

FEBRUARY 1979/\$1

AIR FORCE

PUBLISHED BY THE AIR FORCE
ASSOCIATION

MAGAZINE



**Military Airlift Command:
The Prime Mover**

Air Force Power



TF34 POWERED A-10 CLOSE AIR SUPPORT AIRCRAFT



CF6-50-POWERED KC-10A ADVANCED TANKER/CARGO AIRCRAFT



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GENERAL  ELECTRIC

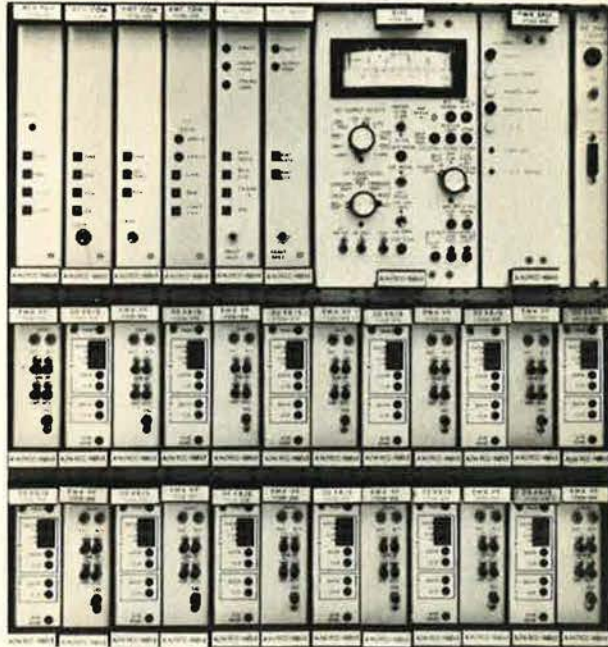
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Northrop teamed with Sanders Associates to compete for contract to produce Airborne Self Protection Jammer (ASPJ), advanced internal ECM system for new generation U.S. Navy and Air Force fighters.

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BOEING

This Month

- 8 **The Power Puzzle** / Editorial
- 4 **MX Still Zigzagging** / By Edgar Ulsamer
- 3 **NATO Turns Thirty** / By Gen. T. R. Milton, USAF (Ret.)
- 6 **New Critical Defense Needs** / By Edgar Ulsamer
- 2 **The B-52: Growing More Vital With Age** / By Bonner Day
- 3 **Making the B-52 Even Better**
- 8 **From the Airlift to Vietnam and Beyond**
By Gen. T. R. Milton, USAF (Ret.)
- 6 **Military Airlift Command: The Prime Mover**
By William P. Schlitz
- Japan and the Shifting Asian Balance** / By James E. Dornan, Jr.
- Tac Recce: A Different Breed of Cat**
By Lt. Col. John P. Kelly, USAF
- Jane's All the World's Aircraft Supplement**
Compiled by John W. R. Taylor
- Nibbling Away at Retirement Programs**
By James A. McDonnell, Jr.
- The Disastrous "Ethics in Government" Law** / By Ed Gates
- 0 **Maj. Gen. H. A. "Bert" Dargue: A Lesson in Leadership**
By Gen. Laurence S. Kuter, USAF (Ret.)

ABOUT THE COVER



With visor-like nose section raised to reveal its cavernous interior, the C-5 stands ready to airlift the US military's heaviest equipment. Photographed by Art Director Bill Ford at Dover AFB, Del., the C-5 symbolizes MAC's emergence as an essential instrument of American foreign policy. The MAC story starts on p. 46.

Departments

- 10 **Airmail**
12 **Unit Reunions**
14 **In Focus . . .**
18 **Aerospace World**
22 **Index to Advertisers**
24 **Capitol Hill**
63 **Airman's Bookshelf**
74 **The Bulletin Board**
75 **AFA Believes**
76 **Speaking of People**
79 **Senior Staff Changes**
83 **AFA State Contacts**
84 **AFA News**
88 **There I Was**

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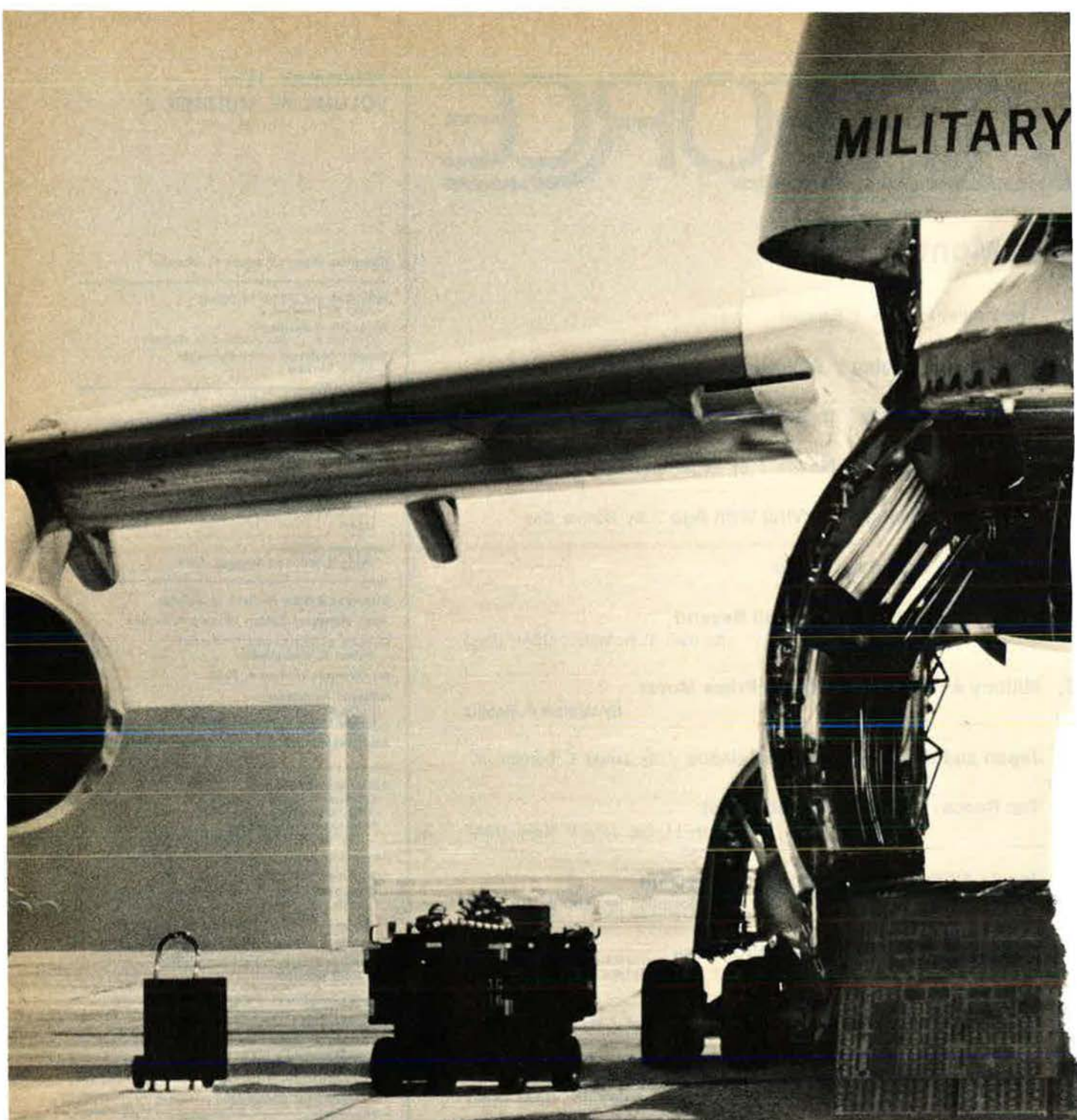
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This is a loadmaster's

The great C-5 Galaxy was born for airlifting—a cargo hold with wings, able to carry anything that can be flown, designed to make cargo handling quick and simple for those who load and unload it.

This giant plane sits close to the ground. It 'kneels' hydraulically on its 28-wheel landing gear, bringing the cargo deck to the cargo instead of vice versa. Then big, fully assembled vehicles can be driven right in and other freight rolled on from truck-bed height. No cranes, lofty docks, or special ground-handling and

lifting equipment are needed.

And the C-5 is the world's only airlifter that loads and unloads through both ends. In actual operation, that wide, 145-foot-long cargo bay—fully loaded—unloads in under 30 minutes. And this huge, ocean-spanning craft can haul more than 200,000 pounds of payload.

Loadmasters know it. If there's one airlifter that stands head and shoulders above all others, it's the low-to-the-ground C-5.



T COMMAND

dream come true.

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The C-5. Built on the only airlifter production line in the U.S., by the people who designed and build the C-130 Hercules and C-141 StarLifter, the people who know more about designing and building airlifters than anyone else. When it comes to airlifters, Lockheed knows how.

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The Power Puzzle

IF ONE is to learn anything from the multitude of events, scheduled and unscheduled, predictable and unpredictable, that crowded into one's consciousness during the last two weeks of 1978 and the first two of 1979, it is the essential fragility of the intricate framework of international relationships that we call the world power structure.

Jiggle one element and the entire structure trembles. Move the position or change the weight of even a small piece of the puzzle, ever so slightly, and equilibrium of the entire arrangement is jeopardized. A major shift among any of the larger, weightier parts can be catastrophic to the stability of the whole.

If this analogy is acceptable, and we think it is basically sound, events at the old year's end and the new year's beginning have set the world to jangling like a mobile designed by a mad artist. As a leading character in Sean O'Casey's marvelous Irish play, *Juno and the Paycock*, put it, "The whole world is in a turrible state of chassis."

That is not the way it was supposed to happen, but then it hardly ever is. One can make a case, based on what one reads and sees, that an elaborate scenario, beginning with the Camp David meetings and winding up with the successful playing of the so-called China card, was intended to wrap up 1978 as a smashingly successful year for the Administration as the ultimate in peace-seeking, peacemaking, and peacekeeping — with enough momentum built up to carry through the balance of this presidential term on a high plane of perceived accomplishment.

The Middle East was to be defuzed, a SALT II agreement would be signed with the Russians to the accompaniment of a well-publicized summit with Mr. Brezhnev. The climax of this foreign-policy hat trick would be the normalization of relations with the People's Republic of China and a highly telegenic summit with Teng Hsiao-ping.

Within a period of a relatively few weeks all three major Administration foreign-policy objectives would be accomplished, in proper order, spaced at decent intervals, and on prime-time television. As President Carter inadvertently described his own assessment to viewers of his China deal announcement — "Massive applause throughout the nation."

Oil would continue to flow to the West from a stable Middle East, peace-threatening tensions with the Soviet Union would presumably be eased by further limitations on strategic arms, and the unfilled needs of nearly a billion mainland Chinese people would create a huge new market for US goods and technology.

Now the making of political capital out of foreign-

policy accomplishments is quite in keeping with tradition that goes back at least as far as Machiavelli. But look at the record, at this writing, shows serious flaws in the scenario as outlined.

An Arab-Israeli settlement is a month past the Carter deadline. OPEC's price meeting resulted in an inflation-fueling 14.5 percent increase, not the modest five percent that the Saudis were going to be helpful about. Meanwhile, Iran has exploded, with the Shah going down the drain along with that oil supply, while the conservative Saudis look on nervously.

All this is to say that the Middle East is more of a tinderbox than ever, with the waters of the Persian Gulf and the Red Sea troubled in a way that inevitably invites Soviet fishing expeditions.

At the same time, meaningful progress toward a SALT II agreement has been impeded both by Middle East developments and by the timing and manner in which the China card was played. A key Iranian side effect has been the dismantling and storage of US intelligence gathering electronic gear, posing serious verification problems with respect to SALT II, problems not likely to be overlooked by critics and opponents of the proposed pact.

With respect to the China situation, the establishment of normal diplomatic, economic, and social relations with the PRC has been inevitable since President Nixon's visit there in 1972. Our concern, rather, is with the concomitant, and almost gratuitous, dumping of the Republic of China on Taiwan, in a secretive bilateral deal without advance consultation with the Congress, with no real guarantees that Taiwan will not be brutally gobbled up as soon as the dust has settled, and the signal then went out to other allies that the word of the US as set forth in mutual defense treaties is less and less to be relied on.

It is one thing to establish diplomatic relations with a large and powerful nation, regardless of whether its interests often will coincide with one's own. It is quite another thing when such recognition includes, as part of the deal, the unceremonious dumping of a friend, an ally, and a trading partner of long years standing.

It is often cited in justification of cold-blooded expediency in foreign relations that a nation has no permanent friends, only permanent interests. It also is said that the enemy of one's enemy is one's friend. There are large elements of truth in both views, but as guides to international conduct they are seriously flawed. One winds up with no friends and undependable allies. This, if our analogy made at the beginning has any validity, is not a good position for very long.

—JOHN F. LOOSBROCK, PUBLISHER AND EDITOR IN CHIEF



"We have a super team. We're motivated. 100% involved. Starting with a paper concept, our team put a high-technology system in the field. There were long hours, setbacks and gallons of black coffee, but we got the job done. Ground warfare electronics took a huge step forward."
(Robert Baker, Project Manager, SOTAS)

EYES OF THE BATTLEFIELD.

SOTAS (Standoff Target Acquisition System), developed for the U.S. Army by our Electronics Division, makes it impossible for the enemy to make a move without being detected. This high-resolution, helicopter-borne radar system, hovering behind the lines, surveys the entire battlefield. Possessing the unique capability to "look deep" to cover the enemy's second echelon, it transmits wide-area closeup

radar pictures to ground display units providing instant detection of any deployment of enemy forces. Operators can select areas, vary the scale, and pinpoint targets in map coordinates. Recorded imagery can then be played back for analysis.

It is the "eye in the sky" from which nothing can hide. For the first time in history, a Division Commander can observe every movement of his own forces and the

enemy's, day or night and in any weather.

As a result of its test successes, the Army has selected SOTAS for full-scale development.

It's the kind of achievement America has come to expect of General Dynamics. If aerospace opportunity interests you, write: **R. H. Widmer, Vice President—Engineering**
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 Pomona, CA 91766

Phalanx, Standard Missile, Stinger,
 Sparrow AIM-7F, DIVADS, Viper

Airmail

The Real Mission

The opening sentence of your AFA Policy Paper, "Force Modernization and R&D," contains a concept I have long advocated. The mission of the Air Force is *not* to "fly and fight and don't you forget it." Flying and fighting are means to an end. The end, the mission, must be, "to deter war or, if need be, to prevail in it." This is what we must not forget.

Maj. Roger L. Gounaud, Jr.
N. Chelmsford, Mass.

Glider Pilot

Congratulations on your "Aerospace World" article on Col. Mike Murphy's award of the Fédération Aéronautique Internationale Gold Medal [November 1978 issue, p. 24]. AFA should know, and so should your readers, that Mike Murphy headed the USAAF World War II glider program and landed the first US glider in the Normandy airborne assault. He was critically injured after landing and was retired from the AAF as a result of these injuries.

We are proud to number Mike among our members.

George F. Brennan
National Representative
Nat'l WW II Glider Pilots Ass'n
Dallas, Tex.

"Title III" Retirement Pay

I strongly recommend that all Reservists now eligible (except for the fact that they have not as yet reached age sixty) for "Title III" retired pay make an *immediate* election for the new Survivor Benefit Plan, naming both spouse and children to receive the maximum benefit effective the day after the Reservist's death.

The new law has an open enrollment period ending September 30, 1979, but it also has a provision that allows revocation of the election up until the same date. Any otherwise eligible Reservists who fail to make such an election and who die between now and September 30, 1979, will have cheated their families out of a completely cost-free annuity equal to fifty-five percent of what their retired pay would

have been, calculated as if they had reached age sixty on the day of their death.

If, by mid-September 1979, the Reservist believes that the ultimate cost of the program is not in line with the potential return, he can always revoke or alter the election before the end of the open period without any cost or future penalty. At least he will have had nine months of free coverage under the program. At most he will have added tens of thousands of dollars to his estate. He should *act now* while he still can.

Lt. Col. Albert K. Stebbins III,
USAF (Ret.)
Fort Mill, S. C.

Name for a Plane

I have been following the recent debates concerning names for our defense aircraft with great interest. The F-16 is a lightweight fighter known for its impressive maneuverability and deadly offensive capability when confronted in close-in air-to-air engagements. It is a multinational fighter that is employed not only in this country but in Europe. Asian countries like Japan are presently considering it for national defense.

The only thing the impressive F-16 fighter lacks is a name. Simulation Technology, Inc. (SIMUTECH) and I would like to suggest one that is comparable to the "catchy" and well-chosen F-15 Eagle. The F-16 *Viper* would be an impressive name. The viper, of course, is a "venomous old-world snake of the family *viperidae*; a common Eurasian species." The Viper, like the Eagle, would prove to be an effective and identifiable name for the F-16; one of the two best fighters in the world today. . . .

John L. Archdeacon
System Analyst
SIMUTECH
Dayton, Ohio

The 333d Was There, Too

I want to thank you for printing my letter in the "Airmail" section of the November '78 issue of AIR FORCE Magazine. Unfortunately, . . . in

printing my letter, one of the squadrons, the 333d, was omitted. My original letter read:

The 318th Fighter Group Association is seeking former members of the 19th FS, 73d FS, 333d FS, 6th NFS, and 548th NFS, all part of the 318th Fighter Group, Seventh Army, Air Force. If you served during World War II in one of the squadrons listed, please contact:

318th Fighter Group Association
c/o Thomas E. Foote
166 Harvard Ave.
Tacoma, Wash. 98466

• *This is an example of a proof reader's nightmare—in the correction of one typesetting error, another is created. Thus, the 333d Fighter Squadron turned up missing. Thanks for calling it to our attention. And now, all you ex-333ders please get in touch with Mr. Foote*—THE EDITORS

RN Officer With the 352d

In July and August of 1944 I had the great privilege to be attached to the 352d Squadron of the 352d Fighter Group of the United States Army Air Forces stationed at Boney, England. The Group was equipped with P-51B and P-51 Mustangs on long-range escort operations over Germany.

I believe I was the only Royal Navy officer ever to be attached to flying duties with the USAAF, and it would give me great pleasure to contact any of the pilots who served in that Group at that time. In particular I would very much like to know whether they have an association with whom I could make contact.

Capt. D. B. Law, RN (Ret.)
Appletree Cottage
East Clandon
Surrey, England

• *The 352d FG held a reunion in Florida last July. The contact listed at that time was Maj. Robert J. Robinson, 1260 N. Harbor Dr., Riviera Beach, Fla. 33404. We have nothing in our files on the 328th, so perhaps former members can drop Captain Law a line.*—THE EDITORS

SEA "Blood Chit"

As many readers may recall, World War II AAF personnel serving in the China-Burma-India Theater and other sections of the war zone were issued cloth "blood chit" patches written in languages native to the

areas in which the flyers were operating, identifying the men as friends and requesting that local personnel assist them.

The Air Force Museum has several of these WW II patches, but we are seeking an example of such a patch as was issued during the SEA conflict. Apparently the distribution of these ID patches was very tightly controlled, but hopefully a reader may have retained one of these artifacts that he would be willing to donate for future display.

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

Museum of Papua

The National Museum of Papua, New Guinea (History), reports in its in-depth study of events of March 10, 1942, that this was the first successful Allied large-scale offensive against the Japanese. The NMPNG has the battle reports of the Navy's *Orktown* and *Lexington*, but only a small part of the history of the 435th Bomb Squadron, 19th Bomb Group. Anyone who can help with the early history of the 435th please contact me undersigned. It is believed that Col. (Capt.) Wilbur J. Beezley was the Squadron historian.

Also, the NMPNG began salvage work on B-17E #41-2446, flown by Capt. Fred C. Eaton, Jr. On February 22, 1942, Captain Eaton was forced to ditch the aircraft in northern New Guinea after a mission to Rabaul. After all these years the plane's condition is reported to be "truly remarkable. . . ."

Dean H. Anholt
Dir., 19th Bombardment Ass'n
1915 E. Arlington Dr.
Springfield, Mo. 65803

Caleb and Bold Orion Projects

I am currently involved in a research project the overall subject of which is air-launched missiles. The first project associated with this is Project Caleb, conducted by the Naval Ordnance Test Station at China Lake, Calif., in the late 1950s. A missile was launched from a Douglas F4D Skyray.

Second is Bold Orion Project that pertains to the air-launched ballistic missile which was first launched from a B-47. In October of 1959, the Bold Orion was launched over the Atlantic and rose to an altitude of 150 miles in pursuit of Explorer VI. Then the project was

moved to Eglin AFB, Fla., where a series of tests was again conducted, this time using the B-58 as the launch craft.

I would very much appreciate hearing from anyone who could assist me in completing my research paper on these projects.

Gerald L. Borrowman
P. O. Box 1032
Weyburn, Saskatchewan
Canada S4H 2L3

Looking for Rescued Airman

Mrs. Jeanette Sevin, a French woman who recently visited the US with her husband, would like to hear from George McKewin, a navigator who was part of a crew shot down over France near the towns of Menncy and Corbeil in June 1944.

Her father, the late Philippe Drouet, hid McKewin and then reunited him with other survivors (one was a pilot, Marvin Long) and assisted in their return to England.

Mrs. Sevin has the impression that McKewin lived in or near St. Paul, Minn. I would be happy to forward her address or any communication from or about McKewin.

E. B. Berlinrut
685 Fifth Ave.
New York, N. Y. 10022

Alumni Book in the Making

If you are a graduate of SIU-C, Det. 205, please send name, address, present rank, and any information about job assignments in the Air Force, education, etc. We are preparing an alumni book, so any information will be helpful.

C/Maj. Jim Mignerey
AFROTC, Det. 205
Southern Illinois University
Carbondale, Ill. 62901

F-86 Sabre in Korea

I would like to hear from anyone who was associated with the F-86 while in Korea (1950 through 1953). The objectives of this research are twofold: To write a series of articles on the Sabre in combat, and to compile a current address list, by squadron, to help old friends get back in touch.

Warren E. Thompson
7201 Stamford Cove
Germantown, Tenn. 38138

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

Downed Bomber in New Guinea

I would appreciate information, including names of the crew, logbook entries, unit attachments, and reason for its loss, on an American bomber shot down/force-landed in New Guinea during World War II. My only information is:

Serial number: Visible on both sides of the tail fin, in numerals approximately twenty centimeters high, and stenciled on in yellow paint, is 286786. This may originally have been 4286786.

Aircraft type: A Douglas A-20 (called "Boston" by the British, "Havoc" by the Americans) solid nose. I think the official designation is A-20G. It had four .50-caliber machine guns mounted in the nose and two .50s in the rear turret.

Location of loss: Near Madang, New Guinea.

Date of loss: Unknown, but probably between 1943 and 1944.

M. J. Claringbould
118 Hawken Drive
St. Lucia 4067
Queensland, Australia

Constellation History

I've been commissioned by *Aero-phile* Magazine to write a history of the Lockheed Constellation for a future special issue. My manuscript will be based on information compiled during the last fourteen years and will cover all commercial and military variants of the aircraft.

I would appreciate hearing from any readers who were associated with Air Force Constellations in any respect—flight and ground crews alike. I'm particularly interested in personal recollections about the plane, its idiosyncracies, extraordinary or unusual flights, etc.

All input will be appreciated and acknowledged.

John T. Wible
5606 Forest Lake Dr.
San Antonio, Tex. 78244

C-47's D-Day Role

I am anxious to obtain information about a World War II Douglas C-47, serial number 41-18487, which I believe was in North Africa (probably with the Twelfth Air Force) in 1943 and in England (probably with the Eighth Air Force) in March 1944. I am especially interested in any information about this aircraft's role on D-Day, June 6, 1944, and its subsequent operations in Europe until the war's end in 1945. Pictures of 41-18487 would be appreciated.

Airmail

The reason for my interest is this: That C-47 still exists. Today it flies for the French Navy, but in 1980 it is to be turned over to the Sainte-Mère Église Museum, in Normandy, for the glory of airmen and paratroopers who took part in the D-Day landings.

All information and any photos I receive will be gratefully preserved at the Museum.

Léon Croulebois
41, Rue Brancion
75015 Paris, France

3d and 38th Bomb Groups

I would like to hear from anyone who had contact with the Douglas A-26 during its service with the 3d or 38th Bomb Groups, FEAFF and USAFE. Any information, whether it be a personal story, photograph, or document, will be gratefully accepted. This material is needed to develop a book on the A-26. Any material loaned will be returned to donor and credited.

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

354th Fighter Group Book

I'm gathering material for a book on the 354th Fighter Group during World War II. If you were a member or have any information and/or pictures of the 354th, please write to

Richard Schrader
3323 Iowa, #341
Lawrence, Kan. 66044

Information About the Phantom

As a research project for the American Aviation Historical Society, I'm studying the history of the F-4A Phantom II aircraft. The F-4A designation was applied in 1962 to the first forty-seven airplanes in the Phantom II series, with US Navy bureau numbers ranging from 142259 to 148275. Although these were Navy aircraft, a number of Air Force people were involved in early development efforts, and in the speed and altitude records set by these Phantoms.

I would appreciate hearing from any readers who can provide information, reminiscences, or photo-

graphs. A particular need is for material on the fifth Phantom II built, airplane number 143390.

Any items lent to me will be well cared for and returned promptly.

Robert F. Dorr
3411 Valewood Dr.
Oakton, Va. 22124

Know Where They Are?

I am interested in getting in touch with any of the following who were my commanders while I served with the 136th Communications Security Squadron during the Korean War: Robert G. Sandstrom, Thomas J. Townley, and Wendell J. Smith.

Lt. Col. Lee W. Collins, Jr.,
USAFR (Ret.)
321 Ella St.
Pittsburgh, Pa. 15224

B-24 "Sho-Sho Baby"

I would like to hear from any crew member of the B-24 named "Sho-Sho Baby," stationed in Italy during WW II. I was the navigator of this crew. The pilot was Bill Shoemaker.

Max Litman
4811 Eagle Way
Palm Springs, Calif. 92262

Can Anyone Be of Help?

I am interested in corresponding with anyone who flew with the 429th Bomb Squadron, 2d Bomb Group, 5th Bomb Wing, Fifteenth Air Force. Of particular interest is information concerning my father, who was shot down over Vienna on February 7, 1945.

Maj. Wayne L. Rickert, Jr.
Hq. USEUCOM
Box 1213
APO New York 09128

I would like to get in touch with anyone who might have known my uncle, Sgt. Earl R. McArthur, who was a crew member of a B-24 in the 67th Bomb Squadron, 44th Bomb Group. He was killed in action over the North Sea July 29, 1944.

Jack Thompson
South Hero, Vt. 05486

43-C Class Ring

I would like to enlist the help of readers in locating the owner of a 1943 pilot training class ring (43-C). The name inside is Don L. Graves. Will be happy to return the ring if the owner will contact me and identify it.

Lt. Col. Francis K. Smith
602 LaSalle Circle
Bellevue, Neb. 68005

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Burma Star Association

CBI vets. Royal Albert Hall, London, England, April 28, 1979. Contact: William P. Houpt, 1662 East Street Road, Glen Mills, Pa. 19342.

1st Strategic Air Depot Ass'n

Planning 1st reunion. Everyone who served with 9th, 40th ADG, and all other units attached to 1st SAD, AAF Station 595, Honington, England, WW II. Contact: Russell J. Zorn, 1561 Meadow Dr., Alde N. Y. 14004.

11th Materiel (Service) Sqdn., WW II

May 5-6, 1979, Williamsburg Motel, Williamsburg, Va. Contact: Joe J. (Jack) Heckler, 76 East Harbor Drive, Teaticket, Mass. 02536.

Flying Cadet Class 39-C

Anyone interested in a 40th reunion 1979? Contact: Col. F. G. Hoffman USAF (Ret.), 228 Chateaugay, Fort Walton Beach, Fla. 32548.

P-47 Thunderbolt Pilots Ass'n

May 11-17, 1979, Sheraton-Univers Hotel, North Hollywood, Los Angeles, Calif. For information and reservation forms, Contact: Wayne S. Dodds, P. O. Box 10428, Glendale, Calif. 91209. Phone: (213) 240-6868.

73d Bomb Wing Association

Superfort Groups 497, 498, 499, 500 plus assigned and attached units on Saipan, WW II, May 3-6, 1979, San Antonio, Tex. Contact: 73d Bomb Wing Association, 105 Circle Dr., Universal City, Tex. 78148, or Reunion Chairman "Chill" McClintick, 215 Thelma Dr., San Antonio, Tex. 78212.

80th Fighter Squadron, 8th FG

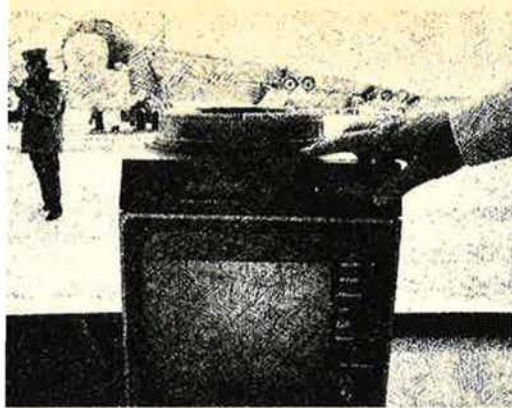
"Headhunters," May 17-20, 1979, El Tropicano Hotel, San Antonio, Tex. Contact: Yale L. Saffro, 7841 Kildare Avenue, Skokie, Ill. 60076. Phone: (312) 673-9040.

304th Fighter Squadron, WW II

May 4-6, 1979, Clearwater, Fla. Contact: Tracy P. Little, 3011 Westover Street, Shreveport, La. 71108. Phone: (318) 635-2426.

452d Bomb Group, 8th AF

Overseas (England), May 24-31, 1979. Contact: Rom Blaylock, P. O. Box 2536, New Bern, N. C. 28560.



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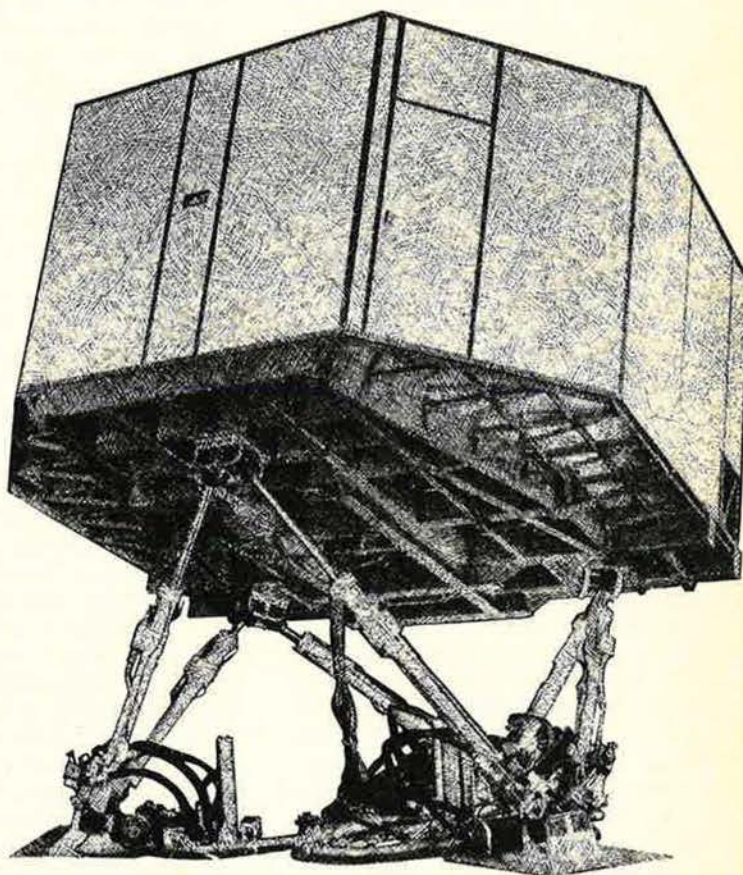
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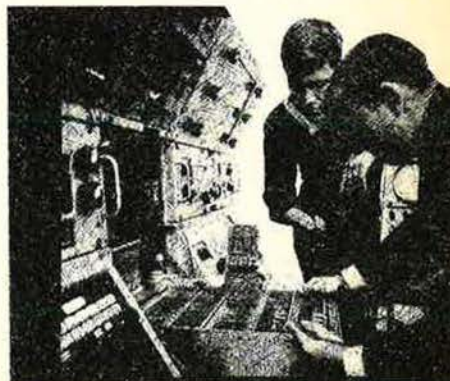
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InFocus...

BY EDGAR ULSAMER, SENIOR EDITOR

Washington, D. C., Jan. 9
MX Still Zigzagging

MX, this nation's often-delayed survivable ICBM, like the legendary "Flying Dutchman," seems to be cast in the role of a phantom condemned to roam forever. After the Defense Department formally notified Congress on October 31, 1978, that development of the missile would precede a decision on how to base it, a surprising about-face took place. Recognizing that the Congress remains firmly opposed to separating missile development and basing—while the White House continues to oppose the multiple protective structures (MPS, formerly MAP) basing mode advocated by the Air Force and supported by DoD—Defense Secretary Harold Brown concluded that a decision on MX program go-ahead should be deferred once more. Hence, the Defense Systems Acquisition Review Council (DSARC) IIA meeting of December 5, 1978, amounted to no more than a ritualistic exercise culminating in the decision to hold a *substantive* DSARC II (full engineering development) by April 1, 1979.

By then, the Defense Department expects to complete comprehensive research on whether or not a new, hybrid basing mode that combines air mobility with multiple aim point basing is a cost-effective alternative to MPS. The latter is opposed by the White House for political, environmental, and verification reasons. Secretary Brown, meanwhile, wrote a personal letter to President Carter, pointing out that two approaches favored by influential White House staffers—namely, "soft" ground-mobile and air-transportable ICBMs—had been eliminated from further consideration because of intrinsic inadequacy.

The new airmobile concept envisions a fleet of some 150 beefed-up and stretched AMST (Advanced Medium STOL) aircraft, each capable of air-launching a single ICBM weighing between 110,000 and 150,000 pounds and carrying between eight and ten warheads. These aircraft, most likely

four-engine types "stretched" by up to thirty feet from the present YC-14/YC-15 configuration, would be based during peacetime in the north-central region of the country, at least 700 miles from the Atlantic. During periods of crisis, the aircraft would disperse, in case of lower threats to military air bases, or under severe threat conditions to predesignated and prestocked general aviation and other short-runway facilities. The aircraft could be rotated among about 4,500 airfields of this type.

Command control and communications (C²) for this fleet would come from a highly survivable medium-frequency ground-wave network. Full alert status, meaning frequent shifting of the fleet among the some 4,500 dispersed bases, could be sustained for more than two days. Final alert would be airborne. If told to launch, the ICBMs—both an eighty-three-inch and a ninety-two-inch diameter design are under consideration—would leave the aircraft through tail-end parachute extraction in the manner tested on a C-5 some time ago.

The ICBM, once on its own, would ignite its rocket engine to perform a "scorpion" launch, so called because the maneuver resembles the shape of a scorpion's tail and travels toward its target with sufficient accuracy to destroy hardened targets. Guidance would be furnished by an "inverted," or ground-based, GPS (global positioning system). Such a system has been developed as a test device of the space-based NAVSTAR GPS and used to measure the accuracy of Trident I SLBMs. NAVSTAR, while technically capable of providing guidance for an air-launched ICBM, is considered too vulnerable to Soviet space weapons. The "inverted" GPS probably would have to be situated in Canada and would require many redundant and camouflaged ground sites.

The proposed airmobile ICBM, according to some forecasts, might have a CEP as low as 500 feet, or better than Minuteman III.

Survivability of the overall weapon system might approach that of MPS-

basing, especially if the AMST carrier could be hardened structurally and electronically to the same degree as the canceled B-1 strategic bomber. Most experts believe that high costs rule out structural hardening. Cost forecasts for such a system are extremely tenuous and range from about ten percent above MPS basing to three times as much.

Two major drawbacks of the proposed airmobile ICBM system—whose AMST aircraft might perform double duty as air-launched cruise missile carriers once a second generation of more survivable and effective ALCMs has come into being—are severe verification problems and uncertain compatibility with SALT. Whether or not such an airmobile system that would put some 4,500 civilian airstrips on the nuclear firing line is politically more acceptable than MPS remains to be seen.

Multiple Protective Structures basing, including trench-based concepts, competes head-on against the airmobile system, with one or the other to be chosen by April 1 for further study and development. A 10 percent refinement of MPS, proposed by USAF planners in order to ameliorate possible verification problems involves using special rail spurs from the ICBM assembly facilities to individual complexes of vertical shelters. Once within the complex of about twenty-five shelters, the missile would be shunted among them by truck-like vehicle. Transit of ICBMs on the rail spurs could be observed unambiguously by the other side satellites.

The central question concerning MX is whether the White House will accept whatever recommendation the Defense Department submits by April 1 and authorize engineering development, or rule that ICBMs—and thus the strategic triad—should be abandoned in favor of beefed-up SLBM and bomber/ALCM forces. Ironically, the categorical US assertion that MPS—then called MAP—was compatible with SALT II, frees the Soviets to shift their ICBMs to MPS basing, even if the US foregoes modernizing its ICBMs.

The Great SALT Sale

At this writing, the signing of SALT II by US and Soviet officials appears to be a question solely of when, not if. White House bullishness is evidenced by the decision to gear up for the next round of arms control, SALT III, even though SALT II is scheduled

to stay in effect until December 31, 1985.

There is slightly less confidence—although the prospects are better than even—of the ratification of SALT II by two-thirds of the Senate, assuming that the Administration doesn't treat the accord as an executive agreement. Under the latter approach—considered legal by most constitutional law scholars even though viewed on Capitol Hill as a reckless twisting of the spirit of the Constitution—a simple majority vote in both houses would make the arms accord binding on the United States.

Either way, strong public support—or the perception of such support—probably will be needed. The mood and coloration of the Congress—especially of the Senate—have changed as a result of the November 1978 elections. This shift, it can be argued, is minor in terms of party labels but clear in regard to a central message: Reading and responding to the immediate concerns of the electorate seemingly reemerge as the number-one function of those whom the voters send to Washington. The result is that the battle for the hearts and minds of the American voter—so far as SALT goes—gains yet greater importance.

Both support for and opposition to the SALT II accord were in full swing before its terms were nailed down completely. Presumably both will reach fever pitch between the signing of this arms-control pact and congressional consideration of it. Public reaction, though, will be anything but feverish. For one thing, SALT lacks the personal, body-blow impact of inflation or similar domestic issues. Also, the arms-limitation accord is abstract and complex enough to foster the belief that it is beyond the comprehension of the general public. This condition probably helps the SALT sellers more than it does the opposing camp. Either way, SALT is far too important a topic to be shrugged off with "leave-it-to-the-experts" insouciance.

The vigor of the Administration's sales campaign has led already to questions about the campaign's propriety, if not its legality. As Rep. Jack Kemp (R-N. Y.) for one has pointed out, the State Department's use of appropriated funds to finance a nationwide series of SALT lectures by government as well as non-government personnel "raises serious questions about whether or not

the Administration has stayed within the bounds of the 1948 statute that prohibits government lobbying with appropriated funds." Representative Kemp plans to launch a formal congressional inquiry "to be certain that the law on this matter is being enforced."

The selling of SALT II, mainly carried out by roving teams of State Department and US Arms Control and Disarmament Agency officials, highlights two pivotal pluses that allegedly result from the accord. First, it is claimed that the momentum of Soviet consumerism—admittedly modest by Western standards—will force the USSR's rulers to allocate more and more of Russia's limited resources to producing consumer goods and thus will halt or even reverse the growth in arms spending.

But there is a catch, according to these government officials: The appealing prospect outlined above could fade rapidly if US hardliners succeed in derailing SALT II.

Therefore, one is told by governmental orators, the calamitous consequences of Congress turning thumbs down on SALT II will be a renaissance of Stalinism in the Soviet Union, resumption of the cold war, and increasing danger of nuclear war. Acceptance of this scenario probably will be in inverse ratio to one's understanding of the dynamics of totalitarian societies in general and of Soviet Russia in particular. This line of reasoning eventually could bring Alexander Solzhenitsyn stomping out of his Vermont retreat once again to lecture the gullible West about Soviet realities.

The second major point made by the ACDA/State Department SALT sellers is that the accord imposes ceilings on strategic nuclear launch vehicles, or SNLVs—meaning ICBMs, SLBMs, and bombers—that force the Soviets to dismantle some of *their* weapons but is *higher* than what the US now has deployed—or plans to deploy—over the life of the treaty.

The latter argument is correct technically. The State Department's projection of Soviet strategic nuclear launch vehicle growth, if unrestrained by SALT II, tops out at about 3,000 by 1985, the final year of a SALT II agreement. While this figure is higher than recent CIA and congressional forecasts, it could be a realistic worst-case assessment.

Under the terms of SALT II, SNLVs are held to a maximum of 2,250. The proponents of SALT II thus are able to point out that the difference between SALT and no SALT is 750 Soviet strategic weapons. Administration spokesmen probably are also correct, technically, in pointing out that the 2,250-SNLV total is higher than the US arsenal would be without SALT.

Ancillary benefits accruing to the US from SALT II, proponents claim, are assured continuation of détente and the prospect that SALT II will be followed by SALT III, IV, and so on until truly stabilizing and enduring arms control is achieved. Further, the Administration's SALT selling drive highlights the fact that the prospective accord safeguards US strategic equality and the option to modernize the nation's strategic forces, if that becomes necessary.

The loose coalition of political forces that opposes SALT II in its present form—there is no significant opposition to the principle of strategic arms control per se—probably will remain under the informal tutelage of the Committee on the Present Danger and its chairman for policy studies, Paul H. Nitze. The Committee, as well as several congressional SALT-watchers, recently provided major clues about some of the potentially troublesome aspects of the accord, which could be considered candidates for specific amendments by the Senate during the ratification process.

A recent informal survey by this column of known SALT II skeptics in the Congress suggests, incidentally, that the "opposition" is more likely to deal with SALT II through amendments rather than by an up-or-down vote. The pro-SALT forces, apparently in anticipation, have selected one of the most able and persuasive Senate strategists, Sen. Gary Hart (D-Colo.), as the floor manager of the ratification drive. This arrangement is unusual since, under normal conditions, it would be assumed that the prospective Chairman of the Foreign Relations Committee, Sen. Frank Church (D-Idaho), would perform this role.

The basic arguments likely to be mustered against SALT II in its present form turn on the contention that the accord does not produce the results sought when initial negotiations got under way more

InFocus...

than six years ago. Fundamental here is that SALT II was to impose a limit of indefinite duration on offensive nuclear forces in the same manner that the SALT II ABM treaty permanently limits ballistic missile defenses.

The distinction between a permanent and a limited-duration treaty obviously is major and permits the application of different philosophical yardsticks. Because of SALT II's time limit and commitment to negotiate a new accord—SALT III—the Administration is able to say that admitted shortcomings of this accord will be corrected in the next one. The critics contend that is tantamount to a commitment to go from bad to worse, that the Soviet Union will not only retain her advantages codified by SALT II but amplify them in SALT III, or not come to terms with the US at that time. The fact that the SALT I Interim Agreement was ballyhooed by the Nixon Administration as not prejudicing SALT II, yet demonstrably did, would seem to support this contention.

Critics also highlight the fact that SALT II limits launchers but not missiles. In 1974, the Ford Administration agreed to this counting method and the Carter Administration translated that concession into binding treaty language.

With two of the new Soviet ICBM types designed for "cold launch"—and all US ICBMs depending on hot launch—a major imbalance could develop. If a missile is cold-launched from its silo—that is, "popped" out of the shelter by compressed gas rather than by its rocket engine—that silo can be used again. Even more important, a cold-launched ICBM is integrated with its own launcher and, therefore, can be erected and fired at any time and from almost any point beginning with the moment it leaves the factory.

Because of this loophole, critics of SALT II argue that the accord fails to limit the Soviet Union's ICBMs—far and away that country's most threatening offensive strategic weapon—and thus flunks the very test that the accord was meant to meet.

Washington Observations

• Even though the Soviet Union is in the midst of negotiating—however haltingly—toward a ban on all nuclear-weapon tests, Moscow saw fit to conduct three provocative underground weapon tests in October and November 1978. Each shot exceeded the Threshold Test Ban Treaty limits. Two of them were arranged for simultaneous detonation, presumably to hinder US detection and assessment. Average yield was at least 170 kilotons. The limit of the Threshold Test Ban that both the US and Soviet Union have agreed to honor, even though the US Senate, as yet, has not ratified the accord, is 150 kilotons. Perhaps the most puzzling aspect of this series of treaty violations is the fact that the US Arms Control and Disarmament Agency—with the support of some factions of the State Department—has succeeded in blocking any formal or informal US complaints on grounds that such an action might jeopardize SALT II.

• The Soviet Union recently began flight tests of new air-launched cruise missiles with a range of at least 1,000 nautical miles. These weapons appear to be optimized for launch at supersonic speed from such aircraft as the Backfire strategic bomber. The new missile will give the Backfire weapon system a tangible range extension that should go a long way toward convincing US skeptics of its intercontinental capability. In a related development, US and allied intelligence observed a new variant of Backfire that appears to be considerably more "long-legged" than previously observed models. US experts noted that the new model is stressed for only about two Gs in aerodynamic loading, compared to four Gs in the older models, and that it exhibited wing changes—all culminating in range increases.

• Defense Secretary Harold Brown, in a December 15, 1978, letter to House Majority Leader James C. Wright, Jr. (D-Tex.), a strong supporter of the FB-111H "stretched" strategic bomber, asserted that current DoD planning "is keyed to the assumption that the manned bomber will be an integral element of our strategic forces for the foreseeable future [and] should include a force of penetrating bombers as well as cruise missiles." Because of the B-52's age—between sixteen and twenty-two years, which exceeds the operational service life of any of its predecessors—"I agree we should

give serious thought to how we might proceed with a possible B-52 replacement. To this end, there is funding in the FY '79 Defense Department Appropriations Act, and additional funds required will be considered for FY '80 and subsequent budgets."

• The sudden and arbitrary US termination of diplomatic relations with Taiwan for the benefit of normalized relations with Peking probably sounded the death knell of Western efforts to halt nuclear weapons proliferation by countries that so far have not sought nuclear arms. Since the Carter Administration's decision to abrogate the defensive alliance with Taiwan erodes further—and dramatically—the confidence of other countries in the value of defense accords with the US, their instinct for self-preservation is likely to impel many of them toward the development and acquisition of nuclear weapons of their own.

• Intermittent efforts at the United Nations—the last one failed in mid-1978—to halt the production of weapons-grade nuclear material on a global basis are slated to be resumed early in 1979 at the behest of the Canadian government. Bans of this type are completely beyond verification and could impede the development of new nuclear weapons.

• SALT II advocates in the Senate reportedly plan to ease ratification by a formal declaration that the US will not extend the accord's three-year protocol that, among others, circumscribes cruise-missile performance.

• Soviet reaction to the normalization of relations between Washington and Peking was less magnanimous than predicted by the US press. First Soviet reaction was intractability at the SALT negotiations, including the resurrection of objections to hardening Minuteman II silos, which the US thought had been resolved. Similarly, there was a conspicuous lack of "give" concerning encrypting data from ballistic missile flights. The US maintains that any encrypting is forbidden, while the Soviets hold that only data pertaining to the number of RVs must be transmitted in the clear. Also unresolved is the related question of decoys that could be used to circumvent all rules on encrypting.

• Pentagon and Air Force interest in a 2,500-kilometer medium-range ballistic missile for use in Europe and other theaters is increasing. Such a weapon would use multiple-aim-point basing.

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Aerospace World News, Views & Comments

By William P. Schlitz, ASSISTANT MANAGING EDITOR

Washington, D. C., Jan. 9

★ NATO defense ministers at a meeting in Brussels early in December agreed to purchase eighteen US-built Airborne Warning and Control System aircraft at a cost of \$1.8 billion.

The Air Force's E-3A Sentry AWACS aircraft entered the inventory just recently and in January for the first time began operational flights over the continental US. They're being operated by TAC's 552d Airborne Warning and Control Wing, Tinker AFB, Okla.

The NATO E-3As will provide surveillance over the European land mass, to guard against low- or high-level attack. Part of the agreement calls for British Nimrod AWACS aircraft to patrol ocean areas around NATO.

The lion's share of the planes' cost—forty-two percent—will be shouldered by the US; West Germany will pay thirty-one percent, and Canada ten percent. The other NATO members will contribute the balance.

The first NATO AWACS, like the Sentry, a Boeing 707 modified with advanced electronic monitoring equipment, is to go operational in 1982 and the rest by 1985. They'll be stationed in West Germany at a standby air base reactivated to receive them, officials said. The Nimrods will be based in the UK.

It is understood that details on operational control, manning, and maintenance of the aircraft have yet to be resolved, although a NATO AWACS program management organization is being activated.

★ USAF in December awarded a \$37-million-plus contract for the development of a new radar system that for the first time will allow B-52s to detect threats from the rear. (See also p. 32.)

The radar, to be produced by Westinghouse Electric Corp.'s Defense and Electronic Systems Center, Baltimore, Md., will warn of the incoming rearward threat to make possible such defensive actions as releasing flares or chaff.

Initially to be built for B-52G/Hs the radar will also be the subject of a follow-on development, integration, and testing program for the F-15 and FB-111.

Over the next five years, about 300 B-52 tail warning systems and thirty sets of spares are to be delivered. Options for the F-15 and FB-111 units, which will have a high degree of commonality with the B-52 systems, were to have been awarded in January.

In another project, the Westinghouse subsidiary has been named prime contractor in a \$200 million contract to provide Morocco with a C³ system for air defense warning and airspace surveillance and management within the country.

Part of the pact calls for training Royal Moroccan Air Force personnel to enable ninety-five percent in-country repair of the nationwide system.

To ensure uninterrupted operations, the system will incorporate highly reliable solid-state components and extensive redundancy.

★ Output of the Minuteman intercontinental ballistic missile, mainstay of the US's land-based ICBM force, ended late in 1978.

Boeing Aerospace Co., which was awarded a Minuteman assembly, test, and installation contract in October 1958, delivered the first production missiles early in 1966 following a massive effort by top defense companies and subcontractors across the nation. Thus, the US had substantial ICBM muscle on alert later in the year when the



—Canadian Forces Photo

A Canadian C-1 Leopard tank is put through its paces during a recent exercise in Ontario. The entire order of 128 German-built Leopards, a number of which are slated for Canadian forces in Europe, is expected to be completed by the summer of 1979.



A new Angle Rate Bombing System (ARBS), whose "eye" can be seen mounted in the nose of this A-4M, is expected to sharply improve the day and night accuracy of these Marine Corps attack aircraft. The plane participated in the evaluation of the weapon aiming and delivery system developed by Hughes Aircraft Co.

Cuban missile crisis came to a head.

Since 1967, 1,000 Minuteman CBMs have been standing alert in their underground silos dispersed over hundreds of miles at Air Force bases from Montana to Missouri.

Minuteman, nuclear-tipped and with a range of more than 6,000 miles (10,000 km), was designed from the outset for improvements dictated by new technology and changing strategic conditions. This led, through the years, to the replacement of the initial Minuteman I with the more capable Minuteman II and III and the hardening of support facilities to better withstand a nuclear attack. Further modification is expected to continue into 1980 at Malmstrom AFB, Mont., and Whiteman AFB, Mo.

★ The Defense Civil Preparedness Agency (DCPA) has issued requests for proposals on an Emergency Satellite Communications System (ESCS) designed to quickly fill the gap when normal communications are knocked out in a major disaster.

Visualized as part of ESCS are transportable ground stations with voice, data, and even TV capability that could be flown or trucked into an afflicted area and be operational within two hours.

The stations would beam off an orbiting satellite for direct communications within CONUS, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. A Network Operations Control Center would be established in the Washington, D. C., area.

The system also calls for sixty-

two fixed ground stations for the capitals of each state, Puerto Rico, the Virgin Islands, and ten regional federal offices.

The transportable terminals would be strategically stationed—one in each state and in Puerto Rico and the Virgin Islands.

Defense officials said that since such communications technology is already well in hand, the ESCS could be set up at modest cost, perhaps as little as \$4 million in each of the first five years. It is expected to go into initial service sometime in 1980–81 under the control of the Federal Emergency Management Agency, which is to become operational in 1979 under President Carter's Reorganization Plan 3. FEMA will link DCPA and the other disaster agencies within the Commerce Department, HUD, and GSA.

"The system would provide a unified emergency communications capability to meet local, state, and na-

tional requirements for peacetime emergencies and civil-defense actions," officials said.

★ Following two years of integration trials, a contract valued at \$120 million was let to prime contractor British Aerospace Dynamics Group for the production of Sky Flash medium-range air-to-air missiles for the Swedish Air Force.

Sky Flash, called the most advanced missile of its type in production, is a semiactive radar-homing weapon equipped with a monopulse seeker that can locate and destroy low-level targets hidden to other missiles by ground clutter. It will arm Sweden's all-weather Viggen fighter, as well as Britain's F-4s and Tornados. It is also being considered by other air forces, including USAF. In early December, it was successfully launched from a prototype F-16 fighter in a test firing at Point Mugu, Calif.

★ The first of a series of tests to determine the extent that infrared sensors can detect and track incoming ICBM warheads was conducted successfully over the South Pacific in early December.

In the test, an infrared telescope was borne by rocket from Kwajalein atoll to the outer edge of the atmosphere. There, it located a payload carried by a Minuteman III ICBM that had been launched from Vandenberg AFB, Calif., tracked its trajectory, and recorded about five minutes of scientific data. The telescope then parachuted into the ocean for recovery.

The test series, sponsored by the US Army Ballistic Missile Defense Advanced Technology Center, Huntsville, Ala., is being conducted by Boeing Aerospace Co.'s Army Systems Division, which is respon-

AIR FORCE Magazine: For the Record

For the past thirty months, Rep. John B. Breckinridge (D-Ky.) has been entering in the *Congressional Record* articles from periodicals and newspapers, and selections from books and government documents dealing with the balance of power between the US and the USSR, and between NATO and the Warsaw Pact. Among the twenty magazines from which articles have been reprinted are such prestigious publications as *Foreign Affairs*, *Current History*, *Commentary*, *Strategic Review*, and *Orbis*, along with several from the service-related journals. Of the forty-six magazine articles chosen by Mr. Breckinridge, seven were from AIR FORCE Magazine, exceeded only by *Strategic Review*, from which eight articles were selected. Among the service-related publications, *Naval Institute Proceedings*, with four articles, stood next to AIR FORCE Magazine.

Aerospace World

sible for building and assembling the sensor-carrying vehicles, undertaking the test flights, and analyzing data derived from them.

★ It appears that the US's orbiting space station Skylab is doomed, its fate sealed by a combination of factors.

NASA's efforts this past spring and summer to extend Skylab's orbital lifespan by using onboard systems to reduce drag did not achieve the hoped-for results, officials said. While internal power and positioning gas jets have become increasingly effective, recent sunspot activity has increased the density of the upper atmosphere, thus hastening the decay of the space station's orbit.

Scientists had hoped that during an early Space Shuttle mission a propulsion device could be mounted on Skylab to boost it into a higher orbit. But delays in the Shuttle timetable pretty much rule out that solution.

NASA now projects that Skylab will enter the earth's atmosphere between mid-1979 and mid-1980, and on breaking up is expected to scatter some twenty-five tons of debris in a belt 3,000 miles long by fifty to 100 miles wide. Since about seventy-five percent of Skylab's flight path is over water, the chances of injury or property damage is considered slim, NASA officials said.

★ It was the end of an era for the British Navy in December with the decommissioning of the UK's last modern aircraft carrier, the *Ark Royal*.

The British, who pioneered the flight of aircraft from ships' decks and, later, the canted deck and steam catapult, are now without full-fledged airpower at sea. The Brits, instead, are pinning their hopes on a new concept: Integrated Maritime Airpower, in the form of a new class of ships exemplified by the 20,000-ton *Invincible*. (As a deterrent, Britain has four SLBM subs.)

Invincible is a cruiser-size ship

with a flight deck just 550 feet (167 m) long. Rather than conventional jet aircraft, it will carry helicopters for antisubmarine warfare and/or up to eight V/STOL Harriers. The ship is equipped with a deck-mounted "ski jump" (see *December '78 issue, p. 35*) for improved Harrier launch capability.

A second "through-deck" cruiser, the *Illustrious*, has already been launched and a third, a new *Ark Royal*, has been ordered. A fourth is expected to be ordered.

While the Royal Navy has shrunk from the heady days when Britannia

ruled the waves, the decline in major warships has been reversed. Britain now has seventeen warship under construction or ordered, including eleven missile destroyers and frigates, all to be armed with the most up-to-date missile systems.

But before this formidable force is seaworthy, British naval strength will be stretched perilously thin indeed.

★ Encouraging news on the aerospace employment scene: By December 1979, jobs in the industry

First Academy Graduate to Earn a Star

Brig. Gen. Harold W. Todd, Class of 1959, is the first Air Force Academy graduate to achieve general officer rank. At recent promotion ceremonies at the Pentagon, General Todd's stars were pinned on by the Chairman of the Joint Chiefs of Staff, Gen. David C. Jones. General Todd's current post is Executive Assistant to the JCS Chairman.

Graduating from Gonzaga High School in Washington, D. C., in June 1955, General Todd entered the first class of the Air Force Academy at its temporary site at Lowry AFB, Colo. During his senior year at the new Academy, he served as Flight Commander and on the Group Staff. Named outstanding cadet in foreign languages, General Todd graduated thirty-fourth in a class of 207. He also pinned on navigator wings.

After assignments at SAC's Barksdale AFB, La., as an air operations staff officer, special projects officer, and aide to the Commander, General Todd was assigned in March 1971 to Hq., USAF. There, he served on the staff of the Commander in Chief and Commander, Fourth Allied Tactical Air Force. During this tour, General Todd authored a NATO study that led to the formation of Allied Air Forces, Central Europe.

Entering the National War College in 1974, General Todd then served as Special Assistant to the Air Force Chief of Staff, and in other staff posts, assuming his present position in July 1978.

General Todd earned his pilot's wings in 1960 and later flew 156 B-52 combat missions in Southeast Asia.



Joint Chiefs Chairman Gen. David C. Jones congratulates Brig. Gen. Harold W. Todd, the first Air Force Academy graduate to earn stars.

are expected to top a million for the first time in eight years.

According to the Aerospace Industries Association, employment will hit 1,024,000 by the end of 1979, compared to the industry high-water mark in 1968 when the monthly average stood at 1,500,000.

The surge predicted for 1979 is predicated on an anticipated aircraft production upswing, especially commercial transports. The bullish forecast is based on the improving financial positions of US scheduled airlines, increased use of aircraft due to promotional fares, new route awards, and the addition of equipment required by federal standards to meet lower engine noise levels. Helicopters and general aviation aircraft built in the US also anticipate a strong market.

Military aircraft production is expected to continue its decline by another 0.2 percent between June 1978 and December 1979.

Employment in the missile and space category is expected to climb from 1977's 191,000 to 205,000 in 1979, mainly because of the accelerating pace of the Space Shuttle program.

★ A three-year experiment to prove the feasibility of harnessing space-age technology to monitor global wheat production has been concluded.

Results of the project—Large Area Crop Inventory Experiment (LACIE)—were presented recently at a symposium at the Johnson Space Center, Houston, Tex., attended by more than 700 people from twenty-two countries. They represented a broad spectrum from private companies to universities.

LACIE was undertaken to determine whether Landsat satellite data and that derived from US environmental satellites could be correlated with surface weather observations to predict production of the world's most important grain crop.

The result: in effect, yes. For example, LACIE predicted a 1977 Soviet wheat crop of 91,400,000 metric tons. The official tally: 92,000,000. (Forecasting production in areas where narrow wheat belts exist proved more of a problem, but future techniques and improved satellite resolution should upgrade accuracy, officials said.)

Involved in LACIE were NASA, the Department of Agriculture, the National Oceanic and Atmospheric

Administration, and universities and industry.

★ Plans are under way to build a facility to house the International Women's Air and Space Museum at the International Airport at Dayton, Ohio.

The museum, incorporated in 1976, is dedicated to recognizing "all women who have contributed a worthy aeronautical activity, feat, deed, special record, or any other significant achievement toward air or space advancement."

Besides an exhibits area, the museum building is to house a theater and library.

Recently elected the museum's first president is Doris C. Scott, Dayton industrial executive and pilot. She and the other museum officials are volunteers who pay their own expenses.

Planned for the museum are an early Amelia Earhart aircraft and a tribute to Katharine Wright, who supported her brothers in their effort to achieve powered flight, and who played a role "in helping to pave the way for other women in the field of aviation." Museums abroad are also working on material for exhibits at Dayton.

Parties wishing to contribute money or artifacts can write in care of the museum, P. O. Box 1387, Dayton, Ohio 45401. Telephone: (513) 223-8223.

★ **NEWS NOTES**—TAC has developed a "lizard" paint scheme of green, brown, and charcoal as **new camouflage colors** for the **A-10**



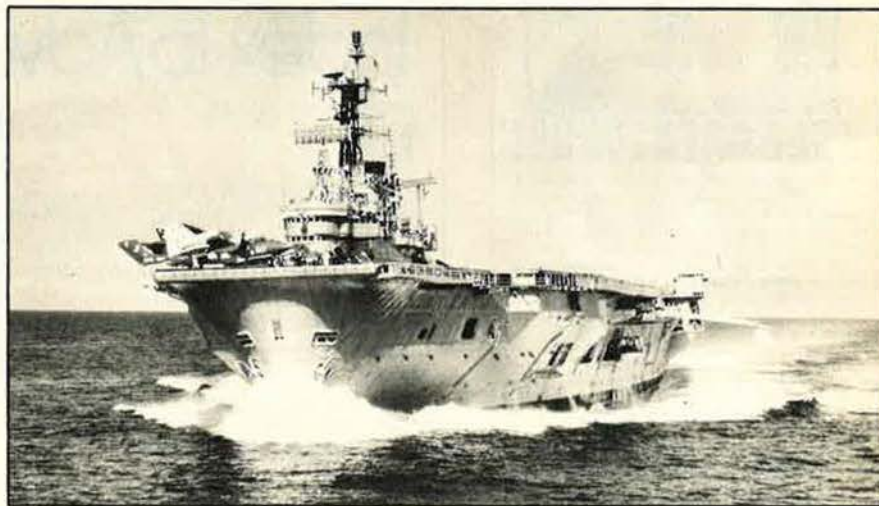
—Canadian Forces Photo

Supreme Allied Commander in Europe, Gen. Alexander M. Haig, Jr., center, is briefed aboard HMCS Iroquois. General Haig has announced that he'll retire in June.

Thunderbolt II to help it blend into a forest background. A-10s began deploying to the 81st TFW, RAF Bentwaters-Woodbridge, UK, in January.

Also in the UK, **SAC's 11th Strategic Group** has been activated and assigned to RAF Fairford, following British permission to **allow additional KC-135** tankers to be stationed in the UK. About 1,100 USAF personnel will be permanently assigned.

McDonnell Douglas is evaluating a **version of the Phantom** dubbed the **F-4T designed solely for high-performance air defense and interception** that would feature much-improved air-to-air performance and no strike or bombing capability. Arming the F-4T would be a 20-mm



With Britain's last modern carrier, Ark Royal, decommissioned, the slack will be taken up with a new concept: **Integrated Maritime Airpower**. See item on p. 20.

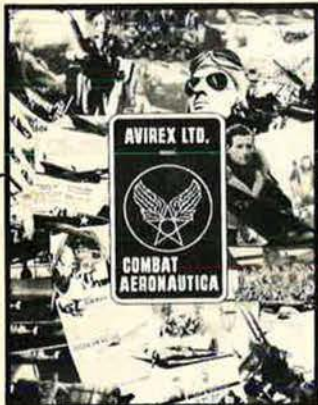
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Aerospace World



USAF's highest-ranking civilian woman employee retired on January 5. Mrs. Lucille S. Schlosser, a GS-16 with thirty years' service, stepped down as Deputy for Procurement and Production, AFALD, Wright-Patterson AFB, Ohio.

cannon and six radar-guided AIM Sparrows or four Sparrows and four heat-seeking Sidewinders. In twenty years of F-4 production, fourteen versions totaling more than 5,000 aircraft have been delivered.

USMC's newest light attack aircraft, the AV-8B V/STOL, made its first flight at the McDonnell Douglas

Corp.'s facility at St. Louis, Mo., in November. The AV-8B is expected to double the payload and flight radius of its predecessor, the UK's AV-8A Harrier. The first and second prototypes of the "B" are to undergo a flight test program at the Naval Air Test Center, NAS Patuxent, Md. Full-scale development was to begin in January and full-scale production is expected to start in 1983. USMC plans to procure 350 AV-8Bs.

Late in 1978, US Army took delivery of the first production Sikorsky UH-60A Black Hawk utility transport helicopter to replace the UH-1 Huey. Army intends to procure 1,100 Black Hawks with production through the mid-1980s at an expenditure in excess of \$2.5 billion.

In December the Air Force grounded a major segment of its C-130 fleet following the crash of a Hercules at Fort Campbell, Ky., in which five crew members were killed. A fault in the engine-control system was suspected. Also, following the crash of a fourth F-15 Eagle in Europe since April, and while stipulating that "there is no trend indicating anything grossly wrong," USAF is investigating the accidents in which one pilot was killed.

In December, and for the first time since the draft ended in 1973, the Air Force fell short—by about 800—of its 5,468 recruitment goal.

Following the successful penetration of the Venusian atmosphere by five US probes in early December, two Soviet vehicles—Venus-11 and -12—landed on the planet's surface several days later and transmitted data for more than one hour.

Index to Advertisers

Aerospace Historian	22
Avirex Ltd.	22
Boeing Co.	2 and 3
General Dynamics Corp.	9
General Electric, Aircraft Engine Group	Cover II
Jesse Jones Box Corp.	87
Jet Electronics and Technology, Inc.	78
Lockheed Corp., The	6 and 7
McDonnell Douglas Corp.	44 and 45
Northrop Corp.	4
Raytheon Co.	Cover III
Rockwell International, Collins Telecommunications Products	73
Singer Co., Kearfott Products Div.	13
TRW Systems Group	1
United Technologies Corp., Norden Systems	17
United Technologies Corp., Pratt & Whitney Aircraft Div.	Cover IV
Westinghouse Electric Corp., Aerospace Div.	25

The ups in NATO seem to have led the downs in 1978. But there are some serious problems that concern alliance commanders as . . .

NATO TURNS THIRTY

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

IN AN increasingly uncertain world, there is something reassuring about Gen. Alexander Haig, a man who takes an international, as opposed to an American, perspective as SACEUR. A visit with him at SHAPE, near the dreary old Belgian town of Mons, makes clear the reason he has become such a celebrated figure in Europe. His views on matters affecting the alliance are uncluttered by any national hang-ups. [On January 3, Haig announced plans to retire in June.—THE EDITORS]

There is the matter of mutual and balanced force reductions, for instance, a negotiation that has created a pleasant, if obscure, career in Vienna for a large number of people who go by the mysterious title of arms controllers. Like most other trades, that of arms control is sometimes goal-oriented. In other words, any agreement, no matter how bad, is, at some point, better than no agreement. Our men in Vienna have evidently reached such a point in their long and tiresome discussions.

The proposal now being floated will have our side trading off tactical nuclear warheads for fewer Soviet tanks and the rearward displacement of a Soviet corps. In one form or another this proposition has been around for a long time, and it is no better deal now than it ever was. It really solves nothing in the way of easing the gross imbalance between the Warsaw Pact and NATO in the Central Region, an imbalance that has been growing at the rate of 12,000 Warsaw Pact troops a year ever since these force reduction talks began.

At any rate, General Haig is decidedly unenthusiastic about this latest proposal, and never mind the fact that it seems to have been essentially a US initiative. On anything affecting NATO, or at least that part of NATO in his area of responsibility, he is clearly a NATO, not a US, general. It is this frankness,

coupled with a rare talent for clear expression, that has made him such a valued asset to the alliance. He is, perhaps, the most influential SACEUR since the Air Force's Gen. Lauris Norstad.

And so, to that extent, things are looking up in this thirtieth anniversary year of NATO. There are a few other positive signs of resurgence, with the adoption, finally, of the E-3A AWACS being the most significant. The presence of this airborne warning and control aircraft should act as a powerful force multiplier to the outnumbered NATO air units in Central Europe.

There are other good omens, too, like the agreement of the NATO Defense Ministers to spend an additional three percent above inflation on defense improvements. This is one President Carter had better not back down on no matter what the pressures, if I understood General Haig correctly. An American default on this commitment, which came, after all, at US urging, would probably be followed by a general default and a severe blow to the credibility of the alliance.

Then there are some positive things going on in Scandinavia, an area that used to be viewed with pessimism and, in the case of Denmark, downright gloom. There was a time when the Danes seemed to have thrown in the towel, but no longer. They are reequipping their air force with the F-16, buying some fine new frigates for their navy, and generally behaving once again like a nation willing to share the burden of European defense.

It is in the south where things are going badly, General Haig's efforts notwithstanding. Turkey, if not gone as a Western ally, is perilously close to it, thanks to the effects of our arms embargo, which went on too many years to be easily forgotten. Our ham-handed efforts to bring about a Cyprus settlement will have a lasting effect on what is still called, somewhat wistfully, NATO's Southern Flank. The Turkish economy is

in desperate trouble, and that, coupled with the damage done to the Turkish military by our embargo, has created an atmosphere ripe for exploitation by xenophobes within Turkey and the Soviets next door.

The other legacy from our earnest, if thoroughly inept, attempts to settle Cyprus is the continued absence of Greece from the forces committed to General Haig's Allied Command, Europe. There are some signs that Greece may come back in the near future, and we can all hope it may happen while Prime Minister Karamanlis is still in the chair. Andreas Papandreu, the leader of the far left, if not openly a part of the Communist opposition, is a dedicated enemy of NATO. If Greece is still out when and if he succeeds the aging Karamanlis, her return to the fold might be hard to manage.

There are, of course, other problems in the Mediterranean. Not the least of these is the unraveling situation in Iran and the danger it poses to NATO Europe and all the rest of us. Only a near dormant, almost moribund, CENTO remains as a show of any sort of allied interest in that part of the world, and Pakistan seems to be moving toward an accommodation with the USSR. NATO's southern boundary may be the Tropic of Cancer, but not where the Persian Gulf is concerned. That vital area remains, for NATO, politically out of bounds.

And so, as the Atlantic alliance celebrates its thirtieth year in April, it can look back, as any of us can who have grown a little old, on some ups and downs. The ups seem to have led in 1978, what with the positive decisions we have noted. Now, as 1979 marks what was once such an improbable event as a thirtieth anniversary, there is, as has always been the case, a little optimism mixed with a little pessimism for the year ahead. ■

Capitol Hill

By the Air Force Association Staff

Washington, D. C., Jan. 4
Coming Up

In addition to the Defense Procurement Authorization and Appropriations Bills, the Ninety-sixth Congress is expected to take up several proposals that could affect military personnel. Among them:

- A reassessment of the All-Volunteer Force. In the past few months, members of Congress and senior Defense officials have voiced concern over the problems being encountered by the military services in meeting recruitment quotas, and the impact this could have in a national emergency. One proposal introduced by the Joint Chiefs of Staff would reinstitute a system of registration and classification of persons eligible for military service in order to provide rapid mobilization should the need arise. Rep. Melvin Price, Chairman of the influential House Armed Services Committee, is also concerned over the present status of the All-Volunteer Force and has promised hearings on this matter sometime this year.

- Changes in the military retirement system. As a result of recommendations made by the President's Commission on Military Personnel, Congress is expected to consider proposals to effect changes in the present military retirement pay system. While no final recommendations have been agreed to, the debate already under way will be long and complicated.

- An increase in CHAMPUS payments from eighty to ninety percent.

- Revision of the rules for recalculating military retired pay of retirees who were recalled to active duty during the Vietnam conflict.

- Authorization of retired pay for Army and Air Force enlisted Reservists after twenty years' active federal military service. Present law allows such pay for Reserve officers—in all military services and for enlisted personnel of the Navy and Marine Corps Reserves.

- GAO recommendations that some 50,000 military billets be converted to civilian positions. Since

1964, some 100,000 military slots have been converted to civilian positions.

- Reimbursement for moving mobile homes within the CONUS during PCS.

- Passage of the Defense Officer Personnel Management Act (DOPMA). This proposal represents a major change to and modernization of the officer personnel laws, which have remained largely unchanged since the Officer Personnel Act of 1947. Enactment of this legislation would provide new grade limitations and other needed officer management system changes.

Weapon Systems

While these issues are not as clear cut as those affecting personnel, congressional attention is likely to focus on such areas as:

- Vulnerability of our land-based ICBM force, including continued debate over the MX missile and its basing mode, as well as development of a largely common missile to fill the Navy's Trident II and Air Force's MX requirements.

- Cruise missile survivability.

- Development of a cruise missile carrier aircraft.

- Maintaining the penetration capability of the B-52 while continuing to study development of a new manned penetrating bomber.

- Modernizing Theater Nuclear Forces, including the Army's Pershing II and studies aimed at a medium-range ballistic missile (MRBM) for the Air Force.

FY '79 Supplemental Budget Request

At this writing there is much confusion about how much money will be requested in the FY '79 Supplemental Budget Request. The request could total as much as \$2.5 billion. The Air Force should get a sizable part of any supplemental appropriations with emphasis on funds for the strategic area (MX missile and basing mode), readiness improvements, and near-term strategic mobility enhancements.

The China Decision

As part of normalizing relations between the United States and the People's Republic of China, the US has agreed to withdraw recognition of the Republic of China (Taiwan) terminate its mutual defense treaty with Taiwan, and withdraw all remaining US troops on Taiwan. Congressional reaction to the news was mixed, ranging from praise for the Presidential initiative to complaints that Congress had not been consulted about the decision. Sen. Barry Goldwater (R-Ariz.) threatened legal action to block cancellation of the Taiwan defense treaty.

The China debate will involve key committees, with the Senate Foreign Relations Committee most deeply involved. Necessary legislation will pertain to: Senate confirmation of a US ambassador to China, authorization of funds for diplomatic offices there, continued arms sales to Taiwan, negotiations affecting trade and cultural programs relating to normalizing relations, and possible consideration of favored-nation status for China.

Congressional Staff

An important factor in the functioning of the Ninety-sixth Congress is the influential role played by congressional staff members, and changes within the committee staffs resulting from the 1978 elections. The influx of some seventy-eight new House members and twenty new Senators coupled with changes in assignments to key committees—Senate Armed Services Committee, Research and Development Subcommittee, House Appropriations Committee, and the House Appropriations Subcommittee on Defense, as well as possible restructuring of other committees—is sure to trigger numerous congressional staff changes. While the final outcome of the reshuffling taking place on the Hill is not yet known, one thing is certain: As committee memberships change and probably expand, you can expect to see growth in committee staffs as well as in personal staffs.

Since 1944, the congressional staff has increased enormously. In 1944 there were 2,289 House staff members, while as of December 1978 the number stood at 8,487, an increase of 6,198. On the Senate side, the staff has grown from 706 to 4,785 in the same period.

A leveling off is not in sight. ■



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From what it takes to assure the viability of ICBMs into the next century and the requirement of improving USAF's theater nuclear forces to how the Air Force copes with the growing strength of the Warsaw Pact, AFA's National Symposium "Toward a New World Strategy"—covered here in a second, final installment—provided a thorough analysis of . . .

NEW CRITICAL DEFENSE NEEDS

BY EDGAR ULSAMER, SENIOR EDITOR
Photos By 2d Lt. Daniel T. Woolley

TO MAINTAIN parity and retain the unique characteristics of the intercontinental ballistic missile, we must develop and deploy a new, more capable ICBM and deploy it in a survivable basing mode. The best alternative we have found to date to accomplish this task appears to be the mobile MX in some form of multiple launch point [MAP] basing." This is how Gen. Lew Allen, Jr., USAF's Chief of Staff, sketched the MX requirement at AFA's National Symposium October 26-27, 1978, in Los Angeles, Calif.

Relating MX to the broad imperative of stable deterrence—the foremost US military objective—General Allen reasoned that this nation needs strategic forces "that are readily seen by all to be at least equal in performance to those of the Soviet Union. Moreover, any Soviet advantage in strategic force characteristics must be offset by an advantage of our own so that the Soviet strategic arsenal cannot serve as a usable instrument for political coercion or diplomatic leverage. [Also] we must not overlook the part perceptions play. If the world gets the idea that the Soviets are ahead in the strategic field, it could affect adversely the actions of our friends, allies, and the Soviets themselves."

The root cause behind the MX requirement and behind the need to modernize other elements of the strategic forces is the "massive and sustained buildup" of the Soviet Union's strategic offensive and defensive forces, according to USAF's Chief of Staff. The probable motives for this "quantitative expansion and qualitative upgrade," he suggested, include these factors:

"Soviet determination to catch [up with] the US in areas where they had lagged, such as ICBM accuracy and MIRV technology;

"Traditional Russian insecurity and the resulting importance of military power;

"The considerable clout of the military and defense institutions within the Soviet system, as evidenced by the top priority accorded to military production in the Soviet economy; and

"The Kremlin leadership's apparent desire to attain a margin of nuclear superiority in support of the Soviet military's strategic warfare doctrine and to shift the so-called 'correlation of forces' in their favor."

While acknowledging that the MX program's proposed MAP (as of late also referred to as Multiple Protective Structures) basing is seen by some as straining verification capabilities relating to SALT, General Allen pointed out that USAF is "working hard to develop an adequately verifiable system utilizing cooperative measures that build upon the framework of existing SALT verification procedures. . . . Nevertheless, given SALT verification concerns, we are continuing to examine other alternative basing modes—including airmobile options—although these too have their own problems."

General Allen rejected as groundless the concern that MAP would prove to be a Pandora's box by opening the doors to a Soviet MAP; he welcomed such a development: "If both sides deploy mobile systems it would be stabilizing," especially if coupled to restraints on the number of RVs (reentry vehicles) the superpowers are permitted to deploy on individual missiles. Such restraints, he suggested, could involve fractionation (limiting the number of RVs of a given missile type), missile production ceilings, inventory control, and other means. Concern about a US MAP system leading to Soviet emulation, he said, rests on the belief that RV limitations can't be enforced. But General Allen countered this contention, saying not only "are we working on the technical aspects [of making constraints of this type] viable," but the Soviets are not likely to seek such a basing arrangement in the first place.

"MAP is a way for obtaining survivability when you wish [specifically] not to have first-strike capability," yet are faced with an adversary who has deployed a large number of RVs. Present asymmetries impelling this nation toward MAP-based ICBMs, he added, developed because of the US decision to limit severely its counterforce weapons and as a result of its firm policy not to use its strategic forces preemptively. The USSR clearly does not share these self-imposed constraints. If—as is the plan—the US limits the number of new MAP-based ICBMs, and thereby continues to signal the Soviet Union that this country still eschews a first-strike posture, "the Soviets certainly wouldn't be motivated to go for MAP themselves," General Allen suggested.

The Joint Chiefs, he told the AFA Symposium, "are agreed on the need to maintain a viable triad," and thus on the importance of preventing the Soviets from checkmating the US ICBM force.

In order to maintain parity with the Soviets, other US strategic force elements also will require modernization over the next several years, even when allowance is made for the numerical ceilings likely to be imposed by SALT II: "We must proceed with the planned addition of the air-launched cruise missile, further upgrade our bomber force, and, eventually, production of a new pene-

trating bomber to assure the survivability and strike capability of our air-breathing leg. Similarly, the 'eyes, ears, and central nervous system' of our strategic force posture—our space and ground-based sensors and communications system—must be upgraded and made more survivable to maintain the credibility of our various response options. Finally, to retain our air sovereignty and surveillance capability and to convince any potential attacker that an assault on the US will not go unchallenged, we must ensure that our air defense forces are adequate to the Soviet threat," General Allen asserted.

Expressing skepticism about the value of large-scale civil-defense programs, USAF's Chief of Staff nevertheless suggested that the massive Soviet CD effort is symptomatic of the Kremlin's determination to maintain nuclear war-fighting—rather than purely deterrent—capabilities. This represents "a major and perturbing indication of Soviet philosophy." Because they do not wish to be confined to an assured destruction capability, the Soviets seek all the capabilities, strengths, and "superiorities" required for winning nuclear war, General Allen said. So far as the actual Soviet civil defense capability is concerned, he expressed doubts that "it will be very effective. . . . It is not the best way of spending resources and people's time. . . . I don't think that we necessarily should respond [as though civil defense were] a single threat" and in kind. The intensive Soviet program does complicate for the US the targeting task by placing "higher demands on our hard-target kill capability," according to General Allen.

While it is unlikely that the Soviets "are under great misconception about the vast damage that would [be suffered] by the Soviet Union in case of nuclear war," the extensive Russian civil defense program makes clear that theirs is a "nation whose thoughts and actions across a very wide spectrum" are orchestrated toward one central objective, the ability to translate nuclear power into usable force, according to General Allen.

THE THEATER BALANCE

But the strategic arena is not the only area of critical concern to USAF, the Chief of Staff stressed: "Soviet tactical and strategic airpower available for attacks on Western Europe is expanding and improving. New aircraft such as the Flogger and Fencer are entering the tactical air armies facing Europe at a rate of over 1,000 aircraft per year in a modernization program that is already eighty percent complete. They represent a far greater challenge to our air-superiority capability than NATO forces have faced in the past. They also have an improved range/payload capability and weapons which give them a significantly improved interdiction role—and a disturbing new airfield attack capability," he told the AFA Symposium.

Further, this buildup in conventional airpower is complemented by increased deployments of "advanced nuclear delivery systems such as the Backfire bomber and the mobile, MIRVed SS-20 IRBM. These developments are particularly disturbing to our European allies since they represent a new level of technology with a degree of precision, flexibility, and military utility not matched by systems in the current NATO arsenal. This obvious Soviet thrust toward escalation dominance in the theater is

viewed by our allies as all the more threatening because of the emergence of US-Soviet parity in the strategic arena," General Allen said.

It may be possible through diplomatic steps—"perhaps through SALT III or some other negotiating forum"—to slow down the Soviet threat to NATO, but "we stand ready to maintain the balance in NATO through force improvements should that course prove necessary. We are aggressively pursuing development programs in cruise missiles, MRBMs, and dual-capable aircraft that could substantially upgrade our nuclear systems in the early 1980s," General Allen said. Augmenting these developments are steps to enhance pertinent command-and-control capabilities to provide "the survivability, precision, and flexibility required to offset fully Soviet deployment of the SS-20s and Backfire," he added.

In more general terms, USAF's Chief of Staff pointed out that fundamental technological trends are depriving the US of its long-standing advantage over the Soviet Union which was "that the qualitative superiority of our men and planes more than made up for the quantitative superiority of the Pact force." As of late, "both our analyses and our operational tests have shown that, as our margin of technological superiority erodes, there is a point of diminishing returns beyond which it is no longer sensible to try to overcome increased numbers with increased sophistication. This means that in meeting any expansion of the Pact threat—or in negotiating mutual limits to constrain this threat—we must pay more atten-



Gen. Lew Allen, Jr., USAF Chief of Staff, addresses the AFA-sponsored Symposium.

tion to the number as well as the quality of forces in the balance," General Allen stressed.

Given the complexity of this balance, he pointed out, "it is not surprising that academic arms analysts—usually more policy- than technology-oriented, and unable to devote their full energies to the task—often fall into the trap of confusing technology projections with current capabilities. This leads to an unfortunate protechnology bias in their attempts to set the balance, which leads to recurrent predictions of the demise of the tank and the fighter aircraft at the hands of precision-guided munitions despite the abundant—and wartime—evidence that such a demise is simply not in hand today."

In the Pacific theater, USAF's Chief of Staff told the AFA Symposium, a key challenge will "be maintaining and improving the harmony of our political, economic, and military interests with those of our friends and allies." President Carter's decision to cut—over time—US ground forces in Korea goes hand-in-glove with an increased commitment to bolster that country's defenses with US airpower. For this purpose, he added, "we have increased our deployment of F-4 aircraft to Korea, we have stepped up our ability to reinforce, [and] we have tested the E-3A AWACS [in Korea to demonstrate] the remarkable advantage [this system] gives to the USAF/ROK team [in managing] the air battle." In Korea, as elsewhere in the Pacific, he added, the military threats "appear manageable if we continue to supply arms assistance in the quantities needed for self-defense and to maintain a balance of forward-based and readily deployable US forces to check Soviet power."

With the advent of the Space Shuttle, General Allen said, the military space mission of the Air Force will gain added importance; hence the service is considering forming a new organization in charge of all space-related activities. Dr. Hans Mark, the Under Secretary of the Air Force, he pointed out, is in the forefront of planning USAF's role in space which possibly might include active operational participation in the Shuttle program.

ENERGY AND NUCLEAR WEAPONS ISSUES

"Nuclear tests are essential for determining the proper functioning of nuclear explosives; calculations do not suffice, and there is no way to experimentally simulate the performance of nuclear weapons," Dr. Donald M. Kerr, the Department of Energy's Deputy Assistant Secretary of Defense Programs, told the Symposium. Discussing the consequences of the proposed Comprehensive Test Ban (CTB) treaty, he pointed out that a ban which "significantly reduced our confidence in the nuclear stockpile might reduce our willingness to accept further substantial cuts in our nuclear inventory under future arms control agreements. Additionally, insofar as a CTB agreement reduces our ability to develop new systems, it will eliminate the contributions to stability that such systems could make in dealing with an evolving strategic situation."

Stored nuclear warheads, called the nuclear stockpile, are subject to physical deterioration of the chemical explosives used to trigger them. While the expected stockpile life of nuclear weapons should be between fifteen and twenty-five years, he said, "some designs have required corrective measures much sooner." There

is "evidence of corrosion and other deterioration" in some currently stockpiled weapons. While in the past it often has been possible to make "fixes" without nuclear testing, in some instances actual testing was required, Dr. Kerr said. "A single such test could mean the difference between returning a weapon to the stockpile with perhaps a minimal fix, and remanufacturing all such weapons over a span of four to eight years, during which time a portion of our nuclear deterrent may be questionable."

Verification, he pointed out, is another crucial problem associated with CTB: "The current US seismic nuclear test detection and verification capabilities have not reached the yields levels that would preclude Soviet weapons laboratories to do some—if not all—surreptitious testing needed to verify the reliability of Soviet warheads, to develop new weapons, and to improve existing designs, according to Dr. Kerr. Testimony by State Department witnesses before Congress alleging a strong US lead over the Soviets in warhead technology, he pointed out, is not based on evidence, but on speculation. It would help, he suggested, if "those who are experts in weapons technology . . . make statements rather than those who are not."

The FY '79 authorization bill, Dr. Kerr disclosed, breaks the stalemate between the Administration and Congress over whether or not the US should build a new strategic bomb. The new weapon, called the B83, is derived largely from the B77 design that the Administration had attempted earlier to cancel, he said. In its place, the Administration had sought to modernize an older weapon, the B43, claiming that considerable savings would be realized in the process. The Ninety-fifth Congress remained unpersuaded and denied funds to modernize the B43. The B83, Dr. Kerr said, is a modern strategic bomb in terms of all essential criteria and will "provide virtually all the capabilities planned for the B77 [although it will be] about forty percent cheaper. Also, the new design will recover to a major degree the



Dr. Donald M. Kerr, DoE's Deputy Assistant Secretary of Defense Programs.



NASA's Dr. A. Lovelace.

R&D investment in the B77" design in the past few years. For the time being, the nuclear weapons expert reported, the US is not likely to encounter any shortage of SNM, the special nuclear materials that form the first stage of nuclear warheads. DoE's production of SNM is geared to a Presidential requirements statement that is issued annually and covers an eight-year period. The current program, which covers the period to 1986-87, he said, can meet the SNM requirements envisioned by the Defense Department. But these requirements don't include warheads for MX and the Trident II/D-5 SLBM. Since no formal decision about the yield requirements of MX has been reached as yet, he added, DoE can't peg the associated SNM requirement. DoE's Defense Programs branch has several candidate designs for MX under tentative consideration and believes that if those are acceptable to the Defense Department there will be no SNM shortfall.

The outcome of the search for new, renewable energy sources—a crucial long-term issue from the point of view of national security as well as economics—might well be a "dead heat" between the US, the Soviet Union, and Western European nations, especially so far as the most promising technology, fusion power, is concerned. The commercial realization of fusion power, however, is not likely before the year 2000 and could involve either the use of ultrahigh-powered lasers or the so-called magnetic containment approach pioneered by the Soviet Union.

US SPACE INTERESTS

"... The President's [recently announced new] space policy embraces the Shuttle as the major new technical capability upon which American space endeavors shall rely for decades to come. This commitment is total, not tentative: The Space Shuttle is truly the keystone to our future in space, whether for military or civilian needs, whether for domestic or foreign programs," Dr. A. M. Lovelace, Deputy Administrator of NASA, told the Sym-

posium. He predicted that the first flight of the Shuttle, also known as the Space Transportation System, will take place by October 1979.

The US so far has no evidence that the Soviet Union is developing a similar system but there is evidence of research in lifting-body technology, Dr. Lovelace reported. The latter is used by Shuttle's Orbiter during reentry from space and presumably is a key requirement for any space transportation system. At present there are no firm plans about transferring one or more Space Shuttles to the Defense Department, but Air Force Under Secretary Dr. Hans Mark is conducting a study of how such an arrangement might work and what advantages would be gained, the NASA official said.

The current Shuttle program involves a fleet of four Orbiters, but NASA is confident that over the long term additional systems will be required to accommodate increasing traffic, Dr. Lovelace said. While the Space Shuttle program is encountering developmental problems—such as with the Orbiter's main engines—NASA and its consultants remain confident that most problems either are, or soon will be, solved, he said. Assuming a successful first flight late this year, NASA plans a number of orbital test flights next year.

The Shuttle program is to reach full operational status in February 1981 at the Kennedy Space Center in Florida and sometime in 1983 at Vandenberg AFB, Calif., Dr. Lovelace said.

Other goals to be realized during the next few years include weight reduction for the Orbiter and the expendable external fuel tanks to increase payload, and some form of thrust augmentation for "particularly demanding payload/trajectory requirements," presumably meaning intelligence spacecraft.

THE NATO CHALLENGE

The Warsaw Pact's some 3,000 fighters, reconnaissance aircraft, and bombers, which confront 1,400 NATO aircraft "can now be almost totally committed to longer-range offensive operations against blue-ribbon targets behind [NATO] lines" because of the tremendous Soviet buildup of attack helicopters and surface-to-air missiles (SAMs), Gen. John W. Pauly, Commander of Allied Air Forces Central Europe and Commander in Chief of USAFE, told the Symposium. With Pact Hind attack helicopters assuming the air-support mission, mobile SAMs picking up the air defense responsibility, and Soviet fighters increasing their range sevenfold and their payload fivefold over the past few years, a near total transformation in the Warsaw Pact's airpower from a defensive to an offensive orientation has taken place, he pointed out. The Pact's capabilities gain added scope from its steadily expanding chemical warfare arsenal: "They have somewhere between 70,000 and 100,000 chemical warfare troops deployed at this time. . . . That is fifteen percent more people than I have in the entire United States Air Forces in Europe. They have the hardware for delivery of chemical weapons, including missiles and aircraft. They have a full range of protective equipment in the hands of their troops. They follow an intensive training program at the unit level and maintain several huge chemical training areas where they use actual chemical agents in their indoctrinations. Finally,



USAFE Commander in Chief
Gen. John W. Pauly.

they have a full range of sophisticated decontamination equipment," General Pauly said.

For the short term, one way of responding to the growing Pact capabilities is to "do everything possible to maximize the readiness of our NATO forces to ensure that we get the greatest possible war-fighting capability out of our resources. . . . For the longer term, we must continue doggedly to search for that technological progress that will keep us out in front of the Pact."

The USAFE CINC cited a number of crucial technological requirements, peculiar to NATO:

- "A whole new concept for a STOL-V/STOL fighter bomber [is needed]. Not just a new 'Super Harrier,' but an aircraft . . . which can carry heavy combat loads . . . has long legs . . . and can operate from battle-damaged runways. We must . . . reduce our reliance on 8,000-foot runways. . . ."

- Also vital are new "sensors to improve our night and adverse weather air-to-surface attack capability. We have a pressing need to detect, locate, and identify armor and vehicles and to attack them on the spot. . . . This hunter-killer capability is an operational 'must' in Europe."

- "We need an autonomous, compact system that allows positive target identification beyond visual range. . . . While the E-3A Sentry has this capability it is [also] needed for the F-15, F-16, and other aircraft."

- There is a vital need for "an entire array of electronic warfare systems to counter the Warsaw Pact's impressive offensive and defensive electronic warfare capabilities. Although the [eventual] arrival of the much-needed EF-111 and the F-4G will [correct some] critical deficiencies, there are still wide areas of the electronic warfare spectrum that need serious attention. We must, for instance, find ways of negating the Pact's impressive jamming capability and at the same time deprive the [opponent] of his command control and communications [potential] by electronic or physical means. An antijamming feature should be a prerequisite for all C³ equipment developed in the future."

- Another urgent need is "better protection for people and equipment from the effects of chemical warfare. For example, a lightweight, comfortable protective suit for [our aircrews] to fly and work in without losing efficiency, combined with a rapid acting chemical warfare detection and decontamination capability to reduce the time people are exposed to chemical agents. . . . We also require munitions to provide multiple kills per pass . . . to offset the numerical advantage of the Warsaw Pact armored threat."

There is a related need for munitions specifically designed to cope with hard targets. "We need a delivery vehicle of sufficient accuracy to hit relatively small, camouflaged targets. It should have a warhead that can penetrate reinforced concrete, earth over-burden, and steel plates that protect command control and communications or other . . . hardened facilities."

Other significant hardware needs of NATO airpower, General Pauly said, include munitions with multiple penetrators that are effective against such area targets as runways, weapons storage sites, and SAM installations; an advanced, medium-range, air-to-air missile that maximizes "the first-shot advantage"; and a reliable secure voice system. Lack of the latter is "regularly identified in

exercises as one of our most critical shortcomings. Too often our people are faced with the problem of compromising security or not getting the job done."

THE LOGISTICS PICTURE

"Often, the Log Command's role [prior to initiation of] the acquisition process has been termed 'challenging user requirements.' That does not mean that we wish to preempt the operational commander's assessment of what he needs to do his job. . . . Rather, we focus our attention on hidden support factors that contribute to higher operational costs and reduce the eventual number of operational sorties," Gen. Bryce Poe II, the Commander of the Air Force Logistics Command, explained at AFA's Symposium.

Among AFLC's key concerns, he said, are several programs to transform the B-52 into an ALCM (air-launched cruise missile) launcher. Two fundamental efforts here are the B-52's Offensive Avionics System modification—expected to cost about \$1.5 billion—and the Cruise Missile Integration modification, expected to amount to a little more than \$1 billion, according to General Poe.

AFLC's business in the foreign military sales sector continues to grow, with "some \$5 billion on our books in terms of international logistics business," he said. An encouraging new trend is that the costs of avionics maintenance "continue to go down but unfortunately our software costs are going up." Further reductions in aircraft avionics costs will be realized once the Space Shuttle achieves full operational status. The Shuttle's flexibility makes it possible to put greater avionics capabilities aboard satellites and reduce correspondingly the avionics requirements of individual aircraft, he predicted.

THE HARDWARE MANAGEMENT TASK

"If somebody wants to shoot down the Space Shuttle, [he] probably can do so. It is a big target in a low orbit. If the attack involves conventional means, spoofing or maneuvering might work. If there is a nuclear attack,



Gen. Bryce Poe II, Commander of Air Force Logistics Command.



AFSC's Gen. D. Slay.

however, these measures would not be effective," Gen. Alton D. Slay, Commander of the Air Force Systems Command, told the AFA Symposium.

The nation, General Slay postulated, is "in a hardware horse race—a deadly serious horse race where there's no payoff for place or show." And a central handicap, he added, is the fact that over the past fifteen years Soviet R&D expenditures "have increased at a steady four percent per year—year in and year out—while for a good part of the time ours declined." Suggesting that for the foreseeable future the Air Force will face the dilemma of having to cope with an ever-expanding welter of technological opportunities while constrained by austere budgets, the AFSC Commander said that the solution is to come up with "affordable, high-quality weapons . . . without asking our customers to compromise significantly on quality." General Slay bluntly asserted that "our weapon systems cost too much . . . ; that they are too expensive to operate and maintain; and that they are often overly complex for the job at hand. . . ." Conversely, he suggested, "we can learn how to build, operate, and maintain qualitatively superior systems at much less cost."

One of AFSC's answers to this problem, he said, is Project Vanguard, which he described as a major and far-reaching planning initiative covering "every dime that is being or will be spent by AFSC" and which will serve as the measure of merit for all short-term programming and budgeting functions. Vanguard, he promised, will be put into operation "in time to affect the next programming and budgeting cycle—and without any additional resources required."

In its dealings with contractors, the Air Force is initiating a number of new policies in order to hold down costs while safeguarding quality. "We are trying to make RFPs [requests for proposals] more realistic, with more leeway for innovation and cost-saving approaches. For one thing, we are now sending draft RFPs to prospective bidders, inviting them to suggest improvements. . . . RFPs will soon reflect a new Command policy to reduce greatly the

amount of data—management and technical—we ask for. We are using a 'zero-base' approach to justify all data requirements."

Also, the AFSC Commander disclosed, tests are under way throughout the command to establish the value of treating past performance by industrial contractors as a "major ranked area in source selection. . . . I have hopes that it will pave the way to improve contract and cost performance in the future."

The Air Force is now writing "special provisions in our contracts that will require the contractor to bear responsibility if his product doesn't perform as advertised." While warranties are not a new contracting tool, he explained, "we are going to make more use of them in the future—including performance guarantees for component improvement program money paid to engine contractors to fix deficiencies in their engines."

Turning to specific technologies and programs, General Slay questioned as "far out" and unbelievable press reports that the Soviets are perfecting particle beam weapons that could destroy US missile warheads from space. "If they can do this—and I don't believe they can—then they have changed the laws of physics."

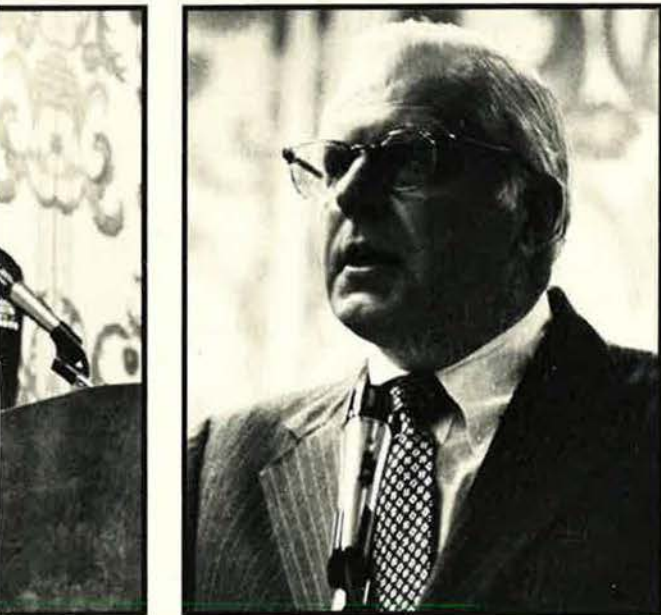
The Air Force, he stressed, "has not become disinterested in Remotely Piloted Vehicles (RPVs). But RPVs . . . have a hard time finding a solid mission outside of reconnaissance."

The Air Force sees compelling reasons for developing an alternate engine to the F100 powering the F-15 and F-16 fighters, and "we are trying to get [such a] program off the ground. But we have no plans for reengining either of these aircraft [unlike the US Navy] which has a driving need to reengine the F-14. We have some problems with the F100 engine but certainly no more than with any other engine in the past. The F100 engine is a real hummer."

One of the more agonizing choices confronting the Air Force, he said, is to define the Enhanced Tactical Fighter project. The options range from an upgrading of existing combat aircraft—such as providing additional avionics for the F-16 and A-10—to making the F-15 "an air-to-ground machine," to the design of a completely new aircraft. In the latter case, he said, the determination is yet to be made whether a new enhanced tactical fighter should be an air-to-ground, an air-superiority, or a dual-capable weapon system.

Air Force Secretary John C. Stetson, who served as the Symposium's keynoter, discussed the pervasive strategic importance of the Persian Gulf region and of its oil supply to the security and economy of the US. Two principal concerns, Secretary Stetson pointed out, are the potential for explosive confrontations between the Israelis and the Arabs, and "Soviet invasion of the [Middle East] area."

The central military need of the US, therefore, is a "power projection capability—a force which can move quickly to any crisis point. Airpower and transport clearly provide that kind of capability. . . . For at least the rest of this century we must maintain a military program, hopefully with our allies, that will deter Soviet military aggression in the Persian Gulf or, if necessary and called upon to do so, help defend the territory from Soviet aggression." ■



Air Force Secretary John C. Stetson was the Symposium's keynoter.

A SIGNIFICANT development, with far-ranging implications for the future employment of US military forces, is taking place with the aging B-52 bomber.

The Strategic Air Command (SAC) is putting increased emphasis on conventional missions in support of theater commanders in Europe and the Western Pacific. In addition, B-52 crews are training for and practicing sea-control operations in close cooperation with the Navy.

The impressive results emphasize

that are causing new excitement in the Strategic Air Command.

In 1976, Gens. Richard H. Ellis, Commander in Chief, Strategic Air Command (then Commander in Chief, US Air Forces in Europe); Russell E. Dougherty (then Commander in Chief, Strategic Air Command); Alexander M. Haig, Jr., Commander in Chief, US European Command; and Robert E. Huyser, Deputy Commander in Chief, US European Command, began discussing ways to use the B-52's capability

training, but they are convinced that B-52 crews would be better prepared if they received more conventional war training than was the practice in the past. As this additional practice comes with no cut in training for nuclear strike missions, crews find their training load has increased.

Says Brig. Gen. Christopher S. Adams, Jr., Assistant Deputy Chief of Staff for Operations at SAC: "We have increased training flight hours slightly for crews. But, more significantly, we have vastly increased the



A B-52G, with SRAM missiles under its wings, flies an electronic countermeasure equipment test.

the advantage of evaluating weapon systems, in this case the strategic bomber, without regard to traditional missions or arbitrarily restricted service roles.

The bomber's strategic nuclear role is not being neglected. Because of the cancellation of the B-1 bomber, the strategic role of the B-52 is expected to be critical in the next decade or more, both as a penetrating bomber and as a cruise missile carrier. The bomber force, in today's missile age, still has the biggest bang—carrying the majority of the megatonnage in America's triad of strategic forces.

But it is the conventional missions

to mass firepower in support of NATO forces, in response to the increasing Soviet threat. These discussions are now beginning to bear fruit as B-52 crews participate in unified and joint command exercises.

Conventional Bombing Missions

SAC has been giving B-52 crews more intensive training in conventional bombing missions. This training reflects additional emphasis on contingency operations and an awareness that the number of B-52 crews with actual combat experience is declining. Not only are SAC commanders attempting to replace that experience with vigorous realistic

types of training conducted during each flight."

The D models, with their specially modified bomb bays, are particularly suited for conventional bombing missions. One D model can carry up to 102 500-pound conventional bombs, more than any other plane flying. Its long range and all-weather and night capability enable the B-52 to deliver this massive firepower in support of ground forces.

In the past year, there have been three major demonstrations of B-52 conventional bombing.

During "Brave Shield 17," a joint Army-Air Force exercise sponsored by the US Readiness Command in

April, SAC B-52s demonstrated their ability to quickly provide conventional bombing support to ground commanders. Twelve simulated bombing missions in support of ground troops were flown on bombing ranges located in the Nevada and California desert.

In September, a special test called "Giant Thrust II" was conducted at Andersen AFB, Guam, to set a realistic limit on the amount of conventional bombing support B-52s can be expected to provide in a con-

After being loaded with sixty Mk-82 500-pound bombs each, the bombers flew on three-and-a-half-hour missions patterned after what might be required in a NATO conventional war. The planes returned to Guam, ran electronic countermeasure exercises, and then recovered at Andersen. After landing, the planes were turned over to the ground crews for fuel, bombs, and maintenance, after which they were assigned to another flight crew.

The cycle for aircrews was dif-

sidered a remarkably low record by veteran SAC pilots.

In the test, 8,188 bombs of the 8,226 scheduled were dropped. The thirty-eight bombs that failed to release on command represent a record low rate in bomb release malfunctions for B-52 missions.

With the new Quick Turn Checklist, a bomber was ready for takeoff on an average of 4.4 hours after its engines had been shut down from a previous flight. Crews were able to load sixty Mark 82 bombs in an

The Strategic Air Command has increased the training of B-52 crews in conventional bombing missions, and also introduced training in such sea missions as mine-laying and surveillance. The additional burden comes without any change in the aging bomber's primary role as a nuclear delivery system . . .

The B-52:

Growing More Vital With Age

BY BONNER DAY
SENIOR EDITOR

tingency situation. An earlier sortie test, "Giant Thrust I," was held at McConnell AFB, Kan., to exercise KC-135 tankers.

In "Giant Thrust II," fourteen aircraft and eighteen crews stationed at Andersen flew twenty-seven sorties a day for five consecutive days, or a total of 135 sorties.

The speed with which ground crews could turn the planes around between sorties was the key to the test. In preparing for the test, SAC developed new B-52 maintenance procedures, which, for the first time, allowed the bombers simultaneously to be refueled, loaded with weapons, and given necessary maintenance.

ferent, but just as hectic. A crew was given an operations briefing two and a half hours before takeoff, flew a sortie, recovered, ate, received a second briefing, flew a second sortie, and recovered a second time. After fifteen hours on duty, the crews were scheduled for seventeen hours of rest before repeating the cycle.

The exercise broke all previous performance records. Of the 135 flights scheduled, 127 took off within ten minutes of the schedule. All 135 flights were over the assigned target on time. Eight spare planes were used when scheduled planes were pulled from the cycle for maintenance. This replacement rate is con-

average of 1.4 hours, compared to an average of 3.5 hours during the fighting in Southeast Asia. And while the standard in Southeast Asia was less than one sortie per plane per day, during the exercise ground crews achieved a per-plane sortie rate of 1.93 a day.

In a third conventional bombing exercise, SAC B-52s in September flew a series of simulated high-altitude missions over West Germany in conjunction with "Cold Fire," a NATO-sponsored air training exercise.

Two B-52s flew a radar-simulated bombing mission from Pease AFB, N. H., on September 19, 20, 21, and

22. The bombers flew against targets in West Germany in support of NATO ground forces participating in exercise "Certain Shield," a ground exercise. SAC representatives had assembled in Europe before the start of these exercises to coordinate the bombing missions with the ground forces.

SAC's participation in "Cold Fire" was significant for several reasons. First, it reconfirmed many of the lessons learned in Southeast Asia, particularly the value of B-52s against enemy assembly areas and the need for tactical air protection of the bombers in high-threat areas. Second, during the exercise SAC crews had an opportunity to test new tactics designed to make the B-52 more responsive to the changing battlefield situation. Finally, as a result of this exercise, SAC commanders initiated the "Busy Brewer" training program to familiarize more SAC B-52 crews with current command control and communications procedures and conventional bombing operations in the European theater.

SAC flew "Busy Brewer" missions in November and December, as the first of a series planned in support of future NATO and European exercises.

Even greater effectiveness could be achieved by deploying B-52s at for-

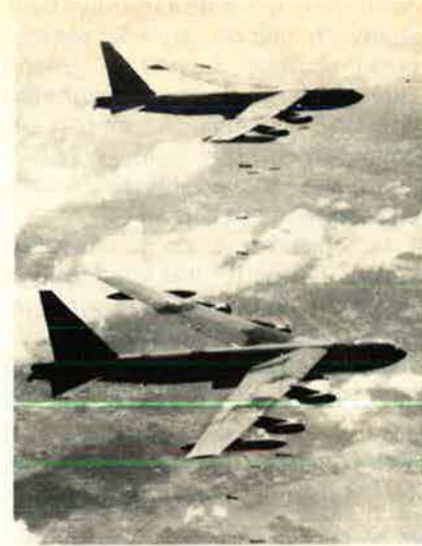
ward bases in Europe during wartime to increase sortie rates and decrease the drain on already heavily committed tankers.

Red Flag Training

Every SAC bomber unit, with the exception of the training wing at Castle AFB, Calif., and the wing based at Andersen, flies in each of ten Red Flag exercises a year. In 1978, more than 600 B-52 sorties were flown in Red Flag. B-52s fly both simulated conventional and nuclear missions.

The big advantage of Red Flag for B-52 crews is the freedom the planes have to fly low-level sorties over the giant Nellis AFB, Nev., range. Low-level flights are difficult to arrange, or are forbidden, in other parts of the country. Also, the Red Flag "aggressor force" of fighters gives B-52 crews a realistic picture of the problems encountered in high- and low-level penetration missions.

In addition to Red Flag exercises, nuclear bomber crews, when not on alert, continue to fly training missions from their home bases. Nuclear weapons are not carried on these training missions. Says Lt. Gen. Lloyd R. Leavitt, Jr., Vice Commander in Chief of SAC: "We are using operational techniques developed over the past couple of years for conventional bombing operations,



Two B-52Ds release bombs over the Vietnam DMZ in an October 1967 raid.

meanwhile maintaining emphasis on the training and operations of B-52 crews for strategic missions." Up to thirty percent of the SAC bomber force is loaded with nuclear bombs and on ground alert at all times SAC airborne alerts ended in 1968

Collateral Missions

In addition to training for nuclear and conventional bombing missions, SAC B-52 crews are developing skills to assist the Navy in sea-control operations.

Under the National Security Act



Improved electronic countermeasure and fire-control systems are being added to help B-52s counter latest Soviet defenses.

of 1947, the USAF is charged with training forces to interdict enemy ships, to protect US shipping, and to conduct aerial mine-laying.

At four B-52 bases, crews flying the D models are trained to lay mines. They are stationed at Carswell AFB, Tex.; Dyess AFB, Tex.; March AFB, Calif.; and Andersen AFB, Guam. Some sixty B-52 crews are on day-to-day call for aerial mining operations. Each crew flies a simulated mine-laying mission at least once a year.

The Navy delivers mines to designated Air Force bases for mining operations. Navy personnel complete assembly of the mines and then turn them over to Air Force munitions crews for loading.

Readying B-52 crews for this mission requires a minimum amount of additional training since there is little difference in mine-laying and conventional bomb delivery techniques.

In September, four B-52Ds assigned to the 7th Bomb Wing at Carswell AFB flew simulated aerial mine-laying missions in support of "Northern Wedding," a NATO maritime exercise.

Operating from Pease AFB, N. H., two-aircraft formations of B-52s flew two separate types of aerial mine-laying missions in support of US Navy and NATO patrol aircraft. On the first type, flown September 12, the bombers carried dummy actuator mines. Each of these mines contains a small explosive charge, which is used to deploy a buoy to facilitate recovery of the mine.

On the second type of mission, flown September 14, the B-52s simulated an aerial mine-laying mission by using cameras.

SAC B-52 crews are also being trained to perform sea-surveillance missions in support of the Navy. This collateral mission as now defined dates back to 1975, when Gen. David C. Jones, Air Force Chief of Staff at the time, and then-Chief of Naval Operations Adm. James L. Holloway, signed the "USAF-USN Collateral Functions Agreement," which specifies that the Air Force will train units for sea-control operations that can be accomplished with "inherent Air Force capability." The agreement was directed more at increasing cooperation between the two services than at giving the Air



The last B-52 built (above) left the assembly plant June 22, 1962, at the Boeing facility in Wichita, Kan. President Eisenhower in the early 1950s inspected the YB-52 prototype with aides and Boeing officials.



Force new authority. The Air Force long has been charged, under the National Security Act of 1947, with training forces to interdict enemy ships, to protect US shipping, and to carry out aerial mine-laying.

Three years of operations have proved that the giant, eight-engine jets can find and identify foreign surface vessels and lay sea mines in support of Navy sea control as well as, and in some cases better than, Navy aircraft. The long range of the B-52 and its ability to loiter for long periods are the prime reasons for the B-52's outstanding performance in this role.

"Busy Observer" is the name given to sea-surveillance training and operations with B-52s. Busy Observer I trains crews to find ships at sea, using US and Canadian vessels as practice objectives. In Busy Observer II, B-52 crews find and photograph Soviet vessels in response to requests by the Navy.

Sea-surveillance training is conducted by SAC's Eighth and Fifteenth Air Forces and the 3d Air Division in Guam. The Air Force has assigned SAC units at ten bases to work on sea surveillance. These include Loring, K. I. Sawyer, March, Robins, Griffiss, Fairchild, Carswell, Seymour-Johnson, Mather, and Andersen. A minimum of sixty B-52 crews maintain proficiency in this collateral mission.

While B-52G and H crews have received this collateral training, in a nuclear war crisis SAC would probably be asked to commit only the D models for contingency missions, with the G and H models reserved for strategic bombing missions. The training phase consists of eight missions per squadron per year. A minimum of one photo is taken on each mission.

In searches for Soviet ships, the Eighth Air Force works with the Navy Atlantic Fleet. In the Pacific,

Making the B-52 Even Better

The air-launched cruise missile (ALCM) is only one of a long series of innovations that have been used over the last two decades to keep the B-52 an effective member of the nation's defense triad of bombers, intercontinental ballistic missiles, and ballistic-missile submarines.

The Air Force has spent more than \$2 billion in major modifications of the B-52 over those twenty years. Several hundred million dollars more are expected to be spent in the months ahead.

No bomber in US military history has been called on to remain operational for the length of time expected of the B-52. The Air Force envisions more than 300 B-52s remaining in the active inventory for the rest of this century. This would represent almost a half-century of service since the first operational B-52 was delivered in June 1955 to the 93d Bomb Wing at Castle AFB, Calif. The last B-52 to be built, of a total of 744, was delivered in October 1962.

Originally designed as an intercontinental, high-altitude, nuclear bomber, the B-52 has seen its mission and performance altered over the years to meet changing defense needs. Structural modifications and new equipment permitted sustained low-level operations, conventional bombing, long-endurance missions, and an extension of its range.

Modifications now under way are designed to cope with the growing air defense capabilities of the Soviet Union and to provide greater reliability at lower operating costs.

Programs include improved offensive avionics, integration of the cruise missile, and new countermeasures equipment.

A full-scale development effort to update G and H model offensive avionics is under way. The improvements are designed to update the bomber's navigation and weapons delivery equipment at a significantly reduced life-cycle cost. Production and installation would extend the program through the late 1980s.

Full-scale development of cruise-missile integration with the B-52 is under Air Force contract. Three B-52G aircraft will be modified with carrier aircraft equipment in support of the 1979 flyoff program between the AGM-86 and the AGM-109 air-launched cruise missiles.

ALQ-122 Smart Noise Operation Equipment is being installed in G and H models by the Air Force. Production of kits for this countermeasures equipment will continue to 1981. The Air Force is installing AFSATCOM kits in G and H models, permitting worldwide communication by satellite. Production continues into 1982.

The Air Force has ordered production of ALT-28 transmitter update and power management systems for G and H models. This equipment provides automated control of radio frequency power and jams enemy radar. Deliveries are scheduled to 1984.

The development and test program for a Tail Warning System for B-52s is nearing completion. The system is designed to detect enemy approaches from the rear and automatically dispense countermeasures.

The Air Force has ordered initial design work on an electronically steerable antenna system (ESAS) for G and H models. The system is expected to improve defensive electronics capabilities of the aircraft. The

contract now in effect will be completed early this year.

Electronically Agile Radar being developed by Westinghouse for possible replacement of present radar in G and H models will be ground- and flight-tested until late 1979. Other systems may be considered in this update program.

The Offensive Avionics System (OAS) package is one of the most comprehensive improvement programs in the life of the B-52.

A full-scale development contract for a new B-52 Offensive Avionics System, valued at \$129 million, was awarded to Boeing Wichita in August 1978. The contract was awarded by the Air Force Systems Command's Aeronautical Systems Division (ASD) at Wright-Patterson AFB, Ohio, and provides for fabrication, integration, and test of selected subsystems to update the offensive avionics of the G and H model B-52s and to provide an air-launched cruise missile capability for the planes.

The goal of the program is to improve the bomber's navigation and weapons delivery systems, to integrate the cruise missile, to meet enemy threats of the 1980s, and to reduce support costs.

Specific avionics improvements include the B-52 weapon delivery system, more dependable electronic subsystems with lower operating and maintenance costs, and hardening against nuclear effects.

Major subsystems in the program include: new computers for navigation and weapon delivery, a common strategic Doppler radar for the inertial navigation system, an attitude heading reference system, a radar altimeter, controls and displays, and a high-accuracy inertial navigation system.

Government-furnished equipment for the OAS package will include the Air Force strategic common Doppler radar and the Honeywell inertial navigation system.

For the remaining OAS subsystems, Boeing has selected the following subcontractors: IBM Federal Systems Div., Owego, N. Y., avionics processors; Lear Siegler Instrument Div., Grand Rapids, Mich., attitude heading reference system; Honeywell Avionics Div., Minneapolis, Minn., radar altimeter; Sperry Rand's Sperry Flight Systems Div., Phoenix, Ariz., controls and displays; and Norden Systems of United Technologies, Norwalk, Conn., radar modifications.

Boeing Wichita will equip a B-52G test aircraft with the new avionics by mid-1980. A twelve-month flight test program will follow. The Air Force anticipates initial retrofit of the B-52G and H models with the new offensive avionics starting about mid-1981. Fleet modification is expected to begin one year later with retrofit of all G and H models.

The B-52Ds have been modified to carry weapons for conventional bombing, antitank warfare, and antiship operations. In addition, the D models at a cost of \$200 million have been given major structural improvements.

The structural improvements, completed in 1977, included replacing panels of the wings and fuselage skins, and replacing electrical wiring in the wings. The effort was designed to extend the service life of the Ds.

Both for the Gs and Hs and for the Ds, the Air Force must continue to find improvements to keep the 1950s-era bomber competitive in the years ahead.

—B. D.



To extend the life of the D models, new skin panels for wings and fuselage, new leading and trailing edges for the wings, and new electrical wiring were added.

the Fifteenth Air Force works with the Third Fleet and the 3d Air Division works with the Seventh Fleet.

In a typical month, B-52s fly sea surveillance missions four times in the Atlantic, once in the Western Pacific, and three times in the Eastern Pacific.

The Air Force effort in sea surveillance has been limited to surface ships so far. B-52s do not have the sophisticated equipment needed to search underwater for submarines. By helping the Navy with the surface threat, the Air Force frees Navy anti-submarine forces to concentrate on tracking foreign submarines.

In surveillance missions, the Navy is responsible for plotting all sightings—from Navy ships and planes, from satellites, and from Air Force sources. The Navy designates a foreign ship as the search objective and gives the ship's approximate location.

After being given the map coordinates, the B-52 crews take over. Two B-52s fly to the approximate area, then conduct a systematic radar search, flying normally at 15,000 feet. Navy planes, usually assigned smaller areas to search, fly at lower altitudes, from 2,000 to 4,000 feet. Two B-52s, flying at the higher altitude, can cover 112,000 square nautical miles in two and a half hours.

After the Air Force crews plot the location of ships within the search area, one plane is brought down to 3,000 feet to locate the specific objective. Pictures can be taken with the K-17, a special camera mounted

on the aircraft. The aircraft then descends to 1,000 feet and maneuvers to the side of the ship so a member of the crew can take photographs with a hand-held camera loaded with high-speed 35-mm film.

The film is sent to the Navy where it becomes a part of the Navy's worldwide file of foreign ships.

Because of its range and air-refueling ability, the B-52 is able to patrol distant corners of the world more efficiently and effectively than any Navy aircraft. Missions last up to seventeen hours as the huge bombers patrol thousands of square miles.

The peacetime role has more important military implications than merely gathering intelligence. In a war, the same planes could be carrying up to three of the conventional-munition GBU-15 glide bombs, each accurate enough to score a direct hit on an enemy naval vessel. Originally designed for tactical aircraft, the GBU-15 has a television sensor that allows the aircrew to launch from a standoff range and guide the weapon to the target. Some B-52s already have been equipped to use the bomb.

The B-52's Future

SAC commanders are working to improve the B-52 as an effective penetrator. (See the accompanying article, "Making the B-52 Even Better.") While the B-1 program was active, improvements for the B-52 were held up in an effort to cut strategic program costs. Now im-

provements are needed to extend the life of the B-52 until a replacement can be acquired.

For the long run, several alternatives are being looked at, including reviving the B-1 strategic bomber developed by Rockwell International; developing a modified, extended-range "H" version of the General Dynamics FB-111 bomber; and designing a new penetrating bomber that could also serve as a cruise missile carrier. Rockwell International and Boeing recently completed a preliminary study on innovative designs for a penetrating bomber.

Which direction US strategic systems go depends entirely upon the President and the Congress, but production schedules are fairly predictable. A prompt political decision, for example, could provide the Strategic Air Command with operational FB-111Hs by 1983 or B-1s by 1984.

If the Administration chooses instead, and promptly, to develop a new penetrating bomber, present estimates are that a conventional penetrator, using present technology, could not be built before the late '80s.

What is clear is that the B-52 is not a weapon in search of a mission, as perennial critics of airpower now claim. Nor is the Air Force looking for jobs for its pilots—a frequent charge of bomber opponents.

US delays and indecision on strategic programs, combined with a massive Soviet buildup of ground-to-air defenses and air and naval power, have forced the US not only to extend the life of the B-52, but to give it new missions.

The B-52, along with the present smaller force of FB-111s, must be the nation's manned penetrator leg of the strategic triad strategy for the next few years and possibly even to the year 2000. The B-52 also is expected to be used increasingly to augment the Navy sea-control missions and the Tactical Air Command's conventional bombing missions. In addition, until a substitute is approved and developed, the B-52 will be the prime carrier of cruise missiles.

It is one of the paradoxes of US nuclear strategy, in fact, that as the B-52 force grows older and smaller, it is also growing more essential to US security. ■

From the Airlift to Vietnam & Beyond

This "participant's view" of airpower lessons learned and unlearned since World War II was presented by the author at the Eighth Military History Symposium, "Air Power and Warfare," sponsored by the Air Force Academy Department of History in October 1978. It will be part of the Proceedings of that Symposium, to be published early in 1980.

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

EVEN after four decades it seems best to draw a veil over my scholastic record at West Point. From those years—I have always hoped they were not formative—certain bits of knowledge have stuck. Predictably enough, all the wrong bits.

I remember, for instance, learning that the Polish cavalry would deal some very hard, perhaps even decisive, blows to an invading force of Germans if Hitler ever made that unwise move. With equal clarity, I recall the knowledge I gained about the relative strengths of the German and French armies. Given the superior leadership, training, and marvelously constructed defenses of the French, it was clear where the advantage lay. It was during that same period that I grasped other solid bits of higher education: the diesel engine, for instance, while admirably suited to heavy machinery, could never be adapted to the passenger car; the laws of aerodynamics seemed to argue against crossing the sonic barrier.

Curiously enough, in this pre-World War II education of mine, I don't recall being taught, one way or another, about the future role of airpower in war. When we studied the situation in Europe, then on the brink of World War II, it was through the eyes of traditionalists. What was good enough for Napoleon was good enough for us.

It is probably just as well, for I was spared having to learn the immutable theories of Giulio Douhet, who was to be proved, later on in that same World War II, less than infallible. And yet, in some ways, he was a pretty good prophet. No one can dispute that airpower played a decisive—perhaps *the* decisive—role in World War II, first in the Battle of Britain, then in the long air campaign preceding D-Day, and, finally, in bringing about the

capitulation of Japan. It was not as Douhet visualized things—it turned out the bombers did need protection, a lot of protection, before daylight bombing became affordable—but airpower nevertheless played a decisive role in that war.

It was such a major role, in fact, that airpower enthusiasts came out of that war prepared to go it alone in any future conflict. I remember a movie produced by the airpower enthusiasts, in those halcyon days when we had a monopoly on the atomic bomb and the bomber ruled as the supreme military instrument, which showed how a few bombers made superfluous all the other expensive paraphernalia of war. In this movie, troops, warships, fighter planes were all neatly crossed out, as a strategic bomber, majestic and invincible, cruised across the screen, prepared to take care of things. The film was produced for the education of Rotary Clubs and other public forums. Happily, it was suppressed at birth by a wise Air Force Chief of Staff.

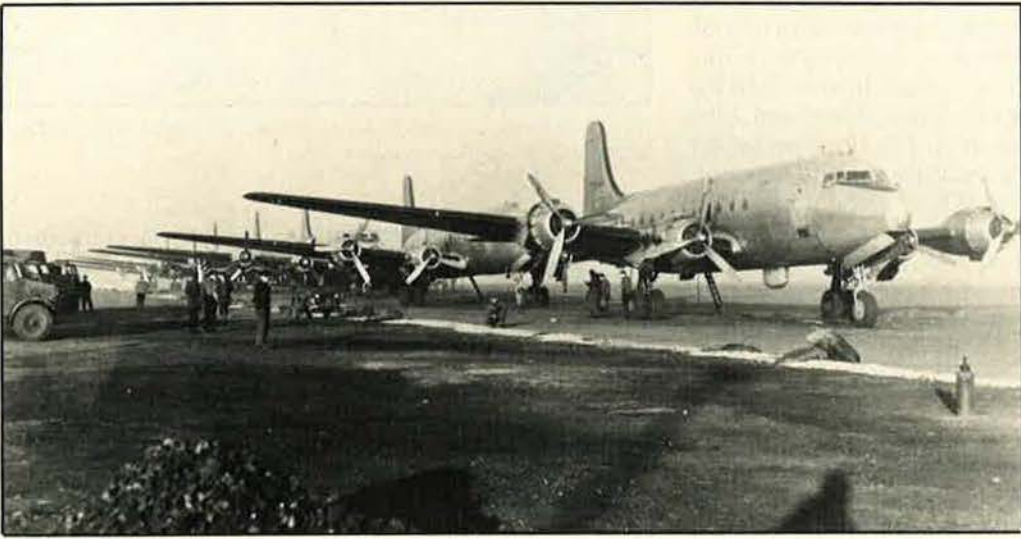
Nevertheless, the feeling was strong in the early 1950s that airpower, which had done so much to win World War II, could do still more if employed with imagination. It was during this period that the Air Force undertook an ambitious study called "Project Control." The theme of Project Control was, essentially, the use of airpower, rather than ground forces, as a basic means of controlling hostile territory. The idea for this study came from the remarkable success the RAF had enjoyed, during the '20s and early '30s, in controlling dissident tribes in the Middle East.

At any rate, Project Control occupied the time and energies of a sizable group at the Air University for the better part of a year. The believers in that project were ardent. Had Vietnam come along about then the theory would undoubtedly have been given a test. There was, of course, no such laboratory available in 1954, and so Project Control, after some exhaustive and exhausting briefings, went quietly into the archives, never to be heard of again. Well, perhaps that is not quite true. Eisenhower's Open Skies proposal does owe something to a study that set out to show how Japan and Germany could have been controlled by the pressure of airpower in the '30s, or failing that, by airpower in the war itself—airpower not tied to a surface strategy.

Like most—maybe all—attempts at constructing a philosophy of war, whether Mahan, Douhet, or the Pentagon theologians who grind out those dreary papers on the doctrinal precepts of the true faith, be it that of the Army, Navy, Air Force, or Marines, Project Control went a little overboard. Nevertheless, there was a considerable amount of solid thinking done in the course of that year's study. Considering our present and apparently aimless strategy in the Pacific, it might be a good idea to resurrect Project Control for another look. Our forces, with the exception of the soon to be withdrawn 2d Infantry Division in Korea, are air and naval. They are highly trained and ready forces. The question is, ready for what? The answer is not as easy as it once was when any right thinking American could promptly answer, when asked a similar question, "To stop the spread of communism."

Airpower in the Cold War

But to get back to the early years after WW II, years that saw the triumphs quickly supplanted by the new Soviet challenge.



Though decisive in World War II, the awesome potential of military aviation, symbolized by the B-17 formation above, has been "the albatross around the neck of airpower" since then. During the cold war, a different facet of airpower proved effective in the Berlin Airlift (left).

In the disorderly demobilization that came on the heels of V-J Day, we lost all vestiges of the great American wartime military machine. The troops left in Europe and Japan were occupying troops, neither trained nor motivated as fighting men—a fact that would be brought sadly home to us in the first days of the Korean War. And so, when the first challenge came from the Soviets over the matter of access to Berlin, we were in a pickle. We could do everything, which is to say we could hit the USSR with nuclear bombs with no fear of retaliation, having first confirmed their warlike intentions by trying an armed convoy to Berlin, or we could do nothing—simply withdraw from that island in the Soviet Zone as being too much trouble.

We chose a middle ground—that of supplying Berlin by airlift, meanwhile deploying some B-29s to England as a quiet reminder of another option at our disposal. In a curious sort of way, the Berlin Airlift was a means of controlling a hostile environment by air alone. The peaceful transports lumbered unmolested over enemy airspace because of the threat of the bombers in England. The fact that the Airlift was, by seeming to legitimize the ground blockade, an extremely elaborate and expensive scheme to evade the issue, is not really material. It was a demonstration of the use of air as a means of controlling a

situation that might well otherwise have ended in war.

In all honesty, however, the Berlin Airlift was notable more for its organizational aspects than for any military lessons we might have learned. Air traffic procedures, approach lighting, and weather minimum thresholds were tinkered with in what was essentially a giant laboratory operating under tightly controlled conditions. We learned that 200-foot ceilings and one-half-mile visibilities were about the limit for the equipment of the time, although we did operate lower—100-foot ceilings and one-quarter-mile visibility—at two airports with flat approaches. Thirty years later, despite all of aviation's advances, these are still the practical landing minimums so long as a pilot, and not an electronic robot, is at the controls.

Thus, the Airlift made some significant contributions to aviation as it carried out that endless round of coal and food deliveries to Berlin. Charles J. V. Murphy, a distinguished journalist with *Fortune Magazine*, described the Airlift as "a Rolls-Royce delivery to the world's biggest poorhouse" in the November 1948 issue of that magazine.

From the military standpoint we did not benefit as much, although we thought we had at the time. In fact, soon after the airlift ended, a large maneuver was laid on

in North Carolina. It was given the name "Swarmers," and it involved two Army airborne divisions, tactical air forces, and a large contingent of air transport, both tactical troop carrier and from the Military Air Transport forces.

Fresh from the Airlift, I was made commander of the air transport forces to the evident dismay of some fairly grizzled troop-carrier types. Our mission was to supply an isolated airhead held by friendly troops who had parachuted in and seized the airfield. The members of the troop carrier persuasion were appalled to learn that our resupply plan was patterned after the Berlin Airlift. No formation flying, just a steady stream of individual transports. The enemy fighters were in ecstasy. They visualized the world's biggest and easiest turkey shoot. Happily for us, the former commander of the Airlift was also the man making the rules for the exercise. The transports were essentially put off limits, protected by some invisible but nonetheless impenetrable defense.

Lt. Gen. Larry Norstad was the Exercise Commander for Swarmers, and he was evidently pleased with a briefing I gave him on our operation plan. At any rate, he dispatched me to Mitchel Field on Long Island to give the briefing to the fearsome Lt. Gen. Ennis Whitehead, who might have been a little out of sorts. His Continental Air Command forces were in the exercise, but he was not. Whatever the reason, General Whitehead cut me off in the middle of my act, almost as if I had been given the hook on a vaudeville amateur hour. "Never show that briefing," he said, "to anyone who has ever experienced combat." He then walked out. Well, I had experienced combat, maybe more than he had, and thus was a little hurt, but there I was, stuck with my charts like Lucky Pierre with his piccolo.

As things turned out, General Whitehead was wrong in his denunciation of our operation. The Korean War came along soon after, and after the initial confusion, air transport began to play an important role in our military resurgence there. The operation plan developed for this air transport was modeled closely after the Swarmers Exercise plan. We had air superiority—indeed, air supremacy—over Korea, and it made good sense to use airlift in the most efficient way. But airlift, in a situation where enemy air is present, has always been a perilous affair. The Germans learned this in their failed air resupply of Stalingrad. We, luckily enough, have never been faced with a situation where any major airlift of ours has had much enemy air opposition to contend with.

But then, that is the whole history of our airpower in the conflicts since World War II. Such aerial combat as we have had in those years, and specifically in Vietnam and Korea, has come only at our insistence. In Korea, our F-86s had to go to MiG Alley for an engagement. The air south of the Yalu was ours alone to use as we wished—for B-29s, transports, or close support. We have raised two generations of soldiers who, while acquiring chests full of combat decorations, have never seen, let alone been attacked by, an enemy airplane. Those rare enemy sightings have been reserved for our fighter pilots who have sought them out.

Airpower's Albatross

Korea taught us some things about interdiction, about close support, and, for that matter, about jet air combat,



In neither Korea, with its distant MiG Alley, nor Vietnam was US air superiority seriously challenged.

but it fell short of being an air war in which the question of air superiority had to be decided. Instead, after the early days of pandemonium and retreat, Korea became a war of attrition and, finally, stalemate.

It was a war in which the air was never really given a chance to function in a decisive way. Had we been allowed to cross the Yalu and attack airfields, transportation choke points, and other targets critical to the Chinese support of the war, instead of viewing the Yalu as the border of a sanctuary, it is at least arguable that Korea would today be unified. As it was, the air campaign in the Korean War was doomed to inconclusiveness, as was the war itself, a fact marked by the never-ending confrontation at Panmunjon. Of course, it can also be argued, as it was then, and persuasively, that attacking across the Yalu would simply have led to all-out war.

That has been the albatross around the neck of airpower since World War II, the fear that attack from the air is too provocative. Where, in World War II, we were, if anything, too uninhibited in our use of airpower—I have in mind such targets as Dresden, Hamburg, and Nagasaki, as well as the no-holds-barred rules of engagement on strafing and targets of opportunity that existed in 1943—we became in the years after that war excessively cautious. The thing we knew best how to do became the thing we were afraid to do.

It was this attitude that governed our initial foray into Vietnam. As it happened, I was a member of the

Gen. T. R. Milton, a regular contributor to this magazine, participated in many of the events described in this article while serving as a World War II bomber pilot in Europe, Chief of Staff of the Combined (Berlin) Airlift Task Force, Commander of Thirteenth Air Force, Tactical Air Command Chief of Staff, and US Representative to the NATO Military Committee. Retired since 1974, he lives in Colorado Springs.



During the Vietnam War, targets for these F-105s and other US aircraft were seldom selected for their military value.

Taylor-Rostow mission sent out in November 1961 by President Kennedy to survey the deteriorating situation in South Vietnam. At the time, I was commanding the Thirteenth Air Force in the Philippines, a job that provided my credentials for inclusion on the mission. The report we prepared for President Kennedy—or rather, the report Gen. Maxwell Taylor and Walt Rostow submitted after considering the inputs of various people like myself—was an exercise in cautious adventurism. The US Mission in Vietnam would be reorganized to give the senior US military man more authority. So far as the air side of things went, we would sponsor a tactical air control system to give the Vietnamese Air Force more responsiveness, and we would beef up the advisory role. There would be nothing beyond that: no use of US airpower, no crossing of borders to get at the enemy who was using Laos freely, and certainly no attacking North Vietnam itself.

Well, the original Taylor-Rostow recommendations looked pretty modest in a few years as thousands of US troops poured into South Vietnam on their mission of search and destroy. But as the war heated up and US casualties rose, our airpower remained shackled, much as it had been in Korea.

From the beginning of our overt entanglement in Vietnam, which is to say about 1963; there was never any doubt as to the military value in hitting some targets in North Vietnam and Laos—targets such as the harbor dredge in Haiphong which was continuously occupied in keeping the fast-silting channel open. It would have been a simple matter to sink that clumsy vessel at some point in its shuttle, and, as it happened, CINCPAC had a plan to do just that. It was, of course, too provocative.

Everything was too provocative, even after the Rolling Thunder bombing campaign of the North began in earnest. The targets were selected at the highest level, as the euphemism for the White House goes, for their psychological rather than for their military value. We lost pilots and airplanes, and condemned those who survived

being shot down to years of imprisonment, all in the name of giving signals to an enemy. It was only during the Christmas bombing of 1972 that we began to show Hanoi what we could do. That brief foray into a sensible use of our airpower became a victim of an impossible political climate.

And so once again we found ourselves concluding an unsatisfactory war. Once again we, who had dropped the atomic bomb on Japan on the reasonable grounds that it would end a bloody war and would, in the long run, save lives, refused to use our conventional, let alone our atomic, airpower to end, or even shorten, another bloody war.

Vietnam has thus become, in the judgment of the casual or biased observer, a failed test of airpower. We had this immense superiority in the air, and we couldn't even put down an insurgency, let alone defeat a third-rate power like North Vietnam.

Some Lessons From Vietnam

There were, of course, a few occasions in that war where people could have got an inkling, at least, of what conventional airpower could do given the chance. The battle for Khe Sanh in early 1968 was such an occasion. All the ingredients, including massive and careful preparations by General Giap, the hero of Dien Bien Phu, were there, save one. At Dien Bien Phu the French Air Force was too weak to be effective, whereas at Khe Sanh air was available in abundance. Even more important, the command and control mechanism was in place, and the aircrews were highly trained and battle-tested. The results were spectacular. The JCS Chairman, Gen. Earle Wheeler, reported enemy casualties at more than 10,000. Our own losses, by comparison, were minor.

One of the more significant operational achievements of that unhappy war has got far less than its share of recognition. That is the routine use of air tankers to extend the range and the bomb load of fighter aircraft. It is a technique that made fighter sorties of three and a half

hours possible, even routine, from the bases in Thailand. The tankers cruised out every day over the jungles of Thailand and Laos for their rendezvous with the fighter-bombers. It was one of the great military sights of modern times to see the fleet of tankers, line abreast, followed by the fighters edging up to the refueling boom like so many hummingbirds. It was no stunt, no sometime maneuver performed in an emergency, but a part of the daily air war routine. If Vietnam did nothing else, it established air refueling as an integral part of tactical air warfare. It has long since become a standard adjunct to tactical deployments. Crossing the Atlantic is no longer a

The Airborne Warning and Control System or E-3A AWACS is another bright spot in the tactical forces' future and one more basis for comparison between land-based and carrier aviation. The E-3A releases tactical air forces from their dependence on fixed ground radar systems. Like the carrier task force, the tactical air task force can now take its control with it. All of this would seem to add up to an important future for land-based tactical air.

Unhappily, we seem determined not to exploit that future. Our present NATO strategy requires tying down a considerable portion of our tactical forces to a European



In Vietnam, tanker operations (above) became an integral part of tactical air warfare, with significant implications for the European theater. Today, in the NATO area, base hardening and aircraft shelters (right) help, but forces remain extremely vulnerable to a surprise attack.

week-long business of island hopping and sweating out weather. Fighter wings now cross nonstop, just like the airlines.

There are a lot of implications for the future in this tanker-fighter partnership. A fighter wing that can move from Idaho to Korea in less than a day is pretty mobile by anyone's standards. An F-111 wing did just that in the tense period following the tree-cutting murders at Panmunjon. When a fighter outfit can fly ten hours or more nonstop, it can deploy quickly to very distant places. And when that same wing can operate against targets located well beyond their airplanes' unrefueled radius of action, new vistas open up for the military planner.

The Mediterranean, for instance, could be covered by F-4s operating out of, say, Spain, with tanker support. Or they could operate out of Germany, or Italy, or Greece, or Turkey, for that matter. They could even, for some purposes, be based in England. I am not proposing, mind you, that the tanker-fighter combination replace the carrier, but it does seem to offer some interesting options in a place like the Mediterranean.



base complex, in fixed numbers and precisely located by the Soviets. Base hardening, to include aircraft shelters, does help, but the fact remains that these forces are extremely vulnerable to a surprise attack.

The present NATO radar defenses are wholly inadequate for low-level detection. The E-3A, when it is avail-

able to NATO in sufficient numbers, will help in extending the warning time. Nonetheless, putting such a sizable share of our tactical air forces on the front lines, so to speak, is not very prudent. These forces are, after all, irreplaceable. There are no World War II assembly lines turning out aircraft on a mass-production basis to replace battle losses, nor will there ever be again. There is not, nor will there be again, a training base for large numbers of replacement pilots. Deploying aircraft in Spain, Portugal, the UK, or even the US would seem to be a better way of exploiting this modern tactical mobility in the interest of conserving forces.

The next time around is going to be a different experience, even a unique one, to a nation that has generally been able to operate its air forces, land or sea, from safe havens. In World War II it was a hard day's ride from England to Schweinfurt and back. The same distance nowadays is no trip at all. The warning time the radars could give the Germans of our coming in World War II was enough to get the defenses alerted, the fighters airborne, and even the smoke generators working. Those European distances haven't changed, and radar, while improved, still operates on line of sight. What used to be for the Luftwaffe of World War II an hour or two of warning and time to get ready has now been reduced to a scant few minutes for the allied air forces in Germany. AWACS will give us a little more edge. Moving back, and exploiting tankers, would give us some more.

Return of Rationality

The past three decades began with the Berlin Airlift, the opening shot, so to speak, of the cold war. It was closely followed by the Korean War and the almost simultaneous creation of NATO, an organization that really came to life as Korea made the threat clear.

Then there came the years of our strategic supremacy and finally the great expectations, followed by the even greater disillusionment, of Vietnam.

Now, we are beginning to put that behind us and along with it the absurd self-flagellation that accompanied any mention of the failed Vietnam experiment—and it was really an experiment as much as it was a war. The subject of national defense is once more being debated rationally instead of emotionally as the enemy reemerges in clear focus. Well, fairly rationally.

There are a few amateur strategists loose in the land who see little future for land-based tactical air forces. It is not a widely held view, especially by the nonamateur strategists. Airpower remains very high on the priority list of those nations most likely to be involved in a war, notably the Arabs, the Israelis, the Nationalist Chinese, and the Communist Chinese. Our own adversary, the Soviet Union, is going all-out in modernizing its tactical air forces.

We are doing pretty well ourselves. The F-15, F-16, the new tanker—although one could wish for greater numbers and some of the congressional enthusiasm so far reserved for the nuclear carrier—are great additions to the tactical capability. The imaginative readiness training that employs aggressor squadrons and realistic combat conditions has almost certainly given us the most highly trained tactical forces in aviation history.

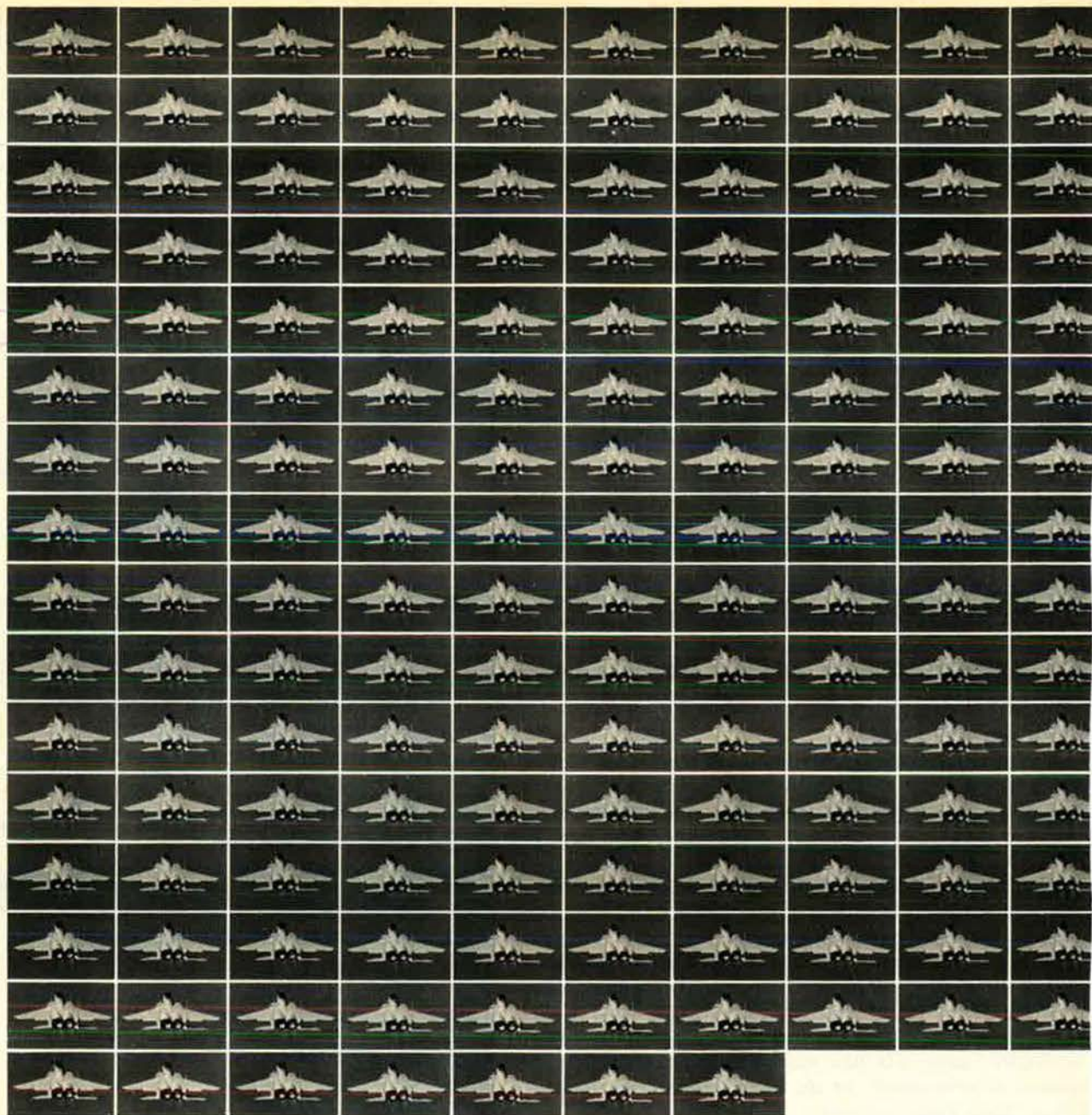
The next thirty years are as hard to predict as the last thirty were. No one, in 1948, foresaw the things that lay ahead of us any more than anyone can now. Almost cer-

tainly our great demobilization and general state of unreadiness contributed to our problems of the past era. It is something to think about as we look ahead.

In summary, none of us knows where we are headed. It is some small comfort that we didn't know thirty years ago—did not, in fact, have even an inkling—and we muddled through one way or another. There is, however, one significant change that thirty years has brought. The world is now a smaller and more dangerous place. If we are going to get through the next three decades with anything like a whole skin, we are going to have to face them far better prepared than we have ever been before. ■



With aerial tankers, the E-3A AWACS (bottom), which allows a tactical air task force to take its control with it, and new fighters like the F-15 (top), F-16, and A-10, land-based tactical air has an important future in warfare.



All in a day's work.

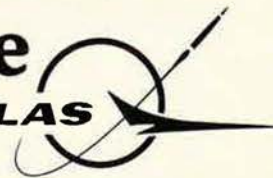
Bitburg Air Base, Germany. An F-15 Eagle streaks into the blustery skies—the final sortie of 322 completed in a 22.8-hour period. Finale to an incredible exercise conducted by the 75-plane U.S. Air Force 36th Tactical Fighter Wing that saw nearly 15 sorties flown each hour—or one every four minutes. A new

“surge” record. And an amazing display of reliability and maintainability for the F-15. Only aircrew rest requirements prevented the 50 Eagles ready for additional flights from being launched.

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MILITARY AIRLIFT COMMAND: THE PRIME MOVER

BY WILLIAM P. SCHLITZ, ASSISTANT MANAGING EDITOR



AMERICANS who watch television newscasts have long since grown accustomed to film clips showing US military transports landing in some remote area of the world, bringing comfort to victims of natural and man-made disasters.

The aircraft involved are usually described as "US Air Force jet transports" without further explanation, as if their role in mercy flights had become institutionalized and were now a matter of course. While these humanitarian missions are laudable and reflect great credit on the service, they are but a single visible aspect of the largely unheralded worldwide responsibilities of the people who fly and manage USAF's fleet of transports—personnel of the Military Airlift Command.

MAC's role is somewhat analogous to managing fire apparatus in a vast and far-flung fire department. During "normal" times, it maintains equipment, conducts routine operations, perhaps rushes an accident victim to the hospital. When fires break out—and these can vary from disaster-relief missions to the resupply of an ally at war—MAC mobilizes to transport fire fighters to the blaze. MAC, however, goes far beyond any fire department. Its planning to fight fires that may never start, including a four-alarmer in Western Europe, is a vital part of the US deterrent.

Charged with supplying airlift to all the services, MAC's importance is reflected in its designation in 1977 as a Specified Command—along with Strategic Air Command and Aerospace Defense Command answerable directly to the Joint Chiefs of Staff. Airlift is now without question a central tenet of US military philosophy.

Reforger

While MAC plans and executes airlift for dozens of military exercises in the US and elsewhere each year, by far its major effort is concentrated on planning to help prevent or contain that possible conflagration in Western Europe.

To this end, its annual training *pièce de résistance* is a massive deployment of troops and their equipment dubbed Reforger. Because of international agreements, the US is annually required to airlift to Europe major elements of Army and Air Force "dual-based" units. That is, units physically in the US but tagged for duty in Europe should NATO be threatened or attacked. Besides demonstrating to friend and potential foe alike the US's capability to reinforce its European-based units, these exercises are a practical means of keeping the wheels of strategic and tactical airlift well oiled.

The planning for Reforger begins almost a year in advance, and for the MAC headquarters staff at Scott AFB, Ill., entails an enormous act of juggling aircraft, people, and equipment. But whether an airlift mission requires a single aircraft or the hundreds of sorties involved in a major operation like Reforger (for "REturn of FORces to GERmany"), the key phrase in planning is "attention to detail."

This attention to detail comes into focus in a document that is the result of months of staff meetings, telegrams, phone calls, conferences, computer runs, and reviews by the planning staff. The end product—in effect, the operations order—is a mind-boggling compilation of detail that establishes the who, what, where, when, why, and how of the airlift operation. A computer printout, it is the thickness of a telephone directory for a good-size city.

When completed, the ops order is furnished to more than 170 military and civilian agencies, both US and foreign, all of whom have a part in the exercise.

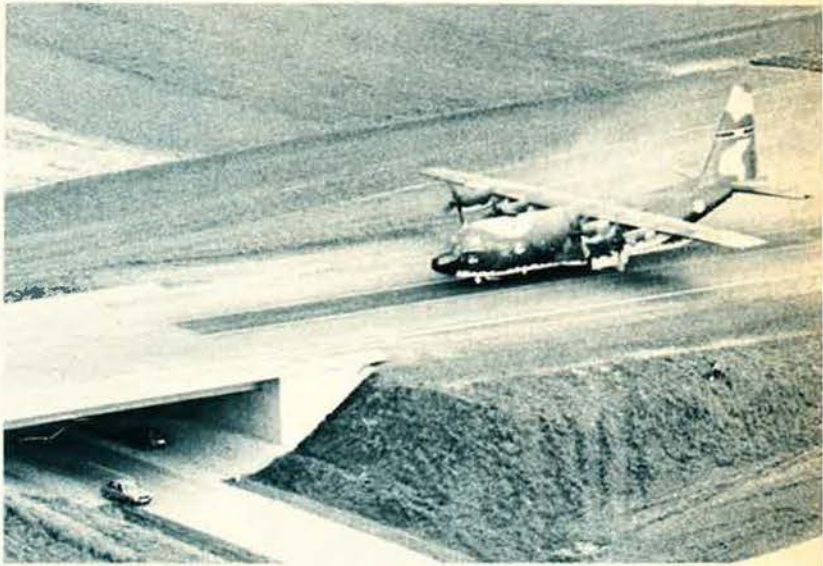
But before any detailed planning can go forward, the basic scope and size of the exercise have to be hammered out, based on JCS approval of both Army and MAC budgets for the undertaking. The number of aircraft that can participate is determined precisely by the number of dollars allocated; and since MAC knows how many aircraft are required to haul X number of troops and their equipment Y miles (and the cost in dollars and cents), Army objectives and MAC resources are then brought into balance.

While this sounds cut and dried, it is not. MAC has several types of transports to work with—the giant C-5, the C-141, and civil aircraft contracted to MAC. The smaller C-130, initially developed as a tactical rather than strategic transport, is used primarily to deploy

troops and equipment from arrival points in Europe. (As the Army continues "heavying up" and increasing the size and firepower of its armored equipment, MAC staffers in the field keep tabs on it to make sure it will fit into the aircraft designated to carry it.)

In the US there are 110 "onloading" bases from which MAC can airlift troops and their equipment. Assigning aircraft as troop carriers or as cargo planes to haul standard and outsize equipment from these bases is a further part of the juggling act.

To carry the fire-fighter analogy further,



Above, a C-130, piloted by CINC MAC Gen. William G. Moore, Jr., lands on a stretch of Germany's autobahn during Reforger '78. Left, US troops unload gear following airlift to Europe aboard MAC transports.

MAC has at its disposal two big, very big, "engine companies." The Twenty-first Air Force, with headquarters at McGuire AFB, N. J., has as its airlift domain the area from the Mississippi River eastward around the globe all the way to Calcutta, India. (See also May 1978 "Almanac Issue," p. 74, for MAC's organization chart.) The Twenty-second Air Force, headquartered at Travis AFB, Calif., controls US airlift in another vast area: west of the Mississippi and across the Pacific to Calcutta.

Thus, with Reforger occurring in its sphere of operations, the Twenty-first acts as controlling Air Force, able to draw on the aircraft and other resources of the supporting Twenty-second.

Aside from the across-the-board experience gained through participation in Reforger by MAC personnel—from maintenance specialists to pilots—the Command has its own list of exercise objectives. And while in most instances these must mesh with ground-force objectives, they essentially are intended to squeeze the most out of the training dollars being spent.

In the 1978 Reforger, for example, MAC planners decided to test the feasibility of using sections of the autobahn, Germany's national highway system, as aircraft runways—emergency sites that could be useful in a war environment. On an 8,000-foot (2,438 m) stretch of completed but as-yet-unopened roadway were landed such tactical transports as the C-130 and German C-160 Transall. The project had evolved into a miniexercise. An Air Force Reserve C-7 Caribou, deployed to Europe for Reforger '78, first dropped members of an Air Force combat control team



Above, loading armor aboard a heavy-lift C-5. MAC has identified the first 4,000 transport loads critical in the early days of a major confrontation in Europe. Left, parachute extraction from a C-130 Hercules.



from the 435th Military Airlift Wing, Rhein-Main AB, Germany, who secured the landing site, put down runway markers, and brought in the aircraft. All but the first aircraft, a C-130 piloted, incidentally, by MAC Commander in Chief Gen. William G. Moore, Jr., carried US troops and equipment. These then engaged in a small-scale ground problem.

But the project was not confined just to putting aircraft down on a strip of concrete. German officials were encouraged to plan for such wartime use of the autobahn by aircraft, and the resulting problems in rerouting motor traffic and refugee control, among other things.

The final list of Reforger airlift objectives is determined by MAC's planning staff, but Command-wide suggestions are encouraged and can be submitted through channels.

Flow Plan the Key

In charge of coordinating Reforger planning is Lt. Col. Jon D. Nylander, of MAC's DCS/Operations. His special province is creation of a "flow plan" that will determine the movement of scores of MAC transports from on-loading bases in the US through such staging bases as Goose Bay, Canada, and Lajes Field in the Azores, to offloading bases in Europe.

It is in the flow plan that attention to detail is critical. One essential is to calculate precisely the arrival and departure times of aircraft at particular stations, so that they won't bunch up and overtax ground facilities, for example.

Timing, then, is crucial. Using the list of Army objectives in planning the Reforger "surge"—the movement of many aircraft on successive missions within a short timespan—MAC prepares a priority timetable for the arrival of troops and cargo in Europe. Many factors have to be considered. For example, because of noise restrictions, aircraft are barred from operating at Ramstein AB, Germany, between 10:00 p.m. and 6:00 a.m.

Again, during Reforger's 300 transatlantic missions, the planes usually complete three cycles (round trips) across the Atlantic before returning to home base for maintenance. (During Reforger '78, almost all aircraft refueled at Goose Bay, Labrador. This resulted in up to twenty-three C-141 arrivals and departures per day in addition to routine traffic.) Since crews are not permitted to fly more than sixteen hours without rest, additional provision must be made for relief crews; planning is meticulous to assure that crews are used economically and do not spend more time than necessary awaiting the arrival of aircraft.

In Reforger and most similar operations, MAC relies heavily on Air Reserve and Air Guard airlift units and other reservists to augment its active-duty forces. Associate units of the Reserve also play a strong role.

While involved in any deployment, MAC must also provide for its regular "channel" (routine) airlift. However, once these aircraft become available they can be dovetailed into the ongoing bigger operation.

With MAC responsible for the well-being of troops during the airlift, preparations must be made for meals and rest, should aircraft be delayed by weather or other reasons at any of the en-route stations. All such factors have to be integrated into the flow plan.

Up until three years ago, flow plans were produced manually, but now much of the drudgery has been eliminated through use of a computer. The MAC staff assembles the plan-

ning data, including departure and arrival times at en-route bases and destinations, types of passenger or cargo loads, flight and ground restrictions, exercise objectives, and many other types of information, and feeds them into the computer. Successive inputs and printouts eventually produce a flow plan that can be fine-tuned.

The fast computer run-throughs also make possible changes in the flow plan aimed at "easing out" the overall operation while introducing as many economies as possible. Staff planners study these initial printouts for "glitches"—mistakes or oversights—any of which could cause ripples throughout the operation. "Because so many 'thinks' go into a flow plan, you always worry about forgetting some essential detail," Colonel Nylander said.

In the matter of filling MAC's support force slots for the exercise—such as maintenance and communications people, etc., based on Air Force specialty code number, "the computer has become indispensable," according to MAC personnel plans chief Lt. Col. Paul W. Poley.

In Reforger, or any airlift in which troops are involved, MAC planners work in harness with the staff of the US Readiness Command, manned jointly by USAF and the Army and headquartered at MacDill AFB, Fla. US Readiness Command, a major function of which is contingency planning, in effect acts as liaison for deployment planning between MAC and the other services.

The two Commands, and MAC's subordinate numbered Air Forces and their wings, are linked by several communications systems, including the Intercomputer Network, the terminals of which are computers that can either produce teletype printouts or screened visuals. This system makes possible conference calls on any aspect of the flow plan or overall ops order of which it is a part. Discrepancies can be pointed out or changes agreed to on the spot, thus ironing out snags.

Prior to the outset of Reforger, not the least undertaking is the repositioning of fuel and spare parts at en-route stations and final destination. When aerial refueling is to be used, tanker requirements must be coordinated with the Strategic Air Command. Usually, aerial port squadrons would also have to be repositioned to conduct aircraft offloading and other preparations, but in Europe such units are already in place and require augmentation only.

Once the Reforger airlift gets under way, MAC staffers assembled in the Twenty-first Air Force Operations Center at McGuire AFB, N. J., monitor it carefully, assisted by an elaborate communications system the mainstay of which is the World Wide Military Command and Control System (WWMCCS).

The Operations Center is manned around the clock, until the last MAC aircraft returns

to its home base. (The redeployment phase of Reforger presents far fewer problems because, among other factors, time is not crucial, thus allowing more elbow room in the flight schedule. But even as the last MAC transport touches down at its home base, MAC staffers have begun to read After Action Reports for pointers in planning the coming year's Reforger.)

In January began Reforger '79, one of the infrequent mass deployments undertaken in winter months. Of the nearly 14,000 troops participating, the 1st Infantry Division (Mech.),



Aerial refueling gives MAC's fleet of C-5s a long strategic reach.

Fort Riley, Kan., will make up the main force with its headquarters and two brigades. Another element, a brigade of the 1st Cavalry Division, is to deploy from Fort Hood, Tex. These units will draw much of their equipment from stores prepositioned in Europe, although a sealift segment of the exercise will take place as standard procedure.

With long-term planning and expert staff work, even large deployments can be conducted on a more or less routine basis. In airlift emergencies, however, planners at MAC headquarters usually find themselves working against time, as they would in the hypothetical situation described below.

MAC's Crisis Action Team

The scenario: There is rioting in the capital city of a small African country. The mood is increasingly anti-American, and the US diplomatic staff on the scene advises that evacuating American citizens is justified. After consultation among State Department, White House, and DoD officials, MAC is ordered to formulate and carry out the evacuation.

A Crisis Action Team (CAT) assembles in the Command Center at MAC headquarters. (Similar groups are in readiness at the numbered Air Force and the wing tasked with the mission.) Drawn from a roster of staff experts in such functional areas as logistics, communications, personnel, and operations, the MAC

headquarters CAT prepares a basic operational plan that may contain a number of options. Working closely with JCS action officers and State Department officials, the CAT works out the details: the number and type of aircraft, routes to be flown (restricted airspace may have to be taken into account), en-route support requirements, refueling needs, diplomatic hurdles, access to adequate airports at destination, self-support factors, specialized equipment and personnel, weather.

The mission is flown. CAT teams work twelve-hour shifts until the last plane returns to base.

Actual exercises similar to this hypothetical case are microcosms of such large-scale operations as Reforger and are planned by the same people, but with "modules" of logistics, personnel, etc., "plugged" quickly into a basic operational plan to deal with an airlift emergency.

Handling such a situation in real life can be very unpredictable.

The initial word from the small US diplomatic mission in Georgetown, Guyana, confirmed that a US congressman and several others had been murdered at Jonestown, the colony of an obscure American religious cult in Guyana.

The National Military Command Center in the Pentagon alerted MAC that airlift would be needed to retrieve the dead and evacuate an undetermined number of wounded.

The CAT at MAC headquarters quickly got a C-141 from the 437th Military Airlift Wing, Charleston AFB, S. C., airborne. Aboard were an aeromedical evacuation team, an Air Force flight surgeon, a Navy pathologist, and a MAC Combat Control Team to provide security. This group arrived in Georgetown, Guyana, after a five-hour flight and immediately began treating wounded flown there from Jonestown's landing strip by light plane.

But as the full horror of events at Jonestown was revealed, it became clear that a major airlift would be required. The Joint Chiefs ordered the establishment of a joint task force composed of the US Southern Command (to provide staffing); US Readiness Command (Army units and light helicopters for in-country operations); and MAC (working with the CAT, its Twenty-first Air Force controlled all airlift during the operation). Communications gear and consular officials were flown into Georgetown, set up as a support base.

At Jonestown, the command post site, the extent of the tragedy made apparent the need for large helicopters. Three heavy-lift HH-53s from MAC's 55th Aerospace Rescue and Recovery Squadron, Eglin AFB, Fla., were flown to Guyana, refueled en route by Air Reserve HC-130Ns. In shuttling out the bodies of the Jonestown victims, these helicopters would fly

some thirty missions totaling ninety-six hours.

Also flown to Guyana to assist in the tragic evacuation were hundreds of Air Force and Army personnel: medical and graves registration teams, communications and other specialists, and support troops. It may be pointed out that, in the Jonestown tragedy, the armed forces were the only organizations trained and ready to meet the unique emergency situation.

Thus, what began as a one-aircraft mission on November 18 quickly grew into an operation that at its height involved thousands of people, scores of air bases, and almost seventy

rates of MAC's C-5s and C-141s would be several times those of peacetime operations), segments of it are conducted from time to time, MAC officials said.

The Readiness Initiatives Group in DCS Ops Plans is composed of senior officers who ponder—and come up with answers to—the “What if?” questions composed at various levels and relayed to it through normal channels.

The contingency plans are constantly updated to reflect evolving global situations, and, with the help of a computer, various alternatives can be cranked in for testing. In this, DCS



Above, a “stretched” C-141 (YC-141B), one of such planes that will add substantial airlift capacity to MAC’s fleet of strategic transports. For strategic airlift, MAC relies on its force of some seventy C-5s and 230 C-141s like the aerial workhorses, right, shown at Rhein-Main AB in Germany.

transport missions. With completion of the re-deployment phase on November 28, the MAC Crisis Action Team stood down.

Planning for Contingencies

At MAC headquarters, DCS Operations Plans is tasked with contingency planning; that is, preparing MAC for any emergency from a full mobilization of US forces at the outbreak of a war to the evacuation of US citizens from countries where trouble is brewing and their lives are threatened.

According to Col. Alexander A. Vivona, Jr., “DCS Ops Plans also focuses on any initiative that will enhance MAC’s capability to deploy US fighting forces and equipment. Under the Joint Operation Planning System, MAC is directly responsible to the JCS.”

While a contingency plan for full mobilization could never be tested in peacetime because of the enormous cost and other factors (surge



Operations Plans works closely with other unified commands to identify requirements—such as the units involved—for contingencies they’re studying. This data is integrated into MAC’s contingency flow schedules.

CINC MAC

At his morning briefing, CINC MAC General Moore is informed, among other things, on the status of his aircraft resources. Through Command-wide computer inputs, he is told the

location, numbers, and types of operational planes, those under repair, and the whereabouts of aircraft flying missions around the globe.

MAC assets consist of about seventy C-5s, 230 C-141s, and 230 C-130s, plus 256 C-130s, sixty-four C-123s, and forty-eight C-7s of the Air National Guard and Reserve. In addition, MAC can count on 298 civil transports, the Civil Reserve Air Fleet (CRAF) contingent (*see below*)—a total of roughly 1,200 aircraft. Despite the size of this airlift force, General Moore envisions a future in which MAC's airlift forces could be stretched ominously thin in meeting contingencies.

The CINC MAC pointed out that the growth in refueling capability provided by the upcoming KC-10 will mean that MAC airlifters can operate to Europe, the Mideast, and the Pacific "without having to rely on other countries to let us land and refuel."

The CINC MAC also makes a good case for the Advanced Medium STOL Transport (AMST). (Funds have been provided in the current defense budget for continued AMST competition between the McDonnell Douglas YC-15 and the Boeing YC-14 for the AMST role, but there is no evidence of a green light for the aircraft's production.) While stretching the C-141, plus the C-5's capacity, and that of the CRAF, makes for a reasonably adequate strategic airlift force, a gap is appearing in tactical airlift because of the continued growth in size and weight of Army firepower. "Our ground forces are simply outgrowing the C-130," General Moore said.

Another factor in the C-130's limitations as a tactical airlifter is that by 1983 MAC will be faced with substantial dollar outlays to keep the aircraft in the inventory. "What is needed is a wide-body aircraft with the speed and lift capability of the AMST that could carry 100 percent of the Army's firepower with fewer aircraft," General Moore said. "While there is not yet recognition by Congress and DoD for the AMST requirement to put it high enough on the priority list for funding, it is essential that ultimately we get this aircraft," General Moore said.

In planning for a NATO contingency, General Moore said, MAC staffers have identified the first 4,000 transport loads critical in the early days of a major confrontation. The ultimate aim is to tag all MAC missions while continuing to update its planning as Army, Air Force, Marine, and Navy requirements change.

MAC staffers are also taking a sharp look at the ninety-six offload bases in Europe and the Mediterranean in terms of contingency readiness, the General said.

In the event of a war in Europe, NATO would not necessarily require complete aerial superiority to safeguard the airlift, although it would have to be protected, perhaps by oper-

ating in escort corridors, the General said, adding that "the problem of reducing the vulnerability of aircraft [in a NATO airlift] is under constant evaluation."

As have other Air Force leaders, General Moore expressed deep concern over the problem of pilot retention, particularly worrisome to MAC since cockpit experience in its transports is directly translatable to commercial airline operation. The temptation to switch from a blue suit to an airline uniform is strong, and so MAC is more affected by the drain than are the other commands.

Civil Reserve Air Fleet

Although it has never had to be activated since its organization twenty-six years ago, the Civil Reserve Air Fleet constitutes a major standby airlift asset. (Commercial airlines were contracted heavily during the Vietnam War to provide flights to and from Southeast Asia; in other instances, where circumstances made it undiplomatic for aircraft with USAF markings to land at foreign airports, commercial airliners flew the missions.)

Each year, DoD purchases about \$200 million worth of airlift from US commercial sources. In fact, almost ninety percent of DoD's annual passenger flights are by civil carriers. The carriers participating in this annual buy are members of CRAF. These carriers, along with other US members of CRAF, have obligated their aircraft for DoD use during emergencies.

In an emergency activation of CRAF, the aircraft would be tasked from MAC headquarters at Scott. MAC staffers work closely with the Department of Transportation in planning for airliner use in contingencies. In this, the aircraft would operate in a strategic mode into a theater rather than tactically.

One major US airlift shortfall is the scarcity of cargo-hauling capacity, since the fleet consists mainly of passenger carriers.

MAC is attempting to rectify this by seeking funds to enhance more than sixty-five 747 equivalent commercial carriers by adding cargo doors and reinforcing the airframe. "However, thus far only \$15 million of a total estimated cost of \$643 million has been allocated," MAC staffer Lt. Col. James W. Poore told AIR FORCE Magazine.

Now in the concept evaluation stage is the C-XX, a large new transport that could be developed jointly and be common to MAC and the civil airlines. Attractive features of this idea are shared development costs, and commonality of parts and maintenance, officials said.

One cannot come away from MAC headquarters without being reassured that serving the nation is a corps of dedicated people trained and ready to respond rapidly when called upon—when the firebell rings in the night. ■

Japan and the Shifting Asian Balance

The Soviets continue to build up their military might in Siberia and the Pacific while US military power declines in Asia and its peripheral regions. Japan, a military midget with the world's third largest economy, has begun to rethink its role in the Far East.

BY JAMES E. DORNAN, JR.

STUDENTS of world affairs have long pointed out that Northeast Asia is one of the most significant geo-strategic pressure points of world politics. Considered in its full extension, embracing the People's Republic of China (PRC), Taiwan, Japan, the two Koreas, Mongolia, and the Asian portion of the Soviet Union, Northeast Asia today contains the greatest concentration of military forces of any comparable region of the world. Only in Northeast Asia do the interests of the USSR, the US, the PRC, and Japan directly intersect. Their relations in the region are, moreover, complicated by the presence of several smaller powers, two of which, armed to the teeth, face each other in bitter hostility across a fragile truce line.

Growing Soviet Military Power in Northeast Asia

Northeast Asia at the moment appears on the surface to be relatively stable, with an uneasy "peace" enforced by an equilibrium of political and military power. Substantial changes in the distribution of power in the region, however, are clearly under way. Foremost among these changes—and the catalyst for many of the others—has been the enormous growth of Soviet military power in Asia during the past decade. For some years the Soviets have deployed more than forty mechanized and infantry divisions along their lengthy border with the People's Republic of China. These forces, however, have traditionally received lower priority than Soviet military units deployed in Europe: They have been manned at fifty percent to seventy-five percent of authorized strength and have received smaller quantities of new equipment.

All that is changing. The 6th Airborne Division, for example, has recently been brought up to its full complement of 7,200 troops. It now contains three parachute regiments, complete with their own artillery, antitank weapons, and combat engineers. New An-22 transport planes are being deployed in Asia to replace older An-12 models. The Soviet Siberian and Far Eastern air forces are being rapidly modernized as well. Over the past four years, Soviet tactical air capabilities in Asia have increased substantially. Older model MiG-21s and MiG-17s are being replaced by six new types of tactical aircraft: late-model MiG-21s, much more formidable machines than earlier models; Su-17 Fitter Cs; Su-19 Fencers; MiG-23 Floggers; MiG-27s; and MiG-25B reconnaissance planes. There are now more than 2,000

Soviet combat aircraft in Asia, including 500 bombers, 1,400 interceptors and fighter-bombers, and 140 patrol planes. During the past five years, the Soviets have constructed twenty new airfields in the region, bringing their total to more than eighty. Recent reports suggest that the new SS-20 MIRVed mobile missile has been deployed in the region, some at the major Soviet base at Komсомolsk on the Amur River north of Manchuria.

It has been the growth of the Soviet Pacific Fleet, however, that has stimulated most of the concern in Asia and the United States. The USSR now has more than 750 ships deployed in Asian waters, including ten cruisers, eighty destroyers and other escort vessels, and 125 submarines, at least fifty of which are nuclear-powered. These ships include some of the most modern in the Soviet navy: *Kresta I* and *Kresta II* cruisers equipped with cruise missiles, *Kashin*-class destroyers, *Grisha*-class frigates, *Ropucha* landing vessels, and a variety of conventional and nuclear-powered subs carrying cruise missiles.

The Soviet base structure in the region has undergone a comparable expansion. Major facilities already exist at Vladivostok, on the Sea of Japan, at Petropavlovsk, on the Pacific, and at Sovetskaya Gavan, on the Soviet coast opposite Sakhalin Island. Recent reports indicate that the Soviets may be expanding their existing naval air station at Korsakov on Sakhalin into a major port facility as well.

The Soviet Pacific Fleet now operates widely in the region in support of Soviet foreign-policy objectives, and has been doing so since 1967. In 1968, for example, sixteen Soviet vessels interposed themselves between the North Korean coast and the *Enterprise*-led US naval task force deployed to the region in response to the seizure of the US reconnaissance vessel *Pueblo*. In 1971, the Soviets undertook large deployments of combat ships to the Indian Ocean in response to Western naval activity during the Indo-Pakistani War, and again to the South China Sea in 1972 during the US mining of Haiphong harbor.

Earlier this year, as negotiations between Tokyo and Peking on the Sino-Japanese Friendship Treaty moved into their decisive stage, the USSR conducted a joint airborne-amphibious exercise on Etorofu Island just north of Hokkaido, one of the four islands in the Kurile chain seized at the end of World War II and still claimed by Japan. Soviet ships operate continuously in the Sea of Japan on such a scale that Shin Kanemaru, Director-

General of the Japanese Defense Agency during the Fukuda government, observed early last year that the Sea of Japan had become a "Soviet lake."

The American response to these developments, in the minds of many observers on both sides of the Pacific, has been uncertain. American military power in Asia has been declining since the United States began to wind down its military role in Vietnam in the early 1970s. The Carter Administration, in particular, appears convinced that hostility between Moscow and Peking imposes severe constraints on Soviet freedom of action in Asia, and that no significant expansion of non-Communist military strength in the region to counter the Soviet buildup is necessary.

While Administration spokesmen have repeatedly reaffirmed the US commitment to the Western Pacific, Asian observers are more impressed by the President's reiterated determination to withdraw all US ground combat forces from Korea, by the decline of the US Seventh Fleet to a total of fifty ships, and by public reports that US global military planning calls for transfer of military assets from Asia to Europe in the event of major war between the US and the USSR. Even US Ambassador to Japan Mike Mansfield, in his Senate days an advocate of reduced military commitments around the world, has expressed concern that President Carter has been paying too little attention to Asian problems and too much attention to Europe.

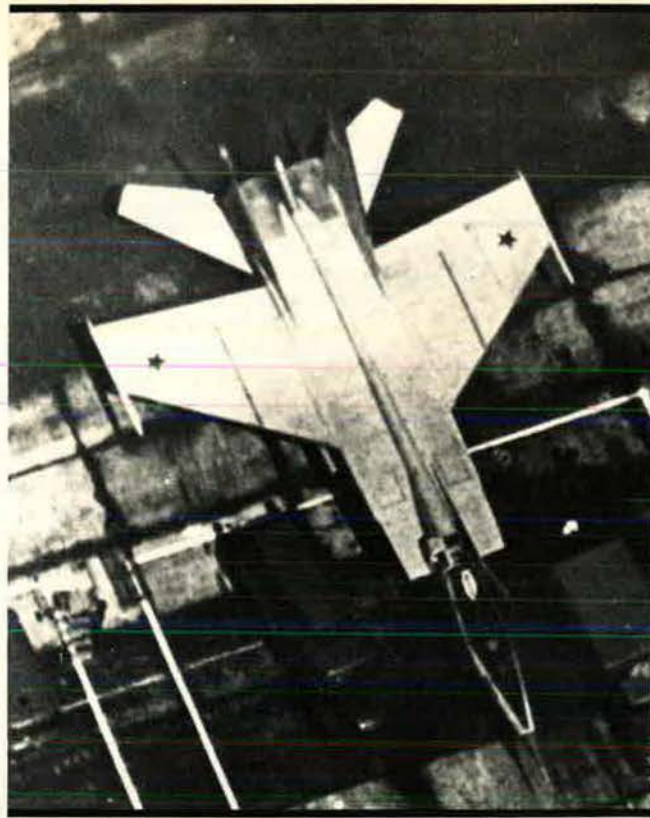
Indicative of the alarm aroused in Asia by the growth of Soviet military capabilities has been the major shift in the foreign policy of the PRC during the past decade. The favorable Chinese response to President Nixon's "opening to Peking" in 1971 was, most observers feel, in large measure inspired by Chinese alarm over the Soviet threat. In recent years, the world has been treated to the amazing spectacle of Chinese officials traveling around the world urging free world nations to arm themselves against the Soviet menace, demanding that the European members of NATO do what they can to prevent the United States from signing the SALT II agreement with the Soviet Union, and suggesting that an expansion of Japan's military capabilities would contribute both to stability in Asia and peace in the world. This last point is particularly noteworthy, since as recently as 1970 a major theme of Peking propaganda was the danger to the independence of the small Asian nations posed by the alleged revival of militarist sentiments in Japan.

Japan's Anomalous Role

China is not the only Asian nation that is reassessing its role in international politics. A similar process is under way in Japan, although it is not yet clear what the outcome there will be.

Commentators have grown accustomed to referring to Japan as an economic giant but a military and political pygmy. This characterization is fundamentally true. Japan has one of the world's three largest economies; although its total defense budget is the tenth largest in the world, its military force is too small and inadequately equipped to deal with the variegated threats to Japan's national interests that could arise in the future—and far smaller than its economic might is capable of supporting.

Japanese defense expenditures have not exceeded one percent of Japan's GNP since 1966—a self-imposed limit



The MiG-25B is one of six new types of aircraft the Soviet Union is using to modernize and increase its tactical air capabilities in Asia.

to which the newly elected Prime Minister, Masayoshi Ohira, has promised to adhere. The Japanese Defense Agency, ostensibly the equivalent of the US Department of Defense, is not a full ministry, nor does its Director-General hold full cabinet rank. There is no standing committee on defense in the Japanese legislature (the Diet), and until recently it was official doctrine that there were no military threats to Japan's security that required contingency planning by the armed forces. Officially, Japan has no army, navy, and air force: Japan's armed forces continue to be designated as the Self-Defense Forces (SDF), with Ground, Maritime, and Air sections.

The reasons for Japan's acceptance of this anomalous international posture—which, incidentally, is sharply at variance with Japanese behavior in the prewar period, when she was deeply caught up in the imperialist power politics of East Asia—have often been discussed. Principal among them has been the attitude of the United States. Stimulated by what one commentator has called "the messianic idealism" of Gen. Douglas MacArthur and persuaded that among the principal causes of World War II in Asia was the authoritarian nature of the Japanese political system, the US decided in 1945 to change that system and, in the process, to prevent Japan from ever again having the military capability to threaten her neighbors. American policies were facilitated by the presence in Japan of a group of like-minded political idealists led by Kijuro Shidehara, as well as by the demoralizing effects upon the Japanese public of the nation's military defeat and of the Hiroshima and Nagasaki nuclear attacks.

Japan's acceptance of a "pacifist" role in the interna-

tional political system was made easy by the political conditions that prevailed in Asia during the postwar period. The attention of the Soviet Union and United States was focused upon Europe, while China was torn apart by a civil war that totally absorbed its energies. Finally, particularly after the Korean War and the signing of the Japanese-American Security Treaty in 1952, Japan's alliance with the US seemingly made unnecessary any concern with security questions.

The "New Spirit"

Within the past several years, however, a combination of events has coalesced to stimulate in Japan a fundamental reexamination of the nation's current international role. One Japanese observer has traced the beginnings of new attitudes on international security questions to 1969, when the island of Okinawa reverted to Japanese control—an event regarded by many Japanese as a key indicator marking the end of the post-World War II era of political dependence on the US.

Several other events during the early years of the Nixon Administration contributed to the emergence of a "new spirit" on foreign-policy questions. The Nixon Doctrine itself was interpreted in some Japanese circles as presaging a US disengagement from the Pacific. The so-called "Nixon Shokku" of 1971, involving the "opening" to Peking and various unilateral initiatives on important economic issues, made it clear to Japanese leaders that the United States would attend to its own interests regardless of the impact on Japan. The collapse of the US position in Southeast Asia in 1975 and the announcement by the Carter Administration early in 1977 that United States ground combat forces would be withdrawn from the Korean peninsula over the course of the next several years dramatically reduced the confidence of many Japanese opinion leaders in American power and in America's reliability as an ally. Public confidence also was shown to be badly shaken in a poll taken by the *Yomiuri Shimbun* early in 1978, in which only nineteen percent of the Japanese people expressed confidence

that the United States would come to the defense of Japan in the event of external aggression.

For the past several years, moreover, official Japanese concern over the growing military power of the Soviet Union has been increasing steadily. Soviet achievement of strategic parity with the United States, increasing incidents of Russian intrusion into Japanese airspace and the growing Russian naval presence off Japanese coasts, and Russian intransigence in negotiations over the return to Japan of the four islands in the Kurile chain, which the USSR seized at the end of World War II, have all prompted a new look in official circles at the precarious state of Japan's military preparedness. In releasing the 1976 Japanese Defense White Paper, Takuya Kubo, then Secretary-General of the National Defense Council, asserted that "the U.S. has been replaced by the Soviet Union as the predominant military power in the Far East." Soviet air and seapower in the region, he said, are "vastly superior" to similar US forces, and constitute a growing threat to the security of the non-Communist states in the Western Pacific.

The 1977 Defense White Paper treated such questions even more thoroughly. Pointing to Soviet deployment of "large land-based ICBMs with massive yield warheads," the White Paper concluded that "the strategic arsenal of the Soviet Union is now numerically superior in almost every indicator to American weaponry." As a consequence, the document continued, "there is growing anxiety that such Soviet efforts might lead to the relative superiority of the Soviet Union in mutual nuclear deterrence, thus placing the Soviet Union in a politically advantageous posture over the U.S. . . . Such a development," the White Paper concluded, "could affect the trust of the Western powers in the U.S."

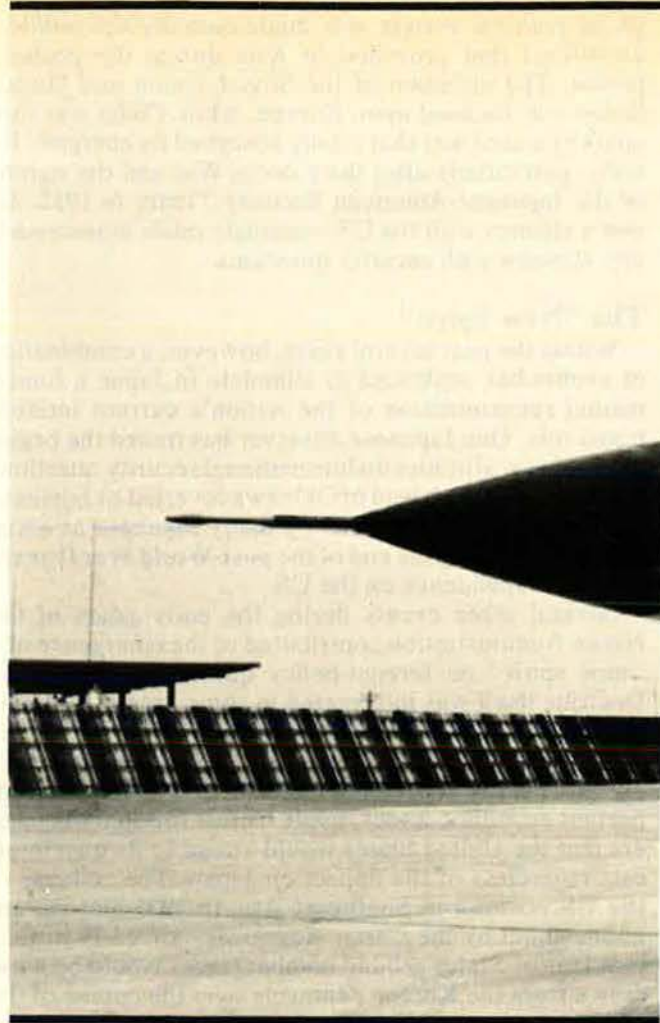
The 1978 White Paper was presented to the press by Ko Maruyama, Vice Minister of the Defense Agency. Maruyama specifically called attention to the Soviet naval buildup in the Pacific, and forthrightly labeled that buildup a direct threat to the security of Japan—a clear departure from prevailing Japanese practice. The report



More than 750 modern Soviet ships, such as this Kashin-class guided missile armed destroyer, are deployed in Asian waters.



The growth of Japanese military capabilities is seen in the Type 74 battle tank with its advanced fire-control system and British-designed 105-mm gun, and the F-1 close-support fighter and Haruna-class destroyer, all designed and built in Japan.



noted Japanese "apprehension" over the planned US withdrawal of ground combat troops from South Korea, observing that the withdrawal "not only may affect the actual military balance but, still worse, may give an impression that the U.S. commitment to the defense of South Korea is being eroded." The report stressed the need for continued Japanese reliance on the security treaty with the United States, but asserted that "nebulous expectations and one-sided reliance" upon the United States should be ended, and called for more efforts by Japan to provide for its own security.

Heightened government concern with security questions is also reflected in the new attention being devoted to long-range planning within the agencies concerned with defense. In 1978, the then-Defense Agency Director-General Shin Kanemaru instructed the Joint Staff Council of the SDF to prepare a plan for joint military operations in the event of a foreign attack. This will be the first such detailed study undertaken by the Japanese armed forces since the so-called Mitsuya or "Three Arrow" plan, which stirred a wide debate over civilian control of the military in the mid-1960s.

Relations With the US

There also is a new interest in expanding the mechanisms for formal cooperation with the United States on defense matters. Existing institutional arrangements for such cooperation are widely regarded as



Japan as inadequate. The Joint Japanese-American Security Consultative Committee (SCC), established in 1960 at the time of the revision of the security treaty, has in the main failed to address central Japanese concerns, particularly as Japanese perceptions of the emerging Soviet military threat have grown more acute. Japan's Foreign Minister Sonoda, after first suggesting that the membership of the Committee should be changed to include the defense ministers of both nations, recently proposed that a new, higher level consultative organization be created at the Cabinet level. Its membership would include the Japanese Foreign Minister, the Director-General of the Defense Agency, and the US Secretaries of State and Defense. US reaction is still uncertain.

There also exists under the SCC a joint Subcommittee for Defense Cooperation, established in 1976 to discuss

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ways of achieving the purposes of the Security Treaty. This committee has failed to live up to Japanese expectations, primarily due to its failure to work seriously toward developing a detailed combined plan to defend Japan in the event of an external attack. There have been reports that JDA Director-General Kanemaru proposed to Defense Secretary Harold Brown, during their meeting in June 1978, a joint plan for defense of the Pacific sea lanes in the event of war in the Pacific. Neither the details of the plan, nor the US reactions, have been discussed publicly.

Even the question of a possible nuclear capability for Japan is now talked about more openly than before—by government officials as well as others. All Japanese public officials in the postwar period have, of course, stated unequivocally that Japan has no intention of acquiring nuclear weapons, and public opinion polls continue to show that an overwhelming majority of Japanese oppose a nuclear-armed Japan. Nevertheless, an early 1978 discussion in the Diet of the constitutionality—as opposed to the desirability—of such a step stimulated little of the hysterical reaction from the media or the opposition party leaders exhibited under such circumstances in the past. Most observers agree that drastic changes in the international environment and in Japan's own security situation could bring about a change in Japanese attitudes toward the nuclear option.

The nuclear issue aside, the outlook on defense issues

of many opposition political leaders appears to be changing dramatically, while that of the Liberal Democratic Party (LDP) leadership continues on the path of recent years. The mainstream of opinion in the governing party continues to favor the maintenance of the Japanese-US security relationship and the gradual expansion of the nation's military capabilities. Little change in the LDP's position on defense questions is expected under the government of Masayoshi Ohira, although the apparently growing popularity of the more hawkish Yasuhiro Nakasone suggests that in the future the center of gravity in the LDP may shift in a more overtly prodefense direction.

More interesting are changes in the public positions of the Democratic Socialist (DSP) and Komeito parties. The DSP, which for years campaigned for a phased abrogation of the security treaty with the US, now sees it as "an important element to keep the balance of power in Asia." So, too, the Komeito, which formerly argued that Japan should negotiate with the US on a cancellation of the treaty. In the new platform just presented to the Party's annual convention, the Komeito approved the maintenance of the Self-Defense Forces and of the Japan-US treaty. Polls taken by the Prime Minister's office in late 1977 show that seventy-eight percent of those who support the Japanese Socialist Party and fifty-five percent of those who vote for Japan Communist Party candidates favor maintaining the SDF, even though the official platforms of those parties continue to call for abolishing the armed forces.

More significant still are shifts in attitudes toward security issues, which have occurred among the Japanese public at large during the past eighteen months. Extensive survey research has shown that during the postwar period Japanese citizens by and large have not believed their nation to be seriously threatened by external enemies. As many commentators have pointed out, this outlook has led to a low level of interest in security issues and in the state of Japan's military preparedness.

In a fall 1978 poll taken by the *Asahi Shimbun*, however, sixty percent of the public indicated at least some interest in defense questions, one of the highest totals ever recorded for this position. Fifty-seven percent of the Japanese public believes that the strength of the SDF should be maintained at its current level and nineteen that it should be increased—once again among the highest totals ever recorded for such positions in the postwar period.

Finally, while a 1977 poll conducted by the JDA found that only seventeen percent of the Japanese favored an increase in defense spending, a mid-1978 survey showed that thirty percent support such an increase. While it would be a mistake to conclude from this limited data, generated at a time of heightened concern over the growth of Soviet strength, that a massive or permanent shift in Japan's national outlook on defense questions has occurred, there can be no doubt that significant changes, both in official circles and among the public at large, are under way.

Military Capabilities

The growth of Japanese military capabilities has been severely restricted throughout the postwar period by the "pacifism" mandated by Article IX of the Constitution

and by the prevalence of the view that there exist no military threats to Japan's security. The size of the armed forces has thus been based on the assumption that at worst Japan would have to defend itself against a relatively minor incursion—from what quarter has never been specified—into its home territory.

The ground forces, authorized for some time to reach a level of 180,000 men, have not been able to attract enough recruits to reach that point in recent years; the JDA hopes that troop strength will reach eighty-six percent of the authorized level this year. The ground forces are organized into twelve infantry divisions and one mechanized division, with assorted special-purpose

Attitudes on defense in Japan may be changing, but these changing attitudes have yet to be reflected in procurement programs tailored to the changing military balance in Northeast Asia.

brigades. Some ground force equipment compares favorably with that of other major free world armies.

Noteworthy is the Type 74 battle tank, first deployed in 1975. It has an exceptionally well-profiled turret, a British-designed 105-millimeter gun, and an advanced fire control system and a special hydraulic system that permits an extremely low profile for combat operations. More than 100 have already been procured, and forty-eight will be delivered during the current fiscal year.

The Japanese ground forces also have nearly 600 earlier Type 61 medium tanks, and about 100 US M-4 Walker Bulldogs of Korean War vintage. Other new mechanized vehicles currently being procured include the Type 73 armored personnel carrier, the Type 73 155-mm self-propelled howitzer, and the Type 74 105-mm self-propelled howitzer. In recent years the ground forces have also received a number of Type 30 battlefield missiles with a range of thirty km, and Type 64 antitank missiles with an effective range of up to 1,500 meters. A longer-range antitank guided weapon is being tested. None of these weapons, however, is being purchased in large enough numbers to provide the ground forces with an effective defense against a modern army of substantial size.

The Japanese navy is in a similar situation. Although it is the most modern of the indigenous fleets of Asia and its ships and aircraft are in general superbly maintained, it is clearly too small to be much of a factor in the regional naval balance. The Maritime Self-Defense Force now has 149 ships, including thirty-two destroyers, three

equipped with missiles and two having a significant ASW helicopter capability.

All of the destroyers now in service were designed and built in Japan. There are fifteen additional escort vessels suitable for blue-water activities, twenty-nine patrol craft designed basically for coastal defense, forty-two mine warfare vessels, and sixteen submarines. One additional missile destroyer of the highly regarded *Tachikaze* class is under construction. It will be equipped with the Standard ARM missile, ASROC, and two Mark 32 torpedo tubes. The new destroyer will carry the Harpoon antiship cruise missile. Many of the Japanese destroyers are equipped with a hull-mounted sonar similar to the US SQS-23 and with Swedish-designed Bofors ASW rockets and ASROC, but only eight of the submarines are truly modern vessels capable of ASW operations in deep ocean waters.

More than half of the aircraft assigned to MSDF are fitted for antisubmarine warfare, the best of these being P-2V and P-2J Neptunes. These are to be replaced over the next eleven years by forty-five P-3C Orions. Overall ASW capabilities thus do not match the threat posed by the growing Soviet undersea fleet. Moreover, the navy lacks effective air defense and ECM capabilities, sea-based tactical air capabilities, sea-going replenishment vessels, and, of course, offensive striking power of any sort. None of these deficiencies will be significantly remedied by planned procurement programs.

In many respects, the Japanese air force is the weakest element of the Japanese Self-Defense Forces. The defecting Soviet MiG-25 Foxbat that landed on Hokkaido Island in September 1976 revealed fundamental deficiencies in the detection and tracking capabilities of Japan's air defense system as well as in command and control procedures. The air force itself is equipped with obsolete or obsolescent aircraft in every category, and has few modern strike and ground support machines.

There are presently 358 combat aircraft in the ASDF, organized into ten interceptor squadrons, six flying the F-104J and four the F-4EJ. Most of the latter were produced under license in Japan. There are also three ground attack squadrons flying the F-86F Sabre, now being replaced by the Japanese-designed and built F-1, a single-seat, close-support fighter version of the Mitsubishi T-2 supersonic trainer. The F-1 carries a multibarrel 20-mm cannon, and can be loaded with two to four air-to-air missiles and two air-to-surface missiles or rockets. It can also deliver eight to twelve 500-pound bombs. Fully loaded, its combat radius, depending on mission profile, is from 190 to 300 nm.

After lengthy debate, the JDA recently decided to procure 100 US F-15 Eagle air-superiority fighters over the course of the next decade, twenty-three of them to be delivered during Fiscal Year '79. The F-104s will gradually be phased out, at the rate of one squadron per year. Fifteen F-1s are also being procured during Fiscal Year '79. No decision has as yet been reached on the future of the F-4s, which are still being delivered to the Air Self-Defense Force.

The Unanswered Questions

It is obvious that the Japanese armed forces by themselves provide no answer to growing Soviet military ca-

pabilities in Asia, whether one considers the primary threat to be from the air, the sea, or the ground. Attitudes on defense in Japan may be changing, but these changing attitudes have yet to be reflected in procurement programs tailored to the changing military balance in North-east Asia. At the moment, Japanese military power remains at best a supplement to American power in the region, power that is declining steadily relative to that of the principal American—and Japanese—adversary.

Japan today remains fundamentally a nation adrift, without a clear strategy for dealing with international politics. For approximately the last 100 years, Japan has had a clearly identifiable goal: to "catch up with the West." In prewar days it was to be attained through the creation of a colonial empire. In the postwar era of American economic and military dominance, the goal was defined essentially in economic terms, and "catching up" was equated with acquiring a per capita income equivalent to that of America—and the advanced European powers. During this period, rapid economic growth was pursued with a single-minded enthusiasm.

At about the time of the Meiji Centennial, in 1968, it became clear that this goal, in terms by which it had been historically defined, was in sight. Thereupon, a very considerable policy debate developed centering on the key question: "What should Japan do next?" As a part of this debate, the possibility of seeking great-power status was first raised, then firmly rejected in favor of continued emphasis on economic growth and development. At the time, however, the strategic and economic environment was very different from that prevailing today. The defense issue is now being raised again, at a time when confidence in America is waning. When the debate over Japan's long-term future again becomes a central issue, which is likely to happen in the near term, it is almost certain to include a serious discussion of national security and Japan's option to become a great power in fact as well as in potential.

That discussion will inevitably focus on broad questions of national strategy as well as national purpose, and will inevitably raise fundamental questions concerning Japan's relations with existing allies and friends. Should Japan reduce its reliance on the United States, and perhaps enter into a new, more organic relationship with Mainland China? Or should Japan become a full partner rather than a weak dependency of the United States, and seek a new division of labor concerning security arrangements in Asia? Should it go beyond the US relationship in thinking about new defense arrangements for the region, and consider a more extensive arrangement involving also such free-world nations as the Republic of Korea? Only when such fundamental questions as these have been answered can the future roles and missions, and therefore the future size, of the Japanese armed forces be determined.

Serious thinking about these issues is at least beginning. Alone of the major contemporary nations, Japan has, as a consequence of a fortuitous concatenation of circumstances, been afforded the luxury of an opportunity to think through the requirements of a viable national security posture, relatively unencumbered by earlier decisions on the size and capabilities of its armed forces. Japan's military potential is vast. The next five years may determine whether it exploits that potential wisely. ■

To counter the Warsaw Pact's numerically superior, highly mobile forces, USAF must provide ground and air commanders fast-reacting, near-real-time reconnaissance. Innovations in equipment and tactics to meet this demand are making . . .

Tac Recce: A Different Breed of Cat

BY LT. COL. JOHN P. KELLY, USAF

IT IS cold and drizzling outside, and low clouds cover the surrounding European countryside. The time is 0400 hours as two crew members walk across the wet flight line toward a lone RF-4C Phantom II reconnaissance aircraft. They are met by the crew chief, and the pre-flight begins.

The mission this morning is to locate major elements of the enemy's second echelon as it sweeps through the German countryside toward its objective. The challenge for the recce bird and its crew is immense. They must locate their target, accurately assess it, and pass the vital information back to air and ground commanders in time for a reactive strike to be carried out. The aircrew will be facing the most sophisticated and integrated air defense system in the history of warfare. Mother Nature isn't helping out either. The weather is lousy!

Except for the cold weather, this scene would be typical of a pre-launch setting ten years ago during the Southeast Asia conflict, and, although the aging RF-4C looks the same as its SEA predecessors, a closer inspection of *this* Phantom reveals a different breed of cat!

And a New Ball Game

Traditionally, tactical air reconnaissance (Tac Recce) has been employed for either prestrike or poststrike photography. Prestrike reconnaissance—locating and recording enemy targets—was used to gather or confirm information on targets to be struck at a later time. Poststrike reconnaissance, on the other hand, was used primarily for battle-damage assessment (BDA)—photographically verifying the extent of target destruction.

The action has changed dramat-



RF-4Cs, equipped for Quick Strike Reconnaissance, can locate and identify targets, relay their location to an interpretation center, stand by until tactical fighters arrive, and then pinpoint the target with a laser beam.

ically, however. No longer can tactical commanders wait long hours for confirmation of enemy activity. And although fixed targets are still important, the highly mobile and numerically superior adversary we face in Europe has created the need for quick reacting, near-real-time reconnaissance.

With this in mind, Tactical Air Command together with industry is updating existing reconnaissance aircraft and systems, revising outmoded tactics, and further refining the fighter/recce interface. The objective is threefold: First, to perform reconnaissance around the clock and in bad weather; second, to reduce the time it takes for intelligence information to reach the decision-makers—the time between the initial tasking (fragging) and the strike decision; and third, to tie strike forces into this reconnais-

sance cycle so that time-sensitive targets can be struck immediately when the tactical commander decides it is essential.

New Recce Systems

Several new systems are being developed to meet these objectives. They include a data-link capable Side-Looking Airborne Radar (SLAR), a Tactical Electronic Reconnaissance (TEREC) system, and a Quick-Strike Reconnaissance (QSR) system. The new SLAR system is an improved version of the one developed for operations in Southeast Asia. Used primarily for standoff border and area surveillance, the newer system interfaces with a ground-based data link receiving and processing facility having a near-real-time exploitation capability.

The Tactical Electronic Recon-

naissance system performs all-weather collection of signals radiated from ground-based acquisition, tracking, and fire-control radars. This emitted data is then transmitted via data link to a ground collection and exploitation system.

The Quick Strike Reconnaissance system is a complex mix of on-board subsystems, other aircraft, and ground equipment. One of its purposes is to provide the ability to strike time-sensitive targets quickly.

Quick Strike Reconnaissance Employment

The QSR concept employs specialized RF-4C sensor and relay aircraft. The sensor aircraft locates and identifies time-sensitive targets, transmits target information through the relay bird (via data link) back to an interpretation facility, which processes and retransmits the data to a combat command center. Airborne fighters can then be directed to the QSR sensor aircraft, which has the ability to pinpoint the targets for them with a laser beam. Sounds a bit like "Star Wars," doesn't it?

The heart of the QSR package is the ARN-101, a digital avionics computer system developed by Lear Siegler, Inc. This central processor uses Loran and inertial inputs to provide precise navigation and steering information and also controls the operation of subsystems within the QSR package.

Some examples of these subsystems are:

- The AAD-5, a high-resolution infrared line scanner that generates infrared (IR) images, which it records on film. The AAD-5 can data-link the IR information down to a ground station.



The RF-4C rocket pod carries seven 2.75-inch white phosphorous rockets used to mark targets. A strike aircraft, following shortly behind the reconnaissance aircraft, uses the rockets' white cloud to fine-tune ordnance delivery.

- The AN/AVQ-26 (PAVE TACK), a device located in a pod mounted on the centerline station or inboard wing station of the RF-4C, containing an imaging infrared sensor with laser ranging and designator capabilities. The PAVE TACK subsystem will allow QSR recce crews to accurately determine slant range and illuminate targets for laser-seeking weapons delivered by strike aircraft.

- The MOVITAS III (Modified Visual Target Acquisition System), a Buck Rogers-type device, is a helmet-mounted sight that can provide the pilot line-of-sight target designation and sensor cueing through the pilot's head movements.

There are other subsystems integrated into the QSR package that will further improve the real-time capability of Tac Recce. Not only

will we have an enhanced all-weather capability of locating lucrative targets, but with the help of the PAVE TACK subsystem we will be able to do something about those fleeting targets.

SCAR

Another recent development for recce is Strike Control and Reconnaissance (SCAR). The SCAR concept in itself is not new. It has, in one form or another, been employed in every past conflict using airpower. SCAR in its broad sense is merely pathfinding—that is, locating and marking targets for strike aircraft. Today's threat scenarios require the ability to locate, identify, and mark mobile enemy forces in a high-threat environment before they engage friendly forces. Since recce crews are trained at low-level, high-speed,

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visual target acquisition, they are well equipped for the SCAR role.

Another reason for using reconnaissance aircraft in this role is that it saves the strike aircraft some vulnerable "float time"—the time needed by the fighters to find a target and maneuver into position for an attack.

The best way to explain SCAR is to describe a typical mission. Most SCAR missions have six main elements: target development, rendezvous, ingress, strike control, damage assessment, and egress.

- **Target Development.** Each SCAR crew becomes intimately familiar with specific areas of the battlefield. Before launch, the crew gets the latest intelligence updates and target priorities, then proceeds at low level and high speed to that area and pinpoints the targets. The SCAR aircraft then moves to a pre-designated rendezvous (RV) point to pick up the strike aircraft.

- **Rendezvous.** Strike aircraft may be allocated to the SCAR crew in one of several ways: Fighters on alert can be launched and proceed to the RV point. Aircraft already airborne can be diverted from targets of lower priority, or an attack flight can preplan a SCAR rendezvous at a prebriefed time and location.

- **Ingress.** After rendezvous the SCAR bird will lead attack aircraft to the target, normally at very low level to avoid detection. Fighter spacing is determined by the enemy defense. The fighters, now freed of the prime responsibility of navigation, can devote more time to visual search and protecting themselves.

- **Strike Control.** The actual attack phase begins at a point called the Attack Reference Point (ARP), located along the ingress route and

at a predetermined distance from the target. The ARP is "marked" by the SCAR bird, using photoluminescence cartridges ejected from the aircraft. These "carts" produce a brilliant flash and a puff of smoke in the air. The fighters, close behind, now have a reference point from which to plan their pullup or "pop point." The next step is to actually mark the target. The recce crew continues from the ARP to the target and marks it with either forward-firing white phosphorous rockets or photoflash carts. By this time, the fighters have started their attack and need only to pick up the target mark to fine-tune their delivery.

- **Damage Assessment.** Recce's job is far from over. After marking the target, the SCAR crew proceeds to a point just outside the target area, rolls into a hard turn, and visually observes the results of the strike. Immediate photographic evidence is obtained by the SCAR aircraft's side-looking, obliquely mounted camera.

- **Egress.** The SCAR recce bird finishes the mission by rejoining the fighters and leading them out of the area, again at very low level and at high speed.

The SCAR concept works well and gives the air commander still another option to use in a complex, high-threat arena. SCAR crews train daily in this role. Selected crews from the active reconnaissance squadrons at Shaw AFB, S. C., and Bergstrom AFB, Tex., together with participating fighter units, practice SCAR tactics during such training exercises as Red Flag, Blue Flag, and joint service maneuvers.

Training

To meet the demanding challenges of modern air warfare, reconnaissance aircrews go through extensive initial and upgrade training programs. The fledgling reconnaissance pilot or weapon systems operator (WSO) fresh from undergraduate pilot or navigator training completes a seventy-seven-training-day program that encompasses fifty to seventy-five hours of flying, thirty-four hours in the "box" (simulator), and fifty-four to seventy-five hours of ground school at Shaw AFB, the home of Tac

Recce. Individually at first during the transition phase, and then as a crew, recce pilots and WSOs learn how to operate the RF-4C. They are taught the fundamentals of low-level, high-speed navigation, then how to employ the aircraft and equipment tactically.

The recce aircrew member is mission-qualified on graduation, but his training is far from over. Soon after he reports to his operational squadron, he begins his theater checkout and training. The squadrons require their crews to operate in all-weather conditions, at high speeds, and very low altitude. Thus, the training never stops. Missions flown at nine to ten miles a minute at altitudes approaching 100 feet are typical and demand precision flying and pinpoint navigational accuracy. Low-altitude sorties flown in the mountains, at night, and in bad weather, using a five-inch-diameter radar picture to follow the terrain, demand supreme crew coordination, faith in yourself, each other, and the equipment, plus a whole lot of guts! The flying is tough and demanding but essential if reconnaissance crews are going to survive in any future conflict.

With the emergence of photoreconnaissance satellites, remotely piloted vehicles, and more complex sensor systems, cynics think the days of manned tactical reconnaissance aircraft are numbered. True, the new unmanned systems will provide additional battlefield information and fill gaps in our present intelligence-gathering system but they will supplement rather than replace the man/machine package. It's pretty tough for an opponent to jam a map, a stopwatch, and a well-trained set of eyeballs.

Tac Recce will continue to modernize and update its systems and tactics. There is even talk of a new reconnaissance aircraft. We also see greater integration of the recce and fighter community. Concepts like QSR and SCAR are only two examples of this effective interface. Tactical reconnaissance is alive and well and keeping abreast of the changing requirements of tactical warfare.

On the surface, Tac Recce may look the same, but watch it work and you'll see a different breed of cat! ■

Airman's Bookshelf

Airpower—A Professional Account

Airpower in Three Wars, by Gen. William W. Momyer, USAF (Ret.), Government Printing Office, Washington, D. C. 20402, 1978. 358 pages. \$4.50.

"I had seen tactical airpower from the viewpoints of the greenest fighter pilot [in 1939], the senior air commander in our longest war, and almost every position in between," says Gen. William W. "Spike" Momyer in the foreword to *Airpower in Three Wars*.

If the Air Force had consciously set about, back in 1939, to career-manage an individual in order for him to become an authority on airpower in general and on tactical airpower specifically, it would have done well to select someone with General Momyer's qualifications and to give him the experience gained from serving in the following "in between" positions: fighter group commander, North Africa, WW II; Chief, Army Air Forces Board for Combined Operations; Assistant Chief of Staff, Tactical Air Command; Chief of Evaluation Group, Air War College; fighter-bomber wing and division commander in Korea and in the US; Commander, Air Training Command; Commander, Seventh Air Force in Vietnam and Deputy Commander for Air Operations, US Military Assistance Command, Vietnam; and Commander, Tactical Air Command.

The experience and perspective that he developed throughout his career kept General Momyer, in his writing, within the confines of the major preoccupations of his many years as a senior commander; i.e., strategy, command and control, counterair operations, interdiction,

and close air support. He has recorded his views in the hope that they will be examined critically and that "our airmen won't pay the price in combat again for what some of us have already purchased."

Chapter I reviews the development of air strategy in World War II, Korea, and Vietnam and the increasing belief among airmen that "airpower, in its own right, could produce decisive results." The next two chapters concentrate on a major issue of the three wars: command and control. It is perhaps the most controversial issue that confronts our military forces because of the deep divergence of opinion existing between commanders of surface forces and commanders of air forces on how airpower should be controlled. General Momyer presents a comprehensive analysis of the differing views.

He records the emergence from World War II of the three basic missions of tactical airpower: counterair, interdiction, and close air support. In his chapters on these three missions, as in his chapters on command and control, he thoroughly analyzes and reviews the differing attitudes and beliefs as to overall concepts, priorities of missions, strategies and tactics, and—of utmost importance—lessons learned and lessons unlearned.

The political constraints on the use of airpower in the Korean and Vietnam Wars are pointed out; in Korea, a stalemate was created, and in Vietnam airpower was not permitted a decisive role. Had not the lessons on the application of airpower already been learned in World War II? General Momyer quotes Field Marshal Gerd von Rundstedt, overall commander of the German forces opposing the Normandy invasion, as to the decisive role played by Allied airpower against Germany.

Not only is *Airpower in Three Wars* a valuable textbook for the professional military airman, but it is a thought-provoking study for the military historian and a fascinating guide for the armchair strategist.

—Reviewed by Lt. Gen.
John B. McPherson,
USAF (Ret.).

POWs: Victories and Heartaches

POW: A Definitive History of the American Prisoner-of-War Experience in Vietnam, 1964–1973, by John C. Hubbell. McGraw-Hill, New York, N. Y., 1977. 633 pages with appendix and index. \$15.

No person who had any feelings at all about the Vietnam War, pro or con, can in good conscience not read this book, for to have had feelings meant one was involved in bringing the war to a close—by protest or by winning.

For those who opposed the war, this book provides incontrovertible proof that, indeed, their media-displayed activities influenced North Vietnamese command decisions as to how to use the hundreds of Americans imprisoned in Vietnam.

For those who supported the men who fought, and for those who fought, the book reveals in detail exactly what it means to be a member of the armed forces of the United States when captured in battle.

In the latter part of this decade, hopefully on the downside of the antihero peak and, equally as hopefully, on the upside of recognizing the rightful place of the American serviceman who fought in an unpopular war, the reader of *POW* will find that the virtue of true courage exists. Courage existed amidst the most debilitating, awesomely frightening, insanity-inducing environment ever devised. Mental and physical pain existed not for hours or days but for months and years. Pain was induced by inept and ignorant captors whose brutality was their government's policy, whose methodology combined ancient Oriental torture and modern Pavlovian response, and whose propaganda goals were supported by actions and words of some Americans in the US government, US media, and the US entertainment field.

There are revelations in this

Airman's Bookshelf

book: circumstances surrounding the early release of selected prisoners; how POW wives banded together to produce better conditions for their husbands; charges of mutiny against two senior officers; and, perhaps most surprising of all, a Secretary of the Army's belief that in prison camps no USAF officer had legal authority over Army enlisted men.

There is inspiration in this book: Surviving in an almost unsurvivable environment with a bedrock belief in God, self, comrade, and country. Devotion to one's fellowman that transcends prejudice. Keeping sane in an Animal Farm bedlam. Generating strength from resources not hitherto recognized.

And there is humor in this book: hacks, coughs, spits, and broom-sweepings that pass vital messages; acting that would do credit to a Woody Allen script when their captors would attempt to film propaganda movies; and the incredible story of a young seaman from South Dakota who fell off his ship in the Gulf of Tonkin one night and went on to bamboozle his disbelieving captors for years.

So to the Hanoi Hoppers and the protesters if they dare, the supporters and the fighters if they will, and to you young folks who want to know of authentic American heroes, I recommend this book. By no means will you finish it in one night, but in no way will you be able to think of much else until you do.

—Reviewed by Lt. Col. Mark Berent, USAF (Ret.). Colonel Berent flew two tours in SEA, in F-100s and F-4s.

New Books in Brief

Bataan and Beyond: Memories of an American POW, by John S. Coleman. When the few remaining American and Filipino troops defending the Bataan peninsula surrendered to the Japanese in April 1942, they were subjected to the infamous "death march" to prison camp. Thousands died, and those who survived faced the ordeal of further harsh treatment by the Japanese.

The author, an Air Force officer, was among those who lived to tell about it. Texas A&M Univ. Press, Drawer C, College Station, Tex. 77843, 1978. 210 pages. \$11.50.

Bomber Pilot: A Memoir of World War II, by Philip Ardery. The author took part in many raids on Hitler's Europe, including the D-Day invasion of Normandy. While detailing air warfare in World War II, he offers a personal dimension to the horror of world war: his fear, longing for home, and grief for fallen buddies. Univ. of Kentucky Press, Lexington, Ky. 40506. 233 pages. \$9.95.

Evolution of the American Military Establishment Since World War II, edited by Paul R. Schratz. Based on a conference that took place in March 1977, the book highlights changes that have occurred in the Department of Defense, the military services, and the Joint Chiefs of Staff organization since World War II. Includes papers presented by historians and commentary by those personally involved in the events since the war. Select Press Service, inc., Maple Street, Conitocook, N. H. 03229, 1978. 125 pages. \$4.50.

Flying Combat Aircraft of the USAAF-USAF, edited by Robin Higham and Carol Williams. This second volume includes twenty-two chapters, each on one combat plane, by pilots who describe what it was like to be in the cockpit over Europe and the Pacific in World War II, Korea, or Southeast Asia. Includes black-and-white photos of the pilots, planes, and cockpits. Iowa State Univ. Press, Ames, Iowa 50010, 1978. 202 pages. \$11.95.

Naval Power in Soviet Policy: Studies in Communist Affairs, edited by Paul J. Murphy. This second volume published under Air Force auspices includes papers by distinguished experts on Soviet policy and Soviet naval development; Soviet naval war-fighting capabilities and missions; the Soviet view on naval arms limitations; and case studies in forward deployment. Includes appendices of officials and officers of the USSR Ministry of Defense and the Navy; higher Soviet military schools; a glossary of selected Soviet naval and related terms; and officer and enlisted ranks in the Soviet Navy. Charts, graphs, index. Available from the Superin-

tendent of Documents, Government Printing Office, Washington, D. C. 20402, 1978. 341 pages. \$5.25.

Naval Race or Arms Control in the Indian Ocean? (Some Problems in Negotiating Naval Limitations), by Alvin J. Cottrell and Walter F. Hahn. Expansion of Soviet naval power, especially in the Indian Ocean area, has been dramatic during the past decade. The authors argue that Moscow seems intent on displacing American forward deployment with its own strategic encirclement of Eurasia. They detail American interests showing that naval limitations in the Indian Ocean are likely to trigger consequences for other key areas. ". . . more is at stake than even the considerable bundle of U.S. and Western interests in the Indian Ocean itself: at stake are the future U.S. strategic mobility, the overseas facilities to sustain that mobility, and ultimately, the ability of the U.S. to help shape world events." National Strategy Information Center, Inc., 111 East 58th St., New York, N. Y. 10022. 78 pages. \$3.00.

Negotiating While Fighting: The Diary of Admiral C. Turner Joy at the Korean Armistice Conference, edited by Allan E. Goodman. One in a series of documentaries from the Hoover Institution archives, this diary by the first head of the UN delegation to the Korean Armistice Conference records the difficulties encountered by Americans who were simultaneously negotiating and fighting. Hoover Institution Press, Stanford, Calif. 94305, 1978. 476 pages \$22.50.

The U.S. War Machine, by a distinguished panel of top experts from the military and academic worlds. This large-size, illustrated encyclopedia of American military equipment and strategy will interest defense analysts and military enthusiasts. Distinguished experts describe how the US could defend itself and its allies and protect its interests overseas. The book analyzes the current and future state of US military structure and forces using a number of tables and charts from AIR FORCE Magazine. Includes index, appendices, extensive color photos. Crown Publishers Inc., New York, N. Y. 10016, 1978. 271 pages. \$17.95.

—Reviewed by Robin Whittle

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT

FEBRUARY 1979



'Backfire-B' version of the Tu-26 photographed from a Draken Interceptor of the Swedish Air Force

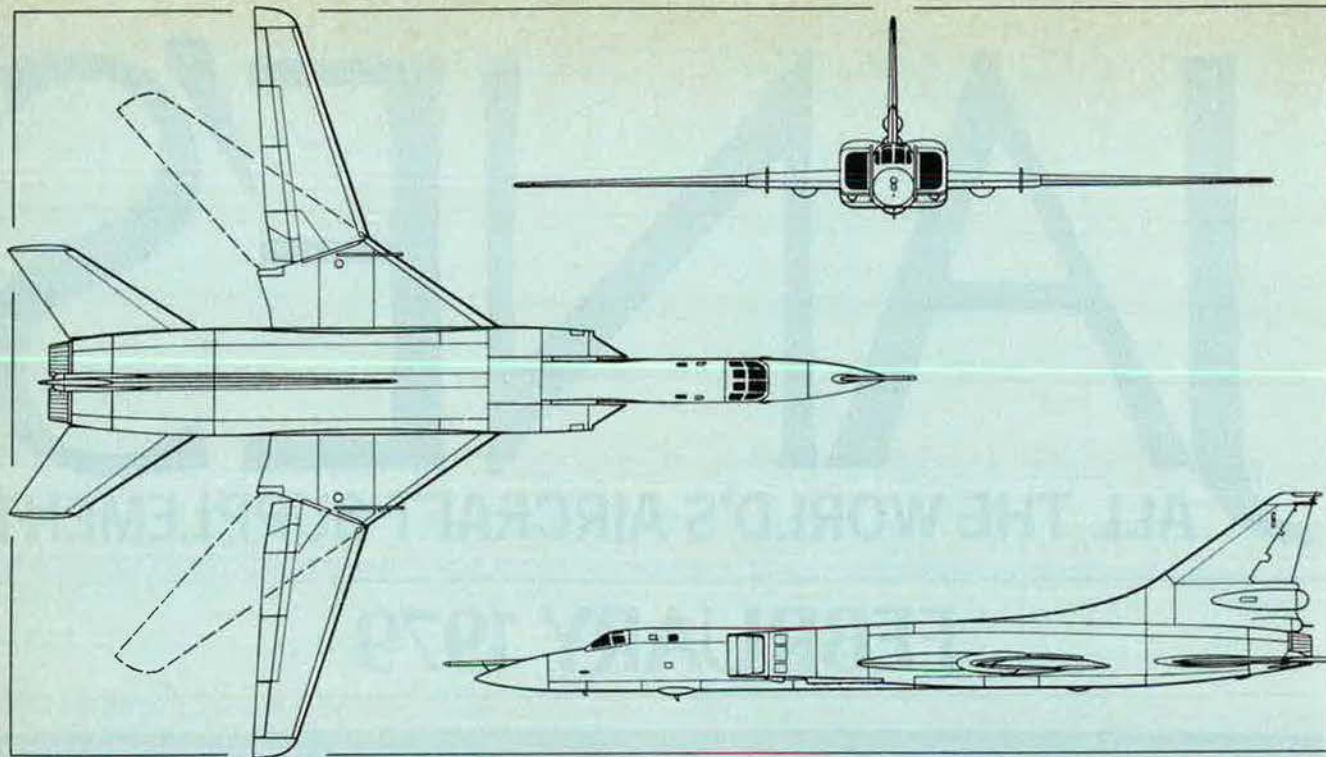
TUPOLEV
TUPOLEV DESIGN BUREAU; USSR

The photograph of the Soviet bomber known to NATO as 'Backfire-B' which illustrates this item was taken from a Saab Draken interceptor of the Swedish Air Force, over international waters, during a Soviet combined-services exercise in the Baltic last June. Points to note include the absence of a flight refueling probe, seen previously on aircraft of this type, and the external stores racks under the air intake trunks, which must impose speed limitations and may be fitted only for exercises

or for short-range ground support missions. Controversy about 'Backfire's' performance continues. Data given in the entry which follows conform with the latest estimates published openly by the Swedish Air Force, and by agencies such as the International Institute for Strategic Studies. Other expert opinion continues to credit the aircraft with a maximum speed in the Mach 2.25/2.5 bracket and a range adequate to cover virtually all of the continental US with the aid of Arctic staging and flight refuelling, from bases in the USSR.

As recently as 25 July 1978, General David

C. Jones, chairman of the US Joint Chiefs of Staff, continued to recommend that 'Backfire' should be counted among strategic weapons covered by the SALT II agreement then being discussed with the USSR. Two US congressional representatives at the talks, Democrats Robert Carr and Thomas Downey, believe, however, that the aircraft's potential is overrated. They suggest, in a report, that the US has two politically feasible choices if the Soviet Union continues to insist that 'Backfire' is not strategic: "It can remain adamant, in which case there will probably be no SALT II and the Soviets will be free to produce modern



Tupolev Tu-26 twin-engined medium bomber and maritime reconnaissance/attack aircraft (Pilot Press)

heavy bombers as well as Backfires without limit. Or it can permit the Backfire to go free in arms-control terms, while neutralising it in military terms."

This second alternative, to cope with an aircraft claimed to be overrated, would cost an estimated \$4,000 million. It is envisaged as requiring new over-the-horizon radars for the US east and west coasts, improvement of the distant early warning line in Canada, employment of the USAF's E-3A Sentry AWACS aircraft, and purchase of at least 100 F-14 or F-15 interceptors for Aerospace Defense Command.

TUPOLEV Tu-26

NATO reporting name: Backfire

Official NATO sources first acknowledged the existence of a Soviet variable-geometry (swing-wing) medium bomber in the Autumn of 1969. Such an aircraft had been expected, as the Tu-22 (NATO 'Blinder') was clearly incapable of fulfilling the long-range strategic bombing role for which it had been intended.

A prototype of the new bomber is said to have been observed in July 1970, on the ground near the Tupolev works at Kazan in central Asia. Subsequent official statements confirmed the aircraft as a twin-engined design by the Tupolev bureau. At least two prototypes were built, followed by up to twelve pre-production models for development testing, weapons trials, and evaluation, by the beginning of 1973. Their official designation was said to be Tu-26; the NATO reporting name allocated to the aircraft is 'Backfire'.

When drawing up the basic parameters for the bomber, the Tupolev bureau is believed to have aimed at a maximum unrefuelled range of 4,775-5,200 nm (8,850-9,650 km; 5,500-6,000 miles) at high altitude. Unwillingness to depart from the Tupolev practice of retracting the main landing gear bogies into fairings on the wing trailing-edges limited the variable geometry to the outer wings, as on the Sukhoi Su-17 and Su-20. There is evidence to believe that the large size of these fairings, with the wheels stowed beneath the wing, caused excessive drag, so that 'Backfire's' range fell

short of what had been planned. Redesign almost eliminated the fairings from later aircraft, after the main landing gear had been revised to retract inward into the fuselage. This accounts for the two versions of the Tu-26 currently identified by NATO reporting names:

Backfire-A. Initial version, with large landing gear fairing pods on the wing trailing-edges. Believed to equip only one squadron.

Backfire-B. Developed version, with landing gear fairing pods eliminated except for shallow underwing fairings, no longer protruding beyond the trailing-edge. Increased wing span.

More than 100 'Backfire-Bs' are in service, with production continuing at the rate of about 36 aircraft per year. Most of them have been allocated to medium-range bomber squadrons of the Soviet Strategic Nuclear Forces; but at least 30 are deployed in a maritime role by Soviet Naval Aviation, and a former RAF Chief of Air Staff, Sir Andrew Humphrey, said in December 1975: "Russian fast, wide-ranging, and high-performance aircraft like 'Backfire', armed with stand-off missiles, may soon become an even greater danger to allied shipping than the relatively slow-moving Russian submarines". It is expected that the 'Backfire' strategic/maritime force will be built up gradually to a total of 250-400 aircraft.

TYPE: Twin-engined medium bomber and maritime reconnaissance/attack aircraft.

WINGS: Cantilever mid-wing monoplane, made up of a large-span fixed centre-section and two variable-geometry outer panels. No anhedral or dihedral, but wing section is so thin that considerable flexing of the outer panels takes place in flight. Leading-edge fence towards tip of centre-section on each side. Each outer wing panel is believed to be fitted with a full-span leading-edge slat, aileron, and slotted trailing-edge flaps aft of spoilers/lift dumpers. Wing sweep is believed to be variable from fully spread to fully swept, rather than limited to one intermediate position as on the MiG-23.

FUSELAGE: Forward of wings, fuselage is basically circular, with large ogival dielectric

nosecone. Centre-fuselage is faired into rectangular-section air intake trunks, each fitted with a large splitter plate and assumed to embody complex variable-geometry ramps. There is no evidence to suggest external area-rule 'waisting' of these trunks.

TAIL UNIT: Cantilever structure, with sweep back on all surfaces. All-moving horizontal surfaces; conventional inset rudder.

LANDING GEAR: Retractable tricycle type, which details remain largely speculative. Each main unit is assumed to carry a multi-wheel bogie, which pivots inward from the vestigial fairing under the centre-section in the bottom of the adjacent intake trunk.

POWER PLANT: Two turbofan engines with afterburners, mounted side by side in the rear fuselage. It is not yet possible to identify positively the type of engine fitted, but US sources have suggested the use of Kuznetsov turbofans similar to those installed in Tupolev's Tu-144 supersonic transport. This would be logical, as each engine rated at 196.1 kN (44,090 lb st) with afterburning in the Tu-144. Up-rated for military use, such engines would give an increase of at least 70% over the installed power in the Tu-22. A less-likely alternative is the turbofan evolved by the Kolesov bureau as backup for the Tu-144, and which is said to be capable of supporting supersonic cruise without use of reheat. Fuel tankage believed to include integral tanks in the engine fixed portion of the wings and much of the centre-fuselage above the weapon bay. A flight refuelling nose-probe can be fitted after one observed refuelling, a 'Backfire' prototype is said to have remained airborne for a further 10 hours.

ACCOMMODATION: Pilot and co-pilot side by side on flight deck, which may be less extensively glazed than the accompanying drawing suggests. Other crew members further aft, as indicated by position of window between flight deck and air intakes.

ARMAMENT: Aircraft observed to date have usually carried a primary armament of one 'Kitchen' air-to-surface missile semi-integrated in the underside of the centre-fuselage.

lage. Aircraft shown in accompanying photograph has multiple racks for stores under the air intake trunks. US reports have suggested that the Soviet Union is developing decoy missiles to assist penetration of advanced defence systems, in addition to very advanced ECM and ECCM. Twin guns in radar-directed tail mounting.

DIMENSIONS, EXTERNAL:

Wing span: fully spread 34.45 m (113 ft)
 fully swept 26.21 m (86 ft)
 Length overall 40.23 m (132 ft)
 Height overall 10.06 m (33 ft)

WEIGHTS:

Nominal weapon load 9,435 kg (20,800 lb)
 Max T-O weight 122,500 kg (270,000 lb)

PERFORMANCE (estimated):

Max speed at high altitude* Mach 2.0
 Max speed at low altitude Mach 0.9
 Max unrefuelled combat range* 4,350 nm (8,050 km; 5,000 miles)

*see introductory copy

MCDONNELL DOUGLAS

MCDONNELL DOUGLAS CORPORATION; Headquarters: PO Box 516, St. Louis, Missouri 63166, USA

**MCDONNELL DOUGLAS AV-8B
 ADVANCED HARRIER**

In late 1973 and early 1974 the British and US governments studied various proposals for advanced versions of the Hawker Siddeley Harrier V/STOL combat aircraft, which had already achieved considerable success in RAF and USMC service. The objective of the Advanced Harrier programme was to evolve a version which, without too much of a departure from the existing airframe, would virtually double the aircraft's weapons payload/ combat radius.

Hopes of developing a design that would meet the future requirements of both nations were dashed in March 1975 when the British Secretary of State for Defence, Roy Mason, stated that there was "not enough common ground on the Advanced Harrier for us to join in the programme with the US". On 15 May 1975, the Sea Harrier FRS. Mk 1 was ordered for the Royal Navy. Development studies for a new US version were continued primarily by McDonnell Douglas to meet requirements of the US Navy and Marine Corps.

Having stated a requirement for approximately 350 Advanced Harriers, the USMC initiated a programme to modify two standard AV-8A Harriers as prototypes of the advanced AV-8B. The first of these flew for the first time at the McDonnell Douglas plant at St. Louis, Missouri, on 9 November 1978, after several weeks of ground testing. Three vertical take-offs and landings were made, and the AV-8B hovered for a total of seven minutes at an estimated height of 40 m (130 ft). The second prototype was scheduled to fly in early 1979. Following evaluation at St. Louis, the prototypes will be flown to the Naval Air Test Center, NAS Patuxent River, Maryland, where the remainder of the test programme will be centred.

The aim of the AV-8B project is to achieve the required improvement in performance by aerodynamic means, while retaining the F402-RR-402 (Pegasus 11) vectored-thrust engine of the AV-8A, thus saving the cost of developing the Pegasus 15 that was originally considered necessary for the advanced version. Airframe changes include the use of a supercritical wing, made from graphite epoxy composite material which saves weight and provides survivability and long life; a raised cockpit; larger wing trailing-edge flaps and drooped ailerons; redesigned engine air in-

takes; and the addition of under-gun-pod strakes and a movable flap panel forward of the pods, to improve VTO lift and reduce inlet ingestion. The landing gear has been strengthened to cater for the higher operating weights and greater external stores loads made possible by these changes.

After completion of the prototype phase, full-scale development of the AV-8B will continue towards a planned launch of full-scale production in 1983. McDonnell Douglas will be prime contractor to Naval Air Systems Command, with British Aerospace as a major subcontractor. Prime engine contractor is expected to be either Pratt & Whitney or Rolls-Royce, with the other as subcontractor.

WINGS: Cantilever shoulder-wing monoplane, of broadly similar planform to Harrier/AV-8A but of supercritical section, approx 20% greater in span and 14% greater in area. Thickness/chord ratio 11.5% at root, 7.5% at tip. 10° less sweepback on leading-edges, and non-swept inboard trailing-edges. Composite construction, making extensive use of graphite epoxy in the main multi-spar torsion box, ribs, skins, outrigger fairings, and wingtips. Trailing-edge single-slotted flaps, of substantially greater chord than those of AV-8A, and drooping ailerons, also of graphite epoxy construction.

FUSELAGE: Generally similar to AV-8A, but with raised cockpit and additional lift-augmenting surfaces. These latter comprise a fixed strake on each of the two underfuselage gun packs, and a retractable forward flap just aft of the nosewheel unit. During VTOL modes the 'box' formed by the ventral strakes and the lowered nose flap serves to augment lift by trapping the cushion of air bounced off the ground by the engine exhaust. This additional lift should allow the AV-8B to take off vertically at a gross weight equal to its maximum hovering gross weight.

LANDING GEAR: Main landing gear strengthened to cater for higher operating weights. Dowty Rotol/Cleveland outrigger wheels and fairings, moved inboard to approx mid-span beneath each wing between flaps and ailerons.

POWER PLANT: One Rolls-Royce Pegasus Mk 803 (F402-RR-402) vectored-thrust turbofan engine rated at 95.64 kN (21,500 lb st). Engine air intakes redesigned, with elliptical lip shape and double instead of single row of suction relief doors. Increased fuel tankage available in wings, raising total internal fuel capacity (fuselage and wing tanks) from approx 2,268 kg (5,000 lb) in the AV-8A to 3,402 kg (7,500 lb) in the AV-8B. Each of the four inner underwing stations capable of carrying an auxiliary fuel tank.

SYSTEM: Onboard oxygen generation system.

AVIONICS AND EQUIPMENT: Inertial navigation system. Microwave landing system. Keyboard control in cockpit for head-up communication, navigation, and identification display. Multi-purpose display for flight/ combat information. Stability augmentation and attitude hold system for speeds from 0-250 knots (0-463 km/h; 0-288 mph). AN/ARN-84 Tacan, AN/ARC-159 UHF, and AN/APX-100 IFF.

ARMAMENT AND OPERATIONAL EQUIPMENT:

Twin underfuselage gun/ammunition packs, as in AV-8A, each mounting a US 20 mm cannon or a 30 mm Aden gun. Single stores point on fuselage centreline, between gun packs, and three stores stations under each wing, with a maximum combined capacity of 4,173 kg (9,200 lb). The four inner wing stations are 'wet', permitting the carriage of auxiliary fuel tanks. Typical weapons may include Mk 82 Snakeye bombs, and laser or electro-optical guided weapons. Main weapon delivery by Angle Rate Bombing System



First prototype of the AV-8B Advanced Harrier making its first hovering flight at St. Louis

(ARBS) comprising a dual-mode (TV and laser) target seeker linked to a Marconi head-up display via an IBM digital computer. Passive ECM equipment.

DIMENSIONS, EXTERNAL:

Wing span: AV-8A 7.70 m (25 ft 3 in)
 AV-8B 9.25 m (30 ft 4 in)
 Length overall: AV-8A 13.87 m (45 ft 6 in)
 AV-8B 14.12 m (46 ft 4 in)
 Height overall: AV-8A 3.43 m (11 ft 3 in)
 AV-8B 3.55 m (11 ft 7 3/4 in)

WEIGHTS:

Basic operating weight, empty:
 AV-8A 5,533 kg (12,200 lb)
 AV-8B 5,693 kg (12,550 lb)

Max T-O weight:

AV-8A (STO) more than 11,340 kg (25,000 lb)
 AV-8B (STO) 13,403 kg (29,550 lb)
 AV-8B (VTO) 8,550 kg (18,850 lb)

Design landing weight:

AV-8B 8,799 kg (19,400 lb)

PERFORMANCE (AV-8B data estimated):

AV-8A operational radius with external loads shown:

vertical T-O, 1,360 kg (3,000 lb)
 50 nm (92 km; 57 miles)
 short T-O (185 m; 600 ft), 2,268 kg (5,000 lb)
 125 nm (231 km; 144 miles)
 short T-O (457 m; 1,500 ft), 3,630 kg (8,000 lb)
 222 nm (411 km; 255 miles)
 short T-O (305 m; 1,000 ft), 1,360 kg (3,000 lb)
 360 nm (667 km; 414 miles)

AV-8B operational radius with external loads shown:

vertical T-O, 3,538 kg (7,800 lb)
 100 nm (185 km; 115 miles)
 short T-O (305 m; 1,000 ft), twelve Mk 82 Snakeye bombs, internal fuel, 1 h loiter more than 150 nm (278 km; 172 miles)
 short T-O (305 m; 1,000 ft), seven Mk 82 Snakeye bombs, external fuel tanks, no loiter
 more than 650 nm (1,204 km; 748 miles)

BELL

BELL HELICOPTER TEXTRON (Division of Textron Inc); Head Office: PO Box 482, Fort Worth, Texas 76101, USA

BELL MODEL 214

A new main rotor blade developed for the Bell Model 214 transport helicopter became the first glassfibre blade of US manufacture to receive FAA certification on 24 July 1978. The two-blade rotor of the Model 214 has a diameter of 15.24 m (50 ft 0 in) and, with a chord of 0.84 m (2 ft 9 in), is the largest glassfibre rotor yet flown. Testing had exceeded 400 flying hours at the date of certification, and



Largest glassfibre rotor blades yet flown being tested on a Bell Model 214

initial FAA approval is for a retirement life of 2,400 hours. Bell is confident that a retirement life of at least 10,000 hours will be achieved when in-plant and service testing have been completed.

Production glassfibre blades will be delivered initially as replacements for conventional blades in service on Bell Model 214Bs. When full-scale manufacture is established, they will become standard on all 214s coming off the assembly line, and a derivative will be designed and manufactured for installation on the twin-engine Model 214ST helicopter which has been developed for service in Iran.

The production version of the blade has a spar consisting entirely of machine-made elements. An orbital machine winds the spar caps, which are of spanwise-oriented S₂ glass-fibres that carry bending loads and centrifugal force. The fibres of these spar caps wrap around the sleeve of the attachment bolt to the hub, forming integral attachment lugs to the hub. Torsional loads in the spar are carried by layers of filament wound crossply material located inside and outside the spanwise spar caps.

The blade skins consist of layers of non-woven crossply E-glass. A layer of woven cloth is applied to the outside of the skin to minimise foreign object damage, and the skins are supported by a Nomex non-metallic honeycomb core. The leading-edge of the blade is protected by a full-length titanium abrasion strip. The paint finish incorporates a semi-conductive graphite layer to aid in dissipation of static electricity.



Bell's new experimental soft-in-plane four-blade rotor under test on a Model 206L LongRanger

Tests have shown that this method of blade construction does not dent as easily as metal. A fatigue crack usually will not grow from a small hole or puncture, and skin patches can be applied with less risk of subsequent cracking. Blades tested by the Lightning and Transient Research Institute of St. Paul, Minnesota, were not damaged structurally by lightning strikes of 200,000 amperes, which is equivalent to the highest strikes recorded on aircraft. In ballistic tolerance tests, one blade virtually 'swallowed' a 23 mm high-explosive impact round rather than permitting it to exit.

BELL MODEL 412

Bell announced on 8 September 1978 its intention to develop a variant of the twin-turbine Model 212 with a four-blade main rotor. The new aircraft, designated Model 412, will be the first production helicopter with a four-blade rotor to be manufactured by Bell, although the company has flown many helicopters with multi-blade rotors for research purposes.

Two new fully-certificated Model 212s are being modified for use in the development and certification programme for the Model 412. The first of these is expected to fly in its new form in June of this year, with FAA type approval in accordance with FAR Pt 29 expected by the end of 1980, permitting deliveries of the Model 412 to begin early the following year. Production will be undertaken simultaneously by Bell and its Italian licensee Agusta.

The soft-in-plane rotor system will have all-elastomeric non-lubricated bearings and dampers, with de-icing provisions in the advanced-shape composite-structure blade. Other changes to the existing Model 212 design will include a new rotating control system, new shorter and stronger dual bearing main rotor assembly, energy-attenuating seats, and rupture-resistant fuel cells. The Pratt & Whitney Aircraft of Canada PT6T-3 power plant on the Model 212 will be retained, but the 412 will have a transmission T-O rating of 975 kW (1,308 shp), compared with 962 kW (1,299 shp) for the 212, and a max T-O weight of 5,216 kg (11,500 lb) compared with 5,080 kg (11,200 lb). It will be designed to operate in an ambient temperature range of -43°C to 52°C.

Technical objectives of the Model 412 programme, in addition to payload improvement include an increase of 20-30 knots (37-56 km/h; 23-34 mph) in cruising speed, initial 5,000 hour main rotor/rotating control retainerment lives, vibration levels below ISO-spec

level three-hour comfort thresholds, and noise levels within pending FAA/ICAO requirements.

A kit to convert existing 212s to the new four-bladed configuration is also being developed and will be certificated concurrently with the Model 412.

AERO BOERO

AERO BOERO SRL; Head Office: Hipolito Irigoyen 505, 2421 Moriteros, Córdoba, Argentina

Latest in the range of light agricultural aircraft produced by Aero Boero is a unique biplane version of the familiar AB 180 Ag, with the chemical tanks installed inside the lower wings. Known as the AB 180 SP, the new version offers improved take-off and landing performance, wider speed range, and greater payload/range capability.

AERO BOERO 180 SP

TYPE: One/three-seat agricultural aircraft.

WINGS: Strut-braced unequal-span biplane. Streamline-section V bracing struts, with cross-struts, each side for upper wings. Two splayed interplane struts each side, from outboard attachments of V struts to attachments near tips of lower wings. Section of upper wings NACA 23012. Dihedral on upper wings 1° 45'. Incidence on upper wings 3° 30' at root, 2° at tip. Light alloy structure, including skins. Light alloy ailerons and flaps on upper wings only.

FUSELAGE: Welded SAE 4130 steel tube structure, covered with Ceconite fabric.

TAIL UNIT: Wire-braced welded steel tube structure, covered with Ceconite fabric. Sweptback vertical surfaces. Ground-adjustable tab on rudder.

LANDING GEAR: Non-retractable tailwheel type. Main wheels carried on faired-in V struts and half-axles. Shock-absorption by helicoidal springs inside fuselage. Main wheels and tyres size 6.00-6, pressure 1.65 bars (24 lb/sq in). Hydraulic disc brakes on main units. Tailwheel steerable and fully castoring.

POWER PLANT: One 134 kW (180 hp) Lycoming O-360-A1A flat-four engine, driving (according to customer's choice) either a Hartzell constant-speed or McCauley 1A200 or Sensenich 76EM8 two-blade fixed-pitch propeller. Three fuel tanks in upper wings, total capacity 201 litres (44 Imp gallons).

ACCOMMODATION: Normal accommodation for pilot only in agricultural role. Provision for carrying two passengers at other times, with baggage compartment on port side, aft of cabin.

EQUIPMENT: One 40A alternator and one 12V battery. Provision for VHF radio, and night or blind-flying instrumentation, at customer's option. Chemical tanks in lower wings, combined capacity approx 330 litres (72.5 Imp gallons).

DIMENSIONS, EXTERNAL:

Wing span: upper	10.72 m (35 ft 2 in)
lower	approx 6.00 m (19 ft 8¼ in)
Wing chord (upper, constant)	1.61 m (5 ft 3½ in)
Wing aspect ratio: upper	7.05
Length overall	7.273 m (23 ft 10¼ in)
Height overall	2.10 m (6 ft 10½ in)
Wheel track	2.05 m (6 ft 8¾ in)
Wheelbase	5.10 m (16 ft 8¾ in)

AREAS:

Wings (upper, gross)	16.47 m ² (177.3 sq ft)
Ailerons (total)	1.84 m ² (19.81 sq ft)
Flaps (total)	1.94 m ² (20.88 sq ft)
Fin	0.93 m ² (10.01 sq ft)
Rudder, incl tab	0.41 m ² (4.41 sq ft)
Tailplane	1.40 m ² (15.07 sq ft)
Elevators (total)	0.97 m ² (10.44 sq ft)

WEIGHTS AND LOADINGS:

No details supplied

PERFORMANCE:

Max level speed at S/L	117 knots (217 km/h; 135 mph)
Max cruising speed	100 knots (185 km/h; 115 mph)
Stalling speed	30.5 knots (56.5 km/h; 35 mph)
Service ceiling with max payload	3,500 m (11,480 ft)
T-O run with max payload	200 m (656 ft)
T-O run without payload	65 m (213 ft)
Landing run without payload	70 m (230 ft)
Range at 75% power	448 nm (830 km; 516 miles)
Endurance at 75% power	4 h 30 min

LAPAN

LEMBAGA PENERBANGAN DAN ANTARIKSA NASIONAL (National Aeronautics and Space Institute); Headquarters: Jalan Pemuda Persil No. 1, Jakarta Timur, Indonesia

Established in 1963, LAPAN has approximately 525 personnel in four centres: two in Jakarta, devoted to aerospace study and space applications; an aerospace technology centre

at Rumpin airfield, near Bogor; and an atmospheric and space research centre at Bandung. In FY 1977 it began constructing a prototype of the XT-400, an eight-seat transport aircraft of indigenous design. Other recent activities have included development and testing of the XTG-01, an experimental mini-RPV (see Addenda to the 1978-79 *Jane's*), and a small rocket engine.

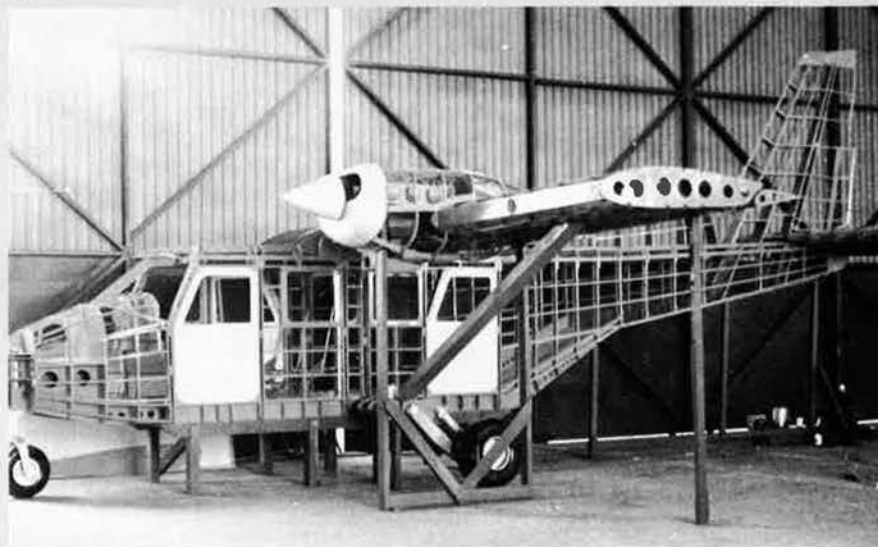
LAPAN XT-400

In the same class as the Britten-Norman Islander, the XT-400 differs from that aircraft by having an upswept rear fuselage with clamshell rear-loading doors. It was designed by Dipl-Ing Suharto, following a market survey conducted in the early 1970s by the Directorate General of Aviation Industries of the Indonesian Ministry of Industries.

The XT-400 is of all-metal construction, and is the first aircraft of Indonesian design able to accommodate more than three people. Its general appearance can be seen in the accompanying artist's impression and photograph of a wooden mockup; in the Autumn of 1978 the wings and forward fuselage of the initial prototype were under construction. This aircraft is scheduled to fly in 1980, and will carry a pilot and up to seven passengers; a later version is planned with seats for 11 passengers. Design is to FAR Pts 23 and 25 (Util-



Aero Boero 180 SP agricultural aircraft is unique in having added biplane wings to house its chemical tanks



Wooden mockup of the LAPAN XT-400 light STOL transport

ity category), and the XT-400 will have STOL capability, including the ability to operate from grass or semi-prepared runways. Applications include those of passenger and cargo transport, aerial survey (equipped with photographic or geophysical survey equipment), and ambulance.

The following description applies to the first prototype:

TYPE: Twin-engined light STOL transport.

WINGS: All-metal high-wing monoplane, with single streamline-section bracing strut each side which is attached to a stub-wing at fuselage floor level. Wing section NACA 2415. Dihedral 2°. Inboard half of each semi-span carries a slotted trailing-edge flap (25% of overall chord); aileron on outboard half of each semi-span. No tabs.

FUSELAGE: Conventional all-metal semi-monocoque structure, with riveted skin. Basically rectangular cross-section in main cabin area. Upswept at rear, to facilitate cargo loading.

TAIL UNIT: Cantilever all-metal structure, with slightly-swept vertical surfaces and long dorsal fin extending almost to wing trailing-edge. One-piece fixed-incidence tail-plane aft of fin, with wide-span elevator. Trim tab in rudder.

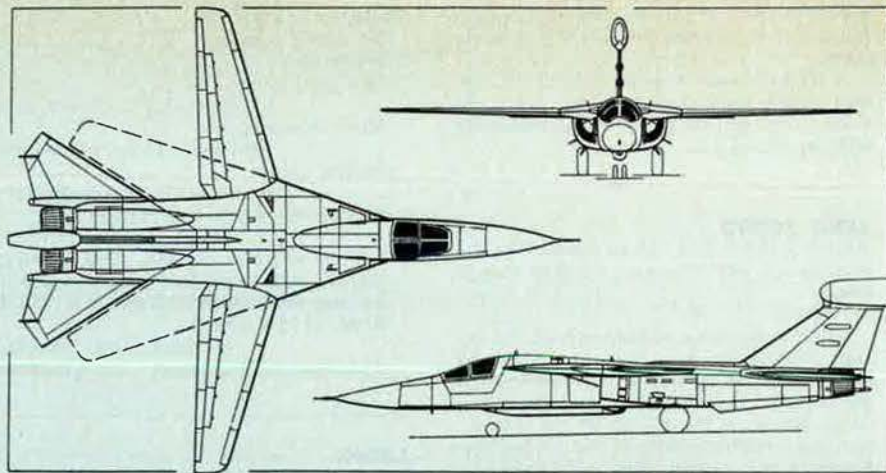
LANDING GEAR: Non-retractable tricycle type, with single wheel and oleo-pneumatic shock-absorber on each unit. Main units attached to tips of stub-wings. Steerable nosewheel. Main-wheel tyres size 7.50-10, pressure 2.55 bars (37 lb/sq in); nosewheel tyre size 6.00-6, pressure 1.65 bars (24 lb/sq in).

POWER PLANT: Two 186.5 kW (250 hp) Lycoming IO-540-C flat-six engines, each driving a Hartzell constant-speed propeller with spinner.

ACCOMMODATION: Passenger version accommodates up to eight persons, including pilot, on four pairs of seats. Pilot's seat adjustable fore and aft. Aeromedical version can accommodate two stretchers and attendants. Two forward-opening car-type doors on port side of main cabin, and one on starboard side. Baggage compartment at rear of cabin, accessible via downward-opening clamshell doors in underside of upswept rear fuselage. These doors also facilitate rear loading and unloading of freight or stretchers in cargo and ambulance versions.

SYSTEMS: Internal/external lighting and other electrical services powered by 24V generator, with voltage regulator.

AVIONICS AND EQUIPMENT: Optional items in-



Grumman (General Dynamics) EF-111A tactical jamming aircraft (Pilot Press)

	clude blind-flying instrumentation.
DIMENSIONS, EXTERNAL:	
Wing span	14.59 m (47 ft 10½ in)
Wing chord, constant	1.80 m (5 ft 10¾ in)
Wing aspect ratio	7.8
Length overall	10.20 m (33 ft 5½ in)
Height overall	4.30 m (14 ft 1¼ in)
DIMENSIONS, INTERNAL:	
Cabin: Length	3.75 m (12 ft 3½ in)
Width	1.08 m (3 ft 6½ in)
Height	1.23 m (4 ft 0½ in)
WEIGHTS AND LOADINGS:	
Weight empty,	
with basic equipment	1,422 kg (3,136 lb)
Max payload (8 persons	
plus baggage)	762 kg (1,680 lb)
Max T-O weight	2,540 kg (5,600 lb)
Max wing loading	100 kg/m² (20.5 lb/sq ft)
Max power loading	6.8 kg/kW (11.2 lb/hp)
PERFORMANCE (estimated):	
Max level speed	148 knots (273 km/h; 170 mph)
Max cruising speed (75% power)	139 knots (257 km/h; 160 mph)
Econ cruising speed (60% power)	126 knots (233 km/h; 145 mph)
Stalling speed	58 knots (106 km/h; 66 mph)
Max rate of climb at S/L	274 m (900 ft)/min
T-O to 15 m (50 ft)	300 m (980 ft)
Landing from 15 m (50 ft)	380 m (1,250 ft)

Range with max fuel	521 nm (965 km; 600 miles)
Range with max payload	260 nm (483 km; 300 miles)
g limits	+3.6; -1.5

GRUMMAN
GRUMMAN AEROSPACE CORPORATION; Head Office and Works: Bethpage, New York 11714, USA

GRUMMAN (GENERAL DYNAMICS) EF-111A

The programme to convert General Dynamics F-111As into prototype EF-111A electronic warfare aircraft, and to evaluate their ability to provide ECM jamming coverage for air attack forces, was initiated in 1972-73. Operational deployment of the F-111A in Southeast Asia, from March 1968, had revealed major shortcomings, despite special preparation under the *Harvest Reaper* programme to provide these aircraft with advanced ECM equipment that would facilitate penetration of enemy airspace. Subsequent enquiry revealed that many factors contributed to the limited success of the F-111A in Southeast Asia; lack of adequate and effective ECM jamming was responsible for many of its problems, as well as those of all other types of combat aircraft in that theatre of operation.

Because of the growing potential of Soviet built air defence systems, which stretch across Eastern Europe, NATO anti-invasion force must have the capability of suppressing literally thousands of radar 'eyes', able to locate precisely the route and speed of counter-attacking air strikes. This is no simple task because updated SAM systems and new interceptors with sophisticated ECM equipment are being introduced regularly by the Soviet Union, providing a now-acknowledged lead in electronic warfare, both ground and air borne.

Senior USAF officials consider that utilisation of the EF-111 as a tactical jamming system, in combination with the E-3 AWAC airborne warning and control system, is vital to help offset the Soviet lead. Because of its vast masking power, the EF-111 is essential to provide cover for air-to-ground operations along the front lines, and to support penetrating allied strike forces. Should future circumstances make it necessary to launch a counter-strike against a Soviet penetration of NATO territory, EF-111s operating on the friendly side of the FEBA (forward edge of the battle area) could blind the enemy's electronic 'eyes' making it possible for NATO strike forces to attack the armoured spearhead, as well as re-



Artist's Impression of the LAPAN XT-400 (two Lycoming IO-540-C engines)

supply areas, reserves, and SAM installations 17-35 nm (32-64 km; 20-40 miles) behind enemy lines, with less than half the losses that could be expected without use of the EF-111s' jamming systems.

Therefore, three modes of deployment are foreseen for the EF-111: Standoff, Penetration, and Close Air Support. In the Standoff role, the jamming aircraft would operate within their own airspace, at the forward edge of the battle area. Out of range of the enemy's ground-based weapons, orbiting EF-111s would use their jamming systems to screen the routes of friendly strike aircraft. In the Penetration role, the EF-111s would accompany strike aircraft to high-priority targets, their Mach 2 capability making them ideal escort aircraft for such a task. The Close Air Support requirement is for escorting EF-111s to neutralise anti-air radars while the strike force delivers its attack on enemy armour.

Design study contracts were awarded to General Dynamics and Grumman by the USAF in 1974, and in January 1975 it was announced that Grumman had been awarded an \$85.9 million contract to convert two existing F-111As to EF-111A prototype configuration. Basic equipment of these prototypes comprises AN/ALQ-99E jammers of the type fitted to the Grumman EA-6B Prowler. In addition, the EF-111A has a modified AN/ALQ-137 self-protection system and a modified AN/ALR-62 terminal threat warning system. The ALQ-99E jammers are mounted in the weapons bay, with their antennae covered by a 4.9 m (16 ft) long canoe-shaped radome. The fin-tip pod, similar in shape to that of the EA-6B Prowler, houses the receiver system and antennae. Total weight of the new equipment is about three tons.

The two-man crew of an EF-111 comprises a pilot and an electronic warfare officer (EWO). All tactical jamming functions are managed by the EWO who can, through computer management, handle a tactical electronic warfare workload which required previously several operators and more equipment. In addition, the automated system of the EF-111 has exceptional capability for picking up, identifying, and assigning jammers to enemy emitters over a wide range of frequencies.

The first flight of an aerodynamic prototype was made on 10 March 1977, and the complete system was flown for the first time on



Second prototype of the EF-111A, modified by Grumman from a standard F-111A

17 May 1977, on the second prototype. Since then, Grumman flight testing of the jamming system has involved 84 flights and 215 flight hours, completed by the two aircraft during a three-and-a-half-month period. USAF flight testing has involved 78 flights and 258 flight hours, their rigorous six-month evaluation programme terminating on schedule.

The USAF's tests verified various mission operational concepts, flight formations, and the jammer's electromagnetic compatibility with other strike aircraft. These latter tests dispelled an earlier concern that the friendly strike force, as well as enemy threats, might be jammed by the powerful signals emanating from the EF-111. In addition, structural flight tests under all operating conditions demonstrated an 'infinite' life for all modified areas of the aircraft's structure. Flying qualities were deemed to be virtually identical to those of the F-111 strike aircraft.

USAF plans envisage the conversion of up to 40 F-111Fs as ECM jamming aircraft.

DIMENSIONS, EXTERNAL:

Wing span: spread	19.20 m (63 ft 0 in)
fully swept	9.74 m (31 ft 11.4 in)
Length overall	23.47 m (77 ft 0 in)

Height overall	6.10 m (20 ft 0 in)
WEIGHTS:	
Weight empty	24,313 kg (53,600 lb)
Internal fuel	14,871 kg (32,785 lb)
Max T-O weight	39,825 kg (87,800 lb)
PERFORMANCE:	
Max level speed at height	1,262 knots (2,337 km/h; 1,452 mph)
Max cruising speed	430 knots (796 km/h; 495 mph)
Service ceiling	15,250 m (50,000 ft)
Min T-O run	1,525 m (5,000 ft)
Ferry range	2,100 nm (3,889 km; 2,416 miles)

WESTLAND

WESTLAND HELICOPTERS LTD; Head Office, Works, and Airfield: Yeovil, Somerset BA20 2YB, United Kingdom

As part of an overall service equipment improvement programme, the Royal Navy's Fleet Air Arm will receive in 1979 the first of 15 Westland Sea King HU. Mk 4 helicopters. Developed from the land-based Commando Mk 2, they will be equipped with flotation gear,



Royal Navy Sea King HAS. Mk 2 demonstrates its heavy-lift capability

folding main rotor blades and tail section, and upgraded avionics and navigation systems; and will be capable of carrying an externally-slung load of 3,630 kg (8,000 lb). They will enter service with Nos. 845 and 846 (Naval Air Commando) Squadrons.

The Navy's Lynx HAS. Mk 2, currently serving with nine Ships' Flights (five in Type 21 frigates, two in 'Leander' class frigates, and two in Type 42 destroyers), may be fitted with additional submarine detection gear, possibly of the dipping sonar type.

The Royal Navy's present Sea King HAS. Mk 2s (21 ordered), which are already equipped with Type 195 dipping sonar, are currently being upgraded by the addition of a Marconi Avionics LAPADS (Lightweight Acoustic Processing And Display System) passive sonobuoy processor to improve their detection capability. This improvement, however, is intended only as an interim measure, and a more effective ASW helicopter, known as the SKR (Sea King Replacement), is now under development to enter Fleet Air Arm service by the late 1980s.

WESTLAND WG 34

This new large helicopter is being developed under Ministry of Defence (Navy) contract, initially as a replacement for the Royal Navy's Sea King HAS. Mk 2 shipboard anti-submarine helicopters.

In the Spring of 1977, the MoD(N) completed a series of feasibility studies to examine how an SKR (Sea King Replacement) would operate, and what sensors and performance standards it would require. These studies demonstrated:

(a) the need for the aircraft to operate at long ranges from its base, and independently of other units;

(b) that this autonomy of operation would best be served by the use of sonobuoys instead of the traditional active dipping sonar;

(c) the need for an automated data handling system to exploit the capability of the acoustic sensors, and to control the range of the supporting sensors required (radar, radar intercept equipment, and magnetic anomaly detector);

(d) that a payload capability greater than that of the present Sea King was needed to carry the required weight of sensors, avionics, weapons, and the fuel load necessary to



HMS Birmingham's Lynx helicopter proves its ability, with harpoon engaged, to remain securely fixed to a steeply rolling deck

achieve a useful endurance; and

(e) that a rotating-wing aircraft of similar dimensions to the Sea King would best meet these requirements while remaining compatible with the size of ships which would carry the new aircraft.

The WG 34, which is marginally smaller than the Sea King but has substantially more payload capability, was selected for development in the late Summer of 1978, and precise airframe, systems, and avionics specifications are currently being defined. It is expected that the WG 34 will be developed and built by Westland in collaboration with other European helicopter manufacturers, among whom Aérospatiale (France) and Agusta (Italy) have been mentioned. The Italian Navy has a requirement broadly similar to that of the Royal Navy, and a number of European armies are seeking a troop transport of similar size and weight to the WG 34. Negotiations towards a collaborative solution were in progress in late 1978; civil applications are also foreseen.



Artist's impression of the Westland WG 34 Sea King Replacement in twin-engined form

The following provisional description of the SKR version of the WG 34 is based on details released up to late 1978:

TYPE: Three/four-seat anti-submarine helicopter.

AIRFRAME: For general appearance, see accompanying artist's impression. Landing gear is fully retractable, main units retracting into fairings on fuselage sides.

POWER PLANT: Two, or possibly three, turbo-shaft engines of an existing type. Engine in takes face sideways, to assist anti-icing.

ACCOMMODATION: Crew of three normally (pilot, observer, and acoustics systems operator); provision for co-pilot if required.

SYSTEMS AND OPERATIONAL EQUIPMENT Marconi Avionics acoustics processing and display systems, developed from the AQ5 901 system now being fitted to the BAe (Hélicoptères) Nimrod MR. Mk 2. Ferranti search radar developed from the Sea Spray current fitted in the Royal Navy's Lynx HAS. Mk 2. Decca ESM (electronic support measure) equipment, also developed from that in the Lynx HAS. Mk 2. Decca Doppler or Omega navigation system. ECM-resistant Joint Tactical Information Distribution System (JTIDS) data link equipment. Magnetic anomaly detector (MAD) of the towed 'bird' type, probably the US ASQ-8; stowed internally in rear fuselage when not in use. Secure voice communications. Ferranti automated tactical data handling system for effective management of sensor. Airframe anti-icing system.

ARMAMENT: Fully enclosed weapons bay capable of accommodating a homing torpedo or other weapons, in forward portion of each fuselage main landing gear fairing. No details of individual weapons yet available.

DIMENSIONS, EXTERNAL:

Diameter of main rotor 16.92 m (55 ft 6 in)
Length overall, rotors turning

20.57 m (67 ft 6 in)

Length of fuselage 17.30 m (56 ft 9 in)

Height overall, rotors turning

5.44 m (17 ft 10 in)

Height to top of rotor head

4.11 m (13 ft 6 in)

Tailplane span 5.03 m (16 ft 6 in)

Wheel track 3.05 m (10 ft 0 in)

WEIGHTS:

Max T-O weight:

ASW Sea King 9,525 kg (21,000 lb)

WG 34 approx 10,886 kg (24,000 lb)

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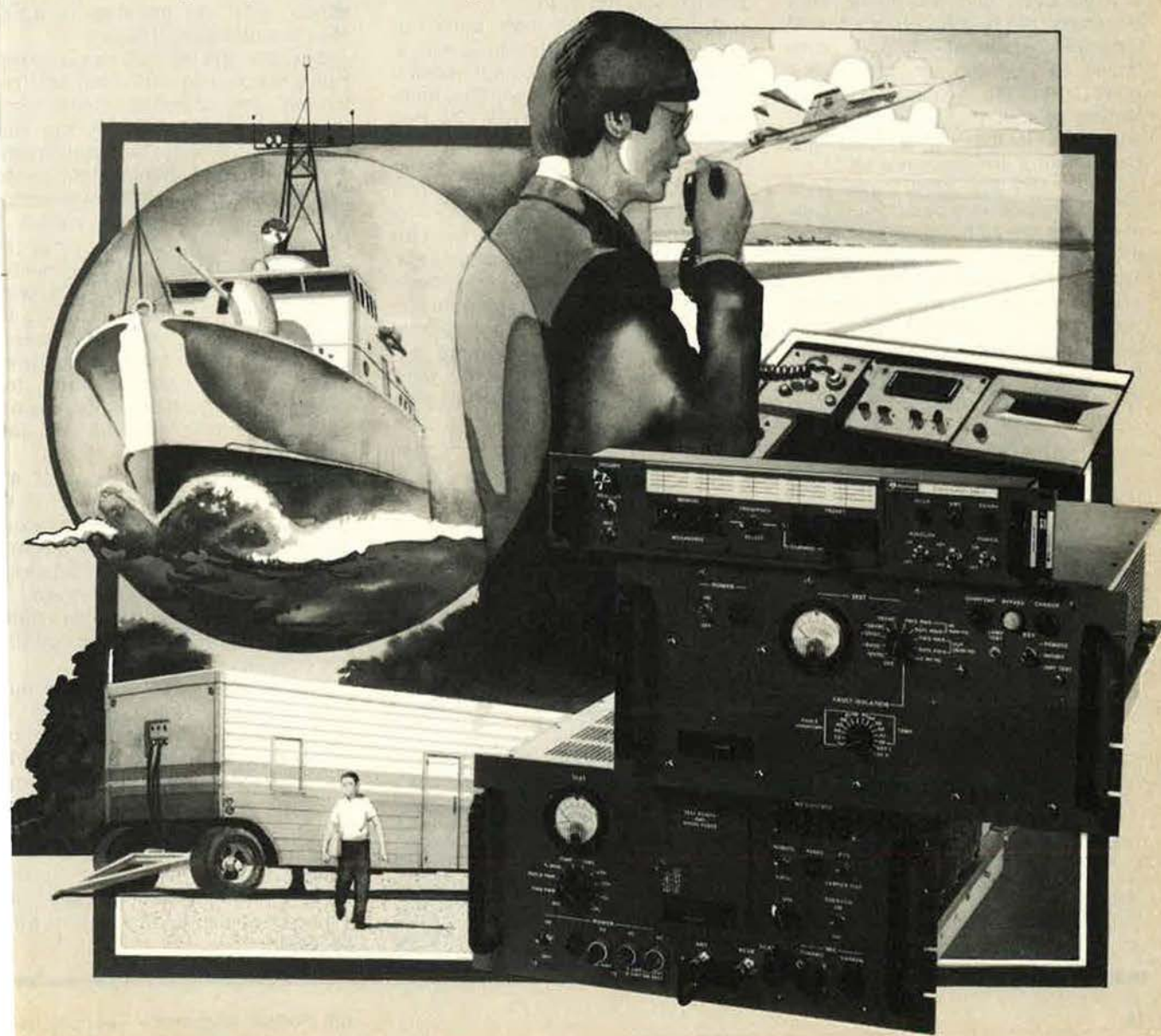
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The Bulletin Board

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

AFRES Manning in "Good Shape"

While most of the nation's active and Reserve military forces have encountered recruiting and other manpower problems recently, the Air Force Reserve has "come through in good shape," top AFRES officials told AIR FORCE Magazine recently. AFRES Chief Maj. Gen. William Lyon and his aides, in a December interview, reported that Reserve personnel strength continues to rise, airmen losses are down, retention generally is satisfactory, overall quality remains high, and "waiting lists" face many officers seeking unit assignments.

In FY '78, the AFRES recruited 2,504 nonprior-service enlisted people and 9,129 with previous service, the 11,633 total topping the goal of 11,000. This permitted the component to exceed the congressionally authorized end-strength of 53,000 for the first time since the advent of the All-Volunteer Force. For FY '79, the AFRES has boosted its recruit-

ing target to 13,195, to include 9,991 prior-service members.

These increased goals materialized about the same time the Air Force acknowledged that it expected to fall short of its December 1978 recruiting goal for the active service. This hasn't occurred in years. The disclosure touched off new demands among AVF critics for resurrecting the draft.

AFRES strength has been increasing each year. Col. Louis J. McKenna, General Lyon's personnel chief at Hq. USAF, said the manpower target for end FY '79 had been hiked to 56,100.

The Palace Chase program, under which certain USAF members can leave active duty early by switching to the Reserve for unit duty, is helping the manpower surge. Last year, 1,520 active-duty members transferred, almost double the number the previous year. Colonel McKenna expects 2,000 more accessions via Palace Chase this year.

Against an overall retention goal

of fifty percent in 1978, the Air Reserve achieved a respectable forty-two percent rate (thirty-three percent for first termers, seventy-eight percent among careerists). This achievement, which the AFRES expects to duplicate this year, resulted in 1,864 fewer Reserve airmen losses than in the previous year.

The principal Reserve enlisted shortages are in aircraft maintenance and air-cargo specialists. With few exceptions, officer billets are filled; for many skills, particularly rated slots, there are waiting lists, officials said.

General Lyon, whose four-year tour as Reserve Chief ends this month, also reported improvement in the Mobilization Augmentee (MA) program. These people fill individual drill pay posts throughout the Air Reserve. More than 400 new airmen became MAs last year bringing the total participants to above 7,500. An increase to 8,500 MAs is anticipated this year.

Because the AFRES has enjoyed some success in recruiting and retention, the Defense Department has slashed its share of the Reserve Forces FY '79 reenlistment and enlistment bonus money to \$300,000. That will only cover about 150 people; one official called "worse than no bonus money at all." The bulk of the \$25 million Congress approved for Reserve bonus money this year is going to the Army Reserve and Army Guard, both remain mired in the manpower doldrums. The Army Guard, for example, was 35,000 members short of its authorized strength the end of FY '78.

General Lyon and his staff attribute their success in manning to the nature of the AFRES mission: improved training programs, a sharp increase in exercises (thirty-four last year compared to seven in 1977) that help get members fully involved, and a hard-hitting recruiting program.

The AFRES established 186 full-time Reserve recruiting slots in 1976. Selected volunteers come on active duty for at least two years to serve in these posts, giving the recruiting effort stability. The Reserve leadership, in addition, works closely with the recruiters. General Lyon frequently invites them to Hq. USAF for consultations and exchanges of ideas. "It's paying off," he said.

Maj. Gen. William Lyon is retiring this month as Chief of the Air Force Reserve, Hq. USAF. He plans to return to his native Los Angeles where he has a construction business. General Lyon, fifty-five, began his four-year tour as AFRES chief in April 1975. Earlier he held high-level Reserve posts in California and was the M-Day assignee to the CINC of Strategic Air Command. He began his Reserve career as an Army Air Corps civilian flight instructor in 1943 and later was appointed a flight officer.



Frocking Nixed Again

The Air Force again has rejected a request that it approve "frocking," a promotion practice enjoyed by Naval officers off and on since 1922 and recently made permanent for that service's enlisted members.

Frocking allows persons selected for promotion to pin on their new insignia without waiting for the effective advancement day, provided they hold billets authorizing the higher grade. Pay of the higher grade does not begin until hikes are official, however.

AFA's Junior Officer Advisory Council recently urged USAF to adopt frocking when promotion lists are released. The JOAC called it a "no-cost" opportunity to recognize performance, which is especially valid now because of mounting retention problems.

Headquarters responded, how-

ever, that frocking might be perceived by Congress as violating the intent of grade limitations and could create "turbulence and confusion" with regard to seniority and authority. Frocking would "be good for the guys frocked, but bad for those not frocked," one official said. Legal problems were also cited in USAF's rejection paper. Similar arguments prevailed in 1975 when a high-level USAF study group weighed, and turned down, the frocking proposal.

Navy officials, meanwhile, acknowledged that there might be dissatisfaction among its selectees not eligible for frocking. But the "overall advantages of frocking, such as prestige of higher grade and improved fleet morale with no requirement for additional funding, far outweigh any actual or perceived disadvantages to frocking," they told

AIR FORCE Magazine. Navy says it now frocks to all grades and ranks above E-3.

O-3 Hikes Up, Ousters Down

Air Force has placed promotions to temporary captain on a fully qualified basis, meaning a higher selected rate and fewer passovers and eliminations. The move, which dropped the best-qualified system, was effective with the O-3 board, which met late last month. About ninety-nine percent of the first-time eligibles are believed to have been selected, which would mean up to 200 more promotions than under the now-discarded system.

With a higher promotion rate, passovers and force-outs will be curtailed. This is highly significant in that the Senate's Armed Services personnel subcommittee has, with DOPMA as a hostage, been pressur-

AFA Believes . . .

Nibbling Away at Retirement Programs

As the Congress begins to examine President Carter's austerity budget, talk about military and Civil Service retirement (along with general discussions of the federal salary structure) assails us from every side. This is not accidental, but rather a calculated attempt on the part of some elected and appointed leaders to (a) make the general public uncomfortably aware of these retirement costs and (b) thus lay the groundwork for eventually scaling down benefits. While the emphasis is on government retirement in general, AFA is especially concerned about the future effect on Air Force civilian and military retirees.

Item—At the end of last year, the Air Force's (and the other services') recommendations relevant to the President's Commission on Military Compensation finally surfaced. The Defense Department, reportedly unhappy with the glaring differences in what the separate services recommended, sent its own compromise recommendation to the President to meet a year-end deadline. Key elements are reported elsewhere in "Bulletin Board," but one important feature would delay receipt of full retired pay until age sixty. The stated reason: to save money.

Item—The Administration has proposed that the cost-of-living raise for federal retirees, including the military, be limited to one annual adjustment. Again, cost savings are cited as justification.

Item—The Congressional Budget Office has released a study stressing that the federal retirement program is one of the most "generous," and lists several "options" to "improve it." All, of course, reduce its benefits.

Item—Officials again raise the old idea of letting Social Security benefits serve as the foundation for government retirement programs.

Item—Both House and Senate Armed Services Committee staffers, pressed for what personnel items they feel will be hot this year, cite "retirement" as a key issue.

Item—Already scheduled for this year (perhaps as this issue of AIR FORCE Magazine reaches you) are comprehensive hearings on the Civil Service retirement program by the House Compensation and Employee Benefits Subcommittee.

The fact is that federal civilian and military retirement is expensive. Military retired costs are now around \$10 billion a year. The CBO study estimates the *untended* obligation of the Civil Service retirement fund will approach \$160 billion by 1984. These are tempting figures for those seeking quick economy targets to shoot at.

But the other side of this coin is that these are long-standing obligations of the federal government. Military retirement, under the present system, actually is deferred compensation, earned by the military man and woman who spent many years at lower-than-standard pay with the expectation of drawing compensatory retirement benefits in later years. Tacit evidence of this came in late December when the Air Force, for the first time since the end of the draft in 1973, came up short on its recruiting quotas. Some observers commented at the time that continued short-falls might cause Congress to be less than enthusiastic about tampering with retirement, a proven enlistment motivator.

In any event, all the talk about overhauling the retirement system is aimed at putting less money in the pockets of military people. Each new retirement plan is touted as "saving money." No one, as far as we know, has yet come up with a "new" retirement proposal aimed at providing better retirement benefits.

AFA's position on both military and civilian retirement is clear. As stated in our 1978-79 Defense Manpower Issues Policy Paper, "We believe that any new retirement system must guarantee no reduction in benefits for military and federal employees serving, or under contract, at the time of enactment." That's pretty plain. We recognize that any system can be improved, but changes in these retirement programs must be considered in the context of overall compensation plans. If money is to be "saved," it must not be at the expense of those who are now in the system. That's not "saving"—that's "taking," and, worse, taking from those who had every reason to believe that the promised retirement benefits would be there when their part of the bargain was honorably and faithfully fulfilled.

—JAMES A. McDONNELL, JR.

The Bulletin Board

ing the Pentagon to curtail promotion-failure exits. Air Force officials hope that such compromises on the up-or-out issue will lead to early Senate approval of the DOPMA legislation.

Last year, under the tougher, best-qualified system, Air Force fired 139 first lieutenants for double passovers. The removals totaled 160 in FY '77 and 132 the previous year.

Officials also hope the increased O-3 promotion opportunity will help mute junior officer criticism of the promotion system and other personnel policies. The extra captaincies can be comfortably accommodated, officials explained, because the groups up for consideration this year and next "are extremely small." The quality is high and won't be compromised by a near-100 percent selection rate, they added.

Hq. USAF may also increase

promotions to permanent Regular major by boosting the present eighty percent "opportunity." It could mean perhaps 200 extra promotions, including some insignia changes, and simultaneously curb promotion failures and firings. Annually, the Air Force has been forcing out more than 700 captains for failure to make O-4.

Also under high-level discussion at year's end: selective continuation of passed-over pilots and scientific and engineering officers.

Pay Actions Far Away

Pentagon authorities at the end of 1978 said they expected to get the long-planned legislation overhauling military compensation to Congress about May 1. The date could slip, however.

Defense Secretary Harold Brown in December sent an "overview" of his retired-pay proposals to the President. If all goes as expected, they will be merged with other Defense-backed pay alterations (e.g., a variable BAQ depending on varying area housing costs) and sent as a single package to the Administration's Office of Management and Budget about now (early February).

Allowing three months for OMB-DoD negotiations would meet the early May target. It all may be academic, of course, because Congress is not likely to tackle the measure seriously this year.

Dr. Brown's complex "two-tier" retirement scheme is an outgrowth of various pay studies. It would provide reduced retirement at the twenty-year service point and contain slight increases at age sixty. Some benefits would be available after ten years of service. Overall, however, the package would eventually reduce retired pay outlays substantially. And the plan he submitted to the President borrows features, such as a Social Security offset at age sixty-five, from the Retirement Modernization Act the Pentagon once supported. The best feature of the Secretary's plan, many service people hold, is that most active-duty members could elect to stay with the current system. OMB, however, may well reject the option feature as far too expensive.

In other military pay matters brewing at press time:

- USAF officials privately expressed great concern over the like-

Ed Gates . . . Speaking of People

The Disastrous 'Ethics in Government' Law

A tough new "Ethics in Government" law will soon hit senior military officials and high-level civilians directly, and the entire officer corps indirectly. Some must lay bare their financial holdings; many may find it more difficult to land post-retirement jobs with defense contractors or do other business with the military.

USAF officers queried by AIR FORCE Magazine all denounced the new statute, branding it "a slap in the face" to officers generally, "blatantly unfair," "a disaster," and worse. Some critics see it as possibly damaging to national security.

USAF's Judge Advocate General Maj. Gen. W. D. Reed and his aides recently explained the new statute's general provisions to JAGs Air Force-wide, so they can advise potential retirees. But definitive answers to many questions the new law raises, particularly about the post-retirement job sections, were not immediately available. The Defense Department, meanwhile, was preparing to amend its Standards of Conduct directive, and the Air Force early this year was to revise AFR 30-30 accordingly.

The Ethics in Government Act of 1978 aims to preserve and promote the integrity of public officials and institutions. One section directs active-duty generals and GS-16s and above to file detailed financial reports with their respective services by May 15, 1979. They must update those reports every year.

The reports must include most of their outside income, such as gifts (except from relatives) worth more than \$250 in some cases, above \$100 in others; reimbursements of \$250 or more from any source; any property held for production of income above \$1,000; and nongovernment sources of com-

ensation more than \$5,000. They must also report activities in outside businesses for the past two years; any arrangements for future jobs or for continuation of payments and benefits by former employers; debts above \$10,000 (other than home mortgages and loans secured by personal property); and financial data about their families.

Furthermore—and this is the big shocker—"the reports and official position descriptions will be available to the public for six years." This means, an official said, that any reporter or anyone else can "come in and help himself."

If a general, admiral, or GS-16 or above fails to file a financial report, or falsifies one, the Attorney General can sue him in federal court. Conviction carries a fine of up to \$5,000.

USAF critics don't fault the financial reporting requirement so much as the rule allowing its release to the public. It's easy to visualize irresponsible reporters or broadcasters, in their search for the sensational, pouncing on the reports of prominent officials. An officer with large assets acquired through inheritance or other legitimate means could be pilloried, or at the least greatly embarrassed. One with meager holdings could be ridiculed.

One three-star officer declared the disclosure section maligns the entire officer corps and impugns military leadership. A fairer system, he said, would be to allow only the respective chiefs of staff or service secretaries to examine the financial reports, in private. This way, he added, a high authority could deal firmly with any violators while the individuals would not be subjected to needless embarrassment.

If added checks were required, the Defense Secretary or

likelihood of another military pay raise cap next October, the third in a row. They contend it will further damage recruiting and retention. Needed to restore full comparability in pay, officials hold, is a raise of 10 to 11 percent in 1979. "But there's no way we're going to get it," one DoD executive said. The President's chief inflation official, Alfred E. Kahn, has already promised another cap. The exact figure will be determined next summer, the executive indicated. USAF officials appear handcuffed in their efforts to block another cap.

- Service and Defense personnel policy experts were talking about raising flying pay. A proposal could go to Secretary Brown early this year, an official said.

- The Administration reportedly was about to propose giving CPI raises to military and Civil Service retirees once a year, instead of the present two times. Individual raises would be reduced only slightly, but the delay in paying part of the money would save the government large sums.

- Defense is drafting legislation to speed payment of bonuses, ranging from \$9,000 to \$13,500 annually, to military physicians the govern-

ment sent through medical school under DoD's Health Professions Scholarship Program. They now serve seven years in order to collect a bonus, while nonscholarship doctors wait four years. The HPSP grads have made this a big issue.

- A plan to raise per diem from the present \$35 ceiling to \$50 has gotten service support within the Pentagon. The proposal, if it gets Administration blessing and if Congress approves, would also authorize up to \$75 a day for travelers to especially expensive areas such as New York City, Chicago, and San Francisco. The previous per diem ceilings, set in 1976, "have been substantially overtaken by increased costs," a draft of the legislative proposal asserts.

JROTC Expanding . . . Slightly

Twenty-seven more high schools are scheduled to field Air Force Junior Reserve Officer Training Corps units starting in academic year 1979-80. Some of the newcomers will replace units dropping from the program because of insufficient student participation (enrollment dropping below eighty-five for two consecutive years). Others are

surfacing under recent legislation allowing the Air Force 285 instead of the present 275 units.

Air Force JROTC enrollment at the start of this year was 31,600. However, this is only about one-third the participants in the Army JROTC, which operates more than 650 units. AFA continues to urge the government to allow the Air Force a more equitable number of units.

The upcoming slight expansion means job openings for retired USAF officers and NCOs, who head up all JROTC units. Those interested should contact AFROTC Headquarters, Maxwell AFB, Ala. The new units, to be established in the following order as vacancies occur, are:

Union HS, Union Township, N. J.; Zion-Benton Township HS, Zion, Ill.; Grants Pass HS, Grants Pass, Ore.; Adrian HS, Adrian, Mich.; Anchor Bay HS, New Baltimore, Mich.; McDowell Senior HS, Erie, Pa.; Thousand Oaks HS, Thousand Oaks, Calif.; Quartz Hill HS, Quartz Hill, Calif.; Penn Cambria HS, Cresson, Pa.

Bedford HS, Bedford, Mass.; Medford HS, Medford, Mass.; Interboro

even the nation's top legal official, the Attorney General, could examine the reports and, if necessary, act on them. But always in private.

The new statute's tighter, more inclusive post-retirement restrictions appear equally offensive. They are designed to curb so-called "revolving-door" situations in which military executives move to firms holding defense contracts, and vice versa. Heretofore, a former officer or civilian employee of any rank or grade could not represent another person, or write or call his former department or office "with intent to influence," if the matter was one under his "official responsibility" during his last year of service. This prohibition has been extended to two years.

What if the subject matter involved is one in which the former officer or employee "had participated personally and substantially" while employed? The new law says he will be barred forever from doing business with his former associates.

The ethics law contains two additional new post-retirement curbs that apply only to general officers and certain GS-17s and above. The first bars them, for two years, from helping anyone to appear before "any department on a matter under that officer's or employee's official responsibility during his last year of service."

The second, even tougher curb against retired generals and supergraders prohibits them from contacting, for one year, their former agency or department with intent to influence on matters of business pending before the agency or department, regardless of the nature of that proceeding, or the degree of association the official had with the matter. "This," one official said, "is a flat bar to almost any topic outside of the weather." Another called it an "iron curtain" between a retired general officer and his former department for a full year.

Air Force critics point out that this provision even acts to bar a conscientious general after retirement from writing the chief of staff regarding his concern over personnel retention, military pay, recruiting, or a host of other topics.

The new law contains sharp teeth to ensure compliance with the post-retirement provisions: a fine of \$10,000 and two years in prison.

The curbs appear to add up to new doors being slammed on full-time and consultant jobs that experts retiring from the services had expected to land. It also seems to mean a great loss of expertise for defense contractors, a loss that could translate into development and production problems and eventual higher costs to the government.

As one informed Air Force source said, "It's difficult to visualize a situation where a retired general could use his expertise in advising an employer who does business with the Air Force without violating the new two-year ban."

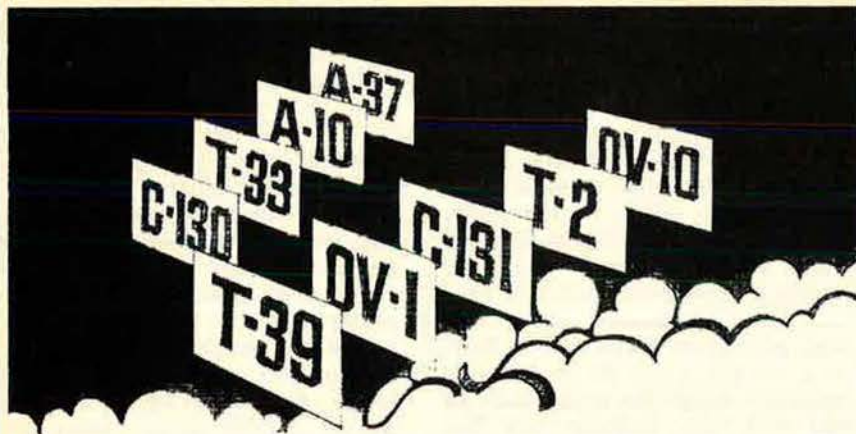
The post-retirement restrictions become effective July 1, 1979; this gives those who would be affected time to retire and be treated under the old, less stringent rules. Accordingly, numerous generals and high-ranking civilians are considering early departure. This could affect military leadership.

Equally disturbing are reports that many talented field grade officers—"potential generals"—with or near retirement eligibility also are weighing early retirement to avoid the tough new provisions of the ethics statute. Logistics, procurement, and JAG officers particularly could lead a retirement exodus.

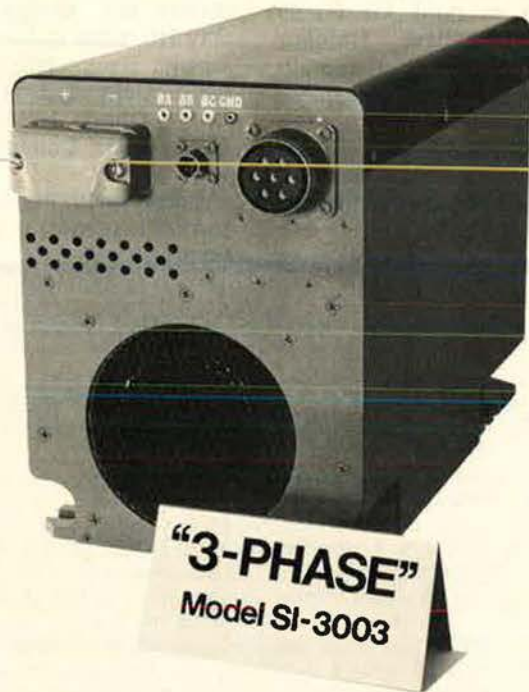
Another prediction circulating in the Pentagon is that the new law will make it more difficult to fill the various service assistant secretaryships and other civilian executive appointee posts with topflight people.

"The services are going to lose talent," one informed source predicted. Other critics look on the new statute as another assault by the government on the military community. "It's the last straw," one youngish, fast-rising lieutenant colonel (on the full colonel's list) told AIR FORCE Magazine.

More serious, perhaps, is the possible adverse impact on the military's future leadership. Stepped-up departures of current and potential generals, it is feared, could erode the quality topside and even hurt national security. ■



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The Bulletin Board

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Tom C. Clark HS, San Antonio, Tex.; Central HS, Manchester, Tenn.; South HS, Worcester, Mass.; New Braunfels HS, New Braunfels, Tex.; Tullahoma HS, Tullahoma, Tenn.; Oakland Mills HS, Columbia, Md.; Taft Union HS, Taft, Calif.; and Newburyport HS, Newburyport, Mass.

Returning to the Fold

Capt. William A. Miller and John N. Higgins, both pilots, and Neal D. Gordon, Jr., a data automation specialist, took early-outs in recent years. They'd had it with the Air Force.

Now, after a long look at civilian life, they and 123 other Air Reserve and Air Guard officers recently returned to the active-duty fold. It's part of the new Voluntary Reserve Return Program, whose second board convened recently and screened 700 more recall bids. Results are due momentarily; those chosen will return shortly.

Why are they coming back? For many reasons, Air Force reports. But the overriding one among "typical returnees" such as Miller, Higgins, and Gordon, is "the closeness of being in the military family . . . the feeling of belonging . . ." the missed on the outside. They expect to find it back in uniform, the Air Force said.

Miller, a 1970 AFROTC grad and a well-paid stockbroker, is now flying with the 5th Fighter Interceptor Sqdn., Minot AFB, N. D. Higgins, a 1971 Air Force Academy graduate and an F-4 pilot, was an assistant division manager for Beech Aircraft Corp. Gordon, a 1970 OTS graduate has been assigned to McClellan AFB, Calif., in the computer system development area.

Distaff Mechanics Doing OK

When Air Force began training women aircraft mechanics more than five years ago, many quarters said it wouldn't work, that women

were not mechanically inclined, wouldn't get their hands dirty, etc. But those predictions were wrong, according to a recent Strategic Air Command study of the way 265 of the command's women mechanics have performed.

Their commanders and supervisors gave them generally good marks and said they were doing as well as male mechanics. Of the 45,500 USAF members in the aircraft maintenance career field, about 2,000 are women, Hq. USAF said.

By contrast, there were only sixteen USAF women pilots and just six female navigators at the end of last year, with equal numbers in training. Flying training for Air Force women, though beginning in mid-1976, is still officially called a "test."

Ten more women officers—five from active duty and five just out of AFROTC—were recently chosen for pilot training and will enter classes early this year. Token selections will continue via boards convening in April and October.

The Air Force female population rose to 46,000 members late last year. The goal for end-FY '79 is 54,300, but officials say 13,300 non-prior-service recruits are needed to attain it.

Short Bursts

Attracting **volunteers for USAF recruiting duty** is as tough or tougher than signing up new recruits. A recent Hq. USAF message lists fifty cities where new recruiters, E-4s and up, are needed "now." And "other vacancies surface daily," the notice says.

Air Force, in a related move, is **extending its Recruiter Helper Program** into FY '79 by picking 550 first-term airmen to return home and help their local recruiters. Instead of staying just fifteen days, as most of the helpers did last year, they'll put in a full month with their recruiters. The 3,600 helpers last year attracted "more than 5,000 enlistments," the Recruiting Service said.

The Army, meantime, has begun **assigning NCOs to recruiting duty involuntarily**. Seems there aren't enough volunteers to maintain that service's huge recruiting force of 5,300 people. The Army early this year also launched a drive to recruit 12,500 youths for the infantry and other combat arms overseas, on two-year enlistments. The three-year hitches weren't doing the job. Another lure Army has obtained to make the new project work is a tasty education bonus for volunteers

to attend college when the two-year enlistments are up.

Col. Robert F. Darden, Jr., Commander of the 3770th Tech Training Gp., Sheppard AFB, Tex., is campaigning to scrap the **military's preposterous leave system** and replace it with the Civil Service leave system or something like it. Needs doing. He notes that military members are penalized because they can't take off the weekend prior or subsequent to a leave.

Another good Darden recommendation: Give service people using their own cars for military business **equal reimbursement** with civil servants using their privately owned vehicles for the same reason. Unfortunately, Darden's recommendations—tossed into the USAF Suggestion Program hopper—aren't likely to get anywhere soon.

Chief of Staff Gen. Lew Allen, Jr., has written his major air commanders to get behind the AFRIP project—that means **Air Force Retiree Involvement Program** (not Rank Has Its Privileges). Keep the nearly one-half million Air Force retirees and the more than 17,000 surviving spouses informed and encourage their participation in base activities, the Chief said. ■

Senior Staff Changes

RETIREMENTS: M/G William C. **Burrows**; M/G James B. **Currie**; L/G Bryan M. **Shotts**.

PROMOTIONS: To **Major General:** William P. **Acker**; Christopher S. **Adams, Jr.**; James I. **Baginski**; Emil N. **Bloch, Jr.**; Bill V. **Brown**; Norma E. **Brown**; William E. **Brown, Jr.**; George M. **Browning, Jr.**; Carl H. **Cathey, Jr.**; Murphy A. **Chesney**; Phillip J. **Conley, Jr.**; David B. **Easson**; Jay T. **Edwards III**; Herbert L. **Emanuel**; James C. **Enney**; Billy B. **Forsman**; Irwin P. **Graham**; Patrick J. **Halloran**; William W. **Hoover**; Charles C. **Irons**; Robert E. **Kelley**; James H. **Marshall**; Earl T. **O'Loughlin**; Leighton R. **Palmerton**; Don H. **Payne**; Herman O. **Thomson**; William R. **Usher**; Jack W. **Waters**; Larry D. **Welch**; William R. **Yost**. To **Brigadier General:** Harold W. **Todd**.

To **ANG Major General:** John B. **Conley**; Lloyd W. **Lamb**; Orlando **Lienza**; Stanley F. H. **Newman**; Hal C. **Tyree, Jr.**; Emory M. **Wright, Jr.** To **ANG Brigadier General:** William F. **Casey**; Robert J. **Collins**; James E. **Cuddihee**; William A. **Free**; Roy A. **Jacobson**; Lloyd L. **Johnson**; Monroe G. **Mathias**; Charles B. **Ocksrider**; William E. **Riggs**; Frank H. **Smoker, Jr.**; Emmett J. **Whalen**; Charles J. **Young, Jr.**

CHANGES: B/G (M/G selectee) **Bill V. Brown**,

from Cmdr., 14th AD, SAC, Beale AFB, Calif., to V/C, 8th AF, SAC, Barksdale AFB, La. . . . **M/G Kenneth D. Burns**, from Cmdr., USAF Security Service, San Antonio, Tex., to Cmdr., TUSLOG, USAFE, Ankara, Turkey, replacing M/G Warren C. Moore . . . **B/G (M/G selectee) James C. Enney**, from Dep. Dir. for NSTL, JSTPS, Offutt AFB, Neb., to DCS/Intel., Hq. SAC, Offutt AFB, Neb., replacing M/G Doyle E. Larson . . . **M/G Doyle E. Larson**, from DCS/Intel., Hq. SAC, Offutt AFB, Neb., to Cmdr., USAF Security Service, San Antonio, Tex., replacing M/G Kenneth D. Burns . . . **M/G James E. McInerney, Jr.**, from Comdt., Industrial College of the Armed Forces, Fort McNair, Washington, D. C., to Dir. of Programs, DCS/P&A, Hq. USAF, Washington, D. C., replacing retiring M/G James D. Currie . . . **M/G Warren C. Moore**, from Cmdr., TUSLOG, USAFE, Ankara, Turkey, to Vice CINC, Hq. ADCOM, Peterson AFB, Colo., replacing retiring M/G William C. Burrows.

M/G John E. Ralph, from Senior Mil. Advisor to Dir., US Arms Control & Disarmament Agency, Dept. of State, Washington, D. C., to Comdt., Industrial College of the Armed Forces, Fort McNair, Washington, D. C., replacing M/G James E. McInerney, Jr. . . . **ANG M/G Joseph D. Zink**, from Asst. C/S for Air, NJNG, to Exec. Officer and member, Reserve Forces Policy Board, Washington, D. C. ■

Airpower Pioneers

Herbert A. Dargue, one of the Army's earliest pilots, participated in the first operational employment of US airpower, and in the 1920s was involved in the fight for an independent air arm. As commander of bombardment units and the Air Corps Tactical School, he exemplified leadership based on loyalty to subordinates. General Dargue, slated for a major role in the Pacific, was killed in a crash five days after Pearl Harbor.

Maj. Gen. H. A. "Bert" Dargue: A Lesson in Leadership

BERT Dargue graduated from West Point in 1911 when graduates who went into the Aeronautical Division of the Signal Corps and helped shape American airpower were few and far between. One year earlier, Delos Emmons had graduated. From the class of 1909 had come Thomas DeWitt Milling who, as Billy Mitchell's chief of staff, was among the earliest vigorous proponents of American airpower. James F. Chaney had been in the class of 1908, and Henry H. "Hap" Arnold had graduated in 1907. One year earlier was the first man listed in the US Military Academy's *Register of Graduates* to achieve prominence as an airpower leader—Frank M. Andrews.

The *Register* lists in barest detail the major commands or positions held by each graduate. The classes of 1906–11 included many officers who attained great prominence in the US Army. Only three of the 512 career briefs, beginning with Andrews and ending with Dargue, contain general or overall acknowledgments of accomplishment. Of the three, one went to the only officer in the group to attain five-star rank, Hap Ar-

BY GEN. LAURENCE S. KUTER, USAF (RET.)



Major Dargue, 2d Bomb Gp. Commander, Langley Field, Va.

nold. His accolade reads, "Pioneer in army aviation and builder of the greatest air force in history." Tommy Milling is the second to be recognized as a pioneer. The third accolade is given to Bert Dargue. The conclusion of his career brief reads, "Pioneer in aviation . . . died in aircraft accident 12 December '41."

I saw first-hand evidence of Bert Dargue's judgment,

leadership, and command ability, all under the cover of extraordinary modesty and self effacement, while serving under him from 1931 into 1939. He made sure that his successes and achievements were credited to his organization and his subordinates, never to himself.

In February 1942, as a permanent captain, I was abruptly promoted from

temporary lieutenant colonel to temporary brigadier general. With such sudden and unexpected prominence, I felt somewhat isolated and alone. I was given a pair of worn sterling silver stars on the back of which Mrs. Dargue had had engraved "Tommy Larry from Bert—Carry on." She gave me this strong support only sixty days after she had lost her husband in a crash. Let there be no doubt, I am prejudiced in favor of Herbert Arth Dargue. I also try to be objective.

Bert Dargue's professional competence, sometimes obscured by his quiet modesty, was apparent at Langley Field, Va., in the early 1930s. In those days, skill as a pilot was generally viewed as a primary qualification for commanding a flying unit and certainly was regarded as an element of prestige among the rated officers. At Langley, the nonrated officers and the senior, older, and less-active pilots had logistic and administrative positions, while offices in the comfortable big red brick base headquarters building near the flight pole. Prominent on the flight line were Clair Chennault, Robert Old, and Clair

ton Bissell, none of whom did anything to disclaim his reputation as a hot pilot. As commander of the 2d Bombardment Group, Major Dargue had his office in the sparse operations tower on the flying line among them.

Low-Key Leadership

Bert Dargue was not known at Langley as a hot pilot, and he never claimed to be one. When he flew as group commander, he chose the top rear gunner's cockpit in one of the group's Keystone bombers as his command position, where he could control the group's formations by hand signals from an open cockpit, where he had unbroken view of the three squadrons, and where all formation leaders could see him. He employed experience, judgment, and thoughtful leadership. And it was Bert Dargue who had been chosen by Maj. Gen. Mason Patrick to be his personal flying instructor when General Patrick was moved from the Corps of Engineers to be the Chief of the Air Service in 1921.

Major Dargue may have anticipated the time when thousands of bombers would rendezvous with swarms of fighters and converge to attack precision targets. As commander of the 2d Bombardment Group, he insisted that all flying elements operate on exact time schedules. Capt. Eugene Eubank was in command of the group's 49th Bombardment Squadron, and I was his operations officer and second in command. Captain Eubank made it very clear to all of us that, if any element of Major Dargue's group ever missed exact timing or under any circumstance failed to meet precise group schedules, it better not be an element of *his* squadron.

One morning, the group was scheduled for a formation exercise. Gene Eubank



In a ceremony at Bolling Field in 1926, President Coolidge awards history's first DFCs to pilots of the 22,000-mile Pan-American Good-Will Flight. Dargue is at the President's right.

was away, and, as acting squadron commander, I was called on for a quick decision about timing. The operation order specified "Cockpits 0745 . . . Start engines 0750 . . . Chocks away 0759 . . . Taxi out 0800." On this mission, the 49th Squadron was scheduled to lead the group, which Major Dargue was to command from the upper rear gunner's cockpit in my Keystone bomber. At 0745, Major Dargue had not shown up, nor had he at 0750. On schedule, engines were started and magnetos checked. When my watch showed exactly 0759 I gave the hand signal for the wheel chocks to be pulled. I had concluded that something important had diverted Major Dargue, and at exactly 0800 I led the group out to take-off position and swung the formation into the wind.

As we started our takeoff run I caught sight of Major Dargue, in winter flying suit, running out from the Operations office toward the formation, his heavy parachute banging behind as he ran. Remembering Captain Eubank's dictum that the 49th would never be the cause of group delay, I pushed the throttles wide open.

We took off, leaving our

very senior commander standing on the ground, sweating and puffing in his heavy flying suit with parachute dragging behind. He was not just a major. I was keenly aware that he was THE MAJOR, and that I was one of many expendable second lieutenants.

The hour-and-a-half formation flight became less and less comfortable as the 0930 landing time drew near, and with it the prospect of facing THE MAJOR whom I had left stranded on the flight line.

I shall never forget Major Dargue's words when we had taxied in and shut down our engines: "Lieutenant Kuter, I am afraid I will have to conclude that you did the right thing. If I had been in your position I doubt that I would have had the courage to do what you did. That is all." And that was all!

While Major Dargue conducted the official business of the 2d Bombardment Group with precision and a reasonable degree of military formality, there was nothing cold or aloof in his relationship with the people in his group. At a time when morale and family spirit were novel ideas, he organized group-sponsored

dances at the officers' club and picnics on the beach. In the early '30s, the military pay freeze locked junior officers to their low ranks and very low pay scales. Entertainment off the base was too expensive for the many second lieutenants in each squadron. The picnics were not only welcomed, inexpensive entertainment, but a source of esprit within the group. Officially, the 2d Bombardment Group was an efficient organization. Socially, it was a healthy, happy family.

Pioneer in Action and Thought

In 1916, Bert Dargue had commanded the 1st Aero Squadron when US troops under Brig. Gen. John J. Pershing were challenged by Pancho Villa's incursions across the border from Mexico. (Another airpower pioneer, Capt. Benjamin Foulois, commanded all Air Service troops during this "punitive expedition.") Bert's son, Donald S. Dargue, has his father's papers that refer to that squadron as "eight box-kite stick and fabric airplanes with minimum support equipment." That was the first time airplanes had been used for reconnaissance and

observation operations in support of engaged US ground forces.

In 1926, an experienced flying leader was needed to command the record-making Pan-American Good-Will Flight—22,000 uncharted miles around South America—over the Central American jungles, then along the rugged Pacific coast, across the high Andes from Chile to Argentina, and back the long route up the Atlantic coastline and through the Caribbean. The aviation pioneer selected to lead that historic flight was Major Dargue. He and his pilots were awarded the first Distinguished Flying Crosses after this first mass flight of such a great distance. The DFC had been authorized during their flight, as the highest flying award. In the many years of our association I never heard him mention any incident from that long and hazardous flight.

Nor did he talk about his earlier association with Billy Mitchell and his influence on Mitchell's explosive demands for the recognition of American airpower. You have to read about the careers of others to learn of Dargue's pioneering in aviation action and thought. From biographies of Billy Mitchell one learns that Arnold and Dargue were the leaders as they, with Spaatz, Eaker, and Bissell, tried to persuade Billy Mitchell that he could accomplish more for American aviation by working within the military establishment than by making slashing public attacks on the authorities, particularly the Secretary of the Navy.

In old *Congressional Records* and, again, in the biographies of others one learns of Dargue's part in the development of American airpower. The Morrow Board rejected Billy Mitchell's far-seeing recommendation for

the creation of a Department of Aeronautics that would parallel a Department of the Navy and a Department of the Army within a Department of Defense. When there were complaints from the Air Service about this rejection, the House Military Affairs Committee conducted an investigation. The Committee questioned Majors Arnold and Dargue. Both advocated a separate Air Force coordinate and coequal with the Army and the Navy. For this and other airpower advocacies, Arnold was reassigned far from Washington. Dargue was reprimanded for "zeal in the cause of airpower."

A decade later, Arnold was back in Washington as Assistant Chief of the Air Corps and later as Chief, while Dargue was at the Air Corps Tactical School, Maxwell Field, Ala. There, he was in effect the Dean of an air war college. When he took charge, he found several younger officers in his faculty who were teaching with vigor and conviction the need to greatly expand the Army Air Corps and to establish a US Air Force, coequal and coordinate with the land and sea forces. These were substantially the views for which he and Hap Arnold had been reprimanded and punished some ten years earlier.

Dargue found that these instructors were teaching their own considered conclusions with the energy, conviction, and zeal that come from self-generated doctrine, rather than from expounding the conclusions or theories of others. He gave his faculty its freedom without explicitly enforcing his views or those of Mitchell or Arnold.

Faith in Planes and People

Dargue made sure that his young instructors' zeal and

Gen. Laurence S. Kuter is one of the four authors of the plan for employing US airpower in World War II. Immediately before the war, he served under Gen. George C. Marshall, who promoted him from lieutenant colonel to brigadier general. In October 1942, General Kuter became commander of an Eighth Air Force bombardment wing and later served in the Pacific as Deputy Commander of the AAF, Pacific Ocean Area. After the war, he commanded MATS (now MAC), the Air University, Far East Air Forces, PACAF, and NORAD.

enthusiasm stayed within reasonable bounds and then defended them against the criticism of faculty members from other branches of the Army and from elements of the Navy. In one case when he was unable to defend one of his younger instructors, he later made generous amends. An Air Corps captain on the faculty contended in a lecture that a large modern fleet, like the US fleet, would suffer a disaster if it should be discovered at anchor in a place like Pearl Harbor by a big force of modern bombers like the B-17. A Navy faculty member indignantly rushed a copy of the lecture to Washington.

In short order, the Secretary of the Navy demanded that the Secretary of War publicly reprimand the captain for this radical departure from Navy dogma. The Secretary of War passed the demand through channels to the commander at Maxwell. The commander did not direct Dargue to deliver the reprimand, which would have been normal procedure, but rather convened the faculty and student officers and delivered a public reprimand himself.

Bert Dargue probably was responsible for the fact that the reprimand was never entered into the captain's file. Later that year the captain was given the highest possible rating in his efficiency report.

Like his flying contemporary, Frank Andrews, Bert Dargue had absolute faith in the aircraft he flew, primitive as they would seem today. I flew with him many times from Maxwell to

Washington in the late 1930s. He always drew a straight line from Maxwell to Washington and flew off airways. His course took him up the backbone of the Appalachians and over the highest of the Great Smokies.

Bert Dargue believed that a prime virtue of the airplane was its ability to ignore mountains, rivers, and winding surface routes and to go straight from one point to another. That was the way he flew. Doubt about the accuracy of flight instruments or the performance of well-maintained aircraft was simply incompatible with Dargue's personality, his convictions, and his confidence in aviation. Like Bert Dargue, Frank Andrews also demonstrated unlimited—perhaps too unlimited—confidence in his airplanes and equipment.

As a major general, Dargue was ordered to Hawaii to head up an investigation of the lack of preparedness at Pearl Harbor on December 7, 1941. En route, he was killed on December 12 when his plane crashed into a mountain in California. The cause of the crash was never established. Seven teen months later, Lt. Gen. Frank Andrews, in the process of assuming command of American Forces in Europe, was killed when his plane crashed in Iceland.

It is interesting to speculate on the course of World War II if Frank Andrews had survived in Europe and Bert Dargue had survived in the Pacific to direct the greatest air forces in history which their colleague Hap Arnold was building.

AFA State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

ALABAMA (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **Donal B. Cunningham**, 1 Keithway Dr., Selma, Ala. 36701 (phone 205-875-2450).

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ARIZONA (Phoenix, Tucson): **E. D. Jewett, Jr.**, 7861 N. Tuscany Dr., Tucson, Ariz. 85704 (phone 302-297-1107).

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CALIFORNIA (Apple Valley, Edwards, Fairfield, Fresno, Hawthorne, Hermosa Beach, Long Beach, Los Angeles, Marysville, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Barbara, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Edward A. Stearn**, P. O. Box 5867, San Bernardino, Calif. 92412 (phone 714-889-0696).

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DISTRICT OF COLUMBIA (Washington, D. C.): **George L. J. Dares**, 12602 Tartan Ln., Oxon Hill, Md. 20022 (phone 301-897-6620).

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NEW YORK (Albany, Bethpage, Binghamton, Buffalo, Catskill, Chautauqua, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Kenneth C. Thayer**, R. D. #1, Ava, N. Y. 13303 (phone 315-827-4241).

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sham, King of Prussia, Lewistown, Philadelphia, Pittsburgh, State College, Washington, Willow Grove, York): **Lamar R. Schwartz**, 390 Broad St., Emmaus, Pa. 18049 (phone 215-967-3387).

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TEXAS (Abilene, Austin, Big Spring, Commerce, Corpus Christi, Dallas, Del Rio, Denton, El Paso, Fort Worth, Harlingen, Houston, Kerrville, Laredo, Lubbock, San Angelo, San Antonio, Waco, Wichita Falls): **Frank Manupelli**, P. O. Box 5250, San Antonio, Tex. 78201 (phone 512-349-1111).

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AFA News

By Don Steele, AFA AFFAIRS EDITOR



Virginia Gov. John N. Dalton, right, presents a certificate of appreciation from the Commonwealth of Virginia to Jon R. Donnelly, Virginia AFA President and National Director. The certificate cited Donnelly for "his unique ability to disseminate aviation information to the general public and his active participation within Virginia's aviation community." Donnelly was one of four under-forty National Directors elected to serve in 1978 and 1979.



The Albuquerque (N. M.) Chapter recently hosted the New Mexico congressional delegation and a gubernatorial candidate at its quarterly meeting. A record turnout assembled to hear the guests present their views on national defense issues. Guests included, from left, Sen. Pete V. Domenici, Rep. Manuel Lujan, and gubernatorial candidate Joe Skeen, with Chapter President V. R. Woodward, right.



The Central Oklahoma (Gerrity) Chapter recently presented its first \$500 Oklahoma AFROTC Scholarship to Harvey V. Jones III, a junior at the University of Oklahoma. Congratulating Cadet Jones is Chapter Vice President Dr. L. A. Yarbrough, center, and Chapter President Gayford Giles.

COMING EVENTS

AFA National Committees and Board of Directors Meetings, St. Anthony Hotel, San Antonio, Texas, February 15-17 . . . **Iron Gate Chapter's Sixteenth National Air Force Salute**, New York Hilton Hotel, New York City, March 24 . . . **Florida State AFA Convention**, Cape Coral, April 28 . . . **Washington State AFA Convention**, Seattle, May 4-6 . . . **Utah State AFA Convention**, Snowbird, May 11-13 . . . **AFA Golf and Tennis Tournaments**, The Broadmoor, Colorado Springs, Colo., May 25 . . . **AFA Nominating Committee and Board of Directors Meetings**, The Broadmoor, Colorado Springs, Colo., May 26 . . . **Twentieth Annual Dinner Honoring the Air Force Academy's Outstanding Squadron**, The Broadmoor's International Center, Colorado Springs, Colo., May 26 . . . **Michigan State AFA Convention**, June 9 . . . **New Hampshire State AFA Convention**, Pease AFB, June 9 . . . **Ohio State AFA Convention**, Rickenbacker AFB, June 19 . . . **AFA's 33d Annual National Convention**, Sheraton-Park Hotel, Washington, D.C., September 16-19 . . . **AFA's Aerospace Development Briefings and Displays**, Sheraton-Park Hotel, Washington, D.C., September 18-20.

chapter and state photo gallery



Fredrick Boorady, left, immediate Past President of the L. D. Bell Chapter, recently received AFA's Medal of Merit. Making the presentation was then AFA National Vice President (Northeast Region) Bill Rapp, now a National Director.



At a recent Houston Chapter AFA meeting, Chapter President Harold Gilbert, right, presented a proclamation from the city of Houston to the 147th Fighter-Interceptor Group, Texas Air National Guard, winners of the 1978 William Tell competition, Col. Robert J. Blissard, Commander of the 147th, accepted the proclamation.



Residents of the enlisted dormitories at Scott AFB, Ill., will have an abundance of reading material, thanks to the Scott Memorial Chapter's \$700 magazine purchase. The Chapter purchased forty individual magazine subscriptions, plus protective covers for use in dormitory dayrooms. Admiring part of the magazine order is Col. E. Wayne McLamb, seated center, Scott AFB Commander, and, from left, CMSgt. Paul Cleary, 375th Aeromedical Airlift Wing Enlisted Advisor; Scott Chapter President Bob Eisenhart; SMSgt. Dexter Devore, Jr., first sergeant of the 375th Air Base Group Headquarters Squadron; and Marilyn Spilsoth, Chapter Executive Council Member and project officer.



AFA Board Chairman George M. Douglas, center, was the guest speaker at a recent meeting of the Fran Parker Chapter at Holloman AFB, N. M. Visiting with Mr. Douglas are New Mexico State President Joe Turner, left, and Chapter President Bruce Koegler. The painting in the background was given to the 49th Tactical Fighter Wing by the Chapter to commemorate the arrival of the first F-15 Eagle at Holloman.



Gen. William Evans, USAF (Ret.), former Commander in Chief of USAF, was guest speaker at a recent quarterly meeting of the Northern Connecticut Chapter. Discussing the meeting's agenda with General Evans, right, is Chapter President Frank Wallace.

AFA News

Col. James D. Gromley, left, Commander of the 57th Air Division, presented a special plaque to Senior Airman Charles R. Walker, Jr., center, during an awards banquet hosted by AFA's Red River Valley (N. D.) Chapter. The plaque honors Airman Walker for becoming the Air Force's top first-term pistol/rifle marksmen. Shown looking on during the presentation is Chapter President Maury Rothkopf.



State and local officers of the New Mexico AFA met recently to hear Frank Jones, AFA's National Vice President (Southwest Region). Present at the breakfast meeting were, from left, Owen Hulfaker, State Secretary; George Doerr, past President of the Clovis Chapter; Vic Grahn, Cannon AFB representative; Joe Turner, State President; Marie Dandrea, Clovis Chapter Secretary; Frank Jones; John Wuest, Clovis Chapter President; Louie Evers, State Treasurer; and Bill Gaedke, representing Cannon AFB.

photo gallery



Maj. Gen. Frank Gerard recently received the New Jersey AFA Distinguished Service Trophy signifying his selection as "Man of the Year—1978." New Jersey State President Len Schiff, left, made the presentation during a meeting at McGuire AFB.



The Delaware AFA joined as cohost and cosponsor with the 436th Military Airlift Wing at Dover AFB, Del., in a salute to former Delaware Sen. John J. Williams, right. Senator Williams was made an honorary member of the Chapter, given a one-year membership in AFA, and received an AFA lapel pin from Jack Strickland, then Delaware Galaxy Chapter resident, left. The salute to Senator Williams was attended by a number of elected officials, including Delaware Gov. Pierre S. duPont; Sen. William V. Roth; Sen. Joseph R. Biden; Rep. Thomas B. Evans; former Gov. Sherman W. Tribbitt; former Gov. Elbert N. Carvel; former Gov. and Sen. J. Caleb Boggs; former Sen. J. Allen Frear; and Dover Mayor Charles Legates. Air Force guests included Gen. William G. Moore, Jr., Commander in Chief, Military Airlift Command; Maj. Gen. Thomas J. Sadler, Twenty-first Air Force Commander; and Col. William J. Mall, 436th Military Airlift Wing Commander from Dover.

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Bob Stevens'

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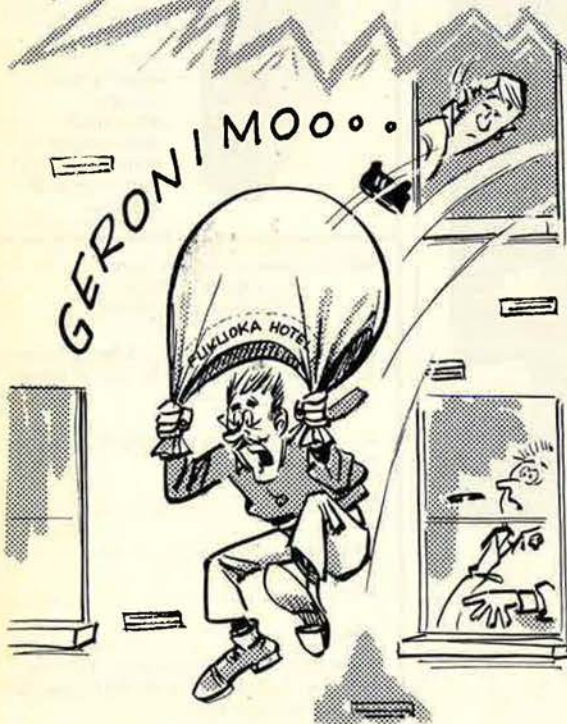
WE 5TH FIGHTER COMMAND TROOPS LIBERATED SOME PRETTY WEIRD BOOZI IN THE OCCUPATION OF JAPAN. "KAMI-KAZE JUICE" WAS A CASE IN POINT. THE SETTING FOR THIS STORY IS TRUE - THE EVENT...WELL, IT COULD HAVE HAPPENED.

THE TASTE TEST WAS GOING SWIMMINGLY WHEN THERE CAME.



A TAPPING AT THE DOOR-

BAM! BAM! BAM! OPEN UP IN THERE - MILITARY POLICE!



STOP HIM? HELL, I THOUGHT HE COULD MAKE IT ... SIR!



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Bob Stevens

EF-111A: fully programmed for supersonic jam sessions.

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For details on Raytheon's airborne ECM capabilities, please write Raytheon Company, Government Marketing, 141 Spring Street, Lexington, Massachusetts 02173.

RAYTHEON



The F-16 fighter: on line, on schedule.

The F-16 multirole fighter, powered by Pratt & Whitney Aircraft's F100 engine, is now operational with the U.S. Air Force's 388th Tactical Fighter Wing at Hill Air Force Base, Utah.

The F-16, built by General Dynamics, is designed for maximum maneuverability in air-to-air combat and

accurate long range air-to-ground weapons delivery. And the fuel-efficient F100 is the world's most advanced military engine, with an unmatched thrust-to-weight ratio.

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