

JULY 1974 / S1

# AIR FORCE

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MAGAZINE

A photograph of two men in military uniforms standing in front of an American flag. The man on the left is Gen. David C. Jones, and the man on the right is Gen. George S. Brown. Both are wearing blue uniforms with numerous medals and ribbons on their chests. They are looking towards the right of the frame.

New USAF Chief of Staff  
**Gen. David C. Jones**

New Chairman of the JCS  
**Gen. George S. Brown**

ALSO IN THIS ISSUE

**Special Section: "The Electronic Air Force"**

**NUMBER**  
**2**

 **SPEARRY**  
**Avionics Report**



**SHUTTLE ACTIVITY**— Sperry Flight Systems is busy working on several shuttle and shuttle-related projects. In addition to aiding in the design and development of the Orbiter's autoland capability, Sperry is developing multiplexer-demultiplexer units for the craft. Orbiter astronauts will train for their missions aboard Grumman Gulfstream II trainers being specially configured by Sperry.

**SPERRY LAUDED**— Based on citations submitted by 250 members of the Aviation Electronics Association (AEA), Sperry Flight Systems was awarded the annual Manufacturers' Award. Presented to the firm judged to have contributed most to the general aviation electronics industry, Sperry was cited "for the consistently high quality of its products, product support network and continued support of the AEA."

**WILCOX ELECTRIC'S** airborne electronics line has been acquired by Sperry Flight Systems. The line, primarily general aviation equipment formerly known as the *Grand Line*, will be produced in Phoenix. It will become part of Sperry's STARS line. Included are communications transceivers, navigation and marker beacon receivers, ATC transponders, distance measuring equipment and area navigation systems. Details regarding equipment warranties, service facilities and deliveries will soon be announced. Wilcox will continue to produce ground based airport and airways equipment.

**SPERRY F-15 VSD PRAISED**— In two recently published reports on the F-15 (AVIATION WEEK & SPACE TECHNOLOGY, March 25, 1974 and AIR FORCE, February 1974), Sperry's cathode ray tube Vertical Situation Display has been highly praised. "Easy to read"... "sharp, bright symbols"... were a few of the comments regarding the four-inch CRT, which displays target acquisition information. Sperry is also developing a larger CRT display for the B-1 and the YC-14. In addition, two Sperry CRT displays are being used in a Buffalo aircraft in NASA's STOLAND project. Another is being used aboard an Air Force C-141 in an all-weather landing test program.

**STARS FOR CASA 212 TRANSPORT**— Approximately \$800,000 worth of Sperry STARS avionics, including flight director systems, radio altimeters and RMIs, were ordered for CASA 212 transports.

**SHORT NOTES**— A brochure describing Sperry's new GH-14 four-inch panel-mounted gyro horizon has been published. Write MS-207A for your free copy... Sperry has opened a new product support center for the east coast in Fairfield, N.J.

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**Single point servicing minimizes turnaround time.**

Waist-high access and built-in self-test eliminate the need for complex ground equipment.

**The A-7 neutralizes targets in 1/3 the usual number of sorties.**

It makes the A-7 the most accurate and cost-effective tactical air weapon system in the world.



**VOUGHT  
SYSTEMS DIVISION**  
LTV AEROSPACE CORPORATION

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## ABOUT THE COVER



Shown are Gen. George S. Brown, who this month becomes the new Chairman of the Joint Chiefs of Staff, and Gen. David C. Jones, who replaces General Brown as USAF's Chief of Staff. The photo is by Bill Ford of the AIR FORCE Magazine staff.

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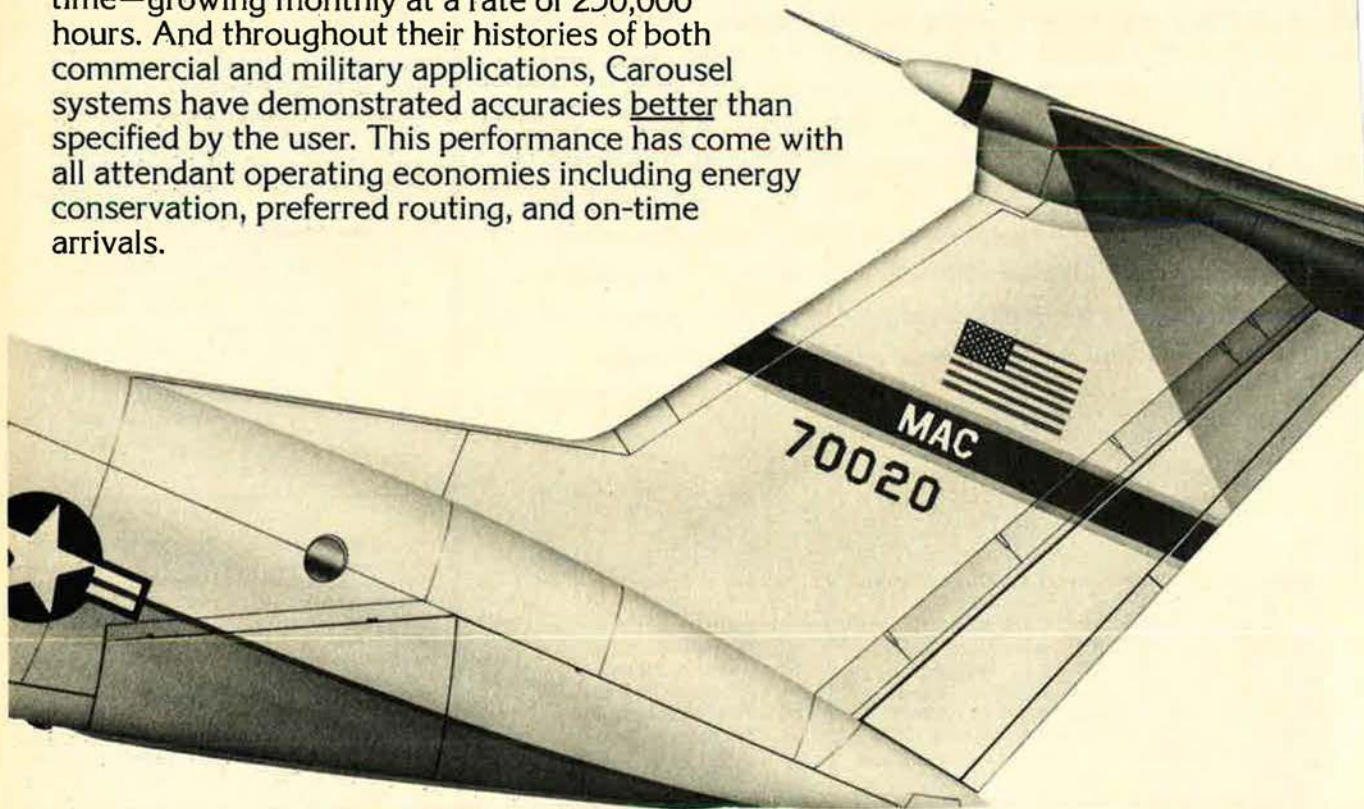
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# DEBUNKING DEFENSE MYTHS

By John L. Frisbee

EXECUTIVE EDITOR, AIR FORCE MAGAZINE

**T**HE debate over strategic forces, a subject that ought to be dealt with in cold logic, has generated more emotion than any other defense issue of recent times outside of the Vietnam War. Like all emotionally charged subjects, it has developed its own mythology. High in the pantheon of myths are two that invariably surface in any attack on US strategic defense policy, whether from Capitol Hill, the academic world, or the media.

The first myth is that the military always overestimates the threat to our security as a scare tactic to extort larger appropriations from the Congress.

The second is corollary to the first—namely, that US strategic forces, sized to match already overestimated opposing forces, touch off what former Secretary of Defense Robert S. McNamara labeled an “action-reaction phenomenon,” with the USSR increasing its forces to match ours, and so on ad infinitum.

Through more than a decade of constant repetition, these two myths have become endowed with something approaching the sanctity of natural law. Without always being able to document specifically our position, AIR FORCE Magazine has frequently questioned the validity of the myth of overestimation. And it always has seemed to us that if the “action-reaction phenomenon” has the inevitability attributed to it, it should work both ways. Its proponents generally apply it only to US actions that are said to trigger an arms race by stimulating a Soviet reaction. We can recall little talk of Soviet actions having a similar effect.

Now, Albert Wohlstetter of the University of Chicago has let most of the air out of these myths in a two-part article, “Is There a Strategic Arms Race?”, the first part of it appearing in the current issue of *Foreign Policy* magazine. A former member of the RAND Corp., Dr. Wohlstetter is a respected veteran in the field of defense studies.

Dr. Wohlstetter's article is based on recently declassified information contained in the annual Posture Statements presented to Congress by successive Secretaries of Defense from 1962 to 1972. He has compared each Posture Statement's estimate of the number of missiles and bombers the Soviets were expected to have five years in the future, against the numbers actually deployed when that time arrived.

The estimates all included a range, from a predicted low to a predicted high. Out of a total of fifty-one estimates covering Soviet ICBMs, SLBMs, heavy bombers, and medium bombers, the low end of the range of estimates *never* exceeded the actual levels deployed by the USSR five years later. The mean between low and high estimates exceeded actual Soviet numbers only

*twice in fifty-one times*, and the high estimate surpassed actuality only *nine* times. For ICBMs alone, the low- and mid-range estimates *never* exceeded actual Soviet strength, and the high level was too high just *twice* in *eleven* years. This record clearly refutes charges that the military overestimates the threat for self-serving reasons.

How explain the consistent underestimation of future Soviet strategic capabilities? Dr. Wohlstetter thinks it was in part a reaction to the one gross overestimate of Soviet potential at the time of the “missile gap” of 1960–61, and in part the result of a misreading of Soviet intentions, based on the belief that their concept of deterrence is a mirror image of our own.

From his study of military history, Dr. Wohlstetter further concludes that the action-reaction phenomenon which “has an aura of mechanical inevitability . . . is simply a portentous tautology.” In real life, inaction by one side can just as well lead to action by the other (We give as our own example the US decision to reduce our bomber force and hold the ICBM force to 1,054 missiles, which apparently encouraged the USSR to go all out for strategic superiority.) Equally plausible, action (or anticipated action) by one side can lead to inaction by the other in an action-inaction sequence. This sequence, Dr. Wohlstetter says, “was McNamara's chief argument against undertaking a thick ABM defense.” In short, Mr. McNamara believed that an anticipated buildup of the Soviet missile force would make our proposed ABM defense ineffective, and do so at a relatively low cost to the USSR. Thus did the discoverer of the “inevitable” action-reaction phenomenon demonstrate his intellectual agility.

Widespread public acceptance of the myths that Dr. Wohlstetter has exposed no doubt has been a prime factor in the decline of US military power in relation to that of the USSR. Certainly a further reduction of this country's relative military strength, based on continued repetition of these myths, would be a good deal more than merely unwise. It would be downright foolhardy.

Albert Wohlstetter has demonstrated conclusively that the military has *not* overestimated Soviet strategic force levels for selfish purposes. And he argues convincingly that maintaining a level of military strength appropriate to the threat *does not* lead inevitably to an arms race through a mythical action-reaction process.

These truths call for wide circulation as an antidote to what Dr. Wohlstetter calls “a kind of naïve cynicism” on the part of the public. Thanks to him, the ammunition that can shoot down two dangerous myths is now at hand. Let's use it. ■



# Wherever disaster strikes, Hercules can strike back.

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and down its rear loading ramp, without the need of ground-handling equipment.

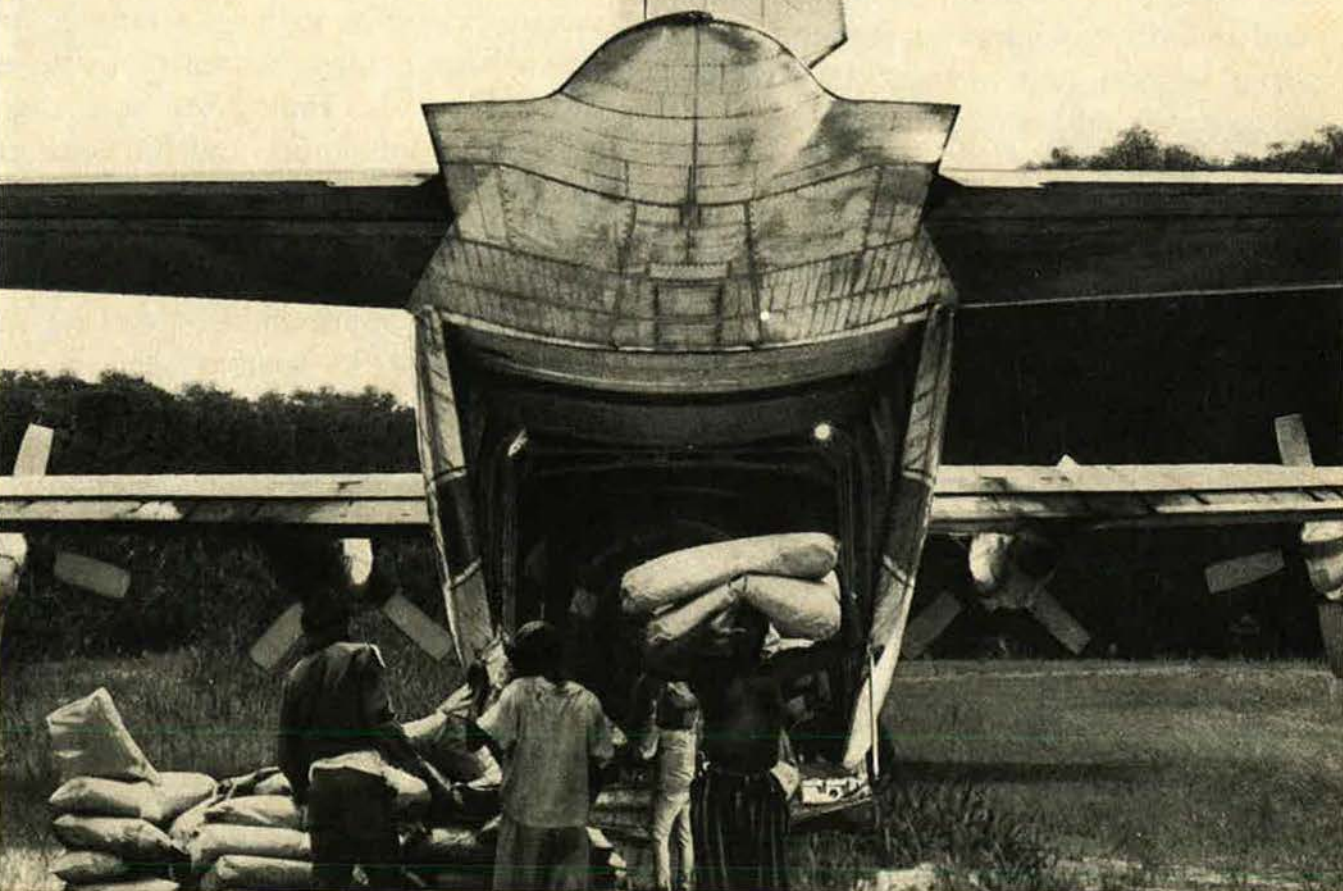
Hercules has been all over the world helping to save lives. It's brought vaccine to fight epidemics, insecticide to fight locusts, iron lungs to fight polio. It's landed on snow, ice, sand and mud.

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## Lockheed-Georgia

A Division of Lockheed Aircraft Corporation  
Marietta, Georgia



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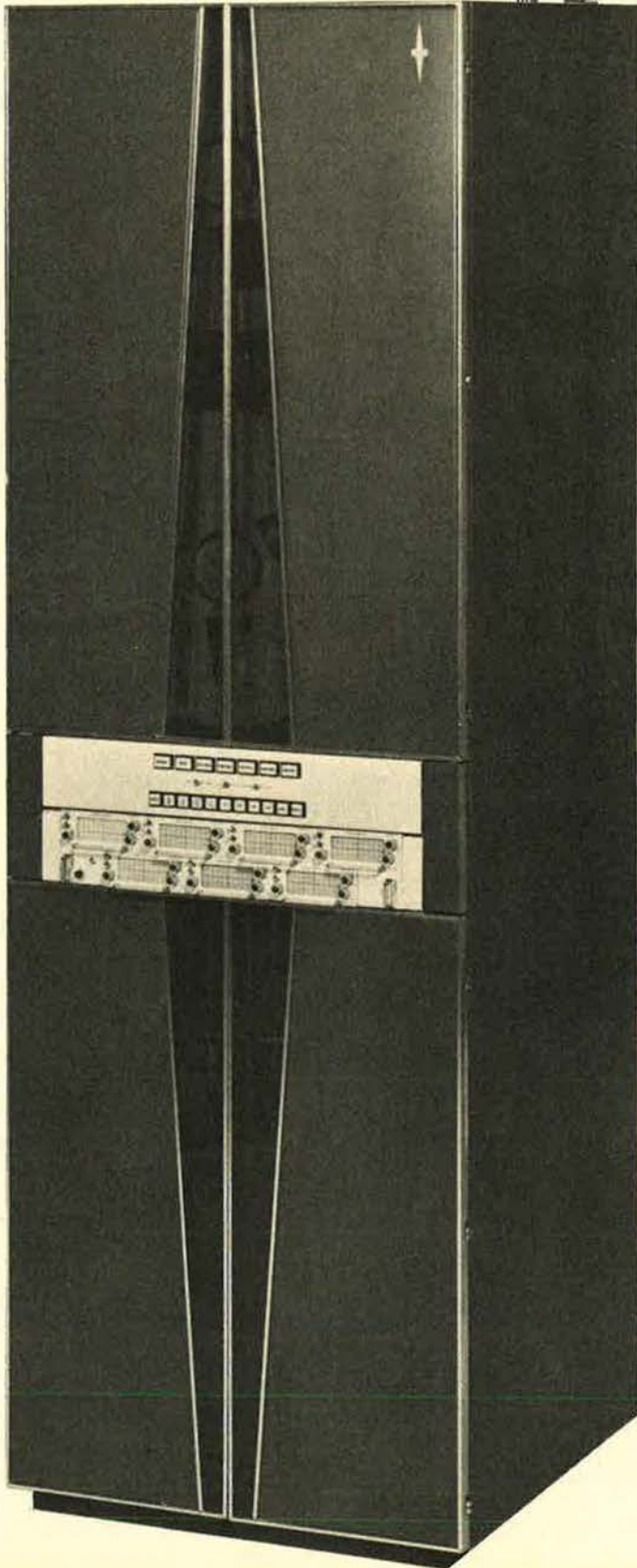
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## Cheers—and a Few Glitches

*Gentlemen:* Congratulations. Your 1974 Almanac issue manages to be an improvement on the superb 1973 version, which has been a constant desktop companion to all of the writers and editors on our staff for the past year. You truly do a service to anyone who has occasion to write about the Air Force!

Maj. John T. Correll  
Editor, AIRMAN Magazine  
Bolling AFB, D. C.

*Gentlemen:* Congratulations on the Almanac issue!

Those facts and figures in the back section are a real gold mine for us in the Information business.

As with all such compendiums of information, however, a few small glitches creep in—as with the program office telephone numbers for AWACS and AABNCP on page 159. The AWACS number should be 271-2711 and the AABNCP 271-2304. Someone misled you with an old number on the first one, and the AUTOVON number on the other.

John T. O'Brien  
Chief, Public Information Div., IO  
Hq., 3245th Air Base Group (AFSC)  
Laurence G. Hanscom Field, Mass.

*Gentlemen:* Just got your May issue and have very much enjoyed it. The data coverage is excellent—and accurate.

One comment for cartoonist Bob Stevens. The last caption, on the XB-42, is somewhat inaccurate. He might be interested in knowing that only one airplane was "pranged." The prototype survived the flight test program and was donated to the Smithsonian Institution. It is now in storage at Silver Hill, Md.

Jay Miller, Curator  
History of Aviation Collection  
The University of Texas  
Austin, Tex.

*Bob Stevens replies:* Since my source, *U.S. Bombers, B-1-B-70*, by Lloyd S. Jones (Aero Publishers, 1962), states "... the original two examples (XB-42) were the only ones built. Both eventually crashed," I can only assume that one of them crashed into the Smithsonian.

*Gentlemen:* Congratulations to you and your staff on another great Almanac issue!

This is an extremely useful reference document which I expect will become as dog-eared from constant use as your previous Almanac issues have. The entire issue is crammed with interesting, relevant information, and we are especially pleased with the articles on Air Training Command and the USAF Recruiting Service.

A typographical error in the ATC article may cause some misunderstanding. . . . In describing ATC's flying safety rate of 1.3 per 100,000 flying hours, a couple of 00s were dropped, making this outstanding rate appear to be a totally unacceptable rate of 1.3 per 1,000 hours. Most of your readers will readily understand that it was a typo, but I did want to set the record straight. . . .

Col. H. J. Dalton, Jr.  
Director of Information  
Hq., Air Training Command  
Randolph AFB, Tex.

*Gentlemen:* I wish to commend you and your literary staff for the fully informative AIR FORCE Almanac, May 1974.

The issue contained more information pertaining to Air Force activities, and more information pertaining to personnel aspects of our past and present service interests than is contained in any half dozen other publications.

I was especially pleased with your article on the Wayward Press and the slanted, biased, and distorted presentation of national news.

As the father of a missing Air Force pilot, I was also deeply interested in your MIA/POW Action Report. There have been so many reports of men actually being held prisoner at one time, but never returned or accounted for, that pressure must be continuously applied to try to force Hanoi and the Pathet Lao to supply information that they undoubtedly have.

I am enclosing a brochure describing the dedication of the Edward H. White II Space Science and Technology Collection at West

Point on May 31, 1974. After the accident at Cape Kennedy on January 27, 1967, memorial contributions of almost \$10,000 sent to the West Point Fund made the literary collection possible.

Maj. Gen. Edward H. White,  
USAF (Ret.)  
St. Petersburg, Fla.

• *General White's son, Air Force Capt. James B. White, was listed as missing in action on November 24, 1969. His status was recently changed to presumed killed. General White's son, Edward, died in the 1967 Apollo fire along with fellow Astronauts Virgil Grissom and Roger Chaffee. General White is a member of the board of directors of the National League of Families of American Prisoners and Missing in Southeast Asia.*—THE EDITORS

*Gentlemen:* Reading the May 1974 AIR FORCE Almanac, I came across a discrepancy on page 82. A short biog of Gen. John C. Meyer tells of being one of the leading aces with 37½ victories in the air or on the ground.

Reading this, I didn't recall any American ace being close to Major Bong or Major McGuire with 40 and 38 victories, respectively, except Colonel Gabreski, with 28 victories, with a total for [two] wars of almost 35 victories.

Reading your magazine further, I came to page 146, which has all American aces of all wars and combined wars. This, then, affirms my conviction of General Meyer with a total of 26 confirmed victories.

I believe a correction should be printed in your next available issue.

Michael D. Piccola, Pres.  
WW II Classic Models, Inc.  
Wantagh, N. Y.

• *The biog of General Meyer specified that his victories were "In the air or on the ground." Eighth Air Force was the only command in WW II that credited ground kills. In compiling statistics, the Albert F. Simpson Historical Research Center at Maxwell AFB, Ala., thus far has used only WW II air-to-air victories, hence the total of 26 in*

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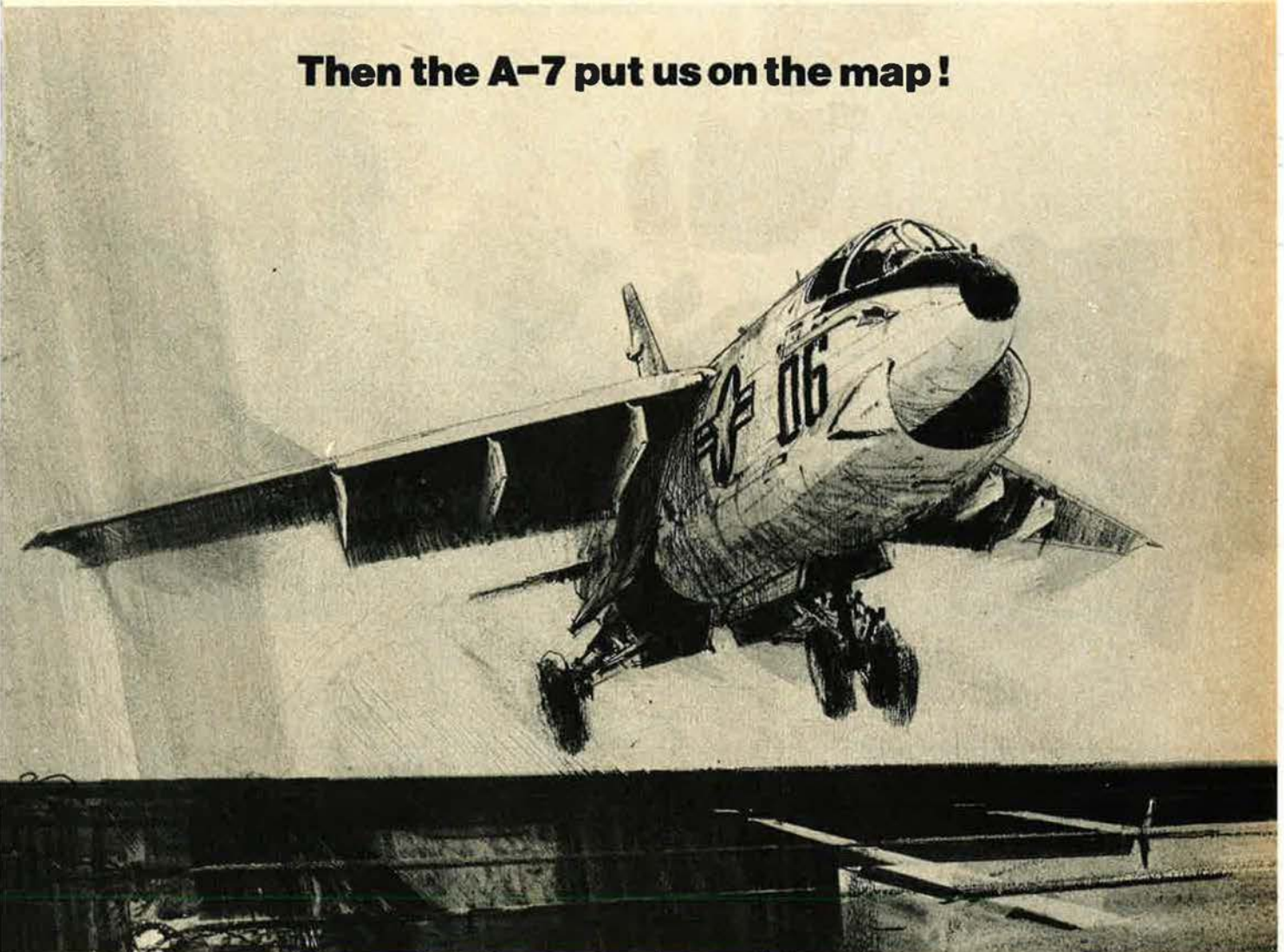
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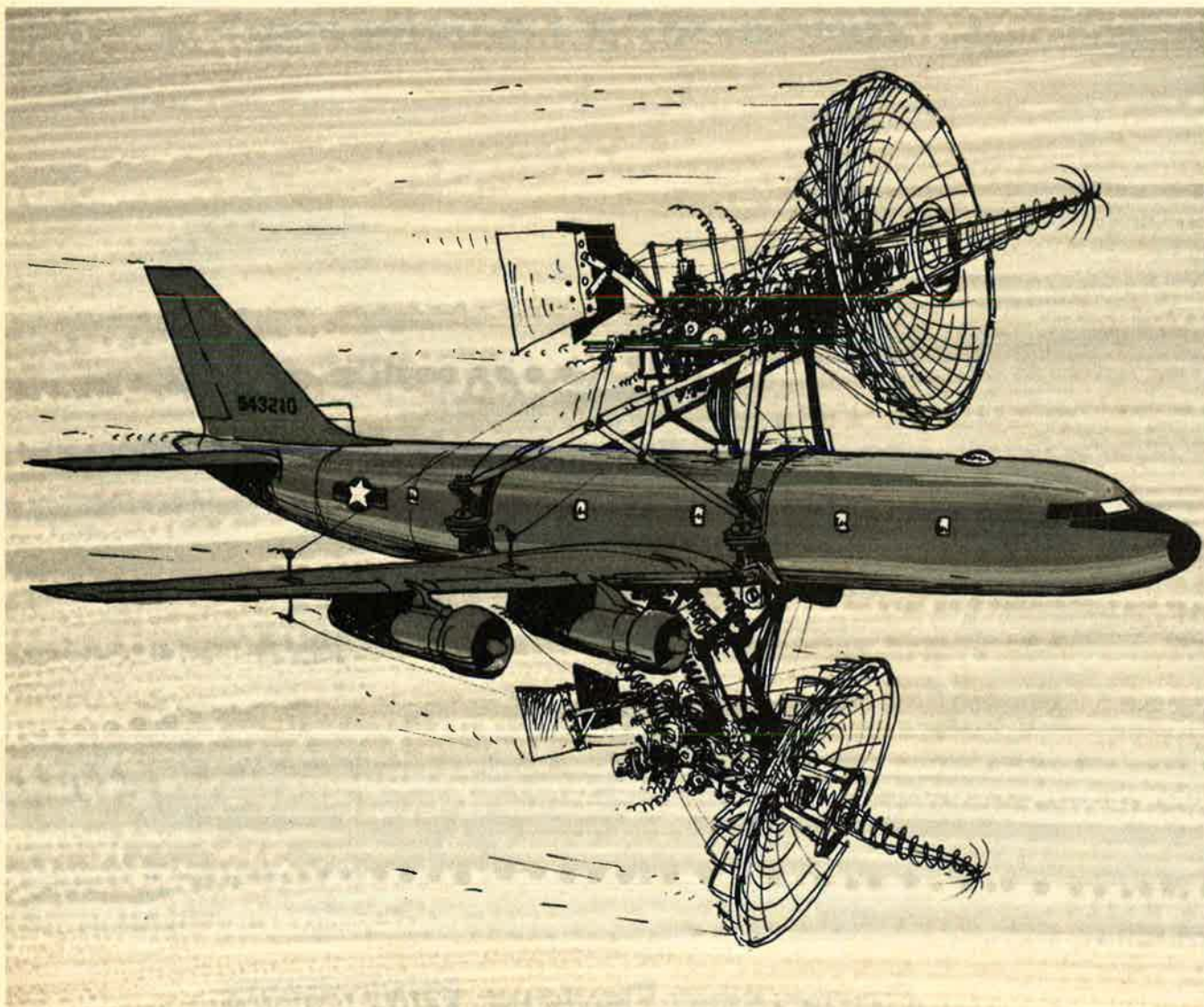


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## Solve your satellite communications problems without fancy antennas.



## Airmail

"Guide to Aces." With continued research into WW II records, these scores are still subject to change, as for example, Colonel Gabreski's, which was dropped from 31 WW II kills in our 1973 listing to 28 in '74, for an overall 34.5 accumulated in two wars.—THE EDITORS

### TWO WW Squadrons

*Gentlemen:* The Thud articles in the April issue were outstanding. Everyone who has flown the F-105 must have flocked to your magazine like moths to a flame; Republic iron carries a lot of fond memories. However, there has been a slight omission in Captain Carson's Reserve 105 article concerning active-duty F-105 squadrons.

There are two F-105G Wild Weasel squadrons: The 561st TFS at George AFB, Calif., and the 17th Wild Weasel Squadron (WWS), formerly the 6010th WWS, at Korat RTAFB, Thailand. The 17th WWS owns the last Thuds in Southeast Asia; and they still roar off of Korat's runway 06 heading for Peach Anchor, and they still talk to Invert Control. . . . The jungles of SEA still echo with the boom of the 105 afterburner. Check six!

Capt. Leo G. Miller, Jr.  
APO San Francisco

• Thank you for pointing out this oversight. We were informed that the 17th TFS was now operating as a detachment of the 561st TFS. We are glad the 17th is alive and well. To you and the Weasels of the 17th—good hunting.—THE EDITORS

### Military Pay

*Gentlemen:* . . . Everyone—the Congress, civilians, retired servicemen's groups—has some position on military compensation. It's an agonizingly complicated subject, involving not just pay and allowances, but the way each interested party perceives them. This difference in viewpoint will, of course, result in a bitter, political dictum unless DoD moves to overhaul the entire system—instead of its reluctant and piecemeal approach so far. . . .

Many have suggested combining the present basic pay, BAS and BAQ into a single, taxable base pay. This makes sense. It should

simplify bookkeeping for everybody, as well as calm critics who see the multitude of allowances as gimmicks to pay military people more without collecting taxes (perhaps a noble thought when servicemen were seriously underpaid, but hard to explain today).

On the other hand, combining everything into a single pay raises the specter of huge retirement bills later. I question this concern. Roughly figuring, if no more than one enlistee out of four completed a thirty-year career—are we doing that well now?—the increase in taxes collected would offset the added money to retirees. Actuaries can work out the exact numbers, but there appears little reason to fear fiscal collapse on this account.

If government accepts the single-pay proposal, other problems move out of the "unsolvable" basket.

Military housing has been a particularly controversial topic, especially for younger enlisted men. For every person who likes government quarters, there are many more who abhor the restrictive, second-class feeling too prevalent in base living. Certainly, these personal annoyances are gradually being removed; but another more direct inequity remains. There is no relationship between what a person gives up (in BAQ) and the quality of his quarters.

Giving everyone the choice of where to live frees the government of this artificial constraint. On-base "rent" can be based on local rates for comparable civilian apartments and houses, with limits, say, between fifteen and twenty percent of base pay. To promote full occupancy, utilities should still be furnished without charge and, perhaps, rents reduced to "equalize" property taxes. Would this help? I think so.

The same rationale can be applied to another problem: BAS and dining-hall attendance. By giving people their choice of where to eat, food-service managers are free to streamline and be far more innovative in their operations. At the minimum, dining facilities should be available to on-duty personnel; anything beyond that depends on the requirements of the location and the manager's aspirations.

These ideas are nothing new. I don't know if they're feasible. What I'm saying is that we make our feelings known and quit griping—and DoD get moving. Sound sugges-

tions abound. Somebody has to put them together in a way that's fair to service people and acceptable to the Congress. Time's a-wasting.

Maj. John F. Takeuchi  
FPO San Francisco

### Building His Own

*Gentlemen:* I am trying to reconstruct a Spitfire fighter aircraft and am experiencing much difficulty in obtaining parts, information, etc. I have obtained a Merlin engine (Mk II) from a local scrap yard and will shortly receive a Workshop Manual from England. If any readers can assist in any way with my project, it will be very much appreciated.

R. B. O. Hellyer, Esq.  
3 Jagersfontein Laan  
Oranjezicht 8001  
Cape Town, South Africa

### F-101 Series

*Gentlemen:* I am doing a work-up on the McDonnell F-101 Series fighters for future publication.

If any readers could contribute articles, clippings, photos, slides, negatives, or other memorabilia connected with the F-101 or XF-88 program, it would be greatly appreciated. Any items will be handled with the utmost care and returned as quickly as possible.

Dennis E. Kelsey  
Rt. 1, Box 356  
Lind, Wash. 99341

### Phantom Stories

*Gentlemen:* Two publishers, one in the UK, the other in the US, jointly want me to do a book called *The Phantom at War*. I'd love to hear from anyone who knows some good stories and pictures about the F-4 or RF-4 Phantom in action in Vietnam or Israel. Photos will be taken care of and returned.

William T. Gunston  
Foxbreak  
Courts Mount Road  
Haslemere, Surrey, England

### Memorabilia for CAF

*Gentlemen:* Last year I visited the aircraft and museum of the Confederate Air Force at Harlingen, Tex. While they have a fantastic collection of flying WW II aircraft and an interesting display of WW II uniforms, equipment, photographs, etc., they have only a bare handful of military decorations, medals, wings, and other appropriate badges.

As a member of AFA and a collector of military medals, I volun-

## Airmail

teered to assist the CAF develop an instructive collection of WW II era medals and insignia of the US military services. Col. Jethro E. Culpeper, Commander, and Col. R. S. Weber, General Manager, have authorized me to remind prospective donors that gifts are 100% tax deductible and may be spread over a five-year period as gifts to a nonprofit educational public foundation.

To preclude duplicate gifts, it was suggested that I coordinate donations. The CAF needs most Army, Navy, Marine, and Coast Guard decorations, service medals, Good Conduct Medals, wings, badges, etc. All items accepted will be identified by the name of the generous donor.

Please advise me by mail of your proposed donation, but please do not send anything until I sort out duplicate offers.

Col. Glenn A. McConnell,  
USAF (Ret.)

1545 Carla Ridge  
Beverly Hills, Calif. 90210

### Unusual C-130s

*Gentlemen:* I'm in the formative stages of a book on the C-130—not just the aircraft, but the markings and camouflage patterns applied to it over the past nineteen years. If anyone has slides or photos of unusually marked or painted C-130s (such as RC-130B, Serial 58-711, which was operated by the 556th Recon Squadron at Yokota, in an overall gloss yellow finish! Anyone take a picture of it?), please contact me.

David W. Davenport  
Lot 91C  
Franks' Mobile Home Park  
Spring Lake, N. C. 28390

## UNIT REUNIONS

### Air Weather Service

Retired ex-Air Weather Service officers in the central California area plan to get together in Sacramento, Calif., in October 1974. Contact

Lt. Col. Milton H. Sipple, Jr.,  
USAF (Ret.)  
2589 Dumbarton Ave.  
San Jose, Calif. 95124

### CBI Hump Pilots Association

The China-Burma-India Hump Pilots Association is holding its reunion August 15-18 at the Arlington Hotel, Hot Springs National Park, Ark. Further details from

Mrs. Jan Thies, Exec. Secretary  
917 Pine Blvd.  
Poplar Bluff, Mo. 63901  
Phone: (314) 785-2420

### B-17 Types

The Martin Provisional Group Association is attempting to locate former members. The reunion agreed upon in July 1943 will be held August 9-11, in Dayton, Ohio. Lt. Gen. Glen Martin will be present. For details contact

Malcolm "Kip" Breeze, Pres.  
1511 Iowa Pl.  
Orlando, Fla. 32803

### 22d Bomb Group

The 25th reunion of the 22d Bomb Group will be held July 25-27, at the San Francisco Hilton Hotel. All associated and support units that were our neighbors throughout the Pacific campaign are invited. We'll be planning our Sydney, Australia, group flight back to visit all the old familiar places. Bring your family, too. And don't forget your picture albums and camera. Contact

Walt Gaylor  
105 Grove St.  
Oakland, N. J. 07436  
or  
Verne Shrewsbury  
15747 Paseo Largavista  
San Lorenzo, Calif. 94580

### 49th Fighter Group

The 27th reunion of the 49th Fighter Group will be held in Harlingen, Tex., July 18-20. Get in touch with

James F. Hyde, Sr.  
Rt. 1, Box 173  
Pottsboro, Tex. 75076

### 36th Fighter Group

The 36th Fighter Group (P-47 Thunderbolts) will hold a reunion in Harlingen, Tex., October 25-27. Contact

Bill Holyfield  
Rt. 4, Box 475  
Mobile, Ala. 36609

### 32d Bomb Sqdn. (H)

The 32d Bomb Squadron (H), 301st Bomb Group (H), will hold its 4th reunion at the Ramada Inn, Milwaukee, Wis., August 1-3. Contact

Clyde J. Yoder  
2131 E. Vista Way  
Vista, Calif. 92083  
Phone: (714) 724-3243  
or  
Ramada Inn  
633 W. Michigan St.  
Milwaukee, Wis. 53203  
Phone: (414) 272-8410, Ext. 109

### Class 45-5B

Class 45-5B, 6th BAA, will hold a reunion August 16-18, in Cleveland, Ohio.

All Childress graduates, in fact all bombardiers, welcome. Please contact  
Arnold Roth, Chairman  
1123 Terminal Tower  
Cleveland, Ohio 44113

Phone: (216) 241-0700 (day)

or

Bill Burmester, BAA Pres.  
485 E. Lincoln Ave.  
Mt. Vernon, N. Y. 10552

Phone: (914) 345-2800 (day)

### 58th Bomb Wing

The 58th Bomb Wing, 20th Air Force, consisting of the 40th, 444th, 462d, and 468th Bomb Groups, will hold their 30th-year reunion in Salina, Kan., August 7-11, at the Hilton Inn. Details may be obtained from

Adrain A. Thomas  
Ludell, Kan. 67744

### 91st Bomb Group (H)

The 91st Bomb Group (H) Memorial Association, Inc., will hold a Western Division Rally-Round September 6-8, in Fresno, Calif. For further information contact

MSgt. George W. Parks, USAF (Ret.)  
109 Wilshire Ave.  
Vallejo, Calif. 94590

### 94th Troop Carrier Sqdn.

The WW II 94th Troop Carrier Squadron, 439th TC Group, will hold its second reunion August 14-17, at the Raintree Inn, Colorado Springs, Colo. For program details and further information write or call

Lt. Col. Adam Parsons, USAF (Ret.)  
44 N. Highland Ave.  
Akron, Ohio 44303

Phone: (216) 535-8332 (night)  
(216) 376-7141 (day)

### 369th Fighter Squadron

A reunion of the 369th Fighter Squadron, WW II, is being held August 10-11, at the Holiday Inn, Findlay, Ohio. Contact points

Floyd Myers  
Rte. #1  
Leipsic, Ohio 45856  
or  
Tony Chardella  
105 Mohawk Trail Dr.  
Pittsburgh, Pa. 15235

### 432d Bomb Group

The 7th reunion of the 432d Bomb Group is being held at Hyatt Lodge, Minneapolis, Minn., August 13-15. Contact

Joe Amon  
3045 Woodlark Lane  
St. Paul, Minn. 55121

### 464th Bomb Group

A reunion of the 464th Bomb Group, 15th Air Force, based in Italy during WW II, will be held in Asheville, N. C., August 9-11. For further information write

H. Robert Anderson  
4321 Miller Ave.  
Erie, Pa. 16509



# For the jobs that need to be done... the engines to do the job.



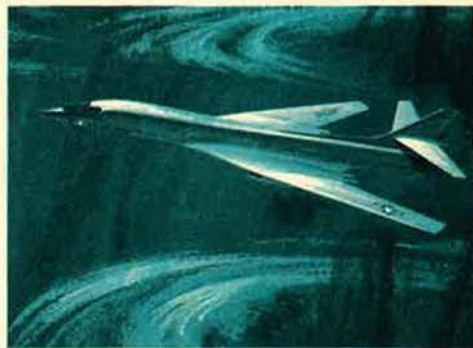
The jobs to be done in free world defense are tough. And getting tougher. Aircraft engine requirements have never been so diverse, or so specialized. The standards of performance not only call for reliability and maintainability. . . but survivability as well. And each aircraft must have the speed, tactical maneuvering, and range for the mission to be completed. General Electric is building the engines that will meet these needs for a number of different aircraft.

## **The TF34**

The Fairchild A-10, designed to fill the Air Force's vital close support role will be powered by the General Electric TF34. The TF34's low fuel consumption increases loiter time in the mission area, and gives rapid acceleration for support flexibility.

## **The F101**

The USAF B-1 strategic aircraft is the first such program since the mid '50's. So its four advanced technology GE F101 augmented turbofan engines were designed to provide the B-1 with Mach 2 speed, greater payloads, and an improved range over today's intercontinental system.



## **The J101**

The lightweight air superiority fighter's environment demands the utmost in maneuverability and response. Its engines must be capable of prompt, rapid acceleration. For the USAF YF-17, General Electric's J101 turbojet is that engine. Responsive. And survivable, with reduced detection factors through low smoke and noise levels.

These are the jobs that have to be done.

And General Electric is building the engines to do the job.



GENERAL  ELECTRIC

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**Cost-consciousness** is no modern phenomenon. Washington's drillmasters faced the money crunch. They still forged a fighting army out of winter-torn veterans in the snows of '77. We have always managed, somehow, to stretch the money to cover the commitments. Today, we're still coping with programs under the restraints of tight money. We still need all the resourcefulness we can muster.

In tight-money areas, one direction we can look to is off-the-shelf compatibility, to help ensure a modern, effective fighting force. Here, SPERRY UNIVAC's family of 16-bit computers is a working example.



**Off-the-shelf compatibility** comes in three forms: the AN/UYK-20, the UNIVAC 1816, and the AN/UYK-15. The small-scale computer family from SPERRY UNIVAC. With third-generation architecture, exceptionally fast cycle and response times, and proven reliability, they're available now. Not paper ideas. Not breadboards. But ready-to-go equipment that can work together in tactical applications. This is interoperability: computers compatible with one another, compatible with hardware already in government inventories. Only minor program changes are required for complete software compatibility.

on time, on target



**One basic purpose:** to provide operating and support forces with the tools to do the job. The rugged AN/UYK-15 is designed to meet MIL E 16400 as well as MIL Standard 110 B. The AN/UYK-20, similar to the AN/UYK-15, includes the addition of powerful micro-program control capabilities, for meeting other requirements more accurately. The UNIVAC 1816 is designed and constructed to meet the stringent requirements of MIL E 5400, for airborne applications. Hard-wearing, super-maintainable computers that work on-line wherever they're stationed: aircraft, shipboard, land-mobile, or dug-in. Already in inventory. Everything is put together with technology that assures easy-fix, low-to-no downtimes.



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**Cost-effective?** You bet it is. Here's an interoperable system already in inventory. Front-line components are air-, sea-, and land-mobile. Other components and programs allow low-cost pre-deployment capabilities. It's a system that can help simplify command and logistics problems, and it's off-the-shelf ready. And most important—it works. It's an outstanding example of SPERRY UNIVAC's application of digital technology. On time, on target. For more on the interoperability story, write or call: Vice-President of Marketing, Sperry Univac Defense Systems Division, Univac Park, St. Paul, Minnesota 55165. (612) 647-4500.

SPERRY  UNIVAC

# Airpower in the News

By Claude Witze

SENIOR EDITOR, AIR FORCE MAGAZINE

## It's the Vote That Counts

Washington, D. C., June 3

The Senate is scheduled to start debate today on the Fiscal 1975 bill to authorize appropriations for military procurement and research and development. The measure was passed by the House, 358 to 37, less than two weeks ago. The House figure is \$22.6 billion.

In the lower chamber, Pentagon spending critics tried hard to chop more than \$1 billion off the bill, but were turned back by decisive margins. Even Rep. Les Aspin of Wisconsin, the man who can't understand why many Americans are apprehensive about Russian military intentions, did not prevail in an effort to impose a slash of \$733.1 million. He lost, 209 to 185. A year ago he did prevail, winning approval of a \$950 million cut in the Fiscal 1974 authorization. The House accepted it, but it was killed in conference with the Senate.

Because the antidefense camp lost by such a wide margin and on such varied issues, the votes should be in our record:

- An amendment to cut the Trident missile submarine program by \$466.8 million and to slow produc-

tion from two to one a year, proposed by Rep. Robert L. Leggett of California. Defeated on a voice vote.

- An amendment to delete \$499 million, terminating development of the B-1 bomber, offered by Rep. Otis Pike of New York. Defeated, 309 to 94.

- An amendment to delete all R&D funding for the achievement of improved guidance and warheads to enhance ICBM counterforce capability, proposed by Rep. Bella Abzug of New York. Defeated, 370 to 34.

- An amendment to put a ceiling of 293,000 men on US troops overseas and cut overall active-duty strength to 1,951,230, proposed by Rep. Ronald V. Dellums of California. Defeated on a voice vote.

- An amendment to the Dellums amendment, changing the reduction overseas from 198,100 to 100,000 offered by Rep. Thomas P. O'Neill, Jr., of Massachusetts. Defeated, 240 to 163.

- An amendment cutting aid for South Vietnam from \$1.4 billion to \$900 million, offered by Rep. Leggett. It was passed, on a voice vote, but only after Rep. F. Edward Hébert, Chairman of the Armed Services Committee, amended it with a compromise figure of \$1.126 billion. An effort by Mr. Leggett to substitute \$1 billion was turned down, 211 to 190.

While the Senate is arguing these and other issues as we go to press, it will start with these recommendations from the Senate Armed Services Committee:

- Approval of the Trident submarine program, except for deletion of \$15 million not needed at this time.

- Approval of development of the B-1 bomber, except for a cut of \$44 million from the \$499 million requested, limiting the program to three prototypes.

- Approval of the R&D authorization of \$77 million to improve the yield and accuracy of ICBMs. In this action, the Armed Services Committee reversed its own subcommittee on R&D, which had agreed with the Abzug amendment, as defeated in the House.

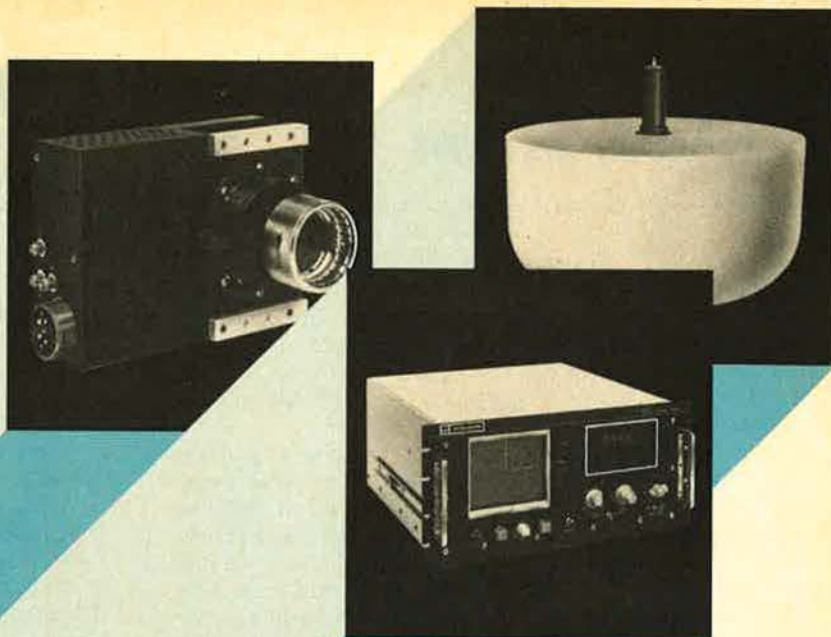
- Approval of \$900 million in aid for South Vietnam, the figure first suggested in the House by Representative Leggett. A compromise of at least \$1 billion is likely.

As the Senate prepares to act, the rout of anti-military forces appears nearly complete. Their attack was led, to a large extent, by Democrats from the camp of Sen. George S. McGovern, whose proposed \$30 billion cut in the defense budget contributed to his own defeat in the presidential race of 1972.

This year, Mr. McGovern claimed authorship, with Rep. John F. Seiberling of Ohio, of a report on the USAF B-1 bomber program, prepared for the Members of Congress for Peace Through Law. It is an attack on the concept of the B-1, arguing that much of the case is implausible, that the B-52 will suffice, and that there is no urgency at this time.

### House-Passed Authorizations

	Administration Request	House-Passed Authorization
<b>Procurement:</b>		
Aircraft		
Army	\$ 339,500,000	\$ 335,000,000
Navy and Marine Corps	2,960,600,000	2,964,100,000
Air Force	3,496,600,000	3,391,400,000
Total aircraft	\$ 6,796,700,000	\$ 6,690,500,000
Missiles		
Army	459,200,000	439,400,000
Navy	620,600,000	620,600,000
Marine Corps	76,000,000	76,000,000
Air Force	1,610,800,000	1,610,800,000
Total, missiles	\$ 2,766,600,000	\$ 2,746,800,000
Naval vessels	3,562,600,000	3,539,100,000
Tracked combat vehicles		
Army	331,900,000	321,200,000
Marine Corps	80,100,000	74,200,000
Total, tracked combat vehicles	\$ 412,000,000	\$ 395,400,000
Torpedoes, Navy	187,700,000	187,700,000
Other weapons		
Army	53,400,000	55,700,000
Navy	25,600,000	25,600,000
Marine Corps	500,000	500,000
Total, other weapons	\$ 79,500,000	\$ 81,800,000
<b>Total procurement</b>	<b>\$13,805,100,000</b>	<b>\$13,641,300,000</b>
<b>Research and Development:</b>		
Army	1,985,976,000	1,878,397,000
Navy	3,264,503,000	3,153,006,000
Air Force	3,518,880,000	3,459,760,000
Defense agencies	555,700,000	510,500,000
Total, research and development	\$ 9,325,039,000	\$ 9,001,663,000
<b>GRAND TOTAL</b>	<b>\$23,130,139,000</b>	<b>\$22,642,963,000</b>



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*\*In aircraft fitted with the APA-69/TG-8 or TG-50, the pedestal may be installed without modifications.*



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## Airpower in the News

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The McGovern-Seiberling paper is being circulated to all Members of Congress for Peace Through Law "for their use and individual endorsement." The organization shrouds itself in some secrecy. It has refused to disclose its roster of members, even to the Library of Congress.

Less clandestine in its attacks on defense is another outfit called Project on Budget Priorities. This organization can be described as a Department of Defense in Exile, led by Paul C. Warnke. Mr. Warnke became General Counsel of the Defense Department in the administration of Robert S. McNamara, and later was Assistant Secretary of Defense for International Security Affairs under both Mr. McNamara and Clark Clifford. He now is associated with Mr. Clifford in a Washington law firm, from where he served George McGovern as vice chairman of the Senator's Panel on National Security in the 1972 campaign.

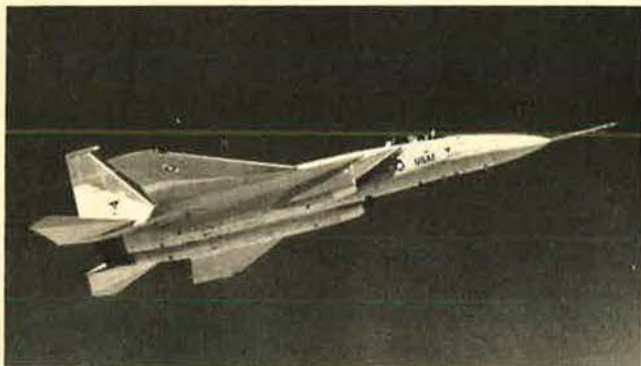
In the Project on Budget Priorities, Mr. Warnke is cast in the role of "convener" of a panel of twenty men who served in the Kennedy and Johnson Administrations, while the war in Vietnam started and escalated.

Mr. Warnke, whose own record includes chairmanship of the Department of Defense Prisoner of War Policy Committee in the years when the POW outlook remained hopeless, was called last week to testify before Sen. John L. McClellan and his subcommittee on Appropriations.

It was less than a week after the House turned a deaf ear to the Project on Budget Priorities, but Mr. McClellan listened as Mr. Warnke talked about his group's Report to Congress on Military Policy and Budget Priorities.

This document, a thirty-two-page booklet that urges an \$11 billion cut in the Fiscal 1975 defense budget request, accuses the Administration of distorting its figures. The report charges there is an actual increase of \$13 billion—not \$5 billion—in the requests for Fiscal 1975.

In his appearance before the McClellan subcom-



*The McDonnell Douglas F-15, USAF's new air-superiority fighter, won plaudits from Paul C. Warnke in testimony on Capitol Hill. He said the aircraft is cost-effective.*

mittee, Mr. Warnke called his proposed cut in defense "modest." Almost immediately, the chairman asked whether the Project on Budget Priorities would support the same approach, a cut based on the Fiscal 1974 expenditures, to the funding requested for other segments of the federal budget, such as social programs. His reply was yes, but the requests for defense are easier to control. The social programs, and Mr. Warnke specifically mentioned Social Security, were characterized by the witness as "insurance." Chairman McClellan said he also looked upon defense as insurance. The witness accused Congress of favoring the Pentagon in its deliberations about the budget, implying that the committee is subservient to the military. The chairman replied that the committee is not subservient, but also cannot avoid relying on the military for military expertise.

Mr. Warnke then accused the Defense Department of preparing for the wrong type of war, and suggested Congress should give better guidance in the area of foreign policy, which has to be backed up by military capability. There was no argument with this, but when Mr. Warnke called for an immediate halt to the Navy's F-14 fighter aircraft program, he was challenged. He said the aircraft is not cost-effective, but USAF's F-15 is cost-effective.

When it was pointed out that Iran is preparing to buy the F-14, the witness said that is Iran's mistake. The chairman recalled that when Mr. Warnke worked in the Pentagon, he appeared before Congress to plead for funding for the Navy's F-111B, a McNamara-regime project that was halted by Capitol Hill's refusal to provide the money. Mr. Warnke said Congress did the right thing in that case and that he had been in error.

The witness expressed the opinion that the drive for new technology in weapon systems far exceeds the need for new technology and cited the Trident missile submarine system as an example. He said the Trident will not add to America's security five years from now. This was followed by a statement that USAF's B-1 bomber should be canceled. Mr. Warnke said the "time of the B-1 probably never will come," because of the improved lethality of surface-to-air missiles.

It is Mr. Warnke's opinion that American concern about Soviet Russia as a military threat is concern about an "unreal risk." He sees no possibility of a



*Grumman's F-14, the fighter designed for the Navy and for possible sale to Iran, was denounced by the Project on Budget Priorities, which urged Congress to cancel it.*



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Northrop Corporation, 1800 Century Park East, Los Angeles, California 90067, U.S.A.

# NORTHROP

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## Airpower in the News

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clash between the powers and holds that the simple proliferation of nuclear weapons and the possibility they may be used by terrorists are the major threats. Chairman McClellan did not argue the point; he simply declared that it is Russia that makes us apprehensive.

The witness said the only military obligations of the United States today are to its NATO allies and Japan. He sees no other potential war area, and that includes

the Middle East. He favors neutralization of the Indian Ocean, where the Russians are increasing their naval activity, and cannot conceive that the USSR would ever try to block oil shipments from the Middle East.

In the House, the authorization bill was debated for more than eight hours. In its votes, recounted above, the chamber turned down the advice of the Project on Budget Priorities. Recommendations of the House Armed Services Committee, detailed in last month's issue of AIR FORCE Magazine, were approved.

The Senate debate is expected to be more lengthy. The Senate Armed Services Committee has some disagreements with the House. One of major interest to USAF is its endorsement of the purchase of twelve Boeing AWACS airplanes; the House voted to cut the order to six. ■

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## The Wayward Press

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As this department approaches its fifth birthday—the Wayward Press feature started in the summer of 1969—it is time for a pause to look beyond the little sins of omission and commission. Our examinations of sloppy reporting and deliberate distortion, usually confined to what is written and broadcast about national security affairs, has been based on a single lament. There is a requirement for higher standards of excellence in the profession of journalism.

We were not encouraged one bit by an article in the April issue of *Quill*, a magazine published by Sigma Delta Chi, also known as the Society of Professional Journalists. The author is Jan Schaffer.

The news appears to be that young people today are flocking into journalism. It is estimated that 11,000 eager graduates stepped into the market this year. It is the highest number ever. And what is their goal? Reporter Schaffer says:

"They come eager-eyed, spurred by the practicality of a major that will also give them a trade; dedicated to trying to change society; and imbued with romantic visions of exposing the crimes of the most untouchable of the nation's leaders."

Robert Haiman, managing editor of the St. Petersburg (Fla.) *Times* is credited with this priceless quote:

"I hear these kids say the same kind of things kids were saying about the Peace Corps five and six years ago. There's no doubt in my mind the whole Watergate thing—Woodward and Bernstein [the *Washington Post's* two young and famous investigative reporters]—has a lot to do with it."

The professional journalists who edit

*Quill* have illustrated the Schaffer piece with a full-page depiction of what is presumably a journalism student—he is reading a newspaper—in his dormitory room. On the wall he has photos of what author Schaffer calls "the newest national folk heroes." They are the already-mentioned Carl Bernstein and Robert Woodward of the *Post*, Sy Hersh of the *New York Times*, and, believe it or not, Clark Kent. It was news to us, but it seems the comic books read by the younger generation have glamorized Superman by turning him into a broadcast reporter with investigative talents.

It has been pointed out here before that there are no real professional standards in the newspaper business, and that all you have to do to be a newspaperman is get a job on a newspaper. The concept that a cub reporter, who first should learn how to write a news lead and meet a deadline, even before some printer introduces him to type lice,\* thinks he is in the Peace Corps forebodes no good for the trade.

Reporter Schaffer says idealism has a lot to do with the rush of young people into newsrooms.

"If you're the press, you can try to work for reform in a different way than

\* Small-town newsmen and a few old-timers who started out as reporters, not Peace Corpsmen, know about type lice. A neophyte, leaving his typewriter to work on page make-up for the first time, is asked by a congenial printer, old enough to be his father, to look between the slugs in a galley of type to make sure there are no type lice. This is always right after the printer has struck a galley proof and wiped off the ink with a rag soaked in benzene. When the youngster has pushed the type lines apart to look, the printer slams them sharply back together. The reporter, as he leans over the type, is sprayed with an inky, smelly mixture that will stain his face for a few days. Then, and only then, has he seen type lice and been properly initiated into the fraternity.

a regular citizen." *Quill* quotes Rochelle Koff of the *Temple News* at Temple University in Philadelphia.

And Mike Gartner, executive editor of the Des Moines *Register*, says the wave of glamour was fanned by Watergate. "The press has gone from being a whipping boy to being a cherished institution."

That may be, here in mid-1974. But Paul H. Weaver, writing in the Spring issue of *The Public Interest*, recommends caution. He says the romantic image of the "adversary press" is a myth. Weaver fears that the press is threatened, in the long run, by "the new movement abroad in the journalistic community." His opinion:

"Partisan journalism would not increase the openness of the system, it would sharply decrease it. It would not reduce the scope of political conflict, but enlarge it. It would not increase the capacity of American government to act effectively and flexibly in meeting emergent needs, but would tend to paralyze it. It would not empower public opinion as a whole, but would transform it into a congeries of rigid ideological factions eternally at war with one another and subject to the leadership of small coteries of ideologues and manipulators."

Partisan journalism, Weaver says in effect, would turn a truly liberal press into a reactionary one.

That statement is incomprehensible, of course, to a youth who thinks he is joining the Peace Corps.

Somehow, we also feel it is incomprehensible to the editors of *Quill*, published by the Society of Professional Journalists, that the press faces such a peril. But it does.





## Scholar Ship.

U.S. Air Force student pilots fly faster than sound for the first time in the T-38. More than 24,000 pilots to date. Northrop built 1,189 of these supersonic teaching machines. And set important records doing it.

All T-38s were built and delivered on time. They have the best safety record of any supersonic jet. And they've earned excellent marks for reliability and ease of maintenance.

Best of all, each T-38 was delivered at or below the promised cost.

We delivered a better airplane for less cost because we did our homework. From first step to last we

applied technology as a creative tool. To simplify. To improve performance. To shrink costs.

Airplanes that make sense. The F-5. The F-5E International Fighter and two-seat F-5F we're building now. And the YF-17 being used by the U.S. Air Force to demonstrate advanced technology. The Northrop family of high-performance, low-cost fighters—pound for pound, the best in the world.

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# NORTHROP

## By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C., MAY 31

The 321st Strategic Missile Wing, Grand Forks, N. D., aced out the other contenders at the recent Missile Combat Competition at Vandenberg AFB, Calif., to become the "Best of the Best" in SAC missilery. (See p. 79 for a report on the AFA Symposium held in conjunction with the meet.)

In so doing, the 321st also was named Best SAC Minuteman Wing and 1974 winner of the Blanchard Trophy, an annual award.

With its victory in the combat crew and maintenance competition, the Grand Forks wing became the second two-time winner in the seven-year history of the SAC exercise; it also won in 1969. Whiteman AFB, Mo., triumphed in 1967 and 1971.

Davis-Monthan AFB, Ariz., was judged best Titan II wing, with an impressive tally of "bests" in the competition; McConnell AFB, Kan., was a close second.

Other winners: Best Minuteman Crew, S-107, 351st SMW, Whiteman AFB, Mo.; Best Ordnance Team, 308th SMW, Little Rock AFB, Ark.; Best Combat Targeting Team, 90th SMW, Francis E. Warren AFB, Wyo.; Best Missile Maintenance Team, 44th SMW, Ellsworth AFB, S. D.; the Best Electro-Mechanical Team, 341st SMW, Malmstrom AFB, Mont., and Best Missile Handling Team, 91st SMW, Minot AFB, N. D.



The detonation on May 18 of India's first nuclear device produced an almost unanimous worldwide expression of concern and dismay.

The device, exploded underground in the vast desert region of India's northwest, reportedly had a force comparable to the weapon dropped on Nagasaki during World War II. Thus, India became the sixth nation to join the nuclear club, following the US, Soviet Union, Great Britain, France, and China.

While the giant nation of Asia's subcontinent proclaimed that it



The placard says it all for men of the 321st Strategic Missile Wing, Grand Forks, N. D. The wing was judged Best Minuteman Wing in the Missile Combat Competition conducted recently at Vandenberg AFB, Calif. For its overall effort, the 321st was awarded the Blanchard Trophy, the most prized honor in missilery.

would use its nuclear capability for peaceful purposes only—presumably mining, earth moving, and the like—editorial comment, especially in the US, was strongly adverse. Why, went the theme of many observers, would a country with the

almost insolvable economic and social problems that are India's choose to expend its limited resources in such a manner? (Many critics mentioned the millions in economic aid the US has extended to India through the years.)

Impressed with the performance of the new F-15 Eagle is Lt. Gen. F. Michael Rogers, Commander of Air University, Maxwell AFB, Ala. The General, who had a key role in developing the aircraft while with the Air Force Systems Command, handled it recently during a familiarization flight at Edwards AFB, Calif., where the McDonnell Douglas fighter is undergoing extensive testing. The General is an old fighter hand—a WW II ace.





## Craftsman Ship.

To build a better airplane, we apply technology as a creative tool from first design to final delivery. In manufacturing, for example, Northrop productivity has been increasing at a rate 30% greater than U.S. aircraft industry averages (based on U.S. Government figures).

We build better because we find simpler, faster, less costly methods. And we put our money on the line: Investing in new tools. Improved equipment. More efficient facilities.

The savings to the customer add up. We delivered all 1,189 T-38s built for the U.S. Air Force at or below cost. We pared \$20 million from the current F-5E program.

And now we're flying the new YF-17 for the U.S. Air Force, the most

advanced demonstration yet of the high-performance, low-cost fighter concept. Another program where our commitment to cost-conscious manufacturing technology makes every penny count.

High performance at low cost. On-time deliveries.

Extraordinary records for aircraft safety and low maintenance. That's the heritage of the Northrop family of high-performance, low-cost fighters — pound for pound, the best in the world.

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# NORTHROP

## Aerospace World

In any case, the ability to create nuclear weapons undoubtedly will strengthen India's diplomatic and military hand with its adversary neighbor—Pakistan—although tension between the two seems to have abated somewhat in the recent past. Another question is the effect the development will have on India's relations with its other neighbor—China.

Meanwhile, the US and USSR, currently engaged in a series of disarmament discussions in Geneva, have received a major setback in their heralded policy of trying to stem nuclear proliferation.

Technically, it is possible for many smaller nations to develop

nuclear-weapon capability. One specter that has haunted mankind in the atomic age is that many will do so, one day the weapons will be used, and the world could be drawn into a nuclear holocaust.



Through most of this summer will be conducted what is billed as the "largest and most complex international scientific experiment ever undertaken."

Called GATE, for Global Atmospheric Research Program—Atlantic Tropical Experiment, the project will be carried out in a 20,000,000-square-mile area extending from the eastern Pacific across Latin America to the Atlantic and to Africa and the western Indian Ocean.

Four years in the planning, GATE will employ some forty ships, about sixty-five buoys, a dozen aircraft, satellites, almost 1,000 land

stations, and more than 4,000 scientists and technicians from seventy-two countries.

Objective of GATE is to study the effects of the tropical atmosphere on global weather. "The tropics are a key but inadequately understood element of the restless planetary circulation of the earth's atmosphere and oceans," project officials said. Understanding the entire global system is prerequisite to reliable weather prediction beyond a few days, they added.

It seems that the tropics absorb half of all the sun rays that reach the earth. At first, much of this huge amount of solar heat is stored in the tropical oceans, but through evaporation it eventually rises upward in cloud systems—the normal circulation of the atmosphere that ultimately affects weather all over the world.

Primary aim of the Atlantic Tropical Experiment—sponsored by the



Catton



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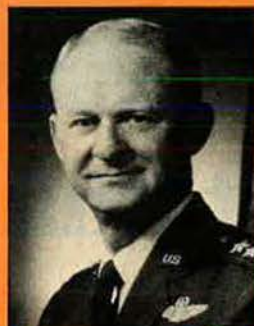
Clark



Dougherty



Vogt



McBride



Wilson



Pauly



Allen

## AIR FORCE LEADERS SHIFT IN KEY POSTS

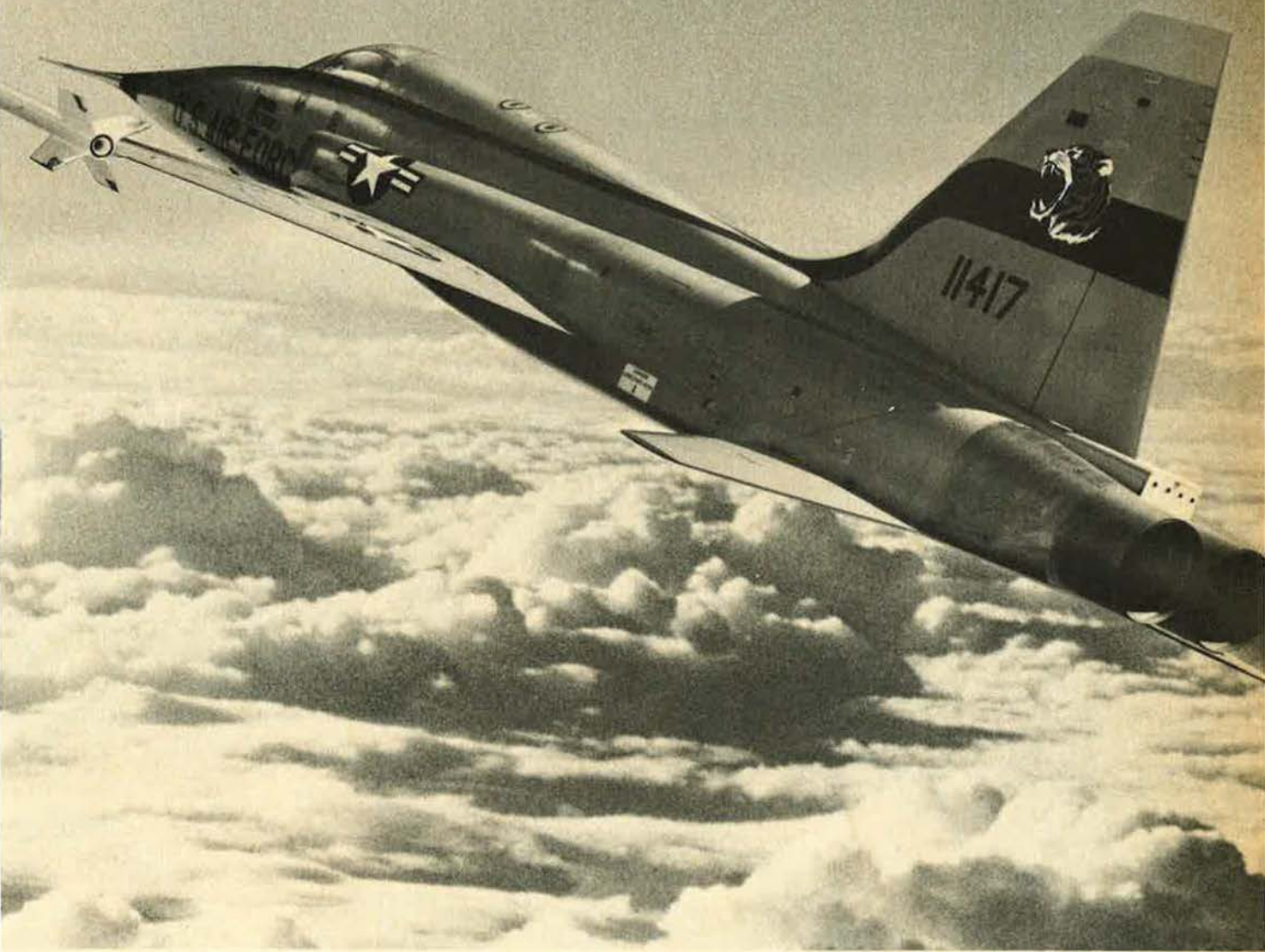
As is usual at this time of year, USAF has announced personnel changes in top jobs. Gen. Russell E. Dougherty, previously SHAPE Chief of Staff, replaces retiring Gen. John C. Meyer as SAC CinC. Present PACAF CinC Gen. John W. Vogt takes over USAFE from Gen. David C. Jones, the new USAF Chief of Staff (see p. 34 on top command changes).

Gen. (selectee) William V. McBride will command Air Force Logistics Command, replacing retiring Gen. Jack J. Catton. General McBride is the former Commander of ATC.

Assigned as CinC, PACAF, is Gen. (selectee) Louis L. Wilson, previously Vice CinC, USAFE.

Lt. Gen. (selectee) John W. Pauly, previously Commander of SAC's 1st Strategic Aerospace Division, has been assigned as Assistant to the Chairman, JCS.

To be Superintendent of Air Force Academy is Maj. Gen. James R. Allen, who will replace retiring Lt. Gen. Albert P. Clark. General Allen formerly was Special Assistant to the AF Chief of Staff for B-1 Bomber Matters.



## Flag Ship.

This is the Northrop F-5E Tiger II. Designated the International Fighter. Because it proved to be the realistic answer to the urgent defense needs of many nations.

Winner in a stringent U.S. Air Force competition, it now joins the F-5, on duty, or on order with the air forces of 22 nations.

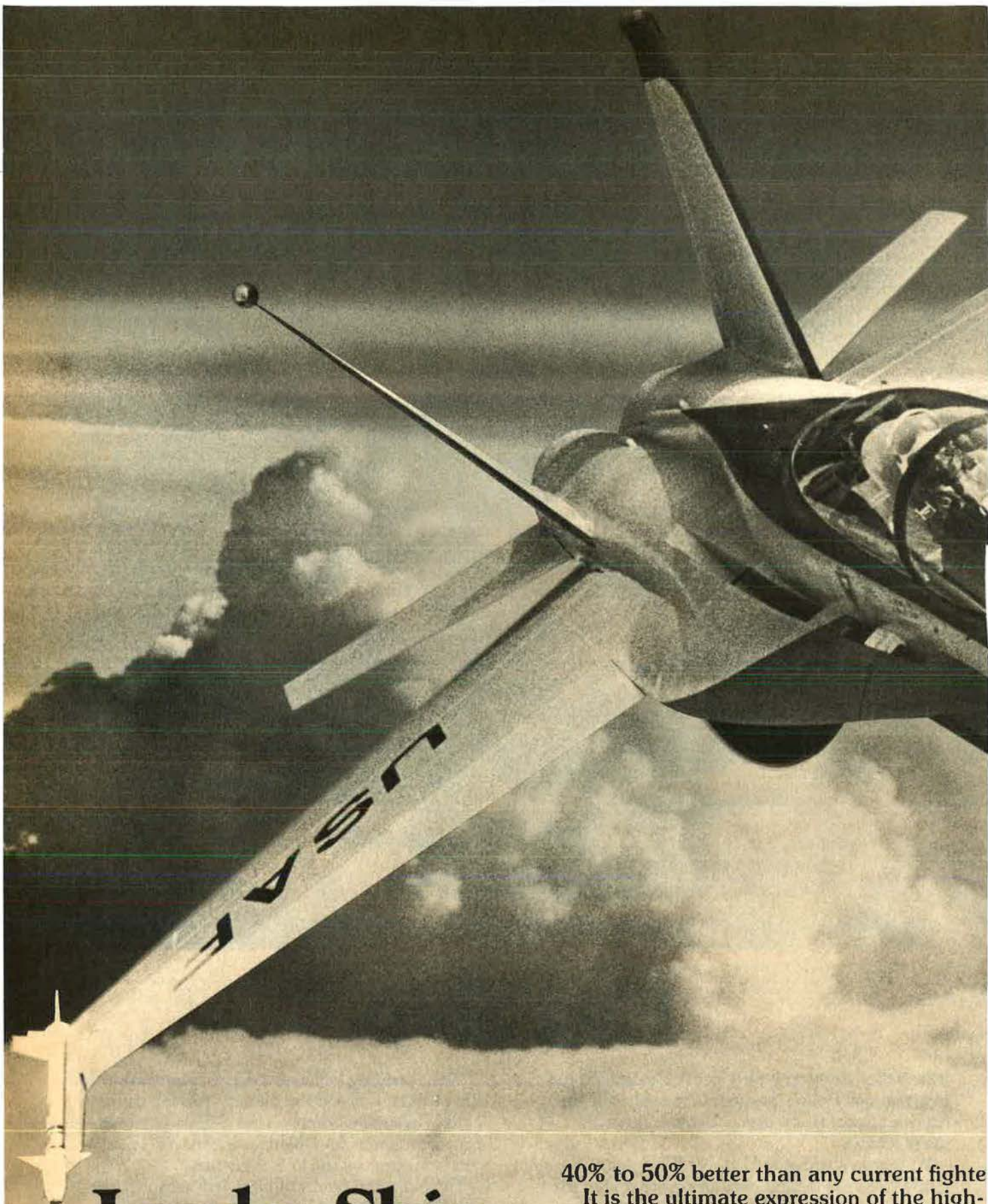
The F-5E Tiger II is a high-performance fighter. Yet its cost permits procurement in necessary quantities. It delivers astonishing combat agility: combining high maneuverability with rapid acceleration. Extended endurance. Air-to-air, as well as air-to-ground versatility. Plus the F-5 family's reputation for easy maintainability.

We're building F-5Es now. Moving forward with the two-seat F-5F tactical trainer. Working with our NATO allies and others on the P-530 Cobra tactical fighter program. And flight testing the YF-17 air combat fighter for the U.S. Air Force.

The Northrop family of high-performance, low-cost fighters—pound-for-pound, the best in the world.

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# NORTHROP



## Leader Ship.

The Northrop YF-17 is an idea whose time has come. More than a Mach 2 fighter able to climb over 10 miles a minute. More than an airplane with astonishing agility:

40% to 50% better than any current fighter.

It is the ultimate expression of the high-performance, low-cost fighter concept. Developed under an innovative U.S. Air Force contract, the YF-17 again demonstrates our ability to use technology as a creative tool. Proof we can increase performance yet reduce costs.

The YF-17 is the culmination of 20 years



of constant improvement using this concept. We've built more than 2,100 forerunners: the F-5, the T-38 and F-5E. All proven high-performance, low-cost aircraft.

And, the creative commitment of our 25,000 Northrop people shines through. A commitment to on-time deliveries. No cost overruns. Meeting all performance promises.

The YF-17 is being flight tested now. Twin-

engined. Twin-tailed. Filled with important innovations. It's the world's newest, most advanced fighter.

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**NORTHROP**

## Aerospace World

UN's World Meteorological Organization and other scientific groups—will be to "collect massive quantities of simultaneous observations," translate them into mathematical terms, and develop models that computers can use in long-term weather forecasting.

Also contributing data to the effort will be spacecraft that will scan the entire experimental area twenty-four hours a day. These satellites will consist of the USSR's Meteor satellites and the US's new SMS-A (Synchronous Meteorological Satellite), ATS-3 (Applications Technology Satellite), Nimbus-5, Defense Meteorological Satellites, and several others.



In another ambitious experiment also to take place this summer, a group of French and US scientists will undertake some sixty deep dives to investigate the huge volcanic scar formed on the earth's crust beneath the mid-Atlantic.

The dives are to be made by the American submersible *Alvin* and France's bathyscaphe *Archimede* and "diving saucer" *Cyana*. Each will be tendered by its own support vessel.

Exploration of the "navel of the world," as the rift in the earth's surface is called, is expected to yield data about how the gigantic

plates that make up the earth's crust are moving in relation to each other. Prevalent theory is that those on the eastern and western Atlantic are pulling apart and "dragging the continents on their backs" while spreading the ocean floor.

As this phenomenon occurs, the result is underwater volcanic upheavals, earthquakes, changes in water temperature, and the creation of enormous ore deposits.

FAMOUS (for French-American Mid-Ocean Undersea Study) has been in the works for two years, with preliminary dives being made last summer. The submersions to nearly 10,000 feet below the ocean surface are to water pressures strong enough to crush all but the specially designed craft. No light penetrates to that depth, and the submersibles must provide their own illumination apparatus.

The area of operations is southwest of the Azores.



The new Air Force Rescue Coordination Center (AFRCC) came into being at Scott AFB, Ill., in mid-May.

According to officials, "The AFRCC is the single federal agency responsible for coordinating all federal search and rescue (SAR) operations within the continental US and organizing existing agencies into a network for rendering assistance to military and civilian persons in distress and to carry out US international obligations in SAR."

The new facility, collocated with the Aerospace Rescue and Recovery Service (ARRS) headquarters, will assume the duty of the

various regional Rescue Coordination Centers (RCC) and of the Central RCC, Richards-Gebaur AFB, Mo. They'll be phased out.

Scott's combined facility will consolidate controller and technical resources, standardize nationwide SAR activities, upgrade command supervision for the humanitarian aspects of the ARRS mission, and beef up coordination among ARRS, the Civil Air Patrol, and state and local authorities.

All inland SAR efforts in the forty-eight contiguous states are conducted as an Air Force responsibility by ARRS. The US Coast Guard takes care of inland waterways and the maritime SAR area. The single contact at AFRCC should improve cooperation between the two services, officials said.

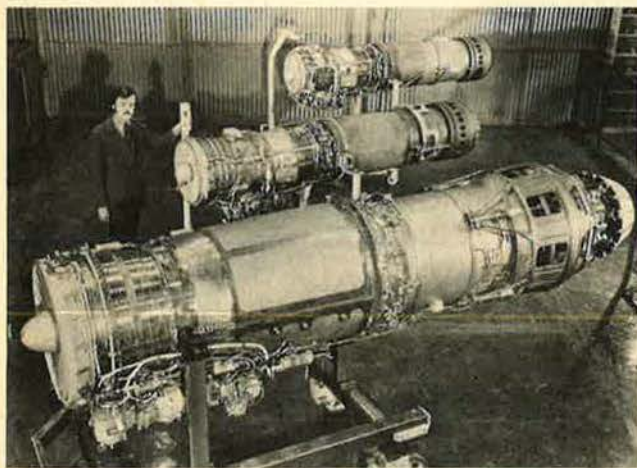


Brazo, the US's first antiradiation air-to-air missile, successfully intercepted a jet target drone in its first test firing recently, officials said.

Brazo, a joint US Navy/USAF project, is designed to home on an enemy aircraft by locking onto its fire-control radar. (*Brazo* is Spanish for "arm.")

During the initial firing, Brazo was launched from an F-4D Phantom manned by Navy and Air Force pilots in a "look-down" tail attack against a BQM-34 drone. A joint-service group observed from the ground at Holloman AFB, N. M., where the test took place.

Navy is technical director in the missile's development, and USAF is responsible for flight testing. Hughes Aircraft Co. is missile system integrator.



GE's YJ101 engine (foreground) is the powerplant of Northrop's new YF-17 lightweight fighter. By way of comparison are GE's J85-13 (rear), one of several versions that power the T-38 and F-5 Freedom Fighter, and the J85-21 (center), power source of the F-5E Tiger II.



Brazo, the nation's first air-to-air antiradiation missile, receives final check before test-launch from an F-4D Phantom. The missile is being tested under a joint Air Force and Navy program at Holloman AFB, N. M., and recently successfully intercepted a jet target drone.



Air Force Avionics Laboratory presently has under test a guidance system that will home on night targets much as the Maverick air-to-ground missile does in daylight. But unlike Maverick, which is TV guided, the new system presents an infrared image to the pilot, and thus is independent of either sun or artificial light.

The system is so designed that an infrared sensor aboard an aircraft works in conjunction with the sensor aboard the missile, which guides it to its target.

So far, seeker lock-on and tracking tests have been conducted aboard helicopters and C-130 aircraft. Next up is advanced testing aboard an F-4D Phantom.



In another hardware development, USAF awarded Westinghouse Electric Corp. a \$22 million, four-year contract to build and test an advanced multimode radar.

Dubbed Electronically Agile Radar (EAR), the new system will be able to carry out functions of several different radars by changing beam shapes and positions at electronic speeds.

"The radar data is processed digitally, allowing essentially simultaneous fine resolution terrain mapping, all-weather terrain-following flight, and precision position and velocity information—thus assuring accurate all-weather weapon delivery," an Air Force Avionics Lab spokesman reported.



A new organization called "Antique Airmen, Inc." is planning a national convention at Ottumwa, Iowa, during this year's Labor Day weekend.

Purpose of the group is "to foster and promote flying and restoration of antique aircraft as well as to enhance fellowship among pilots and owners of such planes," an official said.

Ottumwa, located near the US's geographic center, long has been the site for gatherings of vintage planes. A Navy training center during World War II, the airport there is said to be well equipped for aerial meetings—including long concrete runways and well-maintained hangars and other facilities.

Although this summer's convention will highlight aircraft of bygone



*With new high-speed, high-performance aircraft being added to the inventories, the problem of pilots tolerating extended high "G" forces is getting more attention. Here, a new lightweight, pilot-protective helmet developed for the Navy by Sierra Engineering Co., Sierra Madre, Calif.*

eras, other planes—and spectators—will be welcome, according to Antique Airmen. Many activities are being planned.

Aircraft expected include Beach stagger-wings, Wacos, Stinsons, Cessnas, early Pipers, Fairchild, Ryans, and Stearmans. Such military aircraft of the war years as Mustangs, Grummans, and Spitfires also are to attend.

For additional details, write Chuck Weber, Antique Airmen, Inc., P. O. Box 127, Palos Park, Ill. 60464.



Four Air Force Academy cadets were recently awarded Commendation Medals for separate acts of quick thinking and heroism in past months.

C4C John M. Makuta III was cited for fast action in clearing an infant's throat and restoring its breath by mouth-to-mouth resuscitation, which saved the baby's life.

C1C Robert S. Arnold leaped aboard a truck that was out of control, brought it to a stop, and then administered first aid to the driver, who had been stricken with an epileptic seizure.

C1C Kevin Court and C3C Geoffrey W. Jumper were members of a ski patrol that rescued a fallen and injured climber who might have died except for their prompt action.



**NEWS NOTES—Dr. Bernard List** has been named Commander of the **AF Avionics Lab**, Wright-Patterson

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## Aerospace World

AFB, Ohio, replacing retiring **Col. Michael Bonner**.

**John F. Yardley** on May 20 became the new head of NASA's **manned flight program**, replacing **Dale Myers**, who returned to private industry. Yardley previously was employed by McDonnell Douglas Corp.

Astronaut **Dr. Harrison H. Schmitt**, lunar module pilot on Apollo-17, has been named chief of NASA's new **Office of Energy Programs**. The office will coordinate support of other federal agencies conducting energy R&D and help apply space technology to transmitting, storing, conserving, and using energy in nonaerospace applications.

**Air Training Command** received the Public Relations Society of America's **Silver Anvil Award** for its outstanding PR program during 1973 in institutional programs (government). The effort countered adverse public attitudes toward USAF during the SEA conflict. Anvil Awards are the industry's most prestigious.

In mid-May, **Aerojet Solid Propulsion Co.** delivered the 3,000th **Minuteman motor** to USAF since start of the program in February 1961.

ADC's **21st Air Division** has been awarded the **Frederic H. Smith, Jr. Trophy** for "outstanding management" of its air defense forces. The trophy has been awarded annually since 1962.

The **Cleveland National Airshow**, September 1 and 2 at Burke Lakefront Airport, will be the country's biggest, city fathers say.

**Robert J. Patton** has been awarded the **Exceptional Civilian Service Award**, USAF's highest civilian decoration, for his outstanding performance as B-1 Systems Engineering Director.

**Langley AFB, Va.**, has been named home base for the **first operational F-15 Eagle** tactical fighter wing, expected in 1976.

**Died: Msgr. Augustus F. Gearhard**, pastor of Our Lady of the Oaks Convent, Pewaukee, Wis. He was eighty. A military chaplain who served in both World Wars, Monsignor Gearhard retired as an Air Force brigadier general in 1953. An AFA charter member, he was active in Milwaukee's **Billy Mitchell Chapter**. ■



*Sen. Barry Goldwater received the thirty-fifth annual Frank M. Hawks Memorial Award in April in New York. Presentation of the American Legion honor was made by SAC's retiring Commander, Gen. John C. Meyer, who is a former Post Commander of the Legion's Air Service Post 501. Also participating in the ceremonies are, left, Harry A. Bruno, chairman of the Hawks Award Committee; second from right, Mattituck Post Commander Arthur D. Ward; and H. B. Miller. The Hawks Award is presented annually for outstanding achievements in aviation.*



*Cadets from Carlisle Military School accept the trophy for the Tiger Drill Meet's top overall unit. This is the second year that Carlisle has placed first in the Clemson-sponsored drill competition.*



*Cadet MSgt. Marvin McBride accepts the AFA trophy for best Air Force unit from South Carolina AFA President Burnet R. Maybank. McBride has been named Cadet Corps Commander for the 1974-75 school year.*

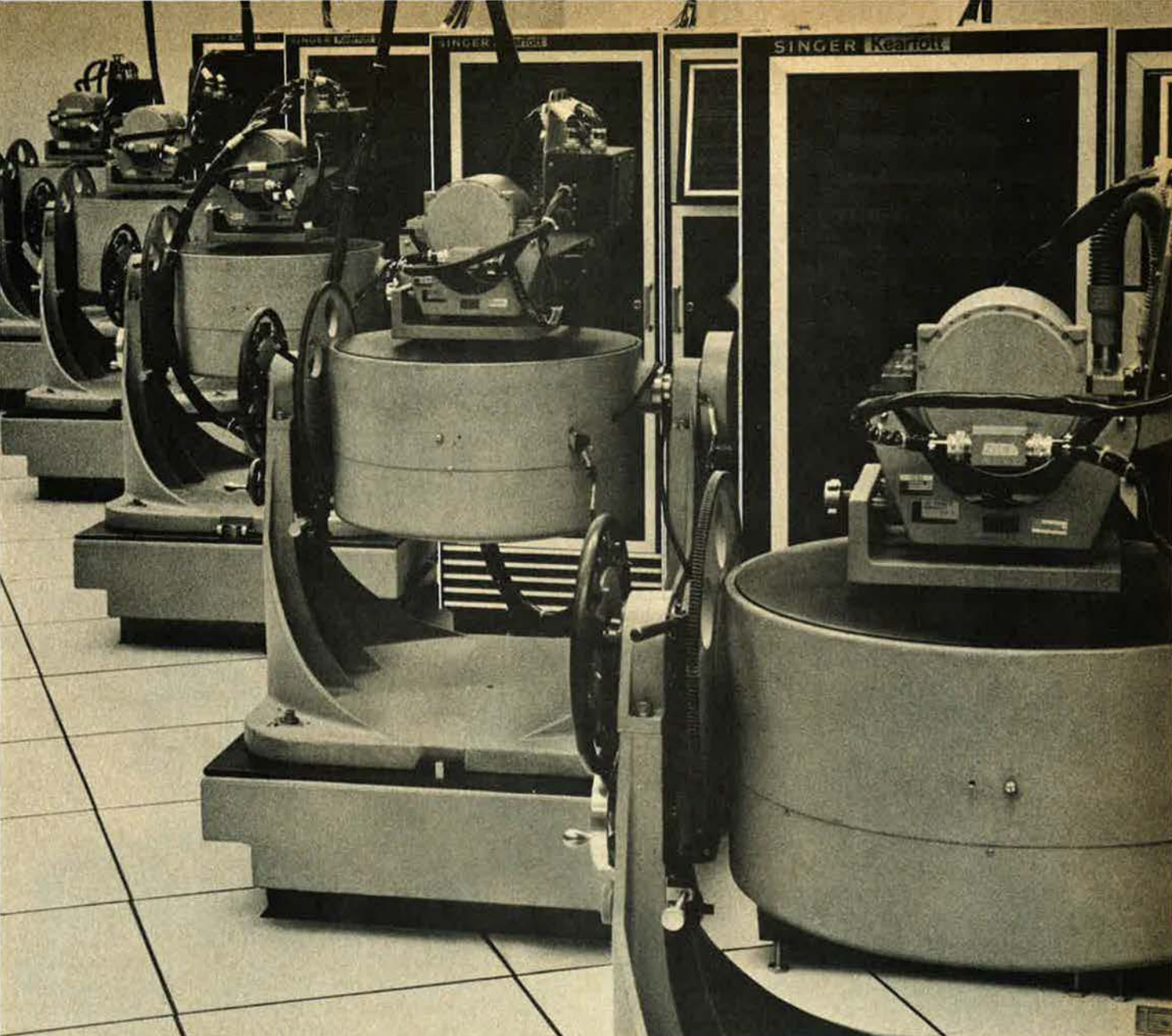
### SECOND ANNUAL CLEMSON "TIGER" DRILL MEET

Earlier this year, Clemson University, Clemson, S. C., held its second annual Tiger Drill Meet for all Junior ROTC units in the state of South Carolina. The meet is sponsored by the University's Departments of Aerospace Studies and Military Science (Air Force and Army Senior ROTC).

This year's competition attracted more than twenty South Carolina JROTC units, including representatives from Air Force, Army, and Navy units. Senior ROTC cadets from Clemson and ROTC staff members shared administrative and judging duties. The competition events included individual and squad or platoon competition in both basic and fancy drill.

Overall meet winner was Carlisle Military Academy (Army JROTC), with a composite score of 964.07 out of a possible 1,000 points. The top Air Force Junior ROTC unit was Irmo High School, whose Aerospace Education Instructor, Col. Thomas E. Lamb, USAF (Ret.), is also AFA's adviser for JROTC affairs.

The winning Air Force unit was presented an Air Force Association trophy by South Carolina AFA President Burnet R. Maybank.



## These Missile Guidance Systems have 3,745 excellent references.

Singer's Kearfott Division has produced over 3,746 Missile Guidance Systems for use in TALOS, BOMARC, MMRBM, SUBROC and SRAM Missiles and Cannon Launched Guided Projectiles.

We've also furnished gyro reference units for Atlas, Nimbus, Mariner, Lunar Orbiter, Surveyor, Orbiting Astronomical Observatory, Lunar Landing Module, Apollo Telescope Mount and the Viking Program.

And recently our inertial mea-

surement units were selected by Rockwell for NASA's Space Shuttle Orbiter and by Martin for an Army advanced radar correlator terminal guidance system. There are even some very advanced new applications we can't talk about.

A record like that can only be based on consistent performance—equipment performance that assures mission success, and management performance that assures on-target delivery and on-target cost.

Behind it all lies our out-front technologies and the talented people who have made our Missile Guidance capability possible. A capability we can bring to bear on your project too. Just check our references. The Singer Company, Kearfott Division, 1150 McBride Avenue, Little Falls, N.J. 07424.

**SINGER**  
AEROSPACE & MARINE SYSTEMS

Gen. George S. Brown, USAF's eighth Chief of Staff, has been elevated to the Chairmanship of the Joint Chiefs of Staff, and Gen. David C. Jones becomes the ninth Chief, the first who was not in uniform prior to World War II. AFA salutes our . . .

# NEW CHAIRMAN... NEW CHIEF

BY CLAUDE WITZE

SENIOR EDITOR, AIR FORCE MAGAZINE



**T**HE selection of Gen. George S. Brown, Air Force Chief of Staff, as Chairman of the Joint Chiefs of Staff, the highest military position in the United States, was announced by the White House on May 14.

Gen. David C. Jones was named to succeed General Brown as head of USAF. Since 1971, General Jones has been both Commander in Chief, United States Air Forces in Europe (USAFE), and Commander, Fourth Allied Tactical Air Force (4ATAF), with headquarters in Ramstein, Germany.

As AIR FORCE Magazine went to press, both men were scheduled to assume their new positions on July 3, following Senate confirmation and the retirement of Adm. Thomas H. Moorer, who has been Chairman of the JCS since 1970. General Brown will be fifty-six years old on his next birthday, in August; General Jones turns fifty-three this month.

General Brown's appointment as Chairman makes him only the second Air Force officer in history to occupy the top Pentagon post. Gen. Nathan F. Twining was Chairman from 1957 to 1960.

Since the Chairmanship was created in 1949, it has been filled by two admirals, Moorer and Arthur W. Radford; and four Army generals, Omar N. Bradley, Lyman L. Lemnitzer, Maxwell D. Taylor, and Earle G. Wheeler, in addition to General Twining (see box).

As Chairman, USAF's General Brown will be the senior military adviser to both the President and the Secretary of Defense, as well as presiding officer of the JCS. He has been Chief of Staff of USAF since last August, when he replaced Gen. John D. Ryan.

It is not many months ago, barely a dozen, that James R. Schlesinger became Secretary of Defense amid proclamations that he probably had the best background and qualifications for the job of any man who has headed the department. General Brown, entering the Chairmanship of JCS, has supporters who make the same claim for him. They can cite the record.

The new chief of JCS, before heading USAF, has in the past fif-

teen years alone, out of a military career that started in 1937, filled these positions:

- As a colonel, he was executive to the USAF Chief of Staff, when the head shed was occupied by the estimable Gen. Thomas D. White (1957-59).

- He was military assistant to the Deputy Secretary of Defense. The man he served was Thomas S. Gates, Jr., whose imprint on the Pentagon remains clear (1959).

- He was military assistant to the Secretary of Defense under both Mr. Gates and Robert S. McNamara, serving through what is probably the most significant administrative transition in Defense Department history (1959-63).

- He worked directly for the JCS as Commander of Joint Task Force 2, at Sandia Base, N. M., a key installation in our weapons research program (1964-66).

- For two years, he was assistant to the Chairman of JCS, under General Wheeler (1966-68).

- He was Commander of the Seventh Air Force in Vietnam and Deputy Commander for Air Operations of MACV at the height of the war in Southeast Asia (1968-70).

- Before taking top command of USAF, he was, for three years, Commander of the Air Force Systems Command, where the newest weapons, now nearing production, were born under his administration (1970-73).

This is a formidable track record, piled on top of a career that started at West Point, where General Brown was in the class of 1941. A year later, he had earned his pilot wings

and was put immediately into the 93d Bombardment Group, flying B-24s, and was sent to England to join the Eighth Air Force. In August of 1943, as a major, General Brown took part in the raid against oil refineries in Ploesti, Romania. The lead plane and ten others were shot down or crashed on the target. Major Brown led the battered unit home to Bengasi, Libya, and was awarded the Distinguished Service Cross for his heroism.

General Brown has had hitches with the Air Training Command, the Air Defense Command, and in transport, including command of the Eastern Transport Air Force—now Twenty-first Air Force—at McGuire AFB in New Jersey. During the Korean War, he was Commander of the 67th Troop Carrier Group, which operated across the Pacific, and Director of Operations for the Fifth Air Force at Seoul.

In his ten months as USAF Chief of Staff, General Brown is credited with raising the morale of both the Air Staff and his commanders in the field. He has been open-minded and innovative, his associates say, and they expect he will leave an imprint on the JCS.

One of the most frequent observations about General Brown is that he refuses to poor-talk his service; even Sen. William Proxmire has noted that the Chief says USAF is a superlative fighting outfit, unmatched in the world, a view that General Brown does not modify even when defending his budget proposals. The men closest to General Brown do not expect any new emphasis on airpower in the closeted

### CHAIRMEN OF THE JOINT CHIEFS OF STAFF

NAME	FROM	TO
General of the Army Omar N. Bradley, USA	August 16, 1949	August 14, 1953
Adm. Arthur W. Radford, USN	August 15, 1953	August 14, 1957
Gen. Nathan F. Twining, USAF	August 15, 1957	September 30, 1960
Gen. Lyman L. Lemnitzer, USA	October 1, 1960	September 30, 1962
Gen. Maxwell D. Taylor, USA	October 1, 1962	July 3, 1964
Gen. Earle G. Wheeler, USA	July 3, 1964	July 2, 1970
Adm. Thomas H. Moorer, USN	July 3, 1970	July 2, 1974
Gen. George S. Brown, USAF	July 3, 1974	



General Brown and the Army's Gen. Creighton W. Abrams have worked together before as evidenced by this 1968 photo, taken at Tan Son Nhut AB, Saigon, when General Brown headed Seventh Air Force and General Abrams commanded MACV.



USAF's new Chief of Staff was the very model of a fighter pilot back in 1965 when he headed the 33d TFW at Eglin.

conferences of JCS, but there may be less emphasis on seapower. The makeup of the new JCS (see box) gives a clue to this shift. It has been pointed out that General Brown, in his service in Vietnam, worked long and hard at the side of the Army's Gen. Creighton W. Abrams, then MACV Commander, and won unstinted admiration from the top soldier.

It is common knowledge in the Pentagon that Defense Secretary Schlesinger favored the elevation of General Brown. The rapport between the two men was immediate and quickly became close. Dr. Schlesinger recognized General Brown's skill and articulate approaches on Capitol Hill, where he has insisted on appearing before committees without backup witnesses; the tactic was successful in keeping testimony confined to broad policy, uncluttered by less relevant detail. General Brown is credited with having elevated the level of congressional examination.

The choice of General Jones to head USAF brings recognition to an officer whose main combat experience was in the Korean War, where he commanded the 19th Bombardment Squadron and flew more than 300 hours on twenty-nine bombing missions.

Like General Brown, his USAF

career has been wide. He has been in the Strategic Air Command, not only as a bomber pilot and commander, but also as chief of an air refueling squadron. He has studied at the Air Tactical School, the Atomic Energy Course, the Armed Forces Special Weapons Course, and the National War College.

Further service with SAC came at headquarters at Offutt AFB, Neb., where he was an operations planner and became aide to Gen. Curtis E. LeMay almost twenty years ago. In 1960, he moved to headquarters in the Pentagon for a four-year tour in key staff positions. From there he went to the Tactical Air Command, finally in command of the 33d Tactical Fighter Wing at Eglin AFB, Fla.

General Jones first went to USAF in 1965 as Inspector General and was Deputy Chief of Staff for Plans and Operations when he

was moved to the Seventh Air Force in Vietnam and soon became Vice Commander. There, his boss was General Brown.

After a hitch again with SAC as Commander of the Second Air Force at Barksdale AFB in Louisiana, General Jones returned to USAF in 1971 and has been there since. Last year he served as host to Defense Secretary Schlesinger at Ramstein, also entertaining the defense ministers of other NATO countries. It is reported that he became a front-runner for the post as Chief of Staff at that time.

General Jones was born in 1921 in Aberdeen, S. D. He was educated at the University of North Dakota and Minot State College. He enlisted in the Army Air Forces as a cadet in 1942 and was commissioned in 1943. His wife is the former Lois M. Tarbell. They have three children. ■

## MEMBERS OF THE JOINT CHIEFS OF STAFF

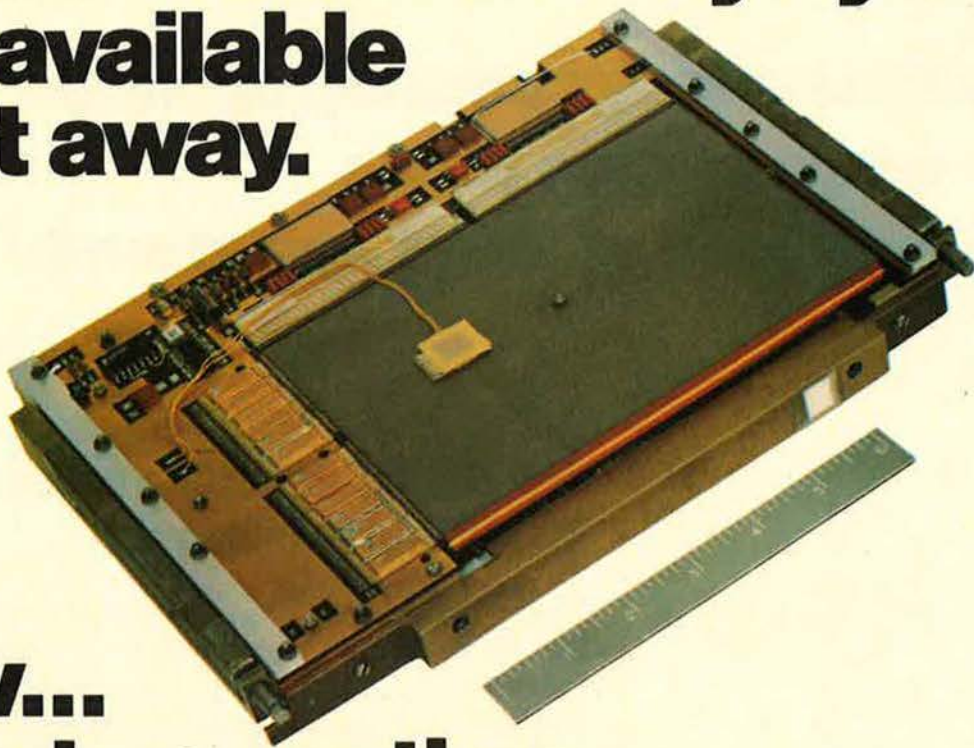
### THE FORMER JOINT CHIEFS

Adm. Thomas H. Moorer, USN  
Gen. Creighton W. Abrams, USA  
Adm. Elmo R. Zumwalt, Jr., USN  
Gen. George S. Brown, USAF  
Gen. Robert E. Cushman, Jr., USMC

### THE PRESENT JOINT CHIEFS

CHAIRMAN	Gen. George S. Brown, USAF
ARMY	Gen. Creighton W. Abrams, USA
NAVY	Adm. James L. Holloway III, USN
AIR FORCE	Gen. David C. Jones, USAF
MARINE CORPS	Gen. Robert E. Cushman, Jr., USMC

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**Q.** Who should I ask? And where can I write for further details?

**A.** Call or write Howard Gorman, Program Manager, Memory Systems, Autonetics Group, Rockwell International, P.O. Box 4192, Anaheim, CA 92803. (714)-632-2481.



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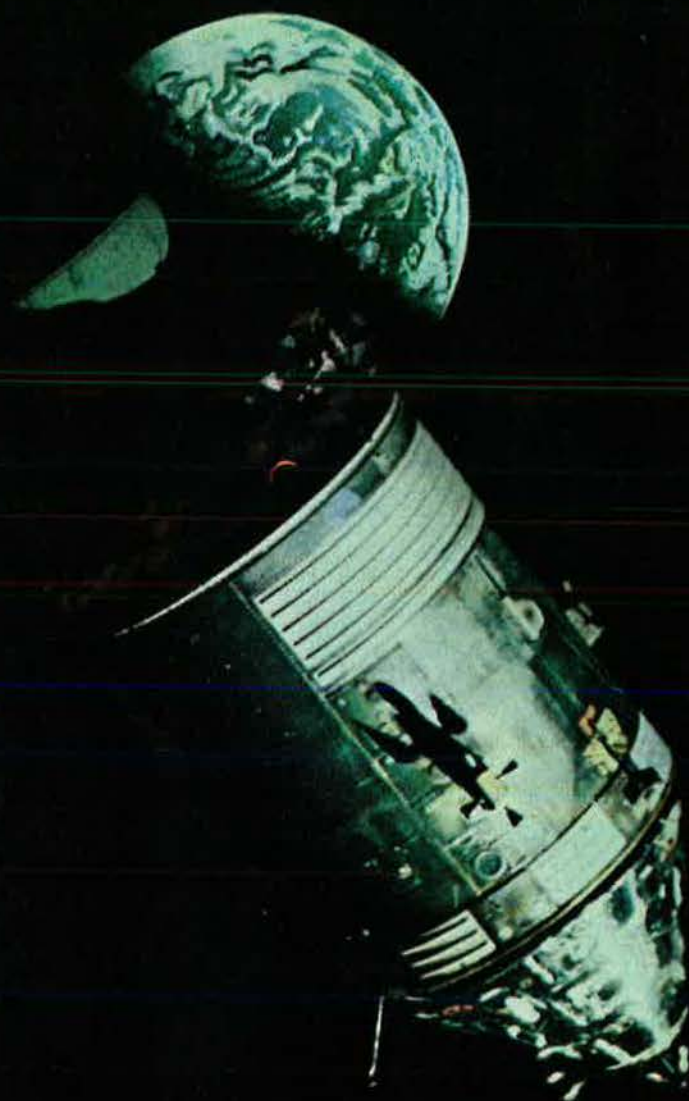
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# LOCKBOURNE AFB RENAMED FOR *Rickenbacker*



—Wide World Photos



**TOP LEFT:** Eddie Rickenbacker, shown here with a model of a Spad on his eightieth birthday. Captain Eddie died last summer at the age of eighty-two.

**TOP RIGHT:** A Spad XIII similar to the ones Rickenbacker flew in France in World War I, on display at the newly renamed air base.

**LEFT:** AF Reservists George Moyer, Douglas Conklin, and James Craig install the Spad's propeller as the biplane is readied for dedication ceremonies at Rickenbacker AFB, Ohio, on May 18.

**BELOW:** Another souvenir of Rickenbacker, this 1914 Dusenber racing car, driven by Rick to a tenth-place finish in the 1914 Indianapolis 500, was also on hand.



On May 18—Armed Forces Day—the Air Force officially recognized a legendary American when it re-named Lockbourne AFB, Ohio, in honor of Capt. Eddie Rickenbacker.

The World War I ace and Medal of Honor winner would have enjoyed the festivities, which included the appearance of aircraft dating from the First World War to the F-15 of today.

Among those present at the dedication were David Rickenbacker, Eddie's oldest son; SAC Commander in Chief Gen. John C. Meyer, ceremonial host; and entertainer Arthur Godfrey, who narrated a special program highlighting Rickenbacker's career. USAF's Singing Sergeants and the SAC Marching Band provided musical accompaniment.

In his address, Under Secretary of the Air Force James W. Plummer said that the base's name change came only after much deliberation, "not to detract from the community of Lockbourne, Ohio, but rather to pay tribute to a native son, an aviation pioneer, and a genuine American hero."

Captain Eddie died of a heart ailment in a Swiss hospital last July.

# THE ELECTRONIC AIR FORCE

One of the pacing and, at times, limiting factors in this nation's quest for a flexible strategic targeting policy is the availability of command control and communications networks that are survivable and provide information on a real-time basis. Recent changes in national policy have led to a revamping of the Defense Department's C<sup>3</sup> structure, whose new head, Thomas C. Reed, talks with AIR FORCE Magazine about . . .



## KEY TO FLEXIBLE DETERRENCE

BY EDGAR ULSAMER  
SENIOR EDITOR, AIR FORCE MAGAZINE



*The WWMCCS master console at Hq. SAC provides a direct link to the National Command Authority.*

**T**HE Defense Department's latest Posture Statement leads off with the words of the Psalmist: "Where there is no vision the people perish." In nuclear war strategy, vision equates with a vast and complex apparatus known as command control and communications (C<sup>3</sup>). If the "vision" of an adversary's actions during a nuclear confrontation is blurred, there is, as Thomas C. Reed, DoD's Director of Telecommunications and Command and Control Systems, told AIR FORCE Magazine, "the terrible temptation to push all the buttons before you go totally blind."

Recent fundamental revisions of US strategic policies are expressly designed to reduce the risk of a nuclear spasm response, in which millions of noncombatants would perish, by providing options to deter or, if necessary, fight nuclear wars at lower levels of intensity. The main burden of providing the options of flexible deterrence clearly falls on the command and control system. As a result, command and control emerge as the key tool for crisis management and are a primal concern of the Pentagon hierarchy at this time.

Consolidation of the command control and communications function in a newly created office functioning at the Assistant Secretary of Defense level, and headed by Mr. Reed, underscores this recognition. The new DoD Directorate, according to Mr. Reed, is, "in the first analysis, the product of a fundamental change in national defense policy, reflecting the President's and [Defense Secretary James R. Schlesinger's] view that the US should not be [immutably committed to] a policy of massive retaliation against civilians, but rather requires the ability to respond to challenge and crisis in a precise manner and with sufficient accuracy so that we can meet our objectives with a minimum of civilian casualties. It is the job of my office to develop basic command and control philosophies that arise as a result."

OSD's concern with boosting the nation's command and control capabilities is expressed even more tellingly, through a funding increase of about \$100 million in FY '75 to expedite command and control systems work currently in progress or provided for under the Five Year Defense Plan. The key items involved in the accelerated schedule, according to Mr. Reed, are "completion of development and continuation of the procurement for the command data buffer system, which allows more flexibility in assigning targets to Minuteman III missiles. Additional development items in the FY '75 request include the capability, from on board the submarine, to vary the targeting pattern, improvements in the processing of warning information, and improvements in our ability to detect missile launches."

In subsequent years, he added, "approximately the same level of funding will be requested to develop and procure systems that specifically support the new options, such as including a self-contained ADP [Automatic Data Processing] system on the AABNCP, the Advanced Airborne Com-



*The Defense Department's Director of Telecommunications and Command and Control Systems, Mr. Thomas C. Reed, reports that the Soviets have achieved a high degree of invulnerability and flexibility in their command and control systems.*

mand Post, and the development of a survivable burst reporting system."

## **VULNERABILITY OF COMMAND AND CONTROL SYSTEMS**

If it is true that vision is vital to the United States' recently enunciated policy of flexible deterrence, it follows that there is a need for a survivable command and control system that, Mr. Reed admits, "we don't have at present." As long as this is the case, the likely response to a wholesale attack on the national command and control structure would be an all-up second strike by the US. While the present relative balance of strategic capabilities does not make such an attack on the US C<sup>3</sup> system likely—"because it provokes the aggressor's own annihilation—crises don't always start with full-blown scenarios, but have a way of cascading, and we, therefore, must be prepared for an attack on our command and control system, either by accident or for other reasons," Mr. Reed told this reporter.

Linchpin for making the command and control structure less vulnerable to strategic attack and "a central element of our new retargeting policy is the development of survivable satellites," according to the Pentagon's command and control chief. In the main, this means that "we need satellites that are survivable, and thereby are able to provide essential command control and communications functions even in an environment degraded by EMP [electromagnetic pulse] caused by high-altitude nuclear detonations."

Hardening and shielding are important tools for enhancing survivability, but are limited by economic and practical considerations. Because of cost, weight, and volume considerations, it is not practical to harden satellites sufficiently to withstand a direct, one-on-one attack by an interceptor missile. Rather, hardening levels are confined to providing protection against the EMP effects of large nuclear weapons detonated above the atmosphere, which otherwise could obliterate a number



*The E-4A Advanced Airborne Command Post will replace the currently used "Looking Glass" aircraft, shown here with Gen. John C. Meyer, SAC's outgoing Commander in Chief, at the control center.*

of satellites at once. This forces a would-be aggressor to attack US C<sup>3</sup> satellites on a one-on-one basis, at best an almost impossible task because of their dispersal. (It is now equally difficult to determine the functions of military satellites short of visual inspection, which is currently neither practical nor tactically sound.)

EMP is the bane of strategic command control and communications system designers because the vast voltage surges—the most destructive aspect of EMP—that accompany a large nuclear explosion are distributed over a wide area. While there is some attenuation in the atmosphere, EMP can propagate freely in space, dissipating its energy only in a limited way over distance. As a result, a multimegaton nuclear burst just above the atmosphere is likely to destroy soft commercial satellites within its line of sight thousands of miles away. It must be assumed, for instance, that a multimegaton weapon detonated in the upper atmosphere is likely to severely damage an unshielded satellite that is directly overhead in geosynchronous orbit at an altitude of 22,300 miles.

The most vulnerable elements of satellites are their solar panels, which absorb solar radiation to power their on-board avionics. Designed to scoop up a maximum amount of energy, these panels, in a nuclear environment, pick up the

wrong kind of energy in quantities that could destroy them.

The Air Force's survivable satellite program currently in early development seeks to overcome this problem through the use of radioisotope power generation (see "Warhead Design and Nuclear Strategy," June '74 issue, p. 55). Two experimental satellites, LES 8 and LES 9, are scheduled for launch in the near future to test the radioisotope power generators developed by the Atomic Energy Commission. The advantage of this form of power generation is "that it is less sensitive to nuclear radiation and, therefore, is a key factor in providing satellite survivability," according to Mr. Reed.

Hardening spaceborne command and control systems against nuclear effects cannot be confined to the satellites, but must include ground-based terminals. To date, Mr. Reed conceded, "we have not been able to come up with any easy solutions to this challenge, but, at the same time, we don't feel that this is a question of making water flow uphill. Obviously, the network requires





that all sensitive electronics be protected from high-energy pulses along incoming paths. The next logical step is to decide whether systems of this type should be able to function during the fleeting moment that EMP is in effect. The answer here is that, while this could be done, it would be so costly as to make the issue unreal.

"The other alternative, then, is to make the system recognize that a nuclear pulse is coming and to shut it down during the few milliseconds that EMP is in effect. The means for doing this are reasonably well understood. They are quite expensive but, nevertheless, are now an integral feature of our systems specifications, not only for satellites and strategic command and control nets but also for TRITAC TTC 39 [the joint tactical communications system that links the tactical communications of the military services into an interoperable net], whose contract has just been let."

The Department of Defense and the individual services, Mr. Reed pointed out, "are conducting rigorous test programs concerning EMP effects on command control and communications networks. The trouble is, however, that the vulnerability doesn't extend to just the hardware, be that simple radios or switchboards, but also affects the miles and miles of communications wire that acts as a giant antenna. As a result, even a detonation that

is a long way off will cause all sorts of troubles at our switchboards and other terminals." The information gleaned from current, intensive EMP research is the basis for "the EMP specs that are being written into all new equipment purchase contracts," he added.

## **NUCLEAR BLACKOUT**

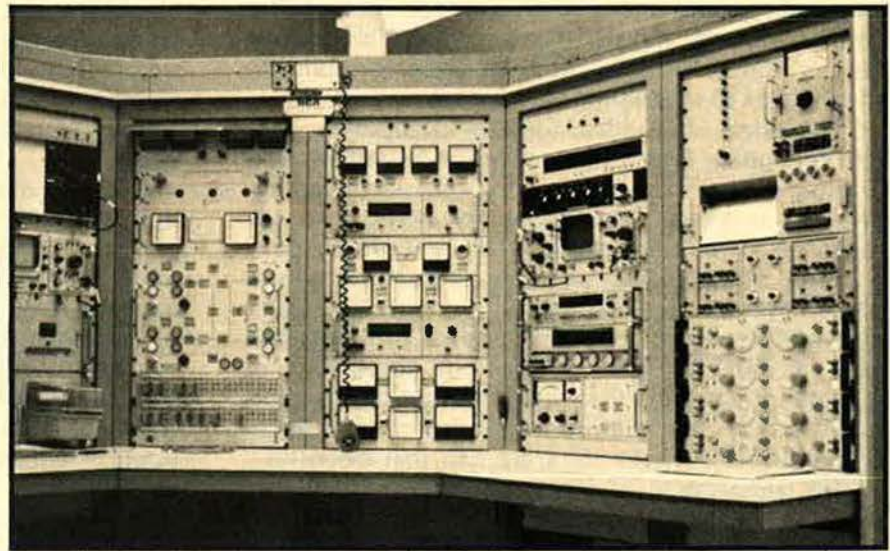
Command control and communications systems also are affected by the effects of large nuclear weapons, through what is, in effect, a communications blackout. This results from the fact the detonation literally blows a hole through the earth's ionosphere. Because all radio communications rely on the ionosphere to reflect signals, this can cause blackouts of varying degrees of severity, depending on the wavelength of the broadcast. A basic remedy is to design systems for extremely low frequency (ELF) and very low frequency (VLF) transmission, since those frequency ranges are less susceptible to nuclear blackouts.

The Soviets gain significant advantages from their ability to deploy very large throw weights on their SS-9 and, potentially, their SS-X-18 missiles and, thereby, can induce massive communications blackouts and devastating electromagnetic pulses. "Since the Soviets pack about the same yield per weight into their warheads as we do, there is a significant asymmetry induced by their much greater payload capability," according to Mr. Reed.

A key means for assuring US command and control survivability is the Minimum Essential Emergency Communications Network (MEECN), currently being improved. While MEECN's technical aspects can't be described because of security considerations, its underlying precept is noteworthy: At present, the US C<sup>3</sup> system has a number of chokepoints—such as antenna farms—which, if knocked out, would destroy the operational effectiveness of many weapon systems, such as individual Minuteman ICBMs. Since it would only take one warhead to "disconnect" several nuclear weapons from the C<sup>3</sup> system, the chokepoints represent very attractive and profitable targets. "It is the purpose of MEECN, in my view, to do away with preferred targets of this type; that is, assure that it is no more profitable to attack" a command and control node than it is to attack an ICBM silo, according to Mr. Reed.



*SANGUINE'S test facility in Wisconsin is used to broadcast ELF signals to shipboard receivers and aids in the design of optimized antennas. The facility's control room is shown in the adjacent picture.*



## THE IMPORTANCE OF SANGUINE

A central requirement of the new, flexible re-targeting policy, according to Mr. Reed, revolves around the ability to "talk with those strategic forces that may, for instance, hold the enemy's cities hostage, and, obviously, this means the submarines." The means for achieving this capability is the US Navy's SANGUINE Project, a one-way, highly survivable communications system, currently awaiting availability of FY '75 funds. SANGUINE is meant to assure reliable and survivable worldwide communications from the National Command Authorities (the President and the Secretary of Defense or their duly deputized alternates and successors) to the SSBN fleet, possibly other strategic forces, and the attack submarines.

SANGUINE's survivability is twofold: Because it relies on ELF transmissions, which can penetrate seawater twenty times deeper than the presently used VLF system, it permits the missile-launching submarines to operate at depths and speeds that improve their chances of survival; also, the nature of ELF signals makes them largely impervious to nuclear communications blackouts and intense jamming. Operating in a frequency range comparable to that of conventional alternating current, SANGUINE, according to Mr. Reed, "isn't really going to be bothered by nuclear disturbances to the ionosphere. At ELF frequencies, the earth and the ionosphere act as a great big wave guide."

Because SANGUINE operates at extremely low frequencies, the information transmission rate is limited compared to conventional frequency ranges. SANGUINE is designed to send short, emergency action messages, leading some to portray it as a doomsday machine. But there are now many such messages, including instructions *not* to fire, that must get through. In addition, operational traffic can be sent over SANGUINE: intelligence warnings, rendezvous orders, changes in DEFCON status, retargeting instructions, etc. SANGUINE can also instruct some or all subs to deploy conventional antennas at optimum, specific times to receive conventional traffic with a minimum of risk. And by simply being on the air, SANGUINE can advise the SSBNs of the status of a crisis.

"Keeping in touch and maintaining discipline leads to stability, not doomsday, in a degraded environment," Mr. Reed told AIR FORCE Magazine.

SANGUINE, from its inception, has been caught up in problems of public attitude and opposition. A natural and immutable characteristic of electromagnetic communication systems is that the lower the frequency, the longer the antenna for efficient transmission. In the case of SANGUINE, this means about a thousand miles of cable located over low conductivity rock formations. The rock is necessary because it prevents signal loss into the earth. Only a limited number of areas in

the United States provide these criteria. Public reaction to speculative reports about siting the system in these areas has been less than favorable because of the alleged environmental impact and the notion that the system represents a high-priority target.

Partly for these reasons, the House Appropriations Committee reduced SANGUINE's FY '74 funding in effect from \$16.7 million to \$8.3 million—in an appropriation bill not passed until December of 1973. Operating under a congressional continuing resolution, the Navy had already expended about \$11 million. After being refused reprogramming authority, the Navy had to suspend further work on the program.

"We have abided by the wishes of the Congress and stood down in April of this year. We have allocated \$13.2 million for SANGUINE in FY '75, which, if authorized by Congress, will be used for broad scientific investigation. Last year, the cart got way in front of the horse, because there were some conversations about where SANGUINE should be sited, and people jumped to unfortunate conclusions about where it should and should not be located. The facts are that our studies of where the system should be located won't be concluded until spring of 1976. Until then, we plan on no more and no less than scientific investigation. We have a test facility in being that can broadcast ELF signals. We want to put receivers aboard some of the SSBNs in order to find out how well the system really works. We also want to do more work on antenna designs and to explore further the environmental impact considerations so that we can answer congressional questions on the basis of facts rather than assumptions," Mr. Reed said.

None of this means, however, that the Department of Defense has forsaken SANGUINE, which is absolutely essential "to the revised strategic deterrence policies of the United States," he emphasized. Congress won't be asked until FY '77 to fund the full program, according to present schedules. Assuming a favorable vote, SANGUINE could become operational by the end of the decade.

## THE ADVANCED AIRBORNE COMMAND POST

The third element, in addition to C<sup>3</sup> satellites and SANGUINE, of what Mr. Reed terms the US strategic command and control triad, is the Advanced Airborne Command Post (AABNCP), a modified Boeing 747—the E-4A—equipped with advanced command control and communications equipment to serve both as NEACP (National Emergency Airborne Command Post) of the Commander in Chief and as SAC's new Flying Command Post. In addition, the E-4A, according to Mr. Reed and senior Navy officials, can provide stopgap service in support of SSBN requirements until SANGUINE becomes operational. This, he explained, will be accomplished by retransmitting

the Advanced Airborne Command Post signals via the Navy's TACAMO communications aircraft. The latter is an airborne VLF (very low frequency) system designed to communicate with submerged submarines located near the orbiting aircraft.

The E-4A development program, for which the Air Force requested \$90 million in FY '75 funds, mainly for RDT&E (research, development, test, and evaluation), is being undertaken in carefully phased increments to take advantage of DoD's growing understanding of the command and control problems in a nuclear war environment. Partly for this reason, and in order to mate the system's capabilities to changing national strategic policies, the program is divided into "blocks."

Block I represents the currently approved AABNCP configuration, which includes highly reliable communications and automatic data processing (ADP) terminals. These consoles can be used as remote terminal entry devices into the ground computer systems of the Worldwide Military Command and Control System, or WWMCCS. As a result, the battle staff of the Airborne Command Post will have access to the same information as personnel on the ground, as long as the ground communications net and the computers themselves remain intact.

"In addition," Mr. Reed said, "a communications processor aboard the aircraft will automatically route incoming and outgoing messages to the appropriate communications and displays." DoD's current budget request, according to Mr. Reed, includes "funds to initiate development of a capability for a self-contained ADP system on board the Block II AABNCP. This system would perform those limited functions required to support the decision-making process even after ground computers supporting the remote terminals may be destroyed."

Present plans call for the acquisition of seven E-4A aircraft—three each will be used by the National Command Authorities and SAC and one is to be kept in reserve.

### **WWMCCS: THE FINAL LINK**

Linking all military command and control systems is WWMCCS, a sprawling computer-based network of command centers that serves as the channel of communications for the execution of the Single Integrated Operational Plan (SIOP), the backbone of US strategic action, and other high-priority operations. It is an established capability, but in a state of continuous updating (see also "Command and Control," page 60). The system's thirty-five new Honeywell computers, the last of which was installed last December, "have provided us with a marked improvement in systems performance, but getting them on line is, as we expected, an arduous task," according to Mr. Reed.

The International Business Machines Corp., he

said, was recently chosen to "act as the WWMCCS systems architect because the system is not just a congeries of machines, but also a set of procedures for using the hardware. The answers here depend on establishing precisely what we want from the system. Obviously, it is our primary tool for detecting precursors of crises and for preventing or managing them. But we must also establish such issues as does the President want a CRT [cathode ray tube display] or a facsimile machine sitting on his desk or does he just want to talk to the Chairman [of the Joint Chiefs of Staff] by phone? The same question, of course, goes on down the line, and the answers get very complex. What is involved is a two-way communication stream that starts out with intelligence that there is something wrong and encompasses execution orders, feedback, and damage assessment. While we are, with the help of IBM, reevaluating the procedural part of WWMCCS, we are confident that the system, as it exists today, can and will give the capacities and capabilities needed to manage strategic contingencies even under 'worst-case' conditions."

### **SOVIET C<sup>3</sup> CAPABILITIES "QUITE SOPHISTICATED"**

A factor that obviously influences the US system is the status of the Soviet command control and communications effort. In Mr. Reed's view, "it is quite sophisticated, although it is not possible to discuss details because of security considerations. The Soviet command and control systems are simple but redundant, and they have taken the necessary steps to achieve a high degree of invulnerability. Their system seems to be designed to provide great flexibility in coping with various types of crises. Further, they maintain tight security controls. Obviously, they have spent a great deal of time and effort on their C<sup>3</sup> system. The tip that we see every day, the ELINT effort, is tremendous."

### **COMMUNICATIONS SECURITY**

While the technology to provide reliable communications security is well in hand, the cost of safeguarding routine traffic has militated against instituting elaborate protective measures. But, "we now have under development some very good, lightweight security devices whose cost does not seem to be prohibitive. Their key feature is the digitizing [translation into discrete mathematical values] of the human voice, encrypting these signals, which gives them the appearance of random pulses, and decrypting [and retranslating them into analog voice communications] on the other end," according to Mr. Reed.

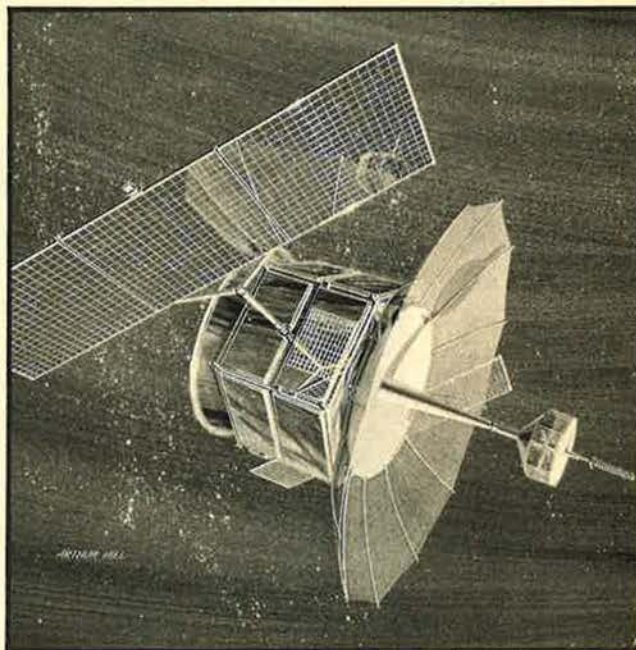
One of the factors inhibiting widespread, field use of cryptographic equipment in the past has been the complexity of the equipment and the personal responsibility for incorrect handling or



loss of the machines. "Obviously, the problem is to come up with a machine that, by itself, is no great secret, and to use this equipment in conjunction with codes that change frequently. The problem is terribly important because field troops don't seem to understand just how susceptible to eavesdropping our voice communications equipment really is," Mr. Reed pointed out.

In summarizing the fundamental objectives of the new DoD Directorate that he heads, and which oversees annual expenditures in the multi-billion-dollar range, Mr. Reed stressed that "our revised strategic policies seek to minimize casualties of noncombatants in case of nuclear conflict. Our posture in this area, of course, is paced by the Soviet challenge. If they do challenge us, we must be in position to select yields and targets in order to preclude civilian population centers from being attacked. The term [retargeting] option really means the ability to understand the challenge, deciding what to do about it, and then evaluate the results and the remaining challenge.

"That is the whole feedback loop. If we don't have the requisite command and control capabilities, we will remain in the massive retaliation or assured destruction posture of the past. It seems to me Secretary [of Defense James R.] Schlesinger was perceptive when he quoted the scripture 'where there is no vision the people perish.' In terms of C<sup>3</sup>, we can't afford to be held to the choice between standing there, blind and dumb, or flailing out in a spasm response." ■



TOP: Main floor area of the WWMCCS installation at Hq. SAC is indicative of the size of the system.

ABOVE: Air Force Systems Command's SAMSO is the contracting agency for the Fleet Satellite Communications System whose first satellite is to be launched late in 1975.

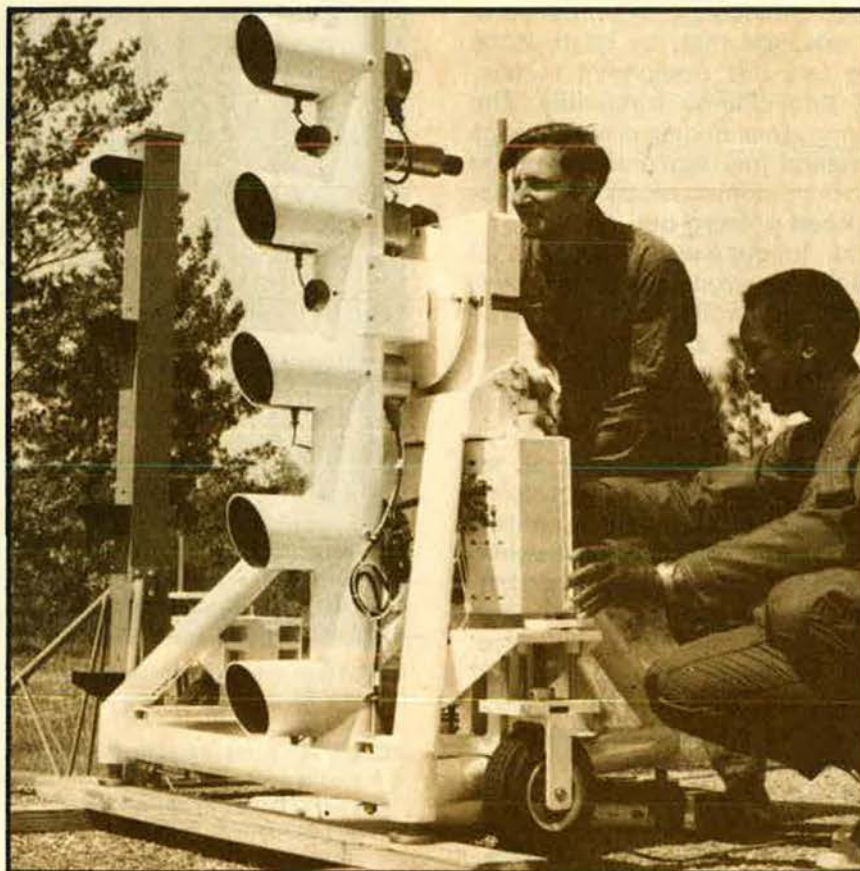
# THE ELECTRONIC AIR FORCE

Almost everything the Air Force does, from administrative tasks to space surveillance, depends on electronic systems and devices that have to function reliably and competently. Planning, developing, and acquiring these systems and components is the job of the Air Force Systems Command's Electronic Systems Division. ESD's new Commander sets forth for AIR FORCE Magazine readers how USAF is shaping electronic technology to meet its many needs . . .

## ESD

## BUILDING TOMORROW'S ELECTRONIC AIR FORCE

BY MAJ. GEN. BENJAMIN N. BELLIS, USAF  
COMMANDER, ELECTRONIC SYSTEMS DIVISION, AFSC



*The versatile laser has not only led to a revolution in guided weapons but, as this ESD-developed system shows, can be used to guard parked aircraft.*

**T**ODAY's military commander faces unique challenges in the exercise of his command authority. The significant increase in the speed of delivery and destructive potential of weapons, the feasibility of a worldwide combat arena, the range of choices of action from all-out attack to politically limited response, and the chance that a wrong decision can alter the course of history all combine to expand and complicate the command function.

The exploding technology of recent decades that produced this novel command environment also has provided the means to solve many of its problems. We at the Electronic Systems Division (ESD) of the Air Force Systems Command are in the business of shaping electronic technology to fit the needs of the operational commanders.

ESD is the Air Force's principal acquisition agency for command control and communications systems. Working in concert with a broad industrial partnership in this country and abroad, the Electronic Systems Division is responsible for developing, producing, and delivering command control and communications systems for the USAF, National Command Authorities, other services, Unified and Specified Commands, and allied nations.

Under ESD's management control are more than sixty active projects ranging in magnitude from equipment to improve the timely transmission of weather maps to the multibillion-dollar Airborne Warning and Control System (AWACS). (A listing of the major projects assigned to the Electronic Systems Division appears on p. 56.)

Managing the acquisition of such systems is an extremely complex business. There are many similarities and some differences in our responsibilities here at ESD, compared to development of aircraft and missiles.

On April 1, 1974, I assumed command of the Electronic Systems Division after serving as system program director of the F-15 fighter aircraft. In the F-15, we have a weapon system whose immediate effect upon the operating commands will be revolutionary. During a short transition period, flying units will be equipped with F-15s, complete with new tactics, new operating procedures, new support equipment, and new training requirements. In short, that unit's life will never be the same.

## **DEVELOPMENT AND PROCUREMENT PATTERNS**

Many of our command control and communications systems are evolutionary. If an operating command's information systems were abruptly replaced with a completely different way of doing things—no matter how technically superior to what went before—the commander might be unable to make the new system respond to what he really needs. However, many of these evolutionary

changes are very nearly revolutionary when you consider AWACS and the Advanced Airborne Command Post.

We at the Electronic Systems Division work hand-in-glove with the using commands—our customers—to make certain that both of us fully understand just what is needed for more effective operation.

Using commands plan their own requirements based on such factors as force structures, missions, and operational concepts. The Electronic Systems Division participates in early planning with analytical and technical inputs. When an operational commander is satisfied that his requirements can be met using a certain approach, ESD is assigned responsibility to develop and possibly produce the system.

This intimate relationship continues throughout the acquisition process. Where appropriate, detachments of ESD people are located at the user command's headquarters, and, in turn, the user is represented by personnel assigned to the ESD System Program Office.

When we get to the systems acquisition stage, we have to take a good hard look at how we plan to do it. Overall, the procurement process is governed by a set of regulations drawn to cover every sort of government action. There is no *one* path to follow for every program. The procurement approach—firm fixed price, cost plus incentive fee, prime contract, or whatever—must be carefully designed for the project at hand, just as we have to tailor our management structure to the task.

For example, the management approach for the Airborne Warning and Control System contains decision points, where the total program is reviewed sequentially to determine whether progress on the technical side warrants approval of long-lead production funding. With AWACS, the demonstration milestone approach permits us to proceed on a logical development program and to transition into production at the appropriate time.

AWACS also typifies the "try-before-buy" principle, where a competitive performance demonstration proves which contractor had the better technical and cost approach. In the case of AWACS, the radar was considered to be the leading risk item; two competitive demonstration models logged close to 600 hours of rigorous test time before one was selected for further development.

We can expect to see more emphasis wherever possible on competitive prototype developments. This is a healthy trend, especially where large follow-on production runs are involved. On the other hand, some of our acquisitions are assemblies of known, available technology and can be

put into production with the development being restricted to architectural design.

## SUPPORTING AGENCIES

In carrying out our command control and communications acquisition mission, four principal support agencies help shoulder the load. Three—the Air Force Cambridge Research Laboratories (AFCRL), MITRE Corp., and Lincoln Laboratory—are located near the Electronic Systems Division Headquarters at Laurence G. Hanscom Field, some twenty miles west of Boston, Mass. The fourth—Rome Air Development Center (RADC)—is at Griffiss AFB, N. Y.

The Air Force Cambridge Research Laboratories, another Systems Command unit, conducts research in the physical and environmental sciences. In addition, AFCRL staff members serve as consultants and do some direct engineering for us. We are moving toward a more direct relationship with AFCRL by locating some of its personnel in our system program offices where we can continually draw upon this expertise.

The MITRE Corp., a Federal Contract Research Center located some five miles from Hanscom Field, provides ESD with systems engineering and technical direction. MITRE and ESD personnel are collocated at both the MITRE facility and at Hanscom, so that an exchange of information can take place continuously at all levels. MITRE's technical competence and experience in the command and control field makes it a valuable resource for our current effort as well as in planning for the next generation of command control and communications systems.

Lincoln Laboratory, operated by Massachusetts Institute of Technology under an ESD contract, works principally in electronics, emphasizing national defense and space exploration applications. The Laboratory is supported by the Air Force, the Advanced Research Projects Agency, and the National Aeronautics and Space Administration. Research activities extend from fundamental investigations in science, through technological development of devices and components.

The other key supporting agency is the Rome (N. Y.) Air Development Center, also a unit of the Air Force Systems Command. Rome is equipment and technique oriented, as opposed to systems as a whole. Much equipment developed by the Rome Air Development Center finds its way into ESD projects, but what might be more important is that many of the results of RADC's research and development form the basis of future systems. ESD relies heavily upon RADC's technical skills in a wide range of areas such as computers, radar, and communications. Further, RADC often operates

more directly with us by acting as the contracting agency—as with the phased-array SPACETRACK radar at Eglin AFB, Fla.—under the management of an ESD System Program Office.

## ESD ORGANIZATION

The Electronic Systems Division itself is a 3,500-man unit, organized around five basic "product" deputates. Their names indicate their areas of responsibility: Deputy for Command and Management Systems, Deputy for Communications and Navigation Systems, Deputy for Surveillance and Control Systems, Deputy for Airborne Warning and Control Systems, and Deputy for Advanced Airborne Command Post.

Let's look at some of the responsibilities of the product deputates.

• **The Deputy for Command and Management Systems** has three chief tasks: first, managing those major ESD efforts that are computer and software dependent; second, providing a focal point for expert advice on the application of computer technology for Air Force users, offices, and support centers; and third, selecting all off-the-shelf automatic data processing equipment required by the Air Force for scientific and management purposes.

This deputate is supporting the Military Airlift Command (MAC) in the development of its Integrated Management System. Nicknamed MACIMS, the system is designed around three centrally located computers and input-output terminals at MAC field installations. The program will be incrementally implemented over the next three and a half years. The Military Airlift Command is the overall program manager, with ESD providing technical support.

Another project of the deputate is the 427M Cheyenne Mountain Complex Improvement Program, which seeks to modernize that NORAD facility by replacing the automatic data processing equipment in the NORAD Combat Operations Center and the Space Defense Center with newer Worldwide Military Command and Control System (WWMCCS) computers. ESD is also providing displays, consoles, and appropriate software. All of this must be integrated into the two Centers without disturbing their normal day-to-day operations.

Another improvement program is the 485L Tactical Air Control System Improvements, a major effort upgrading the 407L-Equipped Tactical Air Control System, which was an earlier ESD project. The 485L work not only will involve a development effort but also a logistics program of some magnitude, since this mobile, lightweight system will be deployed worldwide with our tactical forces—Tactical Air Command, US Air Forces in Europe, Pacific Air Forces, and the Air National Guard.

The 428A Tactical Information Processing and Interpretation System (TIPI) also deserves mention. This program involves acquisition of a mobile, land-based system to derive intelligence information from photographic and electronic data for use by Air Force and Marine Corps tactical com-



manders. There are six elements in this system, and current plans call for production contracts running into 1980.

• **The Deputy for Communications and Navigation Systems** is responsible for developing and producing new, and upgrading old, communications and navigation systems. Many of these new systems are required to support and operate some of our new weapon systems.

This deputate is just completing a massive Department of Defense AIMS (Altitude Identification Military System) program under which it managed the development, acquisition, and installation of air traffic control and identification equipment in some 30,000 Army, Navy, Coast Guard, Marine Corps, and Air Force aircraft, along with associated ground and shipboard radars. This involved twenty-nine prime contractors and thirty-five different equipments at a cost of better than \$1 billion.

Also in the navigation field is the AN/TPN-19 landing control system that provides the Air Force with an air-transportable, rapidly erected terminal control facility with unprecedented ability to guide aircraft through rain that blinds the current family of approach radars.

In communications, a significant project of the deputate is the development of terminals to serve the Air Force Satellite Communications System. Plans call for a modular family of airborne-quali-

fied hardware that can be configured into fifteen different airborne, ground, and transportable terminals, along with a family of ultra-high-frequency airborne command radio transceivers.

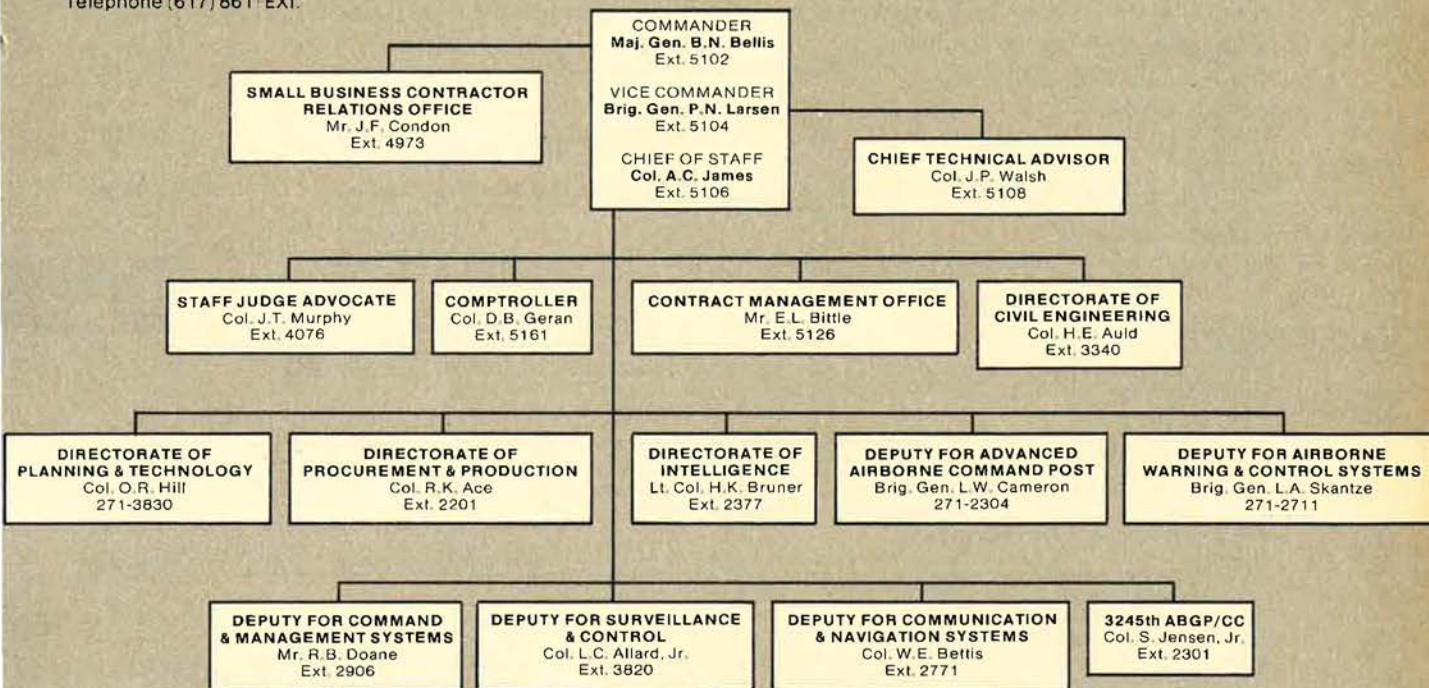
To satisfy the requirements of the Strategic Air Command (SAC) command and control communications in the 1980s, this deputate is working on the SAC Automated Total Information Network (SATIN IV) System. Designed to be survivable through the trans- and postattack phases of a nuclear conflict, SATIN IV will be a command and control record data communications system supporting the peacetime and wartime operations of the National Command Authorities and SAC's general war forces.

• **The Deputy for Surveillance and Control Systems** maintains a pool of expertise in both systems acquisition procedures and electronic technology so that when new surveillance systems are approved the framework exists to bring them to the operational stage quickly, effectively, and economically. There are currently twenty-five active programs assigned here.

*(Text continues on p. 58)*

## ELECTRONIC SYSTEMS DIVISION

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# What's Happening in Electronics at ESD

SYSTEM NO.	NAME AND MISSION	STATUS	CONTRACTOR
404L	<b>Traffic Control Approach and Landing Systems (TRACALS):</b> TRACALS combines USAF updated ground facilities and equipments (fixed and mobile) with associated avionics to provide safe, orderly, and expeditious aircraft movements on a worldwide basis.	Continuing Acquisition	Many
404L	<b>AN/TPN-19 Landing Control:</b> The AN/TPN-19 is a modular, transportable, all-weather, lightweight Ground Control Approach (GCA)/MRAPCON facility designed to provide simultaneous surveillance, identification, terminal area control, and final-approach control of aircraft at a fixed or forward tactical air base. The facility includes an Operations Shelter, an Air Surveillance Radar, and a phased-array Precision Approach Radar.	Acquisition	Raytheon (prime)
407L	<b>Tactical Air Control System (TACS):</b> A highly mobile communications and electronics system for command and control of tactical aerospace operations. Capable of modular deployment by airlift, helicopter, and truck, 407L can be adapted to specific geographic requirements. The system will provide radar and communications in the tactical environment, airspace management, communications for Army support, and air traffic control.	Transitioned	TRW Systems (integration) Many for equipment
411L	<b>Airborne Warning and Control System (AWACS):</b> Provides a survivable airborne air surveillance capability and command control and communication functions. Its distinguishing technical feature is the capability to detect and track aircraft operating at high and low altitudes over both land and water. It will be deployed by TAC in both initial phases of hostilities and in protracted situations. For ADC, it provides an efficient solution to the requirement for survivable, strategic air defense surveillance and control.	Acquisition	Boeing (prime)
414L	<b>CONUS Over-The-Horizon Backscatter Radar:</b> Provides ADC an early warning system against aircraft attack on the continental United States.	Validation	None
415L	<b>Military Airlift Command Integrated Management System (MACIMS):</b> An integrated, real-time, data-processing system to support the Military Airlift Command in accomplishment of its mission as the single-manager operating agency for global airlift services.	Development	None
416L	<b>SEED CLEAR:</b> Update of the existing AN/FPS-27 radar sets to satisfy operational requirements of the North American Air Defense System (NORAD).	Acquisition	Westinghouse (prime)
427M	<b>NORAD Cheyenne Mountain Complex Improvements:</b> A program to acquire new data-processing equipment, software, displays, and communications for the NORAD Cheyenne Mountain Complex. The NORAD Computer System, Space Computational Center, and the Communications System will provide the NORAD Cheyenne Mountain Complex with an integrated, responsive capability and a growth potential that will meet a projected life span of ten years without replacement of major equipment or major software changes.	Acquisition	Philco-Ford
428A	<b>Tactical Information Processing and Interpretation (TIPI) System:</b> The TIPI/MAGIS (Marine Air Ground Intelligence System) consists of four major segments, capable of deployment at various echelons of command of the Air Force and the Marine Corps. Its purpose is to provide, through automated aids, more timely and accurate intelligence to the tactical commander. The segments include a reconnaissance photo-processing segment, a photo-interpretation segment, an intelligence data storage/analysis segment, and an electronic intelligence-processing segment.	Definition and Development	GE for systems integrati Many for equipment
433L	<b>Weather Observing and Forecasting System:</b> A system for the modernization of the Air Force Weather Service to provide high-quality and timely weather observations, information, studies, advice, and forecasts in support of military operations and command and control systems.	Acquisition and Operational	Many
436M	<b>SACCS Computer Update:</b> Provides for the time-phased replacement of three SACCS (SAC Automated Command Control Systems) data-processing centrals by third-generation dual-processor computers. The new computers will interface directly with SACCS Electronic Data Transmission Communications Central (EDTCC), with the SACCS Autodin Teletype Interface Network (SATIN) Computers, and with the 4000th aerospace applications Group Remote Terminal Facility (R&F).	Acquisition	Computer Services Corp.
440L	<b>Forward Scatter Over-The-Horizon Radar:</b> Provides DoD activities with the capability for real-time information on strategic threats to national security.	Operational	Raytheon (prime)
441A	<b>Backscatter Over-The-Horizon Radar:</b> A research and development program to provide the Air Force with information to develop a future capability for detection of strategic threats to national security.	Completed	RCA (prime)
441D	<b>COBRA TALON:</b> A system to provide the Air Force with a detection and tracking sensor system for overseas deployment.	Operational	GE (prime)
450A	<b>Tactical LORAN:</b> Development and qualification of advanced LORAN ground transmitters and airborne systems to satisfy the Air Force Tactical LORAN common-grid requirements for the 1975-1985 time frame.	Acquisition	Sperry-Rand
451D	<b>COMBAT GRANDE:</b> Upgrading, modernizing, and semiautomating the existing Spanish Air Force aircraft control and warning network.	Acquisition	COMCO Electronics Cor (jointly owned by Hugh Aircraft Co. and Com pania de Electronica Comunicaciones)
474N	<b>SEEK SIN:</b> Provides a computer-programming support facility at Laredo MTK, Tex., for further development of SLBM software and associated training, as well as providing a backup capability for SLBM operational data-processing subsystem.	Operational	RCA
478T	<b>TRI-TAC Program:</b> A program to define Air Force requirements for tactical ground communications, both near term and post 1980. It will ensure that Air Force requirements are incorporated into the DoD Joint Tactical Communications Program Office (TRI-TAC). Responsible for development, acquisition, and test of tactical communications equipment unique to the Air Force. Will also guarantee compatibility of Air Force-developed equipment with similar apparatus being procured by other agencies.	Definition Phase, R&D, and Acquisition	None
481B	<b>Advanced Airborne Command Post:</b> Provides the National Command Authority and the Strategic Air Command with an improved command control and communications system. The system will utilize some combination of automatic data-processing and peripheral equipment accessed through remote terminals installed in a large, wide-bodied jet aircraft that will be operable during the pre-, trans-, and postattack phase of a general war.	Acquisition	Boeing (prime)
482L	<b>Emergency Mission Support:</b> A system that will provide air-transportable air traffic control, communications, and navigational aid facilities in support of emergency air operations.	Under implementation on an individual equipment basis	Many
485L	<b>Tactical Air Control System Improvements (TACSI):</b> Provides evolutionary improvements of equipment and capabilities of communication and electronic systems for command and control of tactical aerospace operations. The system consists of automated and miniaturized equipment compatible with existing Tactical Air Control System (TACS) equipment and interfaces with automated tactical data systems of the Army, Navy, and Marine Corps providing interoperability of joint forces.	R&D and Acquisition	General Dynamics, Hugh ITT

# A CHECKLIST OF MAJOR ELECTRONICS PROJECTS

SYSTEM NO.	NAME AND MISSION	STATUS	CONTRACTOR
490L	<b>Overseas AUTOVON Switches:</b> The key element of the overseas portion of the Defense Communications Agency's program to implement a worldwide Automatic Voice Network (AUTOVON). This system provides an automatically switched, wide-band communications network.	Operational with improvements continuing	GT&E Automatic Electric
499L	<b>AIMS Program:</b> Modification of DoD aircraft and modernization of radar beacons and identification systems to improve air traffic control in the National Aerospace System and provide secure identification of military aircraft and ships.	Acquisition	Many
616A	<b>Air Force Support of MEECN:</b> A project to update the Air Force Low Frequency/Very Low Frequency (LF/VLF) System to present-day requirements for CINCSAC and Joint Chiefs of Staff.	Development Phase	Westinghouse
633A	<b>Cobra Dane:</b> A system to acquire a phased-array radar to be installed on Shemya Island, Alaska, for the purpose of collecting data on missile testing and satellite tracking.	Acquisition	Raytheon (prime)
634B	<b>SEEK BUS:</b> A program to develop a high-capacity, reliable, jam-protected, secure, digital-information distribution system that will provide an unprecedented degree of interoperability between data collection elements, combat elements, and command and control centers within a military theater of operations.	Concept Validation Phase	None
642A	<b>SEEK POINT:</b> Design, development, and fabrication of AN/TPB-1A radar system to improve tactical bombing capabilities. System based largely on RADC development of AN/TPB-1 feasibility model. System accuracy, simplicity of operation/maintenance, and mobility are prime engineering objectives.	Operational	Sierra Research Applied Science
1135	<b>Automated Armed Forces Examining and Entrance Station (AFEES):</b> The Automated Armed Forces Examining and Entrance Station (Automated AFEES) Program entails the design, development, test, and evaluation of a prototype Automated AFEES that will substantially improve examinee screening and administrative processing within the AFEES.	Engineering Development	Computer Sciences Corp.
1205	<b>Air Force Satellite Communication System (AFSCS):</b> The program is for the acquisition of UHF airborne/ground force terminals, airborne/ground command post terminals, ancillary equipment necessary for operational control and communications transponders on selected Air Force satellites. In addition, the associated family of modular UHF transceivers will provide a command-communications capability in the line-of-sight mode. The full-grown family of modular UHF radios will result in a common base to provide the transceiver for the satellite SIOP and Force communications terminals and direct replacement of the AN/ARC-27, AN/ARC-34, and other obsolete UHF command units identified by AFSC.	Development/Acquisition	Collins Radio
1213	<b>Airborne Weather Reconnaissance System (AWRS):</b> A high-priority program to provide the WC-130 fleet of the Air Weather Service with improved meteorological data-gathering and information-processing equipment designed to respond to the weather forecasting requirements of the 1970s.	Prototype Acquisition	Kaman Corp. (prime)
1911	<b>SPACETRACK Augmentation:</b> The mission of the SPACETRACK system is to detect, track, and identify man-made objects in space. Improvements are needed to expand the system's capability in terms of extended range, greater coverage, better accuracy, and more timely reporting. Several studies and projects are under way to determine future requirements for modifications to the sensor network, on-site data processing, operating procedures, and system communications. Large ground radars and electro-optical systems are being considered for performing the deep-space surveillance mission.	Conceptual Phase	None
2009	<b>ANMCC Processing and Display System:</b> The system will receive, process, and display Status Warning and Attack Assessment Data to support the National Command Authorities and the Joint Chiefs of Staff. The Processing and Display System for the Alternate National Military Command Center will be a duplicate of the system previously installed in the National Military Command Center. The Processing and Display System is comprised of two Display Subsystems: the Alphanumeric Wall Display Subsystem and the Large-Screen Wall Display Subsystem.	Acquisition	Philco-Ford (prime)
2029	<b>Survivable Satellite Communication System (SURVSAT):</b> A system providing reliable and secure means for complete command and control of weapon systems during crises. Provides the ability to communicate with globally dispersed forces.	Validation Phase	None
2052	<b>Radio Information Distribution System (RIDS):</b> The application of digital techniques, multiplexed buses, time-shared computers, modular software, and integrated displays and controls to provide an information distribution system for Communication, Navigation, and Identification (CNI) equipments on board aircraft.	Conceptual Development Phase	None
5604	<b>Local Digital Message Exchange (LDMX) Secure Terminals:</b> A project to develop secure terminals suitable for normal office environment in association with the LDMX switch program.	Development with Feasibility Demonstrations	General Dynamics Electronics Division
7820	<b>Communications Security (COMSEC):</b> A program to guard overall security of systems against interception, traffic-flow analysis, cryptographic failure, and electronic countermeasures.	Continuing	Many
	<b>Advanced Tactical Command and Control:</b> A system that will provide the tactical air force commander with enemy situation data in near real-time correlated from all sensor sources; and the capability to plan, replan, coordinate, and positively control all available aircraft, weapons, and systems allocated to him to counter the threat.	Conceptual Phase	None
	<b>Air Force Base Information Transfer System (AFBITS):</b> A system to improve the information transfer capabilities throughout an Air Force base. Advanced information storage, processing, and transfer techniques will be applied to the conduct of administrative activities at all levels of base operation.	Conceptual Development	None
	<b>Air Traffic Control Planning:</b> This effort defines issues and identifies potential problems that USAF flight operations must address to operate in a future Air Traffic Control environment, and proposes solutions to those problems.	Conceptual	None
	<b>Base and Installation Security Systems:</b> An evolutionary program to provide for the defense of worldwide DoD resources. The system concept incorporates maximum commonality of major items and a variety of supporting subsystems, offering thereby a flexibility or choice of equipments that can be tailored to the unique physical characteristics of the facility and to the threat.	Development Acquisition Deployment	Many
	<b>SAC Automated Total Information Network (SATIN):</b> A program to provide SAC with an integrated commandwide digital communications system that will satisfy, with updating, SAC requirements for command-control, administrative, and support data transmission into the 1980s.	Conceptual Phase	None
	<b>TAFSEG:</b> The Tactical Air Force Systems Engineering Group (TAFSEG) has the function of illuminating and defining opportunities and problems relative to effective operation between major tactical systems. To do this, TAFSEG has been established as an engineering organization that works independently of, but in close coordination with, system program offices. Results of TAFSEG investigations are acted upon by the system program directors and the AFSC chain of command as appropriate.	Continuing	None
	<b>Weather Systems Planning:</b> To plan for the development and acquisition of aerospace environmental support systems and equipments that would make significant contributions to operational and weapon system effectiveness.	Conceptual Phase	None

ESD Commander Maj. Gen. Benjamin N. Bellis is committed to use electronics to increase USAF's productivity and thereby give the taxpayer the best possible defense for his tax dollar.



The Advanced Airborne Command Post, a modified Boeing 747, is one of ESD's key programs, involving a phased development effort.

The deputate's most recent program to reach the contract phase is COMBAT GRANDE, which will modernize and semiautomate the existing Spanish aircraft control and warning system. An indirect benefit will accrue to the Spanish Civil Air Traffic Control System as the result of accepting digitized radar data from the new system.

Another surveillance program reached the construction stage last summer on Shemya Island, Alaska, with foundation work on a large single-faced, fixed-position, phased-array radar incorporating the latest state-of-the-art detection, automated tracking, and performance capabilities. This COBRA DANE system will be unique in its ability to automatically select a variety of mission modes and data collection techniques. Its mission is to collect information on Soviet ballistic missile tests, with corollary missions of early warning and satellite tracking.

The deputate is starting on the procurement phase of the 414L Continental United States Over-the-Horizon Backscatter Radar. The initial phase of the program will be a limited-capability prototype in Maine. This program is a further example of basing the decision to produce an operational system upon successful technological demonstration of the prototype.

There is an additional set of projects under this deputate that falls into the weather-forecasting category. These include optical and radio solar telescopes to observe activities on the sun's surface which affect the earth's atmosphere, equipment to automate the gathering and transmission of meteorological data, and instrumentation for WC-130 weather reconnaissance aircraft to greatly improve the data-gathering capabilities of the Air Weather Service. The latter project has proved so successful that a near-carbon copy was ordered by the National Oceanographic and Atmospheric Administration for their test purposes.

## OTHER DEPUTATES

Briefly, this sketches the deputates that manage the majority of ESD's programs. The two largest programs at ESD are the Airborne Warning and Control Systems and the Advanced Airborne Command Post. These two programs are organized as "Super" System Programs at the deputate level and are directed by general officers. The status of the Airborne Warning and Control Systems is described in detail elsewhere in this issue. (See the article on AWACS, p. 69.)

The Advanced Airborne Command Post is another example of tailoring our management to the project. It began as a Concept Formulation effort under our Deputy for Planning and Technology, shifted to System Program Office status in the Deputy for Command and Management Systems when the time came to enter the procurement cycle, and then was elevated to a separate deputate (Super SPO) when things really started moving.

The first phase of this program calls for outfitting three Boeing 747-type aircraft with electronic equipment currently on board the smaller EC-135 Airborne Command Posts used by the National Command Authorities and the Strategic Air Command. The second phase will require development of improved command control and communications equipment for four additional aircraft, plus refitting the original three.

Our long-range goal is to make the Advanced Airborne Command Post completely autonomous, with direct communication to the air, ground, and sea forces and with full on-board data-processing capabilities. The vital nature of the Command Post mission requires that the data links be secure, jam-proof, and capable of surviving in a nuclear environment.

The task of keeping an eye to the future belongs primarily to another deputate—the **Deputy for Planning and Technology**. This organization has

the heavy responsibility of formulating concepts for future command control and communications systems, assuring that the thrust of research and development is in the direction of the foreseeable technological needs of upcoming systems, and in keeping abreast of the best available technologies to make certain they are employed in our active programs.

This mission is a foundation stone of the process of acquiring new and improved command control and communications systems for our operational forces. It spans the interval between the definition of requirements (generally a formal Required Operational Capability) on the part of the using commands, and the establishment of a System Program Office to acquire the needed equipment.

## **FUTURE OF ESD**

We see a steadily growing demand for ESD's talents and products. The amount of money provided to the armed forces by the American taxpayer is limited, and the pressure to do more with less translates directly to better command control and communications. This need poses as challenging a task to the modern-day system program director as that faced by any military commander involved in controlling his forces.

We cannot afford insufficient planning and coordinations in initially defining our programs. Too often projects have started without a full realization of what was involved, with resulting cost overruns or money plowed into backtracking in order to cover gaps in planning.

The manager must clearly and objectively define program goals and needs, and match these against available resources and technical capabilities. Once you have done this adequately, perhaps eighty-five percent of the job is done, leaving the manager with the task of following a well-charted road.

A major decision facing the system program director is when to say "Stop, this is the final design." With technology moving so fast, new approaches may show up halfway through a four- or five-year acquisition program, but it is obviously impossible to incorporate every new design and still deliver a complex system when it is needed.

Despite the high cost of sophisticated systems, it's not hardware that consumes most of the available military funds. The lion's share goes into "people" expenses. If we can apply technology to make people more productive, we can give the taxpayer a better guarantee of a dollar's worth of defense for every tax dollar.

Computers and automation offer us this opportunity. Too many people are spending too much time doing repetitive tasks that could be automated by using available machines properly. Written message traffic is a good example. Hour upon hour is spent by people sorting mail, ripping telegrams from machines, bringing messages from

large to smaller distribution centers, resorting, and routing.

How much manpower could be saved with a computer-based direct writer-to-reader service! Small communications terminals in each office could virtually eliminate message centers, freeing people for more meaningful tasks as well as assuring next-day delivery, at worst, of all types of messages. The USAF Military Personnel Center's advanced personnel data system, which links together 140 Consolidated Base Personnel Offices, is a step in that direction.

The Air Force has—in common with industry—shared in the massive application of computers over the past decade. Despite the sophistication that has developed from generation to generation of equipment, neither the government nor industry has really exploited computer hardware to its maximum potential. Part of this is the result of a piecemeal approach to the application of computers. We have solved particular problems, rather than developing hardware and software with more general applications. Now, as computers are applied to more and more functions, we can see the need for a high-level integration, tying these systems together with compatible software and hardware.

In the design of computer systems, it is the software—the thousands of instructions that specify every step the machine must take—which is directly tied to people costs. Techniques for writing programs are still almost an art; we hope to see these procedures themselves automated so that a good technician can do what now must be done by highly paid experts.

Back in 1970, the Air Force formally recognized the need to create a management structure to handle USAF computer applications by endorsing the concept of a Computer Technology Center. As a result, the Information Systems Technology Applications Office is now operating within the Deputy for Command and Management Systems. This office has the function of developing and maintaining a center of expertise to provide consultant services and support to the Air Force Systems Command program offices and to other Air Force organizations concerned with acquiring and improving information systems.

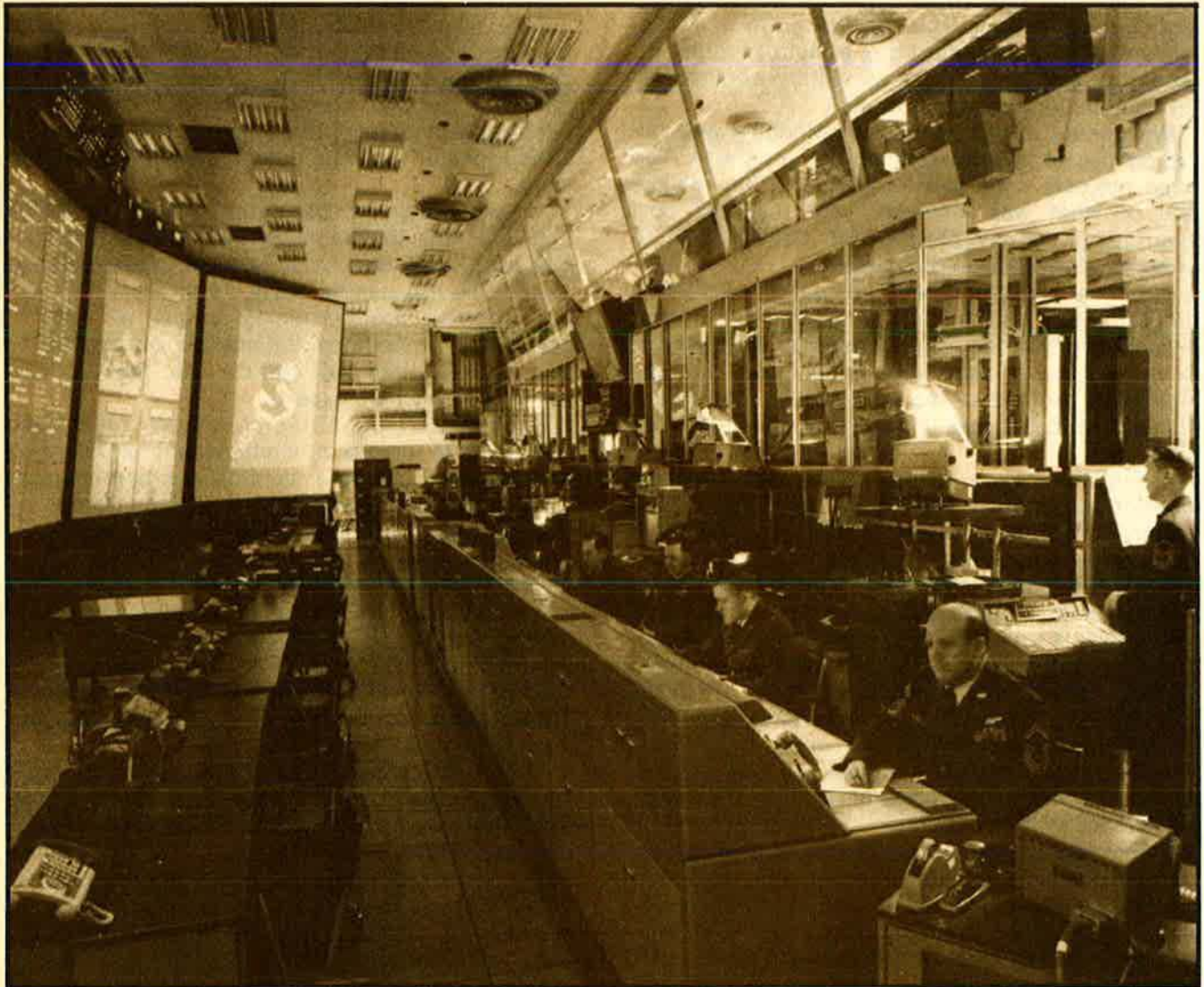
Such past projects of the Electronics Systems Division as the Ballistic Missile Early Warning System, the NORAD Cheyenne Mountain Complex, and the SPACETRACK System are firmly interwoven into the fabric of our nation's defense. There is no question in my mind but that ESD will continue to play a major role in developing the electronic and computer technology so essential to the future command and management of our defense forces. ■

# THE ELECTRONIC AIR FORCE

USAF's principal command and control challenge pivots on secure, survivable communication with the far-flung forces of the Strategic Air Command. Three major and highly sophisticated systems that support SAC's vital information requirements are under full-scale development. The Air Force's Director of Command Control and Communications examines these and related information systems in a broad assessment of . . .

## COMMAND AND CONTROL WHY THE AIR FORCE'S NEW SYSTEMS ARE REVOLUTIONARY

BY MAJ. GEN. LEE M. PASCHALL, USAF  
DIRECTOR OF COMMAND CONTROL AND COMMUNICATIONS, HQ. USAF



*SAC's command and control system is a key element of US C<sup>3</sup> network.*

**C**OMMAND and control and its supporting communications are of growing importance to the United States. In his annual Defense Department Report for Fiscal Year 1975, Secretary of Defense James R. Schlesinger stated that "continuity of command and control of the strategic forces by the National Command Authorities before, during, and after a nuclear attack on the United States is a basic tenet of our national security policy."

The renewed national emphasis on command and control stems from concerns about the effectiveness and survivability of our command control and communications (C<sup>3</sup>) structure. There is still a residue of doubt about its effectiveness, caused by such events of recent history as the *Liberty*, *Pueblo*, and EC-121 incidents. Nuclear blackout, electromagnetic pulse effects, and the very large inventory of Soviet missiles give rise to concern about survivability.

The new targeting strategy being articulated by Secretary Schlesinger, which calls for greater flexibility and selectivity in nuclear response options, levies significant demands on the command and control system and its supporting communications. These demands are reasonably well understood for strategic offensive forces and somewhat less well understood for tactical nuclear forces.

There are available both technology and concepts that will enable us to make significant improvements in command and control systems and their supporting communications. The Air Force and its industry partners have reason to be proud of their contribution and leadership in this area.

### **SOVIET C<sup>3</sup>—THE THIRD REVOLUTION**

The Soviet Union is also putting major emphasis on command and control. In fact, Soviet leaders refer to it as the Third Revolution in military affairs: The first was the creation of nuclear weapons, and the second the development of missile delivery systems.

The Soviet author of the book *Marxism-Leninism on War and Army*, published in 1972, describes it this way: "The third stage of the revolution in military affairs began in the USA and the USSR almost simultaneously. This stage was characterized by the comprehensive automation of military equipment, the automatic control of equipment and the combat actions of troops, and the intensive introduction of scientific knowledge into the military field, notably for the control of the troops."

Emphasis on this stage by the Soviets began in approximately 1968 and has been picking up speed ever since. Although one frequently sees the expression "troop control," and less often the use of the US expression "command and control," the more generally used expression "military cybernetics" has come into vogue and marks their principal concern with the introduction of automa-



*Maj. Gen. Lee M. Paschall, Director of Command Control and Communications, Hq. USAF, stresses that the new targeting strategy levies significant demands on the command control system and its supporting communications.*

Readers of AIR FORCE Magazine will recognize that the United States was well into second-generation command and control systems by 1968, most notably in the USAF.

### **THE US MILITARY COMMAND STRUCTURE**

The Worldwide Military Command and Control System (WWMCCS) was first defined in 1961. It functioned for its first ten years as a rather loose confederation of individual systems that had been designed principally to support the needs of the services and the Unified and Specified Commands.

In late 1971, WWMCCS was redefined as a much more closely knit system whose principal role is that of supporting the National Command Authorities (NCA). WWMCCS, in its revised form, consists of the National Military Command System (NMCS), the command and control systems of the Unified and Specified Commands, of the military service headquarters, and of their individual commands, as well as the command and control support systems of the Department of Defense, plus direct ties with other government agencies. The latter include the White House Situation Room, the State Department Operations Center, the Central Intelligence Agency's Indications Office, and the US Intelligence Board's National Indications Center.

Command and control systems of the participants must directly interface with and satisfy, as the priority task, the information needs of the National Military Command System, which directly supports the NCA.

There are many significant improvements currently being made to the WWMCCS. Some of these are rather widely known, others less well known, and the interrelation of some of the new efforts even less well understood. There are also some tough questions that remain to be answered. Most of them are of the "how much" variety, but there are also some of the "how to" character.

In the "how much" category are such questions as: How much attack assessment is required? How much survivability, particularly of communications, is enough? How much information is needed by the NCA and the NMCS? A "how to" question of some importance is how to achieve rapid, reliable, two-way communications with the sub-launched ballistic missile (SLBM) force in such a way that we don't reveal the location of the submarines. This is by no means a complete list of the questions that must be answered, but these examples do indicate that the questions are not trivial.

I will briefly describe some of the actions now under way to improve WWMCCS and then in more detail some of those that apply more specifically to the Strategic Air Command.

### **NMCS IMPROVEMENTS**

The National Military Command System consists of three command centers: one in the Pentagon, the National Emergency Airborne Command Post, and an Alternate Command Center located in Maryland. Each of these elements of the National Military Command System is being improved. The National Military Command Center in the Pentagon is being expanded by the Air Force for the JCS. Its size is being about doubled, and new integrated displays and improved secure voice and conferencing capabilities, together with other communications improvements, are being provided. There also will be a much closer coupling with intelligence centers.

The National Emergency Airborne Command Post is being reequipped under the Advanced Airborne National Command Post (AABNCP) Program with the E-4 aircraft, which will provide greater endurance, a larger battle staff, and higher powered communications. The new communications capabilities will extend over a complete range of frequencies from VLF to SHF, the latter via the Defense Satellite Communications System. Initially, the AABNCP will have a computer remote terminal capable of access to the ground-based WWMCCS computers, and, in its second phase, a self-contained airborne automatic data processing (ADP) system.

The Alternate National Military Command Center is also being improved by the Army, principally by providing a more survivable communications structure.

### **ENLARGED CAPABILITIES FOR WWMCCS**

There is also a series of WWMCCS-wide improvements. Thirty-five new Honeywell computer systems are replacing a large number of much less capable computers and will allow the beginnings of software standardization within the WWMCCS community. Under JCS auspices, a pro-

totype Intercomputer Data Network has been initiated whose purpose is to learn how to exchange data among the WWMCCS computers and the value of such a data exchange.

The Air Force has been tasked to replace the fifteen-year-old emergency message automatic transmission system (EMATS) with a modernized system capable of meeting the new communications criteria of being able to provide "direct-to-forces" connections. It will also provide semi-automatic message acknowledgment at selected terminals.

There are a number of improvements being made to the Minimum Essential Emergency Communications Network (MEECN), whose purpose is to deliver emergency action messages to strategic nuclear forces via a collection of the most survivable means of communications available.

Improvements are being made to the WWMCCS-related warning systems. Among these are the further development of the capabilities and potential of our early-warning satellites. We have also proposed to the Congress two new SLBM warning radars. They will replace the present SLBM warning system and provide radar detection of the new Soviet SSN-8 SLBM to complement the early-warning satellite infrared detection capability, as the BMEWS system does for ICBMs.

Finally, in recognition of the fact that there are difficult questions left to answer, and to define a set of goals and objectives for the future WWMCCS, there has been established a group to develop the WWMCCS System architecture of the future.

### **C<sup>3</sup> DEVELOPMENT IN SAC**

There are three major command control developments under way for SAC. Each has a close relationship to the other, and we are trying to achieve an initial operating capability for all three at about the same time. These are the SAC AABNCP, the SATIN IV data communications network, and the Air Force Satellite Communications (AFSATCOM) System. Our planning here is directed at achieving a command control and communications system having high confidence of executing the NCA's retaliatory strike orders after the United States has absorbed a massive attack that could include the command control and communications systems as targets.

An airborne command post is our most survivable command center. The AABNCP Program will provide SAC with E-4 aircraft configured like those of the National Emergency Airborne Command Post. Three of these aircraft with their planned C<sup>3</sup> equipment will replace the EC-135 aircraft currently used for the SAC Airborne Command Post (continuously on airborne alert since early 1961), as well as the auxiliary command post ground-alert aircraft.

One simply cannot discuss the AABNCP with-





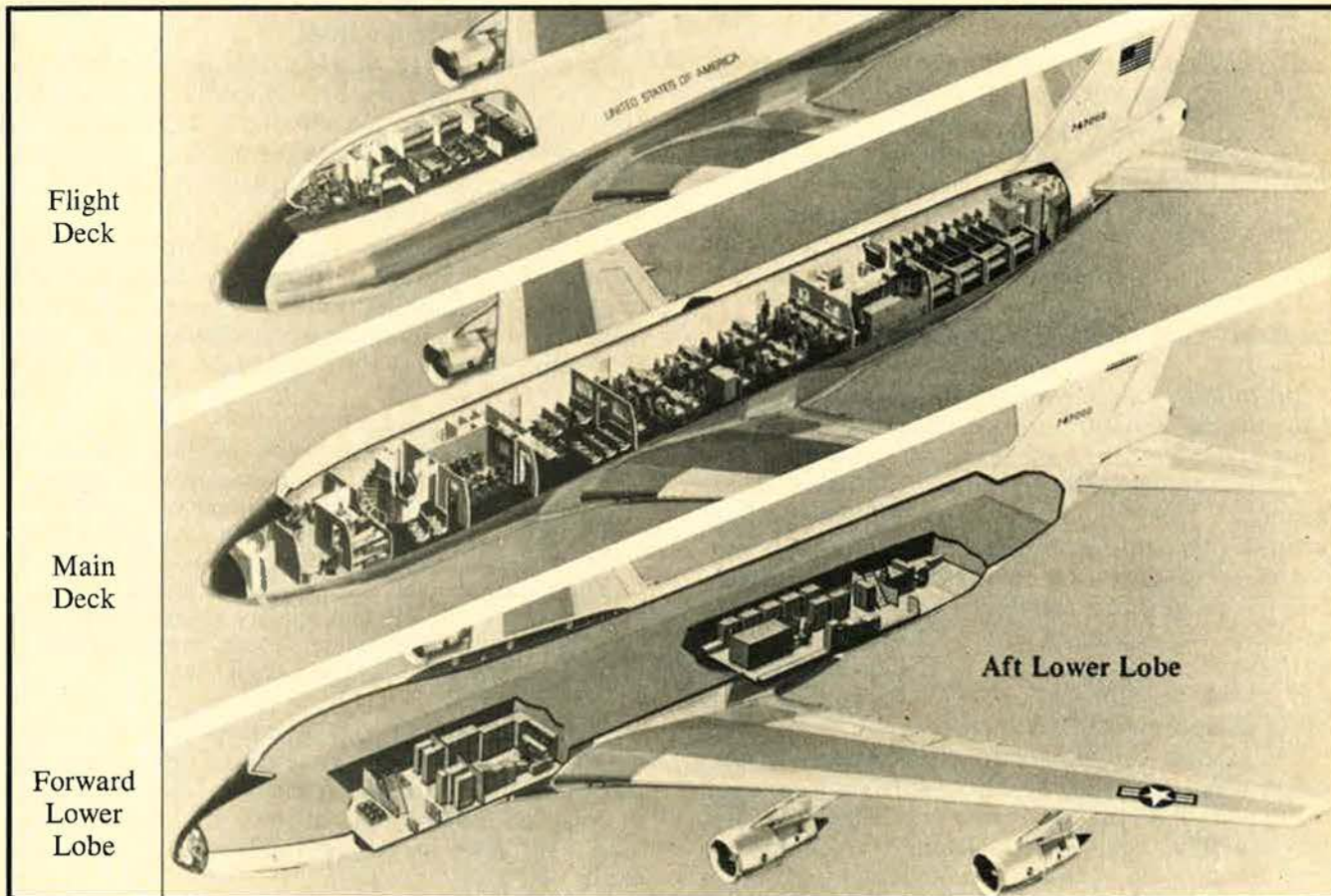
out giving primary consideration to communications. If it cannot communicate, it is without value as a command center. Thus, the importance of the other two related systems, SATIN IV and AFSATCOM.

### **SATIN IV**

The original concept for SATIN IV postulated a new data communications system that would meet all of SAC's information needs; thus the acronym SATIN, derived from "SAC Automated Total Information Network." As that design evolved and particularly as the requirement for survivability was examined, it became clear that the SATIN IV system should be strictly limited to support only that data essential to command and control. It will

*LEFT: This special communications antenna, developed by the Air Force Systems Command's Electronic Systems Division, permits real-time communications between widely separated points via satellite and can be backpacked.*

*BELOW: The Advanced Airborne Command Post (AABNCP) will provide greater endurance, larger battle staffs, and better communications capabilities than the EC-135 aircraft.*



replace the ground-based data communications subsystem of today's SAC Automated Command and Control System and will extend to dispersal bases as well as achieve close and direct coupling with the NMCS and the SAC AABNCP.

The principal system goals are to provide a reliable, secure, and survivable two-way communications network. It must be able to degrade gracefully (perform minimum essential functions) under attack. It can operate at a relatively low data rate (2,400 to 9,600 bits per second) because of SAC efforts over the years to compress the amount of data that must be transmitted, by using highly stylized, preformatted, and fill-in-the-blank information transfer. It must also be able to degrade to a low data rate (seventy-five bits per second) so as to be able to use the AFSATCOM as a transmission medium.

The system operation will make use of minicomputers at bomber and missile bases, connected to regional and headquarters communications processors through the AUTOVON network. AUTOVON, because of its inherent redundancy, provides the most survivable ground-based communications system available to us. Any base communications processor will be able to connect to another surviving base processor without having to rely upon the limited number of regional and headquarters communications processors. This can be done by automatic dial-up of surviving AUTOVON circuits, or by UHF ground entry points to airborne radio relay or command posts, or by AFSATCOM access to airborne elements.

Any surviving terminal will be able to reestablish communications with any other surviving terminal via the communications processors in the AABNCP if the ground base processors are destroyed. Surviving elements of the NMCS will have direct access to SATIN IV in a similar manner so that communications can be established direct to surviving force elements as required.

## **THE AFSATCOM SYSTEM**

The primary mission of the AFSATCOM System is to provide reliable, secure, long-distance UHF communications through satellite relay for the command and control of USAF strategic force elements. The communications network being planned, therefore, is based on a global concept and is being designed to meet the communications needs of these forces. In addition to satisfying these requirements, the AFSATCOM System will provide a communications means to support high-priority missions of other Air Force elements and of certain other DoD elements.

The general communications parameters of the system were selected to optimize its performance for highly mobile platforms that need low-data rate and low-duty cycle, long-distance communications. Simultaneous teletype communications will

be possible over several secure narrow-band channels, at a primary transmission rate of 100 words per minute. The system will also accommodate higher data rates for a very few selected users. Certain antijamming features will be incorporated.

There are three major subsystems of the AFSATCOM System: the space segment, the airborne terminal segment, and the ground terminal segment. Each of these is critical to the global network. The AFSATCOM space segment will consist of dedicated communications transponders on board the Navy Fleet Satellite Communications System satellites to be placed in synchronous equatorial orbit. Polar coverage and added redundancy will be achieved by transponders on the Satellite Data System and on other DoD satellites.

The airborne and ground communications terminals are modular, so that several configurations can be arranged to meet individual user needs. Operation with either precomposed formatted messages or manual push-to-type messages will be possible. Most strategic mission aircraft will be equipped with these terminals. For example, the Air Force plans to equip E-3, E-4, B-52, C-135, FB-111, C-5A, and C-141 aircraft with this capability.

The final segment of the AFSATCOM communications network consists of ground terminals that are planned for installation at key locations. In addition to locations in the continental United States, ground stations are also planned in the European and Pacific areas.

As a follow-on to AFSATCOM, we are developing the technology needed to further improve the survivability of strategic communications satellites. This technology will lead to a new Survivable Satellite Communications (SURVSATCOM) System sometime in the 1980s.

As Secretary Schlesinger noted in his Annual Defense Report, today's system for command and control of the strategic offensive forces is not now as survivable as the forces themselves. Dr. John S. Foster, then DDR&E, stated in January 1973 that:

A military capability is made up of a chain of many links—command, control, communications, logistics, trained personnel, weapons and their maintenance, and the strategy and the tactics to be employed. It is not enough to make any single link overwhelmingly strong. That is why a tenfold improvement in any one military function seldom results in a major overall improvement—unless we are strengthening the weakest link.

Our main efforts today are to ensure that command control and communications do not become the weakest link as we transition from a strategy of assured destruction to one of more flexible response, with its heavy demands on the command and control system. ■

# THE ELECTRONIC AIR FORCE

The Air Force, with some 23,000 people operating more than 1,300 general-purpose computers, is one of the world's principal computer users and one of the driving forces behind advanced data automation technology. In this article, the Air Force's ranking computer executive previews the directions in which USAF computer usage policies are developing . . .

## DATA AUTOMATION HOW USAF IS OPENING A NEW ERA

BY MAJ. GEN. JACK B. ROBBINS, USAF

DIRECTOR OF DATA AUTOMATION, HQ. USAF, AND  
COMMANDER, AIR FORCE DATA AUTOMATION AGENCY



*Computers have become indispensable and ubiquitous Air Force tools that provide vast savings in personnel and resources.*

**W**HEN the Air Force acquired its first general-purpose computer in 1952, unprecedented challenges were anticipated. We were not disappointed. Each year and each new generation of computers has presented its own problems and opportunities. During the past twenty-two years, the Air Force has experienced a spectacular growth in the application of computers to Air Force processes.

However, when one looks at the Air Force Automatic Data Processing (ADP) Program as an entity and examines the ADP management concerns of the Air Force during the '50s and '60s, it is obvious that during those years ADP management was directed primarily toward the use of the computer in a service and support role. Our management attention was generally limited to those computers used as recorders and custodians of functional area data.

This approach was satisfactory in the past. It produced many benefits for the Air Force. The employment of standard computers and standard data systems in support of base-level functional management has provided savings of more than 6,500 manpower spaces, and economic benefits approaching \$1 billion. In addition to manpower and dollar savings, valuable lessons were learned about how computer technology should be managed and applied. An Air Force ADP program management structure evolved which, in the main, was in step with the scope and magnitude of the program and also responsive to the growing congressional interest in the use of automation.

Today, however, we are on the threshold of a new era. Computer systems of the past—functionally aligned, mainly concerned with historical data, and report-oriented—are not satisfactory in today's Air Force. Furthermore, the use of digital computers in the operational environment has significantly expanded in recent years. Computers have become mandatory in almost every area of the modern Air Force.

I believe that the proper application of today's computer technology can provide systems that are more responsive, will permit greater savings of personnel and resources, and—even more important—offer additional opportunities to control and enhance operations.

Computers also can increase interaction between people, between people and vast stores of information, and between functions. Unified banks of data and information are now possible. Such data, either geographically dispersed or consolidated, can be made readily available throughout the Air Force.

Technology is no longer the pacing restraint; cheaper, better, faster, and more reliable hardware is becoming available. Quality, high-capacity communications are available today at a price, and becoming cheaper.

The potential is enormous. The question is: Will we imaginatively seize the opportunity? If our

answer is yes, then some things will have to change.

## **COMPUTER/COMMUNICATIONS NETWORKS**

We will have to modify our concepts and thinking about the use of information. We will have to move away from a view of information that is largely limited to the traditional recording and accounting framework, and toward thinking of information as a powerful tool for actively controlling and directing operations.

We cannot be satisfied with merely imposing computer capabilities upon existing functional systems; rather, we must develop systems in which computers are integral parts, and the total system is designed to take maximum advantage of the power of the computer. Many processes can be much more closely integrated at the operational level, with resulting benefits for everyone. This dictates a move away from serial processing and toward encouraging interaction between systems and users on a continuous basis. In fact, the full potential of computer technology will not be captured until we reorient our thinking from traditional, functional processes to multifunctional activities and the interrelationships of related processes. This is no small or easy change.

The relationship of communications and computers is changing. The potential benefits of networks of computers are beginning to be realized. Such combinations of computers and communications will provide an array of possibilities in computers vs. communications trade offs. The consolidation of scattered data-processing installations into central facilities becomes feasible. Access from remote sites is possible and, for many applications, is cost-effective. Lower communications costs will accelerate the movement in this direction.

Another benefit from computer networks is the sharing of ADP resources. In a sense, the user becomes independent of the limitations of his own computer and can tap the power and, if the system is so designed, the programs and data of computers scattered over great distances.

The combination of communications and computers into networks results in a high level of system complexity. Such complexity requires an evolutionary development approach. This means that one must first develop an initial capability and test it on a small scale before operating on a large scale. With usage, new capabilities are inspired and added, and the evolution continues.

This increased complexity also calls for a higher level of knowledge and sophistication on the part of designers, systems analysts, and software programmers. The supply of such expertise is always in critical supply.

Computer networks that are geographically distributed require high-speed and large-volume digi-



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tal communications. The cost can be high. However, increased competition is driving down costs and providing alternative communications services. Minicomputer technology allows for cost-effective, dynamic allocation of communications capacity so that channels can be shared among many users.

Today, the Air Force is operating elementary computer networks. Project CREATE provides computer support to AFLC/AFCS engineering scientists and AFIT students and faculty. On-line terminals, including graphic scopes, are tied into a network with computer systems located at Wright-Patterson AFB, Ohio.

The Maintenance Analysis Structural Integrity Information System (MASIIS) consists of a network of computers at AFLC and MAC bases tied together through dedicated communications lines. Comprehensive information on malfunction detection and the structural status of selected aircraft is maintained by this system. Information is directly available via the network to selected bases across the United States.

## **PLANNING FOR NEW NETWORKS**

We are currently moving aggressively forward in the planning for additional, more comprehensive networks. Some of these efforts will seek to capitalize on the existing Advanced Research Projects Agency (ARPA) network. This network allows for the interconnection, via common carrier circuits, of dissimilar computers at widely separated centers. An AFSC plan calls for an initial test for netting three computers: one at Wright-Patterson AFB, Ohio; one at Kirtland AFB, N. M.; and one at Eglin AFB, Fla. These computers will be tied together through the ARPA network with an initial goal of sharing the total processing capability among the systems users. A follow-on plan is to add additional computers and terminals to the network. Such netting will capitalize on new relationships among existing capabilities. Our future

plans in the network area are more ambitious; they involve the complete design of new systems.

The Tri-Service Medical Information System (TRIMIS), now being planned, is an example of a local computer network. This system is planned as a health-care system for DoD hospitals and will be developed on an evolutionary basis. The intent is to capitalize on the capabilities of computers to be integrated into the functional processes. Initially, systems in six functional areas will be designed with a minicomputer at the core of each. These highly independent systems will provide an initial operating capability. Based upon experience with these systems, the minicomputers will be tied together with communications links into a network system. An ultimate goal is to drastically reduce the transfer of information by manual means throughout the medical facility.

Another area under current study, with a high potential for a computer network, is the future Air Force base-level system. The "Support of Air Force Automatic Data Processing Requirements Through the 1980s" study (SADPR-85) addresses the total base-level ADP work load that will exist during the 1980s. One provocative alternative for satisfying these requirements consists of a number of command-centered, regional processing networks. Command processing centers connected to the bases and to each other through wide-band communication links could serve most bases. Each base could incorporate several minicomputer systems into its data-handling functions, with most processing accomplished at the regional centers.

This concept would provide the bases access to powerful multiprocessing systems with higher availability and reliability than smaller processors at base level could provide. Furthermore, significant operational savings could be realized, both in operations personnel and the maintenance and control of software.

Such a project is ambitious, and there are differences of opinion regarding the degree of risk and uncertainty involved. One thing is crystal clear—an evolutionary process in developing such networks is fundamental to success. The optimum benefits of the regionalized concept are dependent upon a greater integration of data and information processes than has been our experience in the past. Acceptance of this fact will come only on an evolutionary basis. Ultimately, users will be willing to accept this concept when they are assured that their functional requirements and processes are being achieved. The challenges in this area are as much psychological and organizational as technical. I believe the Air Force is equal to this great effort.

## **AIRBORNE COMPUTER SYSTEMS**

The concepts I have described have operational implications; however, in the main, they are sup-

port-oriented. Another aspect of computer technology is at the heart of the Air Force's operational capability—namely, avionics systems.

In talking about avionics, I refer to the on-board computer systems required for the aircraft to perform its mission. During most of the 1950s and earlier, these functions were performed by analog systems. Each mission function contained its dedicated analog subsystem. In the late '50s and during the '60s, digital computer technology was introduced in the automation of numerous functions.

Present operational aircraft carry a mix of analog and digital capabilities, with a definite trend toward increased digital applications for the future. However, with few exceptions, each system for each airframe has been a specifically tailored item. This results from many causes, among them the approach of adding on each system as a self-contained unit. As a result, we are confronted with a proliferation of diverse computers requiring special languages on board the same airplane. The application of digital computers also increases the potential for incompatibilities, because interactions between systems not previously feasible with analog approaches are now possible.

Reduction in avionics computer proliferation could result in significant savings. The common denominator of digital computers is software, and one of their inherent advantages is the flexibility they permit through software changes. However, the proliferation of computer languages for computers on board a single plane aggravates the software management problem. It is safe to say that our most difficult challenge associated with avionics systems is the total life-cycle management of the software.

In the past, we have not done enough planning on the software aspects of system implementation. The intangible, and partially hidden, qualities of software have played second fiddle to the tangible characteristics of the hardware. In too many cases, the software did not achieve the stature of an explicitly stated end product.

The answers to this challenge are being addressed on two fronts: the technical and the managerial.

The technical answer is suggested by the Digital Avionics Information System (DAIS), evolving from studies at the Air Force Avionics Laboratory. Two aspects of this approach are of interest: first, the use of modular or common equipment design between different aircraft and within the same aircraft; second, changes to an avionics system through software rather than hardware modifications.

Recent Air Force studies have documented the need for unique procedures and management techniques for software because of its inherent lack of visibility and the relatively intangible nature of progress in software development.

In harmony with this concept, the Air Staff has published a new Air Force Regulation 800-14. This

regulation in the Acquisition Management series is entitled "Management of Computer Resources in Systems." The purpose of the regulation is to ensure that computer resources in systems are planned and acquired so as to effectively and economically accomplish Air Force missions. This regulation outlines Air Force policy on the management of computer resources that are elements of larger systems. It recognizes that computer resources in many systems have become items of major importance and must be so managed throughout the life cycle of the system. It places the necessary emphasis on early planning, configuration management, standardization, commonality, user involvement, and organic maintenance.

By following the guidance of this regulation along with the technical approaches suggested by DAIS, we will meet the challenges presented by avionics systems. Our capability to deploy and operate weapon systems in the unexpected combat environment demands that this challenge be met early and head-on.

## AN OPTION FOR THE FUTURE

Automatic data processing has become a common thread permeating nearly every Air Force system, whether it is an accounting system or a weapons system. There is no reversing this trend, nor should anyone desire it. Our combat capability, as well as support capability, is dependent upon the processing power, speed, and flexibility of the computer. I see networks of modular computers evolving for every Air Force role. Some will be of a local nature, limited to a particular weapon system or function; others will provide instantaneous information and control over the distances of thousands of miles.

Computer technology is relatively young. Its characteristics and potential are only beginning to be understood. Downward-spiraling computer hardware cost projections suggest a philosophy of computer hardware extravagance as a realistic option for the future. Such an approach could reap enormous benefits in the areas of systems flexibility and reliability, while at the same time removing constraints that inhibit efficient computer operation and programming. The wider availability and lower costs of future communications will provide new opportunities in computer vs. communications trade offs.

We have capitalized on our twenty-two years of experience with computers in the Air Force. I believe that a viable ADP management structure is evolving today, not based only upon our past experience, but one that also incorporates a progressive view of the future.

This is the area that presents the greatest challenge. To plan for the future; to think imaginatively; to recognize opportunities; to apply the technology creatively so as to support the total Air Force mission—that is *the* challenge. ■

# THE ELECTRONIC AIR FORCE

Throughout the air war over North Vietnam, US pilots had to operate in the enemy's GCI (ground-controlled intercept) environment without benefit of a modern, or even adequate, command and control system. This condition, in the view of both the crews and senior commanders, caused US losses to increase significantly over what they otherwise would have been. Efforts to redress this deficiency and, at the same time modernize the command control of air defense as well as of Army and Navy forces, are in jeopardy because of broadside attacks on . . .

## **AWACS** **USAF'S MOST SUCCESSFUL DEVELOPMENT PROGRAM**

**BY EDGAR ULSAMER**  
SENIOR EDITOR, AIR FORCE MAGAZINE



*The E-3A AWACS aircraft is a modified Boeing 707-320 jetliner powered by TF33 engines and deploying a large radar rotodome.*

**T**HE E-3A AWACS, or Airborne Warning and Control System, for which the Air Force seeks about \$550 million in initial procurement and another \$220 million in R&D funds in FY '75, is, as USAF's Chief of Staff Gen. George S. Brown recently told the Senate Armed Services Committee, "one of the most successful programs we have ever undertaken . . . it is on schedule and has experienced no significant technical problems and, therefore, is within costs; in fact, it has exceeded our expectations."

AWACS, currently in its later stages of development, is a modified Boeing 707-320 topped by a thirty-foot radar rotodome that can detect, track, and manage—in an air-battle sense—large numbers of aircraft at all altitudes down to treetop levels. It also can contribute to the command and control of land and sea forces.

But despite AWACS's paramountcy to the US general-purpose forces and the near-perfect progress of its development, the program is in jeopardy in the Congress, largely because of a General Accounting Office study. GAO's most crucial allegations are that AWACS is being rushed into production prematurely, that "there has been little or no demonstration of the capability of AWACS to properly manage the tactical air situation in a high-density combat environment such as is expected to be encountered in Europe," that the aircraft itself may be unduly vulnerable, and that its radar can be jammed and is subject to performance degradations due to interference from ground-based radars and other electronic systems operated by friendly forces.

The GAO report stated that "in summary, and without attempting to conclude whether the added capability is worth \$2.5 billion, we believe that the AWACS program has the potential for improving the capability of the Air Force to manage tactical air operations in a high-density operational environment. It also appears to us that it could certainly have an important role in limited war or contingency situations where no ground facilities exist. We firmly believe, however, that, in the absence of a high-priority need, a conservative management approach should be followed and that the viability of this concept be well established before production is authorized by the Congress."

It is ironic that the GAO report candidly admits that AWACS appears capable of meeting the fundamental and difficult technological task of high-resolution radar look-down on low-flying aircraft, which is the principal reason for the E-3A. "The AWACS development program has now progressed to a point where the Air Force believes, and tests seem to have confirmed, that a workable look-down radar can be produced," according to the GAO study.

### **DELAY MIGHT BE FATAL**

Delaying the production decision on AWACS, now scheduled for December of this year, is likely

to sound the death knell of the entire effort. It would break the Air Force's contract with its E-3A contractor team headed by the Boeing Co. and result in a schedule slippage of at least two years and a cost growth of about \$260 million per year.

In the view of AWACS System Program Director Brig. Gen. Lawrence A. Skantze, a major delay in the program might be tantamount to its termination. In an interview with AIR FORCE Magazine, General Skantze pointed out that by the time of DSARC III (the formal Defense Systems Acquisition Review Council's meeting at the end of this year when the decision is to be made on whether a production go-ahead is warranted), "we will have tested all risk items thoroughly and accumulated about 1,300 hours of aircraft flight testing." There is no compelling reason for lengthy airframe and engine testing because the AWACS aircraft is a modified Boeing 707-320, of which more than 880 have logged millions of flight hours in worldwide airline service. AWACS's engines are those of the Air Force's C-141, similarly proved in many years of service.

The Air Force, therefore, argues that the most meaningful testing of the system hinges on the unique and highly sophisticated "look-down" radar under development for almost a decade, and other associated electronic subsystems.

### **PROGRAM STATUS**

The E-3A originated as a specific USAF requirement in 1963. The current USAF program is for a buy of thirty-four aircraft—down from an originally planned total of sixty-four because of cost considerations. (There is an added potential for purchases by allied nations.)

The basic AWACS mission, unchanged since 1963, is predicated on joint use in both tactical operations and by strategic air defense forces. Originally, aircraft were to be assigned to both TAC and the Aerospace Defense Command. Early this year, DoD assigned AWACS to the general-purpose force, and, since then, the Air Force has named TAC as AWACS's single manager. A decision on a single main operating base is pending. With the main operating base serving as the hub, aircraft will be allocated to individual users, including NATO. Ancillary missions could involve worldwide disaster control, air traffic control, and support of US Army and US Navy requirements.

### **THE TACTICAL REQUIREMENT**

The stiffer—and pacing—AWACS requirement, according to General Skantze, stems from the tactical role. Tactical AWACS aircraft, serving as autonomous command and control facilities in varying contingency conditions, must manage both offensive and defensive tactical operations as well as search and rescue, transport, tanker rendezvous, and other related functions. To meet these requirements, AWACS must provide reliable, all-



altitude surveillance and control, high survivability, and a capability for rapid, worldwide deployment.

It is axiomatic that during crisis situations the need to know what is going on, where both hostile and friendly forces are, and how best to deploy all available resources are paramount. AWACS is designed expressly for battle-management functions of this type.

An equally important consideration driving the AWACS requirement in the tactical area is the absence of secure, rapidly mobile ground-based control facilities that can survive in a hostile environment. Maj. Gen. Richard G. Cross, Jr., USAF's Director of Operational Requirements and Development Plans, DCS/R&D, and the former head of the so-called "Blue Chip" Tactical Command Center that controlled all Southeast Asian air operations, points out that AWACS will "permit deployment of command and control concurrent with advancing forces.

"AWACS can extend the volume of air surveillance to ranges deep into enemy territory from the ground up. We can appreciate the importance of this capability by reflecting . . . on the considerable emphasis that we and other powers have always given to development of low-altitude pene-

tration tactics and equipment, such as terrain avoidance radar. All this effort, in spite of critical speed and range penalties of low-altitude jet flight, has been expended in order to avoid radar coverage. The overland radar capabilities of AWACS can deny the enemy the traditional advantages of these tactics."

Without AWACS, presently existing systems, at best, detect high-speed, low-level penetrators when they come within about thirty miles of a radar site, or much too late to react effectively. AWACS, by contrast, detects and tracks low-flying targets over considerable distances, even in the presence of severe ground clutter (the intrinsic electronic noise of the earth's surface).

The design of its pulse Doppler radar relies on high pulse repetition frequencies that, combined with elaborate filtering techniques, negate the ground-clutter problem. A fringe benefit of this arrangement is that AWACS is not at all bothered by chaff because the system filters out all objects that are stationary or moving below a certain rate of speed. The significance of this AWACS radar feature is underscored by the experience of the Soviet invasion of Czechoslovakia in 1968. NADGE (NATO Air Defense Ground Environment) was

#### "ADEQUATE TO MEET TACTICAL AND STRATEGIC MISSION REQUIREMENTS"

*On May 11, 1974, Dr. Malcolm R. Currie, DoD's Director of Defense Research and Engineering, in a letter to Sen. Thomas F. Eagleton (D-Mo.), replied to critical questions raised about the AWACS program by the GAO report. The following is excerpted from Dr. Currie's letter:*

In our review of the AWACS program, we concluded that the AWACS CORE configuration is adequate to meet tactical and strategic mission requirements. However, demands of a projected tactical environment make it prudent to plan for augmentation beyond the CORE configuration to maximize its utility. The steps in this augmentation were defined, and the Air Force was directed to plan for continuing the R&D and Procurement program on that basis. This plan, now in effect, provides a basic capability in the near term—without delays imposed by waiting for an "ultimate" configuration—that is able to receive in block changes the highly desirable added capabilities in later block configurations. In this way, the system can be procured in an economical manner and still have the ability to evolve into an even more capable system. The penalties of deferring procurement until an ultimate configuration is in hand are severe. . . .

The development of the AWACS radar over the past seven years has strongly addressed properties of ECM resistance throughout its course. Extensive analysis by the Air Force, and independent analysis by the OSD staff have shown the specific design of the radar to be fully capable of carrying out its mission in the face of the postulated ECM threat. Tests of ECM resistance conducted during the earlier development phases of the radar strengthened our conviction of the adequacy of the design in this regard. Further testing, to be conducted this summer and fall, will serve to verify the analysis already done and will reaffirm the results of the ECM tests done against the radar alone. The results of the verification tests will be a major contributor to our review of the program at the December DSARC.



*Brig. Gen. Lawrence A. Skantze, AWACS System Program Director, stresses that the E-3A development and acquisition effort "has been tailored to proceed at a deliberate pace, leaving time for review at distinct phases of the program [and] is a classic in the sense of deliberacy to achieve minimum risk" by adhering to a carefully structured milestone approach.*

blinded by the massive use of chaff, with the result that the NATO powers were unaware of the initial phase of the operation.

AWACS has proved its mettle in relation to NADGE's limitations in realistic tests during the spring of 1973. During test operations in Europe, AWACS's so-called brassboard prototype model, used earlier in the flyoff of the two competing radar designs, "repeatedly and reliably detected and tracked target aircraft flying at very low levels," according to General Skantze.

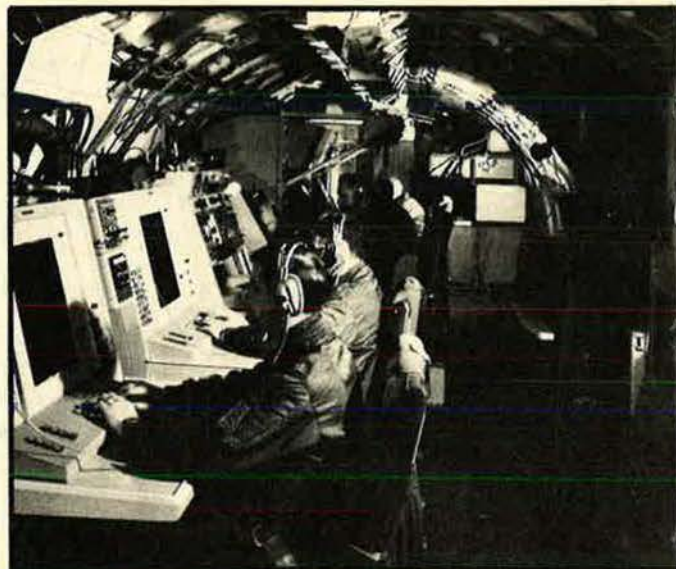
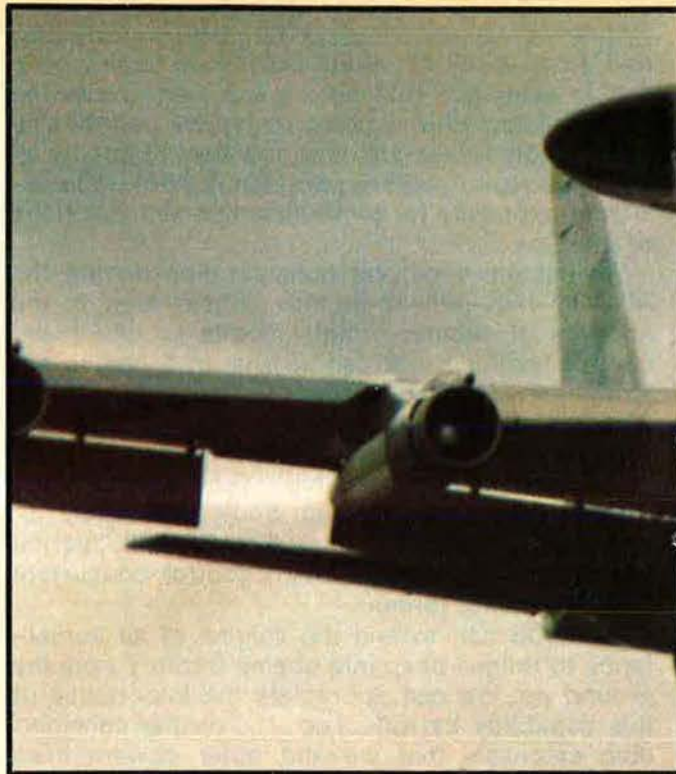
One of the most damaging allegations of the GAO report is that "one authority on radar technology has advised us that, based on current jamming technology, there is a reasonable basis to believe that the AWACS's radar can be jammed by the enemy from about 200 miles away." It is the Air Force's contention that this claim is based on one man's hypothesis and that it ignores AWACS's basic design and performance features.

The categorical Air Force reply to the GAO allegation is that, "based on current predicted intelligence estimates of the ECM environment in Europe, which by any standard is considered to be extremely intense . . . AWACS performance will not be degraded to the extent that AWACS becomes ineffective." General Skantze explained that "it is scientifically impossible to come up with a radar that is totally jam-proof. But the AWACS jam-resistant radar is beyond any comparable system ever built, and it exploits the latest state of the art to the fullest."

A radar system's primary vulnerability to ECM jamming stems from the so-called antenna sidelobes—energy that is being radiated not along the system's main beam but off to the sides. Reduction of the sidelobes was a prime design goal of both the Westinghouse Electric radar and Boeing's radome.

According to General Skantze, "We have been able to demonstrate that our sidelobe performance has exceeded the original specifications." AWACS has successfully withstood jamming attempts by the best available US airborne jammers.

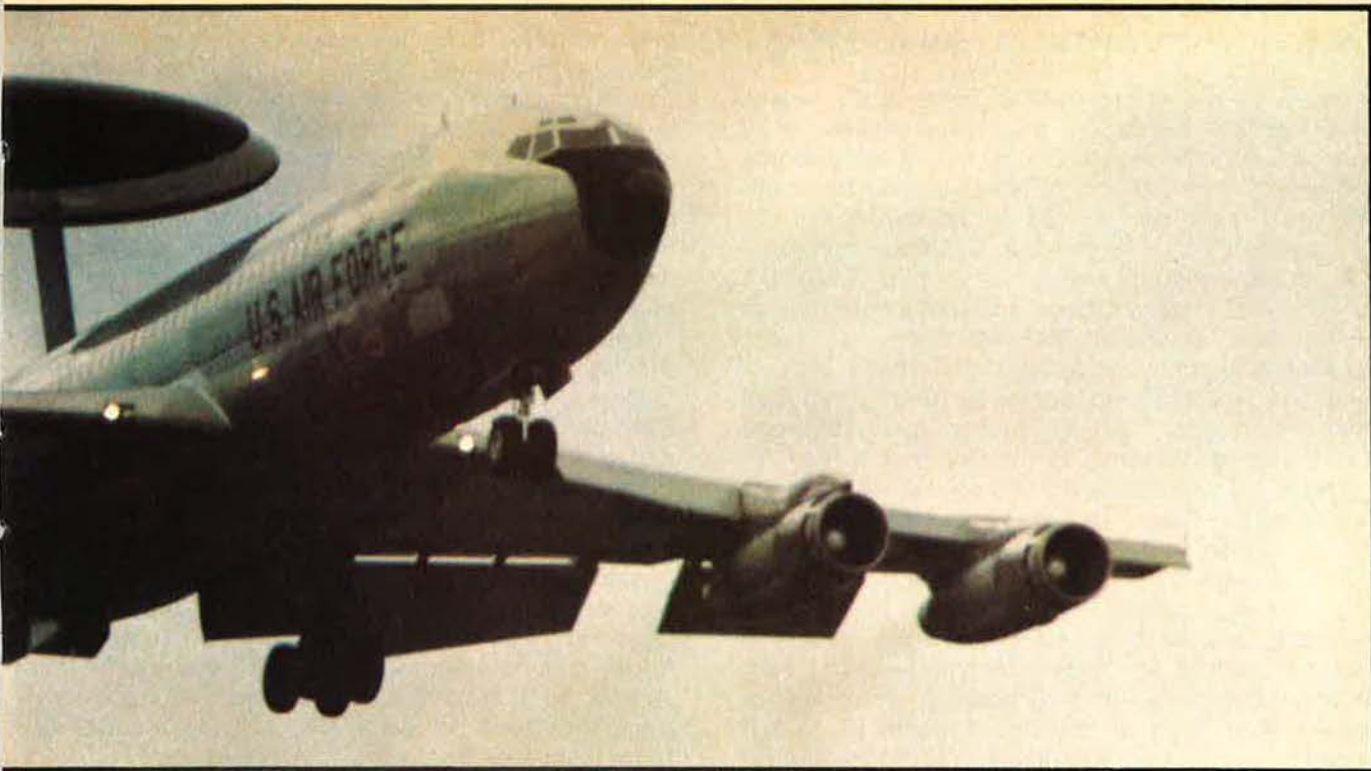
"It is, of course, theoretically possible to come up with some kind of strawman, such as a large-diameter, ground-based jammer radiating vast quantities of power, say in the megawatt range, and then claim that this would defeat AWACS. But it turns out that even these kinds of 'worst-case' assumptions will impair AWACS's performance only to a limited extent and curtail its radar range only slightly," according to the AWACS Program



*TOP: USAF's Tactical Air Command will operate a total of thirty-four AWACS aircraft as part of the nation's general-purpose forces.*

*ABOVE: AWACS's intercept and tracking capacity can be increased considerably if future requirements warrant such performance boosts. The number of operators can be increased from seventeen to twenty-six.*

*RIGHT: Intrinsically capable of providing long "on-station" operation, AWACS can increase its loiter periods even further through in-flight refueling.*



Director. (Sidelobe reduction, narrowing of the radar's mainbeam, and elaborate filtering are needed for ground-clutter rejection as well as to counter ECM since both affect radars in similar fashion.)

A comprehensive Air Force study called Saber Scan (Tactical) II, undertaken by the Air Force at the request of Deputy Secretary of Defense William P. Clements, Jr., preparatory to DoD's AWACS program review at the end of this year, concludes that AWACS will be able to cope through a variety of features and tactics with all foreseeable Soviet ECM capabilities. The threat model underlying the study was provided by DoD's Assistant Secretary for Intelligence. Saber Scan provided conclusive evidence that, in the case of high-powered ground jammers, two AWACS aircraft can work in tandem and thereby defeat the threat. Should the Soviets deploy a large number of ground jammers directed against AWACS's main radar beam rather than the sidelobes, several options to negate such an ECM system are open, including blanking out the jammed frequency on the radarscope or dropping below the radar horizon in relation to the jammer.

## THE SURVIVABILITY QUESTION

The GAO report on AWACS points out, in a less than startling revelation, that if the system is as successful as the Air Force claims, "it will become a high-value target for the enemy, and he could very well make determined efforts to destroy the . . . aircraft or to force it to abort the mission," and adds, without saying why, that AWACS's vulnerability "has not been adequately studied, in our opinion." Based on USAFE's threat model, the Air Force recently undertook a detailed assessment of AWACS's vulnerability and concluded that the system "will be highly survivable and effective in performing its mission in Europe."

The E-3A has inherent features that enhance its survivability. These include a jet platform that allows evasive maneuver tactics; surveillance radar; a sophisticated data processing, display, and communications capability for control of weapons; and an on-board self-defense system to degrade hostile weapons effectiveness. The self-defense capability, at the moment, does not include either guns or missiles. Present plans call instead for ECCM (electronic counter-countermeasures) developed for the B-52's Southeast Asian deployment under a program code-named Rivet Ace. Rivet Ace included radar jammers, flares, and chaff, and proved very effective.

While AWACS's defensive action will vary with prevailing conditions, one tactic could be to simply maneuver beyond the attacker's range or outside the coverage of his detection systems. The E-3A can continue to perform its basic mission while carrying out these maneuvers. This form of survivability is derived from AWACS's speed—greater than 400 knots—and the ability to see threats long before the AWACS is seen by enemy fighters.

Another, possibly overriding, facet of the system's survivability is the fact that AWACS will be operating in a total air operations environment. AWACS, especially in Europe, interoperates with friendly SAMs, fighters, and ECM facilities. All defensive elements—tactics, weapons, and self-defense—General Skantze testified before the Senate's Subcommittee on Tactical Airpower, "interact in a synergistic fashion."

Other specific actions open to AWACS are to drop below the enemy's GCI (ground-controlled intercept) system or to interoperate with NADGE to further broaden its command and control capabilities.

## SYSTEM CAPACITY AND GROWTH POTENTIAL

The GAO assessment of the AWACS program dwells on the allegation that "there has been little or no demonstration" of the E-3A's ability to meet the stringent demands of tactical air-battle management in a high-density combat environment. This claim rests largely on the insinuation that the

present AWACS configuration was arrived at on the strength of the far less demanding strategic air defense mission. The exact AWACS capacities are classified but are known to involve the ability to detect literally hundreds of targets over distances of several hundred miles. (The AWACS radar includes an operating mode that permits tracking beyond the radar horizon, in addition to the more exacting pulse Doppler confined to line-of-sight operation.)

The findings of the Saber Scan II study and previous Air Force assessments, by contrast, provide ample and well-documented information that even the initial AWACS production models, the so-called Block I aircraft, will have the capacity to track the large number of aircraft over the required distances postulated by the intelligence community in case of a high-density European combat environment. (AWACS, from the outset, was designed to permit growth of its radar intercept and tracking capacity to cope with unforeseen future requirements. There are provisions, for instance, to increase AWACS's staff of operators from seventeen to twenty-six and the number of radar consoles from nine to sixteen.)

Another factor, that in the view of Air Force planners was overlooked by GAO, is that the US Department of Defense and NATO do not plan to replace NADGE with AWACS, but instead expect to operate both capabilities in a mutually supporting manner. While it must be assumed that some of NADGE's soft radar sites at the perimeter of the Warsaw Pact nations would be lost, most of the hardened facilities of that system can be expected to remain operational during a large-scale conventional war and capable of working in concert with AWACS aircraft. (One of AWACS's most important features is its ability to look deep into the territory of the Warsaw Pact nations and to detect incipient air attacks, thereby providing the early warning needed to activate the NATO defense systems.)

## AWACS'S BROADENING SCOPE

Secretary of Defense James R. Schlesinger, in his FY '75 Annual Defense Department Report, disclosed that "current planning for [future AWACS aircraft] includes identifying joint service requirements to assist in determining alternative equipment configurations and evaluating the impact of these alternatives for long lead-time funding. We are also working with our NATO allies, who have expressed interest in AWACS as a common system to improve NATO's air defense and command and control capabilities."

Deputy Defense Secretary Clements pointed out in a similar vein that "major opportunities exist for the application of AWACS E-3A capabilities in joint service roles and for NATO defense. At the DSARC, the Army commented on the potential of AWACS to supplement its present capabilities. The Navy confirmed, on the basis of experience in Southeast Asia, that for such operational missions



*AWACS is designed to be highly survivable even under extreme conditions through the use of self-defense systems and by operating in a total air operations environment.*

as search and rescue, tactical strike control, and strike recovery, the integration of airborne early warning functions with surface elements offered an essential and flexible command and control to the joint commanders. I am encouraging the services to aggressively pursue these additional operational applications as the AWACS program continues."

The AWACS System Program Office is currently planning tests in concert with the Army to demonstrate the synergistic effect of coordinating AWACS with the Army's SAM systems to provide mutual self-defense capabilities. The Air Force is conducting similar joint efforts with the Navy on its tactical data system. AWACS can also be used to locate friendly ground forces through the use of beacons. If these beacons are coded and data links are used, AWACS can provide a wide range of command and control capability for ground forces. In the case of the Navy, AWACS appears capable of providing long-distance air surveillance, covering such potential trouble spots as the Mediterranean Sea and particularly over contiguous land-mass areas. An additional long-term tactical AWACS mission currently under study is command and control of Remotely Piloted Vehicles (RPVs).

### **AWACS'S AIR DEFENSE ROLE**

Recent Air Force assessments of the US air defense system's command and control capabilities brought out a range of potential shortcomings. These include questionable survivability of the existing ground-based surveillance, communications, and control facilities; inadequate range of the control system for directing interceptor forces, thereby precluding long-range interception of aircraft threats against the United States; line-of-sight limitations of the ground-based radar system; the lack of flexibility of SAGE (Semi-Automatic Ground Environment) system to meet unanticipated

threats; and inadequate low-altitude overland detection on the part of the aging EC-121 aircraft.

Aerospace Defense Command spokesmen stress that AWACS can provide "a factor of magnitude improvement in all these areas of present limitations." General Cross points out that AWACS "can extend the range of our air defense ground environment, increasing its effectiveness with dedicated air defense interceptors and SAMs or augmentation forces. AWACS could interface with the National Command Authorities through command and control links with the North American Air Defense Command or the Airborne Command Post. With the help of the latter, it can assist in providing necessary surveillance information to strategic offensive forces. In peacetime, if used in support of airspace sovereignty, AWACS can provide a comprehensive air picture within its coverage, which can be responsive to unforeseen threats."

AWACS missions in support of ADC are less demanding than tactical tasks because the number of radar targets can be assumed to be much smaller and the warning time longer. But the ADC mission includes the potential need for operating in a nuclear environment. AWACS is being provided with nuclear hardening of its subsystems to meet this contingency, according to General Skantze.

### **DELIBERATE DEVELOPMENT PACE**

GAO's claim that AWACS is moving toward production prematurely is countered by the Air Force with the statement that AWACS's development "has been tailored to proceed at a deliberate

pace, leaving time for review at distinct phases of the program [and] is a classic in the sense of deliberacy to achieve minimum risk" by adhering to a milestone approach.

According to General Skantze, the AWACS test program focused on two key objectives from its very beginning: "To identify the most difficult task and to ensure that it is being tested early and, secondly, to provide a structured test program that will provide, at each milestone, solid evidence of the performance status of the system and its subelements."

This policy of managing developmental risks in a cautious step-by-step way caused the Air Force to divide the R&D program into several distinct phases. The principal technological risk and fundamental function of AWACS is the look-down radar. Recognizing this potential hurdle, the Air Force started its AWACS effort with a subprogram, known as the "Overland Radar Technology" effort, which proved through half-scale test flights in 1967 that the AWACS radar concept was sound.

With the radar technology proved in principle, the Air Force evolved a development program consisting of a "brassboard," a Systems Integration Demonstration (SID), a "core" or Block I, and a "potential" phase. The brassboard phase got under way in July 1970 with the award of a contract to the Boeing Co. for development and flight test of two competing AWACS radar designs, one developed by Hughes Aircraft Co. and the other by Westinghouse Electric Corp.

Following flight test in the first half of 1972, Westinghouse was selected in October of 1972 to provide the AWACS radar, and the brassboard aircraft deploying the preferred radar design was subjected to rigorous subsequent testing in Europe as well as in the US. Because of the success of the radar test program, it became possible to speed up the AWACS test and evaluation schedule across the board, including Initial Operational Test and Evaluation (IOT&E), electronic countermeasures (consisting of ECM noise jamming, deception jamming, and chaff), and an operational test deployment to the dense European environment and to the Mediterranean area.

The brassboard phase is being followed by the System Integration Demonstration phase, currently in progress and slated to be completed this fall. SID is to demonstrate the viability of the total AWACS system through the integration of the data processor (the largest and most capable airborne computer ever designed), displays, communication, IFF identification, and navigation subsystems with the Westinghouse radar on the brassboard airplane. A fundamental part of this program phase is the Avionics Integration Laboratory equipment, which tests the acceptability and performance of the SID equipment prior to flight test and supplements the airborne testing in areas that can only be validated in a combat environment.

While the AWACS SID airplane is not equipped with the full complement of production-model

subsystems, General Skantze points out that "we have several of each type of subsystem aboard and functioning in an integrated fashion." As a result, by the time of DSARC III, "every critical aspect of AWACS will have been flight demonstrated except for the system's full target capacity and maximum number of jammers," he added. Those factors that cannot be tested in the air, such as full track, target, and ECM capacity, will be put into the ground system exactly as the airborne radar would, and, "by December 1974, the necessary testing of performance, capability, and capacity for Block I will have been accomplished in sufficient depth so that all of the information necessary for sound decision-making will be available."

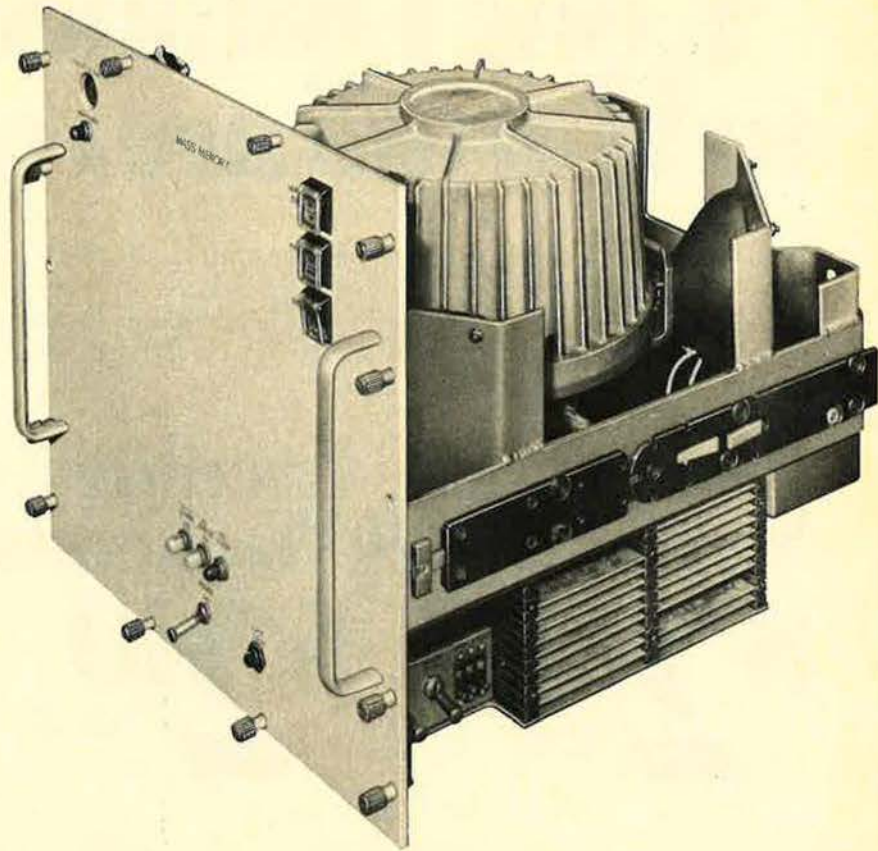
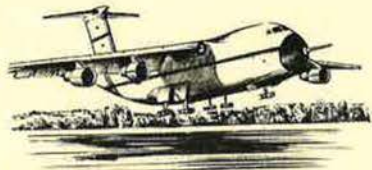
Budgetary constraints at the time of AWACS's first DSARC in July 1970 caused the Air Force to "trade down" to a basic AWACS system effective in both the air defense and the tactical mission but involving a less than full "potential" configuration. In January of 1973, the DSARC directed a change from an eight- to a four-engine configuration on grounds that some reduction in time-on-station was more than made up for by the lower cost of using TF33 engines already in the Air Force's inventory in surplus quantities. This AWACS "core model" has wide latitude for future growth in terms of space, power, cooling, and weight. In addition, Boeing remains responsible for preserving and, in some key areas, demonstrating the full-up or "potential" system performance. (At DoD's request, some of the deletions initially planned for the production AWACS have since been restored.)

Three AWACS DT&E (development, test, and evaluation) aircraft are being used during the program's current R&D phase. These test aircraft will be converted to the standards of the production aircraft and then will join the operational inventory.

The first block of production aircraft, assuming full funding by the Congress this year, will consist of twelve airplanes. The following year's buy—Block II—is also to be twelve aircraft, and seven the third year, a total of thirty-four aircraft. The Air Force, at present, is examining, for DSARC consideration, what changes, if any, may be incorporated into the Block II aircraft.

At a unit procurement cost of about \$40.5 million, AWACS will provide cost-effective modernization of US airpower. As General Cross puts it, "AWACS not only has the capabilities necessary to alleviate limitations in tactical and strategic offensive forces, but it can augment the national peacekeeping capability as an instrument of national policy. It multiplies the capabilities we do have, which is especially critical with reduced military budgets. AWACS provides, in a single, survivable, deployable system, most of the elements necessary for precision control of US forces [and it is also] responsive to evolving requirements." ■

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	Dial-it-yourself	Operator Assisted	
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<b>Nights</b> (11 p.m. to 8 a.m.)	<b>80<sup>c</sup>*</b> First Minute	<b>\$2.85</b> First 3 Minutes	<b>\$7.50</b> First 3 Minutes

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Rates to Hawaii from Arizona, California, Oregon, Washington, Idaho, Utah and Nevada are lower. The above rates do not apply to Alaska.  
\*One-minute call is available only when you dial it yourself at the time shown. Additional minutes are 65<sup>c</sup> each.

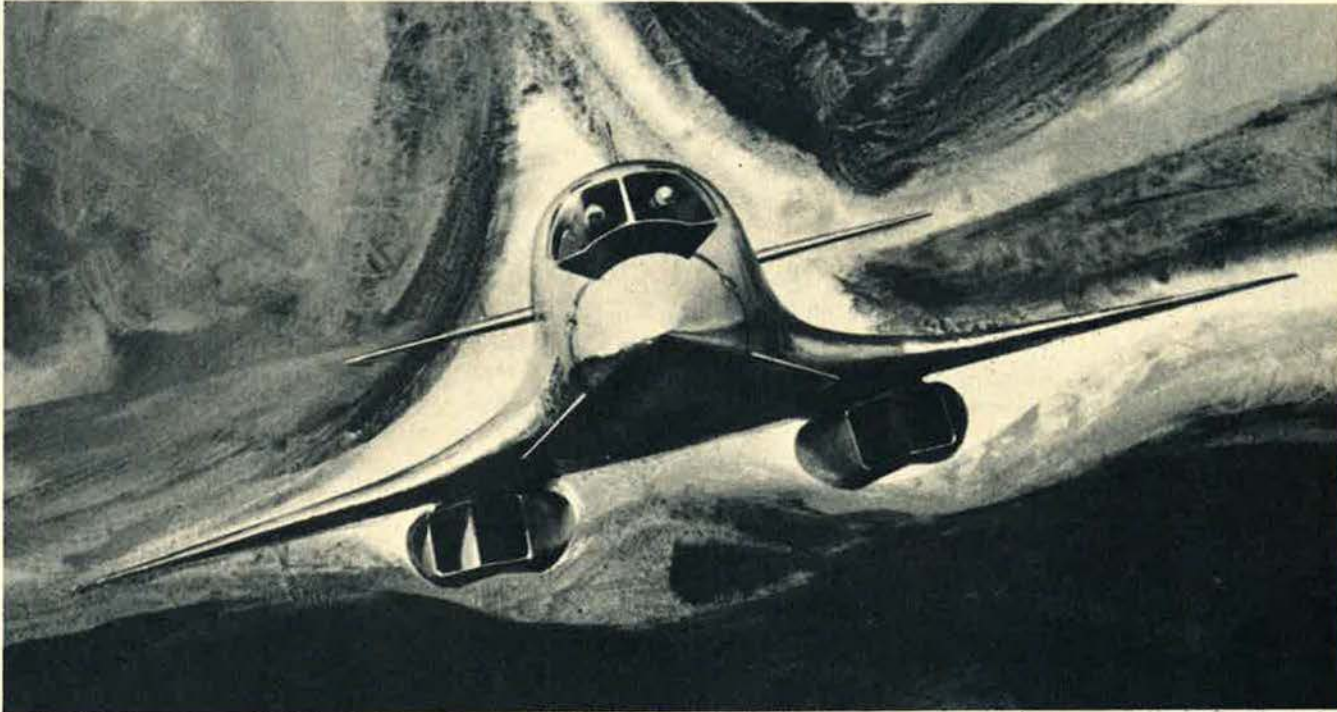
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## AFA Symposium Highlights Strategic Weapons Technology

A capacity crowd of more than 600 aerospace, civic, and AFA leaders attended the Air Force Association's Symposium on "Strategic Weapons Development" held in concert with SAC's 1974 Missile Combat Competition. In the first of two articles on the Symposium proceedings, AIR FORCE Magazine reports on how the recently enunciated policy of flexible targeting affects strategic weapons technology, and on planned as well as potential advances in manned strategic systems . . .



Gen. John C. Meyer stressed the importance of developing and deploying the B-1 as a mainstay of Trlad.

# The Realities of Limited Strategic Options

BY EDGAR ULSAMER

SENIOR EDITOR, AIR FORCE MAGAZINE

**T**HE USSR has been moving in a direction that could put our strategic deterrent forces at risk. In that light, it is essential to put certain potential countermeasures into research and development."

This is how Gen. John C. Meyer, SAC's Commander in Chief, set the stage for AFA's Symposium on Strategic Weapons Development, held at Vandenberg AFB, Calif., May 1-2, 1974, in conjunction with the 1974 Strategic Air Command's

Missile Combat Competition (*see p. 24*). A comprehensive preview of the technological options for meeting present and future strategic requirements, the two-day event featured ranking experts from the Department of Defense, the Air Force, and the Army and Navy.

The recent shift toward a more flexible national strategic targeting policy, which has been discussed extensively by Secretary of Defense James R. Schlesinger, was a promi-

nent topic addressed by Symposium speakers. Explaining that Assured Destruction remains the cornerstone of US strategic deterrence, General Meyer stressed that "we must have the means to deter forms of lesser nuclear pressures and transgressions." To be included among the targeting choices fundamental to the newly enunciated national targeting policy, he said, are:

- Preplanned, flexible options that provide suitable responses to a



*General Meyer keynoted the AFA Symposium, stressing the need to provide the National Command Authority with flexible options in order to limit unintended collateral damage to civilian areas.*



*Under Secretary James W. Plummer suggested that a defense posture confined to a policy of assured destruction would leave the President only the alternatives of suicide or surrender.*

broad range of potential provocations;

- Options that include military targets and provide the opportunity to limit unintended collateral damage;

- Options that bolster deterrence and further reduce the likelihood of nuclear conflict and;

- Options that can deter nuclear escalation, if lower levels of deterrence fail, and can lead to termination of hostilities at a still relatively low level of conflict.

The selective targeting doctrine is not predicated on major new weapon systems, General Meyer pointed out. Emphasis on selective options "does not include the option of a first strike. Neither the USSR nor the United States has, or soon can hope to have, the capability to launch a disarming first strike. Each nation possesses, and will possess for the foreseeable future, a devastating second-strike capability."

The three key elements underpinning the nation's strategic posture, according to General Meyer, are an invulnerable strike force, symmetry in the pressures that could be brought to bear by the threat of employing nuclear forces, and perceived equality between the forces of the United States and the Soviet Union.

Translating these factors into specific weapons requirements, General Meyer saw a need to "maintain and modernize the Triad of strategic forces," adding that, "I cannot place enough emphasis on the importance of developing and deploying the B-1. For it is the B-1 that will sustain the vitality of the Triad's manned aircraft into the 1980s and beyond. And it is the synergistic combination of the bombers, ICBMs, and SLBMs that continues to provide a wholly effective assured destruction capability."

In the long term, he said, it is necessary "that our technological base include better weapon-system accuracy and yield combinations as a prudent hedge against a wide range of potential Soviet initiatives. To preserve a realistic option for modernizing our ICBM forces in the 1980s, we should invest in the advanced technology leading to an entirely new ICBM."

Finally, he added, "we need the warning systems and command and control capabilities that will

assure force survival and permit our national leadership to direct strategic force employment in a selective and restrained fashion. The Advanced Airborne Command Post (AABNCP) and continued modernization of our satellite and radar warning systems are among the needed improvements."

The new targeting doctrine, General Meyer said, has not necessitated a broad retargeting of US strategic systems, because "we retarget Minuteman, along with the other forces, all the time. The nuclear war plan is dynamic; as intelligence indicates new locations or generates new targets, we adapt our forces to these new targets. Also, as new weapon systems such as Minuteman III come into the inventory, we adjust. This will happen also in regard to the B-1 and Trident. Put in other words, it is an old strategy in which there are some shifts in emphasis and priority."

### Reviving Extended Deterrence

Under Secretary of the Air Force James W. Plummer told the AFA Symposium that the United States's new targeting doctrine is designed "to shore up deterrence across the entire spectrum of deterrence objectives and, consequently, further reduce the already low likelihood of nuclear war."

In case of a limited attack on only military targets in the United States, "we clearly should have a response based on targeting options other than an all-out response against the cities of the aggressor," Mr. Plummer said. If the US were to retaliate against Soviet cities, he said, "the Soviets could, and presumably would, fire back against our cities. Thus, the President would be faced with the alternative of suicide or surrender." Because the Soviets would realize that the US is faced with a limited and doomsday-like choice, their war planners "might believe we were self-deterred from using our strategic forces," and conclude that they are in a relatively risk-free situation, he said.

The practical value of limited strategic options, Mr. Plummer said, "is based on the fact that, in an era when both sides have invulnerable second-strike forces, there is no way we can significantly limit

**T**he September "Anniversary" issue of AIR FORCE Magazine will be distributed to those attending AFA's 1974 Aerospace Development Briefings and Displays. In addition to this bonus readership, all advertisements in this issue will be prominently displayed in our "Industry Salutes the Air Force" exhibit at the entrance to Exhibit Hall. Closing for advertising reservations is August 2. Why not join us? It is a good advertising buy!

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MAGAZINE

# Conversation Pieces

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**C**leaning up a Queen's Complexion The beauty of Venice, Queen of the Adriatic, is far more than skin-deep. Many of her buildings are masterpieces of medieval and renaissance architecture. They're embellished with esthetically priceless statuary and other sculpture. And it's all being blackened and eroded by smog from suburban industry. Even works of art that are housed within the public buildings and palazzi of this magnificent city are under attack. Conventional cures, such as chemical solvents or sand-blasting, threaten to do more damage than the disease itself.

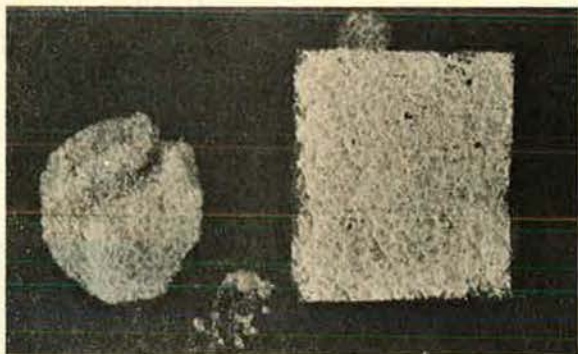
Recent experiments show, however, that a laser beam can be used to remove pollutants and reveal the natural stone or wood finish beneath. This hopeful discovery was a by-product of a joint effort by TRW's Dr. Ralph Wuerker and Dr. John Asmus of the University of California, San Diego, who suggested the idea of laser-powered dry cleaning. The main objective, though, was to see if holography would be a practical way to foil both Father Time and human vandals by preserving the three-dimensional ghosts of famous sculptures.

Wuerker and Asmus were completely successful. The holograms they made in Venice demonstrated that a whole art gallery of sculpture can be recorded on a carton full of glass plates and recreated by projection anywhere in the world. These three-dimensional images are so lifelike that they even show parallax when the observer moves from one position to another. The experiments proved that major international exhibits of sculpture in holographic form can now be delivered by parcel post, while the originals stay safely in their home museums.

Other proposed uses of holography range from advertising displays and truly three-dimensional movies to new types of security systems. At TRW, holographic memories have been developed which can store a whole library in a space the size of a briefcase. The technique is also being used in rocket and jet engine development to show previously invisible details of gas flow and the behavior of high-speed particles. These studies are expected to result in improved turbine-blade and rocket-nozzle designs. Holographic interferometry has also been used to refine spacecraft microwave dish antennas to accuracies far superior to those that are possible with conventional computer methods. Other nondestructive industrial testing techniques are under development and Dr. Asmus continues to improve his methods of restoring art.



Dr. Wuerker aligns a ruby laser and holographic plate to recreate a three-dimensional image of a twelfth-century Madonna and Child, by an unknown Spanish sculptor.



Marble fragment, spot-cleaned by a single, brief pulse of laser energy, reveals its pristine color and texture. The technique is so precise it can be controlled so that only recent encrustations are removed while the natural patina of old stone remains unharmed. Even stone that has been seriously weakened (to a structural strength equivalent to that of a sugar cube, for example) is not further weakened by laser cleaning.

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damage to the United States by a well-coordinated Soviet strike. But, by having the capability to use our strategic forces in limited ways, we may be able to establish a framework to limit the level of conflict." As a result, "after a few weapons were used," sensible leaders could still stop the war well below the Armageddon level.

Another potential gain from the new targeting doctrine involves the interaction between US nuclear deterrent capabilities and NATO.

"With the advent of strategic parity, many Europeans saw a declining credibility of US strategic forces as the ultimate [extended] deterrent for NATO. This decline in credibility was based upon the belief of many Europeans that Americans would not protect NATO by using their strategic forces against Soviet cities, since that would likely mean the destruction of US cities, or in the strategist's jargon, our strategic forces would be decoupled from NATO. Our new targeting doctrine helps show that US strategic forces are still credibly part of the overall deterrent for Europe," Secretary Plummer told the AFA Symposium.

Noting that current, intensive Soviet Strategic R&D programs involve four new ICBM systems that are both larger and potentially more accurate than present weapons, Mr. Plummer pointed out that the Soviets have the means "for upsetting the existing strategic nuclear parity" and to thereby jeopardize "the ability of our strategic forces to meet the deterrent objectives that I previously listed."

While expressing hope that the Soviets might be persuaded at SALT II to abstain from exploiting their throw-weight potential, Mr. Plummer cautioned that "we must keep an adequate deterrent whether the negotiations are successful or not. This means we must initiate now the R&D to be in a position to offset potential Soviet qualitative advantages and to continue to balance present Soviet quantitative advantages."

### Need for Credible Response

John B. Walsh, Deputy Director of Defense Research and Engineer-

ing for Strategic and Space Systems, analyzed the new targeting doctrine from the viewpoint of the underlying technological challenges. It is imperative, he reasoned, to develop "flexibility in our ability to respond—not in the expectation of having to respond to [various levels of attack]—but so that by being able to threaten a credible response we can deter such actions. This flexibility requires both reasonable accuracy and reliable command control and communications."

Equally important is what Mr.

Minuteman with only a small part of their force. When they achieve accuracy comparable to what we have already demonstrated, each of their RVs will have a high probability of destroying a Minuteman. In terms of the technological challenge this represents, the question of when this accuracy will be achieved is of second order. Suffice it to say that



*DDR&E's Deputy Director for Strategic and Space Systems, Mr. John B. Walsh, pointed out that the newly enunciated flexible targeting policy requires both reasonable accuracy and reliable command control and communications.*

Walsh termed a condition of crisis stability measured in the relative capability of the forces remaining after a two-sided counterforce exchange.

Such a condition will exist when neither side's residual force—the war-making capability that remains after either launching or absorbing an attack—dominates the other. Presumably, there is no incentive to attack since the attacker must draw down his own force roughly to the same extent that he decimates his opponent's, Mr. Walsh pointed out.

Mr. Walsh expressed continuing concern with "maintaining the ability of our land-based missile forces to survive an attack." If the Soviets deploy the MIRV system currently in test, "they could attack every

such accuracy can be reached and that we can do no less than plan responses to its being reached," according to Mr. Walsh.

Essentially, there are three responses: silo hardening, defending Minuteman silos through the Site Defense system, and the Advanced ICBM program. The latter, he said, examines alternative basing modes, involving primarily mobility, which "will make survivability depend on uncertainty in target position rather than on the uncertainty in impact point, which is being reduced by improved accuracy."

An interesting aspect of mobile systems, Mr. Walsh said, is "to provide false targets for the attacking reentry vehicles at a cost less than that of the reentry vehicle. The false

target may be an interceptor, it may be a missile shelter, or it may be a region of airspace wherein the missile may be but is not. This points up one of our principal technological challenges—to win the cost exchange game.”

Turning to the survivability of the bomber force, Mr. Walsh pointed out that similar survivability challenges exist, the main ones being quick response and increased hardness. “The quick response allows the bombers to generate large regions of location uncertainty near their bases so that only a barrage attack could be successful against them, while increasing hardness requires a density of barrage such that the whole tactic is unprofitable,” Mr. Walsh stressed.

Regarding the strategic submarine force (SSBNs), Mr. Walsh disclosed that while it is possible to sweep very small regions of the ocean, currently available techniques are too inefficient for large-scale search. “Nonetheless, we are hedging by developing even quieter submarines as well as the long-range Trident missile to increase greatly the operating area of a submarine.” He added that “although ballistic missile submarines are relatively invulnerable when at sea, they spend a surprising fraction of their lives at shore . . . where they are very vulnerable.” In addition, he said, there is a crucial challenge to discover breakthroughs in antisubmarine warfare before an adversary does, so that they can be countered or used.

Another vital strategic weapon quality is the ability to penetrate enemy defenses. Although not widely understood, the problem of intercepting single RVs is “straightforward,” a fact that stems from the predictability of its trajectory. The need, therefore, is for lightweight decoys and other penetration aids, Mr. Walsh said. Cautioning that SALT I limits on interceptor stockpiles could be sidestepped “by using nuclear-armed air defense interceptors as ballistic missile interceptors,” he suggested that “maneuvering reentry vehicles can readjust this balance, but such RVs present many problems of aerodynamic analysis,

energy management, packaging efficiency, and accuracy retention.”

Accuracy, of course, represents an overriding challenge in strategic weapon development, Mr. Walsh pointed out, and is basically determined by the quality of the weapon's guidance system. Guidance errors result from inaccuracies in the inertial reference system and, in the case of mobile launchers, involve also position, orientation, and velocity inaccuracies of the launchers. Other elements affecting accuracy, he said, are separation errors that occur when the RV is freed from its booster; reentry errors caused by unpredictable atmospheric conditions in the target area; and gravity and geodetic inaccuracies introduced by uncertainties regarding the relative positions of the launch point and target, as well as by the mass distribution of the earth, Mr. Walsh told the AFA Symposium.

Pointing out that the accuracy problems confronting inertial systems are difficult even when stellar guidance is used, Mr. Walsh said that terminal fixing or homing must be considered. “Homing missiles are finally coming into their own in tactical applications, but most of the operating principles of tactical missiles are not particularly suitable for strategic applications. Here is a really fruitful field for invention,” according to the DDR&E executive.

Finally, flexible targeting accents the importance of command control and communications systems that provide attack assessment. In order to limit escalation of a conflict as much as possible, he said, “it is essential to know the nature of an attack, its magnitude, its target, and even, in the case of SLBMs, who is the attacker. This information is needed rapidly, reliably, and from a survivable system.”

### Manned Strategic Aircraft

Lt. Gen. James T. Stewart, Commander of the Air Force Systems Command's Aeronautical Systems Division, briefed the Symposium on the B-1 program and advanced bomber technology. Reporting that the B-1 is scheduled to fly for the first time this fall and the production decision delayed to late in 1976, General Stewart said that the cost estimates of the B-1 production program—consisting of 244 air-

craft, spares, ground-support equipment, and training—has increased about twelve percent. He added that the “bulk of the highly publicized cost increases are due to underestimating inflation rates [and] I would observe that the loudest critics today said not a word about underestimating inflation in January 1971 when the first SAR [system acquisition review] was submitted to the Congress.”

The B-1's offensive avionics, he said, will be ready for flight test in the spring of 1976, with about two-thirds of them coming from such other programs as SRAM and the F-111. A contract to develop the aircraft's defensive avionics system was awarded recently to the AIL Division of Cutler-Hammer, he said, and “will benefit from more explicit determinations of what future enemy defenses turn out to be.” The Air Force firmly believes, he stressed, that “we will have a great airplane in the B-1. There is no substitute. Is the program without problems? No—and you shouldn't expect a program of this size and complexity not to have some problems. Are they insurmountable? Not at all. Is it worthwhile? Future national security depends on it. That's why the B-1 is the highest priority program in the Air Force.”

Turning to weapon systems associated with the B-1 as well as the B-52 and FB-111, General Stewart announced that the SRAM (Short Range Attack Missile) considered for the B-1 may be improved over the current configuration by extending the missile's range and refining its terrain-following mode to permit lower approaches to the target. (According to industry sources, SRAM's range could be nearly tripled from its present maximum of about 100 miles.)

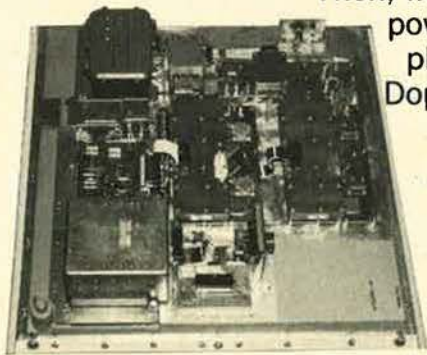
The Air Force is also exploring “a variety of new applications for SRAM, including tactical air-to-ground, antiship, and antisubmarine applications. We have looked at ways and means the SRAM could be modified for the air-to-air anti-SUAWACS [The Soviet Union Airborne Warning and Control System] mission by the addition of a suitable guidance package,” according to General Stewart.

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APN-200 . . . far and away the reliability leader.



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Ideal for retrofit or new airframe installations, this new TACAN is being designed to provide the pilot with quick tuning and lock on, echo protection, co-channel interference protection, freedom from 40° lock-on error, and a 1000-hour MTBF. Low cost solid-state adapters will interface the unit with existing analog display devices and aircraft wiring to lower retrofit costs further.

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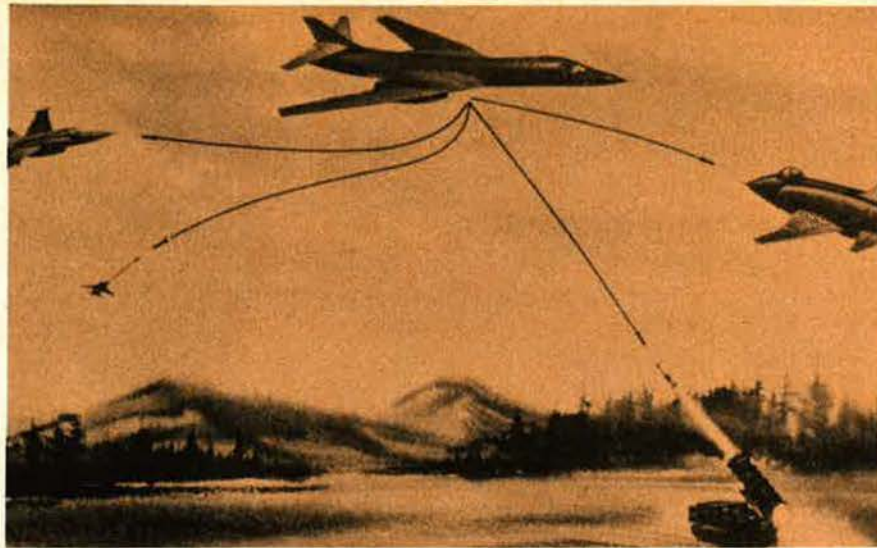


The air-launched cruise missile (ALCM), which is to be funded to the tune of \$80 million this year, "could be the beginning of a new generation of armament for SAC's bomber fleet," according to General Stewart. Scheduled to enter flight test in 1976, the new missile "will be capable of being launched at either high or low altitude and will cruise subsonically to its assigned target. It will have a terrain-following capability for low-altitude flight. The truly significant performance improvement will be its extended range and terminal accuracy." The latter, he said, will be obtained by "a completely new, but highly developed guidance system of the terrain-correlation variety."

(Mr. Walsh informed the Symposium that DDR&E sees no merit in deployment of the air-launched cruise missile from wide-bodied military transports, an approach proposed by some systems designers.)

Other Air Force programs to enhance bomber defenses include an infrared warning system that scans threat areas to the rear of the bomber and, upon detection of an IR seeking missile, automatically initiates countermeasures. Another defensive measure involves improved radio frequency scanning systems to detect hostile electronic emissions and initiate rapid countermeasures.

One option to counter the potential threat of an advanced Soviet AWACS coupled with an improved interceptor aircraft is a bomber defense missile. The Air Force is cur-



The proposed short-range bomber defense missile, depicted in this artist's conception, could be effective against enemy aircraft and SAMs.

rently exploring two bomber defense missile concepts and has started on technology programs "in those functional areas considered to be most critical," General Stewart said. A key feature of one type, he disclosed, is an integral rocket ramjet propulsion system to provide this anti-AWACS weapon with "long range and high supersonic speed."

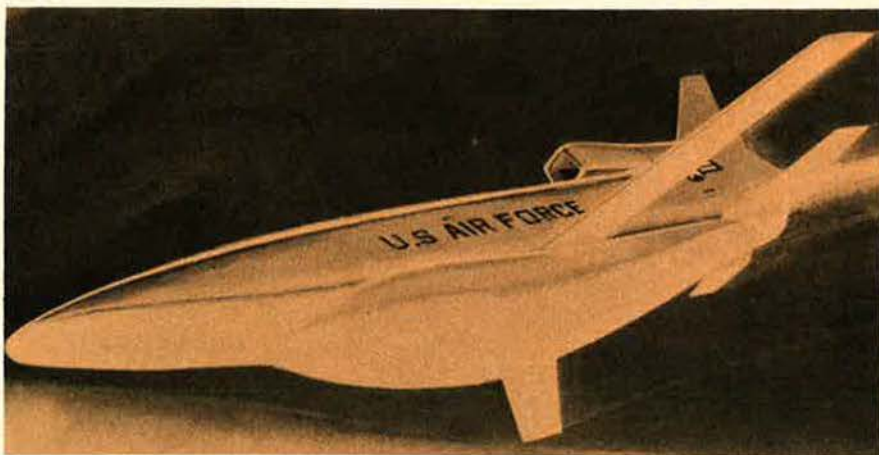
Systems of this type are most efficient at speeds from Mach 1.5 to Mach 3.0. The integral rocket ramjet uses a rocket booster to "power the missile at launch and to accelerate it to supersonic speed. After rocket burnout, the ramjet mode is used to sustain speed. Volume savings are accomplished by packaging the rocket propellant in the same

chamber used for combustion of the ramjet fuel; otherwise a separate booster section would be necessary," General Stewart said. This propulsion program is being carried out jointly by the Air Force Aero Propulsion Laboratory and the Air Force Rocket Propulsion Laboratory.

The short-range bomber defense missile, by contrast, General Stewart disclosed, is a smaller, rapid-reaction missile "that could be directed against close-in interceptor aircraft or against air-to-air and ground-to-air missiles, [thus] forming a protective shell around the penetrating bomber. The missile would be launched at enemy threats approaching the bomber from any direction, intercepting them outside their lethal radius from the bomber."

A critical trait of this high-velocity missile is its ability to change course rapidly and accelerate toward the target, a maneuver called "air slewing," he explained. The Air Force Flight Dynamics Laboratory is currently engaged in associated preliminary research. Flight tests of a demonstration model are scheduled to begin in 1977, General Stewart said.

*(The conclusion of this report on AFA's Strategic Weapons Development Symposium, highlighting ICBM, SLBM, and ABM technologies, will appear in the August issue of AIR FORCE Magazine.)* ■



The air-launched cruise missile, with a range of 1,500 miles, could be the beginning of a new generation of armament for SAC's bomber fleet.

Boeing is now working with the U.S. Air Force to develop an Advanced 747 Tanker/Cargo aircraft that would improve the efficiency and cost of aerial refueling. As well, it could serve as a cargo ship that could carry payloads of up to 280,000 pounds.

In other words, it is really two airplanes for the price of one.

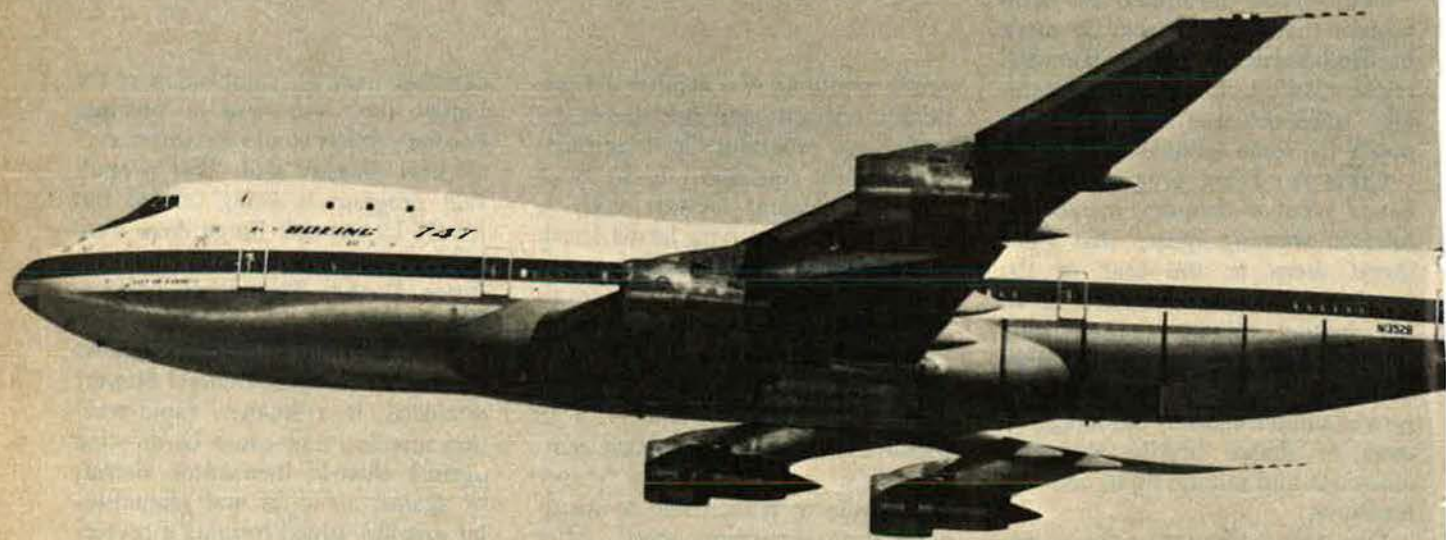
Rather than have two separate aircraft to perform two separate missions, the USAF is in-

vestigating a fleet of off-the-shelf wide-bodied 747s to do the following jobs: (1) serve as an aerial tanker to refuel C-5A and C-141 airlifters; (2) serve as a cargo carrier for the Military Airlift Command; (3) serve as an aerial tanker for the Strategic and Tactical Air Commands.

This sharing of forces in a multi-mission aircraft can mean tremendous economies. And, in the long run, will save taxpayers millions of dollars.

The 747 Tanker/Cargo plane could have helped in the recent Middle East conflict. Mid-air refueling with the 747 would have provided non-stop capability for four C-141's or one C-5A. Refueling these airplanes enroute could have saved the United States 7.5 million gallons of fuel and eliminated the need to stop in the Azores.

It is becoming more apparent that we cannot fully depend upon foreign bases for refueling.



**It's a tanker. It's a cargo ship**

This makes aerial refueling extremely important in future defense plans. One 747 Tanker/Cargo could fly to Europe, deliver 200,000 pounds of fuel and return to the United States without refueling. The result: an immediate aerial pipeline to support the North Atlantic Treaty Organization.

As a cargo ship, the Boeing 747 is no experiment. The 747 Freighter has been in commercial service for more than two

years. The first 747F has made over 1,200 Atlantic crossings. And, in March 1974, the aircraft was averaging about 170,000 pounds of cargo per trip.

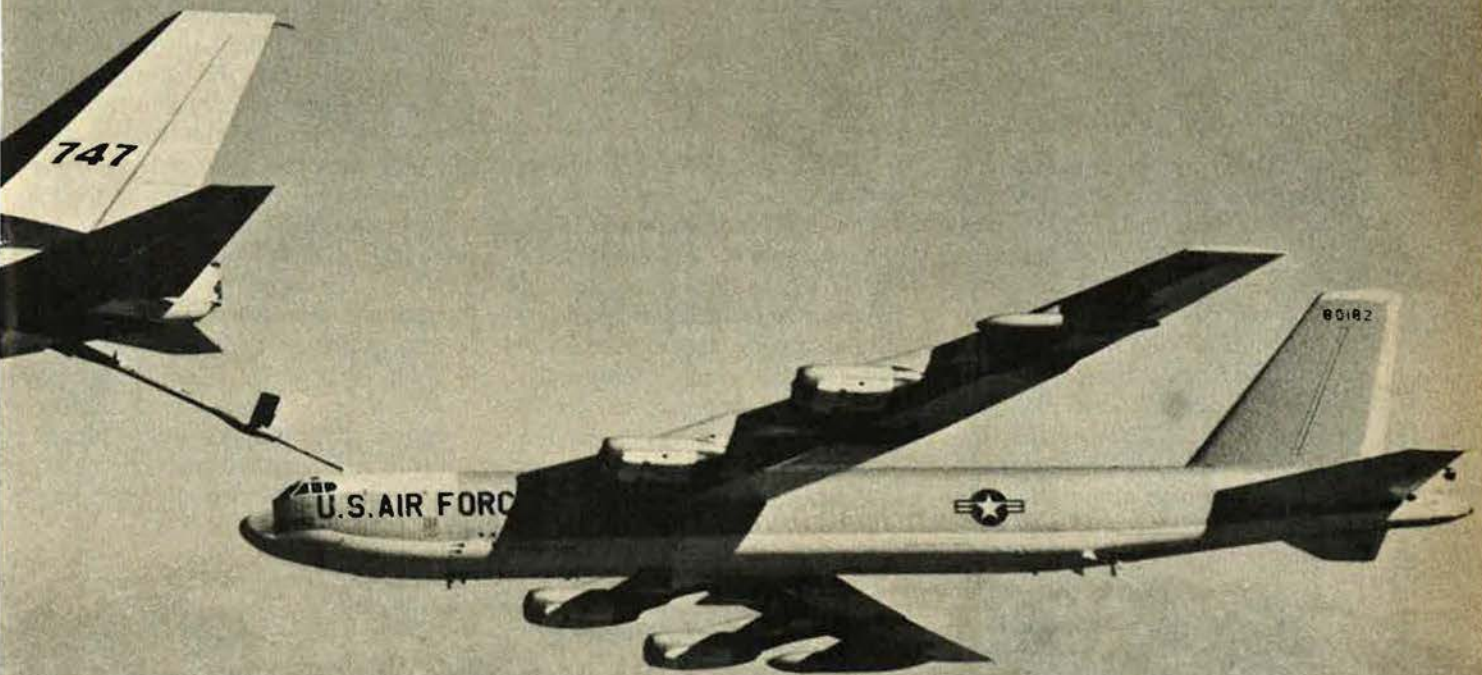
As a military cargo ship, the 747 is the most versatile jetliner in the sky. It can handle 45 military pallets. Or, it can airlift 12 two and one-half ton trucks and nine jeeps, all on the same run.

We have also verified the characteristics of the 747 as an aerial tanker in USAF tests with

both strategic and tactical aircraft.

It all adds up to putting the multi-purpose aircraft concept to work in an extremely significant way — one that will enhance our capability to meet our obligations, maintain world peace and still keep our expense commitments in line.

We believe the Air Force has the right idea and are pleased to be working on this important assignment.



It's a money saver. It's Boeing.

## A TRIP TO THE NATION'S CAPITAL

In May, the Aerospace Education Foundation awarded prizes in its second annual AFJROTC contest. Theme of this year's competition centered on the Air Force as a national resource. More than 10,000 cadets participated in creating entries, and Foundation officials were impressed by the verve and craftsmanship exhibited . . .

# Victors Feted in AFJROTC Contest

BY JAMES A. McDONNELL, JR.  
AFA DIRECTOR OF INFORMATION

**T**HE Air Force as a unique national resource was the theme of the 1974 worldwide AFJROTC presentation contest sponsored by the Aerospace Education Foundation. The winner this year is Air Force Junior ROTC Group 31, from S. R. Butler High School, Huntsville, Ala. This is the second year that the Foundation, an affiliate of the Air Force Association, has sponsored a contest for all high school students

enrolled in Air Force Junior ROTC programs.

The goal of the contest was to promote public awareness of the Air Force and to demonstrate the dividends defense dollars often earn through civilian applications of military experience and equipment.

The contest theme was inspired by the thought that major Air Force contributions to civilian society often go unnoticed. Most citizens

recognize the primary contributions of the USAF as a vital portion of the national defense. The contest went beyond this national security aspect and focused upon the non-military contributions of the USAF to civilian society.

These contributions include the Air Force's new approaches to problem-solving and management that have revolutionized research and development and increased national productivity. Air Force programs have enhanced the research capabilities of colleges and universities. The USAF ballistic missile program provided the foundation for the National Space Program and today contributes to its success through operational, managerial, and logistical support. Air Force requirements have provided a major impetus for the expansion of the aerospace industry into the largest employer in the nation. Air Force personnel who separate from active duty provide a steady flow of highly skilled manpower to the civilian work force. These are among the many broad areas that students were asked to research in preparation of their presentation.

Dr. Wayne O. Reed, Aerospace Education Foundation President, stated: "Our purpose was to supplement and reinforce what the cadets are learning in class by encourag-



*Air Force, Air Force, looking 'cross the land  
Helping people every day in an every-day sort of way . . .*

With these words, written by one of its cadets, the Alabama Air Force Junior ROTC Group 31, S. R. Butler High School, Huntsville, Ala., opened and closed its prize-winning sound-slide entry in the Aerospace Education Foundation-sponsored contest for AFJROTC units. The words were sung to the accompaniment of a guitar, which also provided background music for the entire presentation.

The winning entry was put together by an Aerospace Team of the 31st Group, consisting of about twenty cadets, both male and female. Members of the team, at one point, traveled to Maxwell AFB, Ala., to do research in the Air University Library.

After writing their preliminary script, the cadets prepared slides, using such resources as photos cut from aerospace magazines, posters, models, etc. Final taping of the narration and accompanying guitar background required about seven "run-throughs."

The presentation was keyed to three basic themes—Air Force contributions to the fields of civilian technology, education and training, and humanitarian efforts.

ing them to examine and analyze the Air Force as a unique resource to the nation. They had to project their findings to the public through written or audio-visual presentations created and prepared by themselves."

One hundred and twenty-eight schools entered the contest. The schools represented thirty-six states, and dependent schools from four foreign countries. The winner, four runners-up, and twenty schools earning honorable mention were announced in Washington, D. C., in May (see box). The awards reception honoring representatives from S. R. Butler High School was attended by more than 100 military and civilian leaders, including Secretary of the Air Force John L. McLucas.

In congratulating the representatives of the winning school, Dr. McLucas said, "I had the pleasure of visiting with these cadets and their Aerospace Education instructor today. That was a valuable experience for me to see how some of our students are reacting to the Air Force Junior ROTC program and the enthusiasm they have for it. Their efforts mean a great deal to us in promoting interest in flying and Air Force activities in general throughout the country."

Contest entries were judged by two panels of civilian, military, and government leaders. The contest involved an estimated 10,000 AFJ-ROTC cadets. As a result, many times that number of parents, friends, and teachers of cadets have become more aware of the Air Force as a unique national resource.

The winning unit will select from among its ranks a representative or representatives to be awarded a \$4,000 college scholarship. The top five entries will also be on exhibit during the Air Force Association's Aerospace Development Briefings and Displays held during the AFA National Convention in Washington, D. C., in September.

The three representatives of S. R. Butler High School and their instructor were guests of the AFA in Washington, D. C., May 7-9. They met with many military and

civilian leaders including Sen. James B. Allen and Congressman Robert Jones of Alabama, Secretary McLucas, and Gen. George S. Brown, Air Force Chief of Staff. Gov.

George C. Wallace telegraphed congratulations to the cadets and expressed the pride of the state of Alabama in their accomplishment. ■

### "THE AIR FORCE AS A UNIQUE NATIONAL RESOURCE" CONTEST WINNERS

**FIRST PLACE:** S. R. Butler High School, Huntsville, Ala.

**AWARD:** A \$4,000 scholarship and a distinctive plaque for permanent display by the winning unit.

**RUNNERS-UP** (in order)

West Monroe High School, West Monroe, La.  
Harrison County High School, Cynthiana, Ky.  
Indian River Senior High School, Chesapeake, Va.  
Wheeler High School, Marietta, Ga.

**AWARD:** Plaque for permanent display by the unit.

**HONORABLE MENTION**

Dickinson High School, Dickinson, Tex.  
Ottawa Township High School, Ottawa, Ill.  
Cambria Heights Senior High School, Patton, Pa.  
Apollo High School, Owensboro, Ky.  
Midview High School, Grafton, Ohio  
Lakenheath High School, England  
Jeffersonville Senior High School, Jeffersonville, Ind.  
Irmo High School, Irmo, S. C.  
Hopewell High School, Aliquippa, Pa.  
Neosho Senior High School, Neosho, Mo.  
Moscow High School, Moscow, Idaho  
Orangeburg-Wilkinson High School, Orangeburg, S. C.  
Del Rio High School, Del Rio, Tex.  
North High School, Fargo, N. D.  
Atascadero High School, Atascadero, Calif.  
Abilene High School, Abilene, Tex.  
Palo Duro High School, Amarillo, Tex.  
Wayne County High School, Jesup, Ga.  
Clintondale High School, Mt. Clemens, Mich.  
J. Frank Dobie High School, Houston, Tex.

**AWARD:** Certificate of merit.



AF Secretary Dr. John L. McLucas, left, congratulates S. R. Butler cadets— Cadet Capt. Hurley Johnson, who headed the group; Cadet Lt. Col. Charles Dodd, who played the guitar and sang; and Cadet Col. Steven Ellis, narrator.

# Airman's Bookshelf

## An Astronaut's Ordeal

*Return to Earth*, by Edwin E. "Buzz" Aldrin, with Wayne Warga. Random House, New York, N. Y., 1973. 338 pages. \$7.95.

After a decade of preparation and testing, the Apollo expeditions sent twelve men to walk on the moon between 1969 and 1972. We saw it on television, read about it in *Life*, and stashed away the newspaper headlines for our grandchildren.

Five years after the *Eagle* landed at Tranquility Base, the copilot of that epoch flight has published a chronicle of his personal voyage. Retired Air Force Col. Edwin E. "Buzz" Aldrin describes his life as a series of goals leading step by step to the greatest goal imaginable: to fly to the moon.

Details of his Air Force career, and especially of his NASA astronaut experiences, are fascinating. No, we haven't seen all of it before. Aldrin reassures us that the men behind the heroes' masks were human like us, human in ways that often could not be described in a family magazine like *Life*.

Having returned from the moon, Aldrin found that his goal-orientation was no longer an asset. He faced what the poets called "the ennui of all things done." Worse than Alexander, he literally had no more worlds to conquer.

It was this loss of purpose to his life, Aldrin argues, that led to his psychiatric problems. It wasn't the parades, the ceremonies, the public and private adulation that followed his return from the moon. Consequently, his descriptions of his mental problems have relevance to many more people than just the dozen men who have walked on another world.

Aldrin's description of his self-examination is revealing in its detail. Here and there, some rationalizations still seem to have survived his probing. But he had trained throughout his whole life for his trip to the moon, while he was forced to journey into his own soul without

preparation and with a lot of external and internal roadblocks.

It took more courage to make that second journey, and to describe it to others. Why did he write the book? Aldrin's motives seem clear and commendable. Mental illness is still viewed with superstition, fear, and misunderstanding. *Return to Earth* describes how one man grappled with these problems and came out on top. Other men and women may learn from Aldrin's flight log, when they have to get their own feet back on the ground.

—Reviewed by Capt. James E. Oberg, USAF, DoD Computer Institute.

## More Than Medicine

*The Dangerous Sky: A History of Aviation Medicine*, by Douglas H. Robinson, M.D. University of Washington Press, Seattle, Wash., 1974. 292 pages. \$15.00.

The coverage of this book is much broader in scope than the subtitle, "A History of Aviation Medicine," would imply. Actually, it is a compressed history of aviation as well as aviation medicine, told in parallel by an author who has the great faculty of squeezing an incredible number of essentially historic highlights into a comparatively small and intensely interesting volume.

Beginning with the first balloon flight of Jean François Pilâtre de Rozier and the Marquis d'Arlandes in 1793, the author has captured the essential elements in aviation history during the last 190 years. (Incidentally, Pilâtre de Rozier was a physicist, not a medical man. His title "Physicien" has misled a number of historians, including Dr. Robinson.)

The chapter headings give a clue to the diversity of subjects covered in this absorbing book:

1. The balloon at high altitude.
2. Box kites, doves, and dragonflies.
3. Untutored bravery: World War I, 1914-18.

4. The golden years and the seedtime of aviation medicine: 1919-38.

5. Aviation medicine comes of age: World War II, 1939-45.

6. The jet age.

7. Mass movement around the earth: commercial air transport.

In less expert hands than Dr. Robinson's, a fact book of this kind might tend toward a rather dull recitation of events and dates. Not so in *The Dangerous Sky!* The coverage of aircraft suggests a "mini-edition" of *Jane's All The World's Aircraft*, and the history of aviation medicine, worldwide, touches upon the major scientific highlights of this comparatively new science. Few leaders in aviation, as well as aviation medicine, are overlooked, and the exploits of heroes and scientists are documented.

Footnotes refer to documentary material at the end of each of the seven chapters, and bibliographies have been prepared separately for aviation and medicine. Forty photographs of historical significance liven the book, which closes with a detailed subject index. This completes a unique and valuable volume, one that should appeal to all aviation buffs as well as those interested in aviation medicine.

—Reviewed by Col. George B. Green, M.D., USAF, MC (Ret.).

## For the Armchair Expert

*Armageddon in the Middle East*, by Dana Adams Schmidt. John Day, New York, N. Y., 1974. 257 pages. \$8.95.

One of today's most ominous international situations continues to smolder in the Middle East. Years of regional hatreds and violence reached new intensity and world significance with the October 1973 Arab-Israeli war. The unprecedented US and Soviet arms commitments to their respective clients brought the two superpowers precariously close to the brink of Armageddon; the implementation of Arab oil as a political weapon

dramatically accentuated the vital role of the Middle East in global economics. The war and Arab oil threatened the fragile unity of the Western alliance and isolated the US's Middle Eastern foreign policy as never before.

Drawing on his eleven years' experience as a Middle East correspondent, Schmidt undertakes not only a military/political analysis of the October War and its historical background, but also provides a brief, country by country, exposition on the politics, economics, and ideologies of all the major Middle Eastern states. In evaluating the present crisis, a sound relationship is drawn between the 1967 War, the Fedayeen, and the October War.

Schmidt finally strikes the thematic chord of his work when he ambitiously details a "practical" solution to the complex Arab-Israeli dilemma: ". . . just a little rationality on both sides." Ironically, he had already resolved that the local antagonists—Arabs and Israelis—are possessed by two irreconcilable nationalistic ambitions; hence, with the prerequisites of a viable détente and the continuing rule of "moderate Arab regimes," the author's only salvation for the Middle East, and possibly the world, rests in the mutual goodwill and the strong, peaceful determinism of the US and the USSR.

Schmidt apparently has already forgotten the singular failure of the earlier phases of diplomacy when the superpowers believed they had the power and the responsibility to mold the Middle East. The Arab-Israeli conflict is a situation that only local conditions will ultimately determine. The most the big powers can hope to accomplish is to facilitate a conciliatory atmosphere.

If the student of the Middle East finds Schmidt somewhat shallow and oversimplified, he can at least take comfort in the commendable effort to maintain objectivity—rather refreshing when one considers that most literature on this subject does not escape certain responsibility for inflaming the conflict by hardening views of those directly or indirectly involved. Remember also that rather than the scholar, the author's target is the newspaper-informed American public—the armchair Middle East "expert." Such readers are well served.

—Reviewed by Capt. Steven A. Eszenyi, Dept. of History, USAF Academy.

## New Books in Brief

*Adelphi Papers.* Two recent studies that should be of particular interest to readers are *Adelphi Papers* No. 102 and 103, titled respectively: "Force in Modern Societies: Its Place in International Politics" (26 pages); and "Force in Modern Societies: The Military Profession" (44 pages). The International Institute for Strategic Studies, 18 Adam St., London WC2N 6AL, England. \$1.00 each, postpaid.

*The Admiral's Wolf Pack*, by Jean Noli. The remarkable history of the German U-boats. From *Kriegsmarine* combat records and from interviews with those who served aboard the "Gray Wolves," the author presents an exciting, fast-paced narrative, giving special emphasis to the technology of undersea warfare and to the day-by-day ordeal of those who planned and carried out German naval strategy. Doubleday, New York, N. Y., 1974. 396 pages. \$7.95.

*Air Facts and Feats*, by John W. R. Taylor, Michael Taylor, and David Mondey. This updated second edition progresses from the ancient Egyptians, through the first ascent of a hot-air balloon in Portugal in 1709, and finally to the development of hypersonic flight, man's six landings on the moon, and Skylab. It portrays the men and their craft in sport and competition, commercial aviation, and, perhaps more dramatically, in military and maritime flying, both in peace and in war. The book is illustrated with more than 200 photographs and maps. The Two Continents Publishing Group, New York, N. Y., 1974. 288 pages with selected bibliography and index. \$8.95.

*Escape from Singapore—1942*, by Ian Skidmore. When Singapore fell in February 1942, a few of the British officers on the island decided that, regardless of instructions, they had no intention of surrendering to the Japanese. *Escape from Singapore* is the remarkable story of how Geoffrey Rowley-Conwy—then a major in the Royal Artillery—removed himself and his battery from the island, of how they crossed the Straits of Malacca, of the disasters that befell them and how these were overcome, of their journey across Sumatra, of how Rowley was picked to sail on the *Sederhana Djohanis*, and of his voy-

age to Ceylon. Charles Scribner's Sons, New York, N. Y., 1974. 198 pages with bibliography. \$7.95.

*Handbook of Leadership*, by Ralph M. Stogdill. Professor Stogdill has abstracted, surveyed, and analyzed more than 3,000 books and articles. *Handbook of Leadership* is a sourcebook "intended for the serious reader who wants to know what results have been obtained, who did the research, and what conclusions can be drawn from the accumulated evidence" relevant to the subject of leadership. The complete bibliography is an invaluable aid for further work in the field. The Free Press, New York, N. Y., 1974. 613 pages with bibliography, author index, and subject index. \$19.95.

*Jane's Pocket Book of Commercial Transport Aircraft and Jane's Pocket Book of Major Combat Aircraft*, edited by John W. R. Taylor. Pocket reference books with a photograph, three-view drawing, and pertinent facts and figures about each plane mentioned in both categories of aircraft. Macmillan, New York, N. Y., 1974. Each contains 263 pages with index. \$6.95 hardback, \$3.95 paperback.

*Strategy for the West: American Allied Relations in Transition*, edited by Richard B. Foster, André Beaufre, and Wynfred Joshua. *Strategy for the West* is based on a colloquium held in Juan-les-Pins, France, in May 1973. It surveys current political, military, and economic problems in US-Western Europe relations, evaluates them in the context of the Atlantic Alliance, and within the context of East-West problems. It also suggests new strategies for restructuring US-European security and defense relationships in the light of continuing Soviet policy objectives in Western Europe. Crane, Russak & Co., New York, N. Y., 1974. 258 pages with index. \$11.00.

*To Conquer a Peace: The War Between the United States and Mexico*, by John Edward Weems. The author has told the story of this unpopular, and today little-studied, war through the personal accounts of participants. Among the better known are Lt. Sam (Ulysses S.) Grant, Capt. Robert E. Lee, President James K. Polk, and Capt. John C. Frémont. Civil War historian Bruce Catton calls the book "the

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## Airman's Bookshelf

best general account of the Mexican War I have yet read." Doubleday, New York, N. Y., 1974. 500 pages with chronology, notes, and bibliography. \$12.50.

*U.S. Military R&D Management*, edited by Dr. Robert A. Kilmarx. This report of a three-year study by a panel of ten military R&D experts supports the need for greater defense R&D as a hedge against miscalculations in arms control and as a guard against technological surprise. The panel endorses a small number of "no requirement" projects and stresses the importance of decoupling research from development and development from production. In the panel's view, some persistent problems that impair R&D management cannot be overcome even by the best R&D managers. The Center for Strategic and International Studies, Georgetown University, Washington, D. C., 1973. 77 pages with appendix. \$3.95 paperback.

*Vietnam Studies*, Department of the Army. Several volumes of this series, which eventually will include twenty-two studies, are now available in paperback from the Government Printing Office. Each has been prepared by a single author as a record of his view of the war in Vietnam. They are:

*US Army Special Forces 1961-1971*, by Col. Francis J. Kelly. 227 pages. \$2.15.

*Riverine Operations 1966-1969*, by Maj. Gen. William B. Fulton. 210 pages. \$2.10.

*Airmobility 1961-1971*, by Lt. Gen. John J. Tolson. 304 pages. \$2.80.

*Base Development 1965-1970*, by Lt. Gen. Carroll H. Dunn. 164 pages. \$1.75.

*Communications-Electronics 1962-1970*, by Maj. Gen. Thomas M. Rienzi. 184 pages. \$1.00.

Superintendent of Documents, US Government Printing Office, Washington, D. C. 20402.

Two recent releases in Ballantine's Illustrated History of the Violent Century series are *Bloodiest Victory: Palau*, by Stanley Falk; and *S S Leibstandarte*, by Alan Wykes. Ballantine Books, New York, N. Y., 1974. 160 pages. \$1.50 each.

—By Catherine L. Bratz



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Reception, the Annual Outstanding Airmen Dinner, and the Chief Executives' Reception and Buffet Dinner.

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# The Bulletin Board

By John O. Gray

MILITARY AFFAIRS EDITOR, AIR FORCE MAGAZINE

## More AFROTC Pacts, Early Outs

The Air Force is quarterbacking a new legislative proposal that would increase its ROTC scholarships from the present 6,500 to 9,250. The figure includes 750 scholarships to be earmarked for students who on commissioning would not enter extended active duty. Rather, they would serve eight years with units of the Reserve Forces.

The plan would raise the number of Army and Navy ROTC scholarships to 10,000 and 8,500 respectively. Both services are currently authorized 6,500. Air Force plans to tell Congress the services need the increase in grants "to meet officer manpower commitments."

The proposal at press time was being coordinated among the services. Formal approval of the Defense Department and the White House budget office also are required before the measure can go to Congress.

Some of USAF's additional scholarships would go to students in scientific and engineering fields because "minimum AFROTC requirements" in such hard-to-fill areas "are not forecast to be met" without them. USAF says there are

insufficient incentives in the "no-draft environment" to induce enough prospective Air Reserve and Air National Guard officers to sign up. The special 750 scholarships for the Reserve Forces would solve that problem, Air Force indicates.

A four-year ROTC scholarship package, covering tuition, books, fees, uniforms, and \$100 a month subsistence, is worth an average of about \$13,500 over a four-year period. Much more, of course, where tuition is steep. With the exception of some athletic grants, ROTC pacts are far and away the most lucrative scholarships available. Many youths understand this. There are fifteen times as many applicants as ROTC scholarships.

In a related development, USAF recently announced that AFROTC scholarship officers can apply for early release from active duty. The service is not making specific promises, saying it will examine each request separately. But its declaration that this move "could significantly reduce the number of officers otherwise required to be involuntarily released" suggests strongly that most applications will be approved.

This policy change is definitely

good news for non-Regular officers desperately trying to avoid being RIFed. Air Force earlier forecast that some 2,200 active-duty Reservists, including 500 being RIFed this month, probably will be forced out in FY '75. The final count depends on what Congress approves in personnel strength in the new budget, and the forecast wasn't good. In late May, the Senate was threatening new large manpower cuts.

At any rate, each AFROTC scholarship officer who takes an early voluntary out means one less RIF of a careerist.

Late AFROTC note: no colleges now hosting AFROTC units want out, and 135 institutions are on the waiting list, according to Air Force Secretary John L. McLucas.

USAF, meantime, is dropping several of its 180 units because of low production. The Defense Department has set fifteen as the minimum number of students to be commissioned annually per unit. Reason: cost. At a unit producing fifty new officers a year, the average cost per commissionee is \$8,000, compared with \$22,000 per graduate with units turning out eleven or fewer.

Defense reports that recently 141 Army ROTC units, thirty-seven Air Force units, and five Navy units were below the minimum fifteen production level. For Air Force's part, this prompted "disestablishment" letters for eleven of the schools and letters of "concern" and special study status for the others.

## The Hair Dilemma

Air Force's recent decision to permit Reservists and Air Guardsmen to wear short-haired wigs on training duty surfaced only after long study, extended discussions, and even some surveys. The Air National Guard and Air Force Reserve leadership jointly urged the

At Luke AFB, Ariz., Maj. William B. McDaniel, Commander of the AFRES 302d Special Operations Squadron, congratulates Maj. John Sadowy, aircraft commander, and the first crew to fly a completely Air Force Reserve controlled special operations training mission in the CH-3E.



Air Force to relax hair, sideburn, and mustache regulations as well as permit the wigs. Such action is required to improve recruitment and retention in the Reserve Forces, officials of those components claim.

### Tighten Dual Comp Laws?

Many service members got exercised—and properly so—when Sen. James Abourezk (D-S. D.) recently declared he would try to force military retirees who hold Civil Service

jobs to surrender their retired pay. His attempt—to invoke the penalty via an amendment to the FY '75 Defense authorization bill—undoubtedly will fail, but others could latch on to the idea. Bears watching. Pentagon has supported

## Ed Gates . . . Speaking of People

### The Military Pay System: More and More Bewildering

The military pay system, though desperately in need of simplification, is becoming more and more bewildering. Consider, for example, the differences in the compensation setups for business executives and military leaders.

Members of both groups are the big decision-makers of their respective organizations. They endure the heavy pressures and shoulder the blame when things go awry. So, it might logically be expected that both would enjoy a salary system that puts them well ahead of their subordinates.

Fancy six-figure salaries and bonuses are the order of the day for the board chairmen and presidents of most major firms. The compensation level then drops substantially for vice presidents as well as for lower-level personnel.

But not in the military. Indeed, the government is going in almost the opposite direction. For the last five years, it has placed a lid on the pay of top military and federal employee officials. Rates of some subordinates have already caught up with the top salaries, and more will follow.

Meanwhile, a group of officers receiving special treatment because of a compelling need has zoomed past the services' "board chairmen and presidents" in total pay. These are medical officers now benefiting from the new medical bonus law.

That measure, urgently needed to keep enough physicians in uniform to maintain at least a minimum of medical care, aims to make in-service medical careers as financially attractive as those readily available in private practice. The bonus measure is an extraordinary piece of "must" legislation to meet a critical situation.

Still, it aggravates a worsening pay relationship between high and lower-level executive management in the services. The bonus measure establishes a \$13,500 annual bonus for medical colonels and below who remain on active duty beyond their required service. It also grants an extra \$250 monthly for medics with two to ten years in uniform, and includes the "continuation pay" that medical general officers have been receiving.

What it all adds up to is that scores of medical officers in each service receive more pay and allowances than the members of the Joint Chiefs of Staff and all other four-star officers. The three-star Surgeons General, though their continuation pay amounts to just \$3,000 a year, receive nearly \$48,000. This does not count tax advantage or flying pay.

Chiefs of staff receive approximately \$44,000 in basic pay and allowances, but not counting flying pay and tax advantage.

Medical two-star officers actually outdraw their Surgeon General superiors by a few hundred dollars a year (because their continuation pay is substantially larger). Perhaps more interesting is the fact that medical officer colonels, with the new bonus providing several

times what their now-discontinued continuation pay used to, outdraw four-star officers, \$44,270 to \$44,030 in the case of an O-6 medic with only twenty years' service. With longer service, the spread is greater.

And for most officers, pay will go up with the next general raise, scheduled for October. But not four- and three-star pay for line officers (unless, as the Pentagon urges, Congress apportions new raise money into allowances as well as basic pay).

The big problem pay-wise for the top military leadership is the \$36,000 annual ceiling Congress has imposed on military and federal salaries. It means that \$3,000 per month is the most an officer can receive in basic pay. (The ceiling applies *only* to basic pay. It does not limit allowances, including the medical officer bonus and "continuation pay.") Were there no ceiling, chiefs of staff and other four-star officers now, as a result of the general raises of recent years, would be drawing \$3,603.60 a month in basic pay, or an additional \$7,243 annually.

Similarly, three-star officers more recently have butted head-on into the \$36,000 annual barrier. Otherwise, instead of drawing \$3,000 each month, their basic pay would now total \$3,179. And it won't be long before major generals reach the same barrier, for they are now at the \$2,866 per month rate.

Pay "compression" obviously has reached extreme proportions. Many quarters find it shocking that the top leaders of the largest organization in the nation—the military establishment—are actually outdrawn by many persons of lesser rank.

Any early change to remove the ceiling on the pay of our highest ranking military leaders is problematical, however. Congress, of course, has the power to unsnarl the problem.

Civil servants GS-16 (fourth step) and up also are stymied by the \$36,000 annual pay barrier; many of them haven't shared in recent general raises. Congressmen, who make \$42,000 and have voted themselves by far the largest package of fringe benefits of any government group, recently rejected an Administration proposal to raise top military and federal executive pay and thus remove the \$36,000 barrier. The plan also would have boosted the legislators' own pay.

The latter, fearful of voter reaction to more money for themselves, scuttled the entire package.

The government, in years past when it has tampered with the military pay system, generally avoided the creation of "pay inversions." But, through default, it has created a whopper in the current instance and seems to have adopted a ho-hum attitude about correcting the situation.

And any steps to emulate, even on a small scale, industry's placing of the board chairmen and company presidents well above subordinate executives on the pay scale seem light-years away. ■

## The Bulletin Board

easing of Dual Comp curbs, not toughening them.

### Pay Inversions Worsen

Inversions and other peculiarities in retired military pay are becoming more commonplace. Recent official messages from Defense and the services note, for example, that without speedy relief legislation, service members awaiting retirement will lose money if they delay their exits until after October 1, 1974.

Losses would range from \$5 to \$6 per month for E-5s and E-6s to \$35 for colonels, increasing to about \$200 per month for four-star generals. Main reason: the percentage of retired pay raises not only equals active-duty pay raises, but they now occur twice as frequently because retired pay increases are aligned to the Consumer Price Index.

Compounding the problem for high-ranking people, of course, is the fact that their basic pay has been frozen for five years at the \$36,000 annual level (see "Speaking of People," p. 97). While top active-duty leaders receive no raises, those in retired status receive frequent increases.



Maj. Gen. John J. Pesch (left) has replaced recently retired Maj. Gen. I. G. Brown as Director of the Air National Guard. A veteran fighter pilot, General Pesch began his military service more than thirty-two years ago. Newly promoted Brig. Gen. John T. Guice (right) has been named Deputy Director of the Air Guard. General Guice won his wings in 1944, shortly thereafter entered the US Military Academy, and graduated in 1947. General Pesch is a graduate of the University of Maine.

The US Comptroller General recently ruled that the law provides for retired pay based either on the current active-duty basic pay rate or on the active-duty rate in effect immediately prior to the current one—with both rates adjusted for any retired CPI increases that have been made. This ruling, which many believe is narrower than the Congress intended, serves to nullify any "save pay" provision.

Let's take two lieutenant colonels, both of whom have more than twenty-two years of active service.

Lt. Col. "A" retires July 1, 1974. He is entitled to retired pay based on the current (October 1973) pay rate, or on the previous (October 1972) rate—both with applicable CPI adjustments. The Finance Center will pay him based on the '72 rate, since this, with the CPI adjustments, will net him \$1,076.47 monthly—which is higher than he would receive from the '73 rate. This is the true meaning, then, of the "save pay" provision of the law.

On the other hand, Lt. Col. "B," who remains on active duty after



At the Texas AFA Convention in Wichita Falls, May 10-11, Lt. Gen. William V. McBride, Commander of ATC, is shown after presenting "Instructor of the Year" awards to Capt. Allan L. Collie (left), navigator instructor, and Capt. Alan D. Dillman, pilot instructor, as Mrs. Dillman looks on.



Judge Leroy P. Vital presents to Maj. Gen. Robert N. Ginsburgh, USAF Director of Information, Mayor Richard Daley's proclamation recognizing the first Midwest Information Officers' Conference, held at Chicago on May 3-4. Maj. John Gura (left), and Col. Robert Duguid share the honor.

October 1 of this year, will receive an estimated pay raise of some 6.2% in October. If he then retires, he will find that his retired pay, based on the current rate, would yield \$1,043 a month, and retirement based on the October '73 rate, which would then be the im-

mediate preceding rate, would yield \$1,054—including all applicable CPI adjustments to the October '73 and '74 rates. Yet, this is some \$22 per month less than Lt. Col. "A" is receiving. Consequently, "save pay" becomes for Lt. Col. "B" a hollow victory.

## ALTERNATE ROUTE TO A DEGREE

Going to college isn't the only way to get a college education. As one response to the emphasis on formal academic credentials, Ewald Nyquist, New York State Commissioner of Education, proposed awarding university degrees to anyone who could qualify, without regard to age, place of residence, or method of preparation. In the three years since his proposal, an alternate route to a degree has been established which emphasizes what a person knows, not how he learned it—The Regents External Degree Program.

More than 1,200 individuals, a majority of them servicemen and women, have earned associate in arts degrees from the Regents of The University of the State of New York. Twenty-five percent of these active-duty degree winners received their much deserved recognition without any formal college attendance. Instead, they met requirements through the College-Level Examination Program (CLEP) offered by the College Entrance Examination Board, the United States Armed Forces Institute courses and tests, and the Commission on the Accreditation of Service Experiences evaluations of military service schools. In addition to service schools, proficiency examinations, and correspondence courses, military service graduates also use regular college work to earn their degrees.

Military people may now enroll in: an associate in arts, an associate in science, an associate in applied science in nursing, and a bachelor of science in business administration external degree program. A general baccalaureate degree is currently under development. While each degree program is different, there are some common elements: for example, there are no admissions requirements; the candidates may reside outside New York state; there is no age limit; the method of preparation is not prescribed; general education requirements can be satisfied by passing courses at accredited colleges; no classroom attendance is required. Although the Regents themselves offer no instructional program, detailed examination descriptions and rather extensive bibliographies and suggested study guides are available to assist degree candidates who elect to study on their own.

There are several modest fees to cover part of the administrative costs of the program. (The Regents External Degrees have been funded by generous grants from the Ford and Kellogg Foundations and from the Carnegie Corporation.) In addition to a \$50 enrollment charge, students are required to pay an annual records fee of \$25 and a diploma fee of \$10. The average cost of each test administered by the Regents is \$25. However, many students take examinations offered by other agencies, or study at colleges where they must pay regular tuition fees. Veterans educational benefits may assist students with many of these charges.

How does the program work for service personnel? After examining the program literature, in particular the published degree requirements, and discussing them with his educational adviser, the serviceman enrolls in the degree program of his choice. He has all of his official college transcripts, CLEP scores, USAFI reports, and records of military schools successfully completed—form DD295—forwarded to New York for evaluation.

It is important to note that all official records must come to us directly from the issuing agency or college. A "status report" is then sent to the candidate by the University Registrar. The majority of service personnel initially enrolled already met the requirements for the associate in arts degree without additional study.

It is now possible for military education officers to administer College Proficiency or Regents External Degree Examinations at their own installations. At present, over 4,000 people—including civilians—are enrolled in the program. Further information on Regents External Degrees is available from service education officers or directly from: Regents External Degree Program, New York State Education Department, 99 Washington Ave., Albany, N. Y.

—By Starr Regan, Consultant to N. Y. Regents External Degree Program

This happens because active-duty pay is adjusted by law in October each year, and the rate is determined by Congress. Retired pay is adjusted by law every time the CPI increases at least three percent. Since January 1 of this year, and including the forthcoming July 1 increase, retired CPI increases total 11.9%. The active-duty pay increase due for this coming October is expected to be no more than 6.2%.

DoD had figured that existing statutes guaranteed that later retirees would draw at least as much pay as earlier retirees, but the Comptroller General has held otherwise. By late spring, a relief measure assuring equality had been rushed through the Pentagon and was awaiting action by the Office of Management and Budget. Next stop: Congress. Look for further developments in this space next month.

## Stymied Pay Projects

The medical officer and enlisted re-up bonus bills have both become law, and the long-delayed flight-pay measure was signed by the President on May 31. But what of other important military pay propositions—such as lawyer pay, special pay for remote duty, raising bachelor quarters allowances to the married rate, a Stateside temporary lodging allowance, and sea pay for sailors?

All have been supported by various quarters within the Pentagon. But all appear hopelessly bogged down, mainly because of high price tags. Air Force, for instance, wants to equalize BAQs for bachelors, but within USAF alone the annual cost is estimated at \$50 million. Accordingly, "implementation prior to FY '78 is not likely," a recent Hq. USAF report states.

Navy initiated the Stateside temporary lodging allowance (TLA) plan, and the other services have "concurred." But the Defense Department has blocked a formal legislative proposal because of the plan's "high cost and low Project Volunteer priority." Too bad; lower-ranking families urgently need something extra to cover meals and lodging charges incurred at the start and end of a PCS move. TLA has been paid for years abroad, but it's needed just as much Stateside.

And Defense isn't buying special

## The Bulletin Board

pay for remote-duty service, something USAF has been pushing for years. The latest word from Hq. USAF: "Remote-duty pay will remain under consideration for later development."

### Transfers to Reserves Drop

USAF plans to allow 4,200 airmen and 150 officers to transfer to the Reserve Forces during the fiscal year just under way, a sharp drop from the nearly 8,000 members who transferred during FY '74. This is the Palace Chase program.

Approximately 160 different types of jobs are open to transferring airmen this year. The small officer quota is entirely for pilots with a possible exception of a "very few navigators," authorities said.

### Fewer Collegians Needed

Time was when USAF recruiters signed up thousands of non-ROTC college seniors, the vast majority of them men, every year for Officer Training School. But with male strength slashes, RIFs, and female intake increases now SOP, the picture has changed sharply.

For the fiscal year just starting, Air Force plans to take only 1,328 officer trainees of whom 372—twenty-eight percent—will be coeds. And of the 956 men, 681 will vie for navigator wings, and only two—repeat two—will head for pilot school (AFROTC will provide most pilot trainees).

USAF recruiters in FY '75 also will seek 899 nurses and 1,500 prior-service enlisteds. The rather low 77,882 nonprior service recruit quota for the year includes 10,000 women.

### Share the Wealth?

USAF's success in attracting high-quality manpower has caused some quarters to advocate that it "share the wealth." The powerful House Appropriations Committee for one. A member of the group, during hearings on the FY '75 military budget, asked if Air Force shouldn't take fewer high school graduates and more lower mental category people. Supposedly, more quality would head for the Army



James M. Roche, second from left, Chairman of the National Committee for Employer Support of the Guard and Reserve, accepts the Freedoms Foundation George Washington Honor Medal from Irving Feist, Chairman of the Foundation's Council of Trustees. At left is H. T. S. Heckman of Republic Steel, and, at right, Robert P. Keim, President of The Advertising Council.

and Marines, who are both hurting.

Air Force, not surprisingly, wants none of it. Maj. Gen. Oliver W. Lewis, Air Force's Personnel Programs Director, told the lawmakers such a step would dilute Air Force's readiness capability. And just because a man can't make the Air Force doesn't mean he will opt for another service, General Lewis pointed out.

Air Force has agreed to help the other services to a point: talking up enlistment in them to first-term airmen caught in the FY '75 early release program. A plan has been worked out where authorities at USAF bases are putting Army, Navy, and Marine Corps recruiters in touch with early-exit separatees.

### Retiree Report Awaited

The Air Force Retiree Council at its March meeting at the Randolph AFB, Tex., Military Personnel Center, ground out three and one-half pages of recommendations. Much was on CHAMPUS, other aspects of medicare, retired pay recomputation, and the need for Hq. USAF to give the group more exposure Air Force-wide. Headquarters has withheld details pending "staffing" of the report. The eleven-member Council was formed in 1972 to give USAF's fast-growing retired force a voice at the top.

### Midwest IO Conference

More than 100 active, ANG, Air Force Reserve, and CAP Information Officers from all parts of the nation attended the First Annual Midwest Information Officers' Conference in Chicago on the weekend of May 3. Held at the Playboy Towers Hotel, the highly successful meeting had four panels over the two-day period with participants including top representatives from

radio, television, and metropolitan suburban newspapers. Also participating were Maj. Gen. Robert N. Ginsburgh, Air Force Director of Information, together with members of his staff. The subjects discussed were: "The Media—Where Are We In Their Eyes?"; "Modern News Media and Their Needs"; "Public Information Resources in the USAF"; and "Things We Can Do Now to Help the Media."

The Conference was sponsored by the 9014th Air Reserve Information Squadron, based in the Chicago area, and the Chicago Air Force Office of Information headed by Maj. John Gura. The Air Force Association hosted a cocktail reception on the evening of May 3 for conferees and AFA leaders.

### Dr. Marrs to White House

One of the Air Force Reserve's greatest boosters, Dr. Theodore C. Marrs, ended twelve years of high-level Pentagon service in May when he became a special assistant to the President. Marrs earlier was Air Force Deputy for Reserve Forces, more recently was Deputy Assistant Defense Secretary for Reserves.

### Short Bursts

That recent study by the University of Michigan's Institute for Social Research drew cheers from throughout the Pentagon. The study showed the public rating of the job done by fifteen US institutions, and the military placed first. . . . Air Force's revamped OER system, first slated to start April 1, then July 1, is now set back to November 1; a staffer declared that "we need more time to start it off right." . . . A main reason the services strive not to enlist youths in low mental category IV is that

they're considerably more likely to "experiment with drugs than those in higher mental groups," according to the Pentagon's top civilian medical official, Dr. James Cowan. Yet Army, long plagued with drug woes, had to take 4,090 Cat IVs in March and April, compared with Air Force's lowest-of-the-services Cat IV intake of just sixty during the same period.

With impending construction of the Alaskan pipeline, housing in the Eielson AFB/Fairbanks, Alaska, area has become "scarce and very expensive," Hq. USAF has warned, and there's insufficient on-base family housing. Accordingly, AFers headed for the frigid base who can't get concurrent travel should leave their families at home. Those who bring them anyway "may not qualify for dependent travel pay, temporary lodging allowance, or station allowances," Hq. USAF said.

### Senior Staff Changes

**PROMOTIONS:** To be **General:** Louis T. Seith. To be **Lieutenant General:** Walter T. Galligan; James D. Hughes.

**RETIREMENTS:** L/G Albert P. Clark; B/G Thomas B. Hoxie; M/G William A. Jack; Gen. John C. Meyer.

**CHANGES:** M/G James R. Allen, from Special Assistant to C/S for B-1 Matters, Hq. USAF, to Superintendent, USAF Academy, Colo.,

replacing retiring L/G Albert P. Clark... **Gen. Russell E. Dougherty**, from C/S, SHAPE, Belgium, to CINC, Hq. SAC, Offutt AFB, Neb., replacing retiring Gen. John C. Meyer... **B/G David B. Easson**, from Dep. Dir., Legislative Liaison, OSAF, Hq. USAF, to DCS/P, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing retiring B/G Thomas B. Hoxie.

**L/G Walter T. Galligan**, from Cmdr., USAF Security Service, San Antonio Tex., to Cmdr., US Air Forces, Japan, and Cmdr., 5th AF, PACAF, Fuchu AS, Japan, replacing retired L/G Robert E. Pursley... **M/G Ralph T. Holland**, from DCS/Logistics, Hq. PACAF, Hickam AFB, Hawaii, to Cmdr., San Antonio Air Logistics Center, AFLC, Kelly AFB, Tex., replacing retiring M/G William A. Jack... **L/G (Gen. selectee) Louis T. Seith**, from Dir., J-5, Joint Staff, OJCS, to C/S, SHAPE, Belgium, replacing Gen. Russell E. Dougherty... **M/G Howard P. Smith, Jr.**, from Dep. Dir., Intelligence, DIA, Washington, D. C., to Cmdr., USAF Security Service, San Antonio, Tex., replacing L/G Walter T. Galligan.

—Compiled by Catherine L. Bratz

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A1C Lyndell Cox and Col. James G. Sandman, Commander of 3506th USAF Recruiting Group, cut ribbon opening USAF's exhibit at Spokane's Expo 74. Airman Cox is Miss Fairchild AFB. The Expo runs through October 31.

# MIA/POW Action Report

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

## Continuing Struggle

At its annual convention scheduled for June 28–July 1, the League of Families is hoping once again to galvanize interest in the waning issue of those 1,200 Americans still listed as missing in Southeast Asia.

And for the first time since its initial national meeting in 1969, the League convention will be held other than in Washington, D. C. This year, the gathering will take place in Omaha, Neb., picked for its nationally central location, League officials said.

A source of considerable satisfaction is the invitation to all returned Southeast Asia POWs and their families to attend the Omaha meeting. "Although we have no formal program for the returnees, we look forward to the opportunity to once again meet with you and express our sincere gratitude for your continuing interest and support," League officials said in issuing the invitation to the men that League members labored so many years to help.

Aside from faltering public interest in its reason for being—the status of the MIAs—the League is beset by two other formidable problems: lack of money and internal dissent.

To prop up its dwindling finances, the MIA/POW organization has

asked its members to consider contributing \$5 per month "to enable the National League to continue until its mission is accomplished."

DoD will provide, at the Omaha convention, casualty records of MIAs whose next of kin have requested them. This is just one corollary to the continuing controversy over Defense Department policy regarding the hearings to change MIAs' status to presumed killed.

According to a federal court decree handed down on March 11, 1974, DoD can proceed with hearings to determine such status changes providing the next of kin are notified and given sufficient time to attend, represented by counsel if desired. They are also to be permitted the opportunity to review the evidence.

Thus far, DoD has held off on many status-change hearings because of the unclear legal situation and mounting pressure from Capitol Hill, among other things. A number of congressmen hold that the North Vietnamese have not lived up to their part of the bargain agreed upon in the Paris accords. In the pact that ended US participation in the Southeast Asia fighting and brought about release of US prisoners, North Vietnam committed itself to assist in accounting for American MIAs.

Except for the return of the remains of twenty-three men said to have died in captivity in Hanoi (twenty-seven men whose bodies have not as yet been returned were reported to have died in captivity in Viet Cong territory), little progress has been made in the accounting effort. Congressmen and others believe that pressure should be kept on North Vietnam, although few diplomatic tools other than a helping hand in reconstruction remain.

Related to the accounting imbroglio could be a tricky angle in international law. If the US government officially declares its missing as presumed killed, this might let North Vietnam off the hook, at least technically.

In any case, US officials and MIA family members were hoping for the agreed-upon release of an American civilian pilot, Emmet Kay, captured when his plane went down in May 1973. Hebel Laotian officials balked at the release in early June of Kay and about 600 Thai POWs, some of whom had been Pathet Lao POWs for years.

The groundwork has been prepared for the interrogation of Kay and the Thais to garner information about any Americans still in that part of Southeast Asia—a glimmering hope at best but an outside chance that many MIA family members continue to cling to. ■



Recent memorial services for Col. Norman Schmidt, a USAF pilot who died in a North Vietnamese prison camp in September 1966, were held at George AFB, Calif. More than 500 people, including many former POWs, attended. Brig. Gen. Robin Olds, USAF (Ret.), Colonel Schmidt's commander in Southeast Asia, delivered the eulogy. A flight of F-105s flew in missing-man formation over the chapel.



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## The Standard Plan (\$66,000 Maximum)

Insured's Age	Coverage	Extra Accidental Death Benefit*	Monthly Cost	Optional Family Coverage		Monthly Cost Fam'l Coverage
				Spouse	Each Child**	
20-24	\$ 66,000	\$12,500	\$10.00	\$6,000	\$2,000	\$2.50
25-29	60,000	12,500	10.00	6,000	2,000	2.50
30-34	50,000	12,500	10.00	6,000	2,000	2.50
35-39	40,000	12,500	10.00	6,000	2,000	2.50
40-44	25,000	12,500	10.00	5,250	2,000	2.50
45-49	15,000	12,500	10.00	4,050	2,000	2.50
50-59	10,000	12,500	10.00	3,000	2,000	2.50
60-64	7,500	12,500	10.00	2,250	2,000	2.50
65-69	4,000	12,500	10.00	1,200	2,000	2.50
70-75	2,500	12,500	10.00	750	2,000	2.50



## The High-Option Plan (\$100,000 Maximum)

Insured's Age	Coverage	Extra Accidental Death Benefit*	Monthly Cost	Optional Family Coverage		Monthly Cost Fam'l Coverage
				Spouse	Each Child**	
20-24	\$100,000	\$12,500	15.00	\$6,000	\$2,000	\$2.50
25-29	90,000	12,500	15.00	6,000	2,000	2.50
30-34	75,000	12,500	15.00	6,000	2,000	2.50
35-39	60,000	12,500	15.00	6,000	2,000	2.50
40-44	37,500	12,500	15.00	5,250	2,000	2.50
45-49	22,500	12,500	15.00	4,050	2,000	2.50
50-59	15,000	12,500	15.00	3,000	2,000	2.50
60-64	11,250	12,500	15.00	2,250	2,000	2.50
65-69	6,000	12,500	15.00	1,200	2,000	2.50
70-75	3,750	12,500	15.00	750	2,000	2.50

\* In the event of an accidental death occurring within 13 weeks of the accident, the AFA plan pays a lump sum benefit of \$12,500 in addition to the benefit, except as noted under AVIATION DEATH BENEFIT, above.

\*\* Each child is covered in this amount between the ages of six months and 21 years. Children under six months are provided with \$250 protection once they are 15 days old and discharged from the hospital.

**AVIATION DEATH BENEFIT:** A total sum of \$22,500 under the High-Option Plan or \$15,000 under the Standard Plan 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.

### CHECK THE ADVANTAGES OF THESE AFA PROGRAMS

**Wide eligibility!** If you're on active duty with the U.S. Armed Forces [regardless of rank], a member of the Ready Reserve or National Guard [under age 60], a Service Academy or college or university ROTC Cadet, you're eligible to apply for this coverage [see exceptions].

**Keep your coverage at the low, group rate to age 75, if you wish.**

**Full conversion privilege.** At age 75 [or at any time, on termination of AFA membership] the amount of insurance shown for your age group at the time of conversion may be converted to a permanent plan of insurance, regardless of your health at that time.

**Disability waiver of premium,** if you become totally disabled for at least nine months, prior to age 60.

**Convenient premium payment plans.** Pay direct to AFA or by monthly government allotment.

**Reduction of cost by dividends.** Net cost of insurance to AFA insured persons has been reduced by payment of dividends in eight of the last eleven years. However, dividends cannot, of course, be guaranteed.

**Administered by insurance professionals on your Association's staff,** for excellent service and low operating cost.

### EXCEPTIONS:

**Group Life Insurance:** Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane shall 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, 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.

The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minneapolis as trustee of the Air Force Association Group Insurance Trust. However, because of certain limitations on group insurance coverage in those states, nonactive-duty members who reside in Ohio, Texas, Florida, and New Jersey are not eligible for AFA group life insurance coverage.

### 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. Coverage runs concurrently with AFA membership. AFA Military Group Life Insurance is written in conformity with the Insurance Regulations of the State of Minnesota.

Yes, now the Air Force Association offers members of the United States Air Force their choice of two great new life insurance plans, both designed to meet the special requirements of Air Force personnel.

### Planned for You

Both plans have been specifically designed to fill your particular needs. This is full-time, worldwide protection. There are no war clauses—no hazardous-duty restrictions, or geographical limitations on AFA life insurance protection. At AFA, our policy is to provide the broadest possible protection to our members, including those in combat zones.

### Low Group Rates

And, as a member of AFA, you are able to secure this outstanding protection at low group rates. What's more, there's no increase in premiums for flying personnel. In fact, in most cases, flying personnel are entitled to full death benefits. Only when death is caused by an aircraft accident in which the insured was serving as pilot or crew member does the special Aviation Death Benefit take effect.

### Higher Benefits for Young Families

The higher benefits for younger members make both plans particularly outstanding buys for the young family. The young family breadwinner can make a substantial addition to his life insurance estate at a time when his family is growing up—when his financial obligation to his family is at its greatest!

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Group Policy GLG-2625  
United Benefit Life Insurance Company  
Home Office: Omaha, Nebraska

Full name of member \_\_\_\_\_  
 Rank \_\_\_\_\_ Last \_\_\_\_\_ First \_\_\_\_\_ Middle \_\_\_\_\_  
 Address \_\_\_\_\_  
 Number and Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP Code \_\_\_\_\_

Date of birth Mo. Day Yr.	Height	Weight	Social Security Number	Name and relationship of primary beneficiary
Please indicate category of eligibility and branch of service. <input type="checkbox"/> Extended Active Duty <input type="checkbox"/> Air Force <input type="checkbox"/> Ready Reserve or National Guard <input type="checkbox"/> Other _____ (Branch of service) <input type="checkbox"/> Air Force Academy <input type="checkbox"/> _____ Academy <input type="checkbox"/> ROTC Cadet _____ Name of college or university				Name and relationship of contingent beneficiary
This insurance is available only to AFA members <input type="checkbox"/> I enclose \$10 for annual AFA membership dues (includes subscription (\$9) to AIR FORCE Magazine). <input type="checkbox"/> I am an AFA member.				

Please indicate below the Mode of Payment and the Plan you elect.

HIGH OPTION PLAN		Mode of Payment	STANDARD PLAN	
Members Only	Members and Dependents		Members Only	Members and Dependents
<input type="checkbox"/> \$ 15.00	<input type="checkbox"/> \$ 17.50	Monthly government allotment. I enclose 2 months' premium to cover the period necessary for my allotment to be established. Quarterly. I enclose amount checked. Semiannually. I enclose amount checked. Annually. I enclose amount checked.	<input type="checkbox"/> \$ 10.00	<input type="checkbox"/> \$ 12.50
<input type="checkbox"/> \$ 45.00	<input type="checkbox"/> \$ 52.50		<input type="checkbox"/> \$ 30.00	<input type="checkbox"/> \$ 37.50
<input type="checkbox"/> \$ 90.00	<input type="checkbox"/> \$105.00		<input type="checkbox"/> \$ 60.00	<input type="checkbox"/> \$ 75.00
<input type="checkbox"/> \$180.00	<input type="checkbox"/> \$210.00		<input type="checkbox"/> \$120.00	<input type="checkbox"/> \$150.00

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, sanitarium, 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 understand United reserves the right to request additional evidence of insurability in the form of a medical statement by any attending physician or an examination by a physician selected by United.

Date \_\_\_\_\_, 19 \_\_\_\_\_ Member's Signature \_\_\_\_\_

# AFA News

**By Don Steele**  
AFA AFFAIRS EDITOR



At a recent party honoring Col. Walter J. Chappas, right, on the occasion of his retirement from active duty, AFA's Greater St. Louis Chapter President Donald Kuhn presents the Colonel a plaque of appreciation from the Chapter. Colonel Chappas, as Director of the Defense Mapping Agency Aerospace Center, was an active supporter of the Chapter during its rejuvenation last year.



Ed Nett, right, Wright Memorial Chapter President, presents a writing set to A1C J. M. Holz, "Airman of the Year" at Wright-Patterson AFB, Ohio, as TSgt. S. F. Lopez, center, "NCO of the Year" at the base, admires the writing set he received.

Recently, New Jersey AFA President Amos L. Chalif, left, presented an AFA charter to John P. Kruse, President of the newly organized New Jersey Information Chapter. Also present at the ceremonies in the McGuire AFB Officers' Club were Leonard R. Will, third from left, and James M. Still, Jr., right, Chapter Vice President and Secretary, respectively. The Chapter's membership is made up primarily of Ready Reservists with the Air Force Reserve Information Program. Its mission will be to provide publicity aid to all New Jersey AFA Chapters and to publish the State AFA's quarterly news bulletin.



Among the many distinguished guests at the Nation's Capital Chapter's recent reception and dinner dance honoring Sen. Howard W. Cannon (D-Nev.) were, from left, Mrs. Terry; Senator Cannon; Mrs. McLucas; Air Force Secretary John L. McLucas; Mrs. Brown; Chaplain (Maj. Gen.) Roy M. Terry, Air Force Chief of Chaplains; Mrs. Troutman; Air Force Chief of Staff Gen. George S. Brown; Mrs. Cannon; and Chapter President George G. Troutman. During the program, Senator Cannon received the Chapter's fourth "Distinguished American" Award.



During his recent visit to Griffiss AFB, N. Y., Gen. George S. Brown, USAF Chief of Staff, received the Rome Militia Award from Emyln I. Griffith, Rome Area Chamber of Commerce President. The award, which was presented during a dinner cosponsored by AFA's Collin P. Kelly Chapter and the Joint Military Affairs Committee of the Rome and Utica Chambers of Commerce, makes General Brown an honorary colonel of the Third New York Continentals, defenders of Fort Stanwix. Also present were Mohawk Valley Association for Progress President Dwight E. Vicks, Jr., left, and Collin P. Kelly Chapter President Paul B. Oliver.



## CHAPTER AND STATE PHOTO GALLERY



Lt. Cmdr. Paul E. Galanti, USN, the guest speaker at a recent meeting of AFA's Richmond, Va., Chapter, congratulates MSgt. John Lee Johnson, the Chapter's "Airman of the Year." Looking on are Col. William E. Haymes, left, Virginia's Assistant Adjutant General for Air and, also, Chapter Vice President; and Col. Claude F. Heath, right, Commander, 192d Tactical Fighter Group, Virginia Air National Guard. Commander Galanti was a POW in North Vietnam for some seven years. Sergeant Johnson is a member of the 192d TFG.



In recent ceremonies in his office, Col. Raymond L. Horvath, left, base Commander, Davis-Monthan AFB, Ariz., presented William L. "Benny" Benedict, right, a scroll designating him as "Honorary Mayor," Davis-Monthan AFB. The award was presented "for his unswerving faith and dedication in assisting the base to achieve its goals" for many years. Mr. Benedict is a long-time member of the Tucson Chapter's Executive Council.



Lt. Gen. John B. Hudson, center, Vice Commander, Air Force Systems Command, was the guest of honor and speaker at a recent dinner meeting of the H. H. Arnold Memorial Chapter at the Arnold Engineering Development Center (AEDC), Tenn. Visiting with General Hudson are, from left, John H. Haire, Vice President for AFA's South Central Region; Chapter President L. T. Glaser; General Hudson; Capt. Robert Glenn Certain, a former POW now attending the University of the South Graduate School of Theology; and Col. Webster C. English, AEDC Commander.



At the recent change of command ceremony at Craig AFB, Ala., Eugene Maxwell, left, representing AFA's Selma Chapter, presented Col. Robert B. Tanguy (Brig. Gen. selectee) a plaque in appreciation of his outstanding support of AFA and the Selma Chapter in particular.



More than 400 Air Force, civic, and AFA leaders attended the Tucson Chapter's 14th Annual Air Force Appreciation Dinner. Sen. Barry M. Goldwater (R-Ariz.), center, was the principal speaker. Head-table guests included, from left, Tucson Mayor Lewis Murphy; Mrs. Jewett; Chapter President E. D. Jewett, Jr., who was the master of ceremonies; and AFA National President Joe L. Shosid, who introduced Senator Goldwater. Special guests included Lt. Gen. William Pitts, Commander, Fifteenth Air Force (SAC); Brig. Gen. Raymond Haupt, Commander, 12th Air Division (SAC); and Robert S. Lawson, Vice President for AFA's Far West Region. Chapter Vice President Leo Jordan was the general chairman of the event.

# AFA News



Watching Harrisburg, Pa., Mayor Harold A. Swenson, seated, sign a proclamation observing Friday, March 29, 1974, as Vietnam Veterans Day are, from left, H. M. "Mac" Eaton, President, AFA's Olmsted Chapter; George A. McGovern, Harrisburg Area Veterans Council President; and Don H. Jeffrey, State Veterans Council President, and State Commander of the American Legion. The proclamation was presented to the three as representatives of all Vietnam veterans in both the Harrisburg area and the Commonwealth of Pennsylvania.



During Dallas Chapter's recent Awards Banquet, Chapter President Jack Oxley, left, presents the Chapter's Organization of the Year Award to Jack J. Welch, LTV Aerospace Corp. Vice President for Programs. The award was made in recognition of LTV Aerospace's outstanding support of AFA at Chapter, State, and National levels.

Col. Leonard "Sam" Dereszynski, center, USAFR, a Past President of the Billy Mitchell Chapter and the Wisconsin AFA, and recipient of the Billy Mitchell Memorial Award, displays his award to, from left, Bernard D. Osborne, Vice President for AFA's Great Lakes Region; Wisconsin AFA President Kenneth Kuenn; Brig. Gen. Allred Verhulst (now a major general commanding the Eastern Air Force Reserve Region headquartered at Dobbins AFB, Ga.); and Chapter President Stan Wagenknecht. The award was presented at the Billy Mitchell Chapter's 17th Annual Billy Mitchell Memorial Award Dinner.



At a dinner sponsored recently by AFA's Cheyenne Chapter, Wyo., Lt. Raymond Licata and his wife Cheryl, center, are congratulated by, from left, Roy A. Haug, Vice President for AFA's Rocky Mountain Region; Lt. Gen. Albert P. Clark, Superintendent, US Air Force Academy, and guest speaker; Chapter President Elmer F. Garrett; and Brig. Gen. Gerald G. Fall, Jr., Commander, 4th Air Division (SAC), F. E. Warren AFB. Lieutenant Licata was named the Chapter's "Junior Officer of the Year" for 1973.



During recent ceremonies in the hospital room where he was recovering from surgery, Nebraska AFA President Lyle Remde presented checks totaling \$5,500 to Offutt AFB, to be used for carpeting the Airmen's Dining Hall. The contribution is from the Nebraska AFA and its Ak-Sar-Ben Chapter. Taking part in the ceremony were, from left, State and Chapter Treasurer W. A. Sample; Col. Richard Y. Newton, Offutt AFB Vice Commander; Mr. Remde; State and Chapter Secretary Frank Kaulman; and Lt. Col. Irvin J. Harris, Chief of Services at Offutt AFB.



## CHAPTER AND STATE PHOTO GALLERY



Gen. Paul K. Carlton, second from right, Commander, Military Airlift Command, and Mrs. Carlton, right, chat with Edward Hagenmeyer, left, President, Farmers Bank of Delaware, and Col. George H. Chabbott, USAF (Ret.), a member of the Delaware Galaxy Chapter's Council. General Carlton was the guest speaker at the Chapter's recent dinner meeting in Dover, Del.



Congressman Burt L. Talcott (R-Calif.), left, the guest speaker at a recent meeting of AFA's Monterey Bay Area Chapter, Calif., visits with Chapter President James E. Hampton, center, and Budd J. Peaslee, a Past President of the Chapter, prior to the meeting.



Gen. Lucius D. Clay, Jr., center, Commander, Aerospace Defense Command, was initiated as a member of the Colorado AFA's "Blue Barons," at a recent meeting of AFA's Colorado Springs Chapter. Pictured are, from left, CMSgt. T. E. Fowler, senior enlisted adviser to the Chapter; Maj. Gen. M. J. Ingelido, USAF (Ret.), Chapter President; Colorado AFA President James Hall; General Clay; Roy Haug, Vice President for AFA's Rocky Mountain Region; and Ken Johnson, Chapter Vice President for Programs.



While in Washington, winners of the Charleston, S. C., Chapter's annual AFJROTC essay contest visited AFA National Headquarters and were guests of the Aerospace Education Foundation at its luncheon for finalist judges in the Foundation's recent contest for AFJROTC Unit presentations on "The Air Force as a Unique National Resource." Shown at the luncheon are, from left, Theodore W. Swain, South Carolina AFA Secretary and escort for the cadets; Cadet Robert L. Bell, Garrett High School, Charleston; Maj. Gen. Frank J. Simokaitis, Commandant, Air Force Institute of Technology, and one of the judges; Cadet Clarence Seale, Berkeley High School, Moncks Corner; and AFA and AEF Executive Director James H. Straubel.



Individuals honored recently by AFA's Anchorage Chapter, Alaska, for contributions to the Air Force mission in the forty-ninth state are pictured with Lt. Gen. James C. Sherrill, Commander in Chief, Alaska. They are, from left, Maj. Thomas S. May, Technical Sergeant Holloway, General Sherrill, Chapter President William M. Mack, Lt. Col. James H. Waldman, Mrs. Chapman, and Col. (Dr.) Calvin C. Chapman.

# AFA News



Miss Pamela Duggan, recipient of the Texas AFA's Earle North Parker Scholarship, awarded to the high school senior submitting the best entry in the State AFA's annual essay contest, accepts the scholarship check for \$1,000 from Texas AFA President Stan Campbell, right, as the State AFA Vice President for awards, Bill Stewart, beams his approval. Miss Duggan's essay was entitled "Your Future and Mine—The United States Air Force." A senior at Hirschi High School in Wichita Falls, she is the daughter of retired Air Force MSgt. and Mrs. Ronald J. Duggan.



While visiting the headquarters of United States Air Forces in Europe, and air bases in Germany and Spain, AFA President Joe L. Shosid presented an AFA Charter to the newly organized Rheinland Chapter at Ramstein AB, Germany. In the photo, President Shosid, left, presents the charter to Chapter President Ken Blanchard, as Kay Frank and Carl McRorie, Chapter Treasurer and Secretary, respectively, stand by.

The Middle Georgia Chapter recently sponsored a function to recognize the outstanding efforts of all those who worked on the Chapter's 1974 membership drive. In the photo, Chapter President Ken Greer, left, ignores the heckling of "The Mayor of Morrow," second from left, an entertainer at the function, as he presents a plaque to Lt. Col. Frank Adams; and Certificates of Appreciation to Betty Eskew, Fay Bloodworth, and Lt. Dick Goetze, all recruiting leaders in the drive.



Lt. Gen. Dale S. Sweat, second from right, Vice Commander of the Tactical Air Command, Langley AFB, Va., was the guest speaker at a recent meeting of AFA's Llano Estacado Chapter, Clovis, N. M. With General Sweat are, from left, Chapter President George R. Doerr; New Mexico AFA President John J. Dishuck; and Col. Robinson Risner, Commander, 832d Air Division, Cannon AFB.



# This Is AFA

The Air Force Association is an independent, nonprofit, airpower organization with no personal, political, or commercial axes to grind; established January 26, 1946; incorporated February 4, 1946.

## OBJECTIVES

The Association provides an organization through which free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support

armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace

power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principle of freedom and equal rights to all mankind.



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Bob Stevens'

# "There I was..."



AT THE RISK OF STARTING A RHUBARB WITH NAVIGATORS, THIS STORY HAD TO BE TOLD. EQUAL SPACE WILL BE GRANTED A NAVIGATOR WHO COMES UP WITH AS GOOD A GAG ABOUT PILOTS.

(ED. NOTE: STEVENS, AN OLD FIGHTER JOCK, IS BOUND TO BE IMPARTIAL!)

A.D. 1954-

BASE OF

THE WINGS? GLAD YOU ASKED! THEY'RE **MASTER** NAVIGATOR. BRAND NEW CLASSIFICATION-AND ABOUT TIME, TOO! WE NAVIGATORS...

...HAVEN'T RECEIVED THE RECOGNITION DUE US! WHY, WITHOUT NAVIGATORS MOST OF THE USAF WOULD BE LOST! THE MAJORITY OF PILOTS I KNOW CAN'T FIND THEIR WAY TO THE LATRINE!

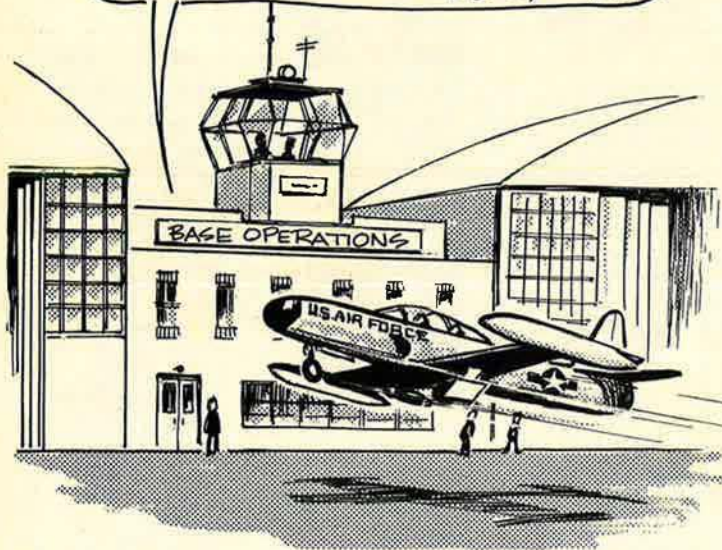


(LONG-TIME FIGHTER JOCK)



AIRPLANE DRIVERS STILL THINK THE WORLD IS FLAT! WE NAVIGATORS HAVE TO LEAD 'EM BY THE HAND EVERY TIME THEY GET OUTTA SIGHT OF LAND! furthermore... **BLAH, BLAH, BLAH**

LISSEN, BIG MOUTH, I GOT 3500 HOURS IN AN AIRPLANE WITHOUT A NAVIGATOR - HOW MANY HAVE YOU GOT WITHOUT A **PILOT** ?!



Bob Stevens

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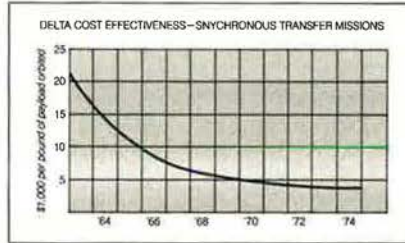
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