

JUNE 1976/\$1

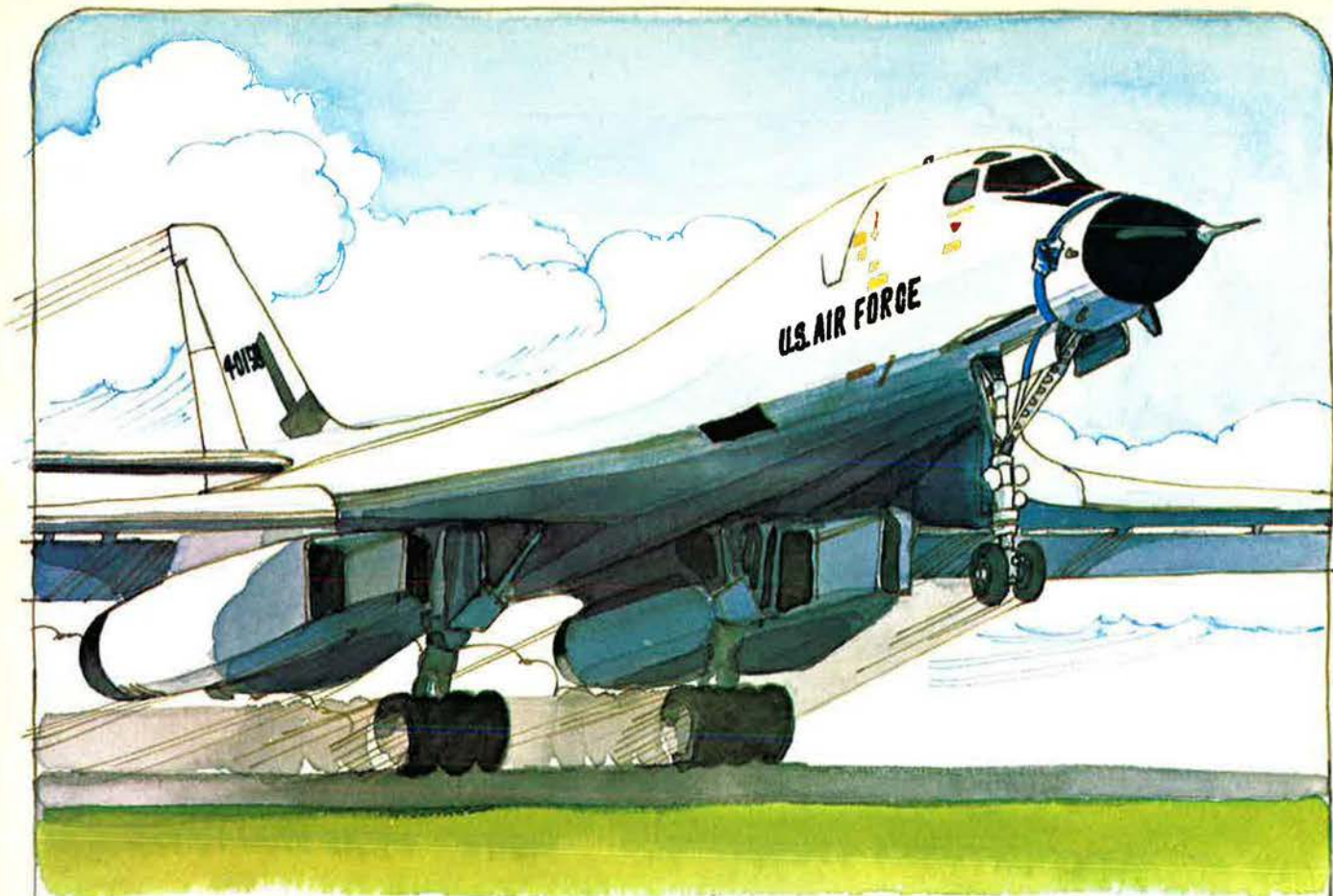
AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE



FLYING THE B-1
An exclusive report by
a USAF test pilot



We produce VSDs for the F-15. Now the B-1 will have ours, too.

Sperry is fast becoming *the* name in cathode ray tube displays for aircraft of all types—fighter, bomber, transport and helicopter.

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used successfully in a number of subsonic aircraft. They are being used in NASA's STOLAND project aboard a Convair 340, deHavilland Buffalo, Twin Otter and a Bell UH-1. The Air Force used a Sperry display in a C-141 during an all-weather landing program.

In the near future our CRT will be installed in Boeing's YC-14 as an electronic attitude director indicator, and aboard Navy SH-3H helicopters, where our display will be part of Teledyne Systems' tactical navigation system.

If you would like to test our CRT capability, call on us. We're Sperry Flight Systems of Phoenix, Arizona, a division of Sperry Rand Corporation, making *flying* machines do more so man can do more.



B-1 VSD

 **SPERRY**
FLIGHT SYSTEMS

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

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Awareness Is a Weapon, Too

BY JOHN L. FRISBEE, EXECUTIVE EDITOR

'Know your enemy" is an axiom as old as the art of war itself. It was largely ignored by the officials who set policy for our military operations in Vietnam, at least at a time when it could have made a difference.

Strategically and tactically, Vietnam was a minor league war—for us, anyway. Nevertheless, there are lessons to be learned, or relearned, from it. Not the least is this: Neither more nor better arms can guarantee lasting success when understanding of the enemy—his motivating philosophy, national and military strategy, social structure, and so on—is either faulty or lacking. That kind of understanding—for want of a better term, we'll call it the intellectual side of war—demands a lot of mental effort. To paraphrase Napoleon, we might say without too much exaggeration that in war, the intellectual is to the physical as three is to one.

Intellectual preparation, essential to success in fighting wars, also is an important part of deterrence. That brings us around to the USSR, and to the observation that, for a variety of reasons, the intellectual side of deterrence, which is primarily associated with the USSR, has not in recent years had the emphasis here that it deserves. For one thing, the Vietnam decade was a diversion. Then, too, Americans tend to be pragmatic, sometimes contemptuous of theory (which can't be quantified, or projected with certainty), and often prone to mistake theory for propaganda.

Hardware and budgets aside, Americans have put a lot less effort into understanding Soviet military/political thought than the Soviets have in studying ours. To be on the low end of the balance beam in both military capability and knowledge of one's opponent would be doubling our jeopardy. Without a widely shared understanding of Soviet operating philosophy, there will be little appreciation of the threat; without that appreciation there will be neither public support of adequate military forces nor perhaps even adequate preparation of the forces we have.

We don't mean to imply that the intellectual side of deterrence has been ignored by the Air Force and the other services. But serious study of Marxist-Leninist operating philosophy has been pretty much the province of a handful of specialists at higher headquarters, and a necessarily lesser fraction of the professional military education programs. That totally integrated philosophy subsumes all elements of national power—physical, intellectual, spiritual. Its goal is world domination; its driving force military might, whether used as a negotiating tool or, under favorable conditions, for conquest. That has been a recurring theme of AIR FORCE Magazine, though we often have been accused of preaching to the choir.

A recent Air Force development encourages us to be-

lieve that our homilies on the threat have not been superfluous. That development is the new Air Force Soviet Awareness program, conceived by Maj. Gen. George Keegan, USAF's Assistant Chief of Staff, Intelligence, and developed under his supervision with the strong support of Air Force Chief of Staff Gen. David C. Jones.

The roots of the Soviet Awareness program go back to 1972, when General Keegan started a project of translating the major Soviet books on military thought. (The series of translations was reviewed in our March Soviet Aerospace Almanac issue.) The nine books translated so far are used in Army, Navy, and Air Force service schools and by research organizations throughout the Free World. They may also be found in some 1,100 civilian libraries. These translations provide a professional basis, previously unavailable to those who can't read Russian for understanding the use of military power as the Soviets see it.

The Soviet Awareness program itself, first discussed publicly by Senior Editor Edgar Ulsamer in our May issue, has already produced instructional materials for Air University and inaugurated a formal course in Washington, where its first students were the Air Force's new brigadier generals. One phase of the course capsulizes the essence of Soviet military thought as expounded by Soviet theoreticians. Unclassified segments that we have seen are done with imagination and clarity. Senior civilian and military officials in the Washington area will start attending the course soon.

The Awareness course is to be videotaped and distributed throughout the Air Force, including the Reserve components, along with supporting instructional materials. Some phases will be tailored to the particular needs of different functional groups within the Air Force—SAC missile and bomber crews, fighter pilots in Europe, R&D people.

The purpose of the Awareness program is not to launch an anti-Communist or anti-Soviet crusade. It is a straightforward, unemotional presentation of the objectives that Soviet leaders have set out for their own people, and of the strategy, concepts, doctrine, tactics, and materiel they have created to reach those objectives.

We hope that similar programs will be established by the other services, and urge that essential parts of the Air Force program be made available on Capitol Hill and to civilian audiences. Americans must take the carefully calculated and minutely described strategic and tactical concepts of the Soviet hierarchy more seriously than we did Hitler's blueprint as set forth in *Mein Kampf*, lest this country be forced into a slow retreat toward oblivion, or into the catastrophe of World War III.



ICS

Internal Countermeasures Set. Designation: AN/ALQ-135.

Makes USAF F-15 practically invisible to hostile forces by automatically jamming their radar signals. Enhances F-15's survivability.

Packaged internally so as not to affect F-15's performance or maneuverability. Most advanced electronic countermeasures system yet developed for tactical aircraft. Dual Mode: continuous wave energy and time pulse energy.

More than 14,000 jamming transmitters produced by Northrop since 1952.

Aircraft, Electronics, Communications, Construction, Services. Northrop Corporation, 1800 Century Park East, Los Angeles, California 90067, U.S.A.

NORTHROP

After 317 hours in 85 flight tests of the B-1 avionics aboard an Air Force C-141 test aircraft;

After over 2,200 tests in our systems integration laboratory;

After four years of development, testing, and retesting of the avionics systems;

B-1 avionics got off the ground for the first time on April 1 at Palmdale, California—just as planned.

B-1 avionics is right on schedule.

Right on budget. And right on target. As expected.

Boeing is the associate contractor for the B-1 avionics system integration.

The B-1 bomber, being built for the U.S. Air Force by Rockwell International, is one of the most remarkable achievements in jet aviation. A manned bomber that can fly at supersonic speeds and carry twice the payload of the B-52. A jet

with a navigation system that guides the B-1 over the earth more surely than the human hand.

It's a major step in another way too. The B-1 will have a life-span of at least a quarter century—because it's designed to accommodate future advances in avionics.

Look at it this way. If the aircraft and engines are the muscle and bone of the B-1 system, the avionics is the eye, brain and





nerve center of the B-1.

A set of sensors collects information and on-board computers interpret and distribute it to the airplane's systems.

It's been a demanding program involving tight deadlines, extensive research, inventive solutions and cost challenges to all members of the B-1 team.

At Boeing we have developed a resourceful, effective team with

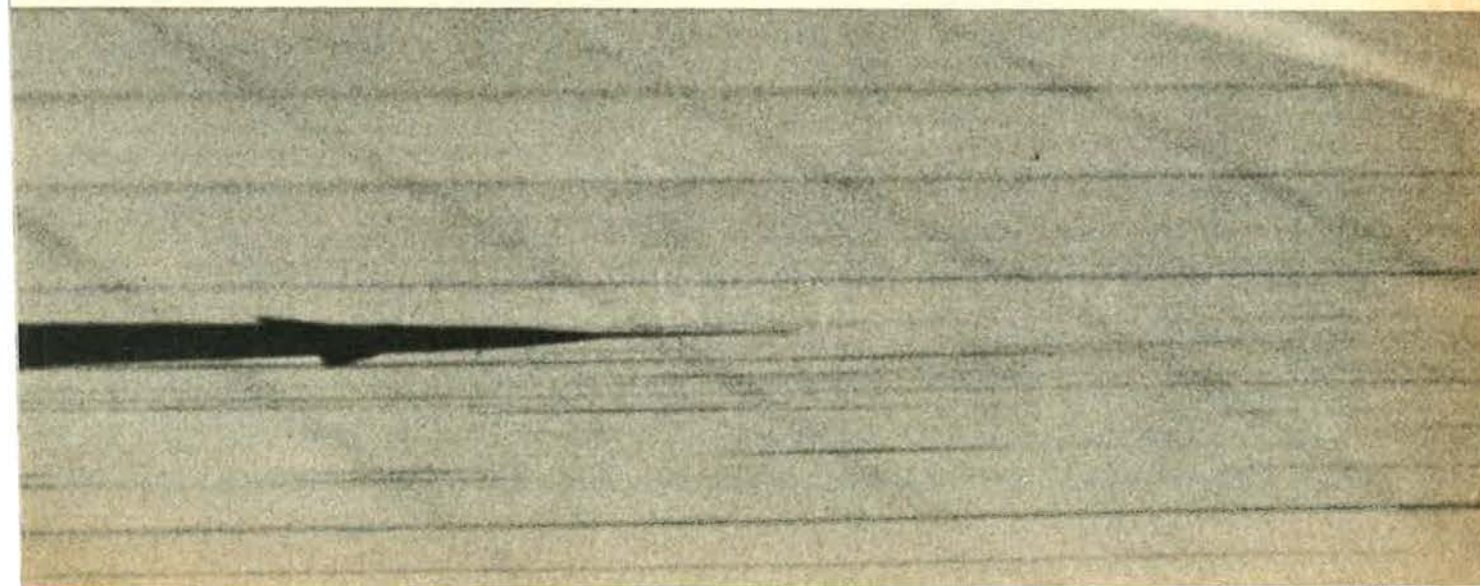
the proven capability to do a demanding job; a team that stands ready to complete this challenge and accept future challenges. We are proud of everyone on the B-1 team.

Because without them, the B-1 avionics would never have gotten off the ground.

BOEING



**April 1, 1976:
B-1 Avionics gets off
the ground.**



Airmail

Misleading Cost Comparison

Capt. Robert G. H. Carroll's "F-16: Swing-Force Fighter for the '80s" in your April issue was most interesting. We share the Captain's expectation that the F-16 will be a fine aircraft when it is eventually built and flown.

However, the choice of certain cost figures for the article—while assuredly inadvertent—could lead to the misconception that the McDonnell Douglas F-15 Eagle costs almost four times as much as the F-16 per aircraft.

The article cites the cost of the F-15 Eagle as "more than \$15 million a copy. . . ." Later, the reader is informed that the approved baseline flyaway design-to-cost goal for the F-16 is \$4.5 million in FY '75 dollars, and that "Air Force program officials indicate they are confident that the F-16 will meet this cost baseline."

In themselves, the figures are correct. But a comparison is invalid. The F-15 Eagle figure includes unit flyaway, plus recurring support costs, plus amortized research and development—all in actual year dollars. On that basis, the comparison would be \$15.26 million per F-15 Eagle vs. \$9.2 million per F-16 (650 aircraft at a total program cost of \$6 billion in then-year dollars).

Unit flyaway comparison in FY '75 dollars would be \$8.4 million per F-15 Eagle vs. \$4.69 million per F-16.

The valid comparison also should consider that F-15 Eagle figures include engineering development for the F100 engine. The F-16, of course, uses the same engine. Therefore, the F-15 Eagle figures cover airplane and engine development while F-16 figures cover only aircraft development.

And while we are on the subject of cost, it should be noted that the money to be paid for 650 F-16s could have bought eighty percent as many—or 520—additional F-15 Eagles.

Certainly the highly sophisticated F-15 Eagle costs slightly more than the, as Captain Carroll put it,

"smaller, more austere" F-16. But the figures included in your article imply a cost difference far in excess of fact.

George S. Graff, President
McDonnell Aircraft Company
St. Louis, Mo.

• *We were guilty of negligence in allowing an invalid comparison of cost figures to slip through—a case of the apples-and-oranges syndrome for which we often have criticized others. Our apologies, and our thanks to Mr. Graff for setting the record straight.—THE EDITORS*

Baker Two-Five

"AAF's Flying Artillery—The 75-mm Baker Two-Five," by Lt. Col. Jim Beavers, has got to be the funniest piece of writing ever featured in your publication. As usual, Bob Stevens came through with his inimitably hilarious cartoons.

As a matter of historical information, I first conceived the flying "75" while a cadet with the flying submarine section of the underground balloon corps. The concept called for a battery of four cannons, mounted in B-24 Liberators, approaching from the IP in inverted flight, stacked vertically seventy-five planes high with a 100-foot distance between each plane, and fire control to be exercised by the bombardier firing through the driftmeter.

Unfortunately, some jealous cost-conscious congressmen from non-military-industrial complex states saw fit to tamper with my strategy. The results are now history, as the war was then unnecessarily prolonged.

Sol Greenberg
Roslyn Estates, N. Y.

I've read your magazine for a number of years, but until today I have never felt I had to write a letter in response to one of your stories.

As a writer of Air Force motion pictures for the last twenty-six years (AAVS), my hat is off to Lt. Col. Jim Beavers for his glorious story on the 75-mm Baker Two-Five. Frankly, I laughed my head off—and still am,

for that matter. Let's have some more of Beavers. You, I might add, need a bit more of the "Beavers Approach." That isn't necessarily a criticism—just an observation.

Jack P. Nickels
Norton AFB, Calif.

As a forty-one-day veteran of the Air Force (September 23, 1965–November 2, 1965, medical discharge), a writer, and an avid reader of anything dealing with World War II aviation, I can't tell you how much I enjoyed Jim Beavers' story on the B-25G in the April issue.

It was a truly delightful piece of writing, made even more fun by Bob Stevens' cartoons.

Airman Basic John M. Flora,
USAF (Ret.)
Indianapolis, Ind.

It Was for Real

In specific reference to Bob Stevens' "There I Was" cartoon in your March issue, and *lest we forget!*, there really was a P-400 fighter aircraft operational in the Southwest Pacific Theater during WW II. It happened to be a variant of our P-39D Airacobra as manufactured by Bell for the British and called "Airacobra I" by the RAF and P-400 on US records.

In due respect to the poor jocks who were saddled to this inept bird, and in reference to Ray Wagner's *American Combat Planes* as well as William N. Hess's *Pacific Sweep*, both excellent books, the 5th Fighter Command in Australia and New Guinea was composed of 250 fighter planes, 100 of which were the Bell P-400s that were side-tracked from their original export status for emergency use in the Pacific. This was during those early dark days after Pearl Harbor, before the P-40s, P-38s, and P-47s were available in any sufficient quantity.

To Bob Stevens—please straighten out that captain and lieutenant at the bar, but for heaven's sake keep publishing your cartoons!

D. B. (Dave) Hutchins
Ex-Armament Officer, 475th
(Satan's Angels) Fighter
Group
Holiday, Fla.

Time to Call a Halt

. . . It is imperative that American citizens become fully cognizant of their inferior position and inability to contain communism, and begi

doing something about those deficiencies. The Communists obtained their exalted world power status through no small concessions on the part of their citizens. The materialistic niceties we Americans have long enjoyed will be short-lived unless we immediately start combating the horrendous challenges and accepting the required personal sacrifices.

The predominant number of main issues now being discussed by the various presidential aspirants generally relate to internal social problems and how each intends to cope with them. Although those issues are significant and require resolution, they should not obscure the most important issue, world security against Communist domination. Above all else, American voters should be clamoring for the candidates' views on how the nation should be led to put a halt to the constant Communist advancements, thereby better assuring the continuation of our national security. . . .

Col. Ben H. Carnell
APO New York

Who's Outta Step?

The April '76 article, "USAF Prepares for First Women Cadets," by James R. Patterson, was informative and thoroughly enjoyable. After the conjecture concerning the appropriateness of female cadets and the DoD testimony prior to opening the academies to women, it is particularly refreshing to note the USAFA's comprehensive and imaginative approach in preparing for the new program. Few innovations have been fortunate enough to be so well studied and so expertly planned.

It also appears that the first women cadets will clearly continue the outstanding tradition of Academy leadership—intellectual, physical, and academic. Although the young woman pictured in the lead photograph on page 50 is not one of the new cadets, she certainly displays a military image comparable to that of the male cadets—though it is unfortunate that the men couldn't quite keep up with the pace set by the role-playing woman cadet.

Maj. Jean E. Klick, USAF
Bellevue, Neb.

With all the rhetoric over women entering the military academies, I

cannot help but wonder why you printed that picture on page 50 of the April issue.

I keep asking myself, "Are they trying to portray the male cadets or the female cadets out of step?"

Stanley E. Stepnitz
Upper Marlboro, Md.

• *Neither. The picture was taken several months before women were admitted to the Academy; hence, the young lady modeling the uniform is not a cadet. We'll bet none of the women cadets will be out of step by the time basic cadet training is over.*—THE EDITORS

USAAF at Goxhill

I am collecting information for a book about the airfield at Goxhill, Lincolnshire, England. It was a USAAF station during World War II, and I would like to contact any of its former personnel.

It was designated Base 345 and was occupied by the 496th Fighter Training Group from December 25, 1943, to February 15, 1945. Prior to these dates, some of the other units that used it as an interim base for theater indoctrination were: 1st, 52d, 78th, 353d, 356th, and 358th Fighter Groups.

C. P. Chaney
32 Hollingbourne Road
Gillingham, ME8 6SS
Kent, England

A Hairy Issue

It's about time the Air Force, along with the other services, changed its haircut policy. It seems as though the "old heads" think that short hair is directly related to discipline and job performance. If this is so, then maybe someone should talk to many of our country's civilian leaders; i.e., congressmen, corporate executives, business leaders, doctors, judges, lawyers, etc. And how about the sons and daughters of our military brass?

In today's world, it is important to be in touch with your contemporaries in the civilian world, and one way is to be able to conform to the accepted styles of the majority of society. Wasn't short hair the current trend when our older

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 interests of space or good taste. Names will be withheld on request, but unsigned letters are not acceptable.

heads entered the service? Their resistance to change in this area is alienating a great number of servicemen, officer and enlisted, who have grown up in a different world.

While a cadet at the Air Force Academy, I built up a feeling that the Air Force was proud of its flexibility and ability to change and keep up with modern times. So why, in the '70s, live with outmoded styles of the '50s and '60s! . . .

I do not advocate abandoning personal grooming standards. . . . But at least allow a person to have a little say in the way he looks. It's about time our brass woke up. Don't keep the current AFR 35-10, and certainly don't abandon it. Liberalize it!

Capt. J. Smith
New York City, N. Y.

'84s To Denmark

I would like to get in contact with anyone who had anything to do with the ferry flights of RF-84Fs to the Royal Danish Air Force in 1962.

The information I hope to gain will be used in a book about the RF-84F in service with the RDAF and the previous history of these aircraft.

Jørgen Larsen
Hedekovvej 7 Ilskov
7451 Sunds
Denmark

Wisconsin Aviation History

The Air Force Association of Wisconsin is working in conjunction with the Wisconsin 99s, the Experimental Aircraft Association, and the Wisconsin Aviation Historical Society to obtain information on Wisconsin aviation history. These groups are leading the way for the Bicentennial Year in this project.

We need pictures, articles, names, places, and plane parts if available. If you can help with any of this, please contact

Aviation History Project
910 North 3d Street
Milwaukee, Wis. 53203

Phone: (414) 273-8288

MIA/POW Research

During the past three years, within my limited capabilities, I have been trying to research MIA/POWs of the VIII Bomber Command shot down while penetrating enemy airspace during WW II. So far I cannot get the facts on the actual count of those men KIA and those who were

Airmail

taken as POWs. Our own group suffered the loss of 189 aircraft and 1,890 crewmen (myself included), the second highest in the VIII Bomber Command.

We would appreciate any help on this research.

Robert W. Owens
96th Bomb Group (H) Memorial Assn.
900 South Western Ave. 2-R
Chicago, Ill. 60612

Trying to Locate . . .

From December 1958 until May 1961 I flew as a radar operator on RC-121Ds with the 964th AEW&C Squadron of the 552d Wing at McClellan AFB, Calif. During much of that time, I flew with a couple of individuals I wonder if any readers could help me locate. My AC was a fantastic guy (then Captain) Theodore H. Lang, Jr., from San Antonio, Tex. One of the flight engineers was a gentleman named (MSgt.) William L. Wright, of Seattle, Wash.

It would be a real honor for me to correspond with these two gentlemen.

Deward E. Hubbart
2032 North E St.
Elwood, Ind. 46036

Would like to locate Ralph Kidd, Class 43-F, Williams Field, Ariz. Later flew P-38s in the Pacific Theater of Operations. I have exhausted all other avenues so perhaps a reader can be of assistance.

Robert K. Fruh
P. O. Box 61
Bismarck, N. D. 58501

I am presently completing a mural for the National Air and Space Museum in Washington, D. C. Located in the World War II Gallery, it depicts an actual B-17 mission of the 359th Bombardment Squadron, 303d Bomb Group, Molesworth, England, on August 15, 1944, against Wiesbaden, Germany. Four B-17s are in the painting and I am interested in locating the whereabouts or status of the following crews:

Plane #42-38050: 2d Lts. Jack R. Hillary, William Robertson III, John E. Rice, and Rocco DeFilippes; SSgts. George E. Paul and Eugene E. Girman; TSgt. Jack F. Pordham;

Sgt. Neldon R. Bishop; and Pvt. James R. Watson.

Plane #42-31483: 2d Lts. Sidney L. Underdown, William C. Knolle, John P. Kenny, and Joseph C. Tyree; SSgts. John J. Kuwik and Frank G. Posado; Sgts. Walter R. Guptill, Richard G. Stevens, and Pius L. Botton.

Plane #42-31830: 2d Lts. Charles Mainwaring, Harold J. Bach, Raymond D. Hammond, and Leonard Stone; SSgts. Leon C. Gauthier and Paul A. Tognetti; Sgts. Bart Cottrell, Robert J. Bittman, and James P. Angeloff.

Plane #42-102496: 1st Lt. Lewis H. Walker; 2d Lts. Joseph J. Doyle, Abraham Wodinsky, and Thomas E. Codney; SSgts. James W. Sublett, Walter L. Hundley, Albert O. Reckert, and Henry C. Mathis; TSgt. Albert J. Lunday.

I would appreciate hearing from any readers who have information on these crew members.

Keith Ferris
50 Moraine Rd.
Morris Plains, N. J. 07950

I am searching for a former cadet who was with me at Keesler Field, Miss., in March of 1944. His name was Disbrow. He, a Sergeant Ramsey, and I had transferred from the 87th Infantry Division in November 1943.

This is not much information to go on but if anyone can help I'd be eternally grateful.

George W. (Bill) Chatfield
19 Wactor St.
Sumter, S. C. 29150

Cadet Anecdotes

I am collecting anecdotes for a book about cadet life at the Air Force Academy. If any reader has an experience to contribute, it will be greatly appreciated and acknowledged. All names will be changed to protect the guilty!

Capt. Steven H. Findeiss
USAFA '68
2100 Cecilia
Big Spring, Tex. 79720

94th Bomb Group

Our Association has located about 1,000 former officers and enlisted members of this WW II Eighth Air Force unit. We estimate that there are 3,000 to 4,000 yet to be found. Few are still on active duty. We understand the following were on active duty fairly recently (some

may still be) and would appreciate any information as to their present address:

Lt. Col. John D. Hamm, 4732860-76; Lt. Col. John R. Hamm, 117144-249; Lt. Col. Knox B. McKee, Jr., 551016605; Col. George A. Robinson, 362124821; Col. James F. Smith, 446128962; and Col. John B. Smith, 229097330.

We are, of course, interested in any former member of the 94th or supporting units who have not yet been contacted.

Col. Frank N. Halm, USAF (Ret.)
President
94th Bomb Group Memorial Assn.
433 N. W. 33d St.
Corvallis, Ore. 97330

Wanted—

Old copies of AIR FORCE Magazine. Will purchase them for the cover price. Please write to

Sgt. Kevin W. Foy
PSC Box 82657
Davis-Monthan AFB, Ariz. 85707

Life-Support Material

To aid in the compilation of an annotated directory of early aviation artifacts related to flying health and safety, I am desirous of corresponding with pilots and air crewmen who may have preserved significant "life-support" material.

Robert J. Bentford, M. D.
Seacost Gardens Apt. 6-A
Indian Harbour, Fla. 32937

POW Camp Raid

On January 30, 1945, the 457th Night Fighter Squadron, flying P-61 Black Widows, conducted sorties over a Japanese POW camp in the Cabanatuan area of Neuva Ecija Luzon, Philippines. That evening members of the 6th US Arm Rangers and Filipino guerrilla raided the POW camp to free some 512 US POWs.

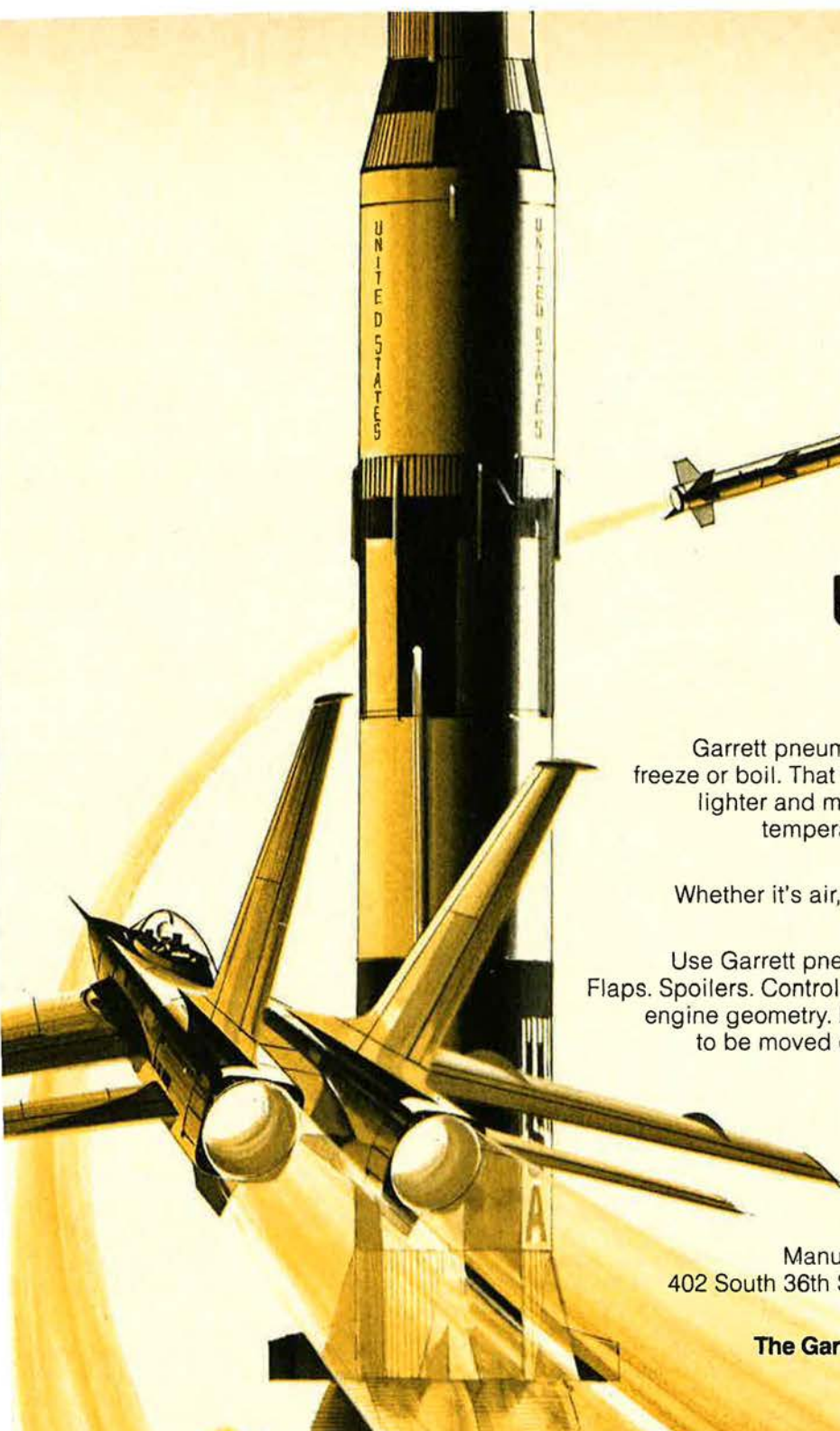
I am writing a book on the subject of this raid and would like very much to contact the crew members of the P-61s for details that are missing in the records.

Forrest Bryant Johnson
30 West 289 Pinehurst D
Naperville, Ill. 60540

UNIT REUNIONS

CBI Hump Pilots

The 31st annual reunion of the China Burma-India Hump Pilots Association



**Need actuators
that won't freeze,
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will be held August 5-8 at the Ramada Inn, Monroe, La. For further information contact

Jan Thies, Exec. Secty.
CBI Hump Pilots Assn.
917 Pine Blvd.

Poplar Bluff, Mo. 63901

Phone: (314) 785-2420

Romania POWs

The 6th annual reunion of prisoners held in Romania during WW II will be held at Valley Forge, Pa., August 23-29. Meet Princess Catherine Caradja, our founder. Contact

William J. Fili
270 Saxer Ave.
Springfield, Pa. 19064

5th DSCS

Former and present members of the 5th Defense Space Communications Squadron, Woomera, South Australia, and tenant units will hold their 2d annual reunion at the Air Force Academy picnic grounds on August 14. Further information from

Lt. Col. Millard Shirley,
USAF (Ret.)
15905 East Tufts Ave.
Denver, Colo. 80232

Phone: (303) 755-4341

34th Photo Recon Sqdn.

The 34th Photo Recon Squadron of 9th AF, WW II, is planning a reunion at the Bonhomme Richard Inn in Williamsburg, Va., August 5-7, 1976. Interested parties contact

Harold L. Vaughn
6520 Sandale Dr.
Columbia, S. C. 29206

43d Air Service Sqdn.

The "Yankee Machine Shop in the Bush," the 43d Air Service Sqdn., will hold its 13th annual reunion August 7-8. For further information write

W. M. Churchill
17010 9th Ave., S. E.
Bothell, Wash. 98011

Phone: (206) 743-1271

47th Bomb Wing

We are tentatively planning a 47th Bomb Wing reunion for all former members who served at Sculthorpe, England, from 1952 through 1960 who would like to meet at Miami's Key Biscayne Island August 6-8. Please contact

Walter E. Collier
12940 S. W. 74th Ave.
Miami, Fla. 33156

or call

James C. Barclay
(305) 445-1481

Frank D. Giquinto
(305) 445-1481

Night Fighters

All members of WW II night fighter squadrons are convening at the Hilton Inn, Colorado Springs, Colo., September 10-12. Write

Roy Atwell
Rio Verde, Ariz. 85255

49th Fighter Sqdn.

The 49th Fighter Sqdn., 14th Fighter Group, will hold a reunion August 6-8 in Albuquerque, N. M. Contact

S. D. Huff
3200 Chetwood Dr.
Del City, Okla. 73115

94th Troop Carrier Sqdn.

The 3d reunion of the 94th Troop Carrier Sqdn. and 439th TC Group Headquarters will be held August 18-21 in San Francisco, Calif., at the Hilton Hotel. Contact

George M. Rubald
430 Edgewood Dr.
Vacaville, Calif. 95688

VB/VPB-106

WW II Liberator/Privateer squadrons will hold a combined reunion in San Diego, Calif., August 12-15. Contact

Gordon K. Ebbe
2211 Wynkoop Dr.
Colorado Springs, Colo. 80909

C-141 Program

The annual reunion of USAF and Lockheed personnel associated with the C-141 development program during 1961-66 will be held June 23 at 4629 Hillard Ave., La Canada, Calif. Contact

Charles Craig
10126 Reseda, Villa 115
North Ridge, Calif.

307th Bomb Wing (H)

The 307th Bomb Wing (H) reunion will be held July 2-4, at the Tri-Arc Travelodge, 161 West 6th South, Salt Lake City, Utah 84010. Contact

Dan W. Cauffiel
3960 Melody Lane
Riverside, Calif. 92504

Phone (714) 689-2827

369th Fighter Sqdn. Assn.

Former members of the 369th Fighter Sqdn., 359th Fighter Group, AAF Station 133, England, WW II, are planning a reunion August 19-22, at Providence, R. I. For complete information contact

Anthony Chardella
105 Mohawk Trail Dr.
Pittsburgh, Pa. 15235

384th Bomb Group

The 5th reunion of the 384th Bomb Group, Inc., 8th AF, will be held in Philadelphia, Pa., August 26-29. For further information write

384th Bomb Group, Inc.
P. O. Box 766
Wall Street Station
New York, N. Y. 10005

388th Bomb Group

The 1976 reunion of the 388th Bomb Group (H) Association will be held at the Holiday Inn-South, Louisville, Ky.,

August 5-8. For further information contact

Edward J. Huntzinger
P. O. Box 965
Cape Coral, Fla. 33904

407th Bomb Sqdn.

A reunion of the 407th Bomb Sqdn., 92d Bomb Group, will be held August 2-5, in Virginia Beach, Va. Members of other squadrons are also invited. Further details from

George L. Reynolds
710 Stewart Ave.
Columbus, Ohio 43206

414th Bomb Sqdn.

The 414th Bomb Sqdn. Association, 97th Bomb Group (H), will hold a reunion in Dayton, Ohio, August 12-15. Further information from

Emil Fortunato
414th Bomb Sqdn. Assn.
97th Bomb Group (H)
107 Meadow Rd.
Oak Ridge, Tenn. 37830

434th Bomb Sqdn.

The 31st reunion of the 434th Bomb Sqdn., 12th Bomb Group, will be held at the Satellite Hotel, Colorado Springs, Colo., July 8-11. Details from

Donald Hiatt
117 Princeton Rd.
Fort Collins, Colo. 80521

452d Bomb Group

The 452d Bomb Group and attached units, 8th Air Force, WW II, Deopham Green, England, will meet in Denver, Colo., August 6-8, for their 2d reunion. Interested persons write

452d Bomb Group Reunion
c/o Reunion Services
Box 1304
Hallandale, Fla. 33009

463d Service Sqdn.

The 463d Service Sqdn. reunion will be held at Valley Forge, Pa., August 20-22. For additional information contact

Edward A. Ellis
321 Clearfield Ave.
Norristown, Pa. 19401

464th Bomb Group

Members of the 464th Bomb Group, 15th AF, based in Italy during WW II are holding a reunion August 13-15, in Dubuque, Iowa. Further information from

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

493d Fighter Sqdn.

The 493d Fighter Sqdn., 48th Fighter Group, 9th AF, WW II, will hold its 4th biannual reunion in Chicago, Ill., at the Wheeling-Northbrook Holiday Inn, August 5-7. Further information from

George Pullis
Fix-Up Leader
493d Fighter Sqdn.
214 Onstott Ave.
DuQuoin, Ill. 628

Airpower in the News

By Claude Witze, SENIOR EDITOR

Counting the Votes That Count

Washington, D. C., May 5

As you know from reading the papers, the election season is upon us and the standards of public discussion of public issues are at the same low level they reach every four years. The most obvious anomaly: We have a Republican Administration, and the President, his Secretary of Defense, and his Chiefs of Staff say the United States is unsurpassed in military strength. They say our forces today are adequate. Yet, it is another Republican—not a Democrat—who is challenging him with the argument that we rank second to the Soviet Union.

At the moment, the Texas primary is past and three more states vote today. The political reporters continue their deplorable performance and confess astonishment when they see the results of the polls. We submit that the nation would be better served if more of them stayed home and covered Congress, which is where the real debate is going on, particularly about national defense.

Evidence continues that both the House and Senate are concerned about Soviet military expansion, a trend that can lead to Russian military superiority before many years have passed. The House has acted on the weapons authorization bill and the Senate will do so in about ten days, or mid-May.

For the record: The House vote is 298 to 52 to authorize expenditures of \$22.9 billion for weapons procurement and \$10.4 billion for military research and development. The total is twenty-five percent more than approved last year and \$29 million more than requested by the Ford Administration. It is \$170 billion less than recommended by



The B-1 bomber: On Capitol Hill, some differences of opinion.

the House Armed Services Committee.

On the floor, the first big test came when Rep. John F. Seiberling, of Ohio, a leader in the 1976 movement to Stop the B-1 Bomber, was rebuffed. He offered an amendment to defer, until after next February 1, the outlay of funds for three of the USAF-Rockwell International supersonic aircraft. The vote was 210 to 177. This was preceded by a long argument in which Mr. Seiberling and his supporters relied on a General Accounting Office report and a study from the Brookings Institution that favors a substitution of a stand-off cruise missile carrier for the traditional manned bomber. Rep. Dan Daniel, of Virginia, a member of the Armed Services Committee, told the House what he thinks of the Brookings booklet:

"At first glance, this report appears to tell a pretty good story. At second glance, the story begins to crumble, and the third glance shows the report to be shallow, inaccurate, and downright misleading." He added that it is "full of simple assumptions compounded by incorrect and inconsistent analysis." (An analysis of these weaknesses appeared in AIR FORCE Magazine of April, on p. 23.)

The only change made in the authorization bill on the House floor was the deletion of \$170 million requested for twelve Lockheed US-3A carrier supply planes for the Navy. The House endorsed a committee recommendation that \$1.1 billion be added for Navy ships and to press its long-standing support for nuclear power at sea in place of conventional power.

Another proposed amendment that lost by a substantial margin, 267 to 95, was one proposed by the youthful Thomas J. Downey, of New York, who wanted to outlaw overland tests of the maneuverable re-entry vehicle (MARV) for the Trident submarine missile. A similar proposal, a year ago, was defeated, 276 to 124. The proposal seems to be based on the assumption that if the United States exercises unilateral restraints, Russia will do likewise. The record does not support the thesis.

About three weeks later, there was another important House vote. This time, the issue was the report of the House Budget Committee, a new factor in the process, which recommended "targets" for spending and revenue in Fiscal 1977. The committee, headed by Rep. Brock Adams, of Washington, suggested that Congress accept a federal deficit of \$50.6 billion in Fiscal 1977, as opposed to the \$44.5 billion figure found agreeable to the White House. At the same time, the committee would cut the Ford defense budget slightly, chopping outlays from \$101.1 billion to \$100.6 billion. Then, it proposed adding substantially to spending for job programs: the funding would amount to \$6.3 billion for 1,100,000 new jobs.

When the bill got to the floor, the liberal faction remained unhappy because defense funding targets had not been further reduced. On the first day of the debate, Rep. Robert N. Giaimo, of Connecticut, a member of both the Budget and Armed Services Committees, tried

Airpower in the News

to cut defense spending authority by \$2 billion. His amendment was defeated, 255 to 145. The next day, Rep. Elizabeth Holtzman, of New York, made another attempt. Her amendment proposed that \$7.5 billion be slashed from the budget committee's defense figure. She suggested that the money should be spent on such programs as mass transit, aid for college students and the elderly, and more welfare programs. The Holtzman proposal was defeated, 317 to 85, and the budget target adopted, 221 to 155.

In the Senate, the budget targets were close to the House figures, ending up with a deficit of \$50.2 billion. There was strong opposition in the Senate to any changes, although the debate went on for three days. Sen. Birch Bayh, of Indiana, did seek a cut of \$500 million in recommended defense outlays, but he lost, 58 to 27.

With all this as background, and the sense of Congress on the record, the fight against the B-1 bomber persisted.

In the House, Rep. Les Aspin, of Wisconsin, resorted to a "Dear Colleague" letter to press his argument, discussed in this space last month, that the figures comparing US and Soviet spending levels are not relevant comparisons. There was more interesting activity in the Senate.

Sen. William Proxmire, also of Wisconsin, proclaimed, as the Senate prepared for an authorization vote, that he would give a series of six speeches, challenging the Air Force to an "open debate" on the merits of the B-1 bomber. He said he would invite USAF to comment on each of his addresses and, according to a press release for April 25, "all Air Force replies will be placed in the *Congressional Record*" by Proxmire along with his speeches.

"I expect the Air Force will disagree with my analysis," the Senator said. "They favor the B-1. I oppose it. The public is entitled to make up its own mind. I hope that in this exchange the American public will be presented with

enough information to form independent conclusions and let Congress know how to vote on this controversial weapons system."

Well, USAF did receive a copy of the first speech and a reply, with analysis of the issues raised, was prepared by USAF Secretary Thomas C. Reed and was included, as promised, in the *Record*. In a covering letter, the Secretary was critical of some of Mr. Proxmire's sources and facts. Some of the data were unauthoritative. Mr. Reed said he looked forward to "continuing dialogue."

When Senator Proxmire had concluded his initial address on the floor, he was followed at the podium by Sen. Barry Goldwater, of Arizona. Senator Goldwater said he welcomed the opportunity to debate the issue and he fully planned to reply at once to each of the programmed Proxmire speeches. He said he would depend on facts supplied by the Air Force and Rockwell International, makers of the B-1. He said Mr. Proxmire's material, according to the Wisconsin Senator, was "collected, analyzed, and prepared by a number of aerospace scientists working independently of the Department of Defense." Mr. Goldwater suggested they should be identified and something put in the *Record* about their familiarity with the airplane.

In large part, the Goldwater speech was built around the point-by-point factual rebuttal compiled by Mr. Reed. The Arizona Senator, who has flown the B-1 at Edwards AFB, found some "glaring mistakes" in the Proxmire presentation. An example is the claim that the original B-1 performance requirements called for a 2,500-foot takeoff. There are few light private jets that can take off in that distance. The Proxmire statistics also claimed that the B-52 has a range of 12,500 miles. One B-52 did fly that far without refueling, from Guam to Spain. But it was empty, filled with fuel, and took advantage of strong tailwinds.

Mr. Goldwater went on to defend the cost history of the B-1, and the management of the project. He denied again that the Air Force requirement for new tankers, in the offing, results from the B-1 program. New tankers will be required whether the B-1 is built or not built.

The Senator said he looked

forward to the rest of the debate—five more Proxmire speeches were scheduled—and he would be prepared to reply in each case.

Well, there was a long delay. A week went by. On May 3, Mr. Proxmire delivered a second address, concentrating on his charge that "the alleged performance advantages of the B-1 bomber are exaggerated or useless compared to other bomber alternatives." This time, he went into the value of the B-1's supersonic capability, the hardening against nuclear blasts, improved takeoff, higher penetration speeds, lower radar image, and larger payload.

Neither the Air Force nor Mr. Goldwater was supplied with advance copies of the speech to prepare replies for inclusion in the *Congressional Record* of May 3. As we go to press, Mr. Proxmire's invitation to "open debate" appears lost in the dust cloud stirred up by his later determination to have the last word. The press, deeply involved at this point with the primary campaign, is giving the Wisconsin Senator the silent treatment he so richly deserves.

As for Mr. Proxmire's aerospace experts, they remain unidentified. It is on the record that he relies to a great extent on the counsel of Herbert Scoville, Jr., of the Arms Control Association, who believes there is no Soviet threat that justifies spending for new strategic systems. The Wisconsin Senator also is a partisan of the National Campaign to Stop the B-1 Bomber. A few days ago, he inserted in the *Congressional Record* a long statement prepared for the Democratic Platform Committee by Ron Freund, a spokesman for the campaign.

There are about thirty organizations involved in Freund's effort. These include the American Friends Service Committee, Americans for Democratic Action, Catholic Peace Fellowship, Clergy and Laity Concerned, Common Cause, Council for a Livable World, Environmental Action, Federation of American Scientists, Friends of the Earth, Indochina Mobile Education Project, Movement for Economic Justice, National Association of Social Workers, SANE, Women Strike for Peace, and similar organizations.

Their argument, similar to Mr. Proxmire's, is that the B-1 is not needed to maintain national security, it is too expensive, and is being

"pushed" only for the prestige and profit of the United States Air

Force and Rockwell International. It is the kind of argument that

makes this year's political claptrap sound like deep thinking. ■

The Wayward Press

We did a little eavesdropping last month at the convention of the American Society of Newspaper Editors, which has been an annual spring event in Washington for a number of years. In 1977, it will be held in Hawaii, leaving only the Daughters of the American Revolution to spice things up around the Capital as the cherry blossoms start to pop.

The editors, it appears, are worrying about a lot of things. There is a recent Harris poll that says public confidence in the press, after rising for three years, has dropped to twenty percent. This is better than it was in 1971, when it hit the all-time low of eighteen percent. The editors sense that they have fewer readers, but the only corrective idea offered was that something should be done to instill newspaper reading habits and newspaper reading skills in children. Schools will be asked to help.

We overheard one editor, from a large Florida daily, proclaim that his circulation is going down because his public is becoming less literate. Fewer and fewer people can and do read, he declared. This, of course, is balderdash. The magazine racks are groaning. The paperback book boom is a staggering American phenomenon. The conventional hardback book stores are operating like supermarkets. The public libraries are busier than bus terminals. In the face of all this, newspaper reading is on the decline. Television is an acknowledged factor, and soon will have its first million-dollar baby, Barbara Walters, anchoring what TV executives call an evening news report. Others call it entertainment. If the Florida editor were selling a deodorant, he would change the formula, instead of trying to have his product used in the classroom to hook buyers while they're kiddies.

Of greater importance to the nation, and the Defense Department in particular, are the screams from the ASNE convention over what it sees as threats to the freedom of the press. We picked up a copy of a report from the society's Freedom of Information Press-Bar Committee. Heavy with clichés, the message it conveys is that every ASNE member must work hard "in the months ahead to prevent imposition of crippling restraints." The report says, at the outset:

"The threats come chiefly from our traditional adversary, the government. But the extraordinary danger comes from what appears to be a growing public receptivity to the proposition that the press is reckless, unfair, insensitive to the right of privacy, and willing to gamble with the national security."

The report sees a fast-growing menace in court-decreed gag orders. The number of them, closing court proceedings or records, doubled from 1974 to 1975. There is increasing use of subpoenas to try to force newsmen to reveal their confidential sources. There are some shield laws—California has one—but do they apply in the face of a court order?

The ASNE committee fears that newspapers, because of recent Supreme Court action, are becoming increasingly vulnerable to libel actions. Another of what the press likes to call "chilling effects" is found in the Privacy Act of 1974, invoked to deny access to criminal records, which used to be available to newspaper reporters. It is buttressed by regulations, created in 1975 by the Law Enforcement Assistance Administration, also relating to the access of criminal information. Upon protests from the press, the regulations have been amended.

Finally, ASNE faces the problem of official secrecy. There is a bill in the Senate this year, known in the trade simply as S 1, that aims to revise the federal criminal code. In its original draft, it proposed that the disclosure of classified information, possession of classified information, or publica-

tion of classified information could be a criminal act. Said the ASNE committee: "The legislation would permit government to operate under the protection of secrecy and outlaw some of the most significant investigative reporting of the last decade, including much of the Watergate reporting."

ASNE claims credit for enlisting support for amendments to S 1 that would modify the "repressive features" of the new law. The Senate Judiciary Committee is exploring the matter.

A couple of Columbia Law School professors, Benno C. Schmidt, Jr., and Harold Edgar, have examined the issues in a recent issue of the *Columbia Journalism Review*. They find it reasonable that there should be radically different ideas about S 1. The reason: "depending on which legal materials you emphasize, it can be argued either that the United States has virtually no laws restricting publication of defense secrets, or that it has stringent laws prohibiting, if not publication, at least conduct necessary prior to publication." These laws go back to the Espionage Act of 1917, but appear to have been used only against spies and their sources. The professors pose the question:

"Would S 1 amount to an Official Secrets Law? Not literally. With the abandonment of the provision making unauthorized disclosure of classified information a crime regardless of whether it was improperly classified, the administration would no longer be able to control information simply by putting a stamp on it. Nor, broad as it is, is the national defense definition able to embrace such things as the details of a highway construction program, on the theory that highways are important in defense emergencies. Thus, press claims that the scope of S 1 is virtually unlimited are clearly exaggerated. Enactment of the bill, however, would clearly make it easier for future administrations to suppress reporting of the details of defense and intelligence affairs."

The authors concede that both the needs of secrecy and freedom of expression must be met.

"The question posed by the controversy of S 1 is whether the nation can still afford to live without clear-cut laws governing defense secrets," they write. "On the whole, the indeterminacy of existing law has been a good thing. The confusion has certainly made the government think twice before testing whether the espionage statutes prohibit publication of defense secrets.

"And perhaps the press, too, has seen in the law's ambiguities grounds for an appropriate caution before rushing into print with the latest security breach. But only a strong and cohesive society can afford such a delicate posture for its laws governing defense secrets. In the wake of the Vietnam War, questions of the press's freedom and obligation may not be allowed to continue unresolved."

As ASNE knows and frets about, newspaper readership is declining. The society has a First Amendment Education Subcommittee, which recommends, with a straight face, a public discussion of the issues called The ASNE Evangelical Movement, Unreformed. With the times beseeching us all to assume and exercise greater responsibilities—and that goes for men in uniform and out of uniform—evangelism is the answer to none of these practical problems. Newspaper readers know that and so should editors. James Reston of the *New York Times* put it this way:

"It [the press] cannot insist on policing the power of government without policing itself. It cannot deny the right of outsiders to monitor the power of the press unless it establishes some professional standards of its own."

ASNE, please copy.

Aerospace World News, Views & Comments

By William P. Schlitz, ASSISTANT MANAGING EDITOR

Washington, D. C., May 5
★ Anticipating the possibility of emergencies aboard the Space Shuttle Orbiter when it becomes operational in the 1980s, NASA has fabricated a unique personal rescue system.

The device—called a Personal Rescue Enclosure (PRE)—would be used should an Orbiter become stranded in space. It is shaped like a ball—thirty-four inches (86.4 cm) in diameter and contains its own short-term life-support and communications systems.

Should an Orbiter become marooned, a rescue Orbiter would be launched to affect transfer of the crew and passengers. Three methods are under study to accomplish this: a space-suited astronaut could simply carry the PREs, each containing one person, from one vehicle to the other; a cable-like device between the two spacecraft could be used; the remote manipulator arm in the Orbiter's cargo bay could retrieve the PREs.

Newly designed space suits will also be available to Space Shuttle

crew and passengers. (A new group of Shuttle astronauts, which in all probability will include at least one woman, is to be named by NASA this summer.)

Instead of the individually customized space suits of the Apollo program, the Shuttle suit features an "adjustable fit" in a two-piece, upper and lower torso combination. The suits will come in small, medium, and large sizes.

The suits are to be made from the same material as the rescue ball, which is composed of three layers—one of Urethane, one of a very strong fabric known as Kevlar, and an outside thermal protective layer. Kevlar will permit lighter suits having better mobility (the convoluted rubber joints that were the trademark of the Apollo/Skylab missions aren't necessary).

A key feature of the new suit is its integral portable life-support system, replacing the previous system that weighed seventy-five pounds and had to be connected to the suit for activities in the vacuum of space.

★ In early April, representatives of sixteen commercial airlines took part in a Civil Reserve Air Fleet (CRAF) exercise at MAC headquarters, Scott AFB, Ill.

Under CRAF, selected civil airline aircraft would be put to military uses during a national emergency, thereby doubling USAF's airlift potential.

Currently, about 320 airliners belonging to twenty-one airlines are involved in CRAF planning, divided into four segments: Alaskan, domestic, short-range international, and long-range international.

While no aircraft movements actually took place during the Scott exercise, airline and MAC personnel worked together to smooth out the centralized mission management that the activation of CRAF would require.

The exercise scenario presupposed the deterioration of a foreign political situation that would bring CRAF's long-range international segment into play.

Procedures, forms, and communication channels were utilized as if an actual crisis, as were weather and aircraft maintenance, mission scheduling, and flight and logistic monitoring.

★ To help the public and nonaeroc



In April, Defense Secretary Donald H. Rumsfeld met with DoD's Senior Reserve Forces Managers. In the foreground, at the head of the table, is Secretary Rumsfeld. Clockwise from his left are: William D. Clark, Deputy Assistant Secretary of the Army (Reserve Affairs); Dr. James P. Gilligan, Deputy Assistant Secretary of the Air Force (Reserve Affairs); Maj. Gen. LaVern E. Weber, Chief, National Guard Bureau; Maj. Gen. John J. Pesch, Director, Air National Guard; Maj. Gen. Charles A. Ott, Jr., Director, Army National Guard; Maj. Gen. W. Stanford Smith, Military Executive, Reserve Forces Policy Board; Rear Adm. William S. Schwob, Chief, Coast Guard Reserve; Brig. Gen. Edward Dillon, Deputy Chief, Air Force Reserve; Maj. Gen. Michael P. Ryan, Director, Marine Corps Reserve; Maj. Gen. Henry Mohr, Chief of Army Reserve; Vice Adm. Pierre Charbonnet, Chief of Naval Reserve; J. Palmer Gaillard, Jr., Deputy Assistant Secretary of the Navy (Reserve Affairs); Will Hill Tankersley, Deputy Assistant Secretary of Defense (Reserve Affairs). DoD has singled out for praise Air Force Reserve Forces for their high state of readiness. For a rundown on these vital USAF components, see the feature article beginning on p. 55 of this issue.

space US industry keep abreast of the flood of innovations and techniques stemming from advanced research and technology, NASA is expanding publication of information about them.

A new publication, "NASA Tech Briefs," will appear quarterly and will be based on NASA's Tech Briefs, the one-page items that NASA's Technology Utilization Office began producing in 1963.

With the Tech Briefs and other NASA input, project officials expect the new journal to contain data on more than 600 innovations, concepts, publications, and computer programs annually, NASA said. Journal subscriptions will be free to US citizens.

Each issue will also have a section called "New Product Ideas," to focus attention on items that may have potential commercial value. Other sections will list books, reports, and computer programs available to domestic users, officials said.

The journal will contain a comprehensive subject index, with a cumulative index published yearly.

★ Techniques developed by NASA to test the purity of water aboard spacecraft are now being applied to monitor the water supplies of several US cities.

Johnson Space Center, Houston, Tex., has teamed up with Boeing Co. to build a trailer-mounted Automated Water Monitoring System that will begin evaluation in June. NASA plans an initial year-long test with the Gulf Coast Waste Disposal Authority, responsible for treating waste water in three Texas counties—

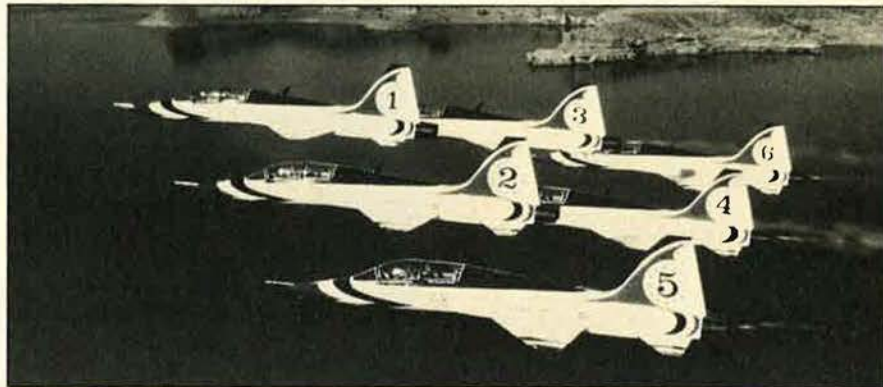
Harris, Galveston, and Chambers.

The system works electronically, and is capable of analyzing treated water for such important ingredients as dissolved oxygen, bacteria, chlorides, residual chlorine, ammonia, nitrate, acidity, temperature, and many other factors.

Training at Williams AFB, Ariz., in September 1976.

And six women will be selected from the active force to begin navigator training at March AFB, Calif., in March 1977.

Women who successfully complete pilot training may be qualified for



In 1975, Northrop T-38 Talons flown by USAF's aerial demonstration team, the Thunderbirds, exceeded the Air Force operational readiness averages by recording a rate of 86.6 percent. Last year, the team logged 2,271 flights.

Under normal conditions, cities monitor water quality by periodically taking samples for laboratory analysis. Results on such vital characteristics as total bacteria count can take days. Object of the new monitoring system is to develop continuous sampling for the immediate detection of bacteria and such other hazards in drinking water as viruses and cancer-causing or cancer-suspect agents.

★ The first ten women candidates for Air Force pilot wings are scheduled to begin Undergraduate Pilot

assignment to as many as twenty types of aircraft in the Air Force inventory.

Under law and regulations, they'll be denied assignment to aircraft that run a high risk of coming under enemy fire.

"The Training and Utilization of Women Pilots," an Air Force report on the subject, lists the following as possibilities: the T-33, T-37, T-38, T-39, T-41, T-43, U-4, UH-1, C-5, VC/C-9, C-12, EC-121, VC-137, VC/C-140, WC-130, WC-131H, C-141, E-4, and a number of C-135 derivatives, including the KC-135 tanker.

USAF officials said no current plan exists to train women helicopter pilots; the effort will be concentrated on fixed-wing pilot and navigator training.

USAF is presently studying the dimensions of aircraft cockpits to determine potential problems for women pilots.

In a related matter, the Air Force is seeking about 120 women enlistees for a trial program to train as security specialists.

Previously, women were barred from this career category because of its combat-related activities. The one-year trial program is to begin this autumn, with the volunteers training in basic specialty and combat courses. USAF has already modified some weapons and equipment for them.



Sgt. Gary B. Giles, 512th Military Airlift Wing (Associate), Dover AFB, Del., has been named AFRES Crew Chief of the Year. His aircraft had the fewest maintenance discrepancies in the Air Force C-5 fleet and was used last year for the first midair launch of an ICBM.

Aerospace World

On successful completion of training, they'll be assigned to Security Police units where they will be evaluated on "their ability to withstand the rigors of security duties under a wide range of conditions," Security Police officials said.

★ In mid-April, US Navy laid the keel of *Ohio*—the first of eleven planned giant nuclear subs.

At 560 feet (171 m) in length and with displacement of 18,750 tons, the *Ohio* will be the biggest sub ever built. She'll be armed with twenty-four Trident I missiles with a range of 4,000 nautical miles. (Trident II, a follow-on missile with possibly even greater range and accuracy, is being considered for development.)

For comparison, the biggest Fleet Ballistic Missile Submarine in the inventory is the *Lafayette* class—about 410 feet (125 m) long and about 7,000 tons.

Ohio will be capable of extended submerged patrols, and will be



CAP National Commander Brig. Gen. William M. Patterson, left, presents a \$1,000 check for Air Force Assistance Fund to USAF Chief of Staff Gen. David C. Jones. The occasion: CAP's National Executive Committee Meeting in Washington, D. C.

Division, Groton, Conn., probably will be ready for deployment in 1979. The sub, which will have a crew of 154 officers and men, has been designed with improved logistics support in mind. Her larger hatches will be able to receive equipment in the form of modular replacements, thus

Besides the other amenities found aboard nuclear subs that spend long periods submerged, *Ohio* will be equipped with a gymnasium.

★ Beginning July 1, all military navigator training will be consolidated with the Air Force program at Mather AFB, Calif. The move will result in an annual DoD saving of about \$900,000, officials said.

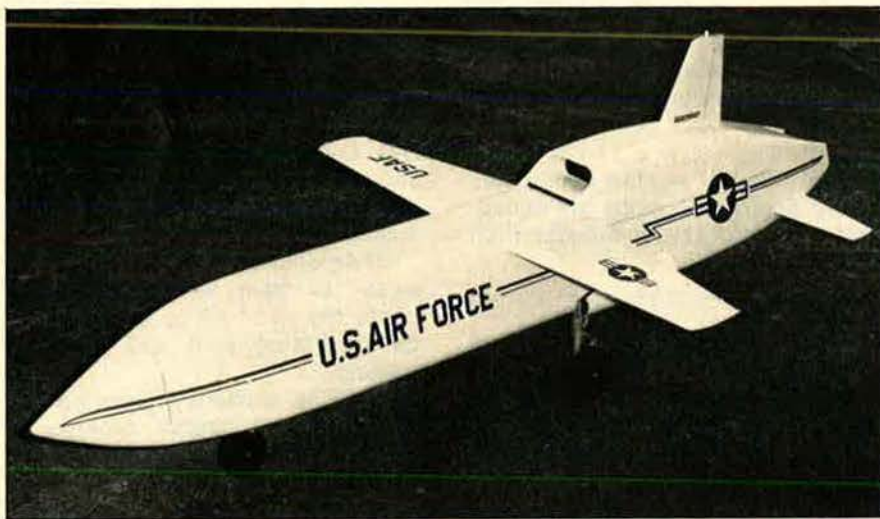
Previously, the separate programs produced about 160 Navy, fifteen Coast Guard, and thirty-two Marine aerial navigators annually. (For its part, USAF plans to train 650 navigators in FY '77, with that figure declining to 350 in FY '78.)

There is no plan to transfer Navy aircraft or associated equipment to Mather.

Navy and Coast Guard student navigators will enter the Air Force training program in its sixth week and remain in it for about twenty weeks, receiving instruction in avionics and celestial and global navigation.

These students will spend eighty-five hours in USAF's special navigator trainer—the T-43—and sixty-four hours in a ground-based simulator. On completion of Undergraduate Navigator Training, specialized training unique to the Navy mission will follow.

On the other hand, Marine Corp navigator students, all enlisted personnel, are to be trained by the Marine Air Navigation School. Prev-



Model of Northrop's preliminary design for USAF's Advanced Remotely Piloted Vehicle. The aircraft would be capable of performing recon, electronic warfare, and strike missions and carrying external stores as well as internal payload. Powered by a GE J85 turbojet, ARPV could be either air or ground launched.

quieter, faster, and more efficient than the currently operational fleet of nuclear subs, each of which carries sixteen Polaris or Poseidon missiles.

Ohio, under construction by General Dynamics Corp.'s Electric Boat

speeding up turnaround time and increasing patrol capabilities.

While *Ohio*'s performance characteristics are classified, it is believed she will at least duplicate the thirty-knot submerged speed of her Poseidon predecessors.

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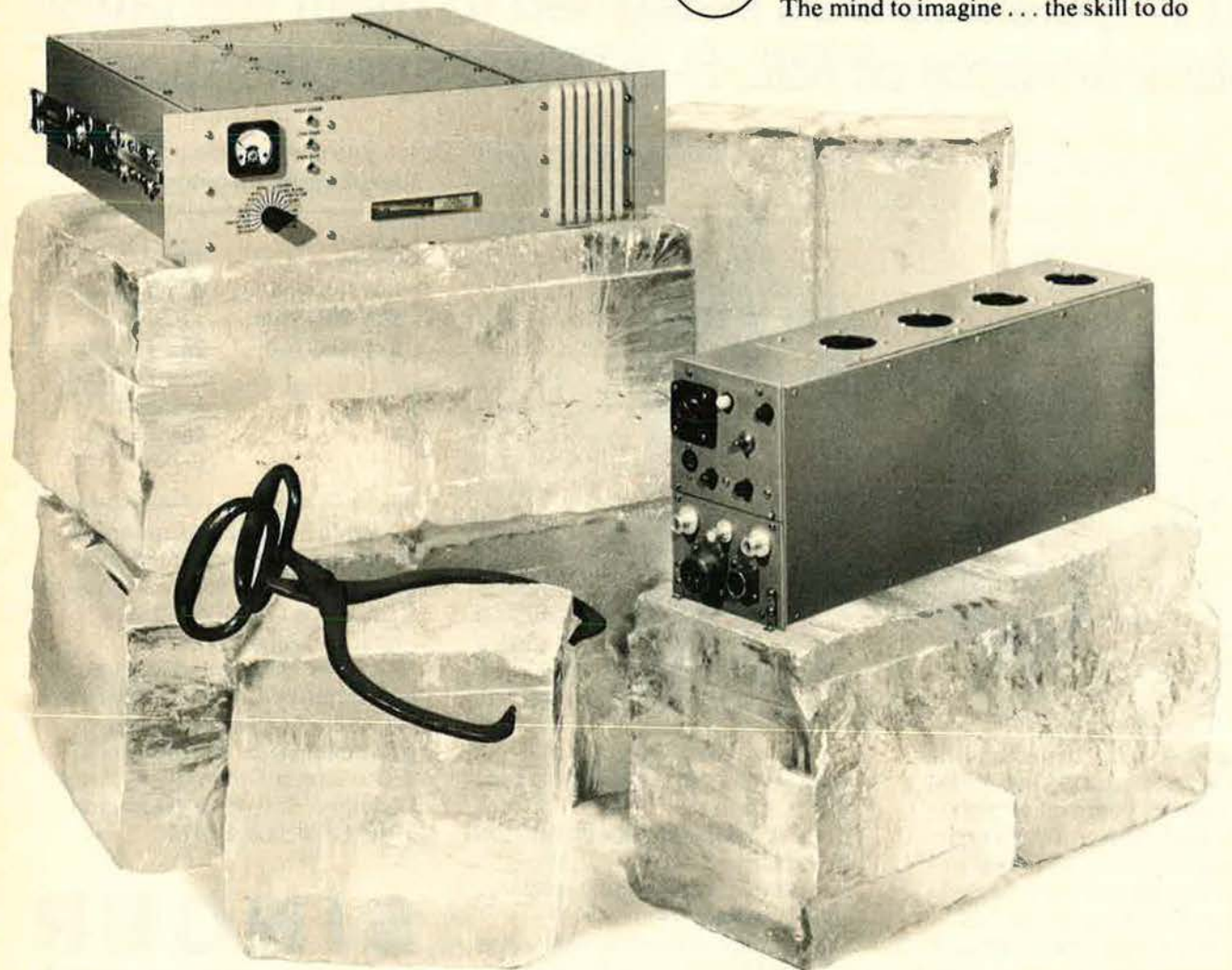
tion and simplicity in state-of-the-art design. The result: high efficiency with lower life cycle cost.

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The granite of Cheyenne Mountain in Colorado has shielded the nerve center of our air defense for more than a decade, since April 1966. Here, the fabled entrance to NORAD's Command Post, on guard twenty-four hours a day.

ously at Corpus Christi NAS, Tex., this facility is being relocated to Mather, where Marine instructors will use Air Force equipment.

★ USAF is realigning its Tactical Air Control System (TACS) in order to improve its tactical communications and control function.

Affected will be active-duty TACS and ANG units charged with providing communications for command and control during combat. They'll be streamlined to improve combat capabilities while at the same time trimmed of excess support manpower. The larger units—Tactical Control Groups (TCGs) and Squadrons (TCSs)—will be reduced in number; offsetting these cutbacks will be an increase in Tactical Control Flights (TCFs)—the smaller, more mobile units.

The plan also calls for the replacement of obsolete, manual com-



A replica of the airplane hangar built in 1910 that served as headquarters for the Wright brothers' flying school at what is now Maxwell AFB, Ala. As a bicentennial project, the hangar was constructed by the faculty of Air University's Squadron Officer School in three days, same time as the original.

munications equipment with up-to-date, computer-aided gear.

These moves will result in manning cuts of 1,020 military and fifty-six civilian slots for the active Air Force. ANG units will be reduced by 1,534 authorizations—twenty-two of them full-time technicians.

One ANG TCG and two TCSs will assume a major mission once converted to the Defense Communications System contingency support

role, an assignment not previously undertaken by ANG.

In terms of units, ANG TCGs will be reduced from six to three, and TCSs from twenty-four to eleven; TCFs will grow from twelve to seventeen. Also, two ANG Mobile Communications Squadrons will be redesignated TCSs and another TCS will be activated.

Among other changes, additional units will be transferred to Europe



Following initial flight in North Kingstown, R. I., Joseph A. Zinno unstraps from his man-powered aircraft, the first such to fly in the U.S. Zinno, a retired Air Force lieutenant colonel, is after a \$92,500 prize for a man-powered plane with certain flight capabilities. For details, see item on p. 20.

—WIDE WORLD PHOTOS

Aerospace World

to beef up NATO's control of air resources, USAF said.

★ On the "lighter" side of the news, in late April, Joseph A. Zinno, USAF (Ret.), became the first American to fly a man-powered aircraft.

The plane, with a balsa propeller operated by a bicycle-like device,

combat crews will replace them.

TAC's 33d TFW, Eglin AFB, Fla., assumed the air defense alert mission in January, and other units at Homestead AFB, Fla., and Seymour Johnson AFB, N. C., followed suit in April.

Three other TAC units will take on the air alert mission by October 1977: at MacDill AFB, Fla., Holloman AFB, N. M., and George AFB, Calif.

NORAD units will continue their traditional air defense mission at twenty other sites in the US.

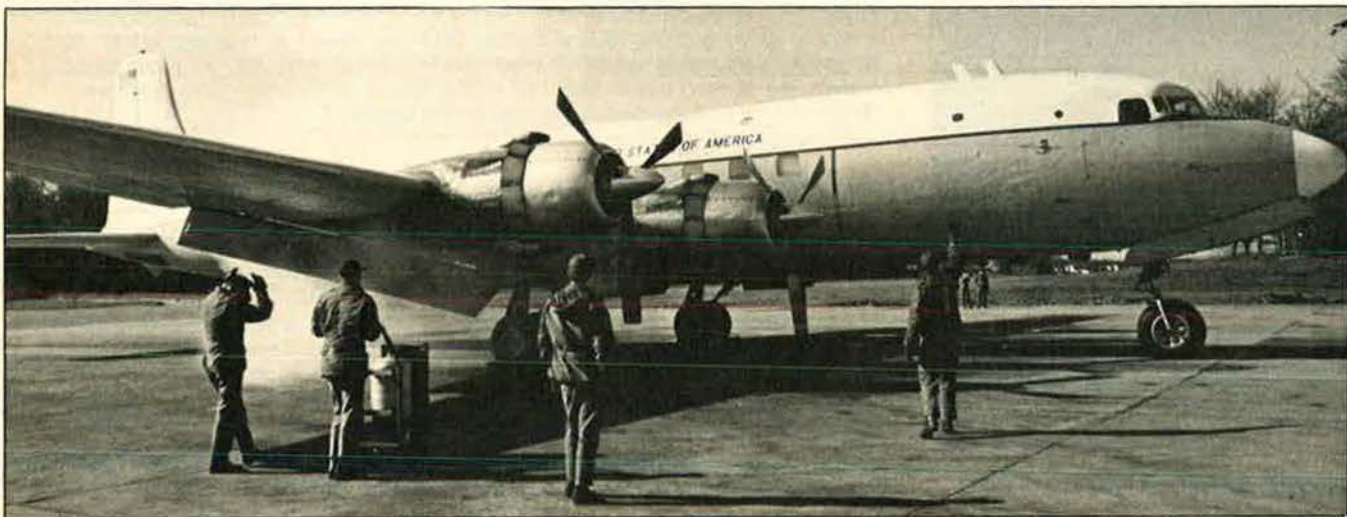
★ The 527th Tactical Fighter Training Aggressor Squadron was offi-

the mission of providing "USAF tactical fighter and reconnaissance pilots with academic and flying training relative to enemy air-to-air philosophy, tactics, and training," Air Force officials said. In time of war, the F-5Es would augment the air defense force.

The unit's twenty assigned aircraft are to be airlifted via C-5 transport to RAF Alconbury, where final assembly will take place.

The 527th has a colorful history dating back to 1942.

★ **Died:** Soviet Defense Minister **Marshal Andrei Antonovich**



gained altitude of about a foot and attained an airborne distance of more than eighty feet.

Built of light woods, aluminum, and plastic sheets, the plane weighs 150 pounds.

The former Air Force lieutenant colonel means to take a crack at the \$92,500 that a British industrialist has offered for the first man-powered plane that flies a figure-eight pattern around two pylons set a half-mile apart.

While a number of Europeans have gotten man-powered planes off the ground, no one has been able to achieve the distance.

★ Tactical Air Command F-4 fighters and crews are augmenting the CONUS air defense interceptor force, NORAD announced.

Air National Guard units that heretofore have been standing air defense alert equipped with F-101 fighter-interceptors are being assigned other types of flying missions, and the TAC aircraft and their

The end of an era, with the departure of the last C-118 Littmaster from USAF's inventory. Last flown by the 7086th Operations Squadron, Ramstein AB, Germany, the C-118 put in better than twenty years' service, compiling hundreds of hours of flight time in the skies over Africa, Europe, Asia, and the Middle East.

cially activated in April as a unit of the 10th Tactical Reconnaissance Wing, RAF Alconbury, England.

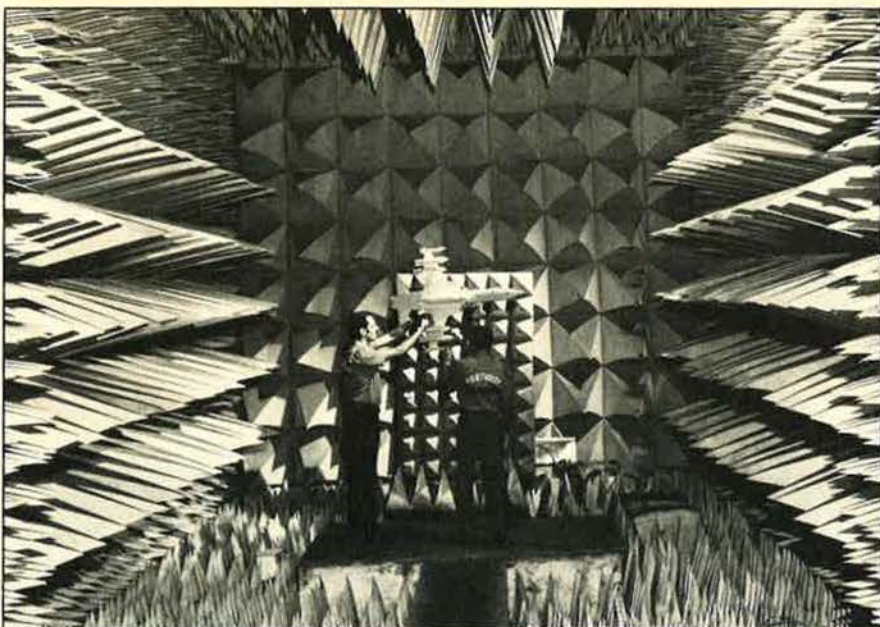
To be equipped with Northrop F-5E Tiger II aircraft, the 527th has

Grechko, in April, of a heart attack. He was seventy-two. An associate of Communist Party leader Leonid Brezhnev since World War II, Marshal Grechko had held the top Soviet

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Technicians make final adjustments to model of Northrop F-5E tactical fighter prior to testing the plane's antennas in the company's Anechoic Chamber—an area free of radio echoes. Known as the "Dead Room," the facility is used to ensure that antennas are positioned so as to prevent any part of the airframe from blocking transmissions. The cone-shaped objects, technology's cave-like stalactites and stalagmites, absorb radio waves to measure a signal's strength.

military post for nine years. During his tenure, the Soviet armed forces were upgraded across the board in an effort to match the US strategic capability and global influence. Marshal Grechko has been succeeded by Dmitri Ustinov, long-time manager of Soviet arms production.

A member of the Central Committee of the Communist Party since 1961 and of the Politburo since 1973, Marshal Grechko wielded enormous power in the Soviet hierarchy, and, although a staunch military man, was believed to be a moderate in the Soviet government.

In the military since the age of sixteen when he fought in the Revolution, Marshal Grechko rose through the ranks to become an army commander during World War II. Following the war, the six-foot, two-inch officer commanded the Kiev Military District. In 1953, he became commander of Soviet forces in East Germany, another key post. (There, he ordered the suppression of the anti-Soviet uprising.) Subsequently, he served as Commander in Chief of Soviet Ground Forces.

In the early '60s, Marshal Grechko was head of all Warsaw Pact forces.

Although his proven ability as a military leader paved the way for his entree into the upper strata of the Soviet military/civil establishment,

it was Marshal Grechko's political reliability and friendship with civilian leaders that no doubt influenced his selection as Defense Minister in 1967.

★ **NEWS NOTES**—A **Defense Review Committee**, chaired by Assistant Secretary of Defense (Manpower and Reserve Affairs) John Ahearne,

is reviewing the **US military's Code of Conduct** and will report its findings by July 1976. Two former POWs are members.

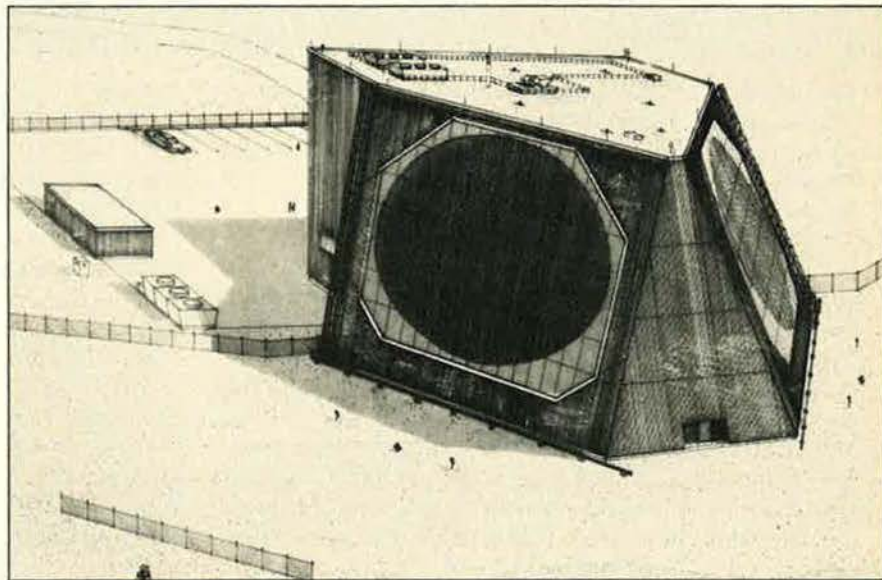
Bennett H. Griffin, a legendary aviation figure whose career dates back sixty years, was recently presented the annual **Bishop Wright Air Industry Award** in New York City. The award, in memory of the father of the Wright brothers, is sponsored by the Aviation Council of the Protestant Chapel, JFK International Airport.

Gerald D. Griffin, Deputy Associate Administrator (Operations) for NASA's Office of Space Flight, has been named **Deputy Director** of Dryden Flight Research Center, Edwards AFB, Calif.

Pioneer aviatrix **Jacqueline Cochran** has presented a silver and gold globe to the Air Force Academy to honor her husband's contributions to the space program. As head of Convair Aircraft Corp., **Floyd B. Odium** used company funds to develop the Atlas missile, thereby cutting by two years the US entry into space.

The Smithsonian's new **National Air and Space Museum**, Washington, D. C., has moved its opening from July 4 to July 1.

Died: Lt. Gen. Royal N. Baker, USAF (Ret.), a veteran of three wars and one of USAF's top aces, of an apparent heart attack in Georgetown, Tex. The former ADCOM vice commander in chief was fifty-seven. ■

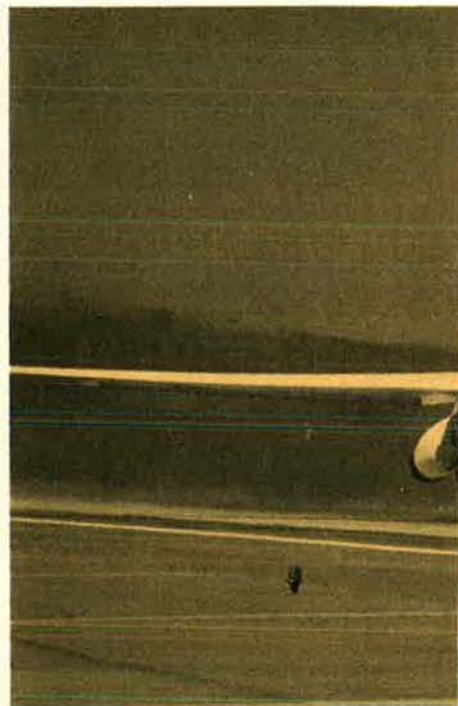


Artist's sketch of PAVE PAWS, the phased-array radar warning system to be constructed at Otis AFB, Mass., to guard the East Coast against attack from missiles launched by submarines. The eighty-foot-high facility is to be built for AFSC's Electronic Systems Division by Raytheon Co., Wayland, Mass. Its 3,500 antenna elements will have a search range of 3,000 miles.

FLYING THE B-1

A Pilot's View

BY MAJ. GEORGE W. LARSON, JR., USAF



No matter what the computers and wind-tunnel studies say, final judgment of an aircraft's performance lies with the pilot. In this exclusive report, a veteran USAF test pilot tells about flying the B-1, and gives his view of how it will perform its assigned mission.

I'm fortunate to have been selected as one of five pilots now flying the B-1 at Edwards AFB, Calif. Representing the Strategic Air Command and the Air Force Test and Evaluation Center (AFTEC), I am primarily concerned with evaluating the B-1's operational utility and effectiveness. This translates to how well the pilot/B-1 combination can perform the intended mission. Based on my experience at the controls, I'm convinced the Air Force has an aircraft with the potential to become a well-suited, state-of-the-art, strategic bomber. Let me elaborate from the pilot's point of view.

Looking at the B-1 from the outside during routine exterior preflights, you almost feel that the Rockwell International aerodynamicists have come up with a sleek, oversized, high-performance fighter. This impression is strengthened on climbing into the cockpit, where

a control stick (not a wheel) and left-hand throttle quadrants await each pilot. Strapping in, you immediately notice two things: optimally located tape flight and engine instruments, and visibility that surpasses any large commercial or military jet in the air today. Further investigation of the crew station reveals a totally automatic fuel and center-of-gravity management system. Without it, a pilot would have to accomplish manually many center-of-gravity and associated fuel transfer changes during a normal mission.

The usual complement of navigational aids and communication equipment is located with crew members in mind. On the third B-1, the primary attitude indicators have been replaced with Vertical Situation Displays (VSD). The VSD is no more than a cathode ray tube, but it permits, among other things, a combined display of attitude, command steering, angle of attack, airspeed, radar altitude, heading, and weapon release timing. This reduces the area coverage required for pilot cross check of cockpit displays. All primary flight controls are either duplicated for each pilot or accessible to both pilots.

Starting the engines doesn't require the associated ground equipment I have grown used to with other

bomber aircraft. Two on-board Auxiliary Power Units (APUs) provide all electrical and pneumatic power necessary for simultaneous engine starts. These APUs also take care of electrical, hydraulic, and cooling requirements for normal preflight actions.

Taxiing the aircraft is easy with nose-wheel steering through the rudder pedals. Smooth, positive differential braking is effective in the event of a nose-wheel steering malfunction. The old groaning and screeching and shuddering associated with other large aircraft brake systems are not present.

With the wings at full forward sweep (fifteen degrees), slats extended, and full flaps, the B-1 is configured for takeoff. As the four General Electric F101 engines are placed in full augmentor (the B-1 term is "augmentor," not "afterburner") there is a smooth, rapid acceleration

and effective, and visibility is excellent. Even with a higher-than-normal adrenalin level and some apprehension, I was able to refuel the B-1 to maximum in-flight gross weight without a disconnect during my first attempt. Unlike recent bomber aircraft, the refueling receptacle is located in front of the pilots. This provides an excellent secondary reference in determining closure rates while refueling.

On the Deck

The second and perhaps the acid test for the B-1 man-machine interface is high-speed, low-level flight. This entails flying the aircraft as low as treetop height over any type of terrain at speeds close to 600 miles an hour. Preliminary flights in this portion of the B-1 operational envelope lead me to believe that the B-1 has



to liftoff speed. Only minimum aft stick displacement is needed at rotation speed, and you find yourself airborne in approximately 3,000 to 4,000 feet. Longer takeoff distances will be required as test-program increases in gross weight are scheduled.

After takeoff, aircraft retrimming is necessary as the flaps are retracted. Since each pilot has a wingsweep control, either can sweep the wings aft to twenty-five degrees, the configuration for medium- or high-altitude subsonic cruise. The throttles are retarded to intermediate power (previously known as military power) in preparation for a climb to cruise altitude.

Maneuvering the aircraft in pitch or roll is a pleasant surprise. Only small control displacements (one and two inches depending upon airspeed) are required. The response to a control stick input is rapid. There are no sluggish or delayed control responses.

Since bomber tactics do not normally include close formation flying, the first real test of the pilot and the flight control system is air refueling. With earlier large bombers, this could become a tedious and demanding task. Refueling the B-1 is much easier. Only very minimal control inputs are required, thrust response is rapid

and effective. The already rapid control responses increase in this high "q" (dynamic pressure) regime. The responsive flight control system, when integrated with the soon-to-be-installed terrain-following system, is designed to be coupled with automatically generated pitch commands. This will allow the aircraft to be flown hands off at low altitude. The pilot will only monitor flight parameters unless a malfunction requires that he fly terrain-following system commands manually.

An equally important factor affecting pilot performance during low-level, high-speed flight is the effect of turbulence on the cockpit area. Since large aircraft are structurally flexible, moderate to severe turbulence occurring at the aircraft's center of gravity can magnify and result in a bone-jarring ride in the cockpit. To reduce this flexing effect, the B-1 has a Structural Mode Control System (SMCS). Through automatic movement of the "canard-like" control surfaces located on the forward fuselage, longitudinal and lateral structural flex are countered and thereby reduced. Preliminary evaluations of this system indicate that it performs its intended function during all phases of flight.

The B-1 is even more pleasant to fly at supersonic

than at subsonic speeds. The aircraft appears to become increasingly stable with an increase in supersonic speeds up to Mach 1.6, the maximum currently being tested.

In the traffic pattern, the B-1 is so responsive you can fly an ILS or an overhead pattern with equal ease and precision. Some pilot adaptation is required prior to touchdown on landing. I consistently feel that I'm higher than necessary when the main gear touches down. The reason is that the pilot sits considerably forward of the main landing gear and is flying the aircraft at an angle of attack of approximately seven degrees during the landing flare. While it makes a grease job more demanding, it does not detract from easily landing the aircraft.

There are many systems, such as the Terrain Following Radar, Automatic Flight Control System, Auto Throttle, Air Induction Control System, and the com-



The B-1 cockpit (above) combines optimum instrument layout and exceptional visibility. Unique for an aircraft of this size is the use of a control stick instead of a wheel. The B-1's variable-geometry wing, fully swept in the photo at right, increases efficiency at high subsonic and supersonic speeds.

plete avionics suite, which have not yet been activated or tested.

Design and state of the art improvements have given the B-1 handling qualities superior to present large bomber aircraft. It is not a fighter aircraft, but its flight characteristics are more representative of a small, responsive aircraft than those of the B-52. During no phase of flight has any difficulty been experienced in controlling the aircraft. In fact, all aspects of flying the B-1 have been extremely pleasurable. The "bus driver" handle given to bomber pilots in the past should certainly change when the B-1 enters the Air Force inventory. It is more akin to a sports car than a bus.

The Next Five Months

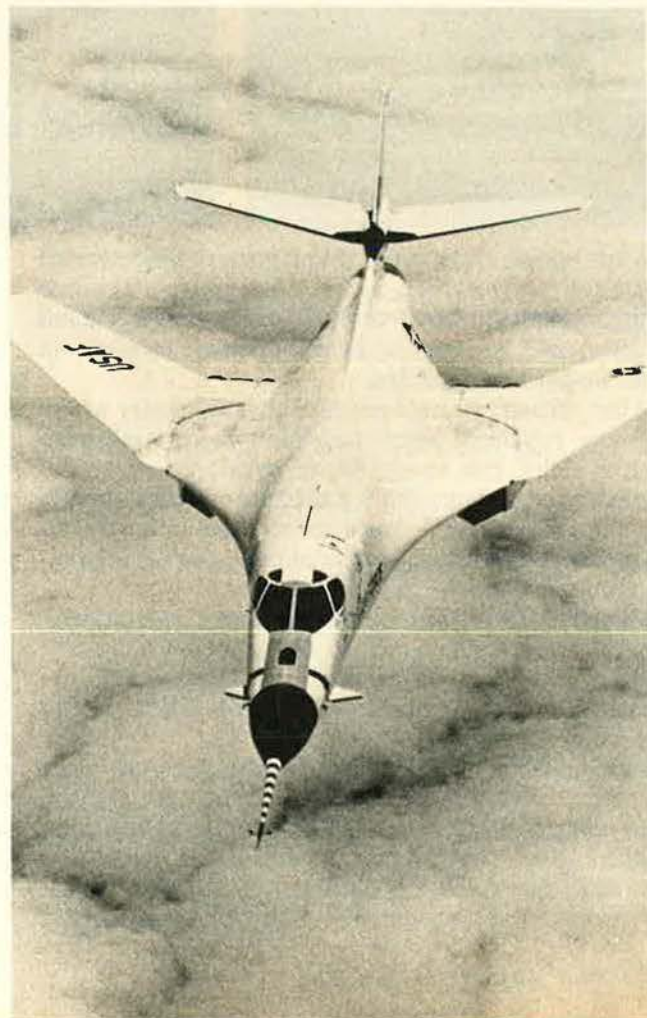
So far, the B-1 test program has concentrated on those items essential to basic airworthiness. Such milestones as flying qualities, stability and control, flutter, air refueling, envelope expansion, and initial performance testing have been completed. From now until next

November major testing emphasis will be on the total weapon system's effectiveness in all phases of its primary operational mission.

The Base Escape Phase will emphasize the B-1's rapid response to early attack warnings. With the onboard APUs, we will demonstrate the weapon system capability to provide quick reaction during alert launches. Since no ground-power units are needed for the B-1 on alert, it will have optimum flexibility for satellite or dispersed basing requirements. We will demonstrate the reaction capability of critical systems such as the offensive avionics complex to provide the immediate navigation data essential for an alert launch.

Once airborne, the Climb, Cruise, and Navigation Phase begins. The optimum climb schedules and cruise altitudes will be determined, and the Automatic Flight Control System (AFCS) performance demonstrated. The AFCS is designed for great flexibility in that it has Flight Path Hold, Altitude Hold, Airspeed Hold, Mach Hold, and Approach modes in pitch, and Roll Attitude Hold, Manual Heading, Automatic Navigation, and Approach modes in roll. The navigation system will be thoroughly exercised to determine its capability to accurately guide the B-1 through a long-range operational mission.

Following the cruise phase of the basic operational mission, the B-1 will be refueled from a KC-135 tanker. Since we already know that the basic aircraft's ability to refuel is excellent, very little other than onboard rendezvous capability and optimum forming altitudes need to be shown.





During aerial refueling, the B-1's flight control and thrust responses are rapid. Having the refueling receptacle in front of the pilots provides a good secondary closure rate reference.

Next comes the meat of the B-1 mission. Dropping off the tanker with a full fuel load, the wings will be swept aft sixty-five degrees and the B-1 will descend to low level for its penetration phase. Much like a giant hawk, the bomber will begin its hedgehopping tactics, utilizing terrain masking when possible, to pass through enemy defenses for a surprise attack. The onboard Terrain Following Radar (TFR) system, coupled with the Automatic Flight Control System (AFCS) and Auto Throttles, will provide this capability.

It is difficult to imagine that any pilot would trust an aircraft to fly itself at high subsonic speeds and treetop altitudes. I'll be the first to admit that system confidence through exposure is mandatory. However, that capability has been demonstrated many times in aircraft like the F-111 series, and the B-1 system is designed to give even better performance in this environment. And during the penetration phase, the pilot will have Forward Looking Infrared (FLIR) to display terrain features ahead of his intended flight path. This FLIR display will be superimposed on his primary flight instrument, the VSD, along with the other essential flight data.

When equipped with its Air Induction Control System (AICS), the B-1 will be capable of penetrating enemy defenses at speeds greater than Mach 2.0 at high altitudes. Without the AICS system installed, the B-1 high-altitude penetration speed is limited to approximately Mach 1.6. Although the initial production models of the B-1 will not have the AICS, the system

will be fully tested to optimize inlet geometry with desired supersonic cruise or dash conditions, thus providing the greatest possible flexibility against future enemy defenses.

The accuracy of the navigation system combined with the flexibility of the onboard Stores Management System (SMS) will also be demonstrated and evaluated during the remaining test program. During either the high- or low-altitude penetration phases, the weapon system will be delivering a varying weapons mix on simulated enemy targets. Even though smaller than the B-52, the B-1 has a greater payload.



In a high-speed, low-altitude penetration, the B-1 will use terrain masking to avoid radar detection. Its Structural Mode Control System moderates low-altitude turbulence.

In this age of modern electronic warfare, the B-1 will have the most advanced Electronic Countermeasures (ECM) system in the Air Force inventory. However, this system will not be tested prior to November 1976. The contract for the defensive or ECM system was awarded after the initial airframe and avionics contracts; a defensive system will not be on board any of the three prototype aircraft currently under test. An initial look at the defensive system will be accomplished on the first preproduction aircraft, the fourth B-1.

After all the weapons are delivered during the basic B-1 mission, the aircraft will start its Withdrawal and Recovery Phase, continuing terrain following until outside of enemy defenses if desired. The variable geometry wing design of the B-1 will allow reconfiguration to optimize range during this withdrawal phase. Testing will demonstrate capabilities at a lower Mach number, with the wings swept at fifty-five degrees.

On reaching the recovery base, the B-1 systems must demonstrate an Airborne Instrument Landing and Approach (AILA). This is the same as an ILS from the

pilot's viewpoint, but with one important difference. The AILA does not depend on ground navigation aids, and is guided totally by the onboard forward-looking attack radar and navigation systems. The flight crew will also assess the B-1's launch and restrike capability.

Even though we have come a long way in demonstrating the basic airframe/engine capability of the B-1, we have even more extensive tests ahead prior to November 1976. From what we already know of the systems that are still to be demonstrated, I feel certain that we can achieve this goal.

I have not discussed some critical systems and capabilities that aren't directly related to the pilot's view of the B-1. I don't mean to imply that they are any less important to the B-1 mission, but they are beyond the scope of this article.



The B-1 is designed to be completely self-sufficient, with onboard APUs providing the necessary power for the ground crew to check out all systems with the built-in Central Integrated Test System computer.

New Maintenance Concepts

The B-1 probably will change our concept of maintainability in the field. The aircraft is designed for maximum self-sufficiency. The onboard APUs will provide the support requirements necessary during ground checkouts, servicing, and troubleshooting systems malfunctions. All the ground crew need do is replace black boxes once a fault has been isolated. Engine changes will require only thirty minutes, as has already been demonstrated by Air Force maintenance crews.

The B-1 will use an onboard Central Integrated Test System (CITS). CITS is really a computer system combined with data acquisition units throughout the aircraft. It provides continuous self checking of all systems during flight, and allows the crew chiefs to selectively operate and fault-isolate systems on the ground. CITS also provides flight recordings that will tell maintenance personnel exactly which portion (black box) of a particular subsystem has been responsible for an in-flight problem. For instance, if an abnormal engine reading is experienced in flight, CITS will enable the crew to determine whether the instrument is faulty or the engine is actually not operating properly. This in turn provides



The author, Maj. George W. Larson, Jr., is Chief, B-1 Operations Branch, 4200d Test and Evaluation Squadron (SAC), Edwards AFB, Calif. A graduate of the Air Force Academy and of the Air Force Test Pilot School, and a veteran of eighty-five EB-66 missions over North Vietnam, he has logged more than 3,100 hours in thirty-six different aircraft types, including the B-47, B-52, and FB-111. Prior to his selection in 1972 as SAC's representative on the B-1 Initial Operational Test and Evaluation program, he was assigned to the Bomber/Transport Branch of AFSC's Flight Test Operations at Edwards AFB, Calif.

the basis for intelligent crew decisions to either continue or alter the mission.

The CITS flight recordings will do more than provide the ground crew an instantaneous list of discrepancies. That information will be fed to a much larger computer for systems operation trend analysis. This trend information will allow the Air Force to identify potential problem areas before they occur—a great improvement in preventive maintenance, safety, and accident prevention.

SAC's concept of maintenance for the B-1 will be basically the normal three-tier arrangement: organizational and intermediate levels at the SAC operating wing, and depot level maintenance at AFLC Air Logistics Centers. An exception will be made for the F101 engine, which will be a two-tier concept, with SAC operating wings performing only organizational maintenance and all other maintenance performed at one AFLC Air Logistics Center. As experience with the aircraft increases, additional components may be maintained in the two-tier manner. This translates to a more cost-effective program and an aircraft that is easier to maintain in the field.

The Test Program

The three prototype B-1 aircraft are, or will be, put through their paces by the USAF B-1 Joint Test Force at Edwards AFB, Calif. The first aircraft had accumulated approximately 150 hours of flight time by the latter part of April. The third aircraft will be flying by the time this article is published. B-1 number three is the only aircraft that will have all offensive avionics systems on board. It is the vehicle that will be used to demonstrate integration of the airframe/engine combination with the systems needed to provide the operational capability. The second B-1 will make its initial flight in July 1976. It will fly later than the third, since it was in a structural testing facility for about six months prior to completing assembly.

The B-1 will have been subjected to more structural testing prior to a production decision than any other military aircraft. This increases aircrew confidence in the machine, but more important, it eliminates structural problems similar to those experienced by some aircraft after they became operational. In fact, most major structural assemblies of the B-1 will have com-

pleted at least two, and in most cases four, life-cycle structural fatigue tests by November 1976.

In the test program are ten pilots, two offensive systems operators, and at least three flight test engineers. This crew force includes personnel from SAC, Air Force Flight Test Center, and Rockwell International, who will have participated in the test program by November. The major portion of Initial Operational Test and Evaluation (IOT&E) will be accomplished with the third aircraft. The first aircraft will continue its developmental role in the areas of envelope expansion, engine inlet testing, and performance testing, while the second aircraft will be primarily devoted to structural loads verification.

The crew members represent only a very small portion of the B-1 Joint Test Force. Included are other specialized representatives of Strategic Air Command, Air Force Logistics Command, Air Training Command, Air Force Systems Command, and the major contractors. The objectives of both AFTEC and AFSC will be met through this combined RDT&E/IOT&E test program.

It is not my intent to suggest that the B-1 has had no design or systems problems during the test program. It would also be naïve to think that no problems will be

encountered with the integration of the avionics and airframe on aircraft No. 3. A fly-before-buy developmental test program is specifically designed to determine these deficiencies, and when possible correct them. In my opinion, the B-1 program has been extremely successful in identifying and correcting deficiencies that have surfaced. I have confidence that the program will continue to operate in this manner. The final objective is a formidable, total strategic weapon system.

There is a great deal of concern about the cost of the B-1, and rightly so. Nobody wants his tax dollars spent for defense if the end result is a system of questionable value to national policy. The B-1 is expensive, if price is the only criterion. However, my criteria are much more encompassing. Do we need a manned bomber? I don't see any other means of assuring a credible nuclear deterrent force without the flexibility of the B-1, including its capability for a show of force and national intent.

While our present B-52 force is effective today, it will be considerably less effective in the combat environment that can be foreseen ten years or so ahead. The B-1, on the other hand, is designed not only to operate effectively in the environment we can foresee, but also to have growth potential to accommodate future defen-

B-1—FACTS AND FIGURES

Type	Strategic Bomber—heavy
Designer and Manufacturer	Rockwell International Corporation (B-1 Division)
Powerplant	Four General Electric F101 high bypass ratio turbofan engines, each approximately 30,000 pounds of thrust
Avionic Subsystems and Integration	Boeing Aerospace Company
Defensive Subsystems	AIL Division, Cutler-Hammer, Inc.
Length	151 feet 2 inches
Height	33 feet 7 inches
Wingspan (aft sweep)	78 feet 2 inches
Wingspan (fwd sweep)	136 feet 8 inches
Weight	350,000 to 400,000 lbs
Speed	Mach 2.0 plus
First Flight	December 23, 1975
Crew-Primary	Two pilots (Aircraft Commander & Copilot) One Offensive Systems Operator (Navigator) One Defensive Systems Operator (Electronic Warfare Officer)
Crew-Additional	One instructor pilot. One instructor systems operator
Weapons	75,000 lbs internal—3 bays. 40,000 lbs external (all current and proposed strategic nuclear weapons plus a varied conventional mix)
Avionics	Terrain Following Radar System 2 inertial navigation systems Doppler Radar Forward Looking Infrared Stores Management System Tacan ILS (Instrument Landing System) Defensive System (installed on A/C #4) CITS (Central Integrated Test System)



The B-1 has accumulated more than 165 flight-testing hours. When it enters production, it will have been subjected to more structural testing than any other military aircraft.

sive or offensive avionics and weapons that may become necessary if technological advances drastically alter the threat. In short, with its larger payload, better performance, and growth potential, the B-1 is a cost-effective system that can assure peace through deterrence into the next century. To abandon it now in favor of a different but vaguely defined manned system, as some have suggested, would only result in a more expensive weapon system and a perhaps critical loss of deterrent capability during the decade or more required for defining, developing, and testing an alternative to the B-1.

It is obvious that I am an advocate of the B-1. However, my advocacy is strongly influenced by one important fact. I have flown the B-1 and am intimately aware of its capabilities and potential. In my opinion, if there isn't a B-1 in our nation's defense forces, we will not be able to effectively support our national policy in the future. ■

The author was US Representative on the NATO Military Committee for three years prior to his retirement in 1974. In March of this year, during a two-week European assignment for AIR FORCE Magazine, he met with top-level civilian and military officials at both NATO and SHAPE Headquarters, and with senior representatives of the defense establishments of several NATO countries. The following assessment of NATO's current effectiveness includes some encouraging developments, and examines in a less sanguine light the critical question...

NATO: How Credible a Deterrent?

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

JUST OVER ten years ago, on March 7, 1965, President de Gaulle wrote President Johnson asking the removal of US forces from France. It was the beginning of a new cold war, the French-American one, and it marked, in de Gaulle's mind at least, the end of the old East-West cold war. It was also the beginning of a new life for NATO, a life in exile from its birthplace.

It had been de Gaulle's original intent to

withdraw entirely from NATO, an organization he had little use for. Fortunately, he settled for a withdrawal from the integrated military structure and the expulsion of all NATO elements from French soil. It was a traumatic time for NATO, homeless, bereft of one of its major partners, and uncertain of its future. Indeed, it was by no means clear that the Alliance had a future.

Now, ten years later, NATO sits happily in

Brussels. The temporary lodgings in Evere have become permanent, and some cosmetic architecture has softened the sprawling complex which, before the plastic surgery, needed only guard towers to pass for one of the tougher Nazi prison camps. There is even a fashionably incomprehensible piece of ironmongery on the lawn depicting, one supposes, something to do with the Alliance. The normal attrition of ten years has also taken care of the more insufferable career NATO staffers who viewed Brussels as Napoleon did Elba. "Oh, Brussels," they would say. "Brussels is all right, but, you understand, it is not Paris."

There are other changes that the ten years and the move to Belgium have brought. When NATO was in Paris, the Supreme Allied Commander was just a few miles away, at Roquencourt. The Standing Group of the Military Committee was 3,000 miles away in the Pentagon. Thus, there was no challenge on the daily scene to SACEUR's preeminence as the leading military figure in the Alliance.

The move to Brussels brought a change. In place of the Standing Group, made up of senior British, French, and US representatives doing the daily work of the Military Committee, a Military Committee in Permanent Session was created and installed in NATO headquarters. SHAPE, meanwhile, was located some forty miles away at Casteau, in the depressed, and depressing, Belgian coal mining region. Until the freeway was completed in 1973, the drive between SHAPE and NATO was the kind one avoided. This, together with the new presence at NATO of a permanent military body complete with an international staff and a Chairman who, by protocol, is the senior military man in the Alliance, tended to lessen the day-to-day influence of SACEUR on the politicians.

The Chairman of the Military Committee—presently Admiral of the Fleet Sir Peter Hill-Norton—attends all Council and Defense Planning Committee meetings and speaks for the military point of view in these sessions. The three SACEURs since the exodus from France—Lemnitzer, Goodpaster, and Haig—have all given the impression of a certain nostalgia for the former arrangement when SACEUR had no local challengers.

Trip-Wire to Flexible Response

The ten years since the French defection have slipped by easily, for the most part. True, there have been crises to face—Czechoslovakia, the Mideast war, Cyprus—but NATO has not really faced them. The Alliance has not had much of a feel, or taste, for crises. These tend to bring out national divergencies rather than allied unity, and they also emphasize an essen-

tial weakness of NATO: On its record thus far, and that record takes in more than twenty-six years, the NATO members are not prepared to subordinate their national interests in favor of the Alliance as a whole.

Thus far it has not mattered. In the early days of NATO, the strategy, the whole basis for the Alliance, was called MC (for Military Committee) 14/2. As strategies go, it was simple. The United States was prepared, in the event of an attack on NATO Europe, to employ its nuclear superiority against Soviet Russia. The NATO forces on the ground in Europe were simply the means to require an attack instead of a stroll, serving as a sort of massive burglar alarm. It was referred to, in fact, as the trip-wire strategy.

Under this strategy, it was very hard to make a persuasive case for large conventional forces. Even though nations agreed, year after year, to certain force goals totaling, for example, thirty divisions in the Central Region of NATO, they never made a serious attempt to meet these goals, probably because, among other reasons, the goals made no real sense in the light of the strategy.

The Kennedy regime was afflicted, as are most incoming administrations, with the newbroom syndrome. In this instance the old strategy, 14/2, the trip-wire strategy, was the thing to be swept out and replaced by a capability to fight a conventional war, at least for a while, before resorting to nuclear weapons. It took five years to sell this idea and adopt, in 1967, the new strategy of flexible response, MC 14/3. Nine years later, this strategy of flexible response is accepted without argument, perhaps even without thought, for the problems in its implementation remain more difficult than ever.

As NATO has aged—"matured" would imply some accumulation of wisdom—it has adjusted itself to life's realities. The flexible response strategy clearly implies a capability to fight conventionally before resorting to nuclear weapons. It is this very implication that is supposed to give NATO its deterrent effect, and deterrence is, after all, what NATO is about. The problem lies in making this capability to fight, and fight effectively, credible. Europe is an open book to the Soviets. There is nothing enigmatic about the European society. Soviet estimates on the ability and will of NATO forces, and their civilian supporting structures, to resist an armed attack should be based on a good deal of first-hand information.

The enigma remains the United States and its likely reaction to an attack that would involve 300,000 US troops and hundreds of thousands of American dependents and citizens. So, in spite of everything that may be said, and mutu-

"...the NATO members are not prepared to subordinate their national interests in favor of the Alliance as a whole."

"There is no longer any doubt about whether or not France is an ally."

ally and solemnly agreed, the basis for MC 14/3, the Strategy of Flexible Response, remains the US strategic capability and the will to use it. Looking down the road, this may not be enough to maintain credibility as the Soviet nuclear strength grows, and the enormous Soviet civil defense effort begins to make Russia less vulnerable to nuclear attack. There are, it seems to me, ways to increase this credibility, but first it would be useful to examine NATO as it is today, warts and all.

Bright Spots in the North

The ten years since de Gaulle's decision to withdraw from the integrated military structure have seen some withering, and some strengthening, of the Alliance. France, in the late 1960s and early 1970s, drew further and further away from NATO. There was a time, in fact, when her relations with the USSR seemed closer than those with her nominal allies. Even the French strategy of the late '60s seemed aimed as much at her allies as at the Soviets. When the Gaullists were still in power, and that arch Gaullist Michel Debré was Defense Minister, conversations between French military officials and the NATO military were almost clandestine.

The years have seen this change. There is still no talk, and no evident possibility, of France rejoining the integrated military structure—or what is called the integrated military structure—but she is in every other way a much more comfortable presence in NATO than she was some years ago. There is no longer any doubt about whether or not France is an ally. The short-lived special relationship with the USSR is a thing of the past, and French-American relations can no longer be thought of as frigid. France has even joined a NATO endeavor to work toward some standardization in European armaments. While this is clearly in France's own self interest, it also represents a major step away from the days when anything with the NATO brand was anathema in Paris.

Germany has, at last, finished with World War II. The guilt complex is over, and the generation at the top now in Germany's military sees no reason to bow and scrape to the victors of that ancient conflict. On the contrary, the Bundeswehr, after going through a rather feckless period of long hair and super democracy, is beginning to look like the traditional German military: efficient, well-equipped, well-led, and without, shall we say, humility. But overseen, this time, by an eminently sensible government. While the Lockheed affair, with its charges of shenanigans in high places twenty years ago, has worked some harm in the defense establishment, the Germans are

no longer tentative about the matter of defense. This particular uproar will inflict no lasting damage in Germany.

There are encouraging signs in Scandinavia as well. The Norwegians, rapidly becoming one of the "have" nations with their North Sea oil, are also becoming more concerned about Soviet intentions and consequently more serious about their own defense and their NATO participation. They have always been a stalwart ally, but they give evidence of becoming still better. Even Denmark seems to be retreating from its policies of a few years ago, policies that reflected a sense of inevitable defeat, and are once again showing some signs of serious military preparations.

The Netherlands is a curious case these days. If you listen to what its government, and particularly its Defense Minister Hank Vredeling, say, you will be very discouraged. The Dutch government makes the sort of statements that come out of our own left-wing politicians. Added to these disconcerting sounds is the Dutch Military Union and the nonmilitary look of the Dutch Army. But if you look at the Netherlands defense budget, the picture is not so clear, for in spite of what Mr. Vredeling said he was going to do, he has not seriously reduced defense spending. The Dutch share of their GNP spent on defense remains about 3.9 percent, not the three percent the Netherlands government threatened. The Netherlands, in fact, pays great attention to the process of consultation within the Alliance, and thus modified its proposed reductions after hearing violent Allied objections.

The Iberian Peninsula

There is a little good news coming from the Iberian Peninsula. For the first time ever, people in NATO are beginning to discuss the probable admission of Spain to NATO, sometime in the next few years. Before the death of General Franco, only the United States supported the Spanish candidacy. If a Spanish official came to Brussels, he would meet NATO people only on neutral ground and on an informal, unpublicized basis. Nothing could illustrate the changed atmosphere better than the visit, early this year, of the Spanish Foreign Minister, Mr. Areilza, to Western Europe. He was received cordially in such traditional anti-Spanish capitals as Copenhagen and The Hague. When he came to Brussels, he paid a call on the Secretary General of NATO, arriving at NATO headquarters escorted by Belgian motorcycle gendarmes and in a limousine flying the Spanish flag. If matters continue on their present course, we may see some sort of Spanish affiliation with NATO within as short a time as two years.

Portugal is another bright spot, at least in

comparison with the situation a year ago. The Portuguese looked communism in the face and decided they did not like what they saw. The result has been a shift back toward the center and a reaffirmation of the importance of Portugal's NATO membership. There are firm indications that Portugal intends to strengthen this membership by committing, for the first time in NATO history, some forces to a defense of the Central Region. Heretofore, Portugal has been almost a shadow member of NATO, contributing little more than the base at Lages, in the Azores, and the site for a small maritime headquarters near Lisbon. The African colonies drained all of Portugal's military capability. Now, Africa is gone, and it appears the internal Communist shadow has receded. Portugal can turn some of its attention to its allied responsibilities.

The most interesting thing in this Portuguese saga is the effect the national will, as expressed by the common people, the poverty-stricken masses, had on the military junta. When the people made their antipathy to communism clear, the Marxist elements in the junta were expelled, and the center of gravity of the Portuguese government moved to a comfortable spot in keeping with the political centers of gravity of most of Socialist Europe, which is to say a little left but not very. Portugal's NATO membership was a moderating influence, even, perhaps, a decisive influence in the country's move away from communism. For while the threat to NATO posed by a Communist Portugal was a grave one, no one panicked. All during Portugal's most difficult days, the NATO political and military leaders were understanding and helpful advisers to their Portuguese allies. It seems to have paid off handsomely.

The Southern Flank: Thickening Clouds

There are no bright spots these days elsewhere in the southern region of NATO.

The Italian military has some enlightened new leadership at the top, but it may have come along too late. The Italian Communist Party has written a new chapter, maybe even a new book, on how to take over a country. They have systematically worked away over the years at the grass-roots level, avoiding controversial issues, winning mayors' seats, fixing the potholes, and collecting the garbage. As coalition after coalition government fumbled along trying to run the country, the entrenched Italian civil bureaucracy became the only real government. The Italian military, essentially in self-defense, became itself a top-heavy bureaucracy, with inflated rank the only way to give pay increases. Here and there the Italians have managed to achieve a good, even first-class military capability, but the overall effect of

these years of wobbly governments has been a stifling one. The new Chief of the Italian Defense Staff, General Viglione, has some imaginative ideas, and he seems determined to reduce the overhead, reform the promotion system, and emphasize quality in place of size in the force structure. He has some notions on defense budgeting that would put some continuity into that process, but, as noted above, he may have arrived on the scene too late.

All Europe, and especially NATO Europe, is watching the apparently inevitable arrival of the Italian Communists in the national government. Apologists for these particular Communists make the usual arguments: they are not Moscow Communists, they are reasonable Communists, they even agree to Italy's membership in NATO. The fact remains that they are Communists. If they were not, they would call themselves something else.

The situation in Italy is reminiscent, according to one wise and highly placed diplomat, of the crisis of 1921. The difference is simply that this time it is the Communists, not the Fascists, who are aiming at control. In the opinion of this same diplomat, our own ongoing Puritan revolution with its passion for total disclosure of all past misdeeds, real and fancied, has harmed the US position in Italy irrevocably. We have brought down, according to him, our Italian friends and left the field to our natural enemies. So Italy remains a great worry to NATO and to our whole Mediterranean posture.

Elsewhere in the Mediterranean there are other worries. Greece, still sulking over the Cyprus affair, remains partly aloof from NATO, steering a course somewhat, but not quite, like that of France. The NATO bases, and the United States elements, remain in Greece, but Greek forces are not committed to the integrated military structure. The immediate effect of this decision is the removal of Greek officers from the Allied headquarters in the Mediterranean. If Greece persists in this independent role, she will inevitably lose NATO funding support under the infrastructure program, one of the areas where SACEUR has real clout.

There is some optimism in NATO circles that Greece will eventually return to full integrated membership when the Cyprus affair reaches some sort of settlement and Greek emotions have simmered down. Quite apart from the fact that the Turkish-Greek hostility runs very deep, and will always be there, the real threat to Hellenic freedom still comes from Moscow. The only logical Greek defense lies in NATO and an alliance, however grudging, with Turkey. If logic prevails, Greece will rejoin the forces of SACEUR.

"Portugal's NATO membership was...perhaps, a decisive influence in the country's move away from communism."

"It is in no one's interest, save the Soviets', to antagonize Turkey further on the Cyprus issue."

Turkey is also in a very tender mood these days as a result of the behavior of our Congress. And if the agreement worked out between Secretary Kissinger and the Turkish Foreign Minister is somehow sabotaged in the Senate, then we are in for some pretty grim times with our old friend Turkey. The Turks make good friends, as we discovered in Korea, and very bad enemies, as various people have learned over the centuries.

In a conversation with an old acquaintance, a high Turkish official, these things came out. The Turks are still our friends, if a little disenchanted at the moment. They understand the importance of the NATO alliance—and thus their ties to the US—to their national defense. But if we attempt any further pressures in the way of arms embargoes, or similar measures, to bring about a Cyprus settlement, then we are risking our position in Turkey. Turkish self-esteem is very much at stake in their agreement with us on the reopening of the bases. If this agreement is overturned, or considerably modified in the Congress, then Turkey will have to assume that the Greek lobby has done its work, and we are no longer to be trusted.

It is in no one's interest, save the Soviets, to antagonize Turkey further on the Cyprus issue. It is especially not in Greece's interest, for Greece is far better with Turkey on her border as a NATO ally, however cool the relationship, than she would be with an uncommitted Turkey for a neighbor. Regardless of what one's views might be on the Cyprus situation, the fact remains that Cyprus lies scarcely fifty miles off Turkey's coast, and the Turks view a Cyprus in unfriendly hands as a threat.

Who Commands What—and When?

There are other allies, other problems, and some further encouraging omens in NATO, but these are probably the most significant ones. It seems clear that the problems, real and potential, outweigh the good omens. The pressures on NATO are no longer coming simply from the other side, although these have not diminished. They now come also from within, and SACEUR, in contemplating his integrated wartime command, must have moments of discouragement.

While the Supreme Allied Commander Atlantic has a similar integrated role, it is not quite the same. The naval forces in the Atlantic are, first of all, mainly American. Beyond that, the integration of the other navies is really more one of coordination and thus a much more manageable problem than is the case with the land and air forces in Europe. It is there, and particularly in the Central Region, that integration is most needed, now, more than ever before. Unhappily, there is no real integra-

tion of these forces, nor have they ever been actually turned over to SACEUR.

NATO is a military alliance, but it is a military alliance that pays the strictest heed to the principles of civilian control. The highest body in NATO is the North Atlantic Council, and this Council, either in ministerial or permanent session, represents the collective political judgment of the Alliance. The senior military body in NATO, the Military Committee, is subordinate to the Council. There is, of course, nothing wrong with that. All democratic nations subordinate their military to civilian control. The problem lies in the inherent inefficiency of a democratic process that requires the unanimous approval of so many nations before any military activity can take place.

Crisis management in NATO relies on consensus. In a building crisis the theory is that the Defense Planning Committee—the Council less France and Greece—agree in unison when the time has come to turn the forces over to SACEUR. When that point is reached, NATO will have an integrated command in being, and not until then. All is in readiness, the headquarters, the communications, the plans, but without an affirmative decision to place the national forces under the international command of SACEUR, NATO remains a collection of allies whose forces are under national command.

Allied Air Forces Central Europe, for example, was created to give overall direction to the air battle in the central region. Previously, the two Allied Tactical Air Forces, 4th ATAF and 6th ATAF, had gone their separate ways. For a number of reasons, some parochial and some substantive, the proposal to create this new air command had very rough sledding, and it was only after two years of intense and sometimes heated discussion that it was agreed, with the Commander in Chief, United States Air Forces Europe, being named Commander, AAFCE. There is an elaborately equipped, secure, war headquarters now in being for AAFCE. The only problem is that the Commander, AAFCE, has nothing to command. The headquarters sits there, manned, ready to operate, but not plugged in except in exercises.

This is illustrative of the situation anywhere in Allied Command Europe, SACEUR's domain. Until the decision is reached to give him his forces, he is without real authority.

The Growing Threat: What to Do About It

In days gone by, the days of a simpler strategy, it did not matter very much that SACEUR did not really command except in wartime. He was, after all, the United States Commander in Europe, the President's military surrogate, and that is what really mattered. It still matters, but

now there are other things that count as well.

The growing capability of the Soviet Union and its Warsaw Pact forces in Central Europe has increased speculation about the possibility of a surprise attack and its probable success. The *Times* of London, in March of this year, reported on page one a study that concluded Warsaw Pact forces could be across the Rhine in forty-eight hours, thus rendering useless the forward strategy and battlefield nuclear weapons. There have been any number of war games and staff studies over the years, which have come up with similar gloomy conclusions about the probable success of a Warsaw Pact surprise attack. A contributor to these conclusions is the assumption that the NATO deliberative process would not be able to react swiftly enough. NATO would be debating, and working toward a consensus, while the roof was coming down around its ears.

What to do about it? Well, if the Soviets have put themselves in position, with sufficient forces, to make the success of a surprise attack credible, then NATO should assume such an attack is likely and prepare for it. As a first step, it might be worthwhile to consider what could be done in advance of a crisis, in a non-provocative, but nonetheless meaningful, way.

As we have seen, the forces allotted to SACEUR are not really his in peacetime. They are national forces, and their day-to-day status is national, not NATO, business. In wartime, they move over to SACEUR's command, but that is, to understate matters, a poor time to begin working out the kinks. Here then, is a proposition: Don't wait for the crisis. Turn over the forces in the Central and Northern regions—those of Norway, Denmark, Germany, the United Kingdom, Belgium, the Netherlands, Canada, and the United States NATO forces in the Central Region—to SACEUR, crisis or no crisis. Make that assignment, that integration, a permanent affair as a deliberate move to improve NATO's capability to react.

I have excluded Italy, Portugal, and Turkey from this proposal for several reasons. There is, first of all, the continuing hostility between Greece and Turkey. With Greece in her present mood, withdrawn as she is from the integrated structure, it would be best to leave things alone in that end of the Mediterranean. Any change might make them worse. Italy is in such uncertain political terrain that she, too, would best be left committed to SACEUR, but not moved into the peacetime structure. As for Portugal, it is much too soon to contemplate any new role for that country.

The nations in Central and Northern Europe are geographically close together, and they would lend themselves more easily to an experiment in peacetime integration. But since

it would be difficult, and very likely disruptive, to attempt this peacetime integration, a question that should be answered has to do with the benefits we might expect from such a radical move.

For one thing, SACEUR could begin to exercise on a daily basis his command and control machinery. There would be a continuity of experience in this area, all up and down the line, not the learn-and-forget-until-next-time result of exercises. There would, moreover, be the discovery of what is wrong with communications, computers, procedures, and the other paraphernalia of command and control together with the chance to fix things calmly.

The business of standardization could take a great leap forward if SACEUR had some real authority. All the Committees, the statements by the great men at Ministerial sessions, the standardization conclaves in one capital or another have, over the years, mainly produced hot air. A SACEUR truly in command could settle some of these vexing obstacles to combat efficiency and have a powerful influence on others.

This ceding of some national sovereignty to international command would not be an easy thing to accomplish. Any such proposal would outrage some nations and divide others. It is probably a wholly impractical idea for these reasons alone, even if the authority to be granted SACEUR in a peacetime integrated command were carefully spelled out and circumscribed.

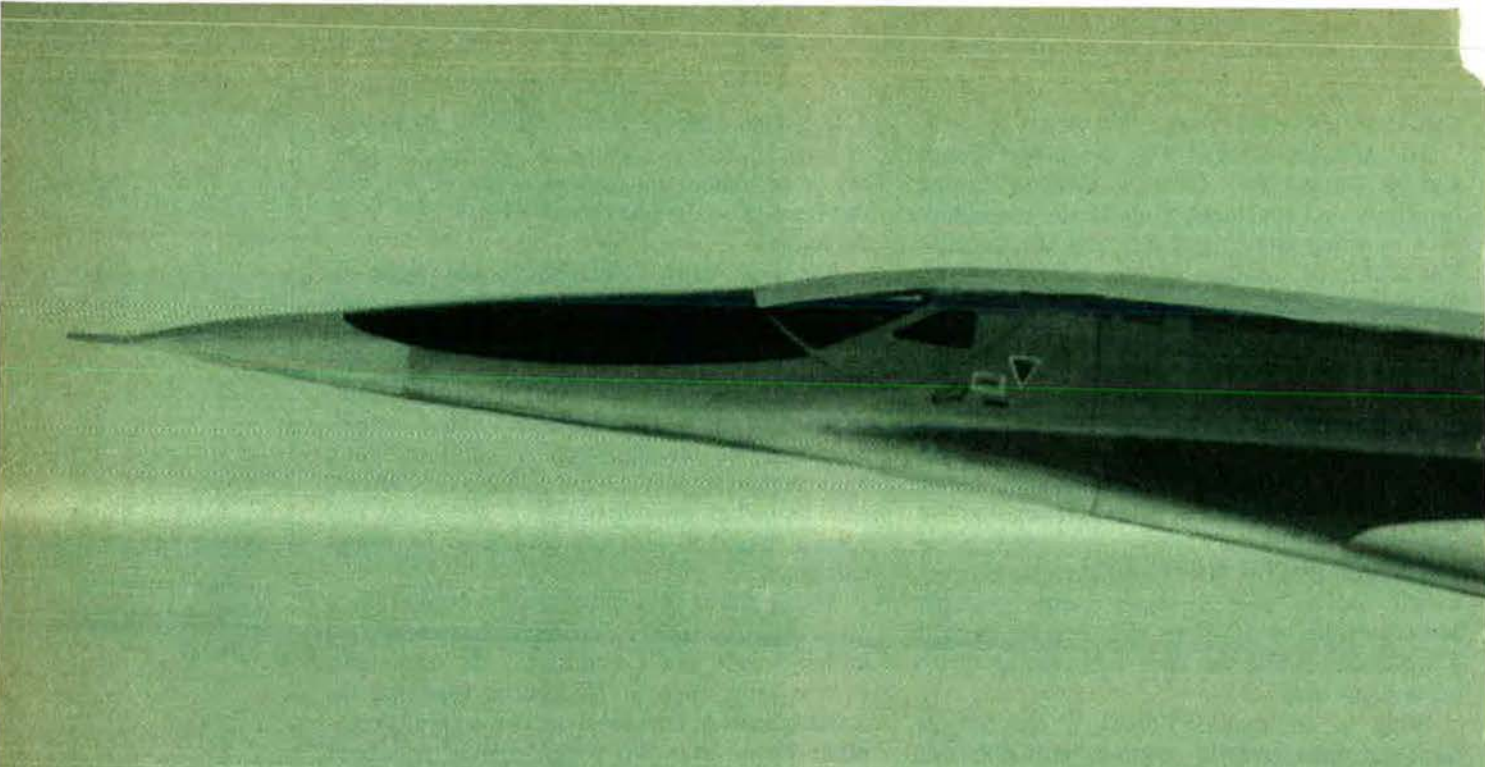
The fact remains that the forces maintained in Central and Northern Europe by the NATO allies make sense only in the context of that Alliance. Together they constitute a force; separately they have little military significance, our own forces in Europe included.

It is equally a fact that any sudden crisis, or a surprise attack itself, will probably find NATO, in its present configuration, slow to react. It is a situation that invites adventurism.

An integrated force in NATO would be better prepared to meet a crisis, once the NATO Council had decided it had to be met. It would be a smoother working force, that integrated force, and thus a more credible opponent to the other side. Credibility is an essential ingredient to deterrence, and deterrence is what NATO is all about.

Politics and national sensitivities being what they are, NATO is probably not yet ready for this step, or even ready to create a committee to study it. But if the world continues on its present uncertain and dangerous course, the day may come when we will see a SACEUR who is, in fact, and in peace or war, the Supreme Allied Commander. ■

"...NATO, in its present configuration...invites [Soviet] adventurism."



The US aerospace community continues to explore the potential for economically feasible high-performance cruise aircraft despite the demise of the US SST program in 1971. Recent achievements open up several promising options for advanced, high-speed military and commercial aircraft . . .

The Technological Case for a Supersonic Cruise Aircraft

BY EDGAR ULSAMER
SENIOR EDITOR

WITH caveats, it can be said that aviation has stood still for three decades. Technology managers in and out of government who hold this view point to the absence of a breakthrough to sustained operations in the supersonic flight regime since the advent of the first turbojet. In spite of numerous evolutionary advances and such notable exceptions as the SR-71 and MiG-25 Foxbat on the military side, and the Concorde and Tu-144 on the civil aviation side, the supersonic barrier to sustained economical high-speed flight remains formidable. Yet there is mounting evidence that supersonic cruise vehicles that exact only moderate increases in fuel-consumption rates compared to aircraft that cruise at subsonic speed could be built in the next decade.

But while these technological options are taking shape, there are no indications that the US will capitalize on

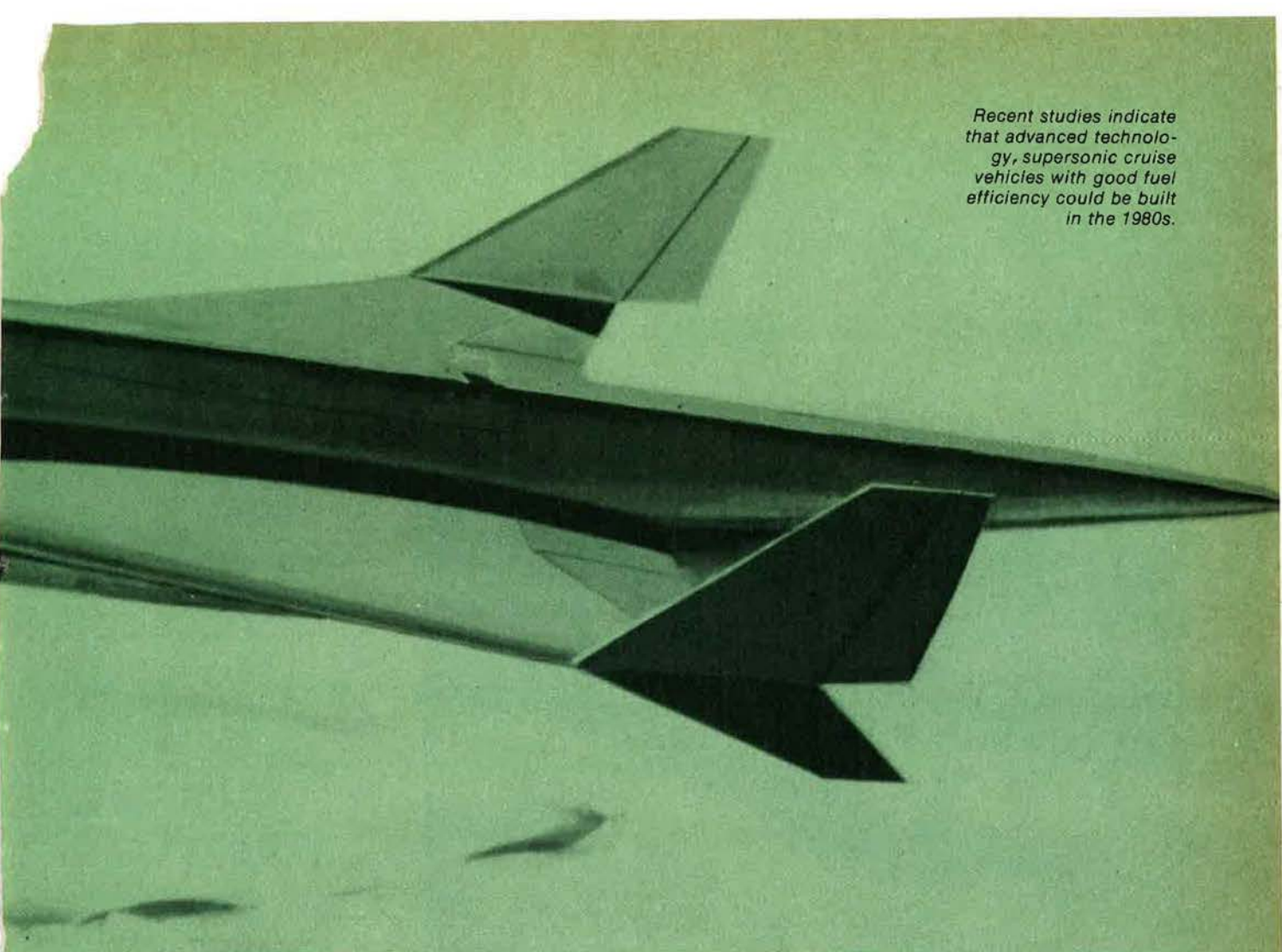
them in the realm of commercial aviation, and no specific plans to use these options in military systems. On the contrary, many military technology managers seem willing to leapfrog supersonic cruise technology in favor of hypersonic designs. Vehicles of that latter type appear capable of operating at speeds between Mach 4.5 and Mach 12, and of serving as airbreathing first-stage boosters for future space shuttle systems and, perhaps more importantly, as advanced air defense and strike-reconnaissance weapon systems.

Following several years of detailed hypersonic technology studies by USAF and NASA, the two agencies undertook a broad, joint study to determine whether a single new research airplane could meet their common flight-test requirements. Concluded last year, that research indicated that such a joint research vehicle is feasible and that its costs might be far lower than originally estimated. Concomitantly, the Air Force and NASA signed a memorandum of understanding last December to "strengthen, amplify,

and extend" the nation's hypersonic technology base through joint research, possibly culminating in the development and flight test of a Mach 6 plus vehicle designated X-24C. (See *March '76 issue, p. 35.*) Envisioned as a versatile hypersonic research tool for flight testing advanced propulsion, structural, and weapon systems, the X-24C could serve as the progenitor of both future commercial and military hypersonic vehicles. Confined to preliminary studies of aerodynamic configurations and thermal protection, during FY '76, these USAF/NASA efforts are to pave the way for a preliminary design study of the X-24C during FY '77. Subsequent actions by the two agencies in the field of hypersonic technology will be governed by the results of this design study. Operational feasibility of a manned hypersonic vehicle is not expected before the 1990s.

Transonic Flight Vehicles

At the low end of the speed spectrum under investigation for improved cruise vehicles is the transonic flight



Recent studies indicate that advanced technology, supersonic cruise vehicles with good fuel efficiency could be built in the 1980s.

regime, which might increase sustained cruise speeds to about 900 mph from the present 600-mph level. Although not seen as a strong contender for either commercial or military applications in the near future, recent promising developments in airfoil and aircraft aerodynamics have given impetus to transonic research: NASA's so-called supercritical airfoil technology that delays the heavy drag problems associated with standing shock-wave formation; and the oblique wing aircraft concept, using varied wing skew angles to achieve maximum aerodynamic efficiencies at various speeds.

The latter configuration, proposed by Dr. R. T. Jones of NASA's Ames Research Center, appears to be equally efficient in the subsonic, transonic, and low supersonic regimes and thus of potential benefit to commercial aircraft operations because of lower noise, greater flexibility, and higher block speed than existing jetliners. Initial assessments of the oblique wing concept also suggest payoffs for military applications, including the ASW

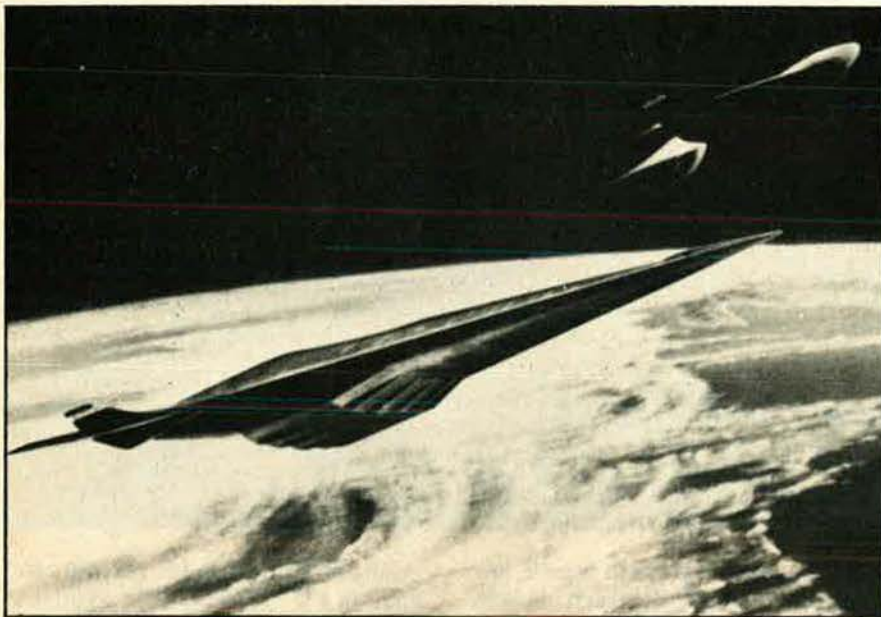
mission where high dash speed, low loiter speed, and fuel-conserving high cruise speed are important. For the same reasons, the variable-skew wing shows promise for an advanced aerial tanker aircraft. Pertinent low-level efforts are called for in NASA's FY '77 budget request to provide the guidelines for integration of the requisite technology elements into the design of an oblique-winged aircraft. Future design studies by NASA will probe such fundamental aspects as wing pivot design and engine location.

The joint USAF/NASA Transonic Aircraft Technology Program (TACT), involving a supercritical wing on a variable-sweepwing F-111 aircraft, has demonstrated the feasibility and advantages of supercritical airfoil technology in the transonic regime. In that regime these flight tests have documented such major performance gains as a fifty percent reduction in turn radius and a 5,000-foot increase in flight altitude. These gains could enhance the air combat maneuver capability of advanced fighter aircraft in a decisive fashion. Flight

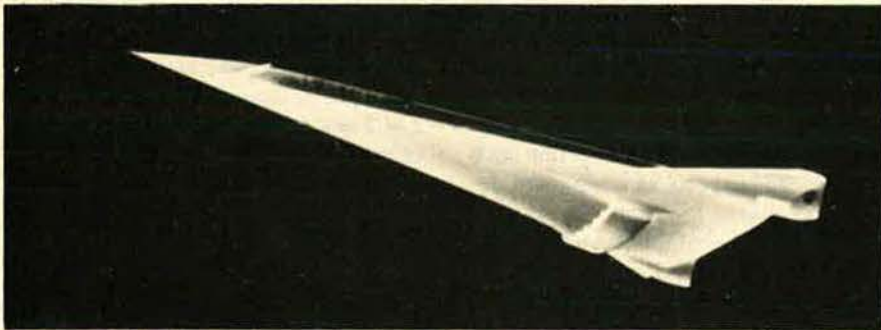
testing of the modified F-111 will continue in FY '77 to provide additional information about transonic aircraft designs.

The Supersonic Challenge

In 1971, the US was forced out of the international SST race by congressional fiat. The decision to abandon the field to the Soviets, and England and France, was preceded by a well-orchestrated publicity and lobbying campaign involving a congeries of interests extending from environmentalists to fiscal conservatives who objected to government-supported civilian technology programs. While the motives that prompted cancellation of the US SST program appear as flawed five years after the fact as they did then, subsequent, unforeseeable events and developments buffered the decision's impact on the US technology base and economy. Central are the tripling in fuel costs in the aftermath of the Arab oil embargo, the worldwide economic and air traffic slump, and the emergence of new technologies that tend to make obsolescent the initial SST de-



NASA and the Defense Department are exploring a wide range of air-breathing vehicles that can operate at speeds above Mach 3 and burn hydrogen fuel. Among the potential applications is a launch platform for future space shuttles.



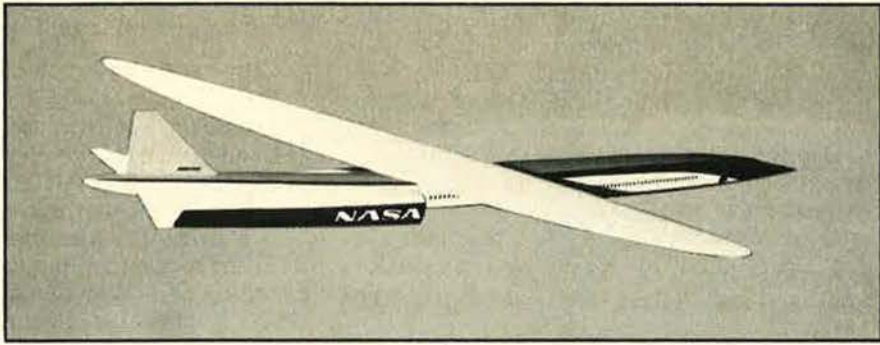
Other possible roles for hydrogen-fueled hypersonic aircraft, so far as national defense is concerned, are advanced interceptors and (shown above) a Mach 12 strike reconnaissance vehicle. Hypersonic vehicles can be expected by the 1990s.

signs, including the cancelled US SST.

Although none of the new technologies represents a breakthrough by itself, in the aggregate the resultant improvements in fuel efficiency, range, payload, and environmental acceptability are dramatic. The most important index of technological progress is concrete evidence that an improved supersonic cruise vehicle could achieve fuel consumption per ton-mile or seat-mile some thirty percent lower than existing supersonic military and commercial aircraft. Concorde and the Tu-144 burn fuel at almost three times the rate of subsonic aircraft; it is probable that advanced designs could cut fuel consumption almost to the level of subsonic aircraft.

In the main, supersonic cruise research in the US is being conducted by the aerospace industry under NASA aegis. While R&D funding (about \$20 million annually, counting NASA in-house efforts, industrial contracts, and industry's own investments) is modest and below the levels planned when the US SST program was terminated, technological progress over the past five years has been broad and significant.

Starting in 1972 and building on the technology base provided by the now-defunct US SST program and related NASA and Defense Department research, a team of NASA contractors began a systematic probe of technological options for the design of future supersonic cruise aircraft, including second-generation SSTs. Participating in this Advanced Supersonic Technology/Supersonic Cruise Aircraft Research (AST/SCAR) program are Boeing, Lockheed, and McDonnell Douglas in the area of integrated systems, and GE and Pratt & Whitney in the propulsion field.



NASA's proposed oblique-wing aircraft could operate efficiently at subsonic, transonic, and low subsonic speeds and increase current speeds by fifty percent. Military applications of the concept include ASW aircraft and advanced aerial tankers.

A key concern of the SCAR program is supersonic aerodynamic efficiency; progress in this pivotal area has been significant. Wind-tunnel tests indicate that innovative configurations produced by the SCAR program can reduce drag at supersonic speed significantly compared to the currently operational SSTs (lift/drag ratios of 9.5 to one compared to slightly better than seven to one for the defunct US SST). The most promising SCAR configuration combines wing-body blending with an advanced wing planform known as the arrow wing.

One of the key design challenges associated with efficient supersonic cruise vehicles is that they tend to be very poor performers on takeoff and climbout because of poor low-speed lift. SCAR points the way toward ingenious solutions to this problem: powered lift techniques borrowed from STOL designs. Tests at NASA's Langley Research Center indicate that engines properly placed over the wing induce almost double the low-speed lift while serendipitously reducing fly-over noise. Blown flaps represent another means to boost low-speed performance of supersonic vehicles without degrading their cruise performance through such conventional, presently used remedies as increased wing area and decreased wingsweep.

Concurrent with, and supporting, the SCAR program in such fundamental areas as configuration and structural design. NASA and its contractors developed a new concept for automated computerized design that permits parallel in place of sequential iterative approaches and thereby speeds up the process manifold. In the past, calculating the specific impacts of a configuration change on structural integrity created serious bottlenecks that often were not understood for

weeks thereafter. The new methods reduce lag time from six or eight weeks to two or three days; the result is not only more rapid, but more precise and far more economical assessment of how configuration changes will affect the design's behavior in terms of aeroelasticity, flutter, and basic performance.

New Propulsion Concepts

The combination of propulsion efficiency and interaction of engines and airframe is probably the most decisive factor in developing economical supersonic cruise vehicles. In the case of the latter, NASA plans on using an F-15 aircraft this year to confirm wind-tunnel data on the results of various engine/airframe integration approaches. There are plans also to develop and test a single-seat research aircraft capable of accommodating different engines to explore further the integration challenge.

Three individual engine research projects support the SCAR program: the Pratt & Whitney MCE-112B and VSCE-502B, and the General Electric Double-Bypass VCE (DBE). These are variable cycle engines that rely on variable fans and burners, and an inverter valve system for airflow control. This variability makes it possible to adjust the engines to various speed regimes, acting as a turbojet supersonically and as a turbofan subsonically. These research designs also employ a novel technique for noise reduction, known as the dual-stream or coannular concept. Considered a breakthrough in noise reduction for supersonic cruise vehicles—a problem that affects commercial designs in a major and military aircraft in a minor way—the dual-stream airflow feature inverts the exhaust flow pattern of conventional engines; a relatively hot, high-velocity

outer jet stream surrounds a cooler, lower velocity core stream. Initial tests indicated that the resultant noise reduction is sufficient to meet or exceed all existing noise regulations without a heavy, cumbersome noise suppressor and with the engine sized for maximum performance rather than tailored to environmental strictures.

The inherent variability of the SCAR engine designs can also reduce the overall drag of a supersonic vehicle in the transonic region by assuring improved, precise inlet and engine airflow matching. Paramount are specific fuel consumption (SFC) gains offered by the SCAR engines. Compared to the GE4 dry turbojet engine of the 1971 US SST, the MCE-112B's fuel consumption is thirty-five percent less at subsonic and between six and eight percent less at supersonic cruise. (Engine efficiency in the subsonic and transonic regimes is of critical importance to both commercial and military aircraft because of the inordinately high amount of fuel spent on takeoff and climbout to supersonic speed and altitude.)

Other areas of advance in supersonic cruise propulsion systems include the sensitive inlet diffuser devices that slow down the rapidly moving outside air and convert its kinetic energy into high pressures before entering the engine. This deceleration of the airstream is accomplished through the creation of a terminal shockwave at the throat of the inlet. But this shock, under certain circumstances, has a tendency to wander upstream from the inlet throat and pop out of the inlet completely, thereby causing inlet unstarts that result in a large thrust loss and a tendency for the aircraft to yaw and roll.

SCAR research has led to a new inlet stabilization device that minimizes

the occurrence of inlet unstart and is characterized by faster response and lower losses than previous designs. Operating on the principle of bleeding air out of the inlet whenever the shock moves too far upstream, the SCAR technique relies on a special valving arrangement that is being tested in a NASA wind tunnel on the inlet of the YF-12A. Depending on the results of this test, the new device may be flight-tested on that aircraft.

Another promising field of engine improvement centers on use of advanced materials, including the development of boron-aluminum composites for use in the fan blades of variable cycle engines. SCAR concentrates considerable effort on the use of new lightweight materials in place of the heavier titanium. It appears possible to reduce fan weight by some thirty-five percent and total aircraft takeoff weight by about 3.5 percent by shifting to boron-aluminum engine components. Similar progress is possible in the fabrication of exhaust system components that, in the case of supersonic cruise vehicles, are both heavy and complex. Use of lightweight materials there could reduce overall aircraft takeoff weight by an additional five percent.

New Materials

Although pioneered by USAF research almost a decade ago, the technology of advanced composites has not found rapid application in airframe construction because of cost and fabrication difficulties. The higher payoff that lower airframe weight promises for supersonic cruise vehicles provides an incentive to explore this economically high-risk technology. There is now enough evidence to support the assertion that existing composite materials used extensively in the design



TACT, the joint USAF/NASA Transonic Aircraft Technology Program involving an F-111 with supercritical wings, scored significant gains in the transonic flight regime, including reduced turn radii.

of a supersonic cruise vehicle could result in weight reductions of up to twenty-five percent compared to a similar titanium structure. At the same time, titanium fabrication technologies in the US are not standing still. The successful application of advanced titanium fabrication techniques pioneered by the USAF B-1 program, for instance, could cut airframe cost in half and reduce structural weight by ten percent, compared to previously available technologies. Under a NASA contract, Rockwell International is examining the applicability of these innovative fabrication and forming techniques to a supersonic cruise vehicle, while Boeing is studying their potential in the design of supersonic cruise combat aircraft.

Ironically, initial research on the use

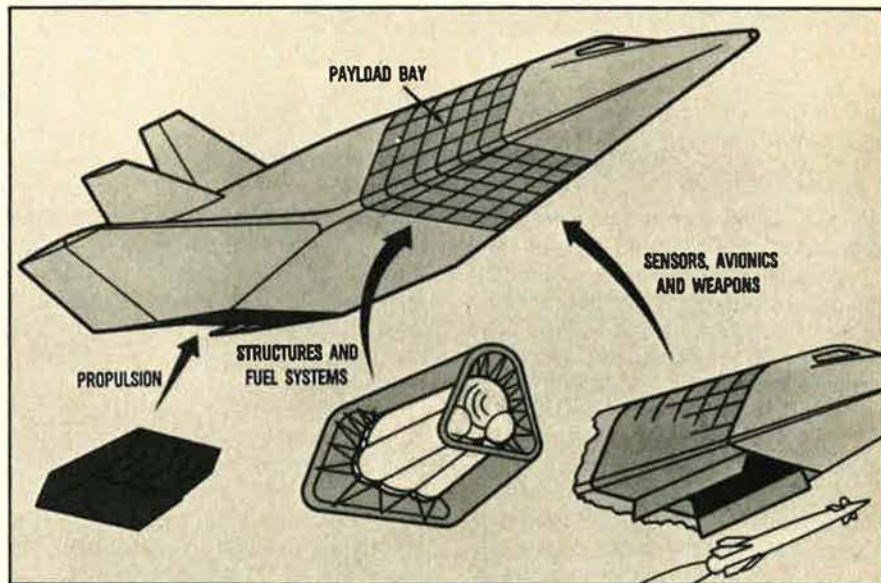
of advanced composite materials in supersonic cruise vehicles indicates that the many pluses inherent in their characteristics also introduce some problems. The extreme stiffness of these materials transfers aerodynamic loads to other portions of the structure and thus can cause stresses in areas where none existed before. This is not considered an ineluctable problem, but requires both time and adjustments of structural design.

Currently under way is development testing of the process for joining titanium and advanced composite materials, including the production of small wing skin panels for the YF-12A that are being subjected to extensive ground test and limited flight evaluation. Graphite/polymide composites are used for the YF-12A panels that will be flight-tested in FY '77.

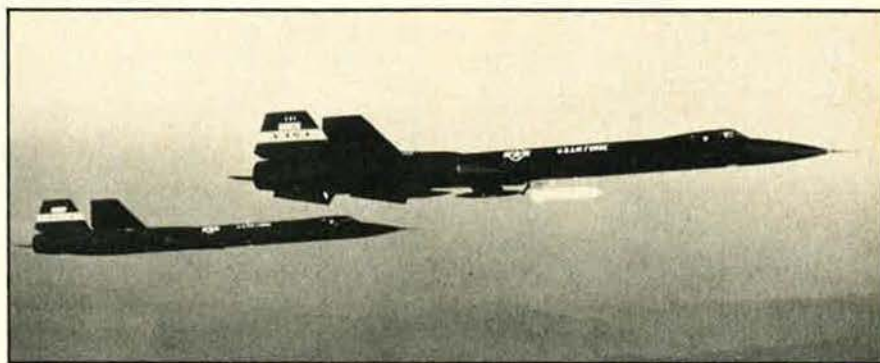
That same aircraft—a prototype of the USAF's SR-71—also continues to serve as the testbed for other experiments and research in the field of advanced supersonic cruise vehicles.

“Cold-wall” research into aerodynamic heat transfer involving the YF-12A is directed at better understanding and potential amelioration of the high-speed skin friction drag that can account for up to forty percent of a supersonic cruise vehicle’s drag. Similarly, the YF-12A proved out in flight the effectiveness of a new “auto-throttle” linked to speed and altitude control subsystems. Altitude “excursions” of supersonic vehicles—caused by overreaction of sensing systems to atmospheric changes—impose severe penalties on their performance, which is hypersensitive to deviations from the optimum altitude for a given Mach number. The new auto-throttle reduces such altitude excursions from the original maximum of 2,100 feet to forty-eight feet. Tests this year will combine engine, inlet, and stability information for transfer to a central digital control system to demonstrate the feasibility of maintaining both constant speed and altitude in the face of atmospheric temperature and pressure variations.

In the aggregate, the findings of the SCAR program about the feasibility of military supersonic cruise vehicles and advanced commercial SSTs point to a potential for major and possibly revolutionary improvements. In the case of SSTs, for example, the new concepts suggest the feasibility of building such aircraft with operating costs and range/payload features nearly equal to such wide-body aircraft as the DC-10-30, while operating at three times their speed. If these postulates are confirmed in future research and test, it may become prudent to resurrect the US SST program, whose only vestige right now is a mockup of the ill-starred aircraft in a roadside museum at Kissimmee, Fla., where for \$2 a head visitors can view it on its flight to nowhere. ■



Air Force and NASA are exploring the potential feasibility of a joint research vehicle, identified as the X-24C, to probe hypersonic flight above Mach 6. The vehicle is to flight-test advanced propulsion, structural, and weapon systems concepts for both agencies.



NASA's YF-12A is the principal testbed for supersonic flight research, including exploration of the so-called "cold-wall" technique for reducing high-speed skin-friction drag through heat transfer.

The Philippines' reservoir of goodwill toward the US, created by three-quarters of a century of bittersweet relations with America, no longer brims, but neither is it dry. As our presence in the Western Pacific diminishes, the Philippines remain . . .

Our Best Foothold in Asia

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

A few weeks ago a small, middle-aged man turned up at the American Ambassador's residence in Manila. He was Diosdado Macapagal, former President of the Philippines, and he was seeking asylum. After some deliberation the State Department refused him on the grounds, apparently, that he seemed not to be in danger. Since any Philippine public figure, and particularly an opposition public figure, is apt to be in danger at least occasionally, it seemed a curious reason. Doubtless there were other and more practical considerations arguing against asylum. At any rate, Macapagal is now reported in hiding, a fact, taking into account the tendency of the Manila press toward hyperbole, that may or may not be so.

I first met Macapagal in 1961. He had just been elected, and everyone expected great things of him. The preceding administration had been judged even more corrupt and inept than the norm, and Macapagal had made some encouraging promises during the campaign. The Philippine election campaigns, before Marcos changed the system, greatly resembled our own—full of pageantry, speeches, and hokum.

Soon after the election, the senior Naval officer, Rear Adm. Red Welch, and I, as Thirteenth Air Force Commander, were invited, along with the American Ambassador, to lunch with the President-elect. For some reason there was an air of secrecy about the affair. We were to meet at the elegant Forbes Park house of Benny Toda, a very rich Macapagal supporter. Well, we met, the five of us, and dis-

cussed the future of the Philippines and how we could work together more closely. In the course of a leisurely afternoon we were even asked what the new President should do about his military forces. Very heady stuff.

Nothing came of any of this, of course. Macapagal's regime, like Garcia's before him, was marked by corruption and governmental lassitude. He will not go down in history for anything much. Still, he was the President of a country that represents, as it has in this century, our best foothold in Asia. The Philippines are a special relation of the United States, and while, like most relatives, they can sometimes be troublesome; they are nonetheless relatives, bound to us in many ways.

Nothing could have made that relationship any clearer than the farewell visit General MacArthur made to the Philippines in that same year of 1961. That visit marked what must be the most splendid occasion in postwar Philippine history. It also, more than anything else that has happened, brought out the special affection Filipinos held for Americans, at least then.

There was an enormous parade in the Luneta, the park fronting on Manila Bay. The old General, who looked frail and faltering as he moved toward the reviewing stand, snapped erect as the first unit marched by. He remained erect, the picture of a soldier, for that whole interminable procession.

That night, there was a dinner at Malacanang Palace. It was an unforgettable affair. Hundreds of can-

dles provided the only light, and the main attraction for millions of mosquitos. The Grand Salon was open, in the tropical style. The Pasig River flowed by just behind the head table and made a fine theatrical setting for the old man who rose, at the end of the evening, to give a marvelous and touching farewell to his other native land, the Philippines. He had lived in that palace when his father, Arthur MacArthur, was the Governor-General.

"As I stand here tonight," he began, without a note, or any other of the usual speaker's props, "the ghosts of friends of other years pass before my eyes." And then he recited a litany of the Philippine great, pausing only slightly when he included his father's name in the list. It was a stunning performance, that speech, better than any stage performance I can remember, and one that took care of United States-Philippine relations for some time to come.

We are all out of MacArthurs these days, it seems. There is no one around who has the sort of aura, and personal claim on Filipino affections, that MacArthur had. Ed Lansdale—the heroic Colonel Hillendale of *The Ugly American*—perhaps, in a different way, but no one else. We can only hope the reserves of good will, and family ties, are enough to keep our arrangements in the Philippines intact.

That same year, 1961, was the beginning of our great Southeast Asian involvement. Through the early and relatively good years, and ending with the last bad years, the Philippines were our sanctum. Clark Field was where the POWs emerged from their long nightmare.

There was a time not many years ago when other places seemed more likely locations for American bases: Okinawa, Taiwan, Thailand, for instance. We are being shown the door in Thailand, and are going back to the 1961 arrangement in that country where we had an advisory group and little else. Okinawa has joined Japan and is no longer the happy US enclave it was in the fifties and sixties. Taiwan is finished as a principal US base, as we draw closer to China.

Still, we need a US presence in that part of the world, a visible presence, moreover. Just being there is stabilizing. The answer seems to lie in a continuation of the boarding arrangement with our relatives in Luzon. ■

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT



Four of the first five production EMBRAER EMB-110P Bandeirante twin-turboprop transports shown ready for delivery to TABA (Transportes Aéreos da Bacia Amazônica) in Brazil

EMBRAER
EMPRESA BRASILEIRA DE AERONAUTICA SA; Head Office and Works: Av Brig Faria Lima, Caixa Postal 343, 12200 São José dos Campos, São Paulo State, Brazil

EMBRAER EMB-110 BANDEIRANTE (PIONEER)

Brazilian Air Force designations: C-95, EC-95, and RC-95

By January 1976, a total of 132 Bandeirantes of various models had been sold, to the Brazilian Air Force (88); Transbrasil (6); VASP (10); Taxi Aéreo Sagres (3); Transportes Aéreos da Bacia Amazônica (5); the Uruguayan Air Force (5); DNOCS (1), SUDECO (1), and FUNAI (1) governmental agencies of the Ministry of the Interior; Furnas Centrais Elétricas (2); and other operators (10). By 1 February 1976, a total of 74 Bandeirantes had been delivered, and production is scheduled to continue during 1976-77 at a rate of four per month.

Metric Standards

The governments of both the United States and the United Kingdom have stated their intention to encourage the adoption and use of metric standards by their nations as soon as practicable. The internationally agreed system of units to be adopted is abbreviated as 'SI', and is built upon a foundation of seven base units, plus two supplementary units, from which all other SI units are derived. It is intended to adopt SI units throughout the next (1976-77) edition of *Jane's All the World's Aircraft*, and they are introduced in *Jane's Supplements to AIR FORCE Magazine* from this issue. The sole exception to the currently recommended international units is that bars are used as the metric units of stress pressure, instead of the newly chosen Pascals, at the request of aviation tyre manufacturers and others in our industry. The familiar 'English' units are also retained in parentheses.

The Bandeirante, which is fully described in the current edition of *Jane's*, is available in the following versions:

EMB-110. Basic 12-seat aircraft; 60 ordered by Brazilian Air Force.

EMB-110A. Navaid checking and calibration version. Two to be ordered by Brazilian Air Force as EC-95.

EMB-110B. Aerial photogrammetric version, with cabin floor apertures permitting the use of aerial cameras (Zeiss RMK A8.5/23, RMK A15/23, RMK A30/23, and Wild RC-10), a Zeiss IRU regulator, and Zeiss NT-1 navigation visors. Other equipment includes Decca 72 Doppler navigation system. Crew includes three equipment operators. Six ordered by Brazilian Air Force as RC-95s, and one by Aerofotogrametria S/A.

EMB-110C. Standard 15-passenger commercial transport version. Entered commercial service with Transbrasil on 16 April 1973.

EMB-110E. Executive transport version with accommodation for seven passengers,



EMBRAER EMB-110P Bandeirante third-level transport in service with TABA of Brazil

four in individual seats and three on a side-ways facing sofa. Other features include a galley, wardrobe, and stereo AM/FM and tape deck. Nine sold in 1975: four to J. P. Martins and one each to Cacique, Bradesco, Banco Nordeste, Zwigal, and Frigus.

EMB-110F. All-cargo version.

EMB-110K. Developed from EMB-110C with enlarged fuselage door 1.35 m (4 ft 5 1/4 in) high x 1.80 m (5 ft 10 3/4 in) wide; 20 to be delivered to Brazilian Air Force.

EMB-110P. Commercial third-level commuter version for 18 passengers, developed from EMB-110C. Seats in six rows of three, at 775 mm (30.5 in) pitch. Rear baggage hold volume increased to 2.0 m³ (70.63 cu ft). Two overwing emergency exits. Five delivered to TABA (Transportes Aéreos da Bacia Amazônica) by early 1976.

EMB-110S. Geophysical survey version. Equipment includes geometrics proton magnetometers, gamma ray spectrometers, and data recording systems.

EMB-111. Maritime patrol version, with AN/APS-503(C) search radar in enlarged nose radome. Twelve ordered by Brazilian Air Force. First flight scheduled for July 1977.

EMBRAER PROJECT 12X

Under the series designation Project 12X, EMBRAER is developing from the Bandeirante a family of three medium-sized pressurised twin-engined aircraft, all named after Brazilian rivers. Three different fuselage lengths are employed, but all have the same cross-section and modular construction, of fail-safe design and built of chemically-milled panels; the same flight deck layout; and substantially the same systems, electronics, and equipment. Each will have a normal cabin pressure differential of 0.4 bars (6.0 lb/sq in) and a maximum differential of 0.43 bars (6.17 lb/sq in). A T-tail configuration is common to all three models, and each will have baggage compartments in the rear of the cabin and in the nose, the latter accessible via two upward-hinged doors.

The three versions are designated as follows:

EMB-121 Xingu. First version to be developed. Prototype, built with production jigs from components of unpressurised Bandeirante, was scheduled to fly in May 1976. Utilises same engine nacelles, landing gear, and (with reduced span) wings as the Bandeirante. Accommodation for 6-9 passengers. Powered by two 507kW (680 shp) Pratt & Whitney Aircraft of Canada PT6A-28 turboprop engines, each driving a Hartzell HC-B3TN-3D/T10178HB-8R three-blade constant-speed metal propeller with auto-feathering and full reverse pitch capability.

EMB-123 Tapajós. Second version to be

developed. Compared with EMB-121, will have new landing gear and supercritical wings of GAW.I section with full-span Fowler flaps. Accommodation for 10 passengers. Powered by two 835kW (1,120 shp) Pratt & Whitney Aircraft of Canada PT6A-45 turboprop engines, each driving a Hartzell five-blade reversible-pitch propeller. Wingtip fuel tanks optional.

EMB-120 Araguaia. Third version to be developed. Same wings and power plant as EMB-123, but lengthened fuselage seating up to 24 passengers. Constant-speed reversible-pitch propellers, similar to those of EMB-123, with electrical de-icing. Wingtip fuel tanks optional.

ELECTRONICS AND EQUIPMENT (all models):

One Bendix RDR-1200 weather radar, two Collins VHF-20A, one Sunair ASB-100A HF, two Collins VIR-30A automatic VOR/ILS, two Collins DF-206 ADF, two RCA AVA-310 audio control panels, two Sperry SPZ-200 flight directors/autopilots, one Collins DME-40 DME, one Collins ALT-50 radio altimeter, one Collins TDR-90 transponder, and one Garrett Rescue 88 emergency transmitter (ELT).

DIMENSIONS, EXTERNAL:

Wing span:	
121	14.14 m (46 ft 4 3/4 in)
120, 123 (over tip-tanks)	14.40 m (47 ft 3 in)
Wing chord at root:	
121	2.46 m (8 ft 0 3/4 in)
120, 123	2.62 m (8 ft 7 1/4 in)
Wing chord at tip:	
121	1.50 m (4 ft 11 in)
120, 123	0.96 m (3 ft 1 3/4 in)

Wing mean aerodynamic chord:	
121	1.919 m (6 ft 3 1/2 in)
120, 123	1.805 m (5 ft 11 in)

Wing aspect ratio:	
121	7.15
120, 123	9

Length overall:	
120	19.45 m (63 ft 9 3/4 in)
121	12.32 m (40 ft 5 in)
123	15.62 m (51 ft 3 in)

Length of fuselage:	
120	18.13 m (59 ft 5 3/4 in)
121	11.01 m (36 ft 1 1/2 in)
123	14.31 m (46 ft 11 1/2 in)

Fuselage max width:	
120, 121, 123	1.86 m (6 ft 1 1/4 in)

Height overall:	
120	5.25 m (17 ft 2 3/4 in)
121	4.94 m (16 ft 2 1/2 in)
123	5.20 m (17 ft 0 3/4 in)

Tailplane span:	
120, 121, 123	5.58 m (18 ft 3 3/4 in)

Wheel track:	
121	5.24 m (17 ft 2 1/4 in)
120, 123	5.10 m (16 ft 8 3/4 in)

Wheelbase:	
120	6.40 m (21 ft 0 in)
121	2.86 m (9 ft 4 1/2 in)
123	5.10 m (16 ft 8 3/4 in)

Propeller diameter:	
121	2.36 m (7 ft 9 in)
120, 123	2.64 m (8 ft 8 in)

Distance between propeller centres:	
120, 121, 123	5.10 m (16 ft 8 3/4 in)

Passenger door (rear, port):	
Height (120, 121, 123)	1.31 m (4 ft 3 1/2 in)
Width (120, 121, 123)	0.63 m (2 ft 0 3/4 in)

Emergency exits (2 overwing, each):	
Height (120, 121, 123)	0.85 m (2 ft 9 1/2 in)
Width (120, 121, 123)	0.51 m (1 ft 8 in)

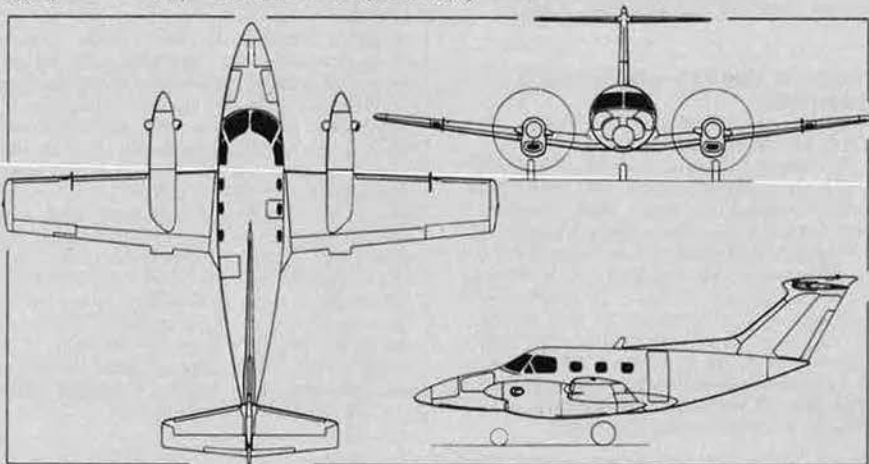
DIMENSIONS, INTERNAL:

Pressurised cabin: Max length:	
120	12.27 m (40 ft 3 in)
121	5.18 m (17 ft 0 in)
123	8.45 m (27 ft 8 3/4 in)
Max width (120, 121, 123)	1.74 m (5 ft 8 1/2 in)
Max height (120, 121, 123)	1.52 m (4 ft 11 3/4 in)

AREAS:

Wings, gross:	
121	27.50 m ² (296.0 sq ft)
120, 123	25.00 m ² (269.1 sq ft)
Ailerons (total):	
121	1.42 m ² (15.28 sq ft)
Trailing-edge flaps (total):	
121	5.04 m ² (54.25 sq ft)
120, 123	6.61 m ² (71.15 sq ft)

EMBRAER EMB-121 Xingu, first of the new Project 12X family of medium-sized pressurised transports named after Brazilian rivers (Pilot Press)



Spoilers (total):	
120, 123	0.25 m ² (2.69 sq ft)
Fin, excl dorsal fin:	
120, 121, 123	2.18 m ² (23.46 sq ft)
Rudder, incl tab:	
120, 121, 123	1.78 m ² (19.16 sq ft)
Tailplane:	
120, 121, 123	3.33 m ² (35.84 sq ft)
Elevator, incl tabs:	
120, 121, 123	2.51 m ² (27.02 sq ft)

WEIGHTS AND LOADINGS:

Weight empty, equipped:	
120	4,300 kg (9,480 lb)
121	3,175 kg (7,000 lb)
123	3,875 kg (8,543 lb)
Max T-O weight:	
120	8,000 kg (17,637 lb)
121	5,600 kg (12,346 lb)
123	7,000 kg (15,432 lb)
Max landing weight:	
120	7,600 kg (16,755 lb)
121	5,300 kg (11,684 lb)
123	6,650 kg (14,660 lb)
Max zero-fuel weight:	
120	7,300 kg (16,094 lb)
123	6,650 kg (14,660 lb)

Max wing loading:	
120	320 kg/m ² (65.54 lb/sq ft)
121	204 kg/m ² (41.78 lb/sq ft)
123	280 kg/m ² (57.35 lb/sq ft)

Max power loading:	
120	4.79 kg/kW (7.88 lb/shp)
121	5.52 kg/kW (9.10 lb/shp)
123	4.19 kg/kW (6.89 lb/shp)

PERFORMANCE (estimated, 121 at AUV of 5,200 kg; 11,464 lb, 120 and 123 at max T-O weight, except where indicated):

Never-exceed speed:	
120	365 knots (676 km/h; 420 mph)
121	316 knots (586 km/h; 364 mph)
123	364 knots (675 km/h; 419 mph)
Max level speed:	
120	305 knots (565 km/h; 351 mph)
121 at 4,570 m (15,000 ft)	252 knots (467 km/h; 290 mph)
123	310 knots (574 km/h; 356 mph)

Max Mach No:	
121	0.635
120, 123	0.67

Max cruising speed at 4,570 m (15,000 ft):	
120	292 knots (541 km/h; 336 mph)
121	252 knots (467 km/h; 290 mph)
123 at 6,000 kg (13,227 lb) AUV	300 knots (556 km/h; 345 mph)

Econ cruising speed at 4,570 m (15,000 ft):	
120	251 knots (465 km/h; 289 mph)
121	210 knots (389 km/h; 242 mph)
123	240 knots (445 km/h; 276.5 mph)

Stalling speed at max T-O weight, flaps up:	
120	106 knots (196 km/h; 122 mph)
121	92 knots (170 km/h; 106 mph)
123	100 knots (185 km/h; 115 mph)

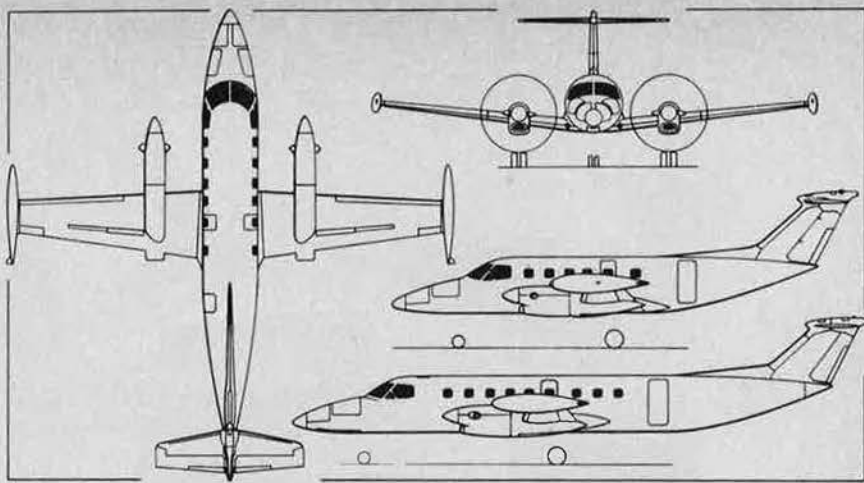
Stalling speed at max landing weight, full flap:	
120	80 knots (148 km/h; 92 mph) IAS
121	70.5 knots (130 km/h; 81 mph) IAS
123	76.5 knots (141 km/h; 88 mph) IAS

Max rate of climb at S/L:	
120	487 m (1,597 ft)/min
121	579 m (1,900 ft)/min
123	624 m (2,047 ft)/min

Rate of climb at S/L, one engine out:	
120	183 m (600 ft)/min
121	165 m (541 ft)/min
123	274 m (899 ft)/min

Service ceiling:	
120	8,535 m (28,000 ft)
121	8,230 m (27,000 ft)
123	9,390 m (30,800 ft)

Service ceiling, one engine out:	
120	4,270 m (14,000 ft)
121	3,960 m (13,000 ft)
123	5,945 m (19,500 ft)



EMB-123 Tapajós ten-passenger twin-turboprop transport, with additional side view (bottom) of the longer EMB-120 Araguaia (Pilot Press)

T-O run:	
120	455 m (1,493 ft)
121 at max T-O weight	520 m (1,706 ft)
123	341 m (1,119 ft)
T-O to 10.7 m (35 ft):	
120	850 m (2,789 ft)
123	396 m (1,299 ft)
T-O to 15 m (50 ft):	
121	715 m (2,346 ft)
Landing from 15 m (50 ft):	
120	710 m (2,329 ft)
121	520 m (1,706 ft)
123	631 m (2,070 ft)
Landing run at max landing weight:	
120	410 m (1,345 ft)
121	315 m (1,033 ft)
123	363 m (1,191 ft)
Range at 6,100 m (20,000 ft), 45 min reserves:	
120 with max payload of 2,720 kg (6,000 lb)	300 nm (556 km; 345 miles)
121 with max payload	1,300 nm (2,410 km; 1,497 miles)
123 with payload of 2,040 kg (4,500 lb)	630 nm (1,167 km; 725 miles)
120 with max fuel and 1,500 kg (3,300 lb) payload	1,590 nm (2,946 km; 1,830 miles)
121 with max fuel	1,400 nm (2,595 km; 1,612 miles)
123 with max fuel and 893 kg (1,970 lb) payload	1,850 nm (3,428 km; 2,130 miles)

LOCKHEED
LOCKHEED-CALIFORNIA COMPANY
 (Division of Lockheed Aircraft Corporation); Head Office: Burbank, California 91520, USA

LOCKHEED US-3A VIKING

On 15 December 1975 Lockheed-California announced the receipt of a \$3 million contract from the US Navy to begin development of a carrier on-board delivery (COD) version of the S-3A Viking, for the transport of passengers and/or cargo between shore bases and aircraft carriers.

Designated US-3A Viking, the new aircraft will be a utility transport, with cargo and/or seats for up to six passengers occupying the cabin space which in the S-3A is allocated to the control stations and equipment of the tactical co-ordinator and acoustic sensor operator. Additional cargo space is provided by deletion of certain ASW equipment, accommodated in the S-3A in the upper fuselage below the starboard

wing, and in six forward and aft lower-fuselage compartments. With no requirement for a weapon load, the split bomb bays also are used for cargo, the bomb bay doors being deleted. Special streamlined cargo pods, with a diameter of 1.07 m (3 ft 6 in) and overall length of 5.08 m (16 ft 8 in), have been designed for attachment to the underwing pylons, used on the S-3A for the carriage of weapons and other stores. Each pod has an internal volume of 2.55 m³ (90 cu ft) and can accommodate up to 454 kg (1,000 lb) of cargo.

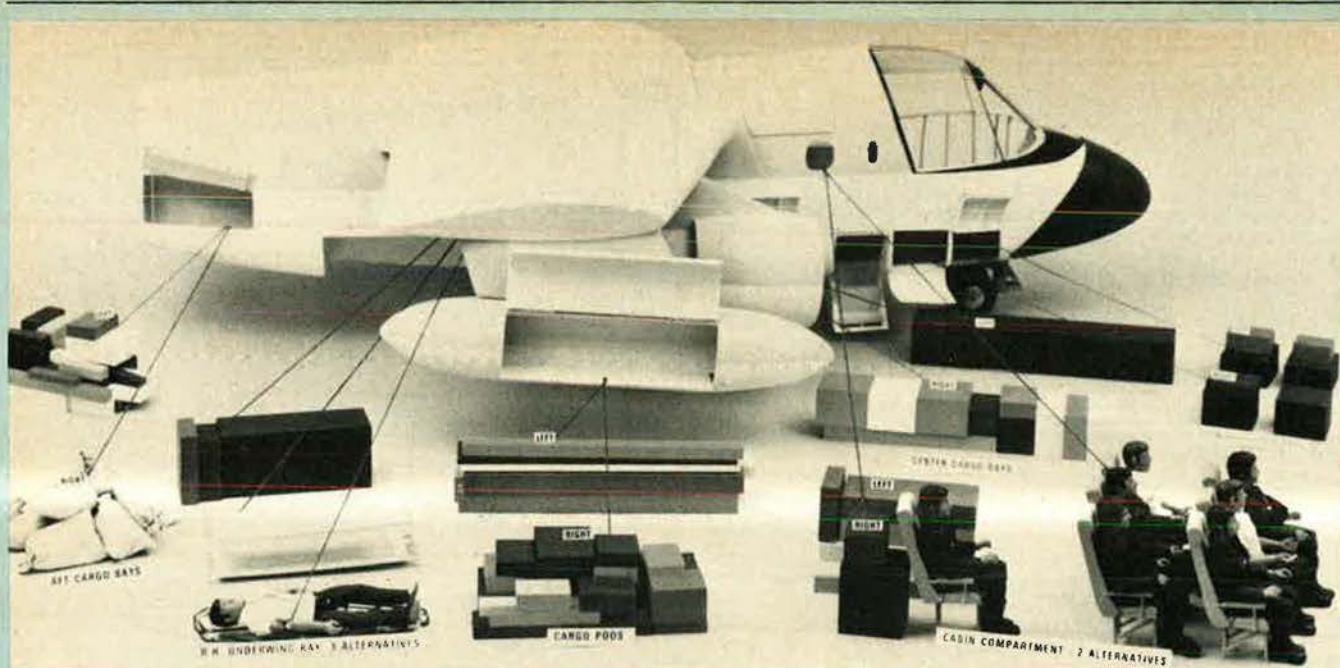
These changes, by comparison with the S-3A, give the US-3A a total cargo volume of 12.74 m³ (450 cu ft), which can be utilised for the carriage of a net maximum payload of 2,608 kg (5,750 lb). For basic passenger/cargo or all-cargo missions, maximum cruise altitude is restricted to 10,670 m (35,000 ft) to maintain a cabin altitude of approximately 3,000 m (10,000 ft); a total of 1,700 kg (3,750 lb) can be carried in the all-cargo configuration, or six passengers (or five plus crew chief/loadmaster) and 1,275 kg (2,810 lb) of cargo. En-route loading equipment weighing 345 kg (760 lb) is standard.

The starboard cargo bay beneath the wing, which is environmentally controlled, could be used in an emergency for the carriage of one or two litter patients.

Construction of the prototype US-3A began in August 1975, and the first flight of this aircraft is scheduled for July 1976. If the US-3A is shown to meet the Navy's requirements, a production contract for 30 is likely to follow.

TYPE: Cargo/passenger transport for carrier on-board delivery (COD).

WINGS: Cantilever shoulder-wing monoplane. Sweepback at quarter-chord 15°. No dihedral. Incidence 3° 15' at root, -3° 50' at tip. All-metal fail-safe structure. Wings fold upward and inward hydraulically, outboard of engine pylons, for carrier stowage. Single-slotted Fowler-type trailing-edge flaps, operated by hydraulic power, with an integral electric motor for emergency operation. Electrically-operated leading-edge flaps, extending from engine pylons to wingtips, are fully extended after 15° of trailing-edge flap movement. Ailerons augmented by underwing and overwing spoilers for roll control. All primary flight control surfaces are actuated by irreversible servos powered by dual hydraulic systems. Loss of either hydraulic system results in loss of half the available hinge movement, but the remaining system can meet all control requirements. Automatic reversion to



Model illustrating typical payload stowage on the Lockheed US-3A Viking

manual control in the event of failure of both hydraulic systems. In emergency operation the spoilers are inoperative. Wing anti-icing by engine bleed air, but portions of wing leading-edges are cyclically heated to reduce consumption of bleed air.

FUSELAGE: Semi-monocoque all-metal fail-safe structure. Two parallel beams form a keelson from nose gear to tail-hook, strengthening the fuselage and improving cabin structural integrity by distributing catapult and arrestor loads throughout the airframe. Cargo bays with external access doors in forward, centre, and aft fuselage. An illuminated in-flight refuelling probe, mounted within the fuselage on the top centreline, is operated by an electric drive and protected by a positive-seal door. It can be extended or retracted in emergency by a hand crank.

TAIL UNIT: Cantilever all-metal structure with swept vertical and horizontal surfaces. Fin and rudder are folded downward by hydraulic servos for carrier stowage. During fin-folding sequence the pedal input to the rudder servo is disconnected to allow the pilot to steer the nosewheel by the rudder pedals. Variable-incidence tailplane, electrically controlled. Elevator and rudder controlled by hydraulic servos. Trim tabs in elevator and rudder. Anti-icing of tailplane leading-edges by engine bleed air.

LANDING GEAR: Hydraulically-retractable tricycle type. Main units, similar to those of the Vought F-8 Crusader, are fitted with single wheels and retract rearward into the aft fuselage. Nose unit similar to that of the Vought A-7 Corsair II, with twin wheels and catapult towbar, retracts rearward into fuselage. Nosewheel steering by hydraulic power. Hand pump for emergency retraction of landing gear. Main-wheel tyres size 30 x 11.5-14.5, Type VIII 24-ply rating, pressure 22 bars (320 lb/sq in) for carrier landings, 16.9 bars (245 lb/sq in) for land operation. Nosewheel tyres size 22 x 6.75-10, Type VII 18-ply rating, pressure 22 bars (320 lb/sq in) for carrier landings, 8.27 bars (120 lb/sq in) for land operation. Hydraulic brakes. Arrestor hook.

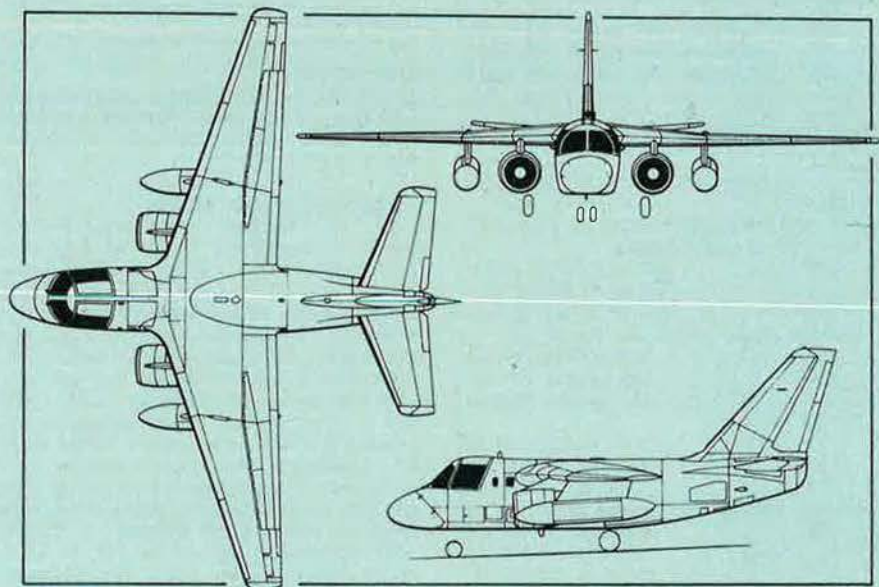
POWER PLANT: Two General Electric TF34-GE-2 high bypass ratio turbofan engines, each rated at 41.25kN (9,275 lb) st, pylon-mounted beneath the wings. Fuel in integral wing tanks, entirely within the wing box beam, one on each side of the fuselage centreline and inboard of the wing fold-line. Usable fuel capacity approximately 7,192 litres (1,900 US gallons). Two 1,136 litre (300 US gallon) jettisonable fuel tanks can be carried on the underwing pylons. Single-point pressure refuelling adaptor located on starboard side of fuselage aft of main landing gear door. Internal tanks may also be gravity fuelled through overwing connections. Fuel jettison system. Anti-icing of engine inlet nozzles by engine bleed air.

ACCOMMODATION: Crew of three, comprising pilot, co-pilot, and crew chief/loadmaster. Pilot and co-pilot side by side on flight deck with transparent canopy. Crew chief/loadmaster and up to five passengers (or

six without crew chief/loadmaster) on two three-abreast rows of seats in cabin aft of flight deck. Windows in cabin sides. Electric windscreen wipers. Windscreen surfaces electrically heated; side canopy is demisted with conditioned air. Liquid rain-repellent system to augment action of windscreen wipers. Cabin pressurised and air-conditioned.

SYSTEMS: Garrett-AiResearch environmental control system, with engine bleed air supply and air-cycle refrigeration unit. Pressurisation system operates at a differential of 0.4-0.55 bars (6-8 lb/sq in), maintaining a cabin altitude of 1,525 m (5,000 ft) to a height of 7,620 m (25,000 ft); 3,050 m (10,000 ft) to 10,670 m (35,000 ft); and 3,505 m (11,500 ft) to 12,200 m (40,000 ft). Two engine-driven pumps supply hydraulic power for two completely independent systems, pressure 207 bars (3,000 lb/sq in). Port system supplies landing gear, flaps, brakes, wing and tail

Lockheed US-3A Viking carrier on-board delivery transport (Michael A. Badrocke)



fold, and arrester hook. Its secondary function is to power one side of the primary flight control servos. Starboard system powers only the primary flight controls, energising one side of the dual servo actuators; port system energises the other. Electrical system includes two 75kVA generators supplying 115-120V AC at a frequency of 400Hz. Secondary DC power is obtained from two transformer-rectifiers that deliver 28V DC at 200A. Battery for operation of emergency communications. Williams Research Corporation gas turbine APU has a 5kVA generator for emergency electric power, providing 115-120V AC at 400Hz to the essential AC bus and 28V DC at 30A through the transformer-rectifiers. Emergency electric power is adequate only for essential capabilities such as those required for night flight under instrument conditions. Fire extinguisher for APU. Dry chemical emergency oxygen generator.

ELECTRONICS: Communication systems com-

DIMENSIONS, EXTERNAL:

Wing span	20.93 m (68 ft 8 in)
Wing span, wings folded	8.99 m (29 ft 6 in)
Wing chord at root	4.29 m (14 ft 1 in)
Wing chord at tip	1.07 m (3 ft 6 in)
Wing aspect ratio	7.73
Length overall	16.26 m (53 ft 4 in)
Length overall, tail folded	15.06 m (49 ft 5 in)
Height overall	6.93 m (22 ft 9 in)
Height overall, tail folded	4.65 m (15 ft 3 in)
Tailplane span	8.23 m (27 ft 0 in)
Wheel track	4.19 m (13 ft 9 in)
Wheelbase	5.72 m (18 ft 9 in)

DIMENSIONS, INTERNAL:

Passenger cabin:	
Max height	2.29 m (7 ft 6 in)
Max width	2.18 m (7 ft 2 in)

AREAS:

Wings, gross	55.56 m ² (598 sq ft)
Ailerons (total)	1.23 m ² (13.3 sq ft)
Fin	8.51 m ² (91.6 sq ft)

Max ferry range
3,230 nm (6,085 km; 3,719 miles)

ROCKWELL INTERNATIONAL/NASA HIMAT

Information from NASA, received after the item in the April *Supplement* went to press, indicates that the HiMAT programme was evolved and is being sponsored entirely by NASA's Hugh L. Dryden Flight Research Center at Edwards AFB, California, and does not involve either the Department of Defense or the US Air Force.

NASA also points out that only two modified BQM-34F Firebee IIs are to be used in later stages of the programme, and not five as stated in the fifth paragraph of the April entry.

PADC PHILIPPINE AEROSPACE DEVELOPMENT CORPORATION; Address: PADC Building, Domestic Terminal Road, Nichols Field, Pasay City 3129, Philippine Republic

By the beginning of 1976, PADC had completed the assembly of 19 of the 38 BO 105 helicopters which, under a current programme, it is building under licence from MBB of Germany. It had also completed the first and second phases of its assembly programme for the Britten-Norman Islander, involving 20 aircraft, and had embarked upon phase 3 of this programme. This phase involves a further 20 Islanders, of which, during the first quarter of 1976, one was due to begin flight testing and seven others were on the assembly line. The fourth and final phase of the current Islander programme will involve a further 60 aircraft, bringing the total to 100.

For the future, PADC embarked in late 1975 upon the preliminary stages of a new fixed-wing aircraft project of national design; a description of this follows:

PADC FIXED-WING AIRCRAFT PROTOTYPE

This prototype development project is a joint venture between PADC and the Philippine government's National Science and Development Board (NSDB); the Metals Industry Research and Development Center (MIRDC) is co-operating in the programme.

The aircraft will be an all-metal, externally-braced high-wing monoplane, accommodating four persons including the pilot. It is intended for carrying passengers or cargo, and will be easily convertible into an agricultural crop dusting or seeding aircraft, with the necessary manoeuvrability to carry out such operations over small field areas. Phase 1 of the programme, which began in October 1975, covered the preliminary design and engineering studies necessary to ensure smooth development; phase 2, which began in January 1976, concerns the detail design, construction, and flight testing of a prototype. First flight is planned for mid-1978.

TYPE: Four-seat light utility and agricultural aircraft.

WINGS: High-wing monoplane, braced by a single strut on each side. Wing section NACA 2415 (constant). No anhedral, dihedral, or sweepback. Incidence 2°. Trailing-edge flaps and ailerons over virtually entire span. Turned-down wing-tips.

FUSELAGE: All-metal pod and boom type.

TAIL UNIT: Cantilever all-metal structure, with slight sweepback on vertical surfaces. Shallow dorsal fin. Balanced rudder and balanced one-piece elevator.

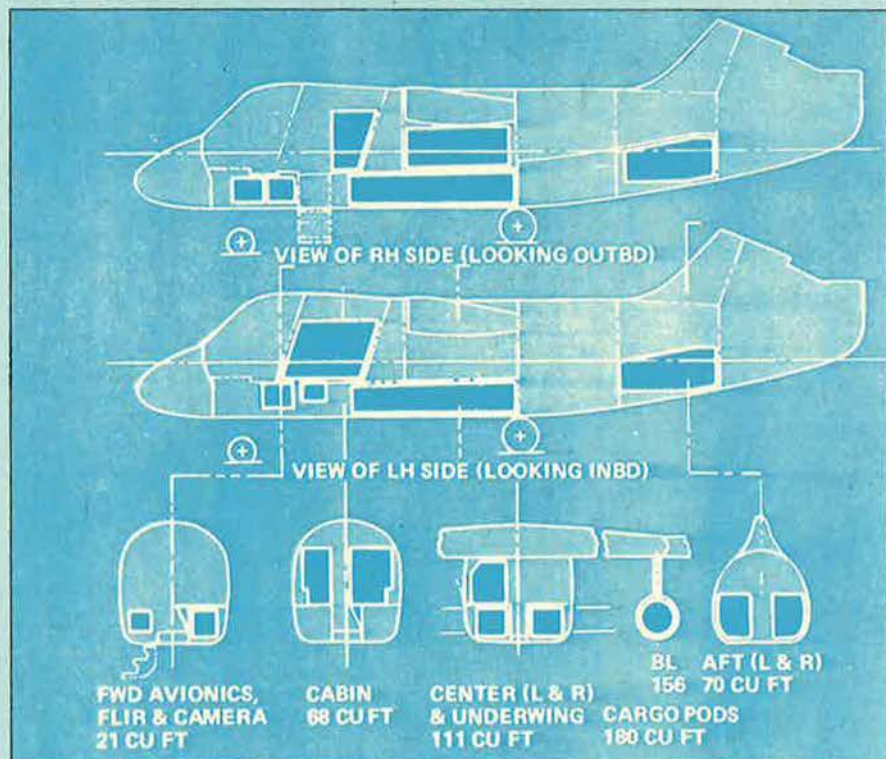


Diagram of cargo compartments on the US-3A COD aircraft

prise dual AN/ARC-156 UHF transceivers; AN/ARC-153 HF transceiver for long-range communications; AN/ARC-175(V) VHF; TSEC/KY-28 UHF secure voice; OK-248A(V)AI internal communication system and radio control, with cabin speaker. AN/ASN-92(V) CAINS inertial navigation system; AN/ASA-84 inertial navigation system interface; AN/ASN-107 attitude and heading reference system; AN/APN-200 Doppler ground velocity system; AN/APN-201 radar altimeter and altitude warning system; AN/ARN-84 Tacan; two AN/ARN-126 VOR/ILS marker beacons; AN/ARN-83 LF/ADF; AN/ARA-50 UHF/ADF; AN/AYN-5 air-speed/altitude computing set; AN/OD-59 navigation indicator group; AN/APX-72 IFF transponder; AN/ASW-33 automatic flight control system; AN/ASW-25 automatic carrier landing system; AN/APN-202 radar beacon; AN/ARA-63 carrier instrument landing system; and weather radar.

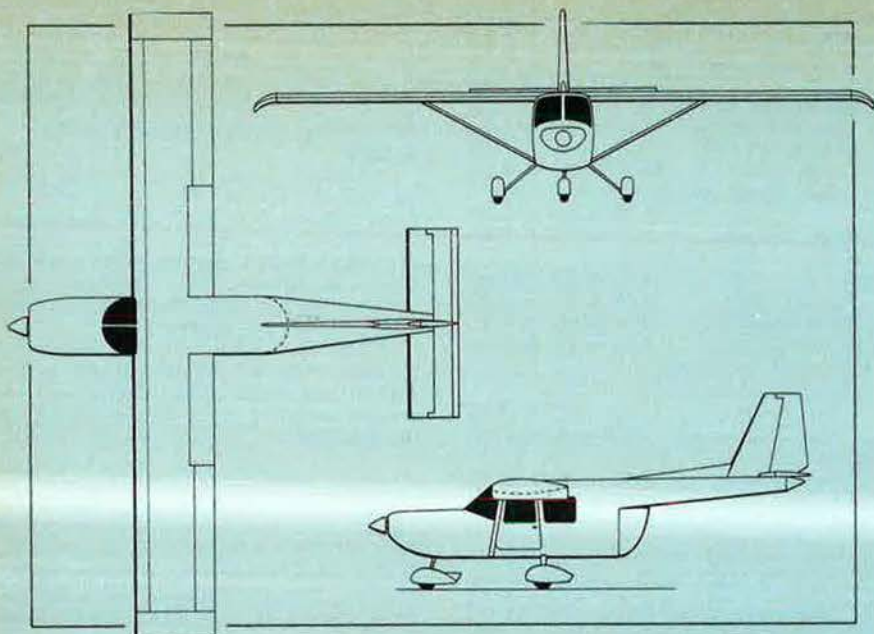
Rudder, incl tab	3.48 m ² (37.4 sq ft)
Elevators, incl tabs	4.32 m ² (46.5 sq ft)

WEIGHTS AND LOADINGS:

Weight empty	10,954 kg (24,150 lb)
Max T-O weight	21,592 kg (47,602 lb)
Max zero-fuel weight	13,290 kg (29,299 lb)
Max carrier landing weight	16,676 kg (36,766 lb)
Max wing loading	388.6 kg/m ² (79.6 lb/sq ft)
Max power loading	262 kg/kN st (2.56 lb/lb st)

PERFORMANCE (at max T-O weight, unless otherwise indicated):

Max level speed at 6,100 m (20,000 ft)	450 knots (834 km/h; 518 mph)
Service ceiling	12,200 m (40,000 ft)
Operational ceiling (with passengers)	10,670 m (35,000 ft)
T-O to 15 m (50 ft) at T-O weight of 19,251 kg (42,441 lb)	807 m (2,650 ft)
Range with max payload	2,000 nm (3,706 km; 2,303 miles)



Provisional three-view drawing of the PADC fixed-wing aircraft prototype, now under development in the Philippines (Michael A. Badrocke)

LANDING GEAR: Non-retractable tricycle type. All three wheels same size. Streamline wheel fairing on each unit.

POWER PLANT: One 224kW (300 hp) Lycoming IO-540-K1B5 flat-six engine, driving a Hartzell constant-speed variable-pitch propeller with spinner. Fuel tank in each wing, combined capacity 189 litres (50 US gallons; 41.5 Imp gallons). Overwing refuelling point above each tank. Oil capacity 11.4 litres (3 US gallons; 2.5 Imp gallons).

ACCOMMODATION: Pilot and up to three passengers, in pairs, in fully-enclosed cabin. Forward-opening car-type door on each side, each with pull-in window for emergency exit. Freight/baggage space aft of rear pair of seats; access via clamshell rear-loading doors. Cabin ventilated.

DIMENSIONS, EXTERNAL:

Wing span	11.66 m (38 ft 3 in)
Wing chord (constant)	1.52 m (5 ft 0 in)
Wing aspect ratio	7.65
Length overall	8.43 m (27 ft 8 in)
Height overall	3.55 m (11 ft 7¾ in)
Tailplane span	3.48 m (11 ft 5 in)
Wheel track	2.40 m (7 ft 10½ in)
Wheelbase	2.20 m (7 ft 2½ in)
Propeller diameter	1.95 m (6 ft 4¾ in)
Propeller ground clearance	0.25 m (10 in)

DIMENSIONS, INTERNAL:

Cabin: Length	2.95 m (9 ft 8 in)
Max width	1.04 m (3 ft 5 in)
Max height	1.22 m (4 ft 0 in)
Floor area	3.07 m² (33.0 sq ft)
Volume	3.82 m³ (135.0 cu ft)
Baggage compartment volume	0.85 m³ (30.0 cu ft)
Freight compartment volume	1.69 m³ (59.6 cu ft)

AREAS:

Wings, gross	17.77 m² (191.3 sq ft)
Ailerons (total)	2.14 m² (23.0 sq ft)
Trailing-edge flaps (total)	1.95 m² (21.0 sq ft)
Fin	1.67 m² (18.0 sq ft)
Rudder	0.84 m² (9.0 sq ft)
Tailplane	3.34 m² (36.0 sq ft)
Elevator	1.51 m² (16.2 sq ft)

WEIGHTS AND LOADINGS (estimated):

Weight empty	992 kg (2,188 lb)
Max T-O weight	1,496 kg (3,300 lb)
Max wing loading	84.2 kg/m² (17.25 lb/sq ft)
Max power loading	3.72 kg/kW (11.0 lb/hp)

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

Max level speed at S/L	168.5 knots (312 km/h; 194 mph)
------------------------	---------------------------------

Max cruising speed at S/L	154.5 knots (286 km/h; 178 mph)
Stalling speed, flaps up	55.5 knots (103 km/h; 64 mph)
Stalling speed, flaps down	46.5 knots (86 km/h; 53.5 mph)
Max rate of climb at S/L	372 m (1,220 ft)/min
Service ceiling	5,300 m (17,400 ft)
T-O run	204 m (669 ft)
T-O to 15 m (50 ft)	436 m (1,430 ft)
Landing from 15 m (50 ft)	568 m (1,865 ft)
Landing run	305 m (1,000 ft)
Max range	424 nm (785 km; 488 miles)

FUJI

FUJI HEAVY INDUSTRIES LTD (Fuji Jukogyo Kabushiki Kaisha); Head Office: Subaru Building, 7-2, 1-chome, Nishi-shinjuku, Shinjuku-ku, Tokyo, Japan

FUJI FA-300/ROCKWELL COMMANDER 700

Design and development of the FA-300, following more than two years of market research, began in Japan in the latter half of 1971. It is currently proceeding as a collaborative venture between Fuji and Rockwell International, following the signing of an agreement between the two companies on 28 June 1974.

The FA-300, known in the USA as the **Rockwell Commander 700**, is designed to conform to FAR 23, Amendment 14. Four flying prototypes are being built, the first of which was rolled out on 5 September 1975 and made its first flight at Utsunomiya on 13 November 1975. The second (N9901S), assembled by Rockwell, flew for the first time at Bethany, Oklahoma, on 25 February 1976. The third and fourth prototypes, also assembled by Rockwell, were due to fly during the first half of this year. Two other airframes will be used for ground testing. Certification by the JCAB and FAA is anticipated by the end of 1976, with deliveries planned to begin in February 1977.

For production aircraft, Fuji will be responsible for the basic structure of all FA-300/Commander 700 aircraft built; Rockwell will be responsible for the assembly, equipment installation, and interior furnishing of those intended for sale in the Americas. The FA-300/Commander 700 is a basic six/eight-seat version, from which other models will be developed. Among the latter has been reported a version designated FA-300-Kai/Commander 710 with uprated engines.

The following description applies to the prototypes:

TYPE: Twin-engine six/eight-seat pressurised cabin monoplane.

Fuji-assembled FA-300 first prototype



WINGS: Cantilever low-wing monoplane, with exclusive Fuji-developed aerofoil sections. Dihedral 7°. Sealed box-beam structure, forming integral fuel tank. Trim tab in each aileron. Pneumatic de-icing of leading-edges optional.

FUSELAGE: Conventional semi-monocoque structure, with rather more frames and fewer stringers than comparable types of aircraft. All-metal construction, primarily of 2024 aluminium alloy, with 7075 aluminium alloy for high-stress members.

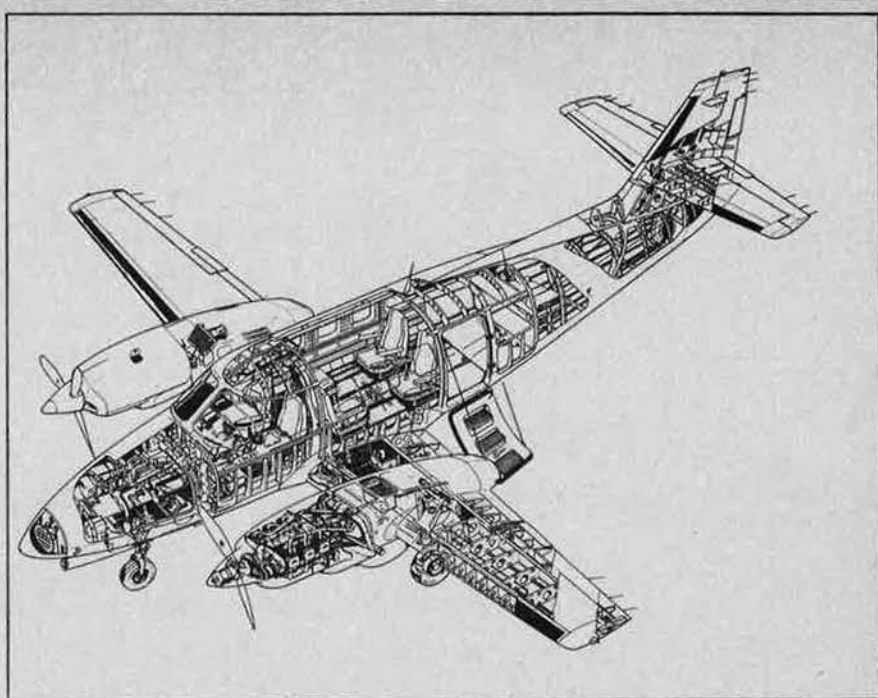
TAIL UNIT: Cantilever all-metal structure, with sweptback vertical surfaces and shallow dorsal fin. Fixed-incidence non-swept tailplane, mounted part-way up fin. Balanced elevators and rudder, each with trim tab. Pneumatic de-icing system optional.

LANDING GEAR: Hydraulically-retractable tri-cycle type, all units retracting forward. Free-fall emergency extension. Oleo-pneumatic shock-absorbers. Main-wheel tyres size 6.50-8 (8-ply rating); nosewheel tyre size 6.00-6 (6-ply rating).

POWER PLANT: Two 242kW (325 hp) Lycoming TIO-540-R2AD turbocharged flat-six engines, each driving a Hartzell three-blade constant-speed fully-feathering metal propeller with spinner. Electrical propeller de-icing system optional. Integral fuel tanks in wings, total capacity 719 litres (190 US gallons; 158 Imp gallons). Oil capacity 11.5 litres (3 US gallons; 2.5 Imp gallons).

ACCOMMODATION: Pilot and co-pilot on individual adjustable and reclining seats. Dual controls standard. Pilot's storm window. Heated windscreen and windscreen wiper optional. Seats for four to six persons in pressurised cabin. Forward and aft cabin dividers optional. Baggage compartments in nose and rear of pressurised cabin. Door with built-in airstair on port side; emergency exit on starboard side. Cabin heated, air-conditioned, and pressurised.

SYSTEMS: Air-conditioning and pressurisation system (differential 0.38 bars; 5.5 lb/sq in). Freon-type 16,000 BTU air-conditioner optional. 45,000 BTU capacity combustion heater, with windscreen defroster. Hydraulic system supplied by electro-hydraulic power package. Pressure pumps, driven by each engine, supply air pressure to gyro instruments, cabin door seal, and (when fitted) to wing and tail de-



Cutaway drawing of the Rockwell Commander 700

icing systems. Electrical system supplied by two 28V 100A alternators and 24V 25Ah lead-acid battery.

ELECTRONICS AND EQUIPMENT: Installed standard equipment is extensive. Wide range of optional electronics available, including radar, communications, area navigation, autopilot, flight director, and radar altimeter. Other optional items include heated windscreen, windscreen wiper, wing and tail pneumatic de-icer boots, ice inspection light, propeller synchroniser, flight hour meter, and strobe light.

DIMENSIONS, EXTERNAL:

Wing span	12.94 m (42 ft 5½ in)
Length overall	12.00 m (39 ft 4½ in)
Length of fuselage	11.635 m (38 ft 2 in)
Height overall	3.90 m (12 ft 9½ in)
Tailplane span	4.92 m (16 ft 1¾ in)
Wheel track	5.045 m (16 ft 6½ in)
Wheelbase	3.16 m (10 ft 4½ in)
Propeller diameter	2.06 m (6 ft 9 in)

Distance between propeller centres	4.751 m (15 ft 7 in)
Propeller/fuselage clearance	0.57 m (1 ft 10½ in)
Propeller ground clearance	0.30 m (11¾ in)

DIMENSIONS, INTERNAL:

Cabin: Length	5.005 m (16 ft 5 in)
Max width	1.45 m (4 ft 9 in)
Max height	1.45 m (4 ft 9 in)
Baggage volume (nose and rear of cabin, total)	1.50 m³ (53.0 cu ft)

AREAS:

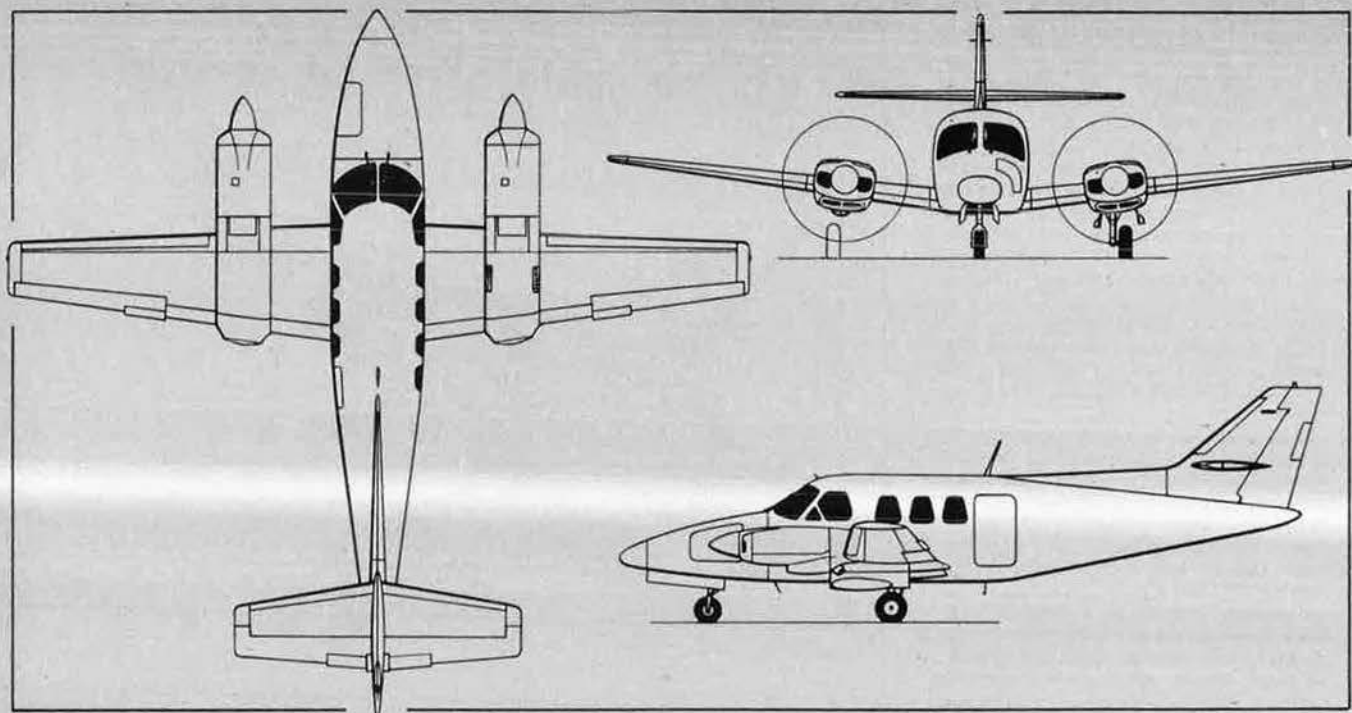
Wings, gross	18.60 m² (200.2 sq ft)
Fin	3.71 m² (39.9 sq ft)
Tailplane	5.15 m² (55.4 sq ft)

WEIGHTS:

Weight empty, standard	1,995 kg (4,400 lb)
Max T-O and landing weight	2,993 kg (6,600 lb)
Max ramp weight	3,011 kg (6,640 lb)

Fuji-assembled FA-300 first prototype in flight





Rockwell Commander 700 six/eight-seat pressurised transport (Pilot Press)

PERFORMANCE (estimated, at max T-O weight except where indicated):
 Max level speed at 2,766 kg (6,100 lb) average cruising weight:
 full power at 6,100 m (20,000 ft)
 231 knots (428 km/h; 266 mph)
 Max cruising speed at 2,766 kg (6,100 lb) average cruising weight:
 75% power at 7,315 m (24,000 ft)
 219 knots (405 km/h; 252 mph)
 45% power at 4,570 m (15,000 ft)
 154 knots (285 km/h; 177 mph)
 Approach speed
 90 knots (167 km/h; 104 mph)
 Stalling speed, power off, flaps and landing gear up
 85.5 knots (158 km/h; 98 mph)
 Stalling speed, power off, flaps and landing gear down
 70 knots (129 km/h; 80 mph)
 Max rate of climb at S/L
 445 m (1,460 ft)/min
 Rate of climb, one engine out, at 1,525 m (5,000 ft)
 78 m (255 ft)/min

Max operating altitude
 7,620 m (25,000 ft)
 Service ceiling (30.5 m; 100 ft/min climb)
 9,265 m (30,400 ft)
 Service ceiling, one engine out (15.25 m; 50 ft/min climb)
 4,085 m (13,400 ft)
 T-O to 15 m (50 ft)
 738 m (2,420 ft)
 Landing from 15 m (50 ft)
 634 m (2,080 ft)
 Range at max (75%) cruising power with 606 litres (160 US gallons; 133 Imp gallons) fuel
 703 nm (1,303 km; 810 miles)

DE HAVILLAND CANADA
 THE DE HAVILLAND AIRCRAFT OF CANADA LTD; Head Office and Works: Downsview M3K 1Y5, Ontario, Canada

DHC-5D BUFFALO
 Following completion of a flight test programme of the 22,316 kg (49,200 lb)

gross weight version of the DHC-5D; and General Electric CT64-820-4 turboprop engines rated at 2,336kW (3,133 shp) each, de Havilland Canada has released the following improved performance details:

WEIGHTS AND LOADINGS (A: STOL assault mission from unprepared airfield; B: STOL transport mission, firm smooth airfield surface):

As 1975-76 *Jane's* except:
 Operational weight empty (incl 3 crew and 680 kg; 1,500 lb allowance for options and electronics):

A, B, 11,362 kg (25,050 lb)

Max payload:
 A 5,443 kg (12,000 lb)
 B 8,164 kg (18,000 lb)

Max T-O weight:
 A 18,597 kg (41,000 lb)
 B 22,316 kg (49,200 lb)

PERFORMANCE (at max T-O weight):

As 1975-76 *Jane's* except:
 Max rate of climb at S/L, normal rated power:

A 710 m (2,330 ft)/min
 B 555 m (1,820 ft)/min

Rate of climb at S/L, one engine out:
 A, max power 201 m (660 ft)/min
 B, max power 113 m (370 ft)/min

†Service ceiling, normal rated power:
 A, B 7,620 m (25,000 ft)

Service ceiling, one engine out:
 A, max power 5,575 m (18,300 ft)
 *B, max power 4,235 m (13,900 ft)

**STOL T-O run:
 A 289 m (950 ft)
 B 701 m (2,300 ft)

**STOL T-O to 15 m (50 ft), mid-CG:
 A 381 m (1,250 ft)
 B 876 m (2,875 ft)

**STOL landing from 15 m (50 ft):
 A 346 m (1,135 ft)
 B 613 m (2,010 ft)

**STOL landing run:
 A 183 m (600 ft)
 B 259 m (850 ft)

† Recommended max operating altitude; climb capability has been demonstrated up to 9,450 m (31,000 ft) at AUW of 18,597 kg (41,000 lb), ISA

* at AUW of 21,320 kg (47,000 lb)

** with 5,533 kg (12,200 lb) payload

First of three Rockwell-assembled flying prototypes of the Commander 700



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TODAY's young Air Force officer will face, sooner or later, a decision as to whether he should remain in his current career field or broaden his knowledge and experience by cross-training into a new field.

Air Force officer strength has dropped by some 40,000 since 1968 and is still declining. It is unlikely that tomorrow's Air Force will be able to afford many highly specialized officers whose experience is limited to one field. Thus, a decision to move to another field could enhance an officer's usefulness to the Air Force, and concurrently help his own chance of selection for increasingly responsible jobs—and the promotions that go with them.

The missile career field is one of the prime career broadening fields for the nonrated, and lately the rated, officer to enter for career progression or, as many do, as a primary career field. The following discussion, based on interviews with personnel people and officers in a wide range of missile-related assignments, highlights some of the pluses and minuses that should be considered by a young officer who is thinking about cross-training into that field.

The strategic missile crew career field is only eighteen years old, dating from the development and deployment of nuclear-armed intercontinental ballistic missiles, under Strategic Air Command. The force originally was made up of Atlas-D, -E, -F, and Titan I liquid-fueled ICBMs. Today, it numbers 1,000 solid-fueled Minuteman II and III missiles, and fifty-four heavy-payload, liquid-fueled Titan II missiles. Considered by many to be the most awesome deterrent force ever to face a potential enemy, the land-based missile force is a significant part of the US concept called Triad—a mixed force consisting of SAC's land-launched missiles and manned bombers, and the Navy's sea-launched missiles. The mix compounds an enemy's strategic offensive and defensive problems, since he could not destroy all three elements simultaneously, and hence would be confronted with the certainty of a retaliatory blow of unacceptable force.

Approximately 2,800 officers and 600 enlisted men are assigned to full-

MAKING THE MARK WITH MISSILES

For both nonrated and rated officers, the missile field, with its variety of duty assignments, offers unparalleled opportunity for operational, staff, and command experience—the mark of the professional Air Force officer.

BY ROBERT G. H. CARROLL
CAPTAIN, USAF
CONTRIBUTING EDITOR

time strategic missile combat crew duty at nine western and midwestern bases. Their mission is to be always prepared to launch one or more of their missiles toward enemy targets on receipt of an authenticated launch order. Crews in the Minuteman force consist of two launch control officers responsible for ten missiles. The Titan crews, two officers and two enlisted men, control a single missile.

As does any new career field, the missile field had its growing pains, especially in the career management area. There was a good deal of uncertainty as to whether it was, in fact, a good field to enter.

Today, all that has changed. The missile career field has come into its own, with a mixture of regular and career Reserve officers, many of whom have cross-trained into missiles for career-broadening purposes or to make it their primary career field. About thirty-nine percent of the former, once they complete a tour as launch control officers, are finding other assignments in the missile field more appealing and challenging than returning to their former career fields. This aspect should not be overlooked by the officer considering volunteering for missile duty.

One of the best assignments as a follow-on to crew duty is missile maintenance. The day-to-day problems of managing men and materiel that the maintenance officer has to face prepare him well for future command opportunity and complement the operational skills developed while on the crew force. Some other missile career areas available after crew duty are: missile staff officer (squadron, wing, and higher levels), Airborne Launch Control Center (ALCC) duty (with hazardous duty pay), missile test officer, and any of a number of missile-related jobs in SAC and other commands.

In addition to being a firmly established career field, a missile combat crew assignment offers the nonrated officer operational experience and a level of weapon-systems responsibility few junior Air Force officers ever achieve—an important aspect of an Air Force career. Until missiles entered the Air Force operational inventory, there were extremely few assignments in which a nonrated officer could gain first-hand operational

experience, and none in which he could command an operational combat unit. This is the major aspect of missile duty that makes it so attractive to the nonrated officer, especially if he wants missiles as his primary career field. Today, four of the nine missile wing commanders are nonrated officers.

On-the-Job Education

How about the missile crewmen's job? Isn't it boring in the hole "babysitting" a bunch of missiles?

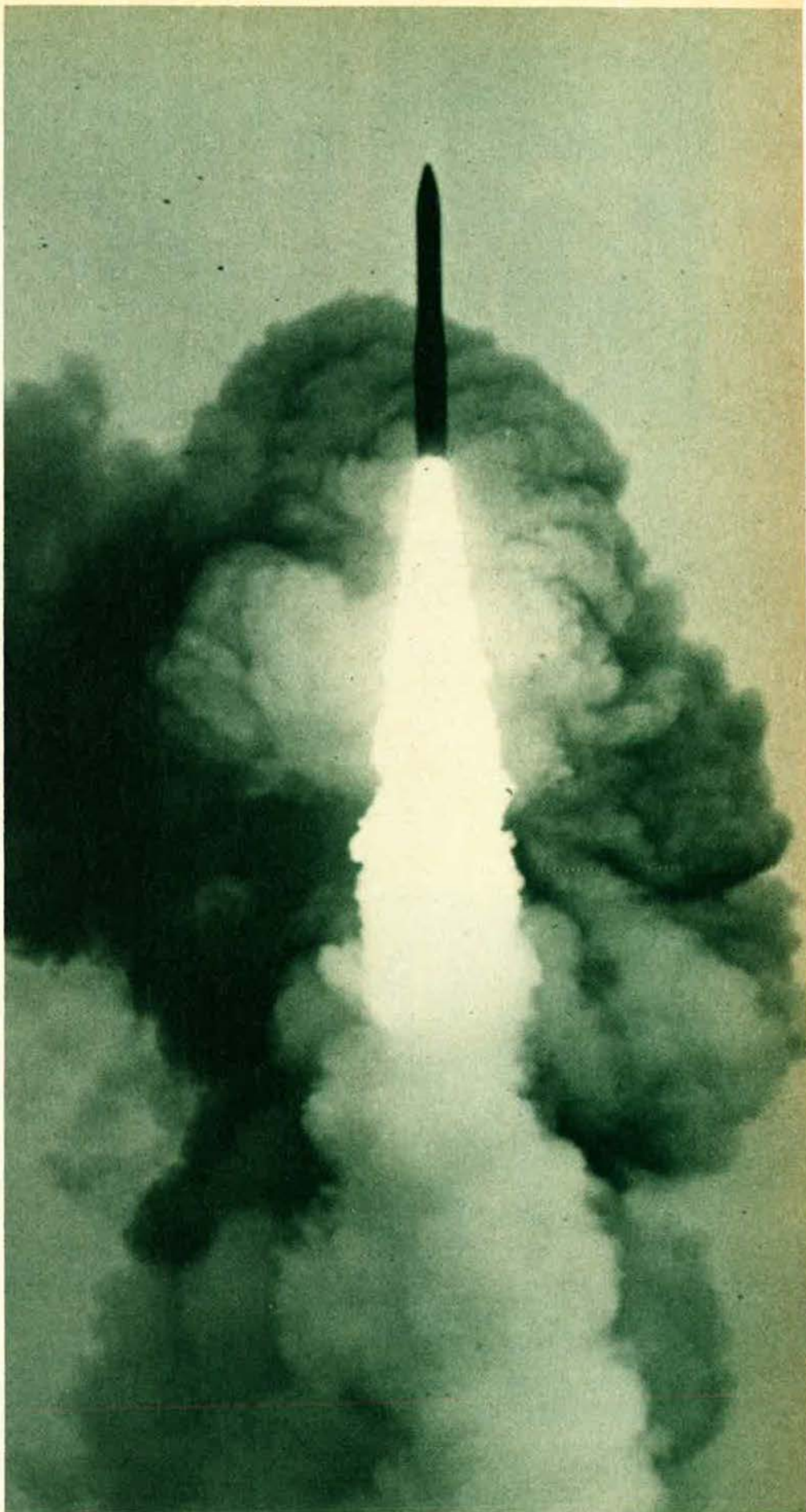
Alert duty can be boring if you let it become so, but as one missileer told AIR FORCE Magazine, it also has liberal injections of intense activity that more than make up for the quiet times.

The term "babysitting," while used by some missile crews to describe their duties, is not really accurate. Command and control procedures, remote targeting requirements, and many more innovations demand from today's missile crews a high degree of discipline, skill, and 100 percent system knowledge. There are still quiet periods during alert duty, however, and a crew member then has opportunities to increase his knowledge, not only of operations, but in a wide variety of academic areas.

The most widely known educational program for missile crews is the Minuteman Education Program (MMEP). It enables a crew member to earn a master's degree free of cost and without military commitment. This opportunity is an added benefit for missile volunteers, since many consider a master's degree one block that should be filled for career advancement. Titan II crews have similar programs available to them.

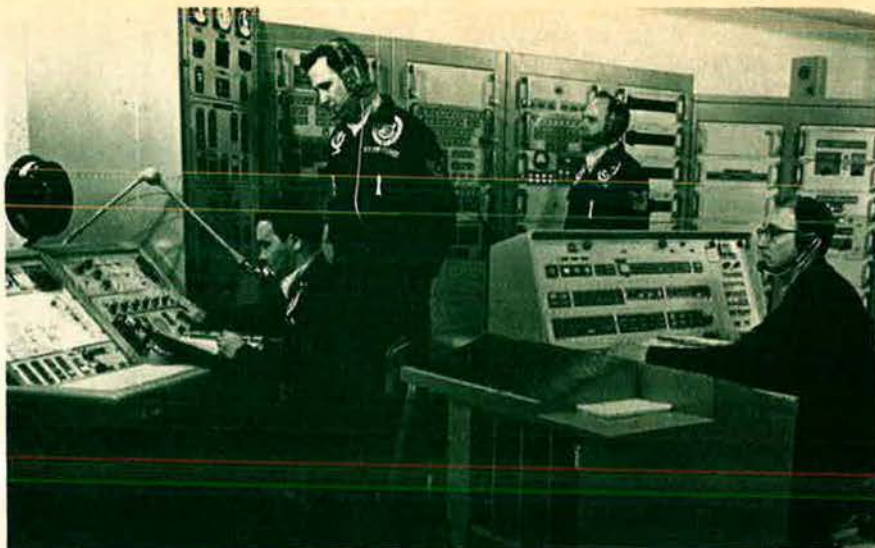
Professional Military Education (PME) is also important. A check of missile crew records shows a high percentage of officers complete PME courses (SOS, ACSC, ICAF, etc.) through correspondence while on crew duty.

For added career broadening, crew members may enroll in "ADSAC"—Additional Duty Career Development Program. ADSAC is designed for officers who want to learn about a support field through on-the-job training and orientation while they are still on crew duty. In most cases, once the program is completed, the





TOP LEFT: Destructive potential of missiles demands tight security and mechanical and human reliability.



TOP RIGHT: A Titan II crew, seen here in a launch control facility, consists of two officers and two airmen who control a single missile.

RIGHT: A Titan II reentry vehicle, heavyweight of the SAC missile force, being prepared for transport.



Minuteman III maintenance men lower a missile into its silo. A maintenance assignment is considered one of the best follow-ons to crew duty.

individual is awarded his new field's entry level Air Force Specialty Code (AFSC).

There must be one final consideration before an officer decides to volunteer for missile duty. It is a very competitive field and, like other Air Force jobs, it requires a high degree of professionalism, dedication, and skill. It also demands an unusual degree of discipline and the ability to cope with unique psychological pressures. Some Air Force officers are simply not adapted to missile duty. Thus, one should give serious consideration to one's ability to do as well in missiles as in one's present field.

How to Apply for Missile Duty

A first step in volunteering for missiles is to fill out an Officer Career Objective Statement, Air Force Form 90, popularly known as the "dream sheet." The Form 90 is a planning document and does not require that

the Air Force initiate personnel action. Your preference for missile duty is entered into the Advance Personnel Data System (APDS) and recorded in the computer at the Air Force Military Personnel Center (AFMPC). If a requirement is levied against your current career field to fill one of the 600 annual open slots in the missile field, your name might be selected. But the only way you can assure action—a yes or no—is to also fill out an Air Force Form 2095, Request for Personnel Action, asking for an AFSC change and formal training (*see AFM 50-5 for course number and description*). Under Air Force regulations this form requires an answer. Your 2095 is routed to AFMPC, where both your career manager and the missile career managers review your records.

The basic requirements for missile duty are availability for assignment, a competitive record (very important), and physical qualification (*see*

AFM 160-1). Availability involves such factors as not being on a controlled tour, having enough time on station, being releasable from your current career field, and having sufficient retainability to complete an initial four-year missile tour. If a rated officer, you will need 1,500 hours' flying time, three years' rated service, and qualification under the provision of the Aviation Career Incentive Act.

Assuming you are selected, a school assignment date can be expected in about six months. (See table below for details on technical courses, bases, and educational programs offered.)

Training for Missile Duty

Complete training for the Minuteman program and simulator training for the Titan program are administered by the 1st Strategic Aerospace Division's 4315th Combat Crew Training Squadron (SAC), Vandenberg AFB, Calif. Ten to thirteen weeks in length, the courses are divided into two sections: academics and Missile Procedures Trainer (MPT) simulator. Titan training begins with academics at Sheppard AFB, Tex., followed by Advanced Academics and Initial Qualification Training (IQT) at Vandenberg.

Classes contain from twelve to



The missile career field offers many opportunities for career progression. One such assignment, available after crew duty, is in the Airborne Launch Control Center, which has the ability to remotely launch the Minuteman missile.

twenty students. "The training is a leveling experience," according to Brig. Gen. Stuart H. Sherman, Jr., 1st STRAD's Commander, who is a nonrated missile officer, "and it demands the student's full attention." The officer who has been out of academics for a while will find it a fast-paced, demanding course.

In the Minuteman program (Titan is very similar) the first week is spent in orientation. Students have diverse backgrounds. Sixty-six percent are

newly commissioned second lieutenants directly out of the Air Force Academy, Officer Training School, and Air Force ROTC. The rest are prior-service officers.

The first few class days are spent on a detailed Professional Responsibilities Orientation program. Included is a discussion of the Air Force Human Reliability Program as it applies to individuals associated with nuclear weapons. The potential missile officer is asked to make an ini-

USAF STRATEGIC MISSILE BASES AND EDUCATIONAL OPPORTUNITIES

Minuteman Bases	Missile	AFSCODE	Course Number *	Education Program	University
Ellsworth AFB, N. D.	MMII/Modernized	1821G	182100G-1	MMEP-MBA	University of S. D.
F. E. Warren AFB, Wyo.	MMIII/CDB**	1821K	182100K	MMEP-MBA	University of Wyoming
Grand Forks AFB, N. D.	MMIII/CDB	1821L	182100L	MMEP-MBA	University of N. D.
Malmstrom AFB, Mont.	MMIII/CDB	1821L	182100L	MMEP-MBA	University of Montana
Minot AFB, N. D.	MMII/Modernized	1821G	182100G-1	MMEP-MBA	University of N. D.
Whiteman AFB, Mo.	MMIII/CDB	1821K	182100K	MMEP-MBA	University of Missouri
Titan II Bases					
Davis-Monthan AFB, Ariz.	Titan II	1821F	182100F	Undergraduate/ Graduate programs	***
Little Rock AFB, Ark.	Titan II	1821F	182100F	Undergraduate/ Graduate programs	***
McConnell AFB, Kan.	Titan II	1821F	182100F	Undergraduate/ Graduate programs	***

*For details concerning course description, see AFM-50-5.

**CDB—Command Data Buffer is the newest capability added to the Minuteman system and allows retargeting of missile from Launch Control Center (LCC).

***Numerous schools are available providing undergraduate/graduate on-base and off-base programs. Write direct to base education office at each base for specific details. Minuteman bases also have additional educational programs available.

Additional information on the missile career field may be found in the SAC Missile Duty Handbook available from SAC/DPRPM, Offutt AFB, Neb. 68113. Career counseling may be obtained from your local CBPO, your career manager at MPC, or SAC/DPRPM.

tial commitment that he will "turn the key" if a launch order is received and verified. SAC and the 4315th have found that laying out the cards early in the course reduces the drop-out rate.

After initial commitment—full commitment comes later—academics begin. Realism is the byword, and the Missile Technical Order (T.O.) the Bible. The T.O. and the MPT are identical to those used in missile operations. Training includes all classified Emergency War Order (EWO) procedures.

Missile training requires no special prior technical training. The academic assignments follow sequences using the T.O., which clearly explains the missile system. For instance, the fourth training day's assignment concerns Launch Control Facility (LCF) subsystems. The reading assignment is more than 100 paragraphs in the T.O., additional study guide reading, and twenty-five questions to be answered in writing. Tests are frequent, with eighty percent accuracy required.

During MPT sessions, the students begin applying their academic knowledge. The first session is approximately eight days into the course, and there will be at least seventeen more by course end. Scheduled virtually round the clock, the sessions last anywhere from four to six hours.

The MPT simulator is computer-controlled and preprogrammed to provide realistic conditions and situations. Instruction is one-on-one, and the environment so real that some crews forget they are in a training situation.

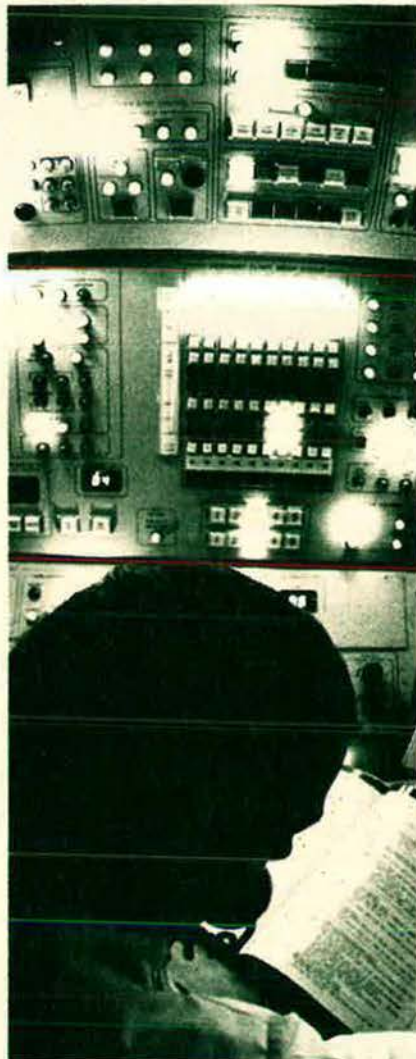
The 4315th CCTS instructors are hand-picked from the missile crew force for their knowledge and ability to work with students. They willingly give extra time to those who need academic help or more MPT time, and deserve much of the credit for making the Strategic Missile Combat crew force the professionals they are.

In addition to providing extra instructor help, the 4315th CCTS operates a self-help learning center eighteen hours each day. Using the center's slides and video tapes, a student can review, at his own pace, most situations he might face on alert.

Integrated between academics and MPT sessions is EWO training.

While an eighty percent score is acceptable in academic exams, 100 percent is required in EWO command and control tests.

With successful completion of aca-



Missile crew training is accomplished in Missile Procedures Trainers (MPTs), where instructors and computers team up to provide students the most realistic situations possible.

demical and EWO training, the student receives a final MPT check session, and usually departs the next day for his new assignment.

Crew Duty

The four-year MPC-controlled missile tour begins after training. The Minuteman crew member is considered mission-ready after successfully completing a qualification check at Vandenberg. Once he signs in at his new base, he must, however, complete ten days of localization training. This consists of unit famil-

iarization, assignment to a crew, and EWO certification. Alert duty begins with little delay after certification.

The Titan crew member, on the other hand, is not considered mission-ready when he departs Vandenberg, and must complete approximately forty days of localization training at his new base. This consists of alert tours with an instructor crew, wing EWO procedures, and additional MPT sessions. Once certified mission-ready, he immediately enters the alert cycle.

Probably the question asked most frequently by the prospective missileer is, "How long will I have to pull alert?" One should plan on four years of crew duty. But there is career progression available from line duty to instructor and evaluator, or even flight commander. An officer should take advantage of this progression opportunity. His mobility from alert crew duty prior to completion of the four-year tour is primarily a function of his performance, and of staff-job availability. Most crew members do take advantage of these opportunities and move off full-time alert to staff jobs during the four-year controlled tour. That kind of progression is normal among crew members seeking upward mobility.

Crew members can expect to spend approximately ten calendar days on alert each month, plus three training days, leaving about seventeen free days. For those participating, an additional eight days or more will be taken up by the academic demands of the master's program. If the crewman has volunteered for additional duties—and most do—he can count on two to three more days of extra work. This leaves, for the average crew member, very little free time.

The end result of the professional training and varied experience inherent in the missile career field should be a better Air Force officer with greater understanding of the Air Force operational mission. The fact that a young officer has made the decision to enhance his career and gain operational experience is an important indicator of his potential value to the Air Force.

Every officer who is serious about an Air Force career should give this careful consideration. ■

With improved manning, newer equipment, and top-level support of the Total Force Policy, our Reserve components are judged by DoD to have a more responsive combat capability than the Reserve of the other services. Despite some minor problems, leaders of USAF's Reserve Forces sum it up this way . . .

AFRES/ANG Best Shape Ever

BY ED GATES, CONTRIBUTING EDITOR

LEADERS of the Air Reserve Forces, when asked to appraise their organizations and people, don't hesitate to pass out the encomiums.

"We're in the best shape ever," the Air National Guard's Director, Maj. Gen. John J. Pesch, said of his outfit recently. Three floors up and a few corridors away in the Pentagon, the Chief of Air Force Reserve echoed those words. "The Air Force Reserve is in excellent shape and the future looks bright," Maj. Gen. William Lyon told AIR FORCE Magazine.

Both spoke with enthusiasm and conviction that Reserve Forces leaders of earlier years, despite a bold front, often didn't convey. Their concern over nagging manpower, equipment, and mission problems sometimes used to show through.

Recent Air Guard and Air Reserve achievements in the Total Force Policy drive the Pentagon is pushing so vigorously have also elicited high marks from the Defense Department. The two air components "are ready to deploy earlier, are more thoroughly integrated into a single command structure, and operate equipment that is more modern" than the other four Reserve organizations, Defense said late last year. Seldom does DoD spotlight one service in such a manner. (The four others: the Army National Guard, and the Army, Navy, and Marine Corps Reserves.)

Both air components enjoy an improved manning picture. Their officials said that with the gradual disappearance of "draft-motivated" members and the invocation of hard-nosed recruiting, the quality of the 53,000-member AFRES and the 94,000-member ANG has reached the level of the Regular Air Force (tops in the military). Still something of a problem is securing the proper balance of members with and without previous service. Plenty of "prior-service" people are available, and they help assure a steady influx of skilled personnel. AFRES/ANG reenlistment rates, meantime, remain near a healthy thirty percent for first-



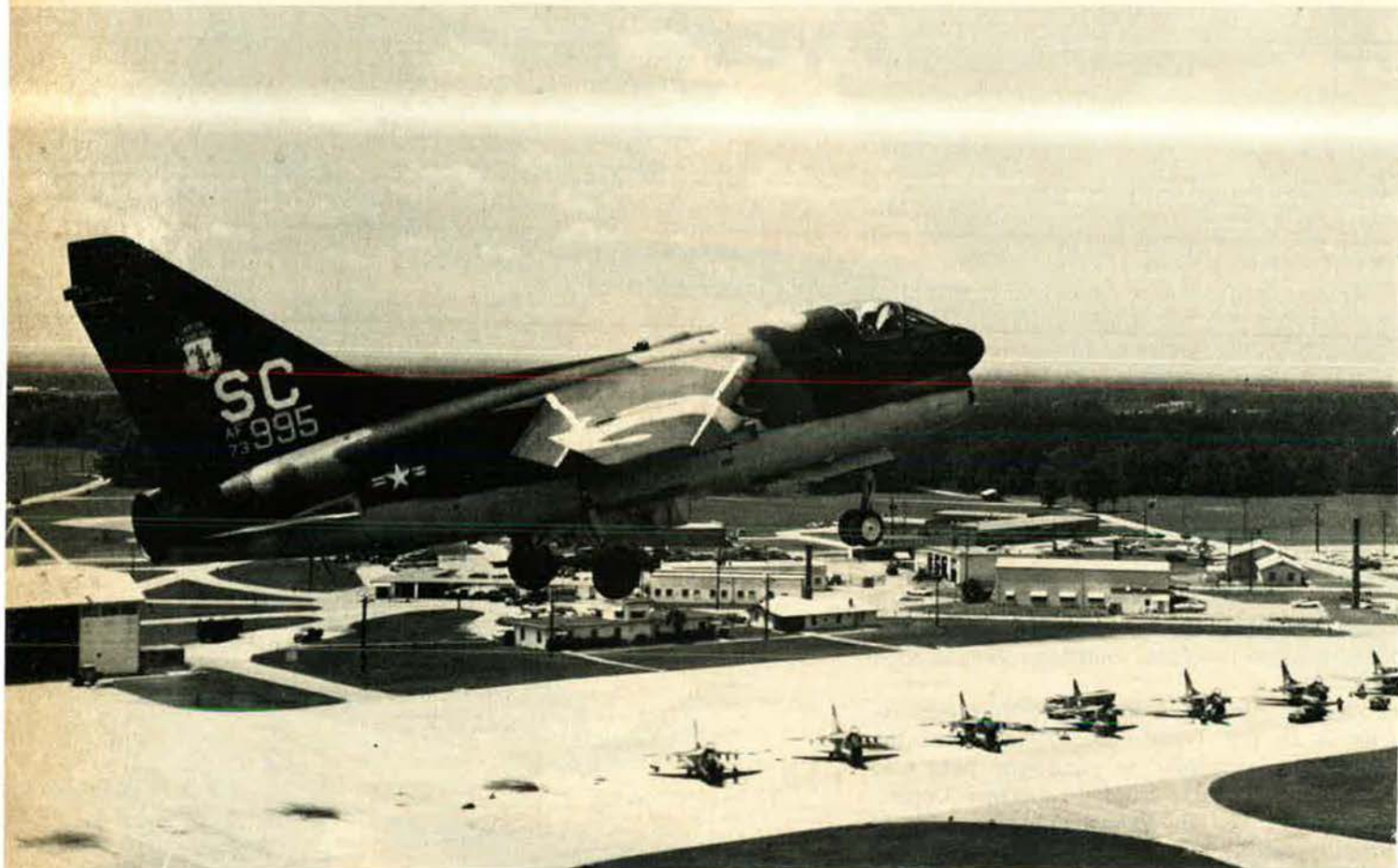
AFRES associate units share flying MAC aircraft with regular crews.

termers and more than eighty percent for careerists.

Consequently, authorities are focusing on recruiting more eager young teenagers without previous service. This drive, if it works, should provide a better balanced force now and ease promotion snarls, overall force aging, and related manpower woes in future years. With this in mind, the AFRES FY '76 recruiting quota of 11,215 young men and women includes 3,215

Guard enlistment and reenlistment bonuses, tuition aid for off-duty study, earlier retirement authority, etc., were given a reasonable chance of becoming law.

But no longer. The Administration holds they aren't needed, and Congress has shown little interest. And, anyway, the White House is maneuvering to restrain the growth of military personnel outlays, not add to them. Indeed, the Defense Department's FY '77 budget



ANG units' "added muscle" is a result of being reequipped with aircraft like this A-7 and the F-4.

without prior service. "So far, we're on target," an official said earlier this spring.

Both forces report very few officer openings, flying or otherwise, in their units, and many have backlogs of qualified applicants. So well-heeled are most AFRES/ANG units with officers that they cannot absorb surplus AFROTC graduates from the active Air Force.

Unwelcome "Initiatives"

Despite the two components' apparent ability to recruit and retain quality performers, some quarters worry about the absence of new incentives they say are necessary as "future insurance" for obtaining manpower in lean procurement years. Only two years ago Pentagon plans (strongly supported by AFA) for Reserve/

calls for several stiff cuts—the Department calls them "initiatives"—in Reserve Forces drill pay.

One would eliminate the dual compensation for Reservists who are also federal employees. Another would allow Defense to cut the forty-eight annual drills of more than 100,000 AFRES/ANG members to twenty-four drills. Fortunately, there is strong congressional opposition to these proposals, which should bring their defeat.

A third "initiative" from the Pentagon would throw a monkey wrench into the components' flying training. To sharpen proficiency, Reserve Forces flyers receive thirty-six extra drills annually. Crew members normally perform them in four-hour increments following a day at their regular jobs. Thus, they usually return home in time for a reasonable night's rest. The Defense Department, however, now says that

such proficiency training must be "authorized only on the basis of one day's pay for eight hours of training."

Reserve Forces authorities, citing safety problems and unreasonably long working days, have strongly protested this move. According to General Pesch, the four-hour program "has been the dominant factor" in the ANG's remarkable reduction in its aircraft accident rate from sixty to only four per 100,000 flying hours. The struggle against the four-hour change continued at press time.

Defense leaders, in urging these and other Reserve Forces savings, claim they would reduce expenditures by \$60 to \$70 million a year.

On a less significant but equally controversial front, the air components have brushed aside the potential problems linked with members' hair lengths. And Generals Pesch and Lyon said they stand four-square behind USAF's devotion to high standards of conduct and grooming.

"It's all the way in or all the way out," General Pesch said in echoing the widely circulated quote of USAF Chief of Staff Gen. David C. Jones about USAF members generally. "Those who won't accept the hair rules and other regulations are out—we don't want them," General Pesch declared. He and General Lyon acknowledged that this firm position may have cost their organizations some skilled people. But they feel that with the draw-down of draft-motivated members, more and more Reservists and Guardsmen are accepting USAF's standards without a fuss.

Creating More ANG Muscle

Flying units were active in the National Guard before World War I. Today's Air Guard contains ninety-one flying units located mainly at civilian airports. (*For the locations of AFRES and ANG flying units, see May Almanac issue, pp. 101 and 103 respectively.*) All the states plus Puerto Rico and the District of Columbia have a piece of the action. In peacetime, the units "belong" to the respective states—for disaster duty and other military-related services. But their federal mission—one they constantly prepare for—is providing combat-ready forces. Once mobilized, ANG units are part of the Air Force.

Director Pesch is assigned to the National Guard Bureau at the Pentagon, where he and his staff plan and direct the ANG's broad program. Their channels are through the State Adjutants General.

Over the past five years Air Guard personnel strength has edged upward from under 90,000 to 94,000. This trend, combined with the Air Reserve's similar steady increase to more than 53,000 drill pay members, contrasts sharply with the tremendous reduction in the parent USAF—from 905,000 to about 585,000 uni-

formed members over the past eight years. And it underscores the government's growing reliance on the Air Reserve Forces for taking over missions from the active establishment.

Not reducing component manpower, in an era when cutting people is the name of the game, also is a key factor in Uncle Sam's effort to restrain the growing costs of military manpower generally. AFRES and ANG members, it seems generally agreed, cost the taxpayers much less than active-duty troops.

The actual savings differ by type of unit; for example, because of varying equipment costs, a Reserve infantry unit would produce larger savings than some Reserve flying units. Dr. James P. Gilligan, USAF's Deputy Assistant Secretary for Reserve Affairs, recently put the comparison in a different perspective by noting that the nation's entire Reserve/Guard program costs less than the food stamp program.

The Air Guard, meanwhile, is rapidly modernizing and converting to newer equipment. The past year has seen a complete phaseout of C-123s, C-119s, F-102s, and F-104s, and their replacement with C-130s, A-7s, F/RF-4s, and KC-135s.

Last year, ninety-six percent of the Guard



Maj. Gen. John J. Pesch has been Director of the ANG since 1974.

THE EFFECT OF BASE REALIGNMENT

Air Reserve and Air Guard units are deeply involved in recently announced USAF base realignment plans for this year and next. These shifts, subject to environmental clearances, will contribute to AFRES/ANG modernization.

Units equipped with aging F-100 tactical fighters, located at Tucson, Ariz.; Des Moines and Sioux City, Iowa; and Foss Field, S. D., will convert to A-7s; F-101 fighter-interceptors at Niagara Falls, N. Y., and Hector Field, N. D., will be replaced by F-4s; and the tactical recon outfit at Louisville, Ky., will shed its RF-101s for RF-4Cs. All are Air Guard installations.

The transfer of KC-135 units from SAC to the Reserve Forces, meanwhile, will be accelerated. Reserve units at March and McClellan AFBs, Calif., will surrender their C-130s for the big tankers, and the McClellan unit will relocate to nearby Mather AFB. ANG KC-97 outfits at Chicago-O'Hare IAP; Greater Pittsburgh IAP; McGhee-Tyson Airport, Knoxville, Tenn.; and Milwaukee, will get the KC-135s. The ANG C-7 unit at McGuire AFB, N. J., will also convert to tankers.

The moves will boost personnel strength at some places, cut it at others. Mather, for example, will add more than 900 people. The South Dakota ANG, on the other hand, will lose 120 spaces.



Maj. Gen. William Lyon was appointed Chief of the Air Force Reserve in 1975.

flying units were officially combat-ready, though that has slipped slightly with the conversion now in progress. Officials forecast a recovery to ninety percent combat-ready next fiscal year.

In the personnel area, ANG authorities recently asked the states to examine the records of all officers with twenty or more "good years" for retirement. The states are coming in with their recommendations for retention or departure. This annual screening-out operation should help assure continued force vitality and better job and promotion opportunities for talented younger officers.

Of course, officers eased out this way will receive Reserve retirement pay starting at age sixty. But the accumulation of more training points and creditable years of service, which would boost eventual retirement pay, will stop. So will regular drill pay.

A similar screening-out plan for retirement-eligible ANG enlisted members is near, officials added. They believe it will ease the organization's promotion slow-down in the upper grades, which has been aggravated by a 250-man skill surplus among E-9s. Authorities have

been searching for alternatives to demoting them, and the screening plan should help.

AFRES—Combat Ready

The Air Force Reserve traces its ancestry to 1916, when a national defense statute authorized 296 officers and 2,000 enlisted men in the Aviation Section of the Signal Corps Reserve. Following World War II, the AFRES experienced various troubles, including prolonged manpower shortages, unrealistic training programs, and outdated equipment. Many members were disgruntled. It wasn't until the mid-fifties and later, with passage of a new law in 1968 creating a separate Air Reserve headquarters headed by an AFRES general, that the component got turned around and slowly headed up the comeback trail.

As Chief of the Air Reserve, General Lyon is USAF's adviser to the Chief of Staff on Reserve affairs. He also commands Headquarters, Air Force Reserve, a separate operating agency at Robins AFB, Ga., which, with its three regional offices, supervises training of units country-wide.

The hard core of AFRES is its fifty-three flying units, located principally at regular USAF bases. Thirty-five have their own aircraft, including F-105s and A-37 fighters, C-123K and C-130 transports, rescue and recovery, and other types. The other eighteen are "associate" units—the most glamorous and applauded AFRES outfits—which share C-141s, C-5s, and C-9As belonging to active Air Force units.

Unlike the Air Guard, where all members belong to units, AFRES has several thousand drill pay members serving as individuals in the "Mobilization Augmentee" (MA) program. They keep their military skills polished by serving one training day a month at Air Force bases and headquarters, and two weeks' annual active duty. Should mobilization occur, MAs would step into the individual slots on a full-time basis. Earlier this spring, there were about 1,700 officer and airman MA vacancies country-wide.

Other AFRES "individuals" serve—mostly without drill pay—in civil-defense programs, as legal advisers to Reservists and their families, and in many other projects. Some 1,600 are Air Force Academy Liaison Officers who promote that institution vigorously among high school students. Their only reward, outside of personal satisfaction, are a few training points and maintaining promotion eligibility.

All told, the Air Reserve has about 132,000 Ready members, including the 53,000 who draw drill pay with units and as individuals. (All Ready members must report for active duty at the call of the President, Congress, or when otherwise authorized by law.) Another 40,000 in the Standby Reserve and the 275,000

RESERVE FORCES BENEFITS

All Air Guard members and most active Air Reservists receive basic pay and, if qualified, flying pay for forty-eight drills a year (one drill equals a four-hour training period), plus full pay and allowances for a fifteen-day annual active-duty tour. Aircrews get an extra thirty-six paid drills annually.

Examples of annual pay: E-6 with twelve years' service, \$1,600; O-3 flyer with more than six years, \$4,750; and a nonrated O-5 with twenty-two years, \$5,500.

During regular drill periods, these base privileges are normally authorized: exchange, theater, open mess, clothing store, transit billeting, field ration dining hall, and sports facilities. On the annual two-week active-duty tour, add commissary.

Also generally available (sometimes with restrictions): medical care, legal assistance, space-available travel, SGLI insurance with up to \$20,000 coverage, and survivor benefits (if the member dies after his retired pay starts).

The retired pay—it doesn't begin until age sixty—is based on the number of "points" and "good years" earned and is computed under an extremely complex formula. Here's how the monthly retired pay works out, under current rates, in two typical cases: a lieutenant colonel with 3,000 points and twenty-two good years, \$412; an E-7 with 3,250 points and twenty-six years—\$238.

persons in the Retired Air Force Reserve are primarily names on rosters who don't figure in any mobilization plans.

Officials are proud to note that AFRES flying units are taking on first-line aircraft and new missions at a steady clip, and all but two of the flying outfits are officially "combat ready." The other two, both converting from C-130s—one to AC-130 gunships and one to a WC-130 recon unit—should be soon.

tive duty, perhaps for prompt dispatch to dangerous foreign trouble spots? Authorities of both groups are positive they will, that motivation is high and improving.

ANG/AFRES leaders joined leaders of the other services in urging Congress to give the President authority to order up as many as 50,000 Reserve Forces members (all services) for not more than ninety days' active duty, without declaring a national emergency. This,



AFRES units are being assigned new missions and aircraft at a steady pace and are maintaining a high state of combat readiness.

Goals for the Future

Both air components would welcome authority to reduce the Reserve Forces retirement payoff age from sixty to at least fifty-five. "It's a management tool we should have to keep the force vital and youthful, and also to give members a fairer shake," one official said. He added that the age-sixty rule also inhibits management from culling the ranks of veteran technicians. These are civil servants—23,500 in the Air Guard and 11,500 in the Air Reserve—who work with the organizations full-time, then train with their units during weekend drills.

Rank and file Reservists, meantime, are growing more concerned over the long wait for pensions and the absence of survivor benefits in case they die before reaching sixty. Unfortunately, because of the extra costs involved, the government is not buying the lower retirement option idea at this time.

What about mobilization? Will today's members, if called up, willingly enter extended ac-

Defense's "number-one" Reserve Forces legislative proposal, has been approved by the House and Senate, and at this writing is awaiting the President's signature.

That option, which AFRES/ANG leaders expect would be used "very sparingly," would allow the government "to place greater dependence on the components and increase their utility and credibility, and thus buttress our overall defense posture," Pentagon officials have been telling the House of Representatives. The Senate passed the "limited call-up" measure last year.

Meanwhile, Air Reserve Forces units and individuals are going about the business of sharpening military skills, should a call materialize. They appear willing and able to give a good account of themselves. ■

Airman's Bookshelf

Four Views of Russia

The Russians, by Hedrick Smith. Quadrangle/The New York Times Book Co., New York, N. Y., 1976. 527 pages. \$12.50.

Russia: The People and the Power, by Robert G. Kaiser. Atheneum, New York, N. Y., 1976. 499 pages. \$12.95.

An American Family in Moscow, by the Jerrold Schecter Family. Little, Brown and Co., Boston, Mass., 1975. 410 pages. \$10.95.

Moscow Farewell, by George Feifer. The Viking Press, New York, N. Y., 1976. 446 pages. \$12.50.

Recently there has been a mini-explosion of Western commentary on the Soviet Union. We have in the years since Khrushchev's "thaw," and the flood of "concentration camp" books that accompanied it, been treated to a great deal of dissident literature about the Soviet Union. This body of literature has enormous value for those seeking to understand the kaleidoscopic social landscape of the contemporary USSR. However, Soviet dissident literature provides a skewed perspective. In spite of the fact that we are now seeing enough works of Soviet dissidents to begin to grasp the fundamental difference between them, for example, between the Medvedev brothers and Solzhenitsyn, Western observers have had precious few glimpses of the diversity in Soviet society. Against the massive backdrop of useless official propaganda, the writings of a few brave souls have

stood out in bold relief, but the shadings have been lost.

The writers of the books under review have sought to do more than peer through the narrow little windows to the West that the Soviet regime cannot keep closed. These books combine to form an unusually comprehensive package for both the novice and the serious student of Russia and the Soviet Union. As bonuses, Messrs. Smith and Kaiser offer works of some literary merit, George Feifer provides a rare excursion into Russian earthiness that rips away the cold, puritanical Soviet façade, and the Schecters, though leaning perhaps a little too heavily on the gimmick of family reporting, have produced some useful insights presented in a breezy, extremely readable volume.

The books complement one another, but they are of unequal merit. By virtually all standards, Hedrick Smith, who received the Pulitzer Prize for his reporting while the New York Times bureau chief in Moscow, again cops first prize. He succeeds not just because he writes well but because he has carefully tailored his subject. He writes about the Russian people, their conditions, and their predicaments. Mr. Smith does not get bogged down in stratospheric issues of East-West relations or the mechanical facets of Soviet totalitarianism. The serious scholar should appreciate this, and the layman seeking to see "if they are really just like us" should be delighted.

Those few Americans who have the opportunity to live in the Soviet Union are never really taken to the Russian bosom. (Feifer's account reveals the fecklessness of an attempt to be so embraced. In fact, his failure is a fascinating aspect of

his work.) Because of this enforced aloofness and the resultant premium on views from the sidelines, the careful, comprehensive perceptions of a professional observer are probably more valuable than the experiences of most diplomats or academicians. Mr. Smith is one of the most penetrating observers to report on the USSR. Perceptive Westerners on assignment in the Soviet Union sense the startling inequities in Soviet society, the vital role of illegal, unofficial relationships, the mysterious and myriad Russian attitudes toward power, authority, freedom, etc., but Hedrick Smith has managed to expand the glimpses and visceral feelings shared by his Western contemporaries living in the USSR (including this reviewer) into complete chapters.

Robert Kaiser's book, paradoxically, has commanded less attention because it attempts to address Soviet reality on a higher plane. Not that Mr. Kaiser, who was the Washington Post's Moscow correspondent, fails to include grass roots observations and vignettes; he certainly does, and at points he does it very well. He has produced a well-written book that meets the need for the professional observer's touch often enough that, if Mr. Smith's book were not on the market, it would have been a top best-seller. Mr. Kaiser invested five years of effort, seeking to synthesize his experience in the USSR, his academic training, and his extensive interviews outside the USSR with former Soviet citizens. His work is a serious effort to describe the relationship of "people and the power." Kaiser seems to be describing a complex picture while Smith, together with his reader, paints one.

The Schecters have produced a novelty, not a serious piece. It does not yield the perceptions of talented observers like Smith and Kaiser because it reflects relatively little of Time Moscow correspondent Jerry Schecter's considerable talent. The book is dominated by his wife and children. This is not a bad thing at all, for Leona Schecter writes well and has tried to tell us something of the Russians as people. The children, unencumbered by grandiose horizons, give us glimpses of Soviet life that are consistently captivating and occa-

sionally very perceptive. It is a collage that also tells the reader something about the difficulties of Westerners trying to cope with Soviet reality.

George Feifer's book, a reflection of his experiences as an exchange graduate student at Moscow University, is a novelty that is also a serious work. The strength of Feifer's effort is that he delves into specific personalities and extensively develops a few of them. He has not sought to produce a Russian landscape, but rather to give his readers a series of snapshots and an occasional portrait. Some of them are atypical. The major figure he depicts, a contemporary, middle-aged Soviet Tom Jones who dies of cancer, is more interesting than instructive. But Feifer nevertheless succeeds in leaving his reader with a better appreciation for the complexities and the vagaries of the Soviet system, and it is this appreciation that is lacking in most Westerners who maintain the image of a monolithic Soviet society.

—Reviewed by Lt. Cmdr. Steve Kime, USN, National Defense University staff, and a former Naval Attaché in Moscow.

The Fall of Singapore

Seventy Days to Singapore, by Stanley L. Falk. G. P. Putnam's Sons, New York, N. Y., 1975. 301 pages with appendices and index. \$8.95.

Stanley Falk vividly tells the story of the success and daring of Lt. Gen. Tomoyuki Yamashita's Twenty-fifth Army, from its landing on the northeast coast of Malaya on the night of December 7-8, 1941, through the rapid advance southward down the Malay peninsula, to the assault on Singapore Island itself and its final surrender just seventy days later. The book is, in the author's words, "less an explanation of why Singapore fell . . . than an attempt to tell how it fell."

The reasons why Singapore fell have been fully revealed in many British accounts of this darkest day in the history of the Empire. While some have sought explanations and scapegoats in the persons of Winston Churchill or Lt. Gen. A. E. Percival, the British Army Com-

mander in Malaya, it is worth re-emphasizing that, given British war priorities in late 1941 that put Singapore fourth behind Home Defense, the Middle East, and aid to Russia, the lack of trained and experienced troops and the total inadequacy of air defense for Singapore should be no surprise.

Dr. Falk, Chief Historian in the Office of Air Force History, is not seeking scapegoats, but puts the entire campaign in its global, strategic context and exercises detachment in his judgments of commanders on both sides. Above all, he shows an understanding of the fearful pressures upon those in high command during that time described so aptly by one British military authority as "the lean years 1939-42." The judgments on Churchill, Percival, and Adm. Sir Tom Phillips are, therefore, less severe than some made by British writers, but, I think, probably nearer the truth.

In telling the *how*, Dr. Falk has drawn upon Japanese archives most extensively, in addition to the many British and American sources. He shows a remarkable grasp for detail in documenting an action-by-action account of the land campaign, as well as the great air/sea battle off the east coast that ended with the sinking of the battleship *Prince of Wales*, and the battle-cruiser *Repulse*, thus eliminating the last Allied capital ships between San Francisco and the Middle East. One is able to feel the contrasting fortunes of the skillful and daring Yamashita against the harassed and often indecisive Percival; of the well-trained Japanese soldier using the jungle to outflank his opponent against the courage and determination of the often ill-trained British, Australian, and Indian defenders. The success of this land campaign thus created the myth of the superiority of the Japanese soldier as a jungle fighter that was not dispelled until much later in the war by the armies of MacArthur and Field Marshal Slim.

Dr. Falk's book will, I believe, fill that gap between the official histories and those accounts written by journalists, some of whom were eye-witnesses, that too often were filled with bitterness and animosity toward those responsible for the British defeat. Perhaps it needed an American military historian to exam-

ine such an emotive moment in British military history with compassion and detachment.

—Reviewed by Squadron Leader John D. Brett, RAF, Deputy for Military History, US Air Force Academy.

Assessing the Soviet Soldier

The Soviet Soldier: Soviet Military Management at the Troop Level, by Herbert Goldhamer. Crane, Russak & Co., New York, N. Y., 1975. 352 pages with index. \$17.00.

The abundance of literature dealing with ongoing SALT negotiations has tended to focus Western analytical attention on the strategic hardware aspects of Soviet military power. It is a welcome relief to come across a study on the Soviet military that takes as its object the human factor at the most basic level: the Soviet fighting man.

Originally a Rand Corporation project, *The Soviet Soldier* introduces the reader to such fundamental considerations as day-to-day troop recruitment, training, management, and control. A particularly instructive section deals with the 1967 USSR Law of Universal Military Service and the anomalies it creates for an increasingly professional and technical military establishment. The law ensures a large force of conscript soldiers (with the obvious exception of the permanent officer corps) but for a relatively short period of active service (two to three years), which intensifies training problems for the more technically complex branches of service. The Party's stinginess on length of service is most likely based on the competing needs of the economy.

Significant portions of the work are devoted to items that should be of great interest to Western military observers: training, military preparedness, discipline, initiative, and morale. Despite traditional Party hesitancy to promote a mass professional force, it has supported, as Goldhamer observes, "a steadily increasing drift . . . toward the realization, psychologically and physically, of a 'nation in arms.'" Military training does not commence with induction but is a standard feature of the Soviet public education system, industrial establishments, and

Airman's Bookshelf

higher education. The benefits of such a widespread program accrue not only to the military but to the Party as well. The military reserves a large pool of militarily competent personnel trained at someone else's expense while the Party has extra opportunities to inculcate its ideological precepts and thereby socialize large masses of young citizens.

But does such a system produce high morale, discipline, initiative, and all the other attributes of the ideal soldier? The only real answer must come from a field test, and the Soviet armed forces have not experienced an effective one since 1945. Of course, the discipline is there, at least enough of it to satisfy Party and military leaders. Morale and initiative are intangibles and therefore harder to get at. That there are morale weak spots was witnessed dramatically in the recent alleged attempted defection of a crew with ship from the Soviet Baltic Fleet. As for initiative, Communist systems are frequently poor in this department and the incessant lectures to the troops preaching the virtues of initiative in operational situations suggest that this is a traditional problem area.

The Soviet Soldier is an interesting and useful work but there are a few weaknesses that should be noted. Soviet military manpower figures of 3,850,000, which were drawn from the 1973-74 *Military Balance*, published by The International Institute for Strategic Studies, are somewhat dated and low. In comparison, former Defense Secretary James Schlesinger's Annual Defense Department Report for FY 1976 and FY '77T, published in February 1975, gives a four million-plus figure with the observation that new analysis of troop numbers assigned to the command and general support elements of the Soviet military could add to this number. This is an issue that bears closer and more critical scrutiny than many analysts have been giving it in years past.

Another problem has to do with the impreciseness of many open

Soviet writings. Soviet writers tend to refer to all their forces under the general rubric of Army and Navy. The nonspecialist reader would be hard put to divine that there are five combat "arms" or "components" under the Ministry of Defense, plus large military formations under the KGB and MVD and therefore independent of the Minister of Defense's control. A few introductory pages addressing the structure of the Soviet armed forces would have been useful to novice and specialist alike.

As a final observation, one should guard against concluding that the Soviet armed forces suffer a debilitating malaise caused by short terms of service and other negative items cataloged by Dr. Goldhamer. Many conscript armies have faced similar afflictions and yet have proven themselves in combat, the Soviet Army included. Nor should one automatically judge that there is a serious lack of initiative in the Soviet military as witnessed by periodic press campaigns berating such faults. These press homilies frequently are traditional symptoms of the exhortative nature of the Party-controlled media in its preaching to all segments of society. In our efforts to cast the Soviet fighting man in human proportions, we must ensure that we don't overcompensate and characterize him as ineffective.

—Reviewed by Dr. John J. Dziak, Department of Defense. The views expressed are his own.

New Books in Brief

Arms for the Arabs: The Soviet Union and War in the Middle East, by John D. Glassman. The author shows how the quality of Soviet weapons delivered or, more importantly, not delivered, played a role in constraining or inducing the Arabs in the three recent Middle East wars. Tables, figures, appendices, notes, selected bibliography, and index. The Johns Hopkins University Press, Baltimore, Md., 1975. 244 pages. \$12.50.

Beowulf, edited by Joseph F. Tusso. Here is the highly acclaimed Donaldson prose translation of *Beowulf* in its entirety. Includes background on the historical, linguistic, and literary setting, along

with critical essays on structure, theme, and symbolic meaning. The editor is an Associate Professor of English at the Air Force Academy. Bibliography, appendices, and index. W. W. Norton and Co., New York, N. Y., 1975. 205 pages. \$2.95 paperback.

Fighters in Service: Attack and Training Aircraft Since 1960. Pocket-size volume of the world's major attack and training aircraft since 1960 in three-view illustrations with authentic color schemes. Text on development, service, performance, weaponry, and specifications. Macmillan Publishing Co., New York, N. Y., 1975. 175 pages. \$6.95.

1975 General Aviation, by Gene Dow. Compilation of all general aviation fixed-wing aircraft manufactured or distributed in the US in 1975. Includes photo, description, '75 improvements, specifications, performance figures, and base price. General Aviation Press, Snyder, Tex., 1975. 176 pages. \$4.95.

The Last Hero: Charles A. Lindbergh, by Walter S. Ross. Originally published in 1968, the book has been revised to include corrections and additions by Lindbergh himself, who finally read the original at the behest of relatives. An illuminating, thorough biography about a man whose perseverance, self-reliance, stoicism, and individualism carried him through a tumultuous life. Harper & Row, New York, N. Y., 1976. 400 pages. \$12.50.

The Military Balance, compiled annually by The International Institute for Strategic Studies, London, England, and reprinted each December in AIR FORCE Magazine, is now available in a hardcover library edition, published by Westview Press, 1898 Flatiron Court, Boulder, Colo. 80301. The price is \$16.75.

The Rocket's Red Glare, by Werner von Braun and Frederick I. Ordway III. A beautifully illustrated story of the history of rockets from the Byzantine era to modern times. Von Braun recounts his work on the V-2 in World War II. Printed on high gloss paper, the book contains rare lithographs, drawings, and color photos. Anchor Press, New York, N. Y., 1976. 224 pages. \$9.95.

—Reviewed by Robin Whittle

Readiness, especially in terms of materiel, has suffered because of funding cuts and the accompanying tendency to apply a "rob-Peter-to-pay-Paul" approach to aircraft and other maintenance. USAF is in the midst of a drive to improve logistics effectiveness . . .

AFLC Steps Up USAF's Combat Readiness

BY EDGAR ULSAMER, SENIOR EDITOR

THE Pentagon's initial ardor for honing the cutting edge of US military power by trimming its "teeth-to-tail" ratio, the proportion of combat to support forces, has cooled. The reason, as this year's posture statements acknowledge, is that the price of cutting back support levels excessively is inadequate readiness and, as Gen. George S. Brown, Chairman of the Joint Chiefs of Staff, told Congress, "deterioration of a credible military capability."

Support of USAF's operational forces, including assurance of their materiel readiness, is the job of the Air Force Logistics Command, headquartered at Wright-Patterson AFB, Ohio, commanded by Gen. F. M. Rogers, staffed by some 92,000 people, and backed up by the resources of the US aerospace industry. AFLC, as General Rogers puts it, "exists only to support the operational forces and, in the last analysis, to provide and execute that support under crisis or war conditions. Otherwise, most of what we do could be done by US industry to some extent."

The command's vital statistics are monumental: AFLC manages about \$12.3 billion annually, controls an inventory worth about \$13.8 billion, maintains USAF equipment representing a capital investment value of more than \$44 billion, is in charge of more than 2,700 individual foreign military sales contracts worth some \$3.6 billion, and has a budget of more than \$5 billion.

Although basically industrial in orientation (more than ninety percent of its employees are civilians), AFLC holds the keys to USAF's readiness and responsiveness. "It is an integrated force that conquers, and AFLC is the linchpin of USAF's integration," General Rogers points out. But teeth-to-tail considerations practiced on and by AFLC long before the Defense Department began preaching this credo have affected negatively the Air Force's logistics support, including surge rates and war reserve stockage. One of AFLC's most crucial functions is to strike a balance between stocking

the myriad supplies and other items needed to sustain USAF combat operations at a specified sortie rate, and for a specified number of days, and the time required for industry and the command to produce and procure replacements at the rate these items are used up or lost in war. While specifics about war reserves and surge rates can't be disclosed, congressional testimony by civilian and military Air Force leaders makes clear that there are deficiencies and backlogs.

The most obvious manifestation of changes in USAF logistics is the decline in AFLC's manpower and facilities, down from some 163,000 people and twenty-one depots in the US and overseas two decades ago, to 92,000 people and five depots confined to the US at present. This "shrinkage," AFLC's Commander points out, was made possible by the advent of modern airlift, creation of the Air Force Systems Command and the Defense Supply Agency, greater reliance on private industry for maintenance work, and higher productivity of the command's own work force. But the shrinkage was not accompanied by a corresponding reduction of workload while there are new trends that increase the cost and complexity of essential USAF logistic support, according to General Rogers. Labor costs, the paramount economic factor, have gone up enormously and now exceed \$20 per man-hour in direct labor cost.

Another factor that poses a fundamental challenge to AFLC, General Rogers said, is the arrival "of higher technology systems that promise so much in terms of automation and end up as such a difficult problem in terms of software maintenance. What is needed—and we are pursuing this energetically—is automatic test equipment that can diagnose failures reliably and with high confidence."

The Increasing Importance of Logistics

Operation and Maintenance (O&M) costs in general and logistics costs in particular have gone up at a far greater rate over the past twenty years than develop-

ment and acquisition costs. The comfortable ratio of about sixty-five percent of the total ownership costs of an average USAF weapon system being absorbed by R&D and acquisition vs. thirty-five percent for O&M has changed to a very uncomfortable thirty to seventy ratio with some weapon systems, according to General Rogers. The rapid rise in manpower costs as well as the greater life expectancy of USAF weapon systems are the principal causes for this reversal in life-cycle costing.

"In this command we used to compute life-cycle costs on the premise of a seven-year life expectancy; in the more recent past, we went to a fifteen- to seventeen-year assumed service life, and we are now upping this factor to twenty years. Obviously, longevity gains of such a magnitude—even if no allowances are made for inflation and man-hour cost increases—trigger almost exponential percentage increases for operational and support costs in relation to acquisition costs," according to General Rogers.

Measuring Readiness

The relative success or failure of logistics support so far as military aviation is concerned manifests itself in the number of aircraft and associated systems that are available for immediate action. But comparing aircraft readiness assessments of the services, by this measure, is difficult because various definitions and standards are in use. Senior Defense Department leaders are concerned about the general fact that for years all services have tended to apply a "rob-Peter-to-pay-Paul" approach to aircraft maintenance because of austere budgets and other, more pressing priorities. In the Navy and the Marine Corps, Defense Secretary Donald H. Rumsfeld told Congress, "the fraction of aircraft grounded owing to a lack of spare parts has been increasing. While the fraction has been stable in the Air Force, the number of 'Not Operationally Ready-Supply' incidents has been rising steadily; thus, the



AFLC's Military Aircraft Storage and Disposition Center reclaims B-52 nose section for use in flight simulators.

stable rate merely suggests that extraordinary actions have been taken to keep the situation from deteriorating further."

Acknowledging that because of differing standards, interservice comparisons of readiness are inappropriate, Secretary Rumsfeld stressed that "cannibalization rates have been growing and fill rates for spare parts have



AFLC's Sacramento Air Logistics Center is the logistical system manager for the F-111 and fourteen other USAF aircraft. The F-111 maintenance line is shown above.

been declining. . . . To keep one airplane or item of equipment operational, parts are being taken from another grounded airplane to provide the spares. Similarly, the number of orders for aircraft components not filled promptly by the supply system has been growing. In short, more than twenty-five percent of some types of [Navy and Marine] aircraft are grounded for lack of spare parts, thus making it difficult to meet peacetime commitments. All of this adversely affects wartime readiness and the deterrent."

According to charts accompanying Secretary Rumsfeld's testimony, the percent of aircraft grounded while awaiting spare parts between 1973 and 1975 was level at about seven percent in the case of USAF, but surged from about thirteen percent to more than twenty percent in the case of the Navy and Marine Corps. Cannibalization rates were depicted by the Secretary as worsening for USAF as well as Navy/Marine aircraft during the same period, reaching about fifteen percent in the case of the Air Force, and more than twenty-five percent for the Navy and the Marines. Pertinent goals set for FY '77 by the Secretary include elimination of the backlog of "broken but reparable spare parts lying on warehouse shelves" and an increase of funds for such repairs.

Recent congressional probes of aircraft operational readiness in all services led to considerable adverse publicity, especially for the Navy and Marines. Some of the criticism failed to come to grips with the nature of readiness, so far as complex aircraft are concerned. As General Rogers points out, the assertion that one-third of all Air Force aircraft are not operationally

ready at a given moment sounds a great deal worse than it is: "Public perception of such an out-of-commission rate might be quite different if it is made clear from the outset that our goal has been and is to be seventy percent operationally ready. Going much beyond an in-commission rate of seventy percent would take us to a point of diminishing returns simply because we would be required to devote too many of our assets—including crews—to keep all our aircraft at such high levels of readiness. Obviously, a certain number of aircraft must be cycled through depot maintenance every day; others have to undergo base-level maintenance; and something else may need tweaking up elsewhere. The Air Force, therefore, decided over a period of years, and with the help of considerable empirical data, just how many aircraft we needed available for immediate action and how many we could have in the maintenance cycle.

"The findings are that the Air Force should work against a goal of about twenty-five percent of aircraft standing down for maintenance at one time, and another five percent for supply. Trying to lower the latter



AFLC's Commander, Gen. F. M. Rogers, is in the forefront of reordering the Air Force's priorities from the traditional approach of performance first, schedule second, and cost of ownership a dimly perceived and distant third, to the compelling pragmatism of life-cycle costing. Mounting O&M costs undergird the change of emphasis in logistics.

figure, we found from experience as well as through economic analyses, means spending an inordinate amount of resources on a very flat part of the curve. Since the conventional wisdom of the logistician says that thirty percent of all possessed aircraft should be in the maintenance and supply cycle at a given time, it is hard to understand why there is so much alarm if somebody discovers that almost one-third of our fleet is not operationally ready."

Similar, although lower, out-of-commission rates are standard for commercial aircraft and trucks, neither of which have the weapons, associated avionics, and other subsystems of military aircraft, General Rogers pointed out.

Improving Logistics Effectiveness

A key factor in improving USAF's materiel readiness centers on modernizing and adequately funding AFLC's five Air Logistics Centers (ALCs), located at Hill AFB, Utah; Tinker AFB, Okla.; Kelly AFB, Tex.; McClellan AFB, Calif.; and Robins AFB, Ga. The function of the ALCs, each of which is assigned specific USAF and foreign air forces weapon systems, is to provide organic

(in-house) or contract (industry) maintenance and modification of assigned systems and other major equipment items as well as carrying out repair of exchangeable components. Funding of the ALCs is to be increased by some ten percent in FY '77—assuming congressional approval—in order to "reduce a serious backlog of work that has resulted from austere funding in previous years," according to Secretary of the Air Force Thomas C. Reed.

An important, related effort, he testified, is the Depot Plant Modernization Program, meant to produce more efficient, productive, and responsive facilities and procedures. The Air Force, he said, is conducting critical reviews and analyses of all aspects of equipment maintenance, both at the depot and the base level. Another maintenance program, the Maintenance Posture Improvement Program launched in 1974, capitalizes on Rand Corporation studies and industry initiatives to streamline aircraft and engine maintenance. Gains are being made, Secretary Reed said, by adopting "the airline-developed, reliability-centered maintenance concept that is based on detailed engineering analysis designed to eliminate unnecessary and redundant maintenance tasks. Such an analysis has been completed for the B-52 and is planned for other in-service aircraft, as well as for those being acquired. These concepts are being tested and, if successful, will reduce the frequency of aircraft inspections and increase airframe availability." Intrinsic elements of this program are consolidation of maintenance functions, streamlining maintenance procedures, and increasing the productivity of maintenance personnel.

In the offing is emphasis on systems analysis in AFLC day-to-day business. According to General Rogers, "Logisticians have not been in the forefront of building mathematical models and capitalizing on other advanced tools for predicting consumption rates and breakage. We have relied on what is called regression analysis—that is, assessing past experience and extrapolating from it what might occur under similar circumstances in the future. But we obviously need more modern computer-based techniques. We depend on so many subsystems in order to make the total system work that we need to know more about when any one of them is likely to bust and why." Information of this type, he said, supports national decisions about where and how many subsystem spares should be stored and which components should be treated as line-replaceable units—that is, modular units that, when defective, can be unplugged on the spot and replaced. Line replacement of critical components is very efficient but also very expensive.

Scheduling depot maintenance for aircraft, missiles, and other major USAF systems, General Rogers asserts, is affected by the complexity and maturity of the system involved. Various approaches are in effect, some predicated on such periodic cycles as a given number of flying hours, others keyed to elapsed calendar time, and a third method centered on evidence of need for maintenance. The IRAN policy of "inspect, and repair as necessary" is no longer in effect, General Rogers said,

"because it is too expensive. It unleashes a dynamic force all its own by creating the incentive to fix everything in sight the minute the aircraft is opened up."

The presently used system of scheduling depot maintenance, General Rogers said, relies on flexible assessments of individual categories of weapon systems. The ALCs and their industrial contractors have some latitude in performing tasks not provided for under routine depot maintenance. "We will negotiate with operational commands about performing organizational and intermediate level maintenance that they are responsible for, once we have opened up their aircraft or other systems. Work on the explosive package of ejection seats, which is highly technical and dangerous, is a case in point," General Rogers said.

Contracts with industry carry provisions for "over and above" tasks, that is, correction of unforeseen problems that otherwise will lead to breakdowns in the future. In the case of mature systems, AFLC usually has enough background information to predict "quite closely" the overall percentage of "over and above" work required; on new systems such forecasts are more tenuous and require close supervision of the contractor, according to the AFLC Commander.

AFLC's Advocacy Problem

The logistician's traditional plea for an equal voice in decisions on weapon systems design is being heeded more as support costs absorb an ever-increasing share of total ownership costs. But "mouthing such catch phrases as life-cycle costing [LCC] and cost of ownership, of itself, doesn't overcome human nature, which tends to put off until tomorrow what doesn't have to be bought today, such as features that increase ease and economy of maintenance. For too long we have had to live with a budgeting approach that refused to look further ahead than the end of the current fiscal year, rather than treating the system's life cycle as an economic whole. Yet, the process of systems acquisition must be perceived, understood, and organized to reflect the real-life fact that it embraces not only advocacy and engineering development but the other critical disciplines of procurement, contracting, budgeting, financial management, maintainability, reliability, supportability, and legal sufficiency," General Rogers pointed out.

Through the direct personal involvement of the Secretary and the Chief of Staff of the Air Force, General Rogers said, "the goal of lowering operational and support costs is coming closer to reality, but we still have problems in getting all the strata involved in the budget planning process to allocate the additional money at the 'front end' to pay for the supposed advantages downstream."

Organizationally, USAF's emphasis on life-cycle costing is reflected by the creation of a Deputy Chief of Staff for Acquisition Logistics at AFLC, of deputy program managers for logistics (answering to Hq. AFLC) at all Air Force Systems Command System Program Offices, and creation of an Air Force-wide LCC Management Group. The latter agency, according to Secretary Reed, is meant to encourage widespread

use of the LCC concept by assuring that "life-cycle cost considerations, including the use of award fees and reliability improvement warranties [RIWs], are being made a part of major new acquisitions. Design decisions for new systems, and determinations whether and how to modify systems already in the inventory, are being based on support cost tradeoff studies."

A first and major step toward transforming LCC from a buzz word into reality is the F-16 Air Combat Fighter program, which, by adopting commercial airline acquisition policies, makes warranties an integral element of its contract structures. Another development conducive to LCC is increasing emphasis on "try-before-buy" in Defense Department acquisition policy. The availability of advanced development and preproduction prototypes, often involving two or more contractors, encourages early testing of systems in terms of O&M costs as well as basic feasibility, utility, and performance, General Rogers said.

The RIW technique, adopted from the airline industry's "failure-free warranties," which assure that the aircraft it is buying are as profitable to own and operate as specified, is a carefully balanced combination of "carrot and stick." If the various performance features that in the aggregate represent profitability are met or exceeded, the manufacturer earns a certain amount of profit; if he doesn't meet the specifications, he is financially penalized by having to correct the deficiency out of his own pocket.

In the case of the Air Force, General Rogers explained, RIW is to be used initially for avionics subsystems and components in the so-called "high-burner" category, meaning prone to incur high support and maintenance costs. The prime contract of the F-16 program includes the option to acquire twelve avionic subsystems under RIW. If the option is exercised, the contractor will repair or replace any failed units during a specified period of time as well as demonstrate *increasing* reliability over the warranty period.

No RIW contracts have as yet been agreed on "because industry is reluctant to accept the attendant risks," General Rogers disclosed. Fundamentally, RIW means "that the prime contractor is in charge of all reparables, including the investment they represent. If there is a black box that he promised would last a certain number of hours but he has bought a type that fails earlier," he must buy additional units and thus is penalized to the extent that shortfalls occur.

Major difficulties in establishing warranties are caused by the fact that Air Force systems often are used more flexibly and almost always under much more severe conditions than commercial aviation systems. This is especially true for new systems that are still in early stages of development. Even though neither the contractor nor the Air Force user knows precisely under what kind of stresses the system or component will be operated, General Rogers believes it is possible to come up with mutually acceptable warranties: "Even in the face of such imponderables we can come up with some reliability specifications within the bounds of developmental milestones although tied to adjustable

factors that come into play as both sides acquire test and other experience. We simply can't live with the status quo; that is, not create real incentives for industry to improve reliability except for the maintenance-hour-per-flight-hour ratio stipulated by 'design to cost' contracts."

Changes in basic approach to engine design may lead to major payoffs in aircraft reliability, increased readiness, and reduced support costs, in General Rogers' view. Traditionally, USAF has been developing and buying engines with the notion "that we will do product improvement work as we go along. If we want to get really serious about reliable engines, we will have to change testing procedures. For example, instead of running a new engine for 150 hours on the bench and then qualifying it with a PFRT [preliminary flight rating

ous designs under study are concerned. "AFLC is analyzing the pertinent cost increases of all alternate basing options under examination compared to fixed silo systems and determining the intrinsic maintenance and reliability characteristics of each of them," General Rogers said. SAC is adding cost estimates of such other support factors as the various security and other specialized forces associated with each MX deployment option under study.

It is already clear that in terms of life-cycle costing, the fixed silo deployment mode, involving a large missile that fits into the existing Minuteman sites but is transportable, represents the lowest-cost approach, General Rogers said. (A senior DoD official told AIR FORCE Magazine that this approach is favored over all others because its estimated acquisition costs are about one-



A Minuteman intercontinental ballistic missile, ready for comprehensive checkover in the missile shops at Hill AFB, Utah, is tied down before inspection and repair at the AFLC installation. The Command's Ogden Air Logistics Center, headquartered at Hill AFB, manages logistical support of the Minuteman II and III weapon systems for the Air Force.

test] rating, we must provide for rigorous front-end testing, in consonance with the mission profile of the aircraft that it is to power. That means tests at the Arnold Engineering Development Test Center's wind tunnels and high-altitude test cells, repeatedly running the engine at 100 percent of throttle, and putting it through representative cycles of 'accels' and 'decels' to simulate actual operating temperatures in its hot section and to recreate other real-life stresses that determine its life-cycle costs. The deterrent to such an approach, of course, is increased costs. We are, nevertheless, moving in that direction. The engine of the F-16 is being tested in the ground-support role, similar to the engine load testing of the A-10, because that mission, in some ways, is more demanding than and different in impact on LCC from the air-superiority role for which it was originally designed," General Rogers said.

MX and Life-Cycle Costing

The Air Force's concern with life-cycle costing extends to the latest and potentially most crucial strategic system under review, the MX advanced ICBM development program. The AFLC Commander, along with the Chief of Staff, CINCSAC, and the AFSC Commander, has his "say" in the MX concept formulation, especially so far as the support costs and life-cycle costs of vari-

sixth those of a hardened mobile system. Because of the large number of MIRVs the Soviets presumably will have available by the time MX might become operational, soft, mobile systems are not being given serious consideration, he said. On the other hand, recent advances in hardening silo-based ICBMs, combined with progress in attack assessment and the attendant heightened reliance on a launch from under attack posture, in the opinion of DoD analysts, assures long-term viability of large MIRVed fixed-site ICBMs.) By contrast, the proposed technique of deploying MX in a network of hardened tunnels to deprive the attacker of specific aim points appears to be the most costly approach in terms of LCC, General Rogers said.

As the Air Force reorders its priorities from performance first, schedule second, and cost of ownership a dimly perceived and distant third, to the compelling pragmatism of life-cycle costing, the challenge to AFLC, already vast, is mounting correspondingly. Under the leadership of General Rogers, a World War II fighter ace devoted to rigorous systems analysis and not averse to solving problems by unconventional—even iconoclastic—methods, there is little room to doubt that AFLC will meet the central challenge of providing the Air Force with the materiel readiness and logistics support so vital to its mission. ■

AAF crews flying out of the UK during World War II were briefed to expect the worst, should they be shot down over occupied Europe. But none, the author included, was prepared for a confrontation with . . .

the luftwaffe's master interrogator

BY ROYAL D. FREY
CURATOR, AIR FORCE MUSEUM

AH, GOOD morning, Lieutenant Frey. Please come in. I am your interrogator, Hanns Scharff."

This was my introduction to those somber sessions with the German Luftwaffe at Oberursel that all Americans who flew over Europe during World War II were warned they would undergo if shot down and captured. The date was February 12, 1944, two days after I had bailed out over Germany when my P-38 had been set on fire by light flak. I was barely twenty years old, and one thought flashed through my mind: Did I have the courage to endure the treatment I believed awaited me?

I looked into the small room with suspicion and anxiety. To the right behind a desk stood Herr Scharff in a blue uniform. Not knowing Luftwaffe insignia of rank, I had no idea whether the man was a private or a colonel.

Time after time I had been briefed

in England on what to expect if captured. The Germans, we were told, would attempt to shock a newly captured flyer into cooperating by overwhelming him with facts about him, his unit, and the men he had been flying with. But no briefing could ever have prepared me for what was to follow.

Scharff quietly asked me to be seated. After a few moments of inconsequential talk about my solitary confinement, he handed me a questionnaire. It began with name, rank, and serial number. Then the questions became more leading: my unit, its location, the type of plane I was flying, and so on. Following instructions I had been given in England, I filled in the first several blanks, drew a diagonal line through the rest, and signed my name at the bottom.

Herr Scharff looked at me with a deep disappointment in his eyes. He slowly opened a desk drawer and

pulled out a folder marked "55th Fighter Squadron." It was bulging with documents on me and my unit, some of which he handed me to read; others he read aloud.

Scharff not only had the names of four replacement pilots assigned to my squadron on January 9, 1944, but also knew that I'd been an engineering student at Ohio State in 1941. He even told me my mother's maiden name.

He continued to throw these surprises at me one after another, and I belligerently fended them off as best I could. Suddenly, he casually remarked, "Well, you know you aren't a prisoner of war until you leave here and are reported to the International Red Cross. We could take you out and shoot you if we wanted." I accepted this comment with a casual shrug, though I could feel my stomach constrict. Much to my relief, Scharff never mentioned this possibility again.

The ultimate shock came when Scharff pulled out a single-page mimeographed secret order I had read in England only ten days previously. It was an official directive stating that the policy of AAF escort fighters protecting the heavy bombers first and attacking enemy fighters second was to be reversed immediately. Scharff's copy was an original; it even had the red rectangular stamp in the upper left corner containing its individual registration number, its date of issue, and the initials of the person who had released it. The Germans certainly had an efficient spy somewhere in England.

After several days of what I considered useless questioning, Scharff released me from Oberursel for a short journey to Dulag Luft, the transient camp in a park near the center of Frankfurt. (Contrary to what I had been told in England, Auswerestelle West, not Dulag Luft, was the interrogation center at Oberursel. Dulag Luft was moved from Frankfurt to Wetzlar after it was bombed by US planes later in 1944.) When the population at Dulag Luft increased to about 200 POWs, we were put into boxcars and taken to our permanent camp, Stalag Luft I near Barth, a village located on the Baltic Sea north of Berlin.

During the next fifteen months at

Barth, I talked with other pilots who had been interrogated by Scharff. We remembered almost to a man the German who had been so soft-spoken and pleasant in contrast to what we had expected. Not one of us had been subjected to any brutality; he had always shown complete respect to us as POWs.

Through the years following the war, I remembered this former enemy with a strange attachment, but I never had the slightest idea we would meet again. In 1970, however, I heard that the German who had questioned AAF fighter pilots was living in California.

With some apprehension I sent a letter to Scharff saying that he probably would not remember me. I soon received an answer: He did remember me most clearly. Before the war, the Scharff family had been close to another German family named Frey. When Hanns was told in 1944 that the next POW he was to question was an American fighter pilot named Frey, he had thought what a strange world it was.

In 1972, at Hanns's invitation, I visited him at his home in Los Angeles. As I turned into his driveway, he came rushing out to meet me. He appeared almost as I remembered him, even after twenty-eight years.

Hanns greeted me with outstretched arms and, for a few seconds, I experienced some of the most confusing emotions of my life. Here was the man who had been my deadly enemy. At the same time, I could not forget how he had treated me. Suddenly I realized he was completely sincere, and without any real conscious effort, I greeted him in turn as a long-lost friend and not as a former enemy.

The evening was spent reminiscing about those interrogation sessions of 1944. First, Hanns would recount an episode during which he had attempted to trick me into revealing some secret or verifying a point he already knew. I would then recall how I had tried to evade or confuse him. We both were amazed at the details we remembered after so many years. Before I left that night, Hanns and I had cemented a lasting friendship. During our periodic visits of the next three years, I learned a great deal about this re-

markable man, his wartime work as an interrogator, and the humorous and bizarre experiences he shared with downed American fighter pilots.

Scharff's Irresistible Force

Although dubbed "Poker Face Scharff" and "Stone Face Scharff" by the London edition of *The Stars and Stripes*, in reality Hanns was and is the epitome of continental charm and grace. He exudes a unique warmth and kindness, traits that made him so effective as an interrogator. He had grown to manhood in an atmosphere of benevolence which he applied in his work for the Luftwaffe. This was in keeping with the example set by his father during World War I when, as the commandant of German occupation forces in the French city of La Capelle, he was cited by the French mayor for his humane and decent treatment of French civilians.

Hanns firmly believes that a man can resist brutality more easily than he can resist genuine kindness. No

doubt this was the key to his success in World War II, for he claims to have gotten at least one bit of information from every person he interrogated, whether or not the man realized it.

Hanns had no formal training as an interrogator. He was drafted in January 1943, and because of his knowledge of the English language, was assigned to the Oberursel interrogation center as a file clerk in the Fighter Section. Late in 1943, the several official interrogators of the Fighter Section were killed in an airplane crash and Hanns, being the senior person remaining in the unit, was ordered to take charge. When interrogating Allied pilots, he wore the insignia of rank that best served his purpose.

Hanns never knew the sources of some intelligence information provided to him. Much of it on pilots, he believes, came from US newspapers received through neutral Portugal, containing articles about local men who had recently graduated



The Luftwaffe's Scharff in 1943. The air battles were often followed by a battle of wits with the master interrogator.

from flying school. Newspaper information from the British Isles was plentiful. Every day he had on his desk the previous day's London edition of *The Stars and Stripes*. Some of his information undoubtedly came directly from German intelligence sources, including agents in England, and from Luftwaffe monitoring of AAF radio channels.

As the Allies rolled into western Germany early in 1945, Oberursel was evacuated by the Germans, who headed eastward. For a while, Scharff was in charge of a small group, but on April 16, 1945, he was captured. After the war, he was hired by US forces as an interpreter.

In 1948, Scharff was brought to the US to testify as a prosecution witness in the trial of an AAF lieutenant who had stolen a P-38 in



The author, in the "squadron" tie, shirt, and jacket, poses for an escape photo he never got to use.

Italy and flown it to southern Germany. After the trial, Scharff decided to remain in the US.

In the early 1950s, he introduced into the United States the technique of producing the smooth-surface Venetian glass form of mosaic art, as it was practiced in pre-Christian times. His murals, containing thousands of small bits of colored glass, have been exhibited across the nation. Probably those that have had the greatest exposure are five beautifully ornate panels adorning the walls of the foyer in Cinderella's Castle at Disney World in Florida.

Clothes "Make" the Man

During one of our conversations, Hanns told me about an intelligence



AAF Col. Einar A. Malmstrom exits an Me-109G following a short flight, arranged by Herr Scharff, over the Luftwaffe fighter base near Eschborn.

technique used at Oberursel that was not known to the Allies until after the war when Hanns revealed it.

It was standard practice for Allied flyers to carry small passport-size photos of themselves wearing civilian clothes. If a flyer were shot down, his photo could be used by the underground for forging identity papers. However, these same ID photos were used by the Germans to identify a POW's squadron.

Each AAF unit had only two or three civilian jackets, shirts, and neckties, which it used to photograph all its personnel. The Germans at Oberursel soon noticed this, together with the fact that each unit photographer used the same background. German Intelligence began maintaining squadron files by jacket, shirt, tie, and background. One Luftwaffe man became so proficient he could identify a POW's squadron simply by looking at the flyer's ID photo.

In addition to interrogating US fighter pilots, Scharff would periodically lecture to Luftwaffe fighter pilots. At one such session Hanns was asked by a group commander named Priller about the significance of tracer bullets he had seen coming from some Mustangs during combat encounters. Scharff soon got the answer during an interrogation of a P-51 pilot. He reported to Priller it meant that the Mustangs were running out of ammunition; the last five or ten rounds for each gun were always tracers.

A few days later, Priller reported that he had just had an engagement with a Mustang and had seen the tell-tale tracers. Priller added that he had no desire to shoot down a defenseless enemy, so he pulled his plane inside the P-51 in a turn, waved goodbye to the Mustang pilot, and peeled off for his base.

Host to the Host of Men We Boast

Early in 1944, Scharff began to entertain some of his guests after their interrogations had been completed. Often he would take them to a nearby restaurant for relaxation after being in solitary confinement. In one instance, a famous AAF ace and another US pilot were taken to the public pool in Frankfurt for an afternoon of swimming among unsuspecting German civilians. Hanns insists there was no sinister intent on his part or treasonable behavior on the part of his guests during such sojourns. It was strictly a matter of kindness.

In mid-1944, Scharff began a guest book that the POWs could sign as they left the interrogation center. This "Guests of Honor" book, which Hanns has donated to the Air Force Museum, is filled with pathos and humor. The first entry, made "under Protest and Duress this 13th day of June 1944" by Col. Charles Stark, reads "You had your job, and I had mine, But after that, We had a damned good time."

Capt. Vernon R. Turner wrote: "Hanns: After these many months

I expect to spend as your guest, come up to (or rather down to) Lubbock, Texas (1109-13th) and I'll treat you to some real country fried chicken—Lordie, how I'd like some now—HINT!"

One of the strangest episodes involving American POWs took place in May 1944, when Col. Einar Axel Malmstrom (for whom Malmstrom AFB, Mont., is named), of the 356th Fighter Group, was released from solitary confinement. Scharff told Malmstrom that he had earned the greatest respect of the Germans at Oberursel as an officer and a gentleman. He said that if there was something Malmstrom really wanted, he would attempt to arrange it. Malmstrom replied without hesitation that he would like to fly an Me-109.

Scharff notified the commanding officer of KG 27 at nearby Eschborn, then took Malmstrom to the airfield where the American was given a rundown of cockpit procedures in an Me-109G. After ensuring the fuel tanks were only partially filled, the Germans permitted Malmstrom to take off for a short flight. He apparently made a good landing, for Scharff does not recall anything unusual concerning Malmstrom's return to the field.

Allied flyers who were shot down over France and captured often were lodged by the Gestapo in its prison near Paris. This caused some consternation at Oberursel, because the Luftwaffe believed it necessary to question a flyer as soon as possible after his capture.

The deputy commander at Oberursel was a Major Junge who, before the war, had been a Focke-Wulf test pilot. In 1938, Junge had attempted a flight from Berlin to

Tokyo but had been forced down in the South China Sea. Fortunately, he was rescued by a plane from the Philippines piloted by a Capt. Jonathan Miller.

Because of the Luftwaffe's insistence that the Gestapo release downed airmen to Oberursel with minimum delay, the Gestapo chief of the Paris region, a T. T. Schmidt, drove to Oberursel to discuss the matter. Following the conference, the Germans engaged in small talk while having tea, and Schmidt asked Junge to tell him about his 1938 flight. After Junge had recounted the rescue, Schmidt casually remarked that he had in his Paris prison an American colonel who had been shot down over France and whose name, oddly enough, was Jonathan Miller. Schmidt described Miller to Junge and the more he talked, the more Junge became convinced that the colonel in the Gestapo prison had to be the same one who had saved his life in 1938. Schmidt agreed to have Miller transferred at once to the interrogation center. Sure enough, Miller was the same man who had rescued Junge in 1938.

This called for a celebration and Schmidt and Junge decided to make a day of it, accompanied by Scharff; Miller; Col. Charles Stark, the American commanding officer at Dulag Luft; and a Luftwaffe officer named Barth. During dinner at a local cafe, Miller, by accident or intent, spilled a full bowl of hot gravy over Schmidt. The story spread like wildfire among the Germans in the area that an American POW had successfully carried out his personal retaliation against the dreaded and despised Gestapo.

Two "Secrets"

The most distasteful memories of all for Scharff involved US fighter pilots suspected of having strafed civilians. One instance involved some Mustangs that reportedly had made a deliberate strafing attack on the ancient university town of Greifswald in northern Germany during the Easter period of 1944. Seven P-51 pilots were captured that day and Berlin ordered them tried, convicted, and executed as examples to others.

The trial lasted for three months and although Scharff produced posi-

tive proof from gun camera footage that the seven pilots were not the guilty ones, some top-level German officials still insisted upon their conviction. The matter was finally settled when Field Marshal Hermann Goering personally directed that if the seven pilots were really innocent, they were to be relieved of the charges and sent to a POW camp. Scharff had saved their lives.

During my latest visit with Hanns, I told him I was finally willing to confess that when he interrogated me in 1944, I had known only two military secrets and that he had failed to get them from me. One was an insane idea for P-38s to tow fuel-laden gliders behind them in order to increase their range—a plan that eventually was canceled. The other was a proposal to put a bombardier and a Norden bombsight in the nose of a P-38 so a formation of these high-speed fighters could drop bombs on targets inside Germany, a plan that was actually developed and used for a period in the spring of 1944.



The dapper subject of this article—Hanns Scharff—in a recent photo. The US is his adopted homeland.

Hanns stared at me for a moment. Then that soft Scharff smile slowly came across his lips and his eyes took on that same mischievous twinkle I had first seen thirty years before. I suddenly realized the truth; he had already known both "secrets" in 1944. ■

The author, Royal D. Frey, was credited with shooting down two Me-110s before the unfortunate encounter with German flak that led to this story. After completion of an MA in history, subsequent to World War II, he divided his time between duties as a civilian historian at Wright-Patterson AFB and active duty with the Ohio Air National Guard during Korea and the Berlin Crisis of 1961. In 1959, he became Chief of Research at the Air Force Museum, and in 1972 was selected for his present position as Curator of the Museum.

The Bulletin Board

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

DMC Urges Sweeping Changes

Military compensation, retirement, promotions, management of people, and length of careers—these are



The five photographs on the next two pages won SSgt. Herman J. Kokojan, photojournalist of Aerospace Audio-Visual Service, Norton AFB, Calif., the 1975 Military Photographer of the Year award. Above, Sergeant Kokojan.

just a few of the personnel programs that would be overhauled if the Defense Manpower Commission recommendations prevail. The high-level civilian panel issued its sweeping report recently after more than two years of intensive study.

It cited many inefficiencies, claiming that full adoption of the report will save the government \$3 to \$4 billion annually by the mid-1980s. Military manpower would remain at the present level—2,100,000 active-duty troops plus 890,000 selected

Reservists. Civilian manning could be cut, over time, to the 1,000,000 level.

The Commission, chaired by Curtis W. Tarr, former Assistant Air Force Secretary (Manpower and Reserve Affairs), recommended converting basic pay, BAQ, BAS, and tax advantage into a "fully taxable military salary," the same for married and single members.

The DMC asserted that attacks on institutional benefits such as dependent medical care, commissaries, and exchanges "arouse emotional reactions among military personnel out of all proportion" to their actual value. They should be retained, the 518-page report holds.

The report seriously questioned such special pays as reenlistment bonuses, dislocation pay, and many others. It calls them "drag alongs" because they are directly linked to basic pay and go up automatically when basic pay rises, whether justified or not.

Needed, DMC insists, is a federal compensation board to make independent judgments on all compensation items. The idea is that bonuses and other special pays would be rapidly adjusted to solve specific manpower problem areas.

The report covers such far-ranging topics as women in uniform, training, management, in-service education, VA benefits, minority recruiting, and unionization of the military. In other highlights, the DMC:

- Supported a revamped military retirement system based on a complex point arrangement. Most members would be required to serve thirty years to receive full pensions. A "grandfather clause" would protect people in uniform before the change takes place. Under the plan, all service members would become careerists or be discharged at the

tenth year of service, and retirement vesting would begin at that point. Reenlistments would disappear.

- Rejected the services' traditional "up-or-out" practice for officers, asserting that it is "failure oriented." Instead, DMC calls for "careful selection" into the career force and "selection-out" authority for occasional later use.

- Declared that to allow for the economic adjustment of employees and communities, base realignments should be announced three years in advance.

- Asserted that, except in scientific-technical areas, a baccalaureate degree is ample formal education "to prepare an officer to achieve four-star rank." Also, the report said, the services can send officers to civilian graduate schools much cheaper than to in-house courses at AFIT and the Naval Postgraduate School. Therefore, the services were urged to check the two institutions periodically to ensure that their "continued existence is justified."

- Said the standby draft should be reinstated.

While the Defense Department may adopt a few of DMC's recommendations, Congress holds the key to reforming manpower policies. The report, however, appears more a possible blueprint for future manpower actions than a basis for immediate changes.

Several key proposals in the report clash with sections of DOPMA and the Retirement Modernization Act, both Defense-sponsored plans. In late April, a House Armed Services subcommittee source said his group, though it was preparing to hold a final hearing on DOPMA, had not yet received copies of the DMC report. Late spring hearings on RMA were still planned, the source said, but there was no indication the DMC proposals would play a significant role in them.

Report Lauds, Questions ANG-AFRES

The Air Guard and the Air Force Reserve are "closely integrated with the active Air Force and are the best examples of effective implementation of the Total Force policy found among the services." So said the Defense Manpower Commission in its exhaustive report on military manpower (see above item).

It also lauded the USAF's "gaining-

command" concept and urged the Navy to emulate the USAF-AFRES "associate" program, under which AFRES units share strategic airlift aircraft with active-duty units.

But the DMC questioned what it called the "high cost" of the Air Reserve Forces programs and whether the "best value is being derived from them." The Commission then recommended (1) manpower cuts at Air Guard state headquarters;

airmen were approved for these tours just a few weeks after the project opened. Grand Forks led with 700 applications approved, and Minot had nearly 650.

The "stabilized base" assignment plan is one of a dozen changes USAF has adopted recently to stretch out tours, shave move costs, and improve personnel stability. Much of the emphasis is on voluntary oversea tour extensions, which

ing a short foreign tour. This also may be extended to officers soon.

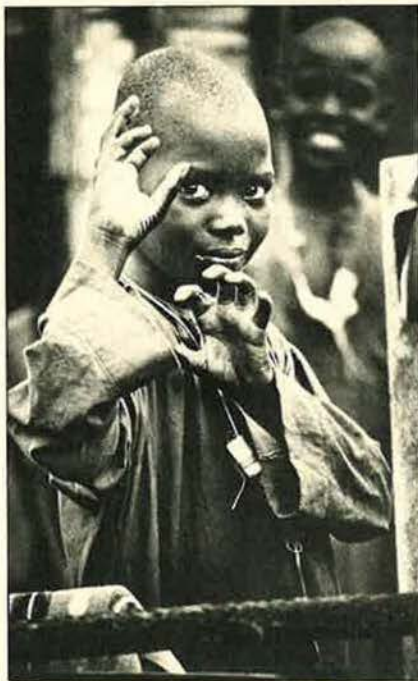
The various PCS "initiatives" will save USAF about \$10 million this fiscal year, less than some authorities had expected. Money-saving changes in movement of household goods also were envisioned, but officials recently said none are planned.

On the Commissary Front

While military-oriented groups including AFA have again urged Congress to provide full commissary store funding to keep customer savings at their present levels, Air Staffers appear resigned to the



"Sport of the Romans," above, won Kokojan (see photo, p. 72) first place in the sports category. His "Helping Hand," far right, "Kung Fu Fighter," right, and photos on p. 74 also were winners.



officials expect will number 2,400 this year.

Also popular is the "home-basing" program, which gives married airmen an assured follow-on tour at their current CONUS station follow-



likelihood of smaller savings within a year or so.

The Defense Department wants Congress to phase out appropriations for commissary workers' salaries over a three-year period (March "Bulletin Board"). By late April, the House, in the annual authorization bill, said it opposed the idea. The Senate Armed Services Committee, however, had endorsed the three-year phase-out.

Regardless of how this immediate confrontation turns out, the high-level feeling in the Pentagon is that before long—"perhaps a year"—Congress will "give in" and the present four-percent surcharge will start rising to an eventual eleven or twelve percent.

"That's about half the present customer savings and is still a pretty good deal," one informed USAF source said in echoing Defense thinking. The real funding

(2) elimination of an AFRES region; (3) expansion of the associate flying program to Tactical Air Command; and (4) a sharp cut of active force advisers to Reserve component units.

Long CONUS Tours Endorsed

Many USAF members prefer a guaranteed extra-long tour at unpopular Stateside bases, to risking quick transfers among bases at large. That's the indication from early results of the new airman "Voluntary Stabilized Base Assignment Program." Officials say they may open it to officers soon.

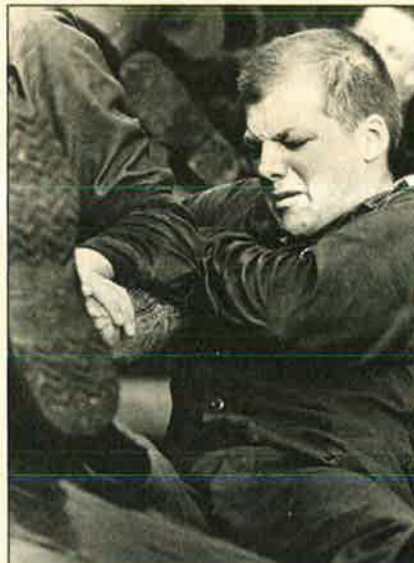
The project (see "Speaking of People," March issue) allows airmen to stay at Grand Forks AFB or Minot AFB, N. D., or Laughlin AFB, Tex., for five straight years. Since all have been low on the base popularity list, it was a real surprise to discover that more than 1,700

The Bulletin Board



"Happy Together"

over full control and management of USAF's 163 stores. Widespread "complexing"—a single management structure for two or more nearby stores, such as Bolling and Andrews AFBs in the Washington, D. C., area—is one change expected



"Nothing Comes Easy"

test, of course, rests with the Appropriations Committees.

AFA President George M. Douglas recently urged the House Appropriations Committee to reject the Defense proposal (as it did last year) and maintain the store subsidy in its present form. Mr. Douglas said "curtailment" of the commissary benefit, which would result from surcharge increases, would be a financial blow to lower-ranking military families, elderly service widows, and many retirees.

USAF, meantime, disclosed that Davis-Monthan AFB, Ariz., will get the first new commissary to be built with funds generated from the one-percent surcharge increase in February. Authorities said other new stores and refurbishing will materialize later, especially following future surcharge raises. The big problem is that it now costs about \$4 million to build a new, fully-equipped store, double the amount required just a few years ago.

Headquarters authorities said "significant savings" in commissary operations will start showing up next year as an outgrowth of the new Air Force Commissary Service. It's now being established at Kelly AFB, Tex., and when it goes into operation on October 1, will take

to save people and dollars and improve efficiency.

USAF's new commissary chief is Maj. Gen. Daniel L. Burkett.

Publications Face Squeeze

USAF's "organizational publications" dealing mainly with people matters cost \$3.5 million last year. Headquarters wants that cut. The answer, it told commands recently, is found in possible consolidation, reduction in frequency of publication, or outright elimination.

The list being "reviewed" includes many local personnel newsletters, which cost very little. But it also includes the thirty-year-old *Air University Review*, which USAF says cost \$301,000 last year, and the newsletter for USAF retired members. Its cost was \$44,000.

Correct Inversion, Civilians Ask

Government civilian employees are still faced with a difficult retired pay inversion problem; Congress failed to correct it last year. Now, USAF's Civilian Personnel Office is trying to resolve the matter.

The office noted that personnel retiring last year and this year, particularly medium- and high-level people, receive smaller pensions

than those who retired several years earlier. The reason stems from the fact that retiree CPI raises have outstripped regular pay increases.

One example circulating around the Pentagon concerns two GS-18s, one who retired December 31, 1970, the other five years later. The latter's pension currently is \$190 a month smaller. In another recent example, an August 1975 GS-13 retiree was receiving \$700 a year less than a June 30, 1973, retiree.

For months the Defense Department has been trying to get the White House to approve a legislative proposal to correct the inversion by increasing the pensions of recent retirees. Air Force officials, meanwhile, want to bypass the cumbersome legislative process. They believe the Civil Service Commission already has authority under existing law to provide a "saved-pay" proviso by regulation.

Congress corrected the military retired pay inversion last fall when it provided for computation of individual retired pay at an earlier date of eligibility.

Early Outs Again

Another round of early voluntary exits, to be effective this month, was recently set in motion. This one was opened to 8,000 first-term airmen whose normal separation dates fall between October 1, 1976, and September 30, 1977. The action is required so USAF can trim down to its FY '76 end strength target of 481,000 airmen; it began the year with 503,000. Normal exits and reduced recruiting will have accomplished part of the reduction.

Veterans Profile Changing

The nation's veterans, now nearly 30,000,000 strong, are better educated and earning more than non-veterans. The Veterans Administration has also noted that they are aging at a rapid clip and the VA medical establishment is playing a prominent role in aging research.

The agency recently reported that in 1974 the more than 28,000,000 veterans not in hospitals or correctional institutions had a median educational level of 12.6 years. It also said that veteran high school graduates in the same year had a median income of \$11,350, compared to nonveteran high school graduates' \$8,870. Among college

graduates, veterans earned \$17,240 vs. \$11,870 for nonvets.

While living veterans number less than fifteen percent of the country's population, VA said that 96,000,000 persons, or forty-five percent of Americans, are "potential beneficiaries" for various VA payments (pensions, dependency-indemnity compensation, etc.).

Thirteen percent of the living

veterans were sixty-five or older last year. That figure will rise to twenty-two percent by 1980.

The agency reported that it spent \$4.1 billion last year to operate its vast medical program, which includes eighty-six nursing-home units with 7,100 beds and eighteen domiciliaries with 10,200 beds.

VA physicians, meantime, are focusing heavily on aging problems

and treatment of older Americans. Prominent in this effort are Dr. James C. Folsom, Chief of Rehabilitation Medicine at the agency's Medical-Surgery Department, Washington, D. C., and Dr. Leo Hollister of the Palo Alto, Calif., VA hospital.

OER Controls Broadened

When Air Force in late 1974

Ed Gates . . . Speaking of People

The 'Fair Market Rental' Proposal

After years of automatically relieving service members who live on base of their housing allowances, the Pentagon has come out strong for a "fair market rental" (FMR) system for both bachelors and marrieds. Each would pay the fair cost of the quarters occupied.

Sounds like a good idea. But first let's take a look at the legislative proposal the Defense Department recently sent to Congress, which, if enacted, will set the scheme in motion. While some members stand to benefit, others would be hit in their pocketbooks.

The Department has advanced the fair rental proposition on the basis that it will save Uncle Sam an estimated \$52 million next fiscal year, increasing to \$700 million in annual savings by FY '84. This kind of advertising, of course, is attractive to government leaders trying to restrain the growth of military outlays.

But some authorities insist the contemplated savings in FMR are grossly exaggerated.

The fair rental proposition is closely linked with pay raises. The President decides the percentage of each active-duty boost; unless Congress disagrees, it becomes law. The present rules also state that whatever the size of a raise, it must be applied equally to quarters allowance (BAQ), subsistence allowance (BAS), and basic pay.

The new proposal, however, would let the President place an abnormally large portion of each future raise, including next fall's, into BAQ. This would mean smaller shares into basic pay. Next fall's raise is scheduled to average about 4.5 percent.

By following this pattern until FY '84, Defense reasons, BAQ will pretty much equal the cost of on- and off-base housing, and occupants will then be paying a "fair market rental." Unlike today, off-base residents should find that the expanded BAQ will cover their full housing costs.

Poorly housed on-base bachelors won't lose all their BAQ; they'll keep some of it, Defense officials promise. They realize that, generally speaking, "bachelor quarters have value substantially below current BAQ rates." This should silence long-standing gripes from many single members.

While several thousand single airmen and officers currently are allowed to reside off base and still draw BAQ, the majority are not—their on-base quarters are officially "adequate." But single members are pressing for "freedom of choice" in housing, a concept Air Force supports but hasn't adopted because of the extra expense of additional BAQ payments. With "fair rental," however, the pressure for the live-off-the-base option would increase. Officials cited one possibility under review: start freedom-of-choice for E-5s and above.

A handful of USAF's on-base family quarters are labeled "inadequate" and occupants pay only about seventy-five percent of their BAQ. But most family housing takes the full

allowance, and most occupants gladly comply. They "make money," knowing that the current monthly BAQ rates—generally well under \$200 for airmen and in the \$200 to \$300 range for most officers—are below actual utility and maintenance costs and rent equivalent.

Packing much of future pay raises into the housing allowance actually may make on-base living somewhat less attractive, for residents would be surrendering more money. They'd actually "see" less of each raise than would people living off-base, and the larger forfeitures would reduce government outlays.

The diminished attractiveness of on-base quarters is linked, at least in part, to the government's decision to cease building additional on-base family quarters.

A good many families living off base, meanwhile, should find much to applaud in the proposed FMR. They would receive 100 percent of their raises. And, with larger shares going into BAQ, which is not taxable, their "tax advantage" will increase. Although some service members scoff at this item of compensation, it is genuine.

By shifting much of future pay raises from basic pay into BAQ—"depressing basic pay," Air Staffers say—Defense expects to save considerable money. A major concern among most troops, however, is that this will severely "restrain" the growth of retirement pay, which is calculated on basic pay alone.

As a matter of fact, USAF experts believe that such action would create a serious inversion between retirement pay for current and future retirees. They recently told the Defense Department it is possible that a person retiring in 1984 would receive less retirement pay than a member (similar length of service and pay grade) who retired before 1968.

USAF officials also have grave doubts about the claimed savings of FMR to the government. They say a detailed analysis might well reveal a large loss in income tax revenues, additional overhead administrative costs, oversea implementation problems, and other difficulties. These could add up to the conclusion that the plan "should be substantially modified or abandoned," these authorities said.

What the government should do, in the view of these Air Staff experts, is wait for the upcoming report of the Quadrennial Review of Military Compensation (QRMC) before deciding to alter the pay-allowance system with the fair rental feature. The QRMC for more than a year has been examining all military compensation items and studying a single salary system. This could clash head-on with Defense's proposed shift in the disbursement of basic pay and BAQ.

It's quite true, as Defense notes, that the present BAQ arrangement penalizes many members. But the Department's complex overhaul proposal hardly seems to be the answer, at least at this point. ■

The Bulletin Board

adopted the "controlled" OER system, its 875 chaplains were omitted; they continued to be rated under the old rules. Result: half received a top block rating, while nearly all got in the top two blocks.

But no more. The men of the cloth have been placed under the same tough controls as other officers, meaning that only twenty-two percent will now rate the top block. Half must receive third blocks.

Controversy, meantime, continues to engulf the overall controlled system throughout the service. Hq. USAF officials are keeping an extra close eye on the program. Individual officers follow selection board results closer than ever as they try to determine what a "one," "two," or "three" block rating really means to their promotions and careers. The next major event for OER watchers: the August 9 temporary majors selection board, when thousands of captains who recently received their first "controlled" rating will be weighed for advancement. The tension is mounting.

Short Bursts

The same IRS decision affecting scholarships of medical students preparing to become military doctors has made **ROTC scholarships subject to federal income taxes**. The value of the ROTC pacts varies, but with college fees soaring generally, they could be worth \$5,000 a year at some private schools. There are attempts under way to get the new tax removed. Meantime, Air Force isn't hurting for AFROTC scholarship applicants. Nearly 12,000 high school seniors recently competed for 405 scholarships allocated for this fall's freshmen. Another forty-five fall scholarship entries will be airmen.

The Defense Department now considers the **family housing deficit service-wide** to be a mere 5,000 units. However, this is misleading, for it doesn't include low ranking families, thousands of whom are far from adequately housed.

Once again Hq. USAF has urged

all hands to try to have their problems solved locally before contacting congressmen or other high government officials. It's good advice, for "congressionals" are expensive, time consuming, and usually provide no solution whatsoever. Rarely do they change anything. Helpful, sympathetic CBPOs can usually provide better answers, the Military Personnel Center noted recently. Meanwhile, USAF's Inspector General, Lt. Gen. Donald G. Nunn, feels that **ninety-five percent** of all complaints could be solved locally.

Last year, Congress started nudging the Administration to **cut the pay of service academy cadets**, it having risen to \$333 per month (half of O-1 basic pay). The President then suggested it be trimmed to \$125 plus expenses. The Defense Department subsequently proposed a total of \$295 a month. Next, the Office of Management and Budget countered with a \$265 figure, but amended that by endorsing a freeze at the current rate "until annual military pay raises cause the \$265 rate to reach . . ." the \$333 figure. Next step in the process: getting a formal proposal to Congress.

Air Force aero clubs completed flying activities during 1975 **without a single fatal accident**. That's never happened before. The clubs' safety record began improving in 1971 when fatalities dropped from 1.46 per 100,000 flying hours to 0.4 in 1973, to zero last year.

June 1 is the effective date of a major new directive outlining **USAF's new three-tier enlisted structure**. New AFR 39-6 also, for the first time, spells out the levels of professional military education an airman within each tier should seek. Responsibilities expected of each grade are defined. The tiers are Apprentice/Trainee (E-1 through E-4 Senior Airman); Technician/Supervisor (E-4 Sergeant through E-6); and Supervisor/Manager (E-7 through E-9). New AFR 39-6 replaces AF Manual 39-6.

Acknowledging that recomputation of military retirement pay isn't going anywhere, The Retired Officers Association is trying a new ploy: talk Congress into giving service members who retired before 1967 a **\$5,000 income tax deduction**. These people left active service before the frequent pay raises made their appearance.

Senior Staff Changes

CHANGES: B/G James A. Abrahamson, from Insp. Gen., Hq. AFSC, Andrews AFB, Md., to Dep. for F-16, ASD, AFSC, Wright-Patterson AFB, Ohio . . . **B/G Thomas G. Bee**, from Audit. Gen. & Cmdr., Hq. AFAA, Norton AFB, Calif., to DCS/Compt., Hq. AFSC, Andrews AFB, Md., replacing B/G Hans H. Driessnack . . . **B/G (M/G selectee) Richard B. Collins**, from Dep. Dir. of Plans & Policy, DCS/P&O, Hq. USAF, Washington, D. C., to Dir., J-5, USEUCOM, Vaihingen, Germany, replacing M/G William B. Yancey, Jr. . . . **B/G Joseph B. Dodds**, from DCS/Compt., Hq. ATC, Randolph AFB, Tex., to Audit. Gen. & Cmdr., Hq. AFAA, Norton AFB, Calif., replacing B/G Thomas G. Bee . . . **B/G Hans H. Driessnack**, from DCS/Compt., Hq. AFSC, Andrews AFB, Md., to DCS/Pro. & Prod., Hq. AFSC, Andrews AFB, Md. . . . **B/G Charles B. Knudson**, from Asst. Dir. for Instls. & Log., NSA, Ft. Meade, Md., to DCS/Air Trans., Hq. MAC, Scott AFB, Ill. . . . **M/G Lloyd R. Leavitt, Jr.**, from Cmdr., Chanute TTC, ATC, Chanute AFB, Ill., to DCS/Ops. & Intel., USAFE, Ramstein AB, Germany . . . **Col. (B/G selectee) James E. Light, Jr.**, from Cmdr., 28th BWg, SAC, Ellsworth AFB, S. D., to Cmdr., 57th Air Div., SAC, Minot AFB, N. D., replacing B/G George D. Miller.

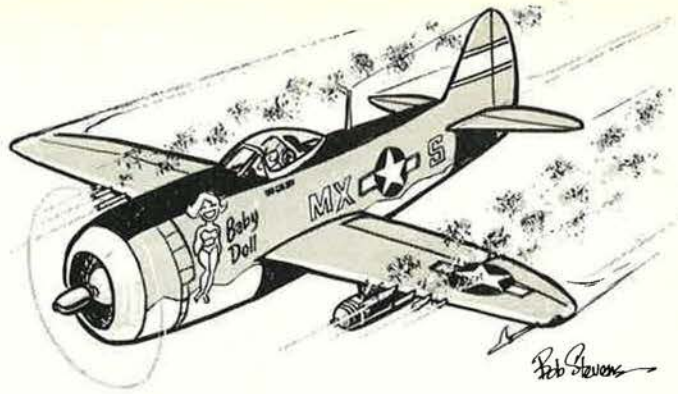
B/G James H. Marshall, from Dep. for Engrg., ASD, AFSC, Wright-Patterson AFB, Ohio, to Insp. Gen., Hq. AFSC, Andrews AFB, Md., replacing B/G James A. Abrahamson . . . **B/G George D. Miller**, from Cmdr., 57th Air Div., SAC, Minot AFB, N. D., to Asst. DCS/Ops., Hq. SAC, Offutt AFB, Neb., replacing M/G John J. Murphy . . . **M/G John J. Murphy**, Asst. DCS/Ops., Hq. SAC, Offutt AFB, Neb., to DCS/Log., Hq. SAC, Offutt AFB, Neb. . . . **M/G Slade Nash**, from Chief, MAAG, Republic of China, Taipei, Taiwan, to Chief, MAAG, Spain, Madrid, Spain . . . **M/G Edwin W. Robertson II**, from V/C Sixteenth AF, USAFE, Torrejon AB, Spain, to Cmdr., Chanute TTC, ATC, Chanute AFB, Ill., replacing M/G Lloyd R. Leavitt, Jr. . . . **M/G William B. Yancey, Jr.**, from Dir., J-5, USEUCOM, Vaihingen, Germany, to V/C, Sixteenth AF, USAFE, Torrejon, Spain, replacing M/G Edwin W. Robertson II. ■

These comments by a P-47 Thunderbolt pilot concerning the Close Air Support mission were published by Air Force Magazine thirty years ago.

It was our experience that excessive speed both in dive-bombing and in strafing was a great disadvantage... strafing speeds in excess of 300 mph did not put us in range long enough to produce lethal concentration.

"Strafing passes generally were initiated from an altitude of 1,500 to 3,000 feet. This seemingly low altitude for strafing was necessary for the squadron leader to pick up a maximum number of targets of opportunity.

"I will concede that high speed strafing reduces the effectiveness of anti-aircraft opposition but extremely high speed attacks cannot give the proper ground support that our ground armies ask for....



"From personal participation and observation the modern fighter-bomber must be maneuverable, relatively slow, rugged and high powered, also capable of carrying great loads long distances.

"The fighter-bomber of the European Theater was the Thunderbolt and unless there are radical changes in the method of waging war... it will be this type of aircraft that will afford the greatest amount of co-operation for our ground armies.

Today - as in World War II - Close Air Support demands the best men and the best machines.



FAIRCHILD
INDUSTRIES

A-10

AFA's 30th Anniversary National Convention and its 1976 Aerospace Briefings and Displays will be held at the Sheraton-Park and Shoreham-Americana Hotels, September 20-23. Accommodations are limited at the Shoreham-Americana Hotel and will be used primarily by other



Executive's Reception and Buffet.

We urge you to make your reservations at the Sheraton-Park Hotel as soon as possible to ensure obtaining your reservations. Arrivals after 6:00 p. m. require a one-night deposit for the night of arrival.



organizations meeting in conjunction with AFA's 1976 National Convention.

All reservation requests for rooms and suites at the Sheraton-Park Hotel should be sent to: Reservations Office, Sheraton-Park Hotel, 2660 Woodley Road N.W., Washington, D.C. 20008.



Be sure to refer to AFA's National Convention when requesting reservations. Otherwise, your reservation requests will not be accepted by the Sheraton-Park.

AFA's National Convention activities will include luncheons for the Secretary of the Air Force and the Air Force Chief of Staff, and the Air Force Anniversary Reception and Dinner Dance. The National Convention will also include AFA's Business Sessions, Conferences, and several invitational events, including the President's Reception, the Annual Outstanding Airmen Dinner, and the Chief



PLAN NOW TO COME TO WASHINGTON, D.C., TO ATTEND . . .

AFA's 30th Anniversary National Convention September 20, 21, 22 and its 1976 Aerospace Briefings and Displays September 21, 22, 23

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OREGON (Corvallis, Eugene, Portland): **Philip G. Saxton**, 15909 N. E. Morris, Portland, Ore. 97230 (phone 503-254-0145).

PENNSYLVANIA (Aliquippa,

Allentown, Chester, Erie, Homestead, Horsham, King of Prussia, Lewistown, New Cumberland, Philadelphia, Pittsburgh, State College, Washington, Willow Grove, York): **Lamar R. Schwartz**, 390 Broad St., Emmaus, Pa. 18049 (phone 215-967-3387).

RHODE ISLAND (Warwick): **Matthew Puchalski**, 143 TAG RIANG, Warwick, R. I. 02886 (phone 401-737-2100, ext. 36).

SOUTH CAROLINA (Charleston, Columbia, Greenville, Myrtle Beach, Sumter): **Roger K. Rhodarmer**, 412 Park Lake Road, Columbia, S. C. 29204 (phone 803-788-0188).

SOUTH DAKOTA (Rapid City): **James Anderson**, 913 Mt. Rushmore Rd., Rapid City, S. D. 57701.

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tullahoma): **James W. Carter**, 314 Williamsburg Rd., Brentwood, Tenn. 37027 (phone 615-373-9339).

TEXAS (Abilene, Austin, Big Spring, Corpus Christi, Dallas, Del Rio, El Paso, Fort Worth, Houston, Laredo, Lubbock, San Angelo, San Antonio, Waco, Wichita Falls): **Vic Kregel**, P. O. Box 9495, San Antonio, Tex. 78204 (phone 214-266-2242).

UTAH (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Robert D. Walker**, 283 W. 550 N. Clearfield, Utah 84015 (phone 801-825-0267).

VERMONT (Burlington): **R. F. Wissinger**, P. O. Box 2182, S. Burlington, Vt. 05401 (phone 802-863-4494).

VIRGINIA (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **Lester J. Rose**, 177 Corinthia Dr., Denbigh, Va. 23602 (phone 804-877-4372).

WASHINGTON (Port Angeles, Seattle, Spokane, Tacoma): **Theodore O. Wright**, P. O. Box 88850, Seattle, Wash. 98188 (phone 206-237-0706).

WEST VIRGINIA (Huntington): **Evelyn E. Richards**, 10 Berkley Pl., Huntington, W. Va. 25705 (phone 304-529-4901).

WISCONSIN (Madison, Milwaukee): **Charles W. Marotske**, 7945 S. Verdev Dr., Oak Creek, Wis. 53154 (phone 414-762-4383).

WYOMING (Cheyenne): **Robert R. Scott**, 508 W. 27th St., Cheyenne, Wyo. 82001 (phone 307-634-2121).

AFA News

By Don Steele, AFA AFFAIRS EDITOR

Unit of the Month

THE RUSHMORE CHAPTER, SOUTH DAKOTA . . .

cited for consistent and effective support of the Air Force and AFA's mission, most recently exemplified in its dinner dance honoring South Dakota's Governor and the Commander of the Military Airlift Command.



—USAF PHOTO

The Hon. Thomas C. Reed, Secretary of the Air Force, was the guest of honor at a reception recently sponsored by AFA's Nation's Capital Chapter. In the photo, Secretary Reed, right, and Chapter President James M. McGarry, Jr., greet Gen. David C. Jones, USAF Chief of Staff. Waiting in the receiving line are, from left, Claude Witze, Senior Editor, AIR FORCE Magazine, and Gen. Robert J. Dixon, Commander, Tactical Air Command.



—USAF PHOTO

At the Nation's Capital Chapter reception held in his honor, Air Force Secretary Thomas C. Reed, second from right, chats with, from left, the Hon. William I. Greener, Jr., Assistant Secretary of Defense (Public Affairs); James H. Straubel, Executive Director, Air Force Association; and Chapter President James M. McGarry, Jr.

The guests of honor and participants in the Colin P. Kelly Chapter's annual "Salute to the Commanders" at Griffiss AFB, included, from left, Col. George Tynan, 416th Bomb Wing (H) Commander; Col. Lloyd Giesy, Rome Air Development Center Commander; Gen. William J. Evans, Commander, Air Force Systems Command (AFSC) and the guest speaker; Chapter President H. J. Hyde, Jr.; New York State AFA President Kenneth Thayer; Brig. Gen. William R. Yost, Commander, Northern Communications Area (AFCS); Col. Elton Hall, Griffiss AFB Commander; Lt. Col. Arnold Lubin, 416th Hospital Commander; and Lt. Col. Fred Williams, 49th Fighter Interceptor Squadron Commander. The function was held at The Beeches Restaurant in Rome, N. Y.



AFA's Lake Superior Northland Chapter recently held a dinner dance in the K. I. Sawyer AFB NCO Club to observe AFA's thirtieth anniversary. The keynote speaker was Lt. Gen. Richard M. Hoban, Commander, Eighth Air Force (SAC), and the guest of honor was Mr. Lynn B. Coleman, the Chapter's first president. During the program, Mr. Coleman, who also is chairman and chief executive officer of the Lake Superior and Ishpeming Railroad Co., received several awards for his dedicated service to the Air Force, to AFA, and to the Chapter. In the photo, Col. Judson H. Ruth, right, Base Commander, presents Mr. Coleman, left, a painting as Chapter President Phillip Thorson, center, looks on. The painting, which includes patches from all squadrons on base, names him an Honorary Base Commander.

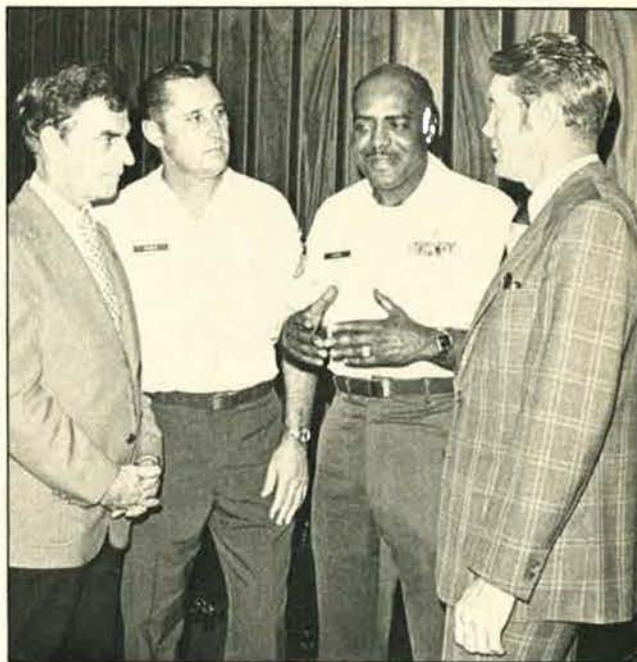


chapter and state photo gallery



—UTAH ANG PHOTO BY MSGT. EDWARD P. LILE

MaJ. Gen. John J. Pesch, Director, Air National Guard, was the guest of honor and speaker at a recent dinner meeting sponsored by AFA's Salt Lake City Chapter. In the photo, General Pesch is shown accepting a metal flag stand from MSgt. Jerry E. Chidester, who made the stand for the General. Seated at the head table are, from left, Chapter President Leigh H. Hunt; Mrs. Roland R. Wright, wife of the Utah Air National Guard Chief of Staff; and Chapter Vice President Darr Alkire, Brig. Gen. USAF (Ret.).



Chief Master Sergeant of the Air Force Thomas N. Barnes was the guest of honor and speaker at a recent meeting of the Jerry Waterman Chapter at the MacDill AFB NCO Club, Fla. Shown are, from left, Chapter Vice President Walter W. Millard; CMSgt. Robert Harris, Sr., Enlisted Advisor to the Commander of the Tactical Air Command; CMSAF Barnes; and Chapter President D. G. Bocock.

COMING EVENTS . . .

New Jersey State AFA Convention, Sky Lodge Inn, Wrightstown, June 4-5 . . . **Wisconsin State AFA Convention**, Layton Ave. Howard Johnson's Motor Lodge, Milwaukee, June 5-6 . . . **New York State AFA Convention**, The Beeches, Rome, June 10-13 . . . **Pennsylvania State AFA Convention**, Airport Hilton Inn, West Pittsburgh, June 11-12 . . . **Virginia State AFA Convention**, Ramada Inn, Roanoke, June 12 . . . **Oklahoma State AFA Convention**, Tinker AFB Officers' Club, June 18-19 . . . **Michigan State AFA Convention**, Selfridge AFB, June 19 . . . **Oregon State AFA Convention**, Sheraton-Portland Hotel, Portland, June 25-26 . . . **Georgia State AFA Convention**, Holiday Inn, Warner Robins, June 26.

Texas State AFA Convention, Stouffer's Greenway Plaza Hotel, Houston, July 23-25 . . . **AFA's 30th Anniversary National Convention**, Sheraton-Park Hotel, Washington, D. C., September 19-22 . . . **AFA's Aerospace Development Briefings and Displays**, Sheraton-Park Hotel, Washington, D. C., September 21-23 . . . **Eighth Annual Bob Hope AFA Charity Golf Tournament**, March and Norton AFBs, Calif., October 2-3 . . . **AFA Symposium** entitled "The Imperatives for National Readiness," Hyatt House Hotel, at the Los Angeles International Airport, Los Angeles, Calif., October 22-23.



—PHOTO BY TOM TEIGUE

During the graduation banquet of the Air Training Command's NCO Academy Class 76-01, MSgt. Eric E. Williams received the coveted ATC Commander's Trophy as the graduate most singularly distinctive in both the academic and leadership phases of the course. Shown following the presentation are, from left, Mrs. Ronald H. Jacobson and T. A. Glasgow, Alamo Chapter Awards Chairman and Vice President, respectively; Sergeant Williams; and CMSgt. Brian Bullen, Senior Enlisted Advisor for the Air Training Command (ATC), who presented the award in behalf of Lt. Gen. John W. Roberts, ATC Commander. The trophy was donated by AFA's Alamo Chapter to show its interest in and appreciation for the professional education of the NCO.

AFA News



AFA President George M. Douglas was the guest of honor and speaker at the General Thomas P. Gerrity Chapter's spring dinner meeting in the Tinker AFB Officers' Open Mess. Shown are, from left, Leonard "Tad" Allen, Raymond D. Holsey, and David L. Blankenship, Oklahoma State AFA Vice President, Secretary, and President, respectively; Mr. Douglas; Altus Chapter President Aaron Burleson; Enid Chapter President Hugh Thurman; and Gerrity Chapter President Harley A. Main.



—USAF PHOTO BY TSGT. RICK PATRICK



At the Pueblo, Colo., Chapter's recent Awards Program, Air Force Academy Second Classman James Glass introduces the USAFA Falcon "Conan" to award winners and Chapter officers. They are, from left, CAP Capt. Wayne R. Lord, recipient of the Chapter's Aerospace Education Award; Chapter President Mel Harmon; Chapter Awards Committee Chairman Boyd Damkohler; Cadet Glass; and CAP Cadet Michael Wermers, recipient of the Chapter's "Most Progressive Cadet" award.

INTERESTED IN JOINING A LOCAL CHAPTER?

For information on AFA chapters in your area, write:
 Assistant Executive Director/Field Operations
 Air Force Association
 1750 Pennsylvania Ave., N. W.
 Washington, D. C. 20006

More than 300 members and guests attended the Rushmore Chapter's recent dinner dance in the Ellsworth AFB Officers' Open Mess. Gen. Paul K. Carlton, Commander, Military Airlift Command, and South Dakota Governor Richard K. Kneip were the guest speakers. Shown are, from left, Chapter Secretary Hoadley Dean; General Carlton; Col. James Anderson, USAF (Ret.); Governor Kneip; and Col. Judson C. Faurer, 44th Strategic Missile Wing Commander at Ellsworth AFB.



AFA Board Chairman Joe L. Shosid, center, was the guest speaker at the 7th Bomb Wing's Dining-In recently held at Carswell AFB, Tex., to celebrate the thirtieth anniversary of the Strategic Air Command. Head-table guests were, from left, J. C. Pace, Board Chairman and Chief Executive Officer, Kimbell Foods; AFA's Fort Worth Airpower Council Chairman Herman Stute; Col. David E. Blais, 7th Bomb Wing (SAC) Commander; Mr. Shosid; Brig. Gen. Thomas P. Conlin, 19th Air Division (SAC) Commander; AFA's Fort Worth Chapter President Folix E. Ankele; Fort Worth Chamber of Commerce President Ed B. Collett; and James R. Terrell, Manager, KTVT-TV and Chairman of this year's United Way Campaign.

chapter and state photo gallery



Honored guests at a Dining-Out held recently at the Hurlburt Field, Fla., Officers' Open Mess, included Maj. Gen. Howard M. Lane, center, Commander, Armament Development and Test Center, Eglin AFB; and Dr. Malcolm C. Crotzer, right, President of AFA's Eglin Chapter. The event was hosted by Brig. Gen. William J. Holton, left, Commander, 1st Special Operations Wing, and observed the Tactical Air Command's thirtieth anniversary. The gentlemen are admiring one of a series of posters on the ten commanders in TAC's thirty-year history.



US Representative David R. Bowen (D-Miss.), center, was the guest speaker at a recent meeting of AFA's Golden Triangle Chapter at the Columbus AFB Officers' Open Mess. In his address, Representative Bowen said, "... we cannot afford to have a second-class Air Force, Army, or Navy. If we allow that, one day we will wake up and find ourselves so economically strangled in world markets and sources of supply that the livelihood of every American family will be jeopardized." Shown with Representative Bowen are Col. James S. Creedon, left, 14th Flying Training Wing Commander; and Chapter President Jesse Elkin, right.



AFA's Hoyt S. Vandenberg Chapter, together with the Society of Women Engineers, the Women's Aeronautical Association, the Michigan 99s, and the Zonta Clubs of Detroit, recently cosponsored the Amelia Earhart Commemorative Luncheon at the Regency Hyatt Hotel in Dearborn, Mich. During the program, the AFA Chapter awarded an AFA Citation to CAP Cadet Col. Donald Parman in recognition of his contributions to the Civil Air Patrol and his accomplishments in the CAP Cadet program. Shown during the presentation are, from left, Chapter President Richard Mossoney, Michigan State AFA President Dorothy Whitney, Cadet Parman, and CAP Col. R. Shiebel, Commander, Michigan Civil Air Patrol.



While visiting Tyndall AFB, Fla., in his military role as mobilization assistant to the Vice Commander of the Aerospace Defense Command, AFA President George M. Douglas, a brigadier general (major general selectee) in the Air Force Reserve, took time out to be the luncheon speaker at a luncheon meeting of AFA's Panama City Chapter. Shown at the luncheon are, from left, Chapter President John Williams; General Douglas; Frank Parker, the Chapter's first president; and Maj. Gen. Frank H. Spink, AFRES, mobilization assistant to the North American Air Defense Command commander.

AFA News

—PHOTO BY ROBERT FLOURNOY, YAANG



Richmond, Va., Chapter President William E. Haymes, Sr., right, is shown with award recipients at the Chapter's recent Awards Dinner. They are, from left, MSgt. Robert W. Mantlo, Virginia Air National Guard "Airman of the Year 1975"; CAP Cadet Lt. Donald A. Wharton, Hanover Composite Squadron (CAP), "Outstanding Richmond Area CAP Cadet"; and TSgt. Larry W. Redmond, Det. 310, Air Force Recruiting, "Outstanding Richmond Area USAF Recruiter."

—USAF PHOTO



Col. George D. Moore, right, Commander, Officer Training School (OTS), Lackland AFB, Tex., presents the "Hats in the Air" photo to "Half Lieutenant" Bill Roth, President of AFA's Alamo Chapter. Mr. Roth, the outgoing chairman of the OTS Subcommittee to the Greater San Antonio Chamber of Commerce's Military Affairs Committee, received the honor in appreciation of his long and dedicated support of the school. He earned the coveted "Half Lieutenant" rank when he participated in "Operation Classmate," a program established by OTS and the Chamber to promote a spirit of cooperation between the military and civilian communities.



How many AFA chapters have their own billboard ad promoting membership in the chapter? The Wright-Memorial Chapter of Dayton, Ohio, is one of the fortunate chapters. Their billboard is located just outside the gate to Wright-Patterson AFB, and the ad was furnished through the courtesy of Fairchild Republic Co.



AFA's Danville Chapter hosted the recent quarterly meeting of the Virginia State AFA at the Danville Holiday Inn. The guest speaker at the evening dinner was Lt. Col. Richard L. Craft, Commander, 27th Squadron, 1st Tactical Fighter Wing, Langley AFB. Shown with Colonel Craft, left, are, from left, Richard C. Emrich, Vice President for AFA's Central East Region; Virginia State AFA President Les Rose; AFA National Director Joe Hodges; and Walter Barrick, a former Vice President for the Central East Region and a Past State and Chapter President.



The Sacramento Chapter's Awards and Honors Banquet, which is held annually to honor both outstanding military and civilian personnel in the Greater Sacramento Area, was held recently in the McClellan AFB Officers' Club. AFA President George M. Douglas was the guest speaker and also presented a number of awards. In the photo, Mr. Douglas, left, is shown presenting the Chapter's Outstanding Airman Award to CMSgt. Richard A. Lema.



Participants in the New Jersey State AFA's Second Annual Chapter Officer Orientation Workshop, which was held at McGuire AFB, included, from left, Don Steele, AFA's Assistant Executive Director/Field Operations; Francis E. Nowicki, Vice President for AFA's Northeast Region; AFA National Director James P. Grazioso, the moderator and the man who established the program; New Jersey State AFA President Joseph Bendetto; and AFA National Directors Herbert O. Fisher and Gerald V. Hasler.

chapter and state photo gallery



On January 9, 1793, French aeronaut Jean-Pierre Blanchard flew a balloon from Philadelphia, Pa., to Deptford, N. J., thus marking America's entry into the world of aviation. In observance of the 183d anniversary of this historic flight, Deptford Township's Bicentennial Committee sponsored a ceremony at the landing site, and an evening dinner dance at which the first Jean-Pierre Blanchard Award was presented to Vice Adm. Charles E. Rosendahl, USN (Ret.). Astronaut Henry W. Hartsfield, Col., USAF, was the speaker at the site ceremonies, and Bruno Gain, Deputy Consul General of France, spoke at the dinner dance. The New Jersey State AFA was instrumental in initiating the observance and the award, and cooperated in staging both functions. Shown during the award presentation are, from left, William J. Howard, Jr., Deptford Bicentennial Chairman and New Jersey State AFA Secretary; Deptford Mayor Ronald Marks; Gloucester County Freeholder John R. Maier; New Jersey State AFA President Joseph J. Bendetto; Admiral Rosendahl, and Rep. James J. Florio (D-N. J.). One of AFA's newest Chapters, the Adm. Charles E. Rosendahl Chapter, was named for the Admiral.



As Andrews Area Chapter President Tony Anthony, center, looks on, Bill Goyer, Vice President of the Northern Virginia Chapter, presents a \$200 check to Nick Masone, left, Executive Director, Air Force Enlisted Men's Widows and Dependents Home Foundation, on behalf of Chapter I of the NCO Academy Graduates, Marion, Wis. The presentation was made during a recent meeting of the Andrews Area Chapter. The Air Force Association continues to urge its local units and members to contribute to the support of this very worthy project. Contributions may be mailed to the Foundation at 354 Woodrow St., Fort Walton Beach, Fla. 32548.



Dr. James P. Gilligan, Deputy Assistant Secretary of the Air Force (Reserve Affairs), was the guest speaker at a recent dinner meeting of AFA's David D. Terry, Jr., Chapter. In the photo, Dr. Gilligan, left, is shown chatting with Col. Russell E. Mohney, center, 314th Tactical Airlift Wing Commander, and Hugh B. Patterson, publisher of the Arkansas Gazette.



Maj. Gen. Richard C. Henry, Vice Commander, Space and Missile Systems Organization (AFSC), was the guest speaker at a recent meeting of the Robert H. Goddard Chapter at the Alisal Guest Ranch in Solvang, Calif. Shown are, from left, Col. Alvin Reeser, Vice Commander, Space and Missile Test Center; Chapter President Bob Hull; Barbara Rowland, California State AFA Vice President (Southern Area); and General Henry.

—PHOTO BY J. W. JACKSON



The Captain Eddie Rickenbacker Memorial Chapter's annual awards to outstanding personnel of the 302d Tactical Airlift Wing (AFRES) at Rickenbacker AFB, Ohio, were presented during a recent Wing Commanders Call. Shown following the ceremonies are, from left, Chapter President Dick Hoerle; SSgt. Jeffrey L. Benson, Outstanding NCO; Capt. Jerry Trott, Outstanding Junior Officer; A1C Willie Brewer, Outstanding Airman; and Brig. Gen. J. L. Townsley, 302d Commander.



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These Figures Tell the Story!

Choose either the Standard or High-Option Plan

The AFA Standard Plan

Insured's Age	New Benefit	Old Benefit	Extra Accidental Death Benefit*	Monthly Cost Individual Plan
20-24	\$75,000	\$66,000	\$12,500	\$10.00
25-29	70,000	60,000	12,500	10.00
30-34	65,000	50,000	12,500	10.00
35-39	50,000	40,000	12,500	10.00
40-44	35,000	25,000	12,500	10.00
45-49	20,000	15,000	12,500	10.00
50-54	12,500	10,000	12,500	10.00
55-59	10,000	10,000	12,500	10.00
60-64	7,500	7,500	12,500	10.00
65-69	4,000	4,000	12,500	10.00
70-75	2,500	2,500	12,500	10.00

The AFA High-Option Plan

Insured's Age	New Benefit	Old Benefit	Extra Accidental Death Benefit*	Monthly Cost Individual Plan
20-24	\$112,500	\$100,000	\$12,500	\$15.00
25-29	105,000	90,000	12,500	15.00
30-34	97,500	75,000	12,500	15.00
35-39	75,000	60,000	12,500	15.00
40-44	52,500	37,500	12,500	15.00
45-49	30,000	22,500	12,500	15.00
50-54	18,750	15,000	12,500	15.00
55-59	15,000	15,000	12,500	15.00
60-64	11,250	11,250	12,500	15.00
65-69	6,000	6,000	12,500	15.00
70-75	3,750	3,750	12,500	15.00

AVIATION DEATH BENEFIT:

A total sum of \$15,000 under the Standard Plan or \$22,500 under the High-Option Plan is paid for death which is caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage.

Optional Family Coverage

(May be added either to the Standard or High-Option Plans)

Insured's Age	Spouse Benefit New	Spouse Benefit Old	Benefit, Each Child**	Monthly Cost Family Coverage
20-24	\$10,000	\$6,000	\$2,000	\$2.50
25-29	10,000	6,000	2,000	2.50
30-34	10,000	6,000	2,000	2.50
35-39	10,000	6,000	2,000	2.50
40-44	7,500	5,250	2,000	2.50
45-49	5,000	4,050	2,000	2.50
50-54	4,000	3,000	2,000	2.50
55-59	3,000	3,000	2,000	2.50
60-64	2,500	2,250	2,000	2.50
65-69	1,500	1,200	2,000	2.50
70-75	750	750	2,000	2.50

* In the event of an accidental death occurring within 13 weeks of the accident, the AFA plan pays a lump sum benefit of \$12,500 in addition to your plan's regular coverage benefit, except as noted under AVIATION DEATH BENEFIT, below.

** Each child has \$2,000 of coverage between the ages of six months and 21 years. Children under six months are provided with \$250 protection once they are 15 days old and discharged from the hospital.

AFA'S DOUBLE PROTECTOR—now with substantial benefit increases—gives you a choice of two great plans, both with optional family coverage. Choose either one for strong dependable protection, and get these advantages:

FAMILY PLAN. Protect your whole family (no matter how many) for only \$2.50 per month. Insure newborn children as they become eligible just by notifying AFA. No additional cost.

Wide Eligibility. If you're on active duty with the U. S. Armed Forces (regardless of rank, a member of the Ready Reserve or National Guard (under age 60), A Service Academy or college or university ROTC cadet, you're eligible to apply for this coverage. (Because of certain limitations on group insurance coverage, Reserve or Guard personnel who reside in Ohio, Texas, Florida and New Jersey are not eligible for this plan, but may request special applications from AFA for individual policies which provide similar coverage.

No War Clause, hazardous duty restriction or geographical limitation.

Full Choice of Settlement Options, including trusts, are available by mutual agreement between the insured and the Underwriter, United of Omaha.

Disability Waiver of Premium, if you become totally disabled for at least nine months, prior to age 60.

Keep Your Coverage at Group Rates to Age 75, if you wish, even if you leave the military service.

Guaranteed Conversion Provision. At age 75 (or at any time on termination of membership) the amount of insurance shown for your age group at the time of conversion may be converted to a permanent plan of insurance, **regardless of your health at that time.**

Reduction of Cost by Dividends. Net cost of insurance to AFA insured persons has been reduced by payment of dividends in 10 of the last 13 years. However, dividends naturally cannot be guaranteed.

Convenient Premium Payment Plans. Premium payments may be made by monthly government allotment, or direct to AFA in quarterly, semi-annual or annual installments.

EFFECTIVE DATE OF YOUR COVERAGE. All certificates are dated and take effect on the last day of the month in which your application for coverage is approved. AFA Military Group Life Insurance is written in conformity with the insurance regulations of the State of Minnesota. The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minnesota as trustee of the Air Force Association Group Insurance Trust.

EXCEPTIONS. There are a few logical exceptions to this coverage. They are:

Group Life Insurance: Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane shall not be effective until your coverage has been in force for 12 months.

The Accidental Death Benefit and Aviation Death Benefit shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or (4) During any period a member's coverage is being continued under the waiver of premium provision, or (5) From an aviation accident, either military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

PLEASE RETAIN THIS MEDICAL INFORMATION BUREAU PRENOTIFICATION FOR YOUR RECORDS

Information regarding your insurability will be treated as confidential. United Benefit Life Insurance Company may, however, make a brief report thereon to the Medical Information Bureau, a nonprofit membership organization of life insurance companies, which operates an information exchange on behalf of its members. If you apply to another Bureau member company for life or health insurance coverage, or a claim for benefits is submitted to such a company, the Bureau, upon request, will supply such company with the information in its file.

Upon receipt of a request from you, the Bureau will arrange disclosure of any information it may have in your file. (Medical information will be disclosed only to your attending physician.) If you question the accuracy of information in the Bureau's file, you may contact the Bureau and seek a correction in accordance with the procedures set forth in the federal Fair Credit Reporting Act. The address of the Bureau's information office is P.O. Box 105, Essex Station, Boston, Mass. 02112, Phone (617) 426-3660.

United Benefit Life Insurance Company may also release information in its file to other life insurance companies to whom you may apply for life or health insurance, or to whom a claim for benefits may be submitted.

Bob Stevens'

"There I was..."

IN THIS EPISODE WE DEAL WITH WHAT FIGHTER JOCKS REFERRED TO AS "BIG FRIENDS."

AND THEY WERE BIG IN MANY WAYS—ESPECIALLY IN THE FORTITUDE (OR "GUTS") DEPARTMENT.

HERE'S TO THE CREWS OF ALL THOSE FORTS, LIBs And '29s!

HOW CUM? THE POWERS THAT BE—IN THEIR INFINITE WISDOM—ALWAYS SELECTED THE RIGHT PHYSIQUE FOR THE JOB AT HAND? TAKE THIS B-17 CREW, F' INSTANCE:



BOMBARDIER TWEEDLE DEE
NAVIGATOR 2nd DUM
HERE HAD TO SHOEHORN INTO THIS OFFICE

PILOT THE HEADMAN
COPILOT IS CARRYING 2 CUSHIONS TO SEE OUT

ENGINEER (ALSO UPPER TURRET GUNNER)

BALL TURRET HE'S SQUOZE INTO THIS THING

RADIO "— OL' BOY

WAIST GUNNERS (WHOSE BEHINDS ALWAYS MET AMIDSHIPS IN BATTLE)

TAIL GUNNER "CHARLIE" WENT IN HERE

IT'S NOSTALGIA TIME, REMEMBER...?

...A FROSTY ENGLISH MORN AT 3AM, THE NISSEN HUT DOOR SQUEAKS OPEN and THE "WAKE-UP SGT." STARTS THE ROLL-OUT FOR THE DAY'S MISSION?

...TRYING TO GET A CUPPA COFFEE DOWN AFTER YOUR FIRST 10-HR MISSION?



...SURVIVING 25 and GETTING ONE OF THESE? ?



Sidewinder AIM-9L. In production and way out front in performance.

Raytheon has received the production release for the Sidewinder AIM-9L missile under a joint U.S. Navy/U.S. Air Force program. Sidewinder AIM-9L is the free world's most advanced, short-range, infrared, air-to-air missile.

Designed by the Naval Weapons Center, Sidewinder AIM-9L features marked improvements in maneuverability, accuracy, and lethality, combined with the addition of an all-aspect capability. As a prime industrial



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Configured for easy installation on a broad range of modern, tactical aircraft, Sidewinder AIM-9L has an extremely versatile deployment potential.

For details on Sidewinder AIM-9L, write to Raytheon Company, Government Marketing, 141 Spring Street, Lexington, Massachusetts 02173.



Sidewinder AIM-9L approaches head-on intercept of target drone at Naval Weapons Center, China Lake, California.

RAYTHEON



DC-10 tanker capability was flight-demonstrated as early as 1971. Here, an artist's conception shows the DC-10 refueling a McDonnell Douglas C-15 Advanced Medium STOL Transport (AMST).

For refueling or resupply, DC-10s can fill the gap.

There's a recognized need to upgrade the U.S. military airlift fleet with more modern aircraft – and a longer-range, non-stop capability.

The McDonnell Douglas DC-10 Tanker/Cargo jet is the economical answer. Backed by a long line of successful military and commercial transports, the DC-10 in either refueling or cargo configuration has a lower initial cost than 4-engined wide-body aircraft, allowing more flexibility and a larger fleet buy for the money.

It's a proven fuel-saver. And the DC-10's commercial airline service record clearly demonstrates its low maintenance/high reliability.

The DC-10 Tanker/Cargo jet. The most cost-effective route to a more efficient airlift fleet. **MCDONNELL DOUGLAS**



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Best for the long haul**