Box 241, Airport Road, Belfast BT3 9DZ, Northern Ireland

By 10 July 1980, firm orders for the Shorts 330 twin-turboprop commuter transport aircraft had reached a total of 60, from 19 customers in eight countries, as follows:

Aerovias del Centro (Venezuela)	3
Air North (Vermont, USA)	2
ALM Antillean Airlines (Curaçao)	2
Chautauqua Airlines (New York, USA)	2
Command Airways (New York, USA)	4
Crown Airways (Pennsylvania, USA)	2
DLT (West Germany)	7
Golden West Airlines (California, USA)	5
Hawaiian Air (USA)	3
Henson Aviation (Maryland, USA)	4
Lineas Aereas Privadas Argentinas	2
Loganair (Scotland)	2
Metro Airlines (Texas, USA)	5
Mississippi Valley Airlines (Wisconsin, USA)	4
Olympic Airways (Greece)	2
Pennsylvania Commuter Airlines (USA)	1
Royale Airlines (Louisiana, USA)	1
Suburban Air Lines (Pennsylvania, USA)	6
Time Air (Canada)	3

On the same day, Shorts released first details of a 'stretched' aircraft, the Shorts 360, seating six more passengers in a lengthened fuselage, and having more powerful and more fuel-efficient engines.

SHORTS 360

The success of the 30-passenger Model 330 has encouraged Shorts to proceed with this longer-fuselage, more powerful 36-seat development, which is planned to enter airline service before the end of 1982. A prototype is scheduled to fly during September 1981, with certification following about a year later.

Designed specifically for short-haul airline operation, over average stage lengths of about 104 nm (193 km; 120 miles), the Shorts 360 retains the basic configuration of the Model 330, the major external differences being the lengthened fuselage (a 0.91 m; 3 ft plug is inserted forward of the wings) and the introduction of a sweptback single fin and rudder instead of the latter's twin assembly. Power plant is a higher-rated version of the proven PT6A turbo-prop engine.

Pressurisation is considered unnecessary in view of the short stage lengths over which the aircraft will operate, and this enables the Shorts 360 to retain the same 'walkabout' headroom, square-section wide-bodied interior, seating comfort, air-conditioning, and other amenities as its predecessor. The new rear fuselage/tail configuration is designed to reduce drag, improve fuel efficiency, and provide even greater baggage capacity. Indeed, considerable emphasis is placed upon the 360's ability to provide more than 0.20 m³ (7 cu ft) of baggage space for each of its 36 passengers, a feature which Shorts claim is unique among today's commuter aircraft.

The following description is based upon that of the Model 330; further details of the Shorts 360 were expected to be made available at the 1980 Farnborough International Air Show.

TYPE: Twin-turboprop commuter transport.

WINGS: Braced high-wing monoplane, of all-metal fail-safe construction, built in three sections. Wing sections NACA 63A series (modified). Thickness/chord ratio 18% at root, 14% on outer panels. Centre-section, integral with top of centre-fuselage, has taper on leading- and trailing-edges, and is a two-spar single-cell box structure of light alloy with conventional skin and stringers. The strut-braced outer panels, which are pin-jointed to the centre-section, are reinforced Skyvan constant-chord units, built of light alloy; each consists of a two-cell box having a smooth outer skin bonded to a corrugated inner

skin. All-metal single-slotted ailerons, each with geared trim tab. All-metal single-slotted flaps, each in three sections. Primary control surfaces are rod-actuated.

FUSELAGE: Light alloy unpressurised structure, of which the nose and rear underfuselage are of conventional skin/stringer construction, the remainder having a smooth outer skin bonded to a corrugated inner skin and stabilised by frames. Centre-fuselage incorporates main wing spar attachment frames, and lower transverse beams which carry the main landing gear and associated fairings.

TAIL UNIT: Cantilever all-metal two-spar structure, with single sweptback fin and rudder and constant-chord, non-swept tailplane. Trim tabs in each elevator.

LANDING GEAR: Retractable tricycle type, with single wheel on each unit. Main units carried on short sponsons, into which the wheels retract hydraulically. Oleo-pneumatic shock-absorbers. Rearward-retracting steerable nosewheel. Design caters for rough-field operation. Tyre pressures higher than on Model 330, due to higher operating weights.

POWER PLANT: Two 965 kW (1,294 shp) Pratt & Whitney Aircraft of Canada PT6A-65R turboprop engines, each driving an advanced-technology propeller with spinner. Fuel in main tanks in wing centre-section/fuselage fairing, total capacity 2,182 litres (480 Imp gallons; 576 US gallons). Normal crossfeed provisions to allow for pump failure.

ACCOMMODATION: Crew of two on flight deck, with dual controls. Seat for cabin attendant at rear of passenger cabin. Standard seating for 36 passengers, in 12 rows of three at 76 cm (30 in) pitch, with wide aisle. Seat rails fitted to facilitate changes in configuration. Galley and toilet at rear of cabin. Entire accommodation soundproofed and air-conditioned. Large overhead baggage lockers. Baggage compartments in nose and to rear of cabin, each with external access, give equivalent of almost 0.17 m³ (6 cu ft) of baggage space per passenger (0.20 m³; 7.2 cu ft per passenger if locker space is included). Passenger door at rear of cabin on port side. Two emergency exits on starboard side, two on port side (incl passenger door), and one in flight deck roof. Cabin divider available for mixed passenger/freight operation, as in Model 330, plus similar provision for all-cargo operation.

SYSTEMS: Generally as for Model 330, with 207 bar (3,000 lb/sq in) hydraulic and 28V DC electrical systems for main services, plus standard de-icing/anti-icing systems.

AVIONICS AND EQUIPMENT: Wide range of radio



Shorts 330 commuter transport in the insignia of Mississippi Valley Airlines, Wisconsin, one of its US operators



Artist's impression of the new Shorts 360 reflects its parentage in the well-proven Shorts Skyvan and 330

and navigation equipment available to customer's requirements. Typical standard avionics comprise duplicated VHF com and nav systems (VOR/ILS/marker beacon receiver), two ILS repeater indicators, two RMI, one ADF, two ATC transponders, one DME, two gyromagnetic compass systems, flight director, HSI, GPWS, PA and stereo music system, flight data recorder, voice recorder, and weather radar.

DIMENSIONS, EXTERNAL:

Wing span	22.76 m (74 ft 8 in)
Wing chord (standard mean)	1.85 m (6 ft 0.7 in)
Wing aspect ratio	12.33
Length overall	21.49 m (70 ft 6 in)
Height overall	6.88 m (22 ft 7 in)
Tailplane span	7.12 m (23 ft 4½ in)
Wheel track	4.24 m (13 ft 11 in)
Wheelbase	7.06 m (23 ft 2 in)
Propeller diameter	2.82 m (9 ft 3 in)
Passenger door (port, rear):	
Height	1.57 m (5 ft 2 in)
Width	0.71 m (2 ft 4 in)
Forward cargo door (port):	
Height	1.68 m (5 ft 6 in)
Width	1.42 m (4 ft 8 in)

DIMENSIONS, INTERNAL:

Cabin: Length	11.02 m (36 ft 2 in)
Max height	1.93 m (6 ft 4 in)
Max width	1.93 m (6 ft 4 in)
Passenger compartment volume	41.06 m ³ (1,450 cu ft)
Baggage volume:	
forward compartment	1.27 m ³ (45 cu ft)
rear compartment	4.81 m ³ (170 cu ft)
lockers	1.27 m ³ (45 cu ft)

AREAS:

Wings, gross	42.08 m ² (453.0 sq ft)
Ailerons (total, aft of hinges)	2.55 m ² (27.5 sq ft)
Trailing-edge flaps (total)	7.74 m ² (83.3 sq ft)
Vertical tail surfaces (total)	7.52 m ² (81.0 sq ft)
Horizontal tail surfaces (total, incl tabs)	9.66 m ² (104.0 sq ft)

WEIGHTS:

Typical operating weight empty	7,480 kg (16,490 lb)
Max payload (36 passengers)	3,184 kg (7,020 lb)
Max baggage load	635 kg (1,400 lb)
Max fuel load	1,741 kg (3,840 lb)
Max T-O weight	11,657 kg (25,700 lb)
Max ramp weight	11,702 kg (25,800 lb)
Max landing weight	11,521 kg (25,400 lb)

PERFORMANCE (estimated, at max T-O weight except where indicated):

Cruising speed at max recommended cruise power	211 knots (391 km/h; 243 mph)
T-O run at S/L:	
ISA	1,320 m (4,330 ft)
ISA + 20°C	1,440 m (4,720 ft)
Landing run at S/L at max landing weight, ISA	1,198 m (3,930 ft)
Range at 3,050 m (10,000 ft), cruising at 211 knots (391 km/h; 243 mph), ISA, reserves for 87 nm (161 km; 100 mile) diversion and 45 min hold: with max passenger payload	230 nm (425 km; 265 miles)
with max fuel	570 nm (1,055 km; 655 miles)

MINTY

E. R. MINTY: Address: 29 Benning Avenue, Turramurra, Sydney, NSW 2074, Australia

MINTY SKYHOOK

Mr Ted Minty began preliminary design of this single-seat lightweight autogyro in 1975, and construction of the prototype was started in early 1978.

The completed aircraft was exhibited for the first time at the Schoefields Air Show, in October 1978. Mr Minty's selection of a twin tail unit for this autogyro, which he has named Skyhook, was influenced by Mr Martin Hollmann in the USA. (Details of the Hollmann HA-2M Sportster appear in the 1979-80 *Jane's*, and this aircraft has a tail unit of similar configuration.) The use of twin tails, which are mounted within the wash of the pusher propeller, provides good directional stability and power-off manoeuvrability. Furthermore, the tails are connected at their base by a horizontal stabiliser which is intended to counteract the pitching moment or 'porpoising' experienced with some autogyro designs. The power plant installation includes ultra lightweight glassfibre cylinder head cooling cowls, designed by Mr Minty, which allow air to be drawn through inlet ducts and over the cylinder heads, the airflow induced by the rotation of the pusher propeller. Following some slight modifications, it is Mr Minty's intention to put the Skyhook into production.

All available details follow:
TYPE: Single-seat lightweight autogyro.



Cabin of a Shorts 330 of Olympic Airways. The new 360 offers the same cabin cross-section and headroom



Skyhook's clean lines should attract pilot-sportsmen



Prototype of the Minty Skyhook single-seat gyroplane, intended for sale in ready-to-fly form

ROTOR SYSTEM: Two-blade rotor of Haller Rotor-Hawk design, with light alloy blades attached directly to a fully-adjustable hub bar. Rotor mast attached to engine mounting frame, and reinforced by two stainless steel cables which are attached to the rotor head so that, in the event of a failure of the mast structure, the rotor blades, mast, and head cannot be lost.

FUSELAGE: Single keel to which are attached the landing gear, fuselage structure, seat, engine mounting frame and rotor mast, and tail unit. The majority of structural attachments are clamped, rather than bolted or riveted, to reduce to a minimum the number of potential fracture locations in the airframe. Glassfibre fuselage shell weighs only 5.4 kg (12 lb). During the Summer months the aircraft can be flown if desired without the removable plexiglass windscreen enclosure.

TAIL UNIT: Twin fins and rudders, the base of the fins united by a horizontal stabiliser attached to the keel. The upper ends of the fins are braced by double V triangular frames of light alloy and chrome molybdenum tube. Fins and rudders each constructed with an Airrx foam core, covered by two layers of continuous woven glassfibre.

LANDING GEAR: Non-retractable tricycle type with single wheel on each unit. Single small tailwheel at aft end of keel. Fully sprung steerable nosewheel. Main wheels are 5 in go-kart wheels, each with a 5.00-5 tyre. Provision for disc brakes.

POWER PLANT: One modified Volkswagen motor-car engine of 1,835 cc capacity, mounted on triangular frame structures supported from the keel, and driving a handmade two-blade silver ash pusher propeller. Fuel tank, incorporated in the base of the pilot's seat, has a capacity of 40.5 litres (8.9 Imp gallons).

ACCOMMODATION: Pilot only, in enclosed cockpit. Aircraft can be flown without plexiglass windscreen enclosure if desired. Adjustable vents in fuselage nose provide ventilation when the aircraft is flown with the cockpit enclosed.

EQUIPMENT: Standard equipment includes cylinder head high temperature and low fuel warning lights.

DIMENSION, EXTERNAL:
Propeller diameter 1.32 m (4 ft 4 in)

WEIGHTS:
Weight empty 161 kg (354 lb)
Max T-O weight 271 kg (597 lb)

PERFORMANCE:
Max level speed more than 87 knots (161 km/h; 100 mph)
Range with max fuel 121 nm (225 km; 140 miles)

EMBRAER

EMPRESA BRASILEIRA DE AERONÁUTICA SA: Head Office and Works: Av Brig Faria Lima No. 2170, Caixa Postal 343, 12200 São José dos Campos, São Paulo State, Brazil

EMBRAER EMB-120 BRASILIA

The EMB-120 Brasília is a twin-turboprop passenger and cargo transport, design of which was started in September 1979. Certification, scheduled for 1984, will be to FAR Pt 25. A mockup of the passenger version was displayed for the first time in Rio de Janeiro on 25 April 1980; general appearance can be seen in the accompanying illustration. An option on 10 Brasília's is held by the Brazilian regional operator TAM; another of the country's airlines, VOTEC, is expected to take out options on 5 aircraft.

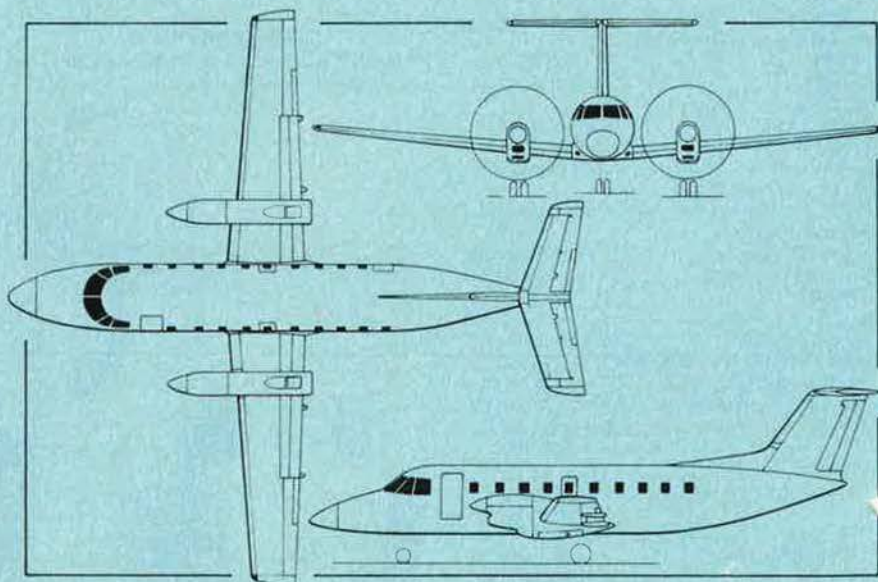
TYPE: Twin-turboprop general-purpose transport.
WINGS: Cantilever low-wing monoplane. Wing section NACA 23016 (modified) at root, NACA 23012 (modified) at tip. Dihedral 6° from roots. Incidence 2°. Sweepback 0° at 66% chord. Three-spar fail-safe structure between engine nacelles (across fuselage), two-spar on outer panels, forming a continuous tip-to-tip torsion

box. Machined and bonded extrusions of 2024 aluminium alloy on spar caps. Chemically milled skin. Double-slotted semi-Fowler all-metal trailing-edge flaps, supported on twin, fully fail-safe tracks. All-metal Frise-type ailerons, each with inset trim tab. Pneumatic-boot de-icing of leading-edges.

FUSELAGE: Conventional metal semi-monocoque fail-safe structure, of circular cross-section. Machined windscreen frames and wing attachment fittings. Chemically-milled skin. Structure pressurised, except for nosecone and tailcone.

TAIL UNIT: Cantilever T tail, of three-spar all-metal construction with chemically milled skin. Fixed-incidence swept tailplane, with horn-balanced elevators. Sweptback fin and double-hinged rudder. Pneumatic booster on rudder (for single-engine operation only); trim and anti-servo tabs in elevators. Pneumatic-boot de-icing of leading-edges.

LANDING GEAR: Retractable tricycle type, with twin wheels and oleo-pneumatic shock-absorber on each unit. Hydraulic actuation; all units retract forward (main units into engine nacelles). Tyre sizes 560 x 200 mm (main), 460 x 140 mm (nose); tyre pressure 5.17 bars (75 lb/sq in) on



Three-view drawing of the EMBRAER EMB-120 Brasília twin-turboprop transport
(Michael A. Badrocke)

main units, 5.86 bars (85 lb/sq in) on nose unit. Multiple-disc brakes, actuated hydraulically by means of a proportional anti-skid system.

POWER PLANT: Two Pratt & Whitney Aircraft of Canada PT7A-1 turboprop engines, each flat rated to 1,118.5 kW (1,500 shp), and driving a Hamilton Standard 14RF-1 four-blade constant-speed reversible-pitch propeller. Fuel in one 1,610 litre (354 Imp gallon) integral tank in each wing; total capacity 3,220 litres (708 Imp gallons). Single-point pressure refuelling, plus overwing gravity point in upper surface of each wing. Oil capacity 16 litres (3.5 Imp gallons).

ACCOMMODATION: Pilot and co-pilot on flight deck; cabin attendant in passenger version. Main cabin accommodates 30 passengers in three-abreast seating, with overhead lockable baggage racks, in pressurised and air-conditioned environment. Baggage compartment aft of passenger cabin. Provisions for wardrobe, galley, and toilet. Main passenger door, with airstairs, forward of wing on port side. Service door in starboard side at rear, also with airstairs. Overwing emergency exit on each side. Optional large cargo/service door at rear on port side.

SYSTEMS: Hamilton Standard air-conditioning and pressurisation system (max differential 0.48 bars; 7 lb/sq in), with dual packs of recirculating equipment. Single main hydraulic system (pressure 207 bars; 3,000 lb/sq in), powered by dual pumps (one on each engine), plus emergency standby system for landing gear extension. Rudder booster actuated pneumatically by engine bleed air. Main electrical power supplied by two 24kW 28V DC starter/generators; two 5kW 28V DC auxiliary generators and 24V 40Ah battery for secondary power. Single high-pressure oxygen cylinder for crew; individual chemical system for passengers. Pneumatic de-icing for wing

and tail leading-edges; electrical heaters to de-ice windscreens, engine air intakes, propellers, and pitot tubes. The starboard engine, with propeller stopped, will serve as an APU to provide bleed air for air-conditioning and electrical power on the ground.

AVIONICS AND EQUIPMENT: Blind-flying instrumentation standard. Provisions for full Category II operation, depending upon avionics and equipment selection by individual customers. Special navigation systems (INS, Omega, satellite) also available optionally.

DIMENSIONS, EXTERNAL:

Wing span	19.77 m (64 ft 10¼ in)
Wing chord at root	2.50 m (8 ft 2½ in)
Wing chord at tip	1.40 m (4 ft 7 in)
Wing aspect ratio	10
Length overall	19.63 m (64 ft 4¾ in)
Length of fuselage	18.38 m (60 ft 3½ in)
Fuselage: Max diameter	2.20 m (7 ft 2½ in)
Height overall	6.05 m (19 ft 10¼ in)
Tailplane span	6.58 m (21 ft 7 in)
Wheel track (c/l of shock-struts)	5.90 m (19 ft 4¼ in)
Wheelbase	6.67 m (21 ft 10½ in)
Propeller diameter	3.20 m (10 ft 6 in)
Propeller ground clearance (min)	0.35 m (1 ft 1¾ in)
Passenger door (fwd, port):	
Height	1.60 m (5 ft 3 in)
Width	0.70 m (2 ft 3½ in)
Height to sill	1.60 m (5 ft 3 in)
Service door (rear, stbd):	
Height	1.40 m (4 ft 7 in)
Width	0.70 m (2 ft 3½ in)
Height to sill	1.60 m (5 ft 3 in)
Cargo door (rear, port, optional):	
Height	1.60 m (5 ft 3 in)
Width	2.00 m (6 ft 6¾ in)

Height to sill	1.60 m (5 ft 3 in)
Emergency exits (overwing, each):	
Height	0.92 m (3 ft 0¼ in)
Width	0.51 m (1 ft 8 in)
Emergency exits (flight deck side windows, each):	
Max height	0.48 m (1 ft 7 in)
Max width	0.51 m (1 ft 8 in)

DIMENSIONS, INTERNAL:

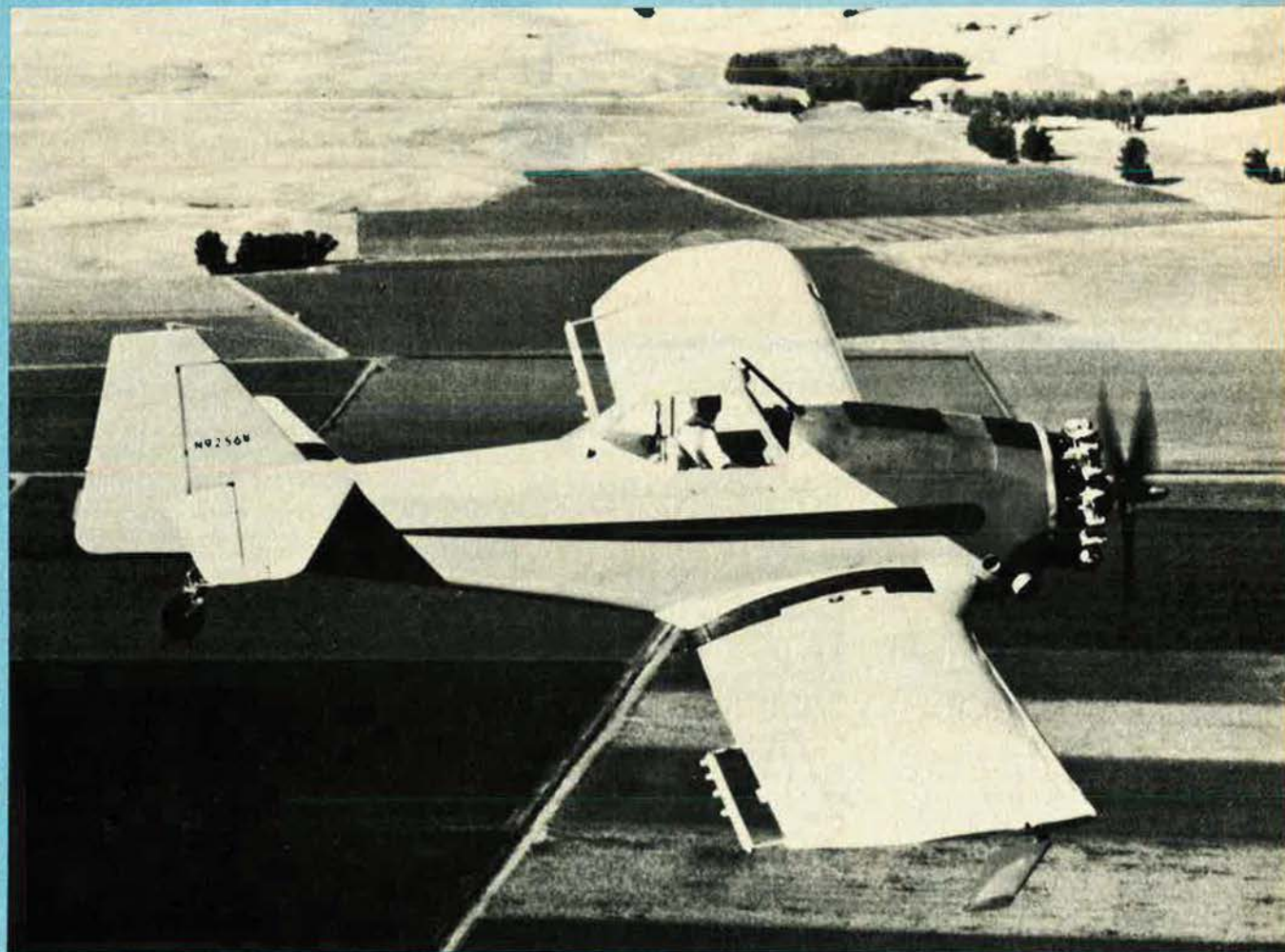
Cabin, excl flight deck and baggage compartment:	
Length	9.11 m (29 ft 10¾ in)
Max width	2.08 m (6 ft 10 in)
Max height	1.75 m (5 ft 9 in)
Floor area	14.00 m ² (150.69 sq ft)
Rear baggage compartment:	
Length	2.55 m (8 ft 4½ in)
Floor area	3.50 m ² (37.67 sq ft)
Volume	5.09 m ³ (179.75 cu ft)
Cabin, incl flight deck and baggage compartment:	
Total volume	approx 33.0 m ³ (1,165 cu ft)

AREAS:

Wings, gross	38.03 m ² (409.35 sq ft)
Ailerons (total)	3.18 m ² (34.23 sq ft)
Trailing-edge flaps (total)	6.50 m ² (69.97 sq ft)
Fin	6.90 m ² (74.27 sq ft)
Rudder	2.20 m ² (23.68 sq ft)
Tailplane	8.86 m ² (95.37 sq ft)
Elevators, incl tabs	3.45 m ² (37.14 sq ft)

WEIGHTS AND LOADINGS:

Basic operating weight empty	5,270 kg (11,618 lb)
Max payload	3,130 kg (6,900 lb)
Max fuel	2,280 kg (5,026 lb)
Max T-O weight	9,072 kg (20,000 lb)
Max ramp weight	9,155 kg (20,183 lb)
Max zero-fuel weight	8,400 kg (18,518 lb)
Max landing weight	8,872 kg (19,560 lb)
Max wing loading	239 kg/m ² (49 lb/sq ft)



The basic Model 620 version of the Weatherly agricultural aircraft, with a Pratt & Whitney R-985 radial engine



Except for its P&WC PT6A-11AG turboprop, the Model 620TP is generally similar to the piston-engined version

Max power loading 4.05 kg/kW (6.66 lb/shp)
PERFORMANCE (estimated, at max T-O weight, ISA):
 Never-exceed speed
 270 knots (500 km/h; 310 mph) EAS
 Max level and max cruising speed at 7,315 m (24,000 ft) 294 knots (545 km/h; 338 mph)
 Econ cruising speed
 250 knots (463 km/h; 288 mph)
 Stalling speed, flaps up, power off
 105 knots (195 km/h; 121 mph) EAS
 Stalling speed, flaps down, power off
 81 knots (150 km/h; 94 mph) EAS
 Max rate of climb at S/L 884 m (2,900 ft)/min
 Rate of climb at S/L, one engine out
 244 m (800 ft)/min
 Service ceiling 10,210 m (33,500 ft)
 Service ceiling, one engine out
 5,485 m (18,000 ft)
 Balanced T-O field length at S/L, and 0.6 weighted landing field length at S/L
 1,200 m (3,937 ft)
 Min ground turning radius
 15.50 m (50 ft 10 1/4 in)
 Range with 30 passengers, no optional fittings, reserves for 100 nm (185 km; 115 mile) alternate plus 45 min
 350 nm (648 km; 403 miles)
 Range with max fuel, reserves as above
 1,400 nm (2,594 km; 1,612 miles)

WEATHERLY

WEATHERLY AVIATION COMPANY INC; Address: 2304 San Felipe Road, Hollister, California 95023, USA

WEATHERLY MODEL 620

Weatherly Aviation developed in the early 1960s a conversion of the Fairchild M-62 for service in an agricultural role, and a total of 19 of the resulting Weatherly WM-62Cs was produced by the Autumn of 1965. Most of these were powered by Continental W670 radial engines, but a few had Pratt & Whitney R-985s. From this conversion programme a slightly larger aircraft, designated Model 201, was developed subsequently and remained in production in several successive versions until late 1979, when construction of the Model 201C ended after more than 100 examples of all versions had been built.

For 1980 Weatherly has introduced two new versions of a slightly larger, sturdier, and faster aircraft which has the designation Weatherly Model 620. Both are available with the optional small sweptback wingtip vanes which were developed for the Model 201. These are intended primarily to modify the spray pattern, but offer also a small improvement to flight performance: they can be folded back beneath the wing for hangar storage.

Two versions of the Model 620 are available: **Model 620.** Basic version, with a 336 kW (450 hp) Pratt & Whitney R-985 radial engine, and with a

1,268 litre (335 US gallon) hopper for liquid or dry chemicals.

Model 620TP. Version with a 373 kW (500 shp) Pratt & Whitney Aircraft of Canada PT6A-11AG turboprop engine, and a 1,287 litre (340 US gallon) hopper.

Few details are available except that these two versions are basically the same from the engine firewall aft; it is believed that in most constructional details they are similar to the slightly smaller Weatherly Model 201C, which is described in the 1979-80 *Jane's*.

DIMENSIONS, EXTERNAL:

Wing span 12.50 m (41 ft 0 in)
 Wing span, with optional wingtip vanes 14.33 m (47 ft 0 in)

WEIGHTS (A: Model 620; B: Model 620TP):

Weight empty, with spray system:
 A 1,270 kg (2,800 lb)
 B 1,134 kg (2,500 lb)
 Design T-O weight: A, B 1,814 kg (4,000 lb)
 Max T-O weight (Restricted category):
 A 2,495 kg (5,500 lb)
 B 2,449 kg (5,400 lb)

PERFORMANCE (at design T-O weight):

Stalling speed: A, B
 50.4 knots (93.3 km/h; 58 mph)
 Endurance:
 A 2 h 30 min
 B 2 h 0 min

Dear Voter:

Every presidential candidate will tell you that he stands for peace and freedom, military strength second to none, and the like—you have heard it all before and you will hear it all again. The candidates almost certainly speak the truth when they endorse the idea of peace with security. It is reasonable to assume that no presidential candidate favors war or insecurity.

Unfortunately, it is a matter of plain and undeniable public record that since the mid-1960s two Democratic and two Republican Presidents have permitted a steady, cumulative slide in American military power relative to that of the Soviet Union (although it is only just to observe that the Congress did cut \$45 billion from Nixon and Ford Defense budget requests). The reason why you, the voter, should examine the candidates with particular care on defense issues in 1980 is because the military and political consequences of the fifteen-year slide finally threaten to overtake us. In the late 1960s, when the United States effectively deferred a generation of military-technological modernization for the prosecution of a war in Southeast Asia (and then used the Vietnam "peace dividend" for nondefense programs), and through much of the 1970s—when hopes of détente and arms control dampened the urge to compete—the United States was able to survive off the military capital accumulated as a result of the policies of a previous time.

No one should be surprised that the United States faces an unusually dangerous period in the 1980s. What else could American voters expect as a consequence of being outspent on defense, year after year, by the Soviet Union? One or two years of deficient US defense investment would not much matter, but a *cumulative* ten- to fifteen-year deficiency cannot fail to have dangerous consequences. As a reminder, although the dollar-ruble exchange is notoriously difficult to calculate, you should know that the Soviet Union, of recent years, appears to have been outspending the United States by roughly forty percent, overall, on defense—while in the crucial strategic forces area, the ratio of Soviet to American expenditure averaged over a decade is approximately 3:1. To repeat, what really matters is not the absolute level of these figures, but rather their persistence.

We are now the better part of fifteen years into a comprehensive, across-the-board program of Soviet military modernization. The essential defense story in 1980 is the same as it was in 1976—except that we are four more years down the relative power curve.

You should be aware that major Democratic and Republican defense spokesmen have tended to converge, over the past year, in their estimation of the seriousness of the US, and general Western, defense condition in the

The candidates for national office will be putting forth their own positions on national security, aerospace power, and allied subjects during October and up to sunrise on November 4, Election Day. However, the communication should be in both directions, with the voters asking the candidates to explain their views. Thus this "open letter" to voters . . .

"Dear Voter"

An Open Letter to the American Electorate

BY COLIN S. GRAY

1980s. Secretary of Defense Harold Brown, for example, has written (in the DoD Annual Report for FY '81, January 29, 1980, p. 14) that

[w]e face a decision that we have been deferring for too long; we can defer it no longer. We must decide now whether we intend to remain the strongest nation in the world. The alternative is to let ourselves slip into inferiority. . . .

Henry Kissinger has said that "the 1980s could turn into a period of great instability. . . . For a period of five to seven years the Soviets may develop an advantage in power useful for political ends. . . . We could be heading into a period of maximum peril." (Interview in *The Economist*, February 3, 1979, p. 20.) Even if you find the characterization of our situation provided by Dr. Brown and Dr. Kissinger to be overdrawn, it is quite evident that there promises to be something unpleasantly different about the 1980s. This difference lends itself to summary all too easily. For the first time ever, the United States will have to do business with a Soviet Union that enjoys military superiority in some vitally important areas of competition, and rough parity in others. Today, unlike the situation in times past, the United States has no crucial regions of military-technical superiority that could compensate for Soviet advantages.

It would be quite improper for me to offer advice, in this forum, as to the prudent national security choice to be made between the presidential candidates of 1980. Apart from the fact that defense matters comprise but one, albeit very major, theme in this election, there is an inherent problem in comparing fairly a candidate with a four-year record of defense policy performance, with candidates whose defense policy performance, of necessity, can be assessed only in terms of the quality of the declarations that they utter. In addition, I cannot fairly compare Democratic with Republican performance because, although Mr. Carter's putative defense policy for 1981-85 must be assumed to be likely to be a continuation of present trends, it cannot prudently be assumed that Mr. Reagan would pick up on the policy paths mapped by Ford and Kissinger. Eschewing partisan comment and retrospective analysis, and ignoring the perishable language of party platforms, I would urge you to approach the election campaign with an open mind and a well-thought-through set of basic questions on national security policy.

You know that each candidate will promise roughly similar performance: peace, security, freedom . . . and so on. However, the US historical experience in dealing with the Soviet Union over the past decade (in particular) has provided some pointers to policy assumptions that are more, as opposed to less, likely to secure agreeable results. What follow are the questions I believe should be put to each of the candidates—followed by a commentary on the importance of the question and some information on the quality of our understanding of the subject in question. The phrasing, and choice, of these questions reflect the character of American presidential elections.

Clearly, it would not be sensible to ask a candidate to specify in great detail exactly which general-purpose forces he would assign to a particular military crisis in the Third World. Past examples of Presidents acting as surrogate theater commanders (or lower) are not encouraging. All that one can reasonably ask of a presidential candidate is that he have sound instincts on the character of possible threats, the nature of plausible US military responses, and the duties of the United States vis-à-vis allies and potential enemies.

What follow are eight specific questions that should elicit answers the electorate can evaluate as being symptomatic of attitudes that it does or does not judge to be appropriate in a prospective occupant of the White House. Readers are, of course, at liberty to endorse the validity of the questions while holding to some skepticism over the commentary.

Question One: How Would You Characterize Soviet Foreign Policy Objectives?

Defense programs are developed, ultimately, in support of foreign policy objectives. The candidates' views of Soviet intentions are critically important as a guide to the quality and quantity of US defense provision that they would be likely to support. What is important is whether or not a candidate recognizes that there is, and can be, no finite limit to Soviet foreign policy ambitions. The Soviet state, or Empire, is legitimized internally by the fiction that its leaders are the authoritative interpreters of the process of historical change. Marxism-Leninism is a universal dogma. Does a presidential candidate recognize this fact, or does he harbor the illusion that the United States can achieve a *modus vivendi* with the USSR—wherein each recognizes the "legitimate" interests of the other? In Soviet eyes, the capitalist system has no "legitimate" interests. Behind this question lurks the issue of whether or not a candidate understands that it is the very character of the Soviet state that is the proximate US security problem.

Question Two: What Kind of Overall Military Relationship With the Soviet Union Is It Desirable for the United States to Seek to Achieve?

For nearly fifteen years it has been axiomatic to assert that rough parity was "good enough" for Western security. Through most of that period the US intelligence community chose to assume that the USSR shared that objective. Indeed, it was believed that the SALT I

agreements of 1972 both expressed and advanced the idea of strategic parity. The Soviet Union endorses parity, or essential equivalence, only as the basis for a bid for preponderance. This is not a politically very divisive issue in the United States in 1980. However, although most informed commentators agree on the character of Soviet military ambition, they are less united on the subject of the character of the proper American response. An increasing number of American defense experts are coming to share Dr. Kissinger's newfound conviction that a mutuality in assured destruction capabilities would translate, in political reality, into American policy paralysis in time of crisis. (See Henry Kissinger, "Kissinger Looks to Future of NATO," *Congressional Record*, September 6, 1972, pp. E. 4291-4.) Given the forward geopolitical location in Eurasia of most of America's friends and allies, it seems at least plausible to assert that the United States must develop and sustain a superiority in escalation control.

Question Three: What Value Do You See in the SALT Process—and What Principles Do You Think Should Guide US SALT Negotiating Policy?

All of the presidential candidates in 1980 agree on the value of the SALT process—though they differ sharply over the merits of SALT II. Voters should understand that they are not restricted to examining the rival analyses of the SALT process, as presented thus far by the candidates—they have the benefit of eleven years of SALT history for their consideration. To date, it is not unduly partisan to observe that SALT agreements (I and II) have tended more to ratify the facts of ongoing strategic modernization programs (which, by and large, have been Soviet) than they have to constrain strategic arms competition in important ways. Nearly eleven years after the formal opening of the SALT process in November 1969, American strategists—of Left, Center, and Right—have come to agree that the Soviet Union appears to accept the view that nuclear war could be won. On a rather more controversial note, voters should observe that the eleven years of SALT experience available for analysis have shown a steady Soviet determination to undermine what American governments have understood by strategic stability. That is a fact. Given the alien character of Soviet strategic policy, as reflected in the SALT process thus far, it is incumbent on presidential hopefuls to specify just what value they perceive in the process. Furthermore, given that SALT achievements to date have ranged from very modest to negative, it is also incumbent on those hopefuls to explain how and why their preferred future SALT negotiating strategies would succeed where other approaches have failed.

Question Four: Assuming that the Great Issues of Strategy Are Settled, What Would You Propose in Order to Ensure that the Armed Forces of the United States Are Capable of Carrying Out Their Missions?

Presidential candidates and the general public may prefer to focus on such sweeping issues as 2½ or 1½ war-waging issues for general-purpose forces, but much of the real action—or lack thereof—happens at the level of the details of military preparedness. It is unreasonable to expect a presidential candidate to speak in very specific terms about manpower retention, ammunition stocks, training goals achieved, or general "readiness"—but it is *not* at all unreasonable to expect a knowledgeable and intelligent candidate to be aware of the fact that his possible administration will face major problems at this "implementation" level of defense policy. The American voter, in 1980, should signal to presidential aspirants that, regardless of their attention to overall defense philosophy, there are matters of military detail (which, overall, may be summarized as "readiness") in need of the most urgent attention. The United States has gross deficiencies in active-duty military manpower and in reserves (and in the retention of highly trained personnel); it has supposedly front-line fighter aircraft that are fifty percent unavailable due to a shortage of spare parts; and it has key technologies that are likely to work well only under very favorable local conditions. While a presidential candidate should not offer detailed hostages to fortune, he should at least signify persuasively that he understands a defense policy to consist of men and machines—and not merely of grandiose-sounding concepts.

Question Five: What Is Your Attitude Toward the Soviet Policy of Intervention in Regions Far Removed from Areas of Traditional Soviet Vital Interest?—and What Would You Do to Reverse the Tide of Soviet Imperialist Expansion?

There is a very general Liberal or Center Western attitude toward Soviet intervention that amounts to a moralizing wringing of hands and quiet whispers that "Soviets will be Soviets." Lest there be any misunderstanding, it is *not* assumed here that any and every Soviet-authored or -exploited adventure in Africa, Central America, or South Asia can or should be opposed forcibly. But this author, for one, would welcome a statement by any presidential candidate to the effect that the United States was changing the ground rules of East-West diplomacy in the Third World as they have been played and observed over the past thirty years. To be specific, it would be agreeable to find a presidential candidate who would deny the "rule" that a Communist government, once imposed, is in place forever. The West at present appears to be locked into the defensive, low-morale position that even to talk of "rolling back" Communist power is grossly adventurous—whereas the

spread of Communist tyranny reflects merely the march of history. Although a prudent candidate probably would not expand such a view in very much detail in public, the American electorate should inquire of presidential contenders whether they might not be willing to commit themselves to defeating decisively the next example of Soviet-encouraged, or -supported, aggression. Angola in 1975 lent itself near-perfectly to the imposition of such a military object lesson, but the opportunity was lost. Above all else, perhaps, the electorate should look for a candidate who recognizes that the unfolding process of Soviet Third-World intervention (Angola, Ethiopia, South Yemen, Afghanistan) has to be stopped dead in its tracks.

Question Six: What Would You Do About the Soviet Invasion of Afghanistan?

This question really is a double-check on the answer provided to Question Five. The American electorate, it is assumed, can perceive that a partial Olympic boycott and UN resolutions are simply gestures to annoy—they do not comprise a foreign policy likely to raise seriously the costs of aggression. Voters should listen for hints that a candidate *really* accepts the Soviet invasion of Afghanistan as a *fait accompli*. Candidates should be invited to speculate on how they believe the Soviets might be induced to see the military and political costs of their invasion as too painful to endure. Direct questions should be posed concerning the provision of antitank and antihelicopter arms, and training, and the moral responsibility of a country that encourages resistance to foreign aggression.

Question Seven: What Do You Think Is the Proper Political and Military Role of the United States Vis-à-vis Our NATO-European Allies?

This question, perhaps, is a little unfair, in that it is very difficult for a candidate to say anything other than platitudes—anything else may rebound to cause embarrassment once he is in office. However, intra-alliance political protocol aside, a worthy presidential candidate should give some strong hint of understanding that the military details of who contributes exactly what to NATO's defense are vastly less important than is *trust* across the Atlantic. Although proud and ancient NATO-European countries do not like to be led, it is a fact that they look for leadership, and steadiness in policy, *only* to Washington. The military politics of NATO should not intrude on a presidential campaign, but a competent candidate should signify, however generally, his understanding of the proposition that the stronger the United States is, and is seen to be, vis-à-vis the Soviet Union, the easier will transatlantic Western alliance politics be to conduct. Above all else, NATO-Europe requires an American ally that is confident in its strength, while not being overly assertive, and that is willing to listen to, and empathize with, the local concerns of NATO-European allies. A sound US defense program overall, and a handful of wise US political appointments, could resolve this issue.

Colin S. Gray, a frequent contributor to this magazine, is Director of National Security Studies at the Hudson Institute, Croton-on-Hudson, N. Y. He is the author of two forthcoming books, *Strategic Studies: A Critical Assessment* (Westport, Conn.: Greenwood Press), and *Strategic Studies and Public Policy* (Lexington, Ky.: University Press of Kentucky). Among Dr. Gray's recent publications is *Strategy and the MX* (Washington, D. C.: The Heritage Foundation, 1980).

Question Eight: Changes in US Nuclear War Strategy Recently Have Been Revealed—How Can Nuclear War Best Be Deterred, and—in the Worst Case—How Should Nuclear War Be Waged, and for What Ends?

In reply to this complex question, the voter should look for a modest and appropriately skeptical response, which—nonetheless—reflects the facts insofar as they are discernible. In the first instance, the voter should expect a competent candidate to recognize that the Soviet adversary, officially, believes that nuclear war—at any level of violence—can be *won*. Next, the voter should expect the candidate to specify those Soviet fears that, if realized courtesy of American nuclear action, would deny victory in Soviet terms (the basic theme here being Soviet anticipation of loss of political control at home). In addition, the voter has a right to expect the candidate to link the deterrent threat posed to the Soviet Union to the measures he would endorse for the physical protection of the American people and their means of livelihood. Finally, though this may be asking a lot, a candidate should be invited to explore the idea that US nuclear strategy, in action, would attempt to enforce a particular kind of war outcome, leading to an acceptable peace.

* * *

A presidential election is not an examination in defense analysis. Candidates should not be judged on the detail of their replies to the kind of questions posed above. However, those eight questions have been designed to elicit the instinctive responses of the candidates, as well as to expose the level of their detailed comprehension of the issues. It is totally unreasonable to expect a presidential candidate (save, *perhaps*, for the President) to have a firm grasp of defense detail over a wide range of policy issues; all that one should ask is that he has a sound instinctual response (*i.e.*, that he has good *judgment*) to basic questions, and that he can distinguish good advice from poor advice. ■

It's unglamorous, belongs to everyone and thus has no special pleasers, but when it is neglected the effects are pernicious. It is USAF's Operations and Maintenance account . . .

The Key to Readiness: O&M

BY LT. GEN. HANS H. DRIESSNACK, COMPTROLLER OF THE AIR FORCE

THE Secretary of Defense, the Joint Chiefs, and the Military Services are united in urging increases in US defense expenditures. One of their greatest concerns in defense readiness. Adequate Operations and Maintenance (O&M) funding is vital to readiness.

Gen. David C. Jones, Chairman of the Joint Chiefs of Staff, recently told a House Appropriations Subcommittee, "O&M—or the broader issue of readiness—is the greatest problem we have in the military right now." Dr. Hans Mark, Secretary of the Air Force, echoed that emphasis, telling the committee, "The importance of our O&M request cannot be overstated." In an AIR FORCE Magazine article on "USAF's Responsibilities in the '80s," Air Force Chief of Staff Gen. Lew Allen, Jr., said, "We are now taking significant steps to expand aircrew training, bolster stocks of spare parts and munitions, and increase operations and maintenance funding." This attention to the O&M appropriation is a major departure from past emphasis on developing and procuring more and better military hardware.

The military might of a nation is traditionally measured in terms of troop strengths and quantities of hardware: divisions, tanks, aircraft, missiles, and ships. As modern forces have become more sophisticated, new weapon systems such as AWACS have acted as force multipliers making numerical military comparisons more complicated than simple arithmetic.

Any assessment of military capability based exclusively on quantitative analysis ignores the essential element of combat—

"readiness." Readiness is defined as the "ability of military forces, units, weapon systems, equipment, and personnel to perform functions for which they have been designed, organized, or trained."

Although the United States has invested heavily in modern weapon systems, some of our most sophisticated systems are not ready to perform to full design capacity. To fully utilize our weapon systems, the Operations and Maintenance supporting structure must be in balance with the force structure it supports. Regardless of age or sophistication, the readiness of our weapon systems is dependent upon the adequacy of our O&M account.

What O&M Buys

Although O&M funding is critical to readiness, the O&M account is not well understood by many who have an otherwise excellent knowledge of military affairs. Even members of the armed forces do not have an adequate knowledge of the account and what it buys. O&M buys such a volume and variety of goods and services it is difficult to grasp the full range and importance of the account.

The O&M appropriation is the keystone of defense appropriations because it sustains and ties together the investment made with other appropriations. Hardware bought with procurement appropriations is operated and maintained with O&M funds. Facilities built with military construction appropriations are supported and maintained with O&M funds. The health, morale, and welfare of the makers of readiness—people—are directly dependent upon the level of O&M

funding. O&M also buys the training our people need to operate and maintain equipment and facilities. In Table I (p. 59), the O&M account is shown in terms of the commodities and services we buy. However, it may be easier to illustrate O&M's impact on readiness if we talk about the things we do with O&M and how these relate to readiness.

Commanders and managers must develop a balanced program with a mix of activities within an overall level of funding. Obviously, commanders in the operational commands give precedence to flying, maintenance of aircraft and missiles, and to training aircrews. In a national emergency, aircraft and crews will be at the forefront. If they are not ready, failure will result. In other commands, whose mission does not involve flying, similar emphasis is given to their prime mission.



In this article, Lieutenant General Driessnack explains why defense readiness requires adequate O&M funding.

Approximately thirty-five percent of the total O&M budget goes directly for support of flying operations. These costs are reflected in Table I as Depot Maintenance (DPEM); Aviation Petroleum, Oil, and Lubricants (AVPOL); and Flying-Hour Supplies. Expenditures in these categories are rising both in dollars and as a percentage of the total budget. Despite the increases, much more is needed. These are the dollars that generate the flying to train aircrews. Our crews need adequate flying training each month in order to maintain their proficiency, and, even with hard-nosed and innovative management, we fall short of our desired training goals in several of our weapon systems.

Aviation POL and flying-hour supplies are easily understood. Aviation POL is the fuel consumed in the flight of aircraft and in maintenance and testing of engines. Flying-hour supplies are the replacement parts used by field maintenance organizations to repair aircraft. Depot Maintenance requires more explanation.

Depot Maintenance provides for centralized maintenance and modification of aircraft, missiles, engines, other major equipment, and their exchangeable subassemblies and components. The current annual expenditure of almost \$2 billion for depot maintenance appears large when viewed in dollar terms, but it is small in comparison to results. The funds spent for depot maintenance either maintain or improve war-fighting capability. Training for combat must be rigorous, because combat itself is rigorous. Under the stress of such training, equipment can deteriorate rapidly. Air Force equipment is also exposed to the elements in some of the world's harshest environments. Since we fight with the weapons we train with, equipment that deteriorates must be restored or replaced. By restoring equipment to a ready state, depot maintenance helps us avoid the tremendous investment of replacement.

Like deterioration, we must deal with obsolescence and the need for new capabilities. In many cases, we avoid buying new equipment by modifying existing systems. The C-141 stretch and the conversion of

the B-52 to enable it to carry cruise missiles are examples of current modifications. In FY '80, we are installing about \$700 million in modifications at an installation cost of more than \$200 million. Although modifications are authorized and paid for in the procurement accounts, installation of the parts and kits is an O&M cost—whether accomplished by contractors or by in-house personnel.

Realistic Flying Training

Expenditures for AVPOL, supplies, and depot maintenance generate flying hours, but just as important as the hours themselves are where and how they are flown. Straight and level flight, for example, would do little to prepare a fighter pilot for war. An aircrew must practice what will be done in actual combat. The Chief of Staff has stated: ". . . training must be rigorous and realistic so that crew members can exploit the full potential of their weapons." When aerial weapons were limited to machine guns and conventional bombs, effective training could take place almost anywhere. As weapons have become more expensive and more lethal, practice with actual weapons has been limited. With funding shortages, expensive weapons cannot be consumed as much as is desired in practice, nor can nuclear bombs be released. Electronic simulation devices have to a large extent replaced practice with actual weapons.

The Air Force has established highly sophisticated training ranges at the Tactical Air Warfare Center, the Tactical Fighter Weapons Center, and various weapons training

sites. On these ranges, aircrews can simulate weapons releases against simulated enemy defenses. These ranges and the simulation devices, such as Air Combat Maneuvering Instrumentation (ACMI), are operated and maintained with O&M dollars. However, to utilize the ranges, we must get the aircrews to them. To sharpen airmanship for combat, we may deploy an F-4 squadron from Moody AFB, Ga., to a range at Nellis AFB, Nev., or an F-111 squadron from RAF Lakenheath, UK, to Aviano AB, Italy. When a squadron is deployed, its maintenance capability goes with it. We airlift maintenance people, spare parts, tools, and equipment, and reimburse aircrews and maintenance personnel for their additive living costs. All these transportation and TDY costs are paid for with O&M dollars.

Training deployments produce other readiness benefits. Units based in the US can become more effective by deploying to Europe or the Pacific to train in the environment in which they may fight. We can improve the effectiveness of our alliances by conducting exchange and interoperability exercises with allied nations. These exercises also require large expenditures of O&M, but have a high payoff in readiness. Exercising is expensive, but it allows us to increase the survivability of our crews and weapons and significantly increase the probability of our success in combat.

For aircrews and maintenance personnel to perform the duties for which they train, they must have the weapons, parts, and supplies they need. Transportation from supply centers in the US to the using unit,



Moisture damaged this BOQ wall at Mather AFB, Calif. Delaying repairs such as this increases their average costs by three percent each year.

wherever it might be, is paid for with O&M funds.

A large share (twelve percent) of the O&M budget is spent for maintenance of real property and other civil-engineering activities. The Air Force investment in physical plant is shown in Table II. Physical plant in the Air Force is the supporting structure for readiness: maintenance hangars, aircraft shelters, and runways. Supporting structure is especially important because the Air Force, unlike the other services, will probably fight from its air bases. Much of the physical plant is of World War II or Korean War vintage, and we are spending large sums of money to maintain facilities that more practically should be replaced, particularly overseas. Operating these old facilities is unnecessarily expensive as well. Shortages of military construction funding have caused the Air Force to continue to operate and maintain marginally effective facilities.

Supporting People

As mentioned earlier, people are our key resource. No investment in equipment and facilities would produce readiness without a well-trained, confident, and dedicated force. We must recruit and retain capable young people, train them to do their jobs, and sustain them and their families. Our recruiting stations, advertising, and the leased vehicles recruiters use are paid for with O&M funds. Our Technical Training Centers are operated with O&M funds. These centers train recruits in entry-level job skills and, as they progress in their careers, the centers provide the skill they need to become senior technicians and managers. When new weapon systems such as the F-15 are bought, instructors and maintenance personnel are sent to the manufacturers' plants for training. With the large turnovers of recent years, requirements to train new people have grown steadily.

Once personnel are trained and in the field, most of their operating support, except for pay and food, is provided by O&M funding. Dormitories are maintained and equipped and dining halls are operated with O&M funds. So are medical care facilities throughout

USAF. Morale, welfare, and recreation facilities are a shared O&M and nonappropriated fund expense. The level of real property maintenance, discussed earlier, determines the condition of working facilities. These types of personnel support probably have more impact on retention than anything other than pay. We have found young people simply refuse to work in run-down, ill-equipped shops or live in run-down, crowded dormitories. They also want and need adequate recreational facilities. Dollars spent for personnel support save much larger dollars needed to train replacements for dissatisfied people who leave the services.

All the equipment, facilities, and personnel of our worldwide operation must be tied together with command and control systems. O&M funding pays for the operation and maintenance of the communications equipment and computers needed for direction and reporting.

Trends of the '70s

If O&M is to sustain and support investment, we must establish a balance between these two expenditures. Total Air Force spending (Figure 1), perhaps surprisingly, increased in each year of the past decade. When the appropriations are adjusted for inflation, the anticipated constant dollar pattern emerges. As we withdrew from the Southeast Asia conflict, the force was drawn down and expenditures declined in real terms. After the FY '75 low, real spending increased as we began a program to rebuild and modernize the force.

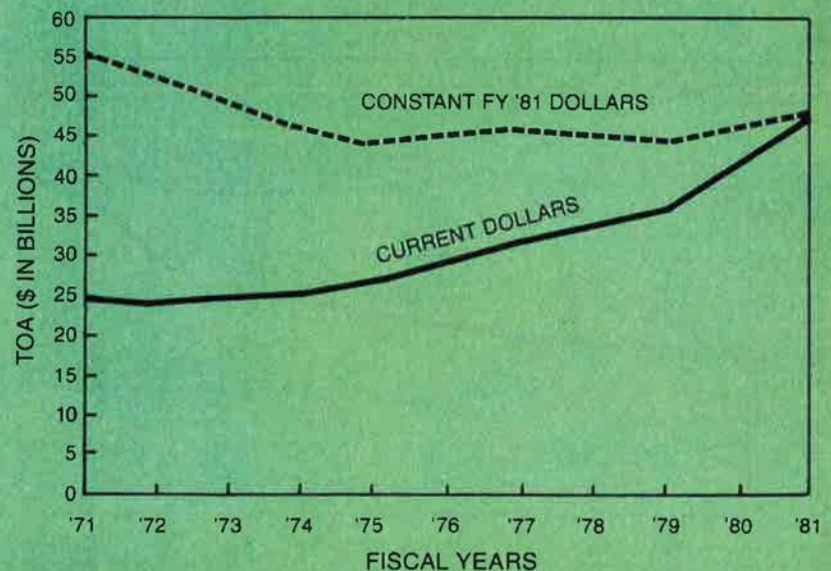
Table I: Air Force Budget O&M Expense Elements for FY '81
(TOA \$ in Billions)

Purchased Equipment	
Maintenance	\$.2
Civilian Pay	2.7
Utilities and Rents	.4
Travel and Transportation	.8
Communications	.3
Depot-Purchased Equipment	
Maintenance (DPEM)	2.0
Other Industrial Fund	
Purchases	.7
Other Purchased Services	2.3
Aviation POL (AVPOL)	2.2
Flying-Hour Supplies	.5
Other Supplies	.9
Other	.2
TOTAL	\$13.2

Table II: Physical Plant

Installations	3,057
Major Installations	134
Buildings	516,000,000 square feet
Airfield Pavements	250,000,000 square feet
Roads and Streets	3,200 miles
Land	11,000,000 acres
Plant Acquisition Value	\$18 billion
Replacement Value	\$83 billion

Figure 1: Air Force Budget Total Program*



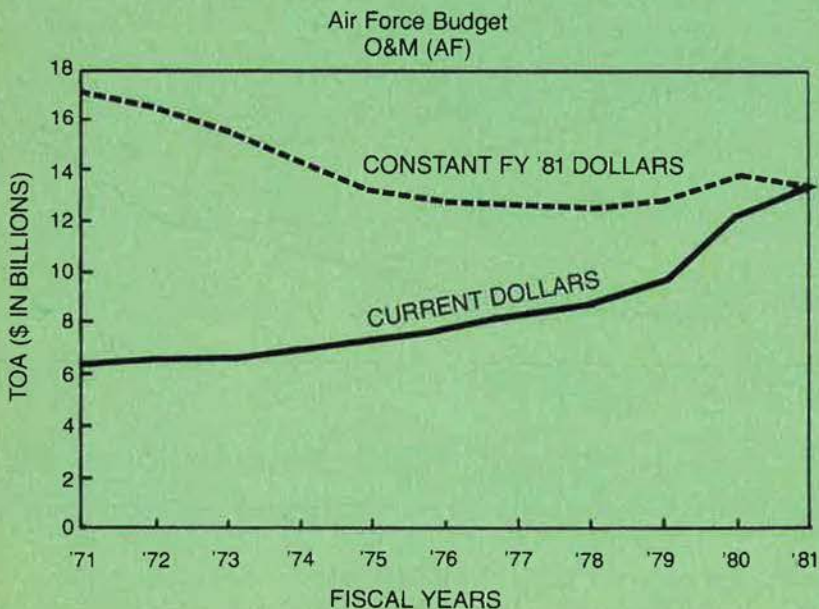
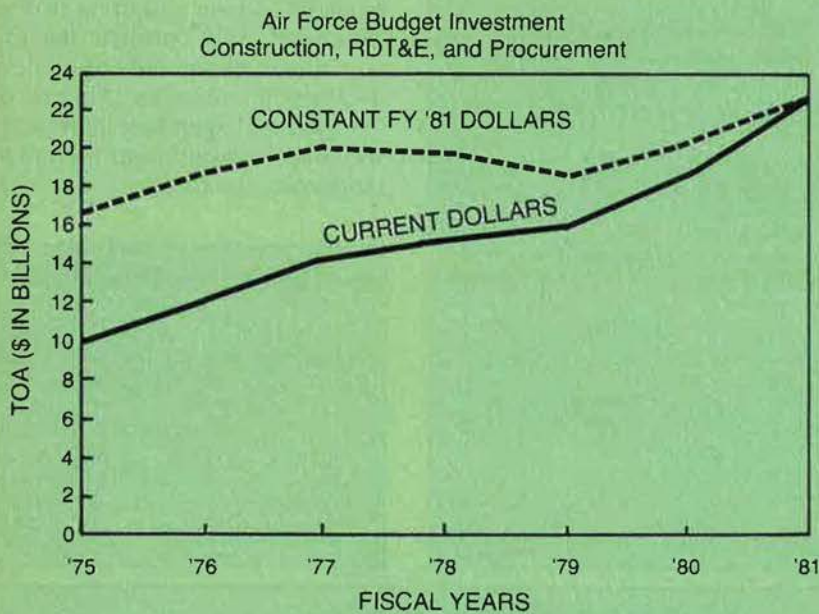
*Deflation adjustments based on Department of Defense Deflators, July 3, 1980.

Table III: Examples of Migrations to O&M

Currently Funded in O&M	FY '80 Cost in Millions	Previously Funded From
Utah Test & Training	\$ 5.8	RDT&E and AF Reserve
Eastern Test Range	101.0	RDT&E
Western Test Range	58.3	RDT&E
First Destination Transportation	18.1	All Procurement Appropriations
Plant # 42 Palmdale, Calif.	3.9	Aircraft Procurement
Software Mods	14.8	Aircraft Procurement
Military to Contact	15.6*	Military Personnel
	\$217.5	

*1,388 conversions at standard rate for E-5

Figure 2: Air Force Budget



In Figure 2, the major components of total Air Force spending are shown. The investment appropriations, while erratic, have increased significantly since FY '75 in both actual and adjusted dollars. At the same time, the O&M appropriation that supports both new and existing investment was declining in real terms. The O&M appropriation did show a slight growth in FY '80, but not enough to compensate for prior years of decreases. In a period in which we replaced almost 1,700 fighter aircraft with new, more sophisticated models, the O&M appropriation to support those aircraft was declining. In view of rising fuel costs and higher-than-predicted inflation, we are now estimating an FY '81 shortfall of almost \$1 billion.

The decline in O&M during a period of heavy investment would not necessarily create a problem if O&M responsibilities were being decreased correspondingly. However, the converse is true. Each year, the competition for O&M dollars increases. By direction of the Office of the Secretary of Defense and the Congress, more burdens have been added to the O&M account. As military personnel strengths decreased, the duties these personnel performed migrated to O&M, where they are performed by O&M-funded civilian employees or under O&M contracts. Ranges that were operated with Research, Development, Test, and Evaluation funding were transferred to the O&M account, and equipment modifications previously bought and sometimes installed with Procurement funds are now installed with O&M funds. Table III shows examples of the cost of these migrations in FY '80 alone. As real O&M decreased and burdens increased, our field commanders have found that maintaining combat effectiveness has become more difficult.

Causes of the O&M Problem

The real decline in O&M expenditures over the past several years has created significant, deep-rooted problems. A number of factors have played roles in the decrease. All lists of causes are never inclusive, but four areas deserve special mention.

Budgeting procedures are par-

tially responsible for O&M's relegation to a secondary role. The Congress and the Defense Department have looked at appropriation requests cast in terms of objects rather than missions or results. When appropriation requests are stated in terms of end items, O&M commodities appear somewhat mundane and inconsequential in comparison to hardware items such as satellites, computers, airplanes, and ships. O&M requests are stated in large, commodity categories such as Civilian Personnel, Travel of Persons, Transportation of Things, Miscellaneous Contracts, and General Support Supplies. The impact of reductions to categories of this nature is difficult to quantify. A budget reviewer might think of a large request for travel as hundreds of underemployed bureaucrats making unnecessary trips. That examiner might make a reduction to a large request for travel funds when he would never consider eliminating a Red Flag exercise. Unfortunately, the result may be the same!

The diversity and sheer size of the O&M account has made it an easy target for Budget Review authorities eager to trim public spending. Additionally, the O&M account has no real advocate or "constituency" because it is bits and pieces of everything. It is everyone's responsibility and therefore no one's. The history of the active O&M account over the past three years reveals that both the Office of the Secretary of Defense and the Congress have made liberal reductions to Air Force requests (Table IV).

The Air Force priorities over the past few years have contributed to the problem. As Maj. Gen. John Chain, Director of Operations and Readiness stated in an August 25, 1980, *Air Force Times* interview, "[Our aircraft] at the end of the Vietnam War were tired and were facing a new generation of Soviet equipment. . . . We had a choice: We could have either bought a new airplane or we could have bought spare parts for our old ones. We couldn't buy both. We made a conscious decision to buy the new airplane."

In real terms, O&M appropriations have decreased annually. Therefore, inflation has certainly

Lt. Gen. Hans H. Driessnack is Comptroller of the Air Force. He received a bachelor of science degree in civil engineering from Syracuse University in 1951 and that same year was commissioned in the Air Force through ROTC. In 1953, he flew twenty-five combat missions in Korea as a fighter pilot. General Driessnack earned a master's in business administration from the Air Force Institute of Technology in 1959. He graduated from the Air Command and Staff College in 1963 and from the Advanced Management Program of the Harvard Graduate School of Business Administration in 1971. Appointed Director of the Budget, Office of the Comptroller of the Air Force, in 1976, General Driessnack assumed the post of Comptroller in 1978.

had a large role in the declining purchasing power of those appropriations. The inflation adjustments in Figures 1 and 2 were based on budgeted inflation rates. Actual inflation has had an even more dramatic impact on O&M. On the average, the past four Air Force O&M requests have included between six

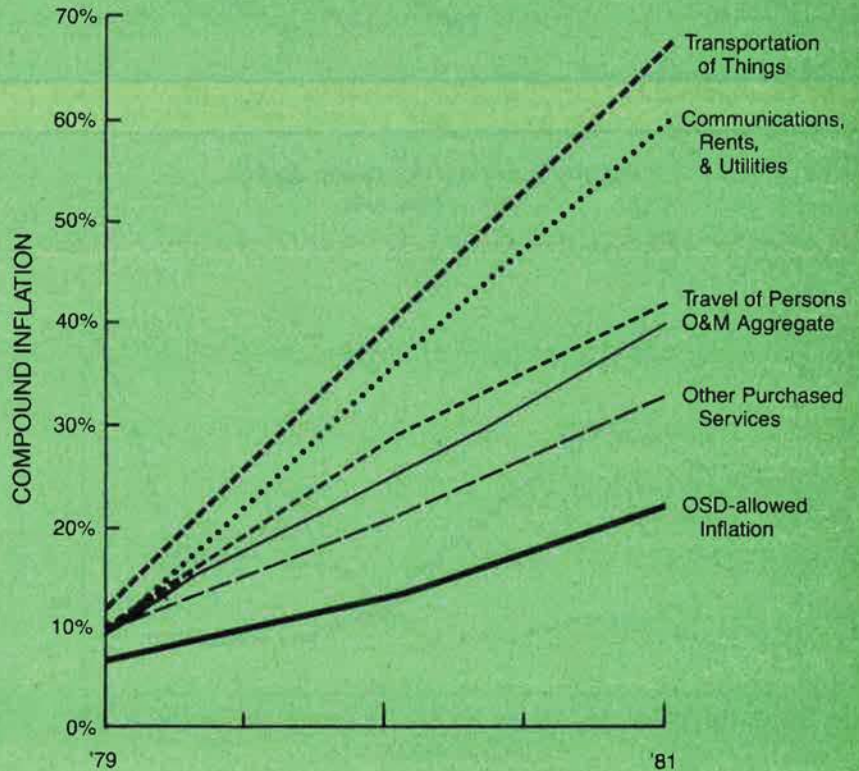
and nine percent for inflation. In reality, except for civilian pay, which was capped, and certain items bought from other departments of the government, actual inflation in the US has been twice the budgeted amount. The compounded impact of inflation on O&M expenditures is illustrated in Figure 3.

Table IV: The Effect of OSD and Congress on USAF Budgets
(\$ Millions)

FY	Request	OSD/OMB Actions	Congressional Actions	Appropriation
'78	\$ 9,949	- 1,363	- 251	\$ 8,335
'79	9,990	- 575	- 172	9,243
'80	11,088	- 334	- 294	10,460

Figure 3: Examples of Commodity Inflation in the USAF O&M Account

(Civilian Pay and POL Excluded)



Overseas inflation is even worse, with annual rates more than 100 percent in Turkey, twenty-one percent in the UK, and seventeen percent in Spain. A composite of European inflation by the kinds of things and services we buy is shown in Figure 4. Inflation at such rates makes defense management extremely difficult, with almost three years between planning and budget execution.

Worldwide petroleum prices have also been a particularly difficult inflation problem for the Air Force, just as they have for most of us personally. From FY '79 to FY '80, O&M funding increased by \$2.5 billion; \$1.3 billion of that increase was consumed by rising fuel prices and fuel-driven transportation rates. Figure 5 compares flying hours to related flying fuel costs. All these factors exert an inordinate

pressure on our commanders to reduce, defer, or eliminate O&M programs and purchases to fulfill absolute mission commitments.

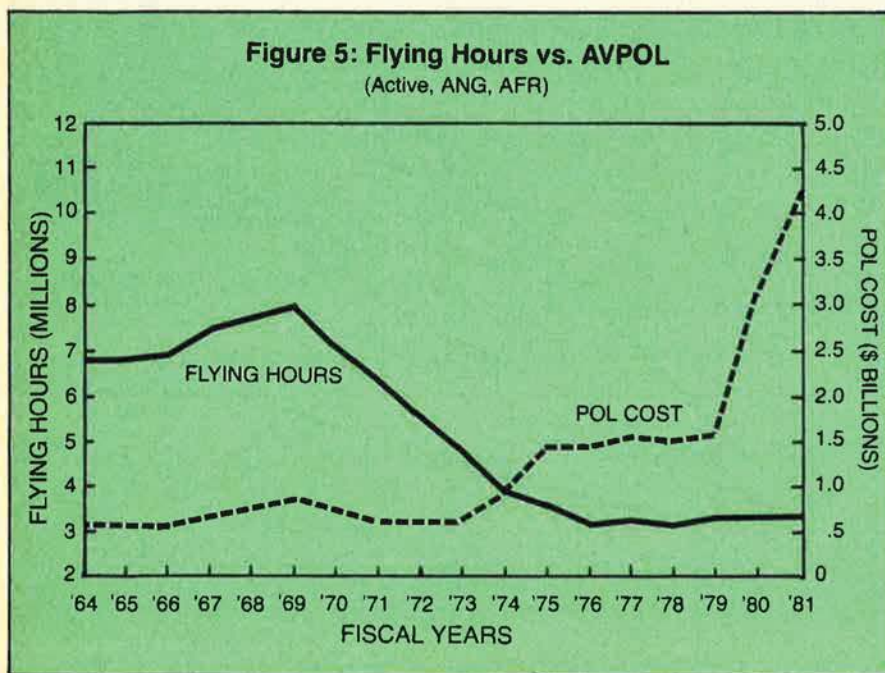
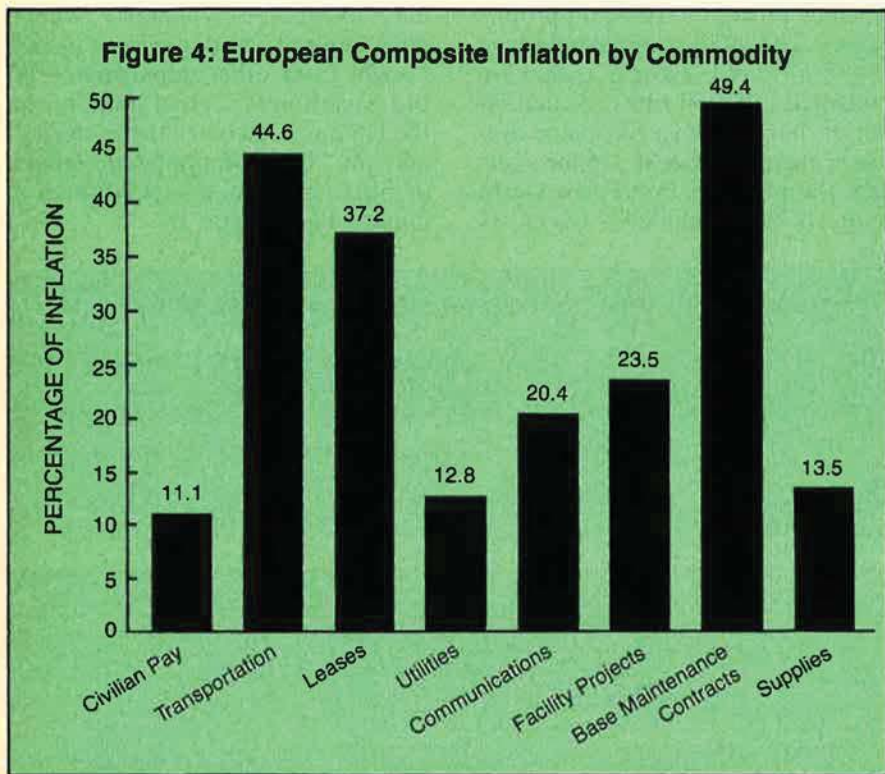
Impacts of the O&M Shortfall

Shortfalls have hit everything we do with O&M. Like all businesses, we find we have a "fixed" cost of operations. Therefore, the things that are not done are those on the upper margin of priorities. These activities are the ones that make the difference between a minimally trained Air Force and a fully combat-ready Air Force.

In the short term, about eighty-five percent of Air Force O&M costs are uncontrollable—that is, we spend eighty-five percent of our O&M just to keep the doors open. At the time an appropriation bill is passed for a particular fiscal year, our personnel, flying-hour program, equipment, and basing structure are at certain levels. None of these can be significantly altered within the affected fiscal year. For example, it might take years to close a base. When the costs driven by the force level are paid, only about fifteen percent remains that can be affected by management action. This same fifteen percent takes the hits year after year.

Our flying-hour program, as currently funded, will maintain a minimum level of combat readiness. Consequently, we must get the most out of each hour flown. However, it would be difficult to increase the level of flying with current funding. War readiness reserve supplies and equipment have been drawn down and consumed in day-to-day operations. The depot maintenance backlog is probably the best indicator of the state of maintenance. Table V shows the growth in the maintenance backlog.

Lack of airlift dollars and TDY funding often prevents our getting aircrews to training ranges and weapons training sites. In FY '80, the Tactical Air Command canceled twenty percent of planned Red Flag exercises, twenty-five percent of planned Blue Flag exercises, and thirty-two percent of planned tactical deployments overseas. Canceling an exercise such as a Red Flag has major readiness impacts. In World War II, Korea, and Southeast Asia, the loss rate for pilots was



very high during their first ten missions. The realistic combat training provided by Red Flag exercises is designed to give aircrews combat experience equivalent to those early missions and, thereby, prevent a recurrence of such losses.

We are concerned that these reductions caused a substantial number of aircrews and maintenance personnel to lose opportunities for high-quality realistic combat training. As a result of the Blue Flag cancellations, 1,500 battle management personnel were not trained for their wartime duties. Approximately 300 aircrews and 2,000 maintenance personnel missed Red Flag exercises, and 1,575 persons could not participate in scheduled tactical deployments to overseas theaters. Additionally, combat support people lost opportunities for needed simulated disaster preparedness training. Unquestionably, our reductions adversely impacted on Air Force combat capability.

The O&M shortfall affects the training of even our front-line units. Economy actions required of United States Air Forces in Europe in FY '79 are shown in Table VI. These actions had a severe impact on aircrew training and readiness.

Gen. John W. Pauly, recently retired Commander of US Air Forces in Europe, identified O&M funding as the most serious problem he faced as USAFE Commander.

The O&M problem has probably had its greatest impact on Real Property Maintenance. Table VII shows the growth in the Backlog of Maintenance and Repair of Real Property. The current backlog includes \$56 million in airfield pavement projects, and we estimate that it will grow to \$89 million by the end of FY '81. Photographs (*see sample, p. 58*) show the deplorable condition of some Air Force facilities. The Congress directed that the backlog be held at the FY '78 level (\$300 million). The Air Force has made every effort to comply with this direction, but adequate funding has not been made available. Delaying maintenance increases the cost of maintenance. On the average Air Force maintenance or repair project, the cost of a delayed project will increase three percent per year for added deterioration plus inflation.

With inflation at current rates, the cost of a deferred project may rise by twenty percent per year.

The continued deterioration of facilities has a serious impact on readiness. In addition to affecting the morale of personnel, inadequate facilities create hazards and can damage or destroy equipment. We cannot allow high-performance aircraft to operate on broken runways and rain to leak on operating electronic equipment. Equipment of undeterminable value has been destroyed by corrosion and exposure to the elements.

Morale of Air Force personnel has been seriously damaged by the O&M shortfall. Because of efforts to maintain combat equipment and training, people programs have been the first to suffer. Many of our airmen live in poorly maintained dormitories with old and broken institutional furnishings. Expenditures for recreational facilities and equipment have, by necessity, almost ceased. The effect of this austerity is particularly acute in remote locations and in expensive overseas areas where our people cannot afford to go off base. As a result, these O&M shortages have been a major factor in Air Force retention problems.

Of course, all the impacts of tightening the O&M belt have not been adverse. In any \$13 billion operation, there is room for manage-

am AFB, Hawaii, where it eliminated substantial portions of the real property maintenance backlog while meeting its National Guard training requirements. Similarly, at Little Rock AFB, Ark., the Civil Engineer bought loaner tool kits and trained dormitory occupants to do minor dormitory repairs.

The Future

The impacts of O&M shortfalls have been severe, and the best efforts of all the Air Force will be required to solve them. By deliberate action on the part of the Air Force leadership, the Air Force Program Objective Memorandum for the next five years restores the balance between O&M and the Investment appropriations. We need to sustain that balance and a reasonable rate of real growth if we are to have the kind of Air Force this country needs and has a right to expect. We cannot afford to do anything less. ■

Table V: Depot Maintenance Backlog
(\$ Millions)

FY '74	\$ 14
FY '75	40
FY '76	54
FY '77	61
FY '78	63
FY '79	66
FY '80 Estimate	185
FY '81 Estimate	172

Table VI: USAFE FY '79 Austerity Actions

- Cancel USAFE/NATO interoperability exercises.
- Cancel F-111/OV-10 weapons training deployments.
- Cancel F-15 towed-target training.
- Reduce Tactical Air Control System (TACS) radar operations.
- Delay A-10 Forward Operating Locations (FOL) activation.
- Cancel required munitions movements.
- Reduce buy of chemical-biological protective equipment.
- Cut F-4G crew training.
- Drastically reduce supplies for communications, real property maintenance, and base operating support.
- Reduce/cancel people programs.

ment improvement. Commanders and personnel in the field must be congratulated for the innovative ways they have found to get the job done. Self-help projects and resource conservation have become the order of the day. For example, an Air National Guard Prime BEEF engineering unit was invited to Hick-

Table VII: Backlog of Maintenance and Repair
(\$ Millions)

FY '78	300
FY '79	366
FY '80 Estimate	498
FY '81 Estimate	494

Joint operational tests such as the just-completed TASVAL and the ongoing EW/CAS provide means for understanding our forces' capability to conduct close air support operations under varying conditions. Joint Operational Testing is . . .

TOMORROW'S WAR TODAY

BY BRIG. GEN.
JERRY MAX BUNYARD, USA

CLOSE air support has been the focus of several joint operational tests sponsored by the Office of the Under Secretary of Defense for Research and Engineering. The purposes: To derive answers to questions about the performance of friendly forces in a close air support environment. The effectiveness and survivability of friendly forces is investigated under varying circumstances and surroundings in two major joint tests. Just completed is Tactical Aircraft Effectiveness and Survivability in Close Air Support of Anti-Armor Operations (TASVAL). Ongoing is Electronic Warfare in Close Air Support (EW/CAS).

TASVAL was a large joint test whose actual maneuvers were conducted at Fort Hunter Liggett, Calif., in August and September 1979. It included players from the Tactical Fighter Weapons Center, Nellis AFB, Nev.; 7th/17th Air Cavalry Regiment, Fort Hood, Tex.; the Air Defense School, Fort Bliss, Tex.; and 4th/40th Armored Regiment of Fort Carson, Colo. The main test objectives were to evaluate factors impacting on the survivability and target-kill effectiveness of AH-1S (Cobra) and A-10 aircraft during typical close air support missions against a heavily defended Red attacking armor ground force.

More than a hundred Red and Blue players were instrumented to determine position, speed, target pairing, and all pertinent event data vs. time. ("Players" included airplanes, helicopters, tanks, air defense weapons, and troops.) Information from individual players was fed to a central computer. In

turn, its programs determined the outcome of engagements between players. Those players who were determined to be casualties were informed within seconds. Casualty removal was used for all players except aircraft. While improvements in instrumentation capacity, accuracy, and reliability are still needed, the TASVAL test was a major first in this type of large two-sided instrumented test. Lessons to be learned from the successes and difficulties experienced during TASVAL can be applied in major test activities of all the services and defense agencies.

Quantitative data from TASVAL were derived from computer calculations after trial execution. (Near-real-time casualties were used to shape the battle and for motivating the Red and Blue players.) Aircraft air-to-ground target kill effectiveness was derived from probability of kill (P_k) "lookup tables" using player position, pairing, and event data. Aircraft survivability was calculated using computer simulations of missile and gun trajectories or "flyout models." Aircraft exposures and engagements were calculated via player position, digital terrain models, event, and pairing data. Although the field execution portion of the test took only two months, the calculation, validation, and distribution of the official TASVAL data base was an eight-

month 'round-the-clock operation. It was completed only in mid-summer. The Air Force, Army, and the Institute for Defense Analyses are still analyzing test results.

TASVAL Applications

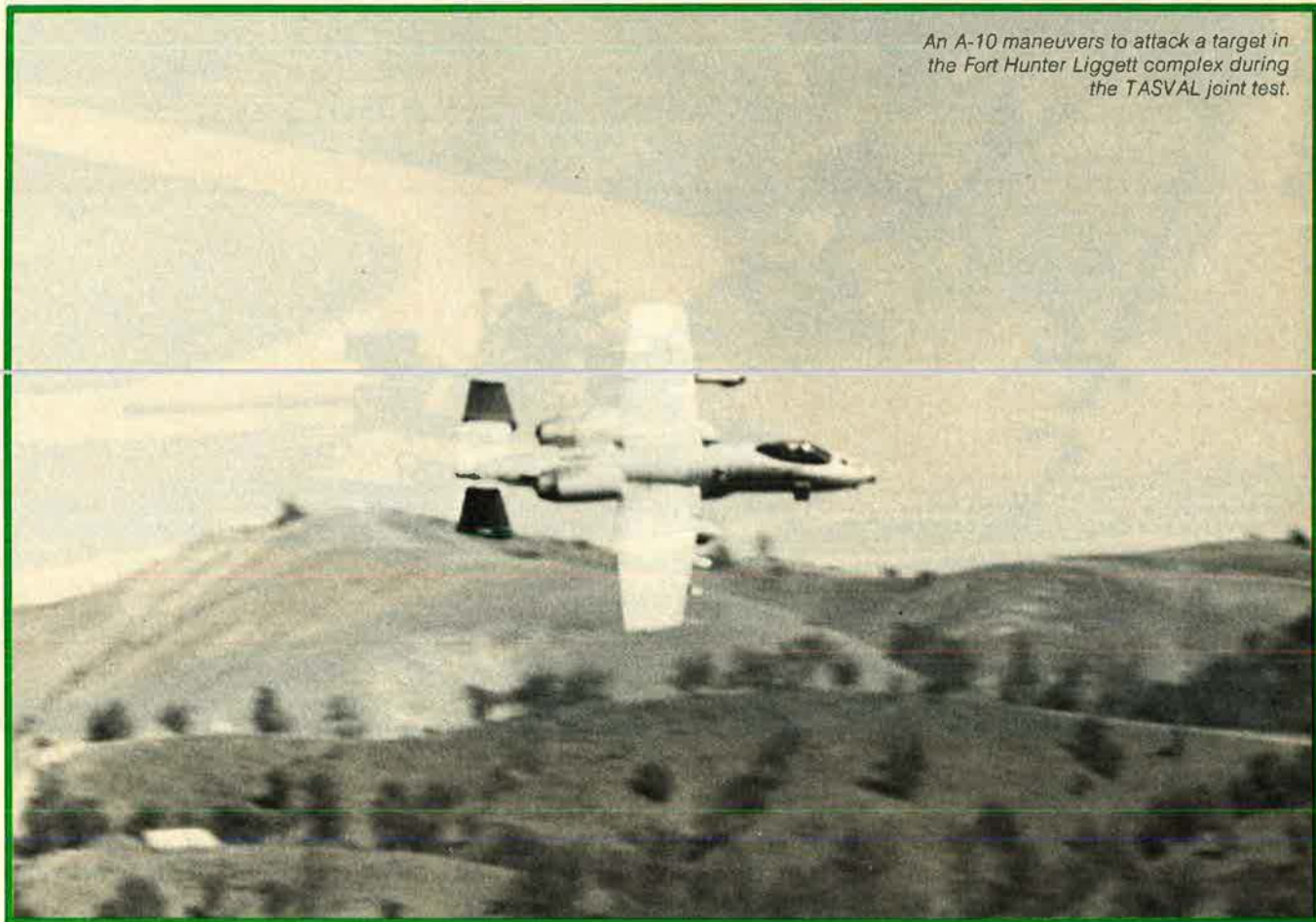
The types of data resulting from TASVAL are expected to find widespread applications. Some examples of the data collected during TASVAL follow.

The TASVAL data base provides a complete time history of the relative positions of all players during each trial in two test sites (Gabilan and Nacimiento Valleys in the Fort Hunter Liggett complex). These positions vs. time plots may be used to examine variations in tactics of Red and Blue players. The flight-path histories of helicopters and fixed-wing aircraft are particularly useful to current and future analyses, because they represent a large sampling of aircraft performing typical combat maneuvers. The position data, incidentally, are in three axes, including altitude information as well as location.

The TASVAL data base will support a survivability analysis which consists of three major phases: exposure of aircraft to air defense units (ADU); engagements of aircraft by ADUs and of ground targets by aircraft; and estimated P_k (probability of kill) resulting from these engagements.

The first phase involves identifying how many times and for how long an aircraft is exposed to the various TASVAL air defense systems. (An exposure is defined as the time that line of sight exists between the aircraft and ADU.) These exposures can then be examined to de-

An A-10 maneuvers to attack a target in the Fort Hunter Liggett complex during the TASVAL joint test.



termine if an engagement took place while the aircraft was exposed. The outcome of a particular engagement is estimated by applying the flyout model—for instance, whether the ADU “killed” the aircraft, or merely had a near miss or missed completely.

Additional analyses are also feasible with the TASVAL data base. Some of the possibilities include:

- Calculation of the probability of engagement, given an exposure between aircraft and ADU;
- Analysis of the number and duration of exposures required by aircraft to deliver their weapons;
- Estimation of reaction times

(i.e., time from aircraft unmask to ADU fire) of the various ADUs; and

- Analysis of the effect on survivability of different ADU positions and different aircraft pilots.

The final step in the analysis of test results was estimating probability of kill (P_k) of the aircraft. This was done by using a missile flyout model. From the results of the model engagements one can determine what percentage of missile firings resulted in a kill, and why the missile missed if there was no kill. In one particular sample, ten percent of the missile firings hit the target and therefore resulted in a P_k . The ninety percent of engagements

that “missed” were broken down this way: In fifty-eight percent of the firings, the missile had too little signal-to-noise ratio; in twenty percent the missile tracker rate was exceeded; in nine percent the missile’s fuze range was exceeded; and three percent of the missiles hit the ground.

EW/CAS Under Way

Electronic Warfare in Close Air Support (EW/CAS) is a long-term, large-scale joint test and evaluation designed to evaluate the effectiveness of airborne electronic warfare equipment, and tactics and techniques for using EW against a



Tanks on maneuver during TASVAL. When close air support aircraft attack armor, they must deal with the air defense threat posed by mobile AA units, inset, that simulate the Soviet ZSU-23-4 AA weapon.

realistic threat during close air support (CAS) operations. Success of the test depends on developing an accurate representation of a potential enemy threat array instrumented sufficiently to obtain quantitative and qualitative data on the outcome of a "many-on-many" battle.

Creating the EW/CAS test environment has been a major task involving significant effort by the services, the intelligence and development agencies, as well as Defense Intelligence Agency (DIA), National Security Agency (NSA), and industry. The threat array represents the air defense and radio-electronic combat (REC) assets of a ten-by-forty-kilometer slice of a potential enemy motorized rifle division in a breakthrough scenario. Approximately 100 threat compo-

nents are simulated. They provide communications intercepts and jamming, surface-to-air missile and anti-aircraft systems, acquisition and height finder radars, and extensive command and control elements to replicate the environment as accurately as our intelligence permits.

The goal of EW/CAS is to understand the synergistic effects of a force-on-force confrontation—that is, to gain insights on which mixes of electronic warfare equipment and tactics work best against a heavily armed and sophisticated enemy. Because the scope is so broad, this test takes a somewhat different approach from TASVAL. In order to reduce equipment and manpower resources and to apply a building-block philosophy to the test methodology, EW/CAS has evolved into a two-phase, incremental test. It

takes advantage of scheduled service exercises or training activities where possible.

Phase I is called the Tactical Communications Jamming (TCJ) phase. It began in October 1978 and was completed in March of this year. It was conducted in six increments. The first three consisted primarily of gathering engineering data on the effectiveness of the simulated communications jammers in an operational environment. Separate tests were conducted to evaluate jamming in the UHF, VHF, and HF bands. After evaluation, data were provided to the services. The data showed where and when communications were possible in each band and gave insights into certain limitations of the jamming systems. The test force was also able to evaluate and refine

instrumentation and data collection and analysis schemes for the subsequent more complex increments.

The fourth test increment introduced the intercept and identification portion of the postulated enemy radio-electronic combat system. It included jamming simulators in each of the communications bands. Friendly forces were played in a close air support scenario executing live air strikes against realistic tactical targets. The entire radio nets for close air support request and execution communications were targeted by the simulated threat anticommunications system. In addition to gathering hard data regarding the effectiveness of US electronic countermeasures (ECCM), the service participants (who were from combat-ready field units) gained valuable training by operating against the most realistic communications jamming threat available.

Working Against Jamming

Test increment five was called the Combined Arms Test. It followed the building-block approach of increasing complexity and more ambitious goals. The total simulated enemy nonlethal radio-electronic combat system was fielded, along with the simulated forces of an enemy motorized rifle division. Friendly forces were represented by a brigade slice of a US infantry division (mechanized) supported by the Air Force Tactical Air Control System, live close air support aircraft, and attack helicopter elements.

During test five, the effects of jamming on the total battle conduct were evaluated, rather than just selected communications nodes. Commanders were under stress and were required to continue the battle even when they were denied all the communications they desired. Communications jamming, of course, does not stop a combat operation, nor is it the decisive element on the battlefield, but it does cause delays and confusion that can have a significant "domino effect" through the command structure. Since test five gathered fairly precise data on attrition as well as maneuver force movements, important information was gained regarding the severity of the jamming threat.

Army Brig. Gen. Jerry Max Bunyard is Deputy Director, Defense Test and Evaluation, in the office of Under Secretary of Defense for Research and Engineering. He is an artilleryman and Army aviator with a background that blends assignments in test and evaluation roles and in operational commands. He served in Vietnam as commander of an artillery battalion in an airmobile division, and later as Commander, US Army Yuma Proving Ground, Ariz. Before his present job he served as Project Manager for the Army's Tactical Fire Direction Center.

As in previous test increments, a significant side benefit was the realistic training provided to the test participants and the opportunity for them to experiment with tactics to defeat the threat.

The communications jamming phase of EW/CAS (test six) culminated with participation in the major joint readiness exercise Gallant Eagle '80, conducted at Fort Irwin, Calif., last March. This was a large field exercise involving four ground maneuver battalions in each of the Red and Blue forces, plus extensive participation by higher command echelons to field army level. In the air, the test included the most Air Force, Marine, and Army air assets involved in a single operation for many years. Aircraft types included US Air Force A-10, F-4, O-2, and C-130; US Marine Corps AV-8, A-4, OV-10, CH-46, and CH-53; and US Army AH-1 and OH-58. More than 25,000 persons were directly involved in the exercise.

Even with the limitations imposed by the free-play scenario, there was good data correlation with previous test increments. As in test five, the contribution of communications jamming had a definite, if not decisive, impact on the outcome of the battle.

In test six the effect of jamming was much harder to quantify. However, the delays, confusion, and lack of timely information reported by the Blue commanders revealed important insights into what US forces can expect if faced with this type of threat. An interesting and important observation of the test force involves the perceptions of the senior commanders. The further the command node was from the engaged forces, the less problems from jamming. This is because the jammers, particularly those targeted against VHF ground nodes, have limited range. Therefore, they are most effective against the troops in contact who are most dependent on timely communications. The senior commanders, while aware

that things were not going well, seldom attributed the problems to jamming and did not take action to remove the threat. Again, the training benefits afforded the exercise participants were a valuable fallout of the test.

Phase II of EW/CAS is the Air Support Operations (ASO) Phase. It will introduce the air defense simulators and tie together the entire threat array mentioned earlier. The ASO test will be conducted on the Nellis AFB range complex with close air support elements from Red Flag 81-3 and 81-5, in March through September 1981, and will also follow the incremental approach used in Phase I. Extensive pretest preparations are under way to evaluate the new simulators, check out instrumentation, and develop the software data collection and analysis schemes. The ASO phase is more ambitious and complex than Phase I; however, it is hoped that by continuing the systematic, incremental approach, detailed information can be gathered that will be vital to the operational forces.

The discussion of TASVAL and EW/CAS highlights the types of results we expect to achieve from joint testing. It has provided empirical data gathered under realistic conditions, to address critical questions regarding future weapon systems. Joint test and evaluation is the best method for addressing conceptual issues that involve more than one service. There have been important and valuable spin-off results such as the identification of the need for combined force tactics, needed modifications of current weapon systems, and the identification of training requirements. JT&E participants have gained knowledge and skills that previously were acquired only in combat. In the case of TASVAL and EW/CAS, the joint test process has given new insight into how close air support will be conducted in any future conflict. ■

EF-111. NEWEST ELECTRONIC WARRIOR.



Eastern Europe has the densest thicket of electronic defenses in the world today.

The EF-111 Tactical Jamming System was developed by the Air Force and Grumman specifically to counter this potential threat—to provide cover for air-to-ground operations along the front line, and to support penetrating strike forces.

In a comprehensive four-year development and test program—the last six months conducted by Air Force personnel at Mountain Home Air Force Base in Idaho—the EF-111 significantly exceeded the operational

reliability and “blue suit” maintainability standards set by the Air Force and Department of Defense.

Tests of the EF-111 system in a simulated Eastern European air-defense environment demonstrated its ability to detect and automatically assign jammers to counter and negate every type of threat encountered.

The need for the EF-111 is a well-established USAF requirement. EF-111 provides the capability to disrupt the Warsaw Pact radar net with support jamming in both standoff and escort roles.

The EF-111. It can do the

job. And with a built-in growth capability to cope with new and more sophisticated threat radars, it will continue to do the job in the future.

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

Grumman Aerospace Corporation, Bethpage, Long Island, New York 11714.



50 years

SPEAKING OF PEOPLE

Engineering a Response to the S&T Shortfall

By Ed Gates, CONTRIBUTING EDITOR

"I T probably won't improve over the next couple of years, and it could grow worse." That's how many officials and observers view the Air Force's "S&T problem"—a result of severe shortages of scientific and technical officers, engineers particularly, and a plunging experience level.

One recent set of Hq. USAF figures showed an overall shortage of 1,622 officers in the R&D and engineering AFSCs. Of the 10,384 authorized billets, only 8,762, or eighty-four percent, were assigned, though certain skills like electrical engineering (with only seventy-five percent manning) were worse off. Still, eighty-four percent overall doesn't necessarily indicate a hopeless situation. The big trouble, however, is the way the figures break out—shortages in captains and above, overages only among the relatively inexperienced lieutenants:

Grade	Authorized	Assigned	Shortage/Overage
Colonel	588	496	-92
Lieutenant Colonel	1,608	1,284	-324
Major	2,136	1,850	-286
Captain	4,686	2,766	-1,920
Lieutenant	1,366	2,366	+1,000
	10,384	8,762	-1,622

Pay, or lack of it, is the main culprit. "Demand in the civilian sector has driven up wages to the point that the services cannot compete for S&T talent," USAF officials declare. Furthermore, the "salary differentials" will increase in the next few years, they assert, noting that military hardware is growing more complex, and this inevitably means "growth within technologically intensive career fields."

In the critical 28XX Engineering career field, for instance, 4,672 authorizations are projected in five years, compared to the 4,395 authorized and 3,774 actually filled earlier this year. Smaller but still significant increases in requirements are forecast in such fields as 26XX Scientific, 27XX Systems Acquisition Management, 51XX Computer Science, and 55XX Civil Engineering.

What is the Air Force doing about it? The answer is a considerable amount. Authorities have been explaining the grim situation to influential members of Congress, pressuring the appropriations committees to stop cutting graduate education funds, and convening the USAF Scientific Advisory Board and other high-level panels to map corrective strategy. S&T production from AFROTC and other commissioning sources has been increased greatly, Reserve S&T officers recalled,

already outbids the service by \$10,000 in annual starting pay and provides such juicy benefits as family dental care, generous house purchase programs, and company-sponsored education plans.

A recent USAF study compares the educational practices of seven companies (IBM, Westinghouse, General Electric, Western Electric, Hughes Aircraft, TRW, and General Motors) with USAF's. The firms employ 159,000 scientific and technical people, of whom at least 50,000 are enrolled in professional continuing education and 3,700 in degree programs. And they are recruiting at least 10,000 S&T people a year. The study calls it industry's "application of the three Rs—recruit, retrain (or educate), and retain enough S&T talent" to meet their soaring needs.

"They know," the study adds, "that the only foreseeable solution to this urgent issue is to develop their own scientific and technical work force and do whatever is required to maintain and retain it."

Whereas nearly all professional level officials in industry are scientifically and technically educated, the Air Force has only nineteen percent of its 82,000 line officers at the baccalaureate level and eleven percent at the graduate degree level educated in S&T skills. Yet Congress year after year has cut USAF enrollments in degree programs and professional continuing education to 800 and 3,000 respectively.

Unless the government turns this around and increases S&T support, USAF will be "unable to meet the demands of design, development, procurement, logistics support, and operation of the weapon systems necessitated by the defense posture of the nation," the study declares. ■

and promotion-failed active-duty officers retained on active duty.

The service is eyeing conversion of some S&T billets from military to Civil Service status, where recruiting is a tad less difficult. USAF is also slowing the withdrawal of rated officers from S&T duties to the cockpit, and converting officers with technical backgrounds into full-fledged engineers through Institute of Technology training. And the Air Force is quarterbacking a \$15,000 "accession bonus" legislative proposal for selected S&T officers.

But whether or not these "initiatives"—and the numerous related ones in operation or on the drawing board—will solve the dilemma is questionable as long as the market value of engineers continues to rise. Industry

AIRMAN'S BOOKSHELF

Straight Thinking in a Disordered World

Strategic Thought in the Nuclear Age, edited by Laurence Martin. Johns Hopkins Press, Baltimore, Md., 1980. 233 pages. \$18.50.

Herein are seven reflective essays from internationally respected strategists; each article alone is worth a critical review.

Coral Bell, on crisis diplomacy, distills nine "conventions of crisis" common to favorable negotiations.

Henry S. Rowen, on nuclear strategic doctrine, makes a powerful case for nuclear flexibility, smothering concepts like mutual assured destruction and minimum deterrence. He argues that only nuclear flexibility permits credible political/military options between holocaust and surrender.

John Garnett, on disarmament and arms control, notes that "the arms race is not a manifestation of human madness" or an "insane out-of-control suicide race promoted by men who are either wicked or stupid." Military competition is rather the "result of reasoned decisions by sensible men grappling to the best of their ability with the wretched situation in which they find themselves." Mutual suspicions cause the rivalry; reduction of distrust is the only possible first step in cooling the contest.

Klaus Knorr, on strategic intelligence, warns of the inevitable trouble that ensues if the "main production of intelligence is closely integrated with the design of foreign policy," because of the "temptation to tailor intelligence estimates to the desires of the policymaker."

Louis-Francois Duchene, on international economics, forecasts a more "contentious international system" with a "quite high level of political disorder" because the world political/economic system is not prepared for looming economic dislocation brought about by the emerging fierce competition for resources.

Robert Osgood, on limited-war

strategy development, notes the decline in doctrinal, strategic, and tactical ideas since the Vietnam War. He believes the Third World will increasingly become the cockpit of the future, and worries about the dearth in the West of original thinking on lower-level conflict.

The premier piece in this collection is Laurence Martin's article on the role of military force in the nuclear age. Martin notes that military power and armed force remain "fundamental instruments of policy." He makes this assertion because of his distress with the tendency within the democracies to consider military activity an aberration. He discerns a movement to redesign forces to suit the function of crisis management rather than a "trial of brute strength." He notes a shift in the West "toward the threat rather than the deed, the shadow rather than substance. . . ." Although he realizes that there are rightfully many inhibitions against using force, he believes these are arguments not for its uselessness, "but for skill in its application."

Strategic Thought in the Nuclear Age is a rare compilation of quality essays about our disordered world. It is a fine addition to the professional airman's bookshelf.

—Reviewed by Lt. Col. Alan L. Gropman, Hq. USAF.

A Sailor Remembers

From Pearl Harbor to Vietnam, the Memoirs of Adm. Arthur W. Radford. Edited by Stephen Jurika, Jr. Hoover Institution Press, Stanford, Calif., 1980. 476 pages with notes, index, and photographs. \$15.

Admiral Radford's memoirs are more than a bit frightening. Written in 1972, he diligently categorizes America's apparent inability to function with any degree of strategic success in Asia. Lessons that ought to have been learned in Korea were not. Our decision toward the French plight in Indochina in 1954 led inevitably to the massive US involvement in

Vietnam, fraught with similar indecisiveness.

The Admiral's memoirs cover the period of 1941-54 (illness apparently prevented him from covering the last two years of his own military career). Thus, he had the advantage of considerable hindsight in drawing comparisons between the French and American involvements in Asia. But even in retrospect, Radford believed the deployment of American forces in Indochina in 1954 might well have averted the larger involvement and debacle apparent even while he was writing what later would become his book.

Radford's recollections have considerable historical value. As Deputy Chief of Naval Operations (Air), he was deeply involved in the postwar unification effort; the rancor and bitterness of that era are recounted. He later led the Navy fight against the B-36 as the Air Force's version of a strategic deterrent.

Later as Commander in Chief, Pacific (CINCPAC), from 1949 through 1953, he had a front-row seat on the military and diplomatic decisions of the Korean War. Quickly won over by MacArthur, Radford was one of the few eyewitnesses to the famed Wake Island meeting between President Truman and the controversial General. His account of that conference differs sharply from many of those who observed it from afar.

Radford's observations of that period are particularly interesting. He has considerable problems with George Marshall's trust in and lack of fear of the USSR. Marshall, as Secretary of State, always felt the atomic bomb deterred the Russians from entering the Korean conflict while Radford probably more correctly surmises the Soviets early on determined how to participate informally without incurring official UN-US wrath. The author also strongly supports the theory of an intelligence pipeline of UN battle plans through Burgess and Maclean, prior to their defection to Russia.

Militarily, Radford's rise from a Navy captain to Chairman of the Joint

Chiefs of Staff in twelve years is indicative of a few of the meteoric promotions resulting from World War II. His climb had several interesting twists: he became a rear admiral and a carrier task group commander during the war without ever commanding a deep-draft ship, and he went directly from CINCPAC to Chairman of the JCS without the now-obligatory tour as CNO.

Of particular interest to AIR FORCE readers are Radford's several chapters on strategic bombing strengths and weaknesses in connection with the B-36 brouhaha and his almost scholarly detailing of negotiations and relationships involving England, the US, and France during the latter's Indochinese misadventure. The Admiral apologizes for that verbosity and then says, "It is important for the American people and the rest of the free world to know how diligently their governments worked to find a peaceful solution to the war that international communism chose to fight in Indochina."

Radford's well-documented fear is that America's leaders never seem to learn from the past, particularly as it pertains to Asia. His exposition is sobering and always thoughtful. It would be hoped the book has wide readership in the Pentagon and the State Department.

—Reviewed by Tommy L. Wilson, aerospace executive.

New Books in Brief

Air Power, edited by Anthony Robinson. This large-format book is a lavishly illustrated compendium of the aircraft of the major air forces of the world. Broken into sixteen chapters corresponding roughly to geographic areas, *Air Power* covers not only the aircraft of various air forces, but also their organization, tactics, and deployment. The book also analyzes each air force's capabilities, problems, and future plans. Many photographs. Index. Ziff-Davis Publishing Co., New York, N. Y., 1980. 304 pages. \$29.95.

Arms, Men, and Military Budgets, by Francis P. Hoerber, William Schneider, Jr., Norman Polmar, and Ray Bessette. A publication of the National Strategy Information Center, this book is the fourth in a series of defense posture assessments, written to present a factual review of defense issues to the public free of the government's usual political and budgetary restraints. The authors conclude that the national security forces of the US are in a "parlous" state vis-à-vis

those of the Soviet Union, and that this situation is largely self-inflicted. The authors agree that short-term "quick fixes" are necessary now to shore up deterrence, and that substantial long-range investments are needed to reverse fifteen years of neglect of US military forces. Tables, notes. Transaction Books, Order Dept. NP, Rutgers University, New Brunswick, N. J. 08903, 1980. 186 pages. \$6.95.

Cause and Circumstance: Aircraft Accidents and How to Avoid Them, by Archie Trammell. Trammell, former Editor of *Business and Commercial Aviation* magazine, collects and updates forty-eight of his safety-oriented "Cause and Circumstance" columns written for that magazine. In his analyses of air accidents, Trammell examines what went wrong and suggests ways to avoid mishaps. Although the book is written primarily for pilots of higher-performance piston aircraft and corporate turboprops and jets, the author hopes that "all pilots of all classes of equipment will become safer airmen as a result of reading this book." Diagrams. Ziff-Davis Publishing Co. (distributed by McGraw-Hill Books), New York, N. Y., 1980. 210 pages. \$12.95.

Design for Safety, by David B. Thurston. The premise of this authoritative book by a prominent designer of small aircraft is that many aviation accidents attributed to "pilot error" are in fact the result of poor design. The author argues that better coordination between designers, airport operators, and the FAA in using available safety devices and procedures will make general aviation safer and more enjoyable. Though detailed, this book is easy to read, and will be of value to the experienced aircraft designer and tenderfoot pilot alike. Illustrations, appendix, index. McGraw-Hill Book Co., New York, N. Y., 1980. 196 pages. \$14.95.

Dunkirk: The Patriotic Myth, by Nicholas Harman. This book is certain to raise controversy concerning its view of the British evacuation of Dunkirk in 1940. The author emphasizes the terrible defeat the British and their allies experienced during the Nazi blitzkrieg beginning in May 1940, and debunks the Dunkirk "myth" he avows was created by British propaganda, which had turned the evacuation into a "victory" for the British. Mr. Harman's discovery that the British suffered a disastrous defeat at Dunkirk may grate on some readers, but his well-researched account will

prove fascinating to those coming to the subject for the first time. Maps, photos, appendices, notes, and index. Simon & Schuster, New York, N. Y., 1980. 271 pages. \$12.95.

Jeppesen Sanderson Aviation Yearbook 1980. A compilation of articles from various publications, the *Yearbook* covers significant developments in aviation for the last year. The book is divided into five sections—general aviation, air carrier, a special section called NOTAMS, military/aerospace, and sport aviation. (Five articles in the military/aerospace section are reprints from AIR FORCE Magazine.) This book is a valuable source for current thinking and trends in aviation. Photos, index. Jeppesen Sanderson, Inc., 55 Inverness Dr. East, Englewood, Colo. 80112, 1980. 442 pages. \$16.95.

Puerto Rico's Fighting 65th U.S. Infantry, by Brig. Gen. W. W. Harris, USA (Ret.). When then-Colonel Harris first took command of the Puerto Rican 65th Infantry Regiment in 1949, he felt "outraged" at being posted to what was then referred to as a "rum and Coca-Cola" outfit. Yet, a scant two years later, his prejudices were stripped away, and he was later to write of his command, "... the men of the 65th United States Infantry Regiment were the best damn soldiers in that war." This is General Harris's own lively account of the 65th's actions in Korea. Photos, maps, appendices, and index. Presidio Press, San Rafael, Calif., 1980. 220 pages. \$12.95.

The USSR and Africa: New Dimensions of Soviet Global Power, by Morris Rothenberg. With Western attention focused at present on Soviet activities in Southwest and Southeast Asia, this book serves as a timely reminder of the strategic importance of the African continent to Western security and economic well-being. The author details the Soviet presence in Africa over the last decade, suggesting that the Soviets see Africa as only one aspect of their global push for hegemony, but also as "the latest, most promising arena for reducing Western and enhancing Soviet influence." Notes, index. Available from Director of Publications, Advanced International Studies Institute, East-West Towers, Suite 1122, 4330 East-West Highway, Washington, D. C. 20014, 1980. 280 pages. Soft cover \$8.95; hard cover \$12.95.

—Reviewed by Hugh Winkler, Associate Editor.

When the staff of the 56th Fighter Group assembled that dreary day in 1947 for a brainstorming session, no one present could have foreseen that from it would evolve a strategic milestone in military aviation . . .

FOX ABLE ONE— The First Transatlantic Jet Deployment

BY COL. FRANK W. KLIBBE, USAF (RET.)

Fox Able One. It sounds like the title of a fairy tale—the kind you might read to your children. I guess, in a way, it is. Except that this story is about a series of events and happenings of a very wise fox and fifteen others who made aviation history during July 1948. That single event—Fox Able One—would be responsible for other “ferry tales” that would follow in the years ahead.

“Fox Able One” was the code name assigned to the first USAF jet crossing of the North Atlantic, from the United States to Germany and back. The success of this mission would establish an important milestone in military aviation history. The operational concepts, techniques, and pioneering efforts would set the stage for greatly improving the tactical mobility and flexibility of future jet fighter forces.

This is the story of how Fox Able One began, and the story of the men behind the scenes who made it all possible. It recalls the wisdom, courage, and dedication of one of the Air Force’s most distinguished military leaders—the late Col. David C. Schilling—and a handful of jet fighter pilots under him.

The year was 1948; the place, Selfridge Air Force Base, Mich., under the command of then Lieutenant Colonel Schilling. This was the home of the 56th Fighter Group of World War II fame, the same unit, then flying P-47 Thunderbolts, that Schilling had commanded in England. But now the group was equipped with USAF’s first jet fighter, the Lockheed F-80 Shooting Star, and assigned to

Strategic Air Command (SAC). Their mission was not specifically defined. The war had ended, the Air Force had recently gained its autonomy from the Army, and the 56th Fighter Group had undergone the pains of reactivation. All these things contributed to a lack of mission definition. Jets, of course, were a new breed of aircraft to us. We found ourselves training new crews, flying aerial and ground gunnery, and, in general, becoming familiar with our first jets. For the most part, we were flying airshows, air demonstrations, and taking weekend cross-country flights for an occasional five pounds of fresh shrimp or a trip to Las Vegas for a welcome change from the winter’s cold.

The Brainstorming Session

It started on a cold, dreary day in 1947. Flying was impossible as a result of low ceilings, poor visibility, and snow and ice that blanketed our seventy-five F-80s. Colonel Schilling (our “Chief”) called a staff meeting. Assembled in the small, austere building that housed the Chief’s office were his three squadron commanders: Maj. Donavon F. Smith (61st Fighter Squadron); Lt. Col. William D. (Bill) Ritchie (62d Fighter Squadron); and Lt. Col. Clay Tice, Jr. (63d Fighter Squadron). Among the others in attendance were Lt. Col. William “Dinghy” Dunham (Group Operations) and myself, Capt. Frank W. Klibbe (Group Maintenance Officer).

The setting and atmosphere of the meeting were strictly informal; we had no agenda. It was the Chief’s excuse to get the troops together for

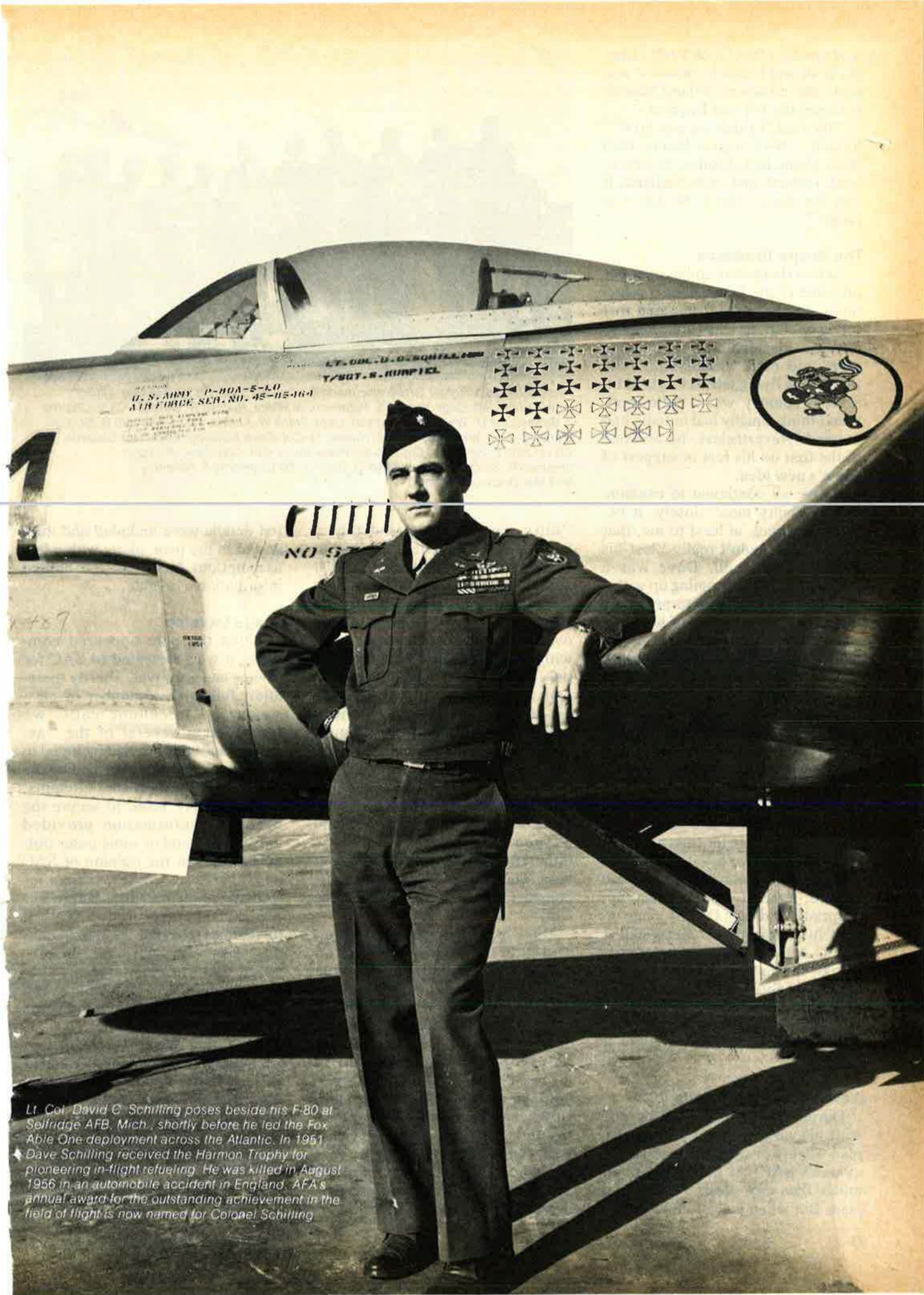
a bull session, to tell a few jokes, with open season for talking about anything on anyone’s mind. You could always count on the Operations people to say something. They always do, and today would be no different! However, in this case, a distinction must be made—namely, the suggestion about to be proposed and advanced by Dinghy had not been preplanned. It was just an idea that came to mind during the course of our discussions—a simple, spontaneous idea and one with merit.

It began when Dinghy casually turned to Dave and said, “Chief, you know what we should do? We should plan to take the entire group on a cross-country flight. We could practice formation, get some instrument time, and it would be a helluva good training mission for our younger pilots.”

Dave thought for a moment, then said, “Hell, that’s not a bad idea. Where should we go?” He then began scrambling through his desk in search of a map of the US. He glanced up at the nearby wall that had a large world map thumbtacked to it. He walked over to the map and, after a minute or so, said, “This map’s too small. Someone get us a larger map of the States.” He returned to his chair, leaned back and propped his feet on the desk, and continued to stare at the map on the wall.

Suddenly, he sat straight in his chair. Then, leaning forward on his desk and with a broad grin on his face, he turned and said, “I’ve got a better idea. Let’s go to England!”

That did it! “Has the old man lost his marbles?” I thought. Nobody



Lt. Col. David C. Schilling poses beside his F-80 at Selfridge AFB, Mich., shortly before he led the Fox Able One deployment across the Atlantic. In 1951 Dave Schilling received the Harmon Trophy for pioneering in-flight refueling. He was killed in August 1956 in an automobile accident in England. AFA's annual award for the outstanding achievement in the field of flight is now named for Colonel Schilling.

said much as Dave took a ruler from his desk and began to measure and scale the distances of land masses between the US and England.

"By God, I think we can do it!" he said. "We can go to Maine, then from Maine to Labrador, to Greenland, Iceland, and on to England. It can be done; the F-80 has the range."

The Scope Broadens

At first there were smiles of doubt on some of the faces, even a reluctance to join in the discussion that followed, but, as Dave continued to develop his idea, we all became more and more enthusiastic. The thought of flying jets to England on a cross-country was a little more than I think Dinghy had initially had in mind. Nevertheless, he was one of the first on his feet in support of Dave's new idea.

As we all continued to examine the feasibility more closely, it became apparent, at least to me, that the old man hadn't really "lost his marbles" after all. Dave was a "thinker," always coming up with a new thought approach to problems facing the group. Some of his ideas were good, and some were pretty bad. I'd spent most of my military career under his command and would describe Dave as a man with ten ideas in his head at any given time, nine of which might be "bummers," but that tenth one was a gem. This one had to be a gem!

The discussions continued. Dave paced the floor, still thinking, often aloud. He turned and said, "We gotta have a name for this, a project name. What'll we call it?"

Several recommendations were offered, none of which seemed appropriate, and then Dinghy came up with his suggestion. "Let's call it 'Fox Able One,'" he said. "Fox—for fighters, Able—for Atlantic, and One because it will be the first flight of its kind."

"That's it!" Dave said. "Project Fox Able One—that's what we'll call it!"

Working Out the Details

During the next few weeks, the staff pieced together a preliminary plan worthy of submission to Headquarters SAC. At first it appeared much like any other operational plan. But when we got down to the



Pilots of the 56th Fighter Group who made the first transatlantic jet crossing, sitting on wing from left, Capt. Warren S. Patterson, Jr., Capt. Russell B. Westfall, Capt. Charles J. Bowers, 1st Lt. William S. Simpson, Capt. Frank W. Klibbe, 1st Lt. Kenneth B. Mullikin. Standing, from left, Capt. Harry F. Hunter, Lt. Col. Dave Schilling, Capt. Ray Dauphin, 1st Lt. John E. Bylander, Capt. Heath Bottomly, Lt. Col. Clay Tice, Jr., 1st Lt. Sherman R. Smith, Lt. Col. William D. Ritchie, 1st Lt. Jerome F. Naleid, and Maj. Donavon F. Smith.

"nitty-gritty," we found that a number of unusual demands had to be resolved. This wouldn't be just another routine cross-country flight from point A to point B across the United States. We would be flying over long stretches of open water, without navigational aids, and with only limited weather information and requirements for immediate air-sea rescue, should the need arise. Even when these requirements were satisfied, we'd be landing at facilities neither designed nor equipped for jets. Base support to include aircraft spares, special tools, handling equipment, fuel and oxygen requirements would be either nonexistent or minimal at best. These were just a few of the considerations that challenged the staff.

Dave worked with Operations and the three squadron commanders to develop a unique concept to satisfy the operational requirements. I, on the other hand, teamed with the maintenance officers to develop and assemble a "flyaway kit." It consisted of necessary spares, special tools, and equipment for maintenance self-sufficiency. The fuel needs (JP-1), together with special oils and oxygen, were identified for pre-positioning at all intended airfields on our route. Communications, billeting, and a host of other essen-

tial details were included and integrated in the plan, along with a few assumptions based on the limited information available.

Snags Develop

When the plan appeared complete, it was presented to SAC for review and approval. Shortly thereafter, following a number of messages and telephone calls, we learned that several of the "assumptions" that we had included in our plan could not be verified by the SAC staff. Further, that attempts, even at USAF level, to secure the necessary information provided only limited and in some cases outdated data. In the opinion of SAC (also shared by USAF), current information was essential before our plan could be approved. SAC then further advised that we should conduct a survey flight over our proposed route to determine the support capabilities of all facilities, and to identify any new requirements peculiar to our mission.

As if that weren't enough, we were told that diplomacy demanded the approval of all foreign governments on whose soil we would land. Specifically, the British government must first extend an invitation before we could go barging off on a flight to England. That's one thing the Chief hadn't thought of! SAC agreed to start resolving the

diplomatic problems while, at the same time, directing us to prepare for the survey flight.

Although substantial progress had been made, it was "back to the old drawing board" for the staff. A C-47 aircraft was selected from base resources, and we began installing cabin fuel tanks inside the cargo area for increased range. We ordered winter flying gear, installed inflatable life rafts, and acquired survival food, coffee jugs, and portable oxygen tanks.

Dave would head the survey team, which included Colonel Tice, Maj. Don Smith, and me. Initially the flight crew (the four of us), along with a qualified navigator and crew chief, were to make up the survey crew. However, at the last minute, we decided it might be prudent to include a qualified instructor pilot (IP). Capt. Richard D. Ramsey was then added to the manifest—a very wise decision that paid off more than once.

Survey Flight Departs

A good example of this came sooner than we expected. Our flight to Bangor, Goose Bay, Labrador, and on to Bluie West One (BW-1) was routine and uneventful. However, following our takeoff from BW-1, we leveled at an altitude of 14,000 feet en route over the treacherous icecap of Greenland, and "all hell broke loose." Clay Tice, Don Smith, and I were in the back of the aircraft preparing for what we thought would be a long game of poker, when Ramsey, the copilot, called back to advise us that we had just entered a heavy concentration of ice crystals and were now flying on instruments. We quickly went forward to observe this unique phenomenon. There we were, at 14,000 feet, with the sun shining somewhere above and reflecting on the ice crystals, millions of diamonds, restricting forward visibility to zero, with no horizon reference. It was truly a peculiar and fascinating sight!

We had just returned to our poker game when, suddenly, there was an unwarranted interruption of the left engine; it had completely lost power! This was followed immediately by loss of power on the right engine as well!

Now, it's fair to say at this point

Col. Frank W. Klibbe, USAF (Ret.), served with the 56th Fighter Group in the ETO during World War II and is credited with seven kills flying the P-47 Thunderbolt. Following his participation in the first transatlantic crossing by jet fighters, he was attached to the RAF in 1950-51. During this period, Colonel Klibbe was Project Officer in another military aviation landmark—the first F-84/B-29 probe-and-drogue aerial refueling, the forerunner of long-range, nonstop jet fighter deployments.

that an air of concern if not sheer panic prevailed, as the crew tried frantically to figure out what had happened. Ramsey was busy switching fuel tanks as Dave was regaining control on instruments, trimming the aircraft, and establishing a glide, but still with no power. The throttles were retarded and the prop controls advanced. However, the mixture controls would not budge from the manual lean position. As we continued to descend, there was a reluctance on the part of the crew to apply too much pressure on the mixture controls for fear of creating even more serious problems.

It wasn't until Ramsey, using a flashlight, examined the throttle quadrant that we learned the cause. A simple lead pencil, the kind used by the crew and routinely placed in the slots of the quadrant, had fallen down, lodged inside, and was preventing forward movement of the controls. With this bit of intelligence, Dave and Ramsey both grabbed the mixture controls . . . pushing, pulling, and sometimes swearing a little. Finally, the controls were freed!

The left engine caught immediately, quickly followed by the right, as the props began to sing like the wings of a hummingbird. After a few thrilling acrobatic maneuvers on instruments, Dave finally regained control, and he began a very welcome and satisfying climb to our assigned altitude.

You have probably guessed it by now. Intrigued by the phenomenon of the ice crystals, we had all forgotten to "dip-stick" the cabin tank then in use (by using an old broomstick to measure remaining fuel), and we had just flat run the tank dry!

As for the pencil . . . well, it was unanimously agreed that pencils, pens, maps, or whatever would never again be placed in the throttle quadrant, even though it was a convenient location.

After we had regained our composites, we couldn't help but speculate on just how close we might have come to settling on the icecap below.

Extending the Survey

Our flight continued on to Meeks Field, Iceland . . . Kinloss, Scotland . . . Odiham, England . . . and finally ended at Wiesbaden, Germany, Headquarters USAF.

Lt. Gen. Curtis E. LeMay, then Commander of USAF, had invited Dave to brief him and his staff on our proposed crossing and the results of our survey findings. It was following this briefing that the rest of us learned that General LeMay had requested that our proposed crossing be extended to include a two-week stay at nearby Fürstentfeldbruck, one of our bases in West Germany. While at "Fursty," we would be expected to conduct jet operations over several German cities and US military installations to boost the morale of the German people as well as that of our own troops. Relations with the Russians were getting sticky, and, though we didn't know it at the time, the Berlin Airlift would start just a few weeks before Fox Able One.

By this time, the jet crossing had taken on added significance. If successful, it would prove the feasibility for rapid deployment of large numbers of fighters via the North Atlantic ferry route to all parts of the European continent. No longer would fighter aircraft have to be dismantled, shipped by sea, and then reassembled at the point of destination, as was the case during World War II. This was Dave's goal—to prove that there was a better way to increase the mobility of our fighter forces. There was no doubt in his mind that we would be seeing General LeMay again soon!

Our survey flight was now complete, and the team returned to Selfridge to finalize our plan. Some changes, of course, were necessary.



At Goose Bay, Labrador, Lt. Col. Dave Schilling gives last-minute instructions on letdown procedures for the tricky approach and landing at Bluie West One, which all sixteen F-80s accomplished without mishap. At BW-1, each pilot faced an ice-laden fjord on both landing and takeoff, with landing uphill to the north, where the greatest obstacle was an ice-shedding glacier at the end of the runway.

The major one was that only sixteen F-80s would be deployed, primarily because of the limited facilities and resources at Bluie West One. We adjusted fuel and oil quantities to meet our demands, as well as the modification of a number of refueling units at en route stops to handle and filter JP-1. Communications were carefully examined and frequencies established common to both the fighters and the support aircraft that would accompany us.

The results of the survey flight had been fruitful and, I might add, a necessary prelude to refining our plan. It also provided a preview of airfields and facilities (which, otherwise, would have been strange to us and the operations of jets), to say nothing of the value to the base personnel who would be receiving us.

Dave made his final trip to Headquarters SAC, where he briefed the staff and ironed out the remaining details. The rest of us sat at Selfridge and waited. Ironically, the motto of the 56th Fighter Group says it best: "Ready and Waiting." We were not only ready but patiently waiting approval that would end our long months of planning. Finally, approval came.

Launching the Flight

On the morning of July 12, 1948, sixteen F-80 jets sat on the ramp at Selfridge, in readiness (new J33 engines installed) for the first leg of the flight. Takeoff was scheduled for 9:10 a.m., local time. The pilots participating in this historic mission, in four flights of four aircraft each, were: "Catfish" Flight: Lt. Col. David C. Schilling, Maj. Dona-

von F. Smith, Capt. Charles J. Bowers, and Capt. Frank W. Klibbe; "Charcoal" Flight: Lt. Col. William D. Ritchie, Capt. Harry F. Hunter, Capt. Russell B. Westfall, and 1st Lt. William S. Simpson; "Clipper" Flight: Capt. Ray Dauphin, Capt. Warren S. Patterson, Jr., 1st Lt. John E. Bylander, and 1st Lt. Sherman R. Smith; "Cobalt" Flight: Lt. Col. Clay Tice, Jr., Capt. Heath Bottomly, 1st Lt. Kenneth B. Mullikin, and 1st Lt. Jerome F. Naleid.

The support aircraft and advance party (ADVON) consisted of two C-54s carrying maintenance personnel, aircraft spares, and ground handling equipment; a C-47 carrying refueling personnel; a portable refueling segregator (primarily for BW-1); an Air Rescue B-17 boat-carrying aircraft; and an Air Weather Service B-29 aircraft. The ADVON was under the direct control of Lt. Col. Dinghy Dunham, flying aboard the B-29 weather aircraft. (Dunham by now had been reassigned to the operations staff of Headquarters SAC.)

Earlier on the morning of July 12, the ADVON was already en route to Bangor, Me. Much of the success of the mission rested in the hands of the ADVON commander. The operational concept on all overwater flights provided for the B-29 weather aircraft to precede the fighters, arrive over destination, and relay by radio message weather conditions for the last-minute flight planning. Critical, of course, was accurate information on winds aloft. It was Dinghy's responsibility and judgment that would ultimately result in a "Go" or "No-Go" message transmitted to Dave.

Once a "Go" message was received, the B-17 boat-carrying aircraft ("Duckbutt-1") would immediately be dispatched, to take up a position on course half the distance between an existing weather boat and our destination. A second B-17 from base ("Duckbutt-2") would be dispatched, taking up a position half the distance from "land-fallout" and the weather boat. Each B-17 would then transmit on a common frequency two minutes out of every five, providing navigational aid to the fighters using their radio compass, and serve as a checkpoint for the rate of fuel con-

sumption. In all cases, the fighters, in flights of four at five-minute intervals, would not take off until the B-17s were on station and transmitting on assigned frequency. The concept was designed for the maximum safety of the crews and to permit minimum disruption if an air-sea rescue should be necessary.

Back at Selfridge, our families, friends, and a number of officials were gathered, waving their last good-byes as we prepared to take off. Dave had already started the "ten-second" countdown for engine start. On the count of "zero," sixteen J33 engines spouted flame from their tailpipes. Within minutes, we were making a sixteen-ship farewell formation pass low over the base.

The flight to Bangor, a distance of 726 miles, was flown at 30,000 feet and took one hour and fifty minutes. Refueling crews were in position and ready for immediate refueling. Our plan was to go on to Goose Bay, Labrador, the same day. At Bangor, all aircraft were reported in commission, and Dave immediately began the briefing for the next leg. The weather was reported good, but was expected to deteriorate later in the day. The word had already been given to ADVON, circling overhead, to proceed to Goose Bay.

An Unplanned Delay

After the briefing and, as each pilot was preflighting his assigned aircraft, I discovered that my aircraft had an inoperative electric trim tab system. I advised Dave of the problem, and he agreed to delay takeoff for a couple of hours while I, with the help of base personnel, tried to isolate the cause. We soon determined that the trim motor had failed. The only replacement part was on one of the C-54s en route to Goose Bay.

Dave quickly made a decision. "Klib" he said, "you get it fixed any way you can and join the rest of us at Goose Bay no later than noon tomorrow. If you can't get it fixed by then, return to Selfridge whenever you can."

You can imagine my disappointment. Not for me alone, but also for Captain Patterson (Clipper 2), who was directed to remain behind with me. Dave and the others promptly took off while the weather was still



Supervising the uncrating of a tailpipe at BW-1 to replace one buckled by heat, one of the few major maintenance problems encountered during the transatlantic crossing and return.

favorable. The distance to Goose Bay was 701 miles and they arrived in two hours and five minutes.

Before the last aircraft departed, I was on the phone to supply people at Wright-Patterson AFB, Ohio, talking with the same people who had been so helpful to us in assembling spares for our flyaway kits. In a matter of hours, I had a new trim tab motor in my hands. Captain Patterson and I installed the motor that same night, and the following morning, after a short test flight, Patterson and I were on our way to Goose Bay, arriving well before noon.

For the next several days (July 13-16), we were delayed at Goose Bay. USAF had directed us not to continue until a flight of six RAF Vampire jets, escorted by two York transports and a pair of Mosquito bombers, arrived at Goose Bay from BW-1. The Vampires were destined for Montreal, Canada. When our British friends arrived and they learned of our undertaking, there was a typical RAF-USAF fighter pilots' party and celebration held in honor of both occasions.

Another factor extended our delay for still another day: the weather at BW-1. The approach into BW-1 can be a little tricky, requiring the best of weather conditions for both letdown and landing. The letdown had to be over open

sea, then through a narrow ice-laden fjord with mountains extending upward on both sides to land on a marginal uphill runway and stop with a glacier facing us at the end. With jets, there was no margin for error. An attempted go-around in such a confined area, even under VFR conditions, would be extremely hazardous. Nevertheless, on the morning of July 17, Dinghy radioed the word "Go" and we were on our way to BW-1. We all landed without incident. The distance was 776 miles; flight time was two hours and twenty minutes.

We stayed at BW-1 for the next two days. This was due primarily to the excessive tailwinds blowing off the glacier, making takeoff risky, despite the fact that the runway was downhill.

It was here that we encountered our first major maintenance problem. A tailpipe on one of the jets was buckled beyond limits because of excessive heat. It required a change. The problem, although not serious, marked the first time that we used our flyaway kit. We changed the tailpipe in less than one hour.

On the afternoon of July 19, winds became favorable and we launched for Meeks Field, Iceland, a distance of 750 miles. The flight time to touchdown was two hours, ten minutes.

Reaching Europe

We knew that crew accommodations at Meeks were extremely limited, so planned our departure for the earliest opportunity. The weather looked good en route to Scotland for the next day. On July 20, we took off for RAF Stornoway, an isolated RAF station on the Hebrides off northwestern Scotland. Distance was 670 miles and it took us one hour and fifty-five minutes. The base was in a so-called "holding status," with only a few RAF officers and a handful of enlisted men to handle our arrival.

Until now, the billeting and food had been very satisfactory. However, this would be an experience most of us would long remember. We were billeted in old World War II-type Nissen huts, with a couple of blankets on a folding cot, and a pot-belly stove to keep us warm. In another hut several yards away were the latrine and washing facilities, with large metal buckets to hold water. The water was only one temperature—cold. There would be no showers tonight, except for the very brave! The rations for our evening meal, although adequate (if you're fond of English cooking) fell far short of satisfying our hunger.

At Clay Tice's suggestion, all of the pilots chipped in money, and one of the RAF officers volunteered to go to the nearest village to buy all the smoked salmon, crackers, and other edibles he could lay his hands on. We washed it all down with a few beers, and our hunger was satisfied. The rest of the evening was spent learning how to convert dollars to pounds, shillings, and pence.

The next morning found us up early, washing and shaving from buckets of cold water as we prepared for an early departure for RAF Odiham. The distance was 525 miles and, with a couple of victory formation passes over the field, we landed with a flight time of two hours.

Our arrival at Odiham was greeted with considerable fanfare and formality. Not far from the runway where our aircraft were parked was a large reviewing stand, appropriately decorated, and on which were seated a number of RAF officers and officials from Britain



Primitive quarters at Stornoway in the Hebrides off the Scottish coast offered scant comfort, but British hosts provided much-appreciated camaraderie.

and several other countries. As we climbed from our cockpits, Colonel Schilling was being informed that he should assemble all the pilots into a group and march them to the reviewing stand. There he was expected to present the pilots formally to Sir John Robb, Air Vice Marshal of the RAF.

Dave quickly called us together and told us what he was expected to do. It was obvious from his reactions and the expression on his face that he hadn't the foggiest idea of the commands necessary to get us from our assembly point to the front of that reviewing stand!

"Hell," he said, lifting his flight cap and scratching his head, "I'm not sure if I remember the commands." With that, he turned to Captain Bottomly, a West Point graduate, and said, "Heath, what the hell are the commands to get from here to over there?" He pointed to the nearby stand.

Captain Bottomly rattled off the necessary commands and followed by saying, "That should do it, Sir."

Dave thought for a moment and then said, "Hell, I'll never remember all of that. Fall in . . . we'll just walk over."

That we did, like a bunch of well-disciplined cattle. We followed Dave to a point in front of the reviewing stand. He then called us to attention and presented us to the RAF Air Vice Marshal.

Following the ceremony, while we were all mingling among those

gathered to greet us, I overheard Air Vice Marshal Robb talking to Dave: "Colonel Schilling, you are truly an amazing chap. Here you've led these lads over 5,000 miles of treacherous ocean, and, be damn, now you can't even march them fifty feet!"

Dave laughed, saying, "Sir, I'm the only pilot in the group with two left feet!"

As guests of the American Embassy, we were treated to a number of official functions, stage plays, and sightseeing tours as we spent the next four days visiting London. This was a welcome treat from the disciplined flight we had just completed. Our British friends were to be commended for their generous hospitality, support, and assistance in making this flight possible—a "first" in jet aviation history.

On to Germany

On July 25, we departed from Odiham on the last leg of the flight to Fürstenfeldbruck, Germany, a distance of 592 miles, which we accomplished in one hour and fifty minutes. As anticipated, Gen. Curtis LeMay and members of his staff would soon arrive to welcome us. Our planned journey only half complete, we had traveled a total distance of 4,740 miles in fourteen hours, ten minutes, with an average ground speed of 335 mph. The F-80 had performed, as designed, with only minor maintenance problems.

For the next two weeks, we flew a

total of seventy-nine sorties, most of which were over German cities and military installations throughout West Germany. The treetop buzz jobs, performed without restrictions, made headlines in both the German press and our own *Stars and Stripes*. Nearby, at Neubiberg AB, our fighter friends of the 86th Fighter Group, who were equipped with P-47 aircraft, were not to be overshadowed by our aerial display. They asked that we join them in a mass formation of forty-eight P-47s and sixteen F-80s as a tribute to our troops in Germany.

There was something nostalgic about this flight, as several of our pilots had flown the P-47 over this same area during World War II. It surely would rekindle vivid memories of the past. Still another thought would enter our minds, as we tucked our wings tightly in formation alongside the veteran fighter of those days: This was the beginning of the end of the P-47's proud and victorious career. It seemed an appropriate finale that the ending would begin over the same land and in the same skies that she had once so effectively dominated.

I cannot say enough about the genuine courtesies, hospitalities, and social affairs extended to us by all of the pilots and families of the 86th Fighter Group during our stay. I shall never forget, nor would the others, our introduction to the traditional 86th "knock-'em-back" parties that slowly took a toll on our general health and welfare. We still had 5,000 miles ahead of us and, without spare pilots, abstinence became the call-sign of the day.

In the next few days, as the ground crews prepared the aircraft for our return, we learned that one aircraft had encountered an engine bearing failure, which required replacement. As members of the 86th looked on and assisted, the engine was quickly replaced from assets in our flyaway kit. In the interim, a gracious German fraulein was putting the finishing touches of paint on the national flags of the six countries visited, which would adorn all of the aircraft for our return flight.

The Return Flight

On the morning of August 14, 1948, the barracks began to hum with enthusiasm of both ground

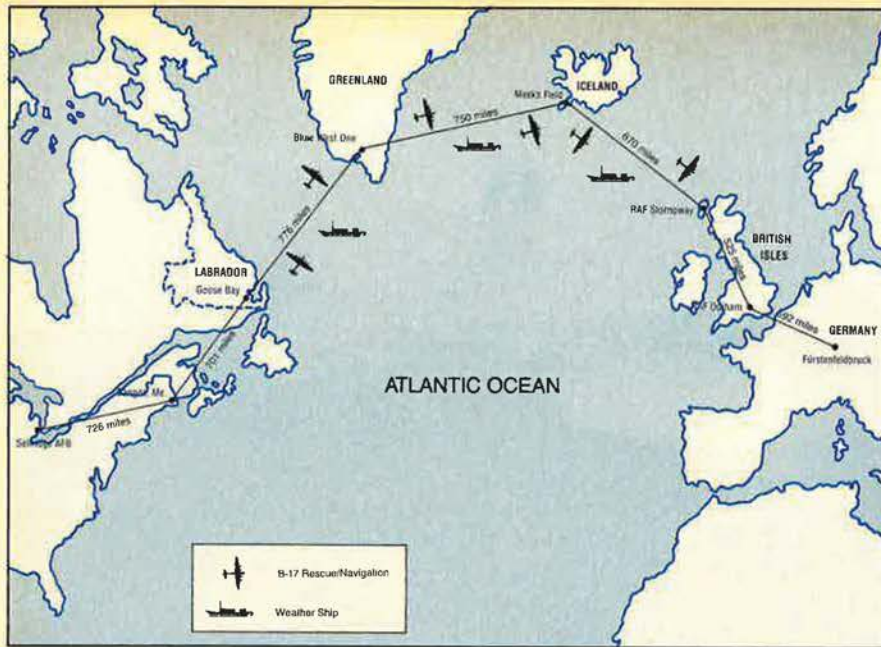


Top photo, it's a "hot start" as the author, Captain Klibbe, checks out an F-80 with a minor maintenance problem. Above, F-80s aligned on the parking ramp following arrival at Fürstenfeldbruck, Germany, terminus of the transatlantic deployment.

crews and pilots. Dave was on the phone extending our thanks to many at Fürstenfeldbruck who were unable to accompany us to the flight line for takeoff. The evening before, as guests of the 86th, we had said our good-byes and drunk a final toast in gratitude for their generous reception and comradeship during our visit. Dave, however, wanted to make that last call to express again our sincere appreciation. However, it was to no avail. As we approached the flight line and began to conduct the final check of the aircraft, off in the distance we heard the roar and saw the faint blur of a formation of P-47s. As they continued high over-

head, we all became witness to the most perfect formation of the numerals "86th" we had ever seen. This was their way of saying "Good-bye and Godspeed" as we prepared for takeoff.

Our return trip would take us back over the route we had traveled to Germany. The flight was uneventful, with one noteworthy exception. On August 20, we completed the trip from Stornoway, Scotland, to Goose Bay, Labrador, in one day, having traveled 2,196 miles in four hours and fifty minutes, with an average ground speed of 454 mph. The total elapsed time from the first takeoff from Storno-



official ferry mission, "Fox Able Two," consisting of four TF-80s and eleven F-80s to Fürstenfeldbruck for the 36th Fighter Group, which was being reassigned from Panama to Germany. The leader of "Fox Able Two," flying in the TF-80, was Colonel Dregne, with Maj. Sam Blair on his wing. Dave and I made up the remaining element.

Fox Able Three, Four, and more would soon follow in our path, as entire fighter groups were deployed to England and Europe.

Later, with the introduction of in-flight refueling, the "Chief" would again pioneer another "first" in fighter aviation history. During July of 1952, as Commander of the 31st Fighter Escort Wing, SAC (equipped with F-84G Thunderjets), he led the first "Fox Peter One" ("Peter" for Pacific) flight of fifty-seven aircraft from Turner AFB, Ga., across the Pacific to Japan.

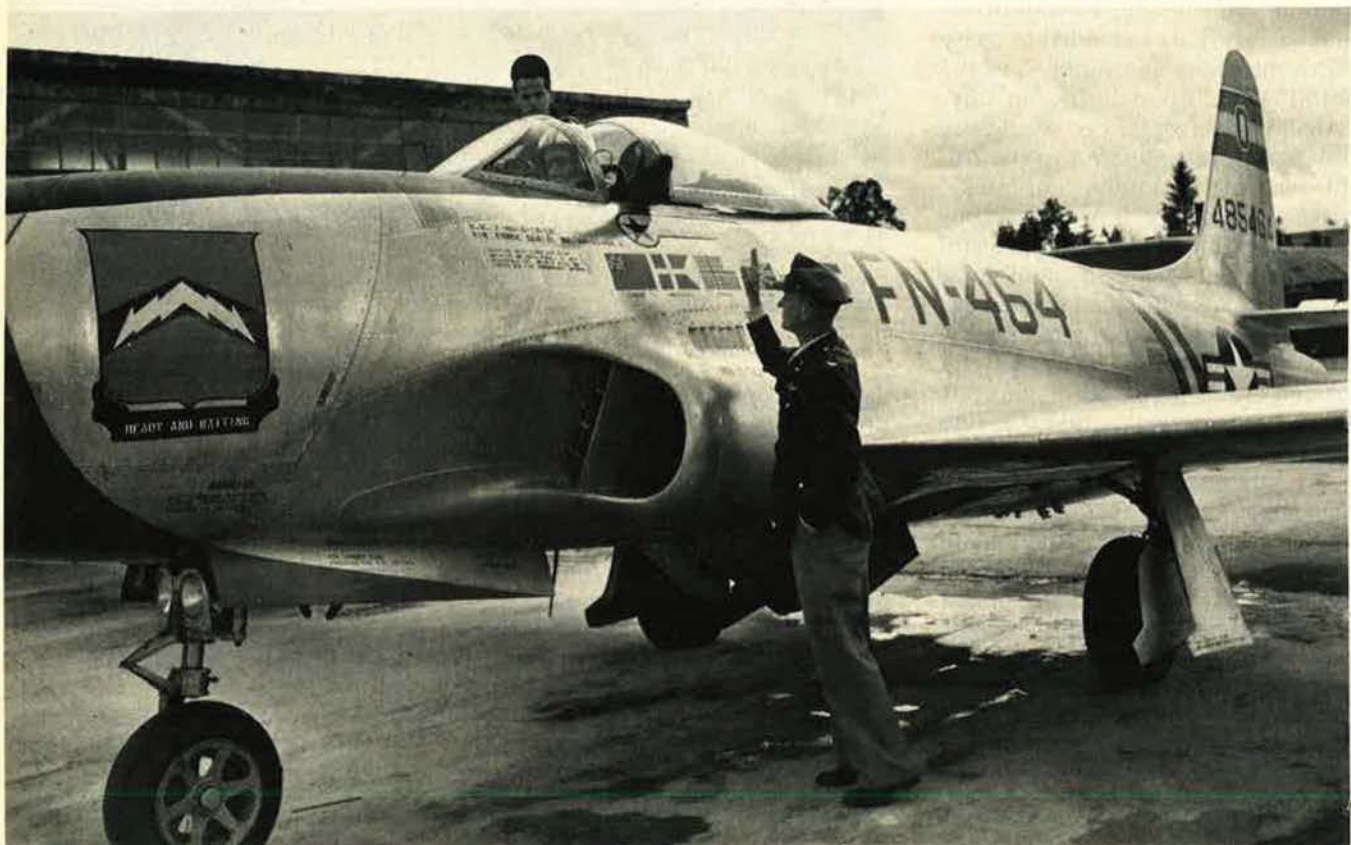
Today, our fighter forces are deployed to the four corners of the globe in a matter of hours—the legacy of a truly great leader and a handful of dedicated men.

This is the end of my "ferry tale."

way, until the last F-80 landed at Goose Bay was twelve hours and thirty-two minutes. Our final leg was accomplished the following day, as all sixteen F-80s landed safely on the runway at Selfridge on August 21, 1948.

What had begun as a planned group cross-country flight ended as

a historic demonstration of the feasibility of establishing the first "jet ferry route" across the North Atlantic. The following year, 1949, Colonel Schilling (then assigned to Headquarters USAF) teamed with the late Lt. Col. Irwin Dregne (then Commander of the 56th Fighter Group, Selfridge) in leading the first



Preparing to depart "Fursty" for the return transatlantic flight. In Germany, the 56th's F-80s flew seventy-nine sorties over cities and military installations throughout the country as a show of strength at the start of the Berlin Airlift.

It's good to be single-minded.

Good for you, and good for us.

Being single-minded makes it easier to concentrate on the things we do best... providing you with advanced systems and components for guidance, navigation and control. Products that offer cost-effective performance and high reliability.

This single-mindedness has made it possible for us to contribute to a wide range of significant programs that put us in the best of company... yours.

- INERTIAL NAVIGATION/WEAPON DELIVERY SYSTEMS—Super Etendard
- INERTIAL NAVIGATION SYSTEMS—F-16, JA-37 Viggen
- INERTIAL MEASUREMENT UNITS—F-4E/RF-4C, J-35 Draken, Pershing II
- STELLAR-INERTIAL GUIDANCE SYSTEMS—Trident Missile, Assault Breaker
- DOPPLER RADAR NAVIGATION SYSTEMS—AAH, BO-105, PAH-1 Helicopters
- ATTITUDE AND HEADING REFERENCE SYSTEMS—Aquila Army RPV
- STABILIZED GUN SIGHT SYSTEM—XM-1 Abrams Tank
- ACTUATORS—Harpoon, Pershing

For additional information write to: The Singer Company, Kearfott Division,
1150 McBride Ave., Little Falls, NJ 07424.

Kearfott

a division of The **SINGER** Company

THE BULLETIN BOARD

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

Some New Benefits "Discretionary"

That long list of new personnel benefits nearing final congressional approval at press time may help turn the critical retention problem around. But members should understand that some of the goodies are "entitlements" locked in concrete and will positively be paid while others are "discretionary."

That means that the Pentagon and the Administration, operating under language Congress wrote into the measures, is deciding who gets what. That "what" may be something less than members expected.

The continuation bonus, of up to four months' basic pay for rated officers who extend beyond their obligated service, is an example. It provides that the Secretary of Defense decides who gets a bonus and how much. The full bonus could easily mean \$8,000 a year for many military flyers. But there was talk that under regulations coming out of DoD Navy pilots might qualify for some continuation bonus money while Air Force pilots might receive nothing. That smells of trouble.

Other discretionary planks in the new benefits packages—in the FY '81 military authorization bill and the Nunn-Warner amendments—include: (1) the Zone C reenlistment bonus for members with ten to fifteen years of service; (2) raising the ten cents a mile reimbursement limit on PCS moves to 18.5 cents; (3) removal of the seventy-four-cent cap on the trailer allowance; (4) CHAMPUS improvements permitting immunizations for children under two and raising the monthly aid for members with handicapped dependents from \$350 to \$1,000; (5) raising from \$35 to \$50 the Stateside per diem rate ceiling; and (6) increasing the enlistment and reenlistment bonus ceilings from \$3,000 to \$5,000 and \$15,000 to \$20,000, respectively. The \$600 bonus for enlistees and reenlistees in the Individual Ready Reserve, also a discretionary benefit, applies initially only to the Army.

An official explained that Defense,

in changing the joint travel regulations, may set the new PCS mileage reimbursement rate below the 18.5 cent ceiling and peg the new trailer allowance figure below the \$1.50 per mile said to be the national average for moving a trailer. Similarly, the new CHAMPUS maximum for handicapped dependents could, under regulation changes, be set below the \$1,000 maximum. Reenlistment bonus ceilings, of course, will be lower than the \$20,000 authorized, which applies only to Navy nuclear specialists.

New benefits cited as genuine "entitlements" include the twenty-five percent boost in flight pay, a ten percent hike in BAS, the "save pay" for enlistees taking commissions, and the \$30 monthly family separation allowance for lower-ranking enlistees. All these were to be effective September 1, 1980. If payment rules did



Former Air Force Secretary John C. Stetson is the new Chairman of the National Committee for Employer Support of the Guard and Reserve, succeeding James M. Roche, who had headed the Committee since its creation in 1972. The Committee has been instrumental in getting 360,000 employers to sign statements in support of Reserve Forces. AFA recently honored Mr. Roche, citing him as a fine example of a volunteer citizen.

not surface in time, payments would be retroactive.

The variable housing allowance was to be discretionary, starting October 1, 1980, and become an entitlement a year later.

The 11.7 percent raise in basic pay and allowances was to be effective this month. While the measure's language gives the President authority to "reallocate" up to a quarter of the raise to members in critical skills, Air Force officials were betting that the Chief Executive would heed their advice and not reallocate. They say that reallocation wouldn't amount to enough extra money to keep disgruntled specialists in service and would only alienate people who receive less than the 11.7 percent.

Physician Pay Raise

The response among Air Force physicians to the recent doctor pay raise has been excellent, the USAF Surgeon General's office told AIR FORCE Magazine. A spokeswoman said that within two weeks after the measure became law, some 2,600 of the 3,400 Air Force doctors had signed up for at least one additional year of service and were collecting between one and three of the four special pays authorized by the new measure.

Others were signing up later in the summer, though specific totals had not been compiled at press time. "We are highly pleased with the early results," the spokeswoman said. Sponsors of the legislation had insisted it would pay off in improved retention.

The Air Force began making three of the new pays immediately: (1) a bonus of \$2,000 to \$5,000 for board-certified physicians; (2) an annual payment of up to \$10,000 based on length of service; and (3) monthly incentive pay that increases salary to comparable private levels.

Payment of the fourth bonus, providing up to \$8,000 annually for critically short specialists, was slated to begin this month.

The Surgeon General's office reported that as of midsummer USAF physician strength stood at 3,404, or

138 short of the authorized 3,542.

In a related development, the Surgeon General's office said that while it had failed to get Congress to lift the ban on commissioning of physician assistants, it wasn't giving up. Furthermore, it is soliciting enlisted applicants for PA training in 1981. The other services appoint their PAs warrant officers while USAF, with no WO appointment program, settles for E-9 status.

Armstrong Bill Would Help Reserves

The legislator who has been waging a one-man battle for active-duty benefits, Sen. William Armstrong (R-Colo.), has launched a similar campaign for members of the Reserve Forces. Armstrong-sponsored measures for the active-duty community have included pay raises, greatly increased educational benefits, and removal of parking fees charged service people at government parking lots.

More recently, he has introduced what he calls the "Strength in Reserve Act of 1980," a measure to encourage enlistment and service in the military Reserve Forces of the US. It would give members of the National Guard and Ready Reserve: (1) priority for government-guaranteed student loans administered by the Department of Education; (2) loan forgiveness of up to \$2,000 a year for each year—up to four—of honorable service; and (3) the same preference in federal hiring accorded active-duty veterans.

USAF Has Some Category IVs

USAF for the period FY '77-79 originally believed, and publicly reported, that it recruited virtually no Category IV youths, the lowest mental group accepted by the armed forces. Actually, it has recently been revealed, nine percent of its FY '79 recruits turned out to be Category IVs. For the two previous years, Category IVs actually represented six percent of USAF's recruits, rather than the "less than one half of one percent" previously reported.

The other services are much more heavily loaded with Category IVs. The Army first reported that nine percent of its 1979 recruits were in Category IV, but the "corrected scores" show that actually forty-six percent were in that group.

The errors surfaced from problems with revamped qualification tests and scoring methods.

Hq. USAF says it has identified the nine percent making up its 1979 Category IV group and is "tracking" their

performance. However, results probably won't be available until next calendar year.

Asked if USAF plans to recruit any Category IVs in the future, officials said they "will continue to accept all applicants who meet the Air Force enlistment standards, including Category IVs. The number is uncertain because there are no quotas or targets established by AFQT category. However, we will continue to maintain the quality of Air Force accessions at a high level."

USAF's reported/corrected percentage of recent recruits follows (totals may not add due to rounding):

FY 1979				
	Category I	Category II	Category III	Category IV
Reported	6%	35%	60%	0
Corrected	5%	36%	50%	9%
FY 1980 (first 9 months)				
Reported	6%	36%	58%	0*
Corrected	4%	38%	50%	8%

*Less than 1/2 of 1 percent

Lawmakers Extending GI Bill Cutoff

Congress is in the process of extending the GI Bill's termination date of December 31, 1989. The objective: To improve personnel retention.

A major step in this direction came recently when the Senate decided that a veteran discharged in 1980 and thereafter would not be entitled to GI Bill educational payments after one of the following: (1) a five-year period following the initiation of an education program after discharge if such initiation occurs within two years after discharge, or (2) December 31, 1989, whichever is later.

Following are three examples:

- A member discharged on January 1, 1982, would have until December 31, 1989, to use his GI benefits. No change from the present.

- A member discharged January 1, 1985, beginning a post-service education plan by December 31, 1986, would have five years from his starting date to use his benefits. Thus, if he starts the program of education September 1, 1986, GI Bill benefits would be available through August 31, 1991. If he did not start his program on or before December 31, 1986, the December 31, 1989, cutoff date would apply.

- A veteran discharged December 31, 1990, would have until December 31, 1992, to begin his program. Say he did this on September 1, 1992—he would have until August 30, 1997, to use his benefits. Of course, if he failed

to start an educational program before December 31, 1992—two years after discharge—his entitlement would be lost.

The intention is to remove the incentive for experienced military members to leave service early in order to use up their full GI benefits before the present termination date. House approval is needed.

In other veterans' legislation:

- The Senate approved a 14.3 percent increase in (1) disability compensation drawn by more than 2,300,000 service-connected veterans, and (2) dependency-indemnity compensation drawn by surviving

dependents of deceased service members and veterans whose deaths were service-connected. However, the House earlier approved a thirteen percent raise for both groups, so the difference will be compromised. October 1, 1980, is the effective date of the increase.

- Both Houses have approved, in different forms, measures to permit veterans to refinance existing VA home loans that have lofty interest rates. They would save a bundle in mortgage payments. The VA home loan interest rate hit an all-time high of fourteen percent last April 1, then dropped to 11.5 percent six weeks later. This left nearly 40,000 vets who had purchased homes and trailers during the high-rate period paying monstrous penalties for years, with no refinancing proviso. For example, a vet who borrowed \$50,000 at fourteen percent would pay, over the thirty years of the mortgage, \$36,000 more than if he had been able to secure a VA loan at the 11.5 percent rate. Early final approval seems certain.

- While the House voted to halt GI Bill flight training, the Senate wants merely to cut training payments from the present ninety percent of tuition to sixty percent. Final resolution is expected soon.

- The Senate has voted to increase benefits for veterans who as a result of service-connected ailments are blind or have lost the use of both arms.

Ellis Convinces Solons on Dorm Funds

Like other top Air Force leaders, SAC's Gen. Richard H. Ellis (who at the AFA Convention last month received AFA's top national award, the H. H. Arnold Award) has stood foursquare for ample funds to improve members' living conditions. But when he told the House Appropriations Committee recently that the USAF dormitory funds in the FY '81 military spending request are an "urgent requirement," committee member Rep. Silvio O. Conte (R-Mass.) fired back this salvo:

"The [committee] staff compares them with college dormitories. You provide your people with refrigerators, sofas, coffee tables, easy chairs, and carpeting, when the other services generally offer a desk and a set of drawers or less.

"You put sometimes two and three to a room where the other services may have half a dozen people in one room, not counting what are called open bays." Representative Conte then asked the SAC chief: "If additional O&M money is approved for military dorms, would you agree that it makes more sense . . . to give it to the other services who don't even come near you?"

General Ellis was ready. "They can spend their money this way, too," he declared. "This is one reason why our recruitment and retention rate, bad as it is, is better than theirs. This is not the 1940s and the '50s, when I was hanging around the service in open-bay dormitories, and places like that. Our people today expect more. We have not been able to meet their expectations by a long shot. They think they ought to have a room by themselves and a semiprivate bath—that is the way they want it. This is part of the price of the All-Volunteer Force. I wouldn't give up a nickel," General Ellis concluded.

At which point Representative Conte replied, "You have convinced me."

Retirement Overhaul Plan Reviewed

It was more than two years ago that Defense Secretary Harold Brown unveiled the Administration's complex proposal to revamp the military retirement system. Congress, however, placed the plan in the deep freeze and little has been heard from it since.

Until very recently, that is. A detailed analysis of that proposal and the six preceding retirement overhaul plans has just been published by the American Enterprise Institute under the title *Military Retirement:*

THE BULLETIN BOARD

The Administration's Plan and Related Proposals. The package—an eighty-five-page booklet—outlines each and every plank in each project and sets down all the pros and cons.

On twenty-year retirement, for example, the Institute explains how proponents insist it is vital to help keep the force young and vigorous. But critics, like Adm. Hyman Rickover, claim there are few military jobs that cannot be performed by persons fifty-five or older. There is considerable elaboration on both sides, always balanced, but never is an opinion advanced as to which side is correct.

The same ultra-objective look is taken on cost-of-living adjustments, adequacy of retirement benefits, the formula for computing pay, deferred annuities vs. earlier payments, contributory vs. noncontributory systems, vesting, severance pay, etc. How proponents and opponents of each side view the situation is spelled out, leaving the reader to decide which viewpoint is correct.

The first retirement proposal covered was advanced by the 1969 Quadrennial Review. Next were the plans of the Interagency Committee (1971), the DoD Retirement Study Group (1972), the Defense Manpower Commission (1976), Rep. Les Aspin (1976 and amplified later), the President's

Commission on Military Compensation (1978), and finally the Administration plan as advanced by Secretary Brown in 1978. Several, but not all, opted for continuing the twenty-year option; most called for early vesting rights; four of the seven recommended the "high three" as the basis for computing retired pay; and a variety of positions were expressed on Social Security offset.

Yet, it's all been academic—lots of talk, but no action to actually apply surgery to the retirement system. Still, that doesn't mean the 1978 Brown proposal, officially called the Uniformed Services Retirement Benefits Act (USRBA) of 1979, or portions of it, won't receive serious attention sometime in the future. Accordingly, many members will want to remain aware of the elements involved.

As the Institute's careful recapitulation spells out, USRBA among many other things would: vest members with retirement benefits after ten years when they could withdraw part of their benefits; continue to permit retirement after twenty years; defer some annuities until age sixty; and reduce the 2.5 percent factor in many cases. The system would remain non-contributory, and severance pay—equal to five percent of annual basic pay for each year of service—would be provided all members involuntarily separated after five years.

Another feature of the Brown proposal, which is the one near-retirees like best, would allow members on board when the measure becomes law to adopt it or stay with the old system.

To secure a copy of *Military Retirement:*



Stephen B. Jones, right, a seventeen-year-old high school junior from Bloomfield Hills, Mich., and an International Science Fair winner, discusses his project with Air Force Secretary Hans Mark at a recent luncheon at the Pentagon that also honored other top high school scientists. USAF, whose Secretary and Chief of Staff both hold doctorates in physics, promotes and fosters scientific talent among the nation's youth. First-place winners at this year's International Science Fair received a \$50 savings bond from AFA plus a complimentary year's subscription to AIR FORCE Magazine. Second place winners received the magazine.

ment: *The Administration's Plan and Related Proposals*, send \$3.75 to the American Enterprise Institute for Public Policy Research, 1150 17th St. N. W., Washington, D. C. 20036.

Short Bursts

USAF has taken another step to reduce hardships associated with reassignments, by giving transferees seven days of permissive TDY to go home hunting. It's much less than what many private firms give employees who move; legislation is required to equalize this wide gap. But the change does protect a member's regular leave, and is solid evidence of the Air Force's continuing and intensified policies oriented toward its personnel.

Military people forced to pay to park at government lots, while members of Congress and their huge staffs enjoy free parking, much of it in multimillion dollar underground garages, will be less than thrilled at the following recent Air Force report to Congress which reads: "As a result of the parking fee assessment, the Air Force will collect about \$239,000 in FY '80. However, the cost to administer the program will exceed the fees collected." AFA adamantly opposes any military parking fees.

That long-pending move to raise the ceiling on personal property loss claims against the government, from \$15,000 to \$40,000, moved forward recently when the Senate Judiciary Committee approved the bill. The House okayed it earlier. The main beneficiaries will be US service people who were booted out of Iran and were forced to leave valuables behind. Through last year nearly 500 USAF members hit in that evacuation had been reimbursed for up to the then \$15,000 limit.

An Inspector General of the Defense Department? Such a bill—it would also create IGs for Justice, State, and the Treasury Departments—has been introduced in the Senate.

USAF's officer shortage has led to a cut in Squadron Officer School classes from eleven to eight and one-half weeks. Also, future SOS grads will no longer incur a one-year service obligation.

With the Vietnam-era bonus for Michigan state veterans having expired this past summer, only four states—Illinois, Massachusetts, New Hampshire, and Vermont—are still taking applications for bonuses for service during that war. Those four are among the eighteen states that have paid bonuses to vets of the past four wars—Vietnam, Korea, World

"Maggie Davis has caught the spirit that every fighter pilot has. They're tough, they're sometimes mean, and they're sometimes loners, but they get the job done. I hope EAGLES has great success."

—Senator Barry Goldwater,
Major General USAF
Reserve

The dramatic story of the Air Force's fabulous new supersonic fighter, the F-15 Eagle—and of the men and women who fly it, maintain it, love it, and sometimes die in it.

"Panoramic...conveys the excitement of flying."

—Publishers Weekly
\$13.95



EAGLES

A NOVEL BY
MAGGIE DAVIS

William Morrow

War II, and World War I. Interestingly, twenty states (including Texas and California) have never paid bonuses to veterans of any war.

It looks as if Congress for the second year in a row will reject the Defense Department's bid for a cost-of-living allowance for single and unaccompanied service members stationed abroad, despite the fact that overseas commanders have pressed hard for it.

Headquarters has confirmed, via a special audit, that the number of command-sponsored dependents overseas as of October 1, 1980, will be within the established ceiling of 123,000. Accordingly, USAF officials say, no delays or other restrictions on kin transfers overseas are being laid on. However, authorities will track the situation closely, and if it looks like the ceiling will be reached, the service "will make decisions on each request for concurrent travel to ensure the quota is not exceeded."

Looks like "frocking" is still out. Officials, after careful study of the idea (see July 1980 "Bulletin Board"), have recommended against "frocking"—allowing promotion selectees to wear their new rank, without the pay, before the official promotion date.

The Reserve officer recall and modification of the up-or-out program have contributed to USAF's re-

duced OTS production plans for FY '81. The OTS intake total for FY '80 was put at 4,700 new lieutenants, compared to 4,023 estimated for the year just starting.

Senior Staff Changes

PROMOTIONS: To be Brigadier General: William T. Tolbert.

RETIREMENTS: B/G Harry J. Dalton, Jr.

CHANGES: B/G Donald W. Goodman, from Exec. to C/S, Hq. SHAPE, Casteau, Belgium, to Ass't Vice Dir. for Attachés & Trng., DIA, Washington, D. C., replacing retiring M/G Anderson W. Atkinson . . . B/G Melbourne Kimsey, from Dep. Dir. of Programs, DCS/P&E, Hq. USAF, Washington, D. C., to Chief of Tactical Systems, Directorate of Research & Engineering, NSA, Fort Meade, Md. . . . Col. (B/G selectee) William T. Tolbert, from Cmdr., 388th TFW, TAC, Hill AFB, Utah, to Cmdr., 1st TFW, TAC, Langley AFB, Va.

SENIOR ENLISTED ADVISOR

CHANGES: CMSgt. Thomas J. Feeney, to SEA, Hq. AFISC, Norton AFB, Calif., replacing retiring CMSgt. Philip A. Arvizo . . . CMSgt. Frank M. Whitacre, to SEA, Hq. AFSINC, Kelly AFB, Tex., replacing retired CMSgt. Herbert W. Vaughn. ■

America's Security in the 1980s

**A National Symposium of the Air Force Association
Hyatt House Hotel, October 23-24, 1980
Los Angeles, California**

A searching look by high-level national security experts at the emerging defense needs of the country and the Free World.

FEATURING

KEYNOTERS:

**The Hon. Hans Mark, Secretary of the Air Force
Gen. Lew Allen, Jr., Chief of Staff, USAF**

SPEAKERS:

**Dr. Seymour L. Zeiberg, Deputy Under Secretary of
Defense for Research and Engineering
Gen. Richard H. Ellis, Commander in Chief, SAC
Gen. Robert E. Huyser, Commander in Chief, MAC
Gen. Alton D. Slay, Commander, AFSC
Gen. Wilbur L. Creech, Commander, TAC
Gen. Richard L. Lawson, US Representative to NATO
Military Committee
Lt. Gen. James V. Hartinger, Commander in Chief,
NORAD/ADCOM
Maj. Gen. Guy Hecker, Jr., Director of Air Force Legislative Liaison**

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 preview of our emerging global strategy.

Your registration includes a ticket to a Buffet-Reception, 6:00 to 8:00 p.m. Thursday, October 23, honoring the Symposium participants. Registration for all Symposium events is \$90.

For information and registration, call Jim McDonnell or Dottie Flanagan at (202) 637-3300.



**Air Force Association, Suite 400, 1750 Pennsylvania Ave., N.W.
Washington, D.C. 20006**



QUALITY

WE'VE BEEN SELECTED BY THE DoD TO PARTICIPATE IN THE CONTRACTOR ASSESSMENT PROGRAM (CAP) AS EVIDENCE OF OUR QUALITY EXCELLENCE.

- The first West Coast contractor to be so awarded.
- Selection based upon demonstrated quality performance.
- Result of quality vigilance and product assurance training.
- Dedicated to quality in the design, production and support of advanced defense systems for over twenty-five years.



**Ford Aerospace &
Communications Corporation
Aeronutronic Division**

Commanding Respect Worldwide.

AFA NEWS

Chapter and State Photo Gallery

By Vic Powell, AFA AFFAIRS EDITOR



Guests at a recent luncheon meeting of the Nation's Capital Chapter included, from left, DeWitt S. "Pete" Copp, author of *A Few Great Captains*, an account of the development of American airpower; Gen. Robert C. Mathis, USAF Vice Chief of Staff; and Lt. Gen. Ira Eaker, USAF (Ret.), one of the "great captains" in Mr. Copp's book. Here General Eaker re-lives the flat spin his P-12 fell into when he was flight-testing the aircraft with the extra weight of radio and battery, as related in the book.

Air Force Secretary Dr. Hans Mark, right, was the guest speaker at the recent Armed Forces Week Banquet jointly sponsored by the Albuquerque, N. M., Chapter, and the Military Affairs Committee of the Greater Albuquerque Chamber of Commerce. Those attending the event included, from left to right, Lt. Gen. Ernest Hardin, USAF (Ret.); V. R. Woodward, Chapter President and chairman of the Military Affairs Committee; and Secretary Mark. The event also honored area junior and senior ROTC students.



Virginia State AFA Leigh Wade Chapter met recently at Fort Lee AFS, Va., to honor the NCO and Senior NCO of the Year. Attending the dinner were, from left to right, George Aguirre, Chapter President; CMSgt. James V. Taylor, USAF, Senior NCO of the Year; Rep. Robert W. Daniel, (R-Va.), featured speaker at the event; and SSgt. Robert C. Wortman, USAF, NCO of the Year.



The Pennsylvania Army and Air National Guard and the sports teams of Pennsylvania State College were recently honored with a dinner dance sponsored by AFA's Olmsted Chapter, Camp Hill, Pa. Richard Anderson, offensive coach, Penn State University, State College, center, accepted the unit's sports trophy. Left to right, Robert Pomeroy, Chapter President; Betty Crawford, Civil Air Patrol and Chapter public affairs officer; Anderson; Jack Flaig, Pennsylvania State AFA President; and Richard Welliver, Civil Air Patrol Group 30 Commander.

CALENDAR OF EVENTS

- AFA 1980 Symposium, "America's Security in the '80s,"** Hyatt House Hotel, Los Angeles, October 23-24 . . .
- Air Force Ball,** Century Plaza Hotel, Los Angeles, October 24 . . .
- Chicagoland O'Hare Chapter Symposium,** O'Hare Ramada Inn, Des Plaines, Ill., March 14, 1981 . . .
- Iron Gate Chapter's 17th National Air Force Salute,** Sheraton Center, New York, March 28, 1981.

Outstanding Airmen of Missouri for 1980 were presented awards recently at the Missouri State AFA Convention at Whiteman AFB, Mo. From left to right are TSgt. Roy Howard, Jr., Senior NCO (Reserve), 442d Consolidated Aircraft Maintenance Squadron, Richards-Gebaur AFB; SSgt. Robert R. Bryce, Junior NCO (Active), 351st Security Police Group, Whiteman AFB; Brig. Gen. Keith D. McCartney, Commander, USAF Recruiting Service; SMSgt. Michael D. Foret, Senior NCO (Active), Data Automation Division, Whiteman AFB; and Stuart E. Popp, President, Missouri State AFA.



During the recent Connecticut State AFA Convention, a reception committee met Gen. Alton D. Slay upon his arrival at the airport. General Slay, right, was the featured speaker at the affair. The committee included, left to right, Maj. Gen. John Freund, Adjutant General of the State of Connecticut; Frank J. Wallace, State President; Joe Zaranka, State Vice President; Mrs. Martha Falcone, wife of New England National Vice President Joe Falcone; and Lily Coulson, State Secretary.



Las Vegas Chapter President Bob McLellan, right, welcomes Larry Berardi, manager of Halifax Engineering, Inc., at Nellis AFB, Nev., as a Community Partner of the Chapter. The certificate was presented during a luncheon meeting of the civilian-military council of the Las Vegas Chapter. The firm joins a growing list of the unit's Community Partners.



Longtime AFA leader Robert L. Carr represented AFA at the awards ceremony of the AFJROTC at the Johnstown, Pa., Vocational Technical School. Mr. Carr pins the AFA Bronze Medal on Cadet Col. R. Baran, right, as Maj. J. J. Collins, unit commander, looks on. The unit has provided four cadets in the past five years to the Air Force Academy.



AFA National Director Brig. Gen. Joe L. Shosid, USAFR, right, recently received the Legion of Merit in ceremonies at the Pentagon. The award was presented by Secretary of the Air Force Dr. Hans Mark. General Shosid serves as Mobilization Assistant to the USAF Director of Public Affairs.

AFA NEWS PHOTO GALLERY



The Los Angeles Airpower Chapter presented its Schriever Award to Dr. Hans Mark, Secretary of the Air Force, during the Salute to the Space Division luncheon sponsored by the Chapter. More than 800 people attended the anniversary program celebrating the unit that built the nation's first ICBM and developed the military space program. The award is named for Gen. Bernard A. Schriever, USAF (Ret.), right, who in 1954 became the first Commander of ARDC's Ballistic Missile Division, and later was Commander of ARDC itself and its successor, AFSC. The award recognizes exceptional support to USAF missile and space programs.

Southern Indiana Chapter was chartered recently at ceremonies in Bloomington. The charter was presented by Roy Whitton, left, President of Indiana State AFA, to John Cummings, Chapter President. Lt. Col. Steve Rogers, second from left, is program chairman. Dave Wimmer, second from right, is Secretary. Bill Ramsey, far right, is Treasurer.



Gen. Robert C. Mathis, USAF Vice Chief of Staff, was the principal speaker at the New York State AFA convention banquet held recently in Rome. With General Mathis at the banquet were, left to right, Henry C. Newcomer, New York State AFA President; James T. Kane, President of the Colin P. Kelly host Chapter; General Mathis; and Victor R. Kregel, AFA National President.



One of the top AFA new member recruiters was honored recently by the Altus, Okla., Chapter. William L. Dobbs, Chapter President, right, presented an Outstanding New Member Recruiter award to MSgt. Norman W. Olsen, who signed up thirty-five new members during the recent membership drive.



Lt. Col. Jack Lundgard of the Spirit of St. Louis Chapter, Mo., adjusts the microphone for Cadet Col. Suzanne Hamel, who addressed a special Airman and Cadet Awards Banquet sponsored by the Chapter. Cadet Hamel received the AFA Silver Medal during the Banquet. More than fifty cadets attended the special youth recognition program, during which Brig. Gen. James L. Gardner, Inspector General, Hq. MAC, right, spoke about America and its young people.



Charles E. "Chuck" Yeager, right, honored recently at a reception in Los Angeles attended by aerospace executives and community leaders, will serve as Honorary Chairman of this year's Air Force Ball. At left is K. Robert Hahn, General Chairman of the Ball, which will be held October 24 in Los Angeles. Yeager is pointing toward a 300-pound model, carved in ice, of the Bell X-1 rocket-powered aircraft in which he made history's first supersonic flight on October 14, 1947.



National AFA President Victor R. Kregel recently honored the Air Force Academy's Outstanding Squadron by presenting a blue guidon streamer at ceremonies on the Academy parade grounds. The 4th Squadron, 1st Group, received the Outstanding Squadron Award that includes a trophy, engraved plaque, and personalized desk sets for each member.



Gen. Bennie Davis, Commander of Air Training Command, recently presented an AFA Citation to Fred Whitaker, instructor for the Minuteman Missile Course at Chanute AFB, Ill., honoring him as the ATC Instructor of the Year. The award was presented at an AFA awards banquet held at the base.

Shown is Master Navigator tie.



XMAS presents that are good all year. For \$10 you can get one of these ties for a friend or yourself and contribute to the Air Force Historical Foundation: Command Pilot, Pilot, Master Navigator, Missileman, Navy Pilot, and the brand-new Flight-Surgeon. Send your check and specify pattern to: **AEROSPACE HISTORIAN** Eisenhower Hall Manhattan, KS, 66506, USA.

FOR THE COLLECTOR . . .



Our durable, custom-designed Library Case, in blue simulated leather with silver embossed spine, allows you to organize your valuable back issues of AIR FORCE chronologically while protecting them from dust and wear.

Mail to: Jesse Jones Box Corp.
P.O. Box 5120, Dept. AF
Philadelphia, PA 19141

Please send me _____ Library Cases.
\$4.95 each, 3 for \$14, 6 for \$24. (Postage and handling included.)

My check (or money order) for \$ _____ is enclosed.

Name _____

Address _____

City _____

State _____ Zip _____

Allow four weeks for delivery. Orders outside the U. S. add \$1.00 for each case for postage and handling.

AFA STATE CONTACTS

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

ALABAMA (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **Frank M. Lugo**, 5 S. Springbank Rd., Mobile, Ala. 36608 (phone 205-344-9234).

ALASKA (Anchorage, Fairbanks): **Frank X. Chapados**, 1426 Well St., Fairbanks, Alaska 99701 (phone 907-452-1286).

ARIZONA (Phoenix, Tucson): **John P. Byrne**, 9318 Country Club Dr., Sun City, Ariz. 85351 (phone 602-974-7137).

ARKANSAS (Blytheville, Fayetteville, Fort Smith, Little Rock): **Arthur R. Brannen**, 605 N. Hospital Dr., Jacksonville, Ark. 72076 (phone 501-982-2585).

CALIFORNIA (Apple Valley, Edwards, Fairfield, Fresno, Hawthorne, Hermosa Beach, Long Beach, Los Angeles, Marysville, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Barbara, Santa Monica, Vandenberg AFB): **Edward A. Stearn**, 15 Cardinal Lane, Redlands, Calif. 92373 (phone 714-889-0696).

COLORADO (Aurora, Boulder, Colorado Springs, Denver, Fort Collins, Grand Junction, Greeley, Littleton, Pueblo, Waterton): **Stephen L. Brantley**, 1089 S. Buchanan St., Aurora, Colo. 80011 (phone 303-370-7153).

CONNECTICUT (East Hartford, North Haven, Storrs, Stratford, Westport, Windsor Locks): **Frank J. Wallace**, 935 Poquonock Ave., Windsor, Conn. 06095 (phone 203-688-3090).

DELAWARE (Dover, Wilmington): **John E. Strickland**, 8 Holly Cove Lane, Dover, Del. 19901 (phone 302-678-6070).

DISTRICT OF COLUMBIA (Washington, D. C.): **Jack Reiter**, 1800 K St., N. W., Suite 600, Washington, D. C. 20006 (phone 202-463-7970).

FLORIDA (Broward, Cape Coral, Fort Walton Beach, New Port Richey, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tallahassee, Tampa): **John G. Rose**, 5723 Imperial Key, Tampa, Fla. 33615 (phone 813-855-4046).

GEORGIA (Athens, Atlanta, Columbus, Rome, Savannah, St. Simons Island, Valdosta, Warner Robins): **Lee C. Lingelbach**, 217 Ridgeland Dr., Warner Robins, Ga. 31093 (phone 912-922-7615).

GUAM (Agana): **Joe Gyulavics**, P. O. Box 21543, Guam 96921 (phone 671-734-2369).

HAWAII (Honolulu): **William B. Taylor**, 233 Keawe St., #630, Honolulu, Hawaii 96813 (phone 808-531-5035).

IDAHO (Boise, Twin Falls): **Ronald R. Galloway**, Box 45, Boise, Idaho 83707 (phone 208-385-5247).

ILLINOIS (Belleville, Champaign, Chicago, Elmhurst, Peoria): **Kurt Schmidt**, 2009 Vawter St., Urbana, Ill. 61801 (phone 217-367-6633).

INDIANA (Bloomfield, Indianapolis, Lafayette, Logansport, Marion, Mentone, South Bend): **Roy P. Whitton**, P. O. Box 674, Greenfield, Ind. 46140 (phone 317-636-6406).

IOWA (Des Moines): **William D. Sampson**, 2600 48th Pl., Des Moines, Iowa 50310.

KANSAS (Topeka, Wichita): **Cletus J. Pottebaum**, 6503 E. Murdock, Wichita, Kan. 67206 (phone 316-683-3963).

KENTUCKY (Louisville): **Ray H. Sanders**, 2517 Windsor Forest Dr., Louisville, Ky. 40272 (phone 502-935-8208).

LOUISIANA (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Shreveport): **John H. Allen**, 10064 Heritage Dr., Shreveport, La. 71115 (phone 318-797-3306).

MAINE (Limestone): **Alban E. Cyr**, P. O. Box 160, Caribou, Me. 04736 (phone 207-492-4171).

MARYLAND (Andrews AFB, Baltimore): **William L. Ryon**, 8711 Liberty Lane, Potomac, Md. 20854 (phone 202-338-8500, ext. 512).

MASSACHUSETTS (Boston, Falmouth, Florence, Hanscom AFB, Lexington, Taunton, Worcester): **Zaven Kapriellan**, 428 Mt. Auburn St., Watertown, Mass. 02172 (phone 617-924-5010).

MICHIGAN (Battle Creek, Detroit, Kalamazoo, Marquette, Mount Clemens, Oscoda, Petoskey, Southfield): **Howard C. Strand**, P. O. Box 668, Battle Creek, Mich. 49016 (phone 616-963-1596).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Kenneth M. Holloway**, 13 Hermosa Dr., Ocean Springs, Miss. 39564 (phone 601-857-8382).

MISSOURI (Kansas City, Knob Noster, Springfield, St. Louis): **William A. Dietrich**, 904 Carnoustie Dr., Kansas City, Mo. 64145 (phone 816-561-2134).

MONTANA (Great Falls): **Luclen E. Bourcier**, P. O. Box 685, Great Falls, Mont. 59403 (phone 406-453-1351).

NEBRASKA (Lincoln, Omaha): **Lyle O. Remde**, 4911 S. 25th St., Omaha, Neb. 68107 (phone 402-731-4747).

NEVADA (Las Vegas, Reno): **James L. Murphy**, 2370 Skyline Dr., Reno, Nev. 89509 (phone 702-786-2475).

NEW HAMPSHIRE (Manchester, Pease AFB): **Charles J. Sattan**, 53 Gale Ave., Laconia, N. H. 03246 (phone 603-524-5407).

NEW JERSEY (Andover, Atlantic City, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Forked River, Fort Monmouth, Jersey City, McGuire AFB, Middlesex County, Newark, Trenton, Wallington, West Orange): **Leonard Willf**, 203 Cranford Rd., Cherry Hill, N. J. 08003 (phone 609-429-4245).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **Joseph H. Turner**, P. O. Drawer 1946, Clovis, N. M. 88101 (phone 505-762-4557).

NEW YORK (Albany, Brooklyn, Buffalo, Chautauqua, Garden City, Hempstead, Hudson Valley, New York City, Niagara Falls, Plattsburgh, Queens, Rochester, Rome/Utica, Southern Tier, Staten Island, Suffolk County, Syosset, Syracuse, Westchester): **Thomas J. Hanlon**, P. O. Box 400, Buffalo, N. Y. 14225 (phone 716-632-7500).

NORTH CAROLINA (Asheville, Charlotte, Fayetteville, Goldsboro, Greensboro, Kitty Hawk, Raleigh): **William M. Bowden**, 509 Greenbriar Dr., Goldsboro, N. C. 27530 (phone 919-735-5884).

NORTH DAKOTA (Concrete, Fargo, Grand Forks, Minot): **Warren L. Sands**, 7 Spruce CC Village, Minot, N. D. 58701 (phone 701-852-1061).

OHIO (Cincinnati, Cleveland, Columbus, Dayton, Newark, Youngstown): **Francis D. Spaulding**, 718 Martha Lane, Columbus, Ohio 43213 (phone 614-866-9381).

OKLAHOMA (Altus, Enid, Oklahoma City, Tulsa): **William N. Webb**, 404 W. Douglas Dr., Midwest City, Okla. 73110 (phone 405-734-2658).

OREGON (Eugene, Portland): **Martin T. Bergan**, 12868 SE Ridgecrest, Portland, Ore. 97236 (phone 503-288-5611, ext. 236).

PENNSYLVANIA (Allentown, Beaver Falls, Chester, Dormont, Erie, Harrisburg, Homestead, Lewistown, Philadelphia, Pittsburgh, Scranton, State College, Washington, Willow Grove, York): **John B. Flaig**, P. O. Box 375, Lemont, Pa. 16851 (phone 717-233-0357).

RHODE ISLAND (Warwick): **King Odell**, 413 Atlantic Ave., Warwick, R. I. 02888 (phone 401-941-5472).

SOUTH CAROLINA (Charleston, Columbia, Myrtle Beach, Sumter): **Edith E. Calliham**, P. O. Box 959, Charleston, S. C. 29402 (phone 803-577-4400).

SOUTH DAKOTA (Rapid City, Sioux Falls): **D. L. Corning**, Camp Rapid, Rapid City, S. D. 57701.

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tri-Cities Area, Tullahoma): **Polly Murphy**, Twin City Real Estate, Midland Shopping Center, Alcoa, Tenn. 37701 (phone 615-983-4414).

TEXAS (Abilene, Amarillo, Austin, Big Spring, Commerce, Corpus Christi, Dallas, Del Rio, Denton, El Paso, Fort Worth, Harlingen, Houston, Kerrville, Laredo, Lubbock, San Angelo, San Antonio, Waco, Wichita Falls): **William W. Roth**, P. O. Box 360, San Antonio, Tex. 78292 (phone 512-226-8301).

UTAH (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **William C. Athas**, 2268 South 3270 West, Salt Lake City, Utah 84119 (phone 801-973-4300).

VERMONT (Burlington): **John Navin**, 350 Spear St., Unit 64, South Burlington, Vt. 05401 (phone 802-658-0770).

VIRGINIA (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **H. B. Henderson**, 10 Cove Dr., Seaford, Va. 23696 (phone 804-838-1300).

WASHINGTON (Seattle, Spokane, Tacoma): **Harry E. Goldsworthy**, P. O. Box 2951 TA, Spokane, Wash. 99220 (phone 509-838-5079).

WEST VIRGINIA (Huntington): **James Hazelrigg**, Rt. 3, Box 32, Barboursville, W. Va. 25504 (phone 304-522-3616).

WISCONSIN (Madison, Milwaukee): **Charles W. Marotske**, 7945 S. Verdev Dr., Oak Creek, Wis. 53154 (phone 414-762-4383).

WYOMING (Cheyenne): **G. Robert Bessett**, 5820 Osage Ave., #102, Cheyenne, Wyo. 82001 (phone 307-635-2888).

AIR FORCE MAGAZINE PROUDLY PRESENTS THE

Keith Ferris Military Aviation Calendar for 1981

Following the success of its 1980 calendar, and the pleasure it has given to thousands of purchasers, AIR FORCE Magazine has again commissioned aviation artist Keith Ferris to produce twelve original paintings for the 1981 calendar.

These twelve new Ferris paintings have been executed exclusively for this purpose. Each painting depicts a noteworthy event in military aviation. They span military aviation history, both in time and geography, and depict a variety of air forces and aircraft missions.

Aircraft depicted in the 1981 calendar are: T-37 jet trainer; P-51 Mustang fighter; Russian MiG-21 fighter; Japanese "Betty" bomber; C-123 Provider transport; B-57 Canberra bomber; German Ju-87 Stuka dive bomber; FF-1 US Navy fighter; Sopwith Camel carrier launch; F-106 Delta Dart interceptor; Tornado multirole combat aircraft; B-10 bomber.

Keith Ferris, son of an Air Force officer, grew up around airplanes, and has been painting them for more than twenty-six years. He is an AFA member, belonging to the Union-Morris (New Jersey) Chapter. Ferris's aviation paintings are renowned for their technical accuracy and depiction of events as seen through the eyes of a pilot.

The descriptive commentary accompanying each painting is written by Jeffrey L.



Paintings, such as "Solo Student Over the Numbers" shown above, measure 12" x 8 3/4" and are suitable for framing.

The Keith Ferris Calendar

% AIR FORCE Magazine
1750 Pennsylvania Ave., N.W.
Washington, D.C. 20006

Please send me _____ copies of the 1981 KEITH FERRIS Military Aviation Calendar at \$7.95 each for AFA members (\$8.95 for non-AFA members), postpaid.

Enclosed is \$ _____
I am am not an AFA member.
 Charge my credit card as follows:
 MasterCard American Express Visa
Card # _____
My card expires on _____

Signature _____
Name (PRINT) _____
Address _____
City _____
State _____ ZIP _____

Ethell, expert aviation writer, and also the son of an Air Force officer. Ethell's research not only contributes to the veracity of Ferris's paintings; it enhances the enjoyment and appreciation of the events painted.

Each full-color reproduction is appropriate for framing. In fact, persons ordering two copies can have one for calendar use and frame the other right away.

The 1980 calendars — the first offered by AIR FORCE Magazine — are already collectors' items; the 1981 calendars are certain to continue the tradition. They make a perfect gift for aviation enthusiasts everywhere.

Orders received now will be filled in early November, plenty of time for Christmas mailing, even overseas.

Quantity discounts are available on request.

SEE NEW BENEFITS FOR FAMILY COVERAGE!

NOW AVAILABLE TO

20%
Dividend
paid for 1979
calendar year

CURRENT BENEFIT TABLES

Insured's Attained Age	STANDARD PREMIUM: \$10 per month	HIGH OPTION PREMIUM: \$15 per month	HIGH OPTION PLUS PREMIUM: \$20 per month
	Basic Benefit*	Basic Benefit*	Basic Benefit*
20-29	\$85,000	\$127,500	\$170,000
30-34	65,000	97,500	130,000
35-39	50,000	75,000	100,000
40-44	35,000	52,500	70,000
45-49	20,000	30,000	40,000
50-54	12,500	18,750	25,000
55-59	10,000	15,000	20,000
60-64	7,500	11,250	15,000
65-69	4,000	6,000	8,000
70-74	2,500	3,750	5,000
Aviation Death Benefit*			
Non-war related	\$25,000	\$37,500	\$50,000
War related	\$15,000	\$22,500	\$30,000
Extra Accidental Death Benefit*			
	\$12,500*	\$15,000*	\$17,500*

*The Extra Accidental Death Benefit is payable in addition to the basic benefit in the event an accidental death occurs within 13 weeks of the accident, except as noted under AVIATION DEATH BENEFIT (below).

*AVIATION DEATH BENEFIT: The coverage provided under the Aviation Death Benefit is paid for death which is caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage. Furthermore the non-war related benefit will be paid in all cases where the death does not result from war or an act of war, whether declared or undeclared.

OTHER IMPORTANT BENEFITS

COVERAGE YOU CAN KEEP. Provided you apply for coverage under age 60 (see "ELIGIBILITY") your insurance may be retained at the same low group rates to age 75.

FULL TIME, WORLD WIDE PROTECTION. The policy contains no war clause, hazardous duty restriction, combat zone waiting period or geographical limitation.

DISABILITY WAIVER OF PREMIUM. If you become totally disabled at any time prior to age 60 for at least a 9-month period, your coverage will be continued in force without further payment of premiums as long as you remain disabled.

FULL CHOICE OF SETTLEMENT OPTIONS. All standard forms of settlement options, as well as special options agreed to by the insured and United of Omaha, are available to insured members.

CONVENIENT PAYMENT PLANS. Premium payments may be made by monthly government allotment (payable to Air Force Association), or direct to AFA in quarterly, annual or semi-annual installments.

DIVIDEND POLICY. AFA's primary policy is to provide maximum coverage at the lowest possible cost. Consistent with this policy, AFA has provided year-end dividends in all but three years (during the Vietnam War) since the program was initiated in 1961, and basic coverage has been increased on six separate occasions.

ADDITIONAL INFORMATION

Effective Date of Your Coverage. All certificates are dated and take effect on the last day of the month in which your application for coverage is approved, and coverage runs concurrently with AFA membership. AFA Group Life Insurance is written in conformity with the insurance regulations of the State of Minnesota. The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minnesota as trustees of the Air Force Association Group Insurance Trust.

EXCEPTIONS: There are a few logical exceptions to this coverage. They are: **Group Life Insurance:** Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane will not be effective until your coverage has been in force for 12 months.

The Accidental Death Benefit and Aviation Death Benefit shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or (4) During any period a member's coverage is being continued under the waiver of premium provision, or (5) From an aviation accident, either military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

ELIGIBILITY

All members of the Air Force Association are eligible to apply for this coverage provided they are under age 60 at the time application for coverage is made.

*Because of certain restrictions on the issuance of group insurance coverage, applications for coverage under the group program cannot be accepted from non-active duty personnel residing in either New York or Ohio. Non-active duty members residing in Ohio, however, may request special application forms from AFA for individual policies which provide coverage quite similar to the group program.

OPTIONAL FAMILY COVERAGE (new benefit schedule effective 6/30/80) PREMIUM: \$2.50 per month

Insured's Attained Age	Life Insurance Coverage for Spouse	Life Insurance Coverage for each Child*
20-39	\$20,000.00	\$4,000.00
40-44	15,000.00	4,000.00
45-49	10,000.00	4,000.00
50-54	7,000.00	4,000.00
55-59	5,000.00	4,000.00
60-64	3,000.00	4,000.00
65-69	2,000.00	4,000.00
70-75	1,000.00	4,000.00

*Children under six months are provided with \$250 coverage once they are 15 days old and discharged from the hospital.

Upon attaining age 21, and upon submission of satisfactory evidence of insurability, insured dependent children may replace this \$4,000 group coverage (in most states) with a \$10,000 permanent individual life insurance policy with guaranteed purchase options.

Please Retain This Medical Bureau Prenotification For Your Records

Information regarding your insurability will be treated as confidential. United Benefit Life Insurance Company may, however, make a brief report thereon to the Medical Information Bureau, a nonprofit membership organization of life insurance companies, which operates an information exchange on behalf of its members. If you apply to another bureau member company for life or health insurance coverage, or a claim for benefits is submitted to such a company, the Bureau, upon request, will supply such company with the information in its file.

Upon receipt of a request from you, the Bureau will arrange disclosure of any information it may have in your file. (Medical information will be disclosed only to your attending physician.) If you question the accuracy of information in the Bureau's file, you may contact the Bureau and seek a correction in accordance with the procedures set forth in the federal Fair Credit Reporting Act. The address of the Bureau's information office is P.O. Box 105, Essex Station, Boston, Mass. 02112. Phone (617)426-3660.

United Benefit Life Insurance Company may also release information in its file to other life insurance companies to whom you may apply for life or health insurance, or to whom a claim for benefits may be submitted.

ALL AFA MEMBERS (under age 60)



APPLICATION FOR AFA GROUP LIFE INSURANCE



Group Policy GLG-2625
United Benefit Life Insurance Company
Home Office Omaha Nebraska

Full name of member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

Date of birth			Height	Weight	Social Security Number
Mo.	Day	Yr.			

This insurance is available only to AFA members

- I enclose \$13 for annual AFA membership dues (includes subscription (\$9) to AIR FORCE Magazine). Please send membership application.
- I am an AFA member.

Name and relationship of primary beneficiary

Name and relationship of contingent beneficiary

Please indicate below the Mode of Payment and the Plan you elect:

Mode of Payment	Standard Plan		High Option Plan		High Option PLUS Plan	
	Member Only	Member And Dependents	Member Only	Member And Dependents	Member Only	Member And Dependents
Monthly government allotment (only for military personnel). I enclose 2 month's premium to cover the necessary period for my allotment (payable to Air Force Association) to be established.	<input type="checkbox"/> \$ 10.00	<input type="checkbox"/> \$ 12.50	<input type="checkbox"/> \$ 15.00	<input type="checkbox"/> \$ 17.50	<input type="checkbox"/> \$ 20.00	<input type="checkbox"/> \$ 22.50
Quarterly. I enclose amount checked.	<input type="checkbox"/> \$ 30.00	<input type="checkbox"/> \$ 37.50	<input type="checkbox"/> \$ 45.00	<input type="checkbox"/> \$ 52.50	<input type="checkbox"/> \$ 60.00	<input type="checkbox"/> \$ 67.50
Semi-Annually. I enclose amount checked.	<input type="checkbox"/> \$ 60.00	<input type="checkbox"/> \$ 75.00	<input type="checkbox"/> \$ 90.00	<input type="checkbox"/> \$105.00	<input type="checkbox"/> \$120.00	<input type="checkbox"/> \$135.00
Annually. I enclose amount checked.	<input type="checkbox"/> \$120.00	<input type="checkbox"/> \$150.00	<input type="checkbox"/> \$180.00	<input type="checkbox"/> \$210.00	<input type="checkbox"/> \$240.00	<input type="checkbox"/> \$270.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth			Height	Weight
		Mo.	Day	Yr.		

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes No

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanatorium, asylum or similar institution in the past 5 years? Yes No

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes No

If YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid.

I hereby authorize any licensed physician, medical practitioner, hospital, clinic or other medical or medically related facility, insurance company, the Medical Information Bureau or other organization, institution or person, that has any records or knowledge of me or my health, to give to the United Benefit Life Insurance Company any such information. A photographic copy of this authorization shall be as valid as the original. I hereby acknowledge that I have a copy of the Medical Information Bureau's prenotification information.

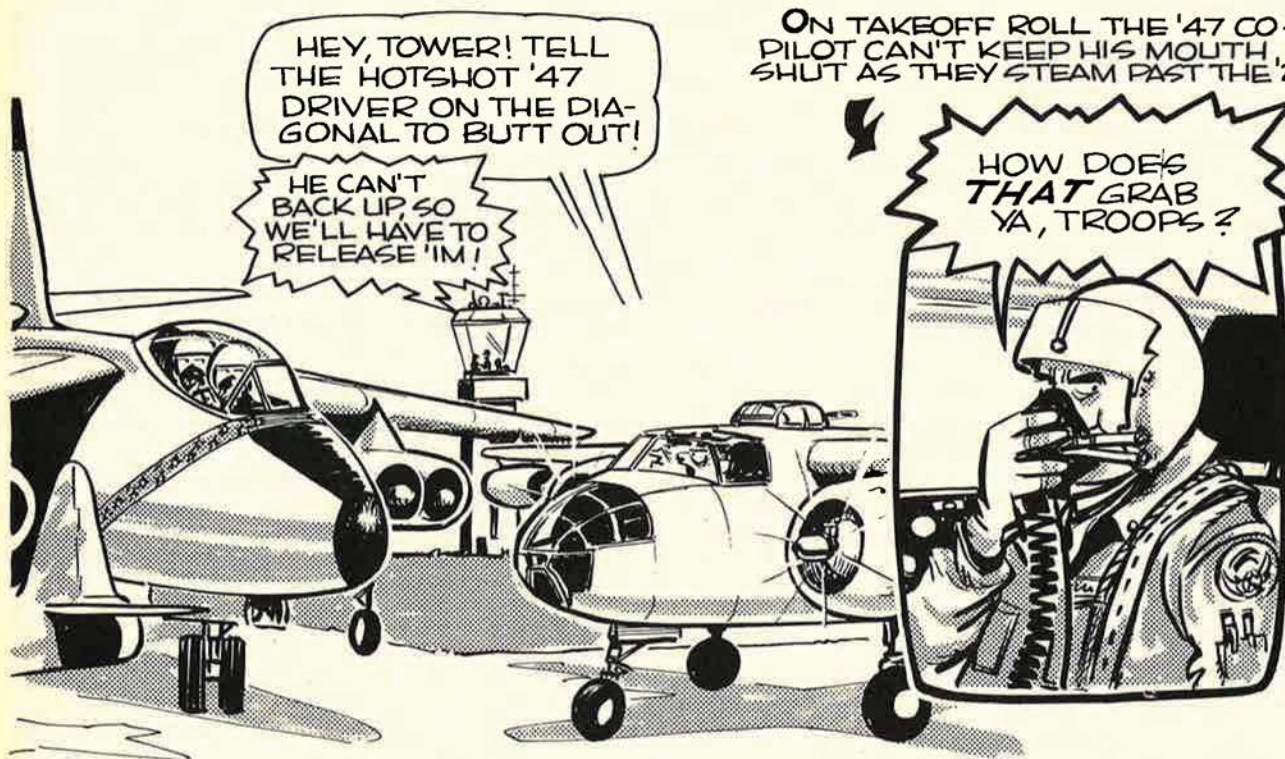
Date _____, 19____ Member's Signature _____

Bob Stevens'

"There I was..."

IF YOU'VE EVER HAD SOMEONE HORN INTO THE LINE AHEAD OF YOU WHILE AWAITING TAKEOFF CLEARANCE, YOU'LL APPRECIATE THIS STORY. THE SETTING WAS AN AIR BASE SHARED BY THE OLD B-25s and THE THEN NEW B-47 MEDIUM BOMBERS—

ON TAKEOFF ROLL THE '47 COPILOT CAN'T KEEP HIS MOUTH SHUT AS THEY STEAM PAST THE '25s—



WHEREUPON, THE B-25 COPILOT FLIPS ON THE EMERGENCY EVAC ALARM BELL and HOLDS AN OPEN MIKE UP TO IT—



A seeker to find the foe in the fog...

because someone asked Sperry.

Countering atmospheric conditions is the key to countering massed armor threats in the '80's.

Sperry millimeter wave seekers are designed to solve the midcourse and terminal guidance problems that limit other seekers, with the capability of finding armor in rain, fog, low clouds, smoke, snow and battlefield debris.

Tracking passively, the seeker is designed to sense the difference in natural, self-emitted radiation between the target tank and its background.

Sperry radar/sensor technology is being expanded in other areas. We're developing alarm sensors and decoys that will thwart the effectiveness of antiradiation missiles. We're researching tactical applications for spread spectrum techniques and fiber optics. And for missile and air defense, our dome radar employs a single planar array for hemispheric coverage, which is more cost-efficient than conventional systems. Our jamming modules can provide a variety of aircraft with a variety of tactical options.

Sperry advanced radar/sensor systems have been applied to a variety of fire control situations. Our lightweight Sea Archer 2 incorporates infrared, laser and TV sensors – with an optional radar – to meet the air/surface defense needs of small ships and patrol craft. Our stabilized optical sight provides precise track-

ing in any weather or light. And we're applying phased-array techniques to extend existing fire control capabilities to permit detection and tracking of high-diver-angle missiles.

Our land warfare inertial activities range from forward observer and artillery survey to radar azimuth and moving vehicle applications.

For more information on what we're up to in advanced radar/sensor systems, just ask us...we understand how important it is to listen.

Write to: Sperry Division Headquarters, Gyroscope Marketing, Great Neck, NY 11020.
Or call (516) 574-3640.



 SPERRY

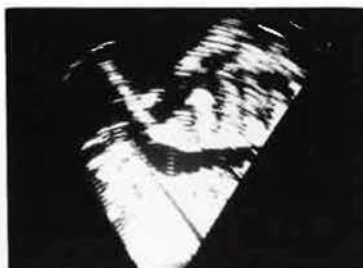
SPERRY IS A DIVISION OF SPERRY CORPORATION



Aerial photo



Conventional radar



Eagle's new radar



New eyes and claws for the Eagle.

Our F-15 Strike Eagle, equipped with new synthetic aperture radar, can "see," map, and display in the cockpit tactical mobile targets *20 nautical miles* away. It can do it day or night, fair weather or foul.

This new, sharper-eyed Eagle, part of a McDonnell Douglas Advanced Fighter Capability Demonstration program, offers the Air Force the night and under-weather (even in-weather) attack capability it needs—*with an existing and proven aircraft.*

Along with improved APG-63 radar, the Strike Eagle carries FAST Packs for 10,000 additional pounds of fuel. With FAST Packs, the Eagle can still carry four AIM-7F Advanced Sparrow missiles; or 8,800 *additional* pounds of air-to-ground ordnance; or infrared tracker

and laser-spot designator pods. In total, over 24,000 pounds of external ordnance can be carried on the F-15 weapons stations.

To take full advantage of its sharp new eyes, the Strike Eagle will fly with a two-man crew. The second crewman serves as navigator and weapons system operator, easing the pilot's workload.

The Strike Eagle. It's still an Eagle through and through, with air-to-air superiority second to none. Now it can be a long-range, under/in-weather precision bomber—the only fighter that can release its ordnance while flying faster than the speed of sound. It's one aircraft that offers the flexibility, without sacrifice of performance, that America needs in the cost-conscious times ahead.

F-15 Strike Eagle
**MCDONNELL
DOUGLAS** 