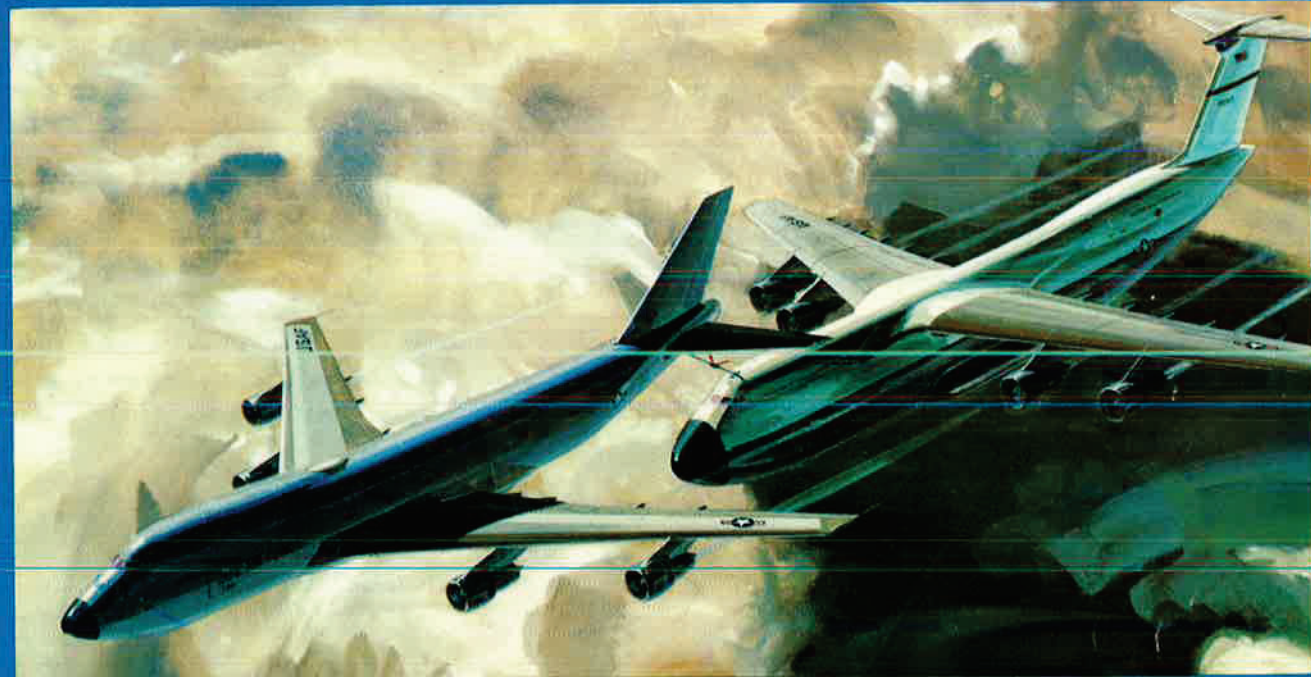


FEBRUARY 1975 / \$1

# AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE



## AIRLIFT'S NEW LOOK

A cargo/tanker derived from the 747 (above, fueling a C-5) or the DC-10 (left) could transform our strategic airlift. See p. 24

# Our ADAPT Aerospace Digital Computer.

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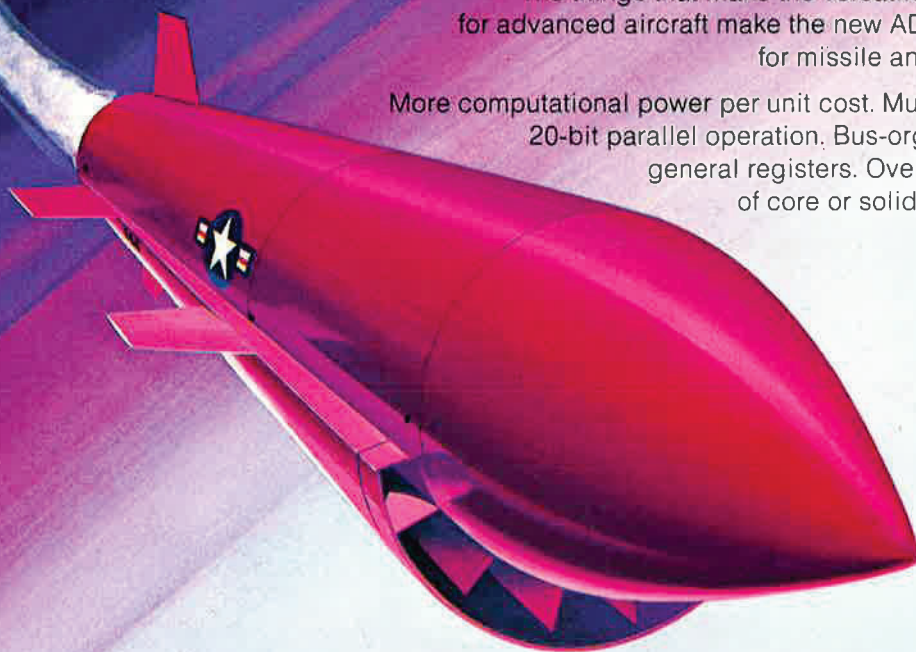
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# AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

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USAF is exploring the use of wide-body cargo/tankers to give strategic airlift greater range and to support SAC and TAC (see p. 24). Artists' conceptions on the cover show the C-5 being refueled by two candidates for the task: the Boeing 747, top, and the McDonnell Douglas DC-10.

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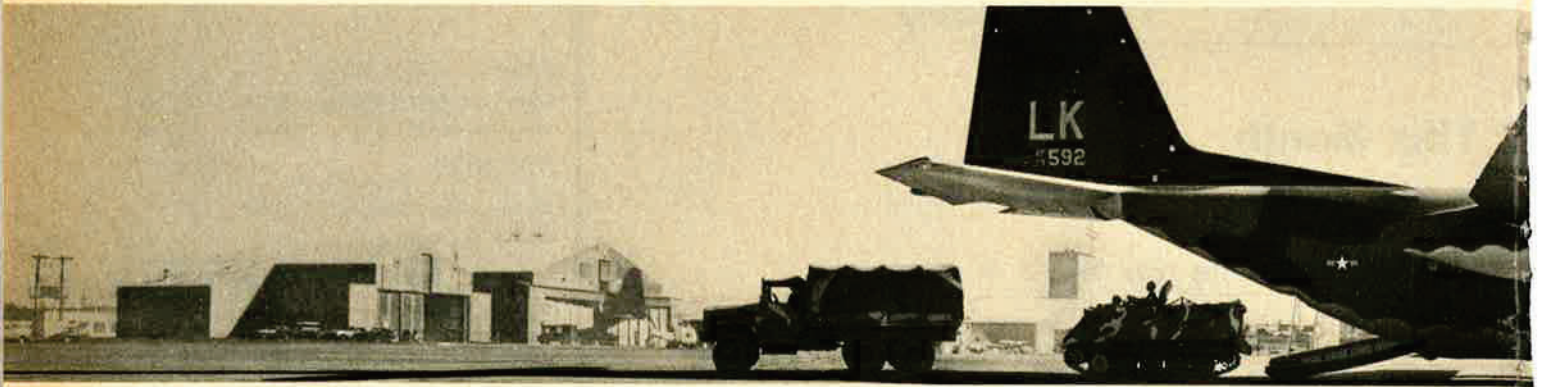
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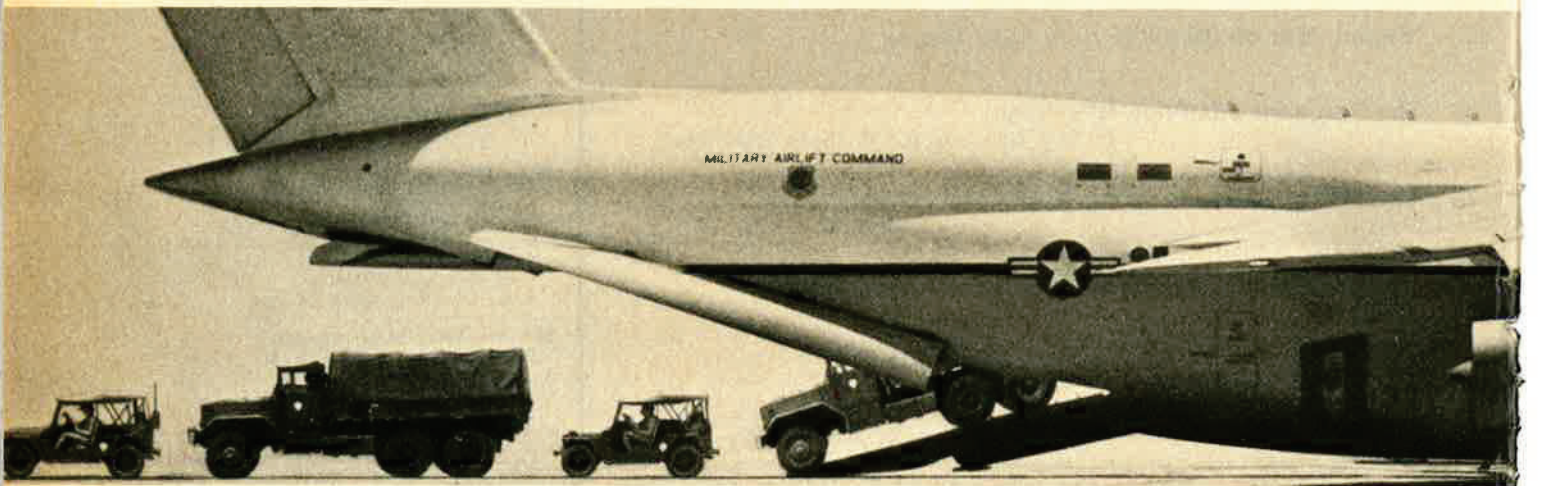
# You get more out of



The C-130 Hercules can carry 45,000 lbs. of outsized cargo.



The C-141 StarLifter can carry 72,000 lbs. of cargo across oceans.



The C-5A Galaxy can carry 220,000 lbs. of anything from giant Chinook helicopters to 50-ton M-60 tanks.

There are no airlifters like our airlifters.

At Lockheed-Georgia, we have the only airlift production line in the U.S. There we build our airlifters to do what other planes can't.

Just look at the C-130 Hercules. It doesn't need ground-handling equipment to load or unload from its rear doors at truck-bed height. A rear ramp can be lowered so completely assembled trucks and bulldozers can be driven right off to work.

The C-130 can land on 2,100 foot runways of sand, gravel and even snow. Or airdrop if it has to.

This timeless machine is the toughest, most proven

airlifter in the world. That's one thing 37 nations agree on.

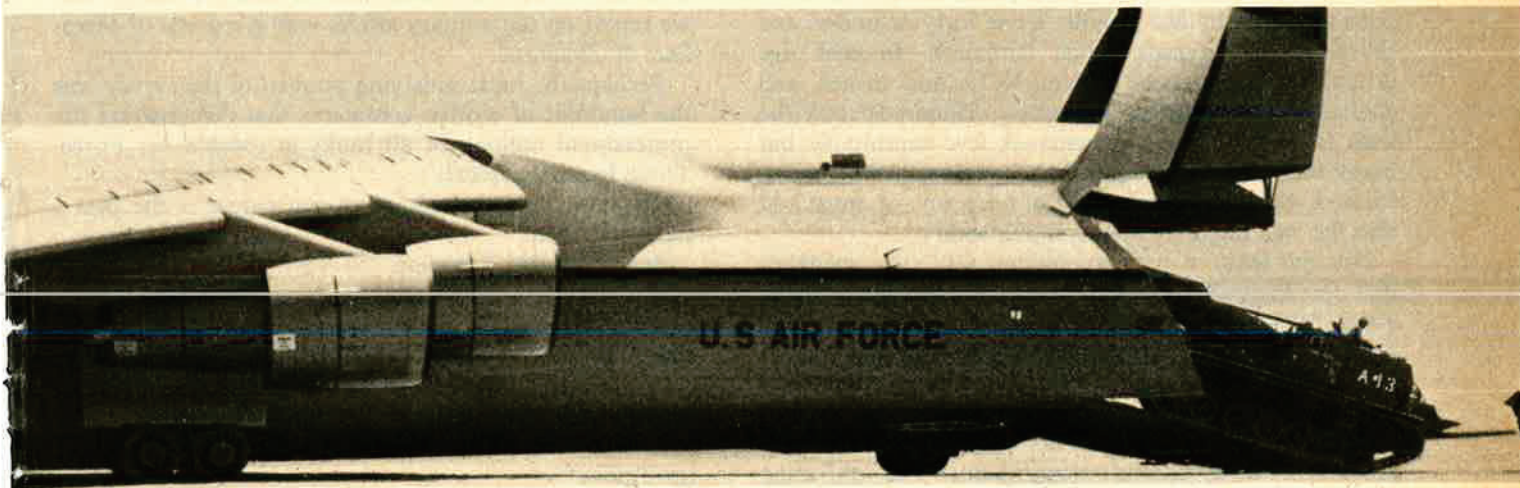
Then there's the C-141 StarLifter. This strategic airlifter is a plane of many missions. Ranging from personnel and cargo airlift to heavy airdrop.

Five-ton trucks and other large vehicles can be driven on and off through its rear cargo doors. And palletized cargo has been unloaded in less than 10 minutes.

To give the C-141 even more capability, the U.S. Air Force is planning to stretch the fuselage and add in-flight refueling.

And of course, the C-5A Galaxy. No other plane being developed or redesigned can match it, in capability or mission flexibility.

# a Lockheed Airlifter.



For one thing, the C-5A can carry cargo impossible for other planes. It's also the only plane that can load or unload cargo simultaneously through two huge cargo openings, front and rear.

The landing gear kneels so the cargo door is close to the ground. Then shoulder-high ramps lower to permit vehicles to be driven on and off.

As a result, the C-5A has been unloaded in only 30 minutes in actual operation.

The C-5A also saves precious time in the air. It can be refueled in flight. Airdrop when you can't land. Find its way in the worst weather with one of the world's most advanced

navigational systems.

It can land on unimproved runways as short as 1,200 feet. Take off in less than 3,000.

The C-5A is the most advanced airlifter in the world. And will be for years to come. It has even made a successful live-drop and launch of a Minuteman intercontinental missile.

The Lockheed Airlifters. They're the backbone of the Military Airlift Command. They're built by the company who knows more about building airlifters than anyone.

**Lockheed**  
Lockheed Aircraft Corporation

# READERS' CRITIQUE

**M**OST NCO supervisors and commanders will tell you there's one group you should listen to if you want to really find out how your outfit is doing. That group is the men and women who have been around long enough to understand what you're trying to do, but not so long that they've adjusted too comfortably to established ways of doing things.

Taking a page from that book, last November we sent out a questionnaire to 18,000 new members who joined the Air Force Association in the spring of 1974. Most of them are active-duty people, but the number includes a generous sprinkling of Air Force supporters who aren't in uniform. Members were asked to identify themselves on the questionnaire only by grade, AFSC, major command, age, and flying status.

Relating to AIR FORCE Magazine, members were asked if they read the regular monthly departments ("Airpower in the News," "Aerospace World," "Airmail," etc.) "always, frequently, seldom, or never." They had a chance to rate as "important," "interesting," or both, thirteen subject areas frequently covered in feature articles—such as defense policy, R&D, personnel, combat operations, and military history.

The first 4,000 questionnaires that came back have been analyzed by age groups: those forty or under, and those who have passed that landmark. In each age group, the responses of officers, NCOs and airmen, and civilians were tabulated separately. Hundreds took the time to add written comments—a few unprintable but many that offered thoughtful and constructive criticism. Immodestly but in the interest of accuracy, we must add that the vast majority were complimentary.

Not the least of our satisfaction was clear evidence that the magazine is being read. In both age groups, about seventy-nine percent of officers, eighty-five percent of NCOs and airmen, and eighty percent of civilians said that they spend from one hour to more than three hours each month reading AIR FORCE.

All grade and age groups showed a remarkable uniformity in rating monthly departments. The four most popular proved to be "Airpower in the News," "Aerospace World," Bob Stevens' monthly "There I Was" cartoon feature, and "Jane's All The World's Aircraft Supplement." From seventy-six percent to ninety percent of readers said they read these departments "always" or "frequently."

Low-level entry on the departmental totem pole was "Airman's Bookshelf," which fifty percent of officers and civilians and fifty-eight percent of NCOs and airmen read "always" or "frequently." In the publishing business, any monthly department that's read by half of a magazine's subscribers is considered to be in good health.

So far as feature articles are concerned, there again was surprising uniformity of opinion. Give or take a point or two in relative standing, all groups rated as "most important" our articles on defense policy, congressional activities, personnel, international relations, management, and R&D/new weapons. Least important ratings went to military history, activities at Air Force bases, and foreign air forces and equipment.

The same areas that scored lowest in "importance" stood at the top of the "interesting" category, while the "most important" subjects scored the lowest in the "interesting" bracket. But when "important" and "interesting" scores were combined, articles on new weapon systems came out on top.

Already we're working on ways to make the "important" articles more interesting and to bring out the professional importance of the kinds of articles that everyone agrees are interesting.

These relative rankings, plus written comments, have persuaded us that AIR FORCE Magazine should give more attention to management and the support areas. We're working on that, too. We also are intrigued by several suggestions for adding new categories of information. For instance, a number of members asked that we report on the military affairs voting records of Members of Congress.

Perhaps the most satisfying product of the survey was the hundreds of written comments that demonstrate the professional outlook of all ranks in today's Air Force. These four are typical:

**Captain:** "Your coverage of *our* career is the best I have ever seen."

**Senior Master Sergeant:** "A very professional magazine—must reading for any career officer/NCO."

**Sergeant:** "When your magazine started coming, I didn't see how I had lived without it. Fully eighty to ninety percent of what I've learned about the latest Air Force issues I learned from AIR FORCE Magazine."

**GS-13:** "AIR FORCE Magazine is the best of its kind I have seen."

Since you, as one of AFA's 130,000 members, may never be asked to fill out a questionnaire, we'll end this report with the words that closed a similar editorial memorandum on a different kind of survey four years ago:

"There's an alternate route for telling us what you do and don't like about AIR FORCE Magazine. It's called 'Airmail,' the letters-to-the-editor department.

"We urge you to use it. Only with your help can we make AIR FORCE a constantly better publication. After all, it's your magazine. We just manage it."

—THE EDITORS

# Conversation Pieces

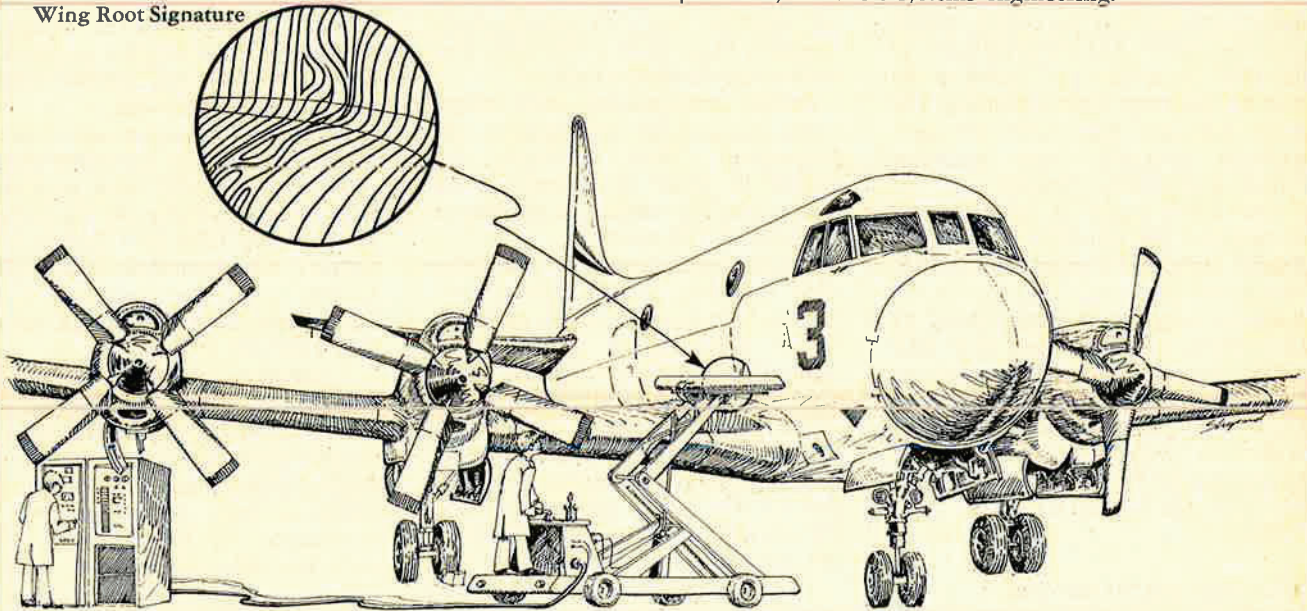
## Fault-Finding Without Tears

With today's huge high-speed aircraft, meticulously careful maintenance is essential to safety as well as to efficient operation. A vital element in every maintenance program is the kind of probing inspection that detects even invisible signs of corrosion, fatigue, and other early symptoms of deterioration in highly stressed structures.

This need has given rise to a whole new breed of test engineers. They use magnetism, high-frequency sound, penetrating dyes, and now the coherent light of laser beams to find the subtlest internal flaws before they become dangerous.

Under the innovative leadership of Dr. Pravin Bhuta, a TRW team has developed a system that uses holographic interferometry to reveal potential weaknesses in landing gear, wing panels, turbine blades, and other critical parts of aircraft. With the sponsorship of the U.S. Navy's Analytical Rework Program Office, the system has been successfully used in an ordinary maintenance environment.

Wing Root Signature



The first tests were conducted in a TRW lab, however, where wing panels from a P-3 patrol plane were inspected. The prototype holographic systems not only found every flaw that had been previously located by conventional methods but also found several that had not been detected at all.

The next step was to do the same kind of job under workaday maintenance conditions *without* disassembling parts or removing paints or sealants. The completed sys-

tem was taken to a Navy facility and the holographic equipment was mounted on a fork lift. It produced clear fringe patterns without external optics, whether it was pointed up, down, or sideways.

With this degree of mobility and flexibility, *in situ* inspection of critical parts becomes a practical reality not just for aircraft but for countless different kinds of structures. Compared with conventional methods, the saving in time alone is estimated to be as high as fifty percent.

When the technique has been fully developed, it will provide a cradle-to-grave record. Technicians will be able to compare the optical signature of the factory-new structure with later signatures, made during routine maintenance. Any significant differences will indicate the need for preventive repairs.

Dozens of promising ideas are under investigation at TRW, where we put the most advanced technology to work on the practical problems of defense, energy, transportation, and basic systems engineering.

For further information on the holographic interferometry system, write on your company letterhead to:

**TRW**  
SYSTEMS GROUP

Attention: Marketing Communications, E2/9043  
One Space Park, Redondo Beach, California 90278

## Good Question

*Gentlemen:* In the December issue of AIR FORCE Magazine, your editorial on page 6 states "...the USSR invests between thirty and forty percent of its GNP in arms,..."

On page 47 of the same issue, "The Military Balance" article [statistics under "The Soviet Union"] estimates USSR GNP for 1973 at 441 billion rubles and estimated defense expenditures for 1974 at 23.8 billion rubles. According to my calculations, this amounts to about 5.4%. From the same article, the US ratio is about 6.4%, which is about what your editorial states.

Whence the anomaly?

R. A. Wagner

Palos Verdes Estates, Calif.

• *The editorial reported that "several disillusioned Soviet economists have revealed that the USSR invests between thirty and forty percent of its GNP in arms..." There is no way of verifying their accuracy. We think they are high—that the percentage probably runs between fifteen and twenty percent.*

*The 5.4% figure is obtained by comparing the officially announced Soviet defense budget with GNP. The same percentage is given in the table on page 91. It is conceded by both hard- and soft-liners that 23.8 billion rubles is a ridiculously low figure for the Soviet defense budget. Note that "The Military Balance" states on page 47 that the cost of Soviet armed forces would be about \$96 billion at US prices.—THE EDITORS*

## View from Across the Sea

*Gentlemen:* "Yankee Ingenuity in England," written by Mr. Claude Witze [October 1974 issue], is in content and opinion unanswerable: quite right! The British *do* suffer from sour grapes where US technology is concerned—especially since much of it was originally British until the British government scrapped whole programs and encouraged scientists to go abroad!

However, let us get that jingoistic slant into perspective. The USAF's SR-71 was only sent to Farnborough to steal the scene. You know that;

I know that. The fact that it didn't is not something to get all uptight about. It is perhaps regrettable, but only natural, that the British aerospace press should concentrate mainly on what Britain or Europe is up to. After all, Farnborough is our show, and up until this year, almost exclusively so. We don't find the US press giving British exhibits major coverage at US shows, nor even the French or Germans at the two major European shows, if it comes to that.

Mr. Witze's whine about an undistinguished press finds a sympathetic ear with me. I often feel the same. However, we need to get all things into perspective. I find, as a press officer with a very large British electronics company, that even with the technical press in the US (let alone with newspapers) British technology and technical developments are often not reported just because, it seems to us at this distance, they are not US developments.

British newspapers and magazines are not US newspapers and magazines. They obviously are biased in favor of "home" news, just as the US magazines are biased in favor of US news.

British newspapers are nowhere near the size of US newspapers. Space for stories is at a premium. To an editor trying to sell newspapers to the British public, such back-up logistic information as Mr. Witze wanted to see is irrelevant to the story. I saw no shortage of British people and press reporters visiting the plane and talking with the crewmen and guards. The British people were interested in it.

In fact, I would cheerfully admit that even amongst the many US aerospace magazines I have read, none, other than AIR FORCE Magazine itself in this article, has reported the details so minutely. That's why I always try to read AIR FORCE Magazine.

As regards Arthur Reed's [London] *Times* style of writing—Arthur needs no defense by me. All I can say is that I find no difficulty with his sentences, nor, I suspect, do the other millions of readers of this the world's most prestigious newspaper. If simple sentence structure is re-

quired for Mr. Witze's understanding, I suggest that he read British newspapers geared for those of his intellectual standing: *The Sun* or *The Mirror*, perhaps.

But to return to the serious: I have no real argument with Mr. Witze. What I have tried to point out to you in this letter is that you are—unintentionally, I'm sure—guilty of the same prejudices and insularity of outlook as those whom you criticize. "Let him without sin cast the first stone..." I in no way exclude myself, incidentally. I'm as nationalistic as the next fellow, be he British or American.

Instead of only seeing what's wrong with each other, why can't we try to build cooperation? Mr. Witze mentioned the RAF support for the SR-71 if required. That was news. That's what could have made an article for AIR FORCE Magazine that would have built a positive response to US and British military and civilian personnel.

Instead of moaning about British technology being poached abroad (mainly to the US) here in Britain, why not concentrate on the cooperation of the USA and British aerospace developments—the MONA system jointly developed by British Decca and USA E-Systems, as just one example of many?

I maintain that Britain's technology of ten years ago, teamed with USA production and marketing techniques of ten years ago, would have made Britain and the USA an unbeatable team worldwide. As the conclusion of Mr. Witze's article only too ably pointed out, it *is* far too late for Britain and—I regret to have to say—far too late for even the USA. You are fast following Britain's desperate scramble into oblivion and bankruptcy!

John D. Stettaford  
North Watford  
Herts, England

## Conservatives or Liberals?

*Gentlemen:* In a letter printed in your December issue, Col. John M. Verdi, USMCR (Ret.), writes: "We tried the wrong defendants at Nuremberg. It was not Hitler and his crew who made World War II; it was



the foolish, improvident liberals whose incompetence and lethargy deceived him and persuaded him that the peoples they spoke for were degenerate and cowardly."

Colonel Verdi's history is not correct. In the late 1930s, it was primarily the conservatives, not the liberals, who opposed preparation for military confrontation with Hitler. One among many examples was a 1937 article John Foster Dulles wrote in *Atlantic Magazine* arguing that Hitler did not give us cause for serious concern. Another was Charles Lindbergh's continuing opposition to the war. In contrast, liberals such as George McGovern were prepared to sign up from the beginning.

The Vietnam experience has caused many Americans . . . to equate liberalism with pacifism, and conservatism with militarism. While there is some validity to this, it is by no means the whole story. Conservatives tend to be most strongly antagonized by economic authoritarianism (*i.e.*, communism). In contrast, liberals tend to be most strongly antagonized by political authoritarianism (*i.e.*, police states). This is why many liberals rejected the war in Vietnam while at the same time supporting a military commitment to Israel.

Robert Sherman  
Washington, D. C.

#### General Brown

*Gentlemen:* In reviewing your editorial, "Not Bigotry . . . But Concern," I am struck by your total failure to recognize that in addition to the inaccuracies and ignorance of General Brown's statements, his unauthorized public comment on American foreign policy is in itself cause for concern. By his unbelievable display of locker-room mentality, General Brown has shown himself to be undeniably unsuited for his position. I cannot help but wonder if General Brown has spent his thirty-two years of military service in a total vacuum. His "buzzword clichés" are reminiscent of the remarks made by similarly high-placed military officers in another place at another time.

The education General Brown is getting by the overwhelming critical public response to his verbal lapses may prove too expensive to the nation and to the Air Force. He has unfortunately put himself in a position of distrust and suspicion with many legislators and taxpayers who

will see in him an obstacle to the vital requirements of our necessary military posture.

Lt. Col. Irwin R. Ziff, USAF (Ret.)  
Fairfax, Va.

*Gentlemen:* I had been wondering how AIR FORCE Magazine would address the matter of General Brown's appearance at the Duke University seminar, and now I know! The comments in the January issue by Mr. Witze were clear-eyed and levelheaded, and their publication was to good purpose.

When General Brown was Commander of the Air Force Systems Command, I was in the aerospace industry on the West Coast where I could see the professionalism and leadership he brought to that job. They were, of course, the very qualities that resulted in his becoming Air Force Chief of Staff and then Chairman of the Joint Chiefs. He is a thoroughly good and decent man. Peter Kahn's comment, "There is absolutely no indication that General Brown in any way holds anti-Semitic views," is to be believed.

As for Mr. Witze, I have known him for almost thirty years. I have respect for his talents as an aerospace reporter. Witze's tongue, as

#### CALLING PAUL A. TODD

On December 5, 1943, a B-17 of the 388th Bomb Group started back to its base in England after taking part in a raid on enemy submarine pens at Bordeaux, France. The B-17, nicknamed "Ole Bassar," was piloted by Lt. Paul A. Todd. The Flying Fort had suffered battle damage during the raid, and near Colleville, in the Normandy countryside, one engine went out and the aircraft had to drop out of formation. Six German FW-190s attacked the cripple and shot it down in flames. Both Todd and his copilot—Clarence Willingham—were able to parachute safely. Todd was taken prisoner by the Germans, but Willingham was able to escape, helped by the French resistance forces. The two men have not been seen or heard from each other in the thirty-one years since that day, and now Clarence Willingham is trying to locate his former pilot. Anyone having information about former B-17 pilot Paul A. Todd is invited to contact the "Airmail" department of this magazine.

all who know him will testify, is as rough sometimes as a three-sided rasp. But the integrity of the man and his writings is 100%, and that is what really matters.

Walter T. Bonney  
Frederick, Md.

#### USSR's Secret Agents

*Gentlemen:* Your magazine has been a great pleasure to read over the past twenty years, and your book reviews are always a welcome source of information.

The November '74 issue contains the following passage on page 88, left-hand column: ". . . the notorious Cheka of Tsarist times. . ." [review of the book *KGB, The Secret Work of Soviet Secret Agents*].

Cheka was a post-revolutionary, Soviet outfit; the Tsarist security organization was called Okhrana.

Maj. Gerald L. Geiger, USAFR  
Washington, D. C.

• Major Geiger is correct. *The Encyclopedia Britannica states that the Cheka was organized in December 1917.*—THE EDITORS

#### Reaffirmation of Faith

*Gentlemen:* I am wearily going through the daily routine of a joint headquarters when I come across the September 1974 issue of our magazine. On page 28 is a low-key report that points out the successful completion of 5,000 flight hours by the P&W F100 engine. Hurrah—success! But wait. Something is lacking.

The *Stars & Stripes* (overseas airman's only daily printed link with the real world) only printed the first half of the story, *i.e.*, the recriminations and allegations concerning the capabilities of the designers and manufacturers as well as doubt cast upon the qualifications of the Air Force men charged with the basic development program for the engine.

Now that the engine is proving out, I would like to see credit given where doubt was cast and a public acknowledgment that the program managers and designer/manufacturer teams do come up with correct solutions. We need a strong reaffirmation of the faith placed in our trusted officials. A side benefit would be informing our enemies as well that our people are capable of sound planning for the future.

Far too often the public is only informed of the lesser events, disasters, and failings of our people. The

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## Airmail

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public needs to be informed of both sides of a discussion, and we, the Air Force, need affirmation such as this spread far and wide in these troubled times.

Col. William A. Schauer, Jr.  
FPO NY

### East Germany's Markings

*Gentlemen:* The MiG-19 pictured at the top of page 52 of the December 1974 issue of AIR FORCE Magazine is marked with German Democratic Republic markings (East Germany) and not the Rumanian Air Force as the caption indicates. . . .

MSgt. Earl L. Otto, USAF (Ret.)  
Tacoma, Wash.

• *Our apologies. Sergeant Otto is right.*—THE EDITORS

### Reduce Government Spending

*Gentlemen:* I believe your column, "Airpower in the News," for the month of November has done your readers a disservice by perpetuating the myth that reduction of federal spending can do nothing to slow inflation.

Despite the constant barrage of such claims to which the American public has been subjected over the past several years, and despite the protestations of members of Congress and others who have a vested interest (for whatever reasons) in continually greater spending by the federal government, the fact remains that reduction of spending by government is the *only* action which will slow or stop inflation.

My dictionary (Webster's *New World*) defines "inflation" as: "an increase in the amount of currency in circulation, resulting in a relatively sharp and sudden fall in its value and rise in prices; it may be caused by an increase in the volume of paper money issued or of gold mined. . . ."

Inflation, therefore, may be more simply defined as that condition that results when government spends more money than it takes in, and makes up the difference by printing more bills, each of which obtains its value by reducing proportionately the value of all the other money in circulation.

The only agency that can control

the amount of money in circulation is the federal government. Food prices, fuel costs, and commodity price increases are symptoms, not causes, of the inflation.

The economic policies of John Maynard Keynes, to which former President Nixon announced his allegiance some years ago, have proven disastrous wherever they have been implemented. It is time (indeed, it is far past time) to abandon these neosocialist economics in favor of a balanced budget and elimination of frivolous spending and ever-increasing federal bureaucracies that are unresponsive to the needs and desires of the American people.

Capt. Warren S. Kirkland  
APO New York

### Information Sought

*Gentlemen:* I am restoring a Lockheed 10A, Mfg. 4-38, N 241 M, to authentic World War II markings. Any help regarding history, use, purpose, service markings, etc., of the Lockheed 10 series will be greatly appreciated.

Dr. James A. Almand  
Grand Prairie Professional Center  
Carrier Pkwy. & Dalworth St.  
Grand Prairie, Tex. 75050

### Airline Pilot's Friends

*Gentlemen:* Capt. Jose Velloso de Souza, a Brazilian pilot for Varig Brazilian Airlines resident in Portugal, graduated from UPT with Class 44-E at Eagle Pass, Tex. He is interested in contacting former classmates who may remember him. Former friends of Captain Velloso de Souza please contact him through me.

Capt. F. Dixon Jordan  
Assistant Air Attaché  
American Embassy  
APO New York 09678

---

## UNIT REUNIONS

### 40th Troop Carrier Sqdn.

The 40th Troop Carrier Squadron, 317th TC Group, will hold a reunion July 3-5, 1975, at the Sheridan-Gateway Motel, Dayton, Ohio. Contact

Crispin M. Wood  
2622 Blue Rock Rd.  
Xenia, Ohio 45385

Phone: (513) 426-7283

### P-40 Warhawk Pilots

The 4th annual P-40 Warhawk Pilots Association reunion will be held at the Imperial House North, Dayton, Ohio,

June 27-29, 1975. For information contact

Lloyd Hathcock, Chairman  
34 College St.  
Dayton, Ohio 45407

Phone: (513) 223-8432

### Class 42-K

Members of Class 42-K are trying to have a reunion. Please send name and address of classmates also when you contact

Col. Art Salkin  
905 16th St., N. W.  
Washington, D. C. 20006

Phone: (202) 638-5023

### P-47 Pilots Association

The 1975 reunion of the P-47 Thunderbolt Pilots Association will be held May 2-4, in Atlanta, Ga. For further information write or call

Robert Powell, Chairman  
P. O. Box 49087  
Atlanta, Ga. 30329

Phone: (404) 636-3747

### SR-71ers

The 9th Strategic Reconnaissance Wing is sponsoring a reunion for all former SR-71 crew, staff, maintenance, and contractor personnel. Will be held April 11-13, 1975, at the Holiday Inn Motel in Reno, Nev. For advance room reservations and details please contact

Col. John H. Storrie  
2 Lakeview Dr.

or

Capt. Bruce S. Douglass  
3563 Dumosa Way  
Beale AFB, Calif. 95903

### 351st Bomb Group (H)

Members of the 351st Bomb Group (H) stationed at Polebrook, England, during WW II, interested in a reunion, please contact

Lt. Col. Donald B. Drought,  
USAF (Ret.)

2449 University Blvd. West  
Jacksonville, Fla. 32217

Phone: (904) 733-8833 or 733-8294

### 367th Fighter Group

The 367th Fighter Group, consisting of the 392d, 393d, and 394th Fighter Squadrons, WW II, will be attending their 12th annual reunion July 24-26, 1975. The gathering will take place at Dayton, Ohio, and will be hosted by Walt Pettit. Any former members not previously located are asked to contact

J. T. Curtis  
367th Secretary  
4514 Sheffield Lane  
Corpus Christi, Tex. 78411

### 385th Bomb Group (H)

The 385th Bomb Group (H) of WW II has scheduled its 5th reunion at the Atlanta Townhouse, Atlanta, Ga., April 25-27, 1975. For further information contact

Frank B. Walls, Pres.  
Reynoldsville, Pa. 15851

# SCIENCE/SCOPE

A new ultra-lightweight radio for tactical field operations, developed by Hughes, employs micro-miniaturized circuits including LSI (Large Scale Integration) to provide high reliability, plug-in modules for easy maintenance, and an AM mode for compatibility with current military systems. Called the HC-191 Manpack, it is a version of the AN/PRC-104 single-side-band transceiver Hughes is building for the U.S. Marine Corps. It has a frequency range of 2 to 30 MHz and 280,000 channels to make enemy jamming difficult. Another significant combat advantage is its completely silent automatic electronic tuning.

The complete Manpack radio weighs only 12½ pounds including a battery pack that gives 16 hours of service before recharging. With its built-in 8-foot whip antenna, the HC-191 has a range of up to 30 miles in the most difficult jungle or mountain terrain. For a copy of the HC-191 brochure, write: Marketing Department, Hughes Aircraft Company, Bldg. 600/C231, P.O. Box 3310, Fullerton, Calif. 92634.

A new type of infrared missile seeker has been developed by Hughes under a joint Air Force-Navy program. Called Imaging Infrared (IRR), the seeker produces a TV-like image on a cockpit viewing screen by sensing the differences in pattern created by small variations of heat radiation, thus enabling pilots to find targets at night. The IRR is also effective through haze. Hughes recently was awarded an additional contract by the U.S. Air Force, lead service in the program, to build seekers and do further testing.

A versatile hand-held laser for the infantry, equally suitable for guiding attack aircraft to enemy targets or making the position of a cut-off unit known to rescue or supply aircraft, is being developed by Hughes for the U.S. Army. Resembling a stocky, short-barreled rifle, the AN/PAQ-1 Lightweight Laser Designator consists of three easily-replaceable modules designed to withstand rough field handling. It has been made a tri-service device by the Department of Defense.

Two shipboard air-defense radar systems for Japanese destroyers have been delivered by Hughes to the U.S. Naval Sea Systems Command. The systems provide simultaneous information on the altitude, range, and bearing of air targets. Similar systems are at sea aboard naval vessels of Australia, Italy, Spain, West Germany, and U.S.A.

Laser rangefinders for the U.S. Army's M-1 battle tank are being developed by Hughes for prototypes by both Chrysler Corp. and General Motors Corp. Following a competitive evaluation in mid-1976, the Army is expected to select a single contractor. Hughes currently produces laser rangefinders for the Army's M60A2 tank and M551 Sheridan vehicle and is developing a full-solution laser fire control system for an improved version of the M60A1. A tank with a laser rangefinder can fire far more quickly and with a much higher first-round hit probability.

Creating a new world with electronics

**HUGHES**

HUGHES AIRCRAFT COMPANY

# Airpower in the News

By Claude Witze

SENIOR EDITOR, AIR FORCE MAGAZINE

## The Bucking Colts Take Over

Washington, D. C., January 6

Congress, the 94th, will convene on January 14, a week from tomorrow at this writing. In addition to the new ideas that will flood the calendar, it faces an agenda of unfinished business left over from the 93d Congress. This list does not include anything important in the area of national defense, but the New Year was greeted, as usual, with a spate of projections on the size of the Fiscal 1976 Defense Department budget. The spending request, it appears, will be for about \$95 billion; this is an increase of about thirteen percent over Fiscal 1975, required by what inflation has done to all of us. Total Obligational Authority (TOA), it is anticipated, will hit at least \$103 billion, and a figure \$4 billion higher than that, about \$107 billion, was being discussed in the Pentagon only a week ago.

The whole issue of the cost of weapon systems will continue to boil in the 94th Congress. They are building a subway system in Washington these days, the projected cost of which has nearly doubled, from \$2.5 billion to \$4.5 billion. This news has been on the front pages of the local papers, but does not seem to provoke charges of mismanagement. Those are reserved for the recent disclosure of last September's Pentagon Selected Acquisition Reports. Figures released on December 27 show that the projected cost of forty-two major defense systems is up \$4.2 billion since June. Of that, \$3.5 billion is attributed to inflation. Total estimated cost of the forty-two programs now stands at \$147.8 billion.

The breakdown by service is interesting. The figures in this tabulation are in millions of dollars:

Service	Total Estimate	Increase of Sept. 30
Navy	\$65,107.2	\$ 17.9
Army	27,722.3	3,115.5
Air Force	54,996.7	1,051.6

Here we see the Army, with the smallest total program, accounting for the lion's share of the cost increases. The reason, the Pentagon says, is that the Army has recently changed its price indices, indicating they had not been correct in the past. So far as the Air Force is concerned, \$310.4 million of its \$1,051.6 million can be attributed to Congress itself, which added F-111 and A-7D aircraft to the budget, against Pentagon advice.

A couple of weeks before these announcements, the Members of Congress for Peace Through Law came out with a report on how to reduce the federal budget by cutting defense. The study was prepared by Rep. Les Aspin of Wisconsin, a member of the Armed Services Committee. Mr. Aspin lists what he calls "doubtful military projects," from all three services. With few exceptions, the programs he would cut or eliminate involve aircraft and missiles, plus Trident submarines,

frigates, and destroyers. There also are suggested severe inroads on research and development, winding up with a projected saving of \$8.5 billion.

There is a rationale given for all of this, with the exception of Mr. Aspin's proposal that the Army should nearly double its procurement of M-60 tanks. He would add \$200 million to raise the Fiscal 1975 order from 510 to 1,010. It is not made clear why members of Congress who favor peace through law should find more than two dozen military projects "doubtful" to this cause, but find merit in 500 M-60 tanks. The Army's stock of tanks is low, and has been ever since large numbers were shipped to Israel in late 1973, an argument for the \$200 million that Mr. Aspin failed to mention.

Probably the most important news about the new Congress is that the outlook continues gloomy for national security issues. And the recently deceased 93d Congress is not without blame for this. It did little to improve legislative machinery—so little, in fact, that the Democratic caucus of the incoming House already has grabbed the bit and altered the power structure. Action got under way the first week of December at a preliminary session, where seventy-five newly elected members were made welcome. The caucus convenes again next week, and more feathers will fly.

Here are some of the votes as tallied at the December session:

- Rep. Phillip Burton of California, a veteran reformer and one of the most liberal members of the House, was chosen caucus chairman, 162 to 111, over B. F. Sisk, a more conservative man from the same state. Said Burton, "The winds of change have arrived." Said Sisk: "People don't want to see Congress flying off into the wild blue yonder with too many innovations and wild spending schemes." Both statements are prophetic.

- Required that nominations of all chairmen of Appropriations subcommittees be approved by caucus vote. The count on this issue was 147 to 116. The practical effect of this is that Appropriations Chairman George H. Mahon, the veteran Texan who chairs the parent committee and the defense subcommittee, will preside over a group owing its loyalty to the party caucus, and its chairman, rather than to Mr. Mahon. The liberals would like nothing better than to pry Mr. Mahon away from his grip on defense issues. Another subcommittee chairman certainly threatened by this change is Jamie L. Whitten, the second ranking Democrat and chairman of the Subcommittee on Agriculture, Environmental and Consumer Protection. Watch for a much more liberal man to take over that desk.

- By a vote of 146 to 122, the caucus stripped Democrats on the Ways and Means Committee of their power to make committee assignments. The job was given instead to the Steering and Policy Committee. This will test Speaker Carl Albert, who chairs the group.

There were other votes, but this suffices to show

Unaccustomed as we are to giving political warnings, in these unusual times it would be derelict to ignore the Democratic Shooting Star of the House of Representatives, Phillip Burton of California.

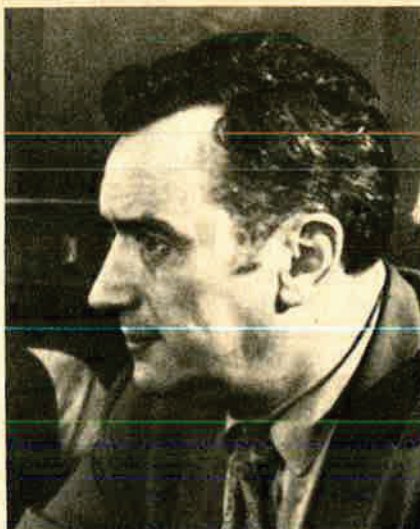
It has been reported that one of his colleagues in the House made this observation about Mr. Burton: "There's only one constituency he gives a damn about: the poor, the elderly, the black, and the disabled."

No doubt, this is an extreme opinion.

For the factual background, Mr. Burton is forty-eight years old, described as a veteran reformer and one of the most liberal members of the House. He was born in Ohio, but educated in California, where he became a lawyer in 1952 at the Golden Gate Law School. He served in the California State Assembly, where he was chairman of the Committee on Social Welfare. He has been in Congress since 1964, when he won his seat in a special election. He has served on the Education and Labor Committee and on the Committee on Interior and Insular Affairs.

He came to the House in 1964 describing himself as a "fighting liberal," a supporter of civil rights, and a foe of the war in Vietnam. By the time of the 92d Congress, he was chairman of the Democratic Study Group. He has a reputation as a compromiser and, again, as an opportunist with vast ambition.

## Watch This Man



California's Rep. Phillip Burton is now No. 3 among House Democrats and considered in line for the speakership.

He has been called a "totally political animal."

As of today, Mr. Burton is the No. 3 man among House Democrats and considered in line for the speakership. Ahead of him are the present Speaker, Carl Albert of Oklahoma, and Majority Leader Thomas P. O'Neill, Jr., of Massachusetts. They are sixty-six and sixty-two years old, respectively.

According to the *Wall Street Journal*, Burton's election as chair-

man of the Democratic caucus marks the first time that "a real liberal with a taste for power" has gained such a position. The liberal Americans for Democratic Action gave Mr. Burton a 100 percent rating in 1973. The conservative Americans for Constitutional Action gave him a rating of eight percent.

There are almost endless stories on Capitol Hill about Mr. Burton's abrasive personality. Many are offended by his sheer brashness and unlimited energy.

Before last November's election, Mr. Burton is said to have claimed, with some pride, that he was helping about forty liberals in their effort to win a seat in the House. Most of them were elected.

These results were reflected in the votes at the first meeting of the Democratic caucus in December. The things Chairman Burton wanted most, including his own selection for that job, were accepted by comfortable margins. He appears to be assured of well more than 140 votes, enough to prevail with ease. There were 162 Democrats who voted for him as chairman.

It should not be forgotten that this Congress, with seventy-five new, mostly liberal, Democrats in the Burton camp, will be seeking reelection in two years. If they do not get their own way, a good number of heads could roll. They have the votes to do it, if everything else fails. National security issues rate low on their list of priorities. ■

that supporters of Caucus Chairman Burton can round up strength to have their own way. They have been spared the task of removing Wilbur D. Mills as chairman of Ways and Means. If he had not done it to himself, the caucus would have kicked him out next week, when it meets again to get down to serious business.

It is no secret that one man who is more apprehensive than he will admit in public is F. Edward Hébert, Armed Services Chairman. He may be the No. 3 target for the liberals, after Wilbur Mills and Jamie Whitten. Mr. Hébert, however, claims strong support from the House Democratic leadership. On top of this, there is no obvious Democratic replacement with the wings of a dove.

We reported last month that there was talk of reducing the size of the House Armed Services Committee from forty-four to thirty-seven. It now appears the new figure will be forty, with twenty-eight Democrats and twelve Republicans. At this date, we can cover six new Democratic members of the House committee. They are:

• **Abraham Kazen, Jr.**, of Texas. He has been in the House since 1967 and has served on the Foreign Affairs and Interior and Insular Affairs Committees. In the past, he has been a supporter of defense programs.

• **James F. Lloyd** of California. A moderate to liberal freshman, he was a career Navy officer who retired in 1963. Aviator and information officer, later in the public-relations business. May be dovish on defense, because, he says, "I have become far more humanistic since I got out of the service."

• **M. Robert Carr** of Michigan. Young, thirty-one, liberal, with affiliations with Senators Gaylord Nelson, Ted Kennedy, and Walter Mondale, as well as the American Civil Liberties Union. Rate him as anti-defense.

• **Lawrence P. McDonald** of Georgia. His vote will offset Carr's. McDonald is a physician, outspoken conservative, member of the John Birch Society and the National Rifle Association. He has served in the Navy.

• **Thomas J. Downey** of New York. Now the youngest member of the House at twenty-five years. He is single and still a law student. Won on an upset. There is nothing in the record to indicate his views on defense.

• **Won Pat**, a delegate from Guam, can vote in committee, but not on the floor. He is a member of the Navy League and the Air Force Association.

On the Republican side of the committee the only new member will be Andrew J. Hinshaw of California. He has been a strong supporter of defense programs

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## Airpower In the News

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in the past, a member of Congress for two years, and has served on the Government Operations and Post Office and Civil Service Committees.

As the 94th Congress sets out for what must become two tumultuous years, there are two other factors that this résumé cannot neglect. One is budget reform, which has been voted and is off on an unsteady track, and the other is leadership. The impact of both on national security issues could be momentous.

The budget reform bill was signed in mid-summer, and little has been heard of it since. But the people who are involved with legislative liaison for all government departments are highly concerned. This is particularly true for the Defense Department and the military services, where budget issues tend to be more controversial and under heavier fire than in other areas.

New procedures will not become fully operative until 1976, when the Fiscal 1977 budget comes up for discussion. That year will see the start of the government's fiscal year move from July 1 to October 1, to fit the new timetable Congress has decreed for financial affairs. Separate Senate and House budget committees are charged with the job of tightening congressional control over decisions that will have impact on overall fiscal policy. The effect is that of opening another ring in the circus.

Predictions on congressional leadership will be made by reporters more foolhardy than this one. Back around Thanksgiving, the esteemed *Congressional Quarterly* said of the House: "The top leadership on both sides of the aisle is likely to be reelected without serious challenge." Less than two months later, the same editors wrote:

"The top leadership of the House of Representatives may find that it was easier to tame the seasoned old broncos of Capitol Hill than the new bucking colts elected last November. In fact, there is a possibility that the Democratic and Republican leaders may be unhorsed instead."

For details, read your daily newspaper, with salt. ■

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## The Wayward Press

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It is difficult to understand how newspapers can be so different, while the myth prevails that they are monolithic. There are people all across this land who will continue in 1975, as they have before, to lump the "press" into a basket, like liberals or lawyers or garbage collectors. Yet, there is nothing so diverse, displaying so many variations in the daily output, as American newspapers.

One of the phonies, given wide circulation during the Agnew era, is that the *New York Times* and the *Washington Post* are spinning, arm-in-arm, around an axis. The axis sets a pattern, this theory goes, and also creates a field of journalistic gravity, toward which all other, and lesser, newspaper planets are attracted. It simply isn't true.

This came to our attention again on Christmas Eve with a surprise bigger than the one created by Santa Claus. All three television networks had, the night before, carried adequate reports on the fact that the Air Force's B-1 bomber, built by Rockwell International, had left the ground for the first time and flown for an hour and sixteen minutes over the California desert (see also p. 15). Certainly, that was news and recognized as such by the TV news reporters.

What with the rush of Christmas travel and family excitement, it was not until the creatures stopped stirring, even the mice, that we read the *Post* and the *Times* of December 24. Incredulously, the discovery was made that the *Post*, Washington's most distin-

guished newspaper, and one that pretends to have national impact, ignored the news about the B-1. The day before, on December 23, the paper had routinely reported under the dateline of Istres, France, that a French fighter-bomber, the Mirage F.1, had made its first flight. The Mirage is not intended for USAF, it will not lend its strength to American strategic power, and paying for it is not a problem for the American taxpayer. But the first F.1 flight was news to the *Post*, the newspaper that, twenty-four hours later, was to find no news value in the first flight of the B-1.

The *New York Times* of December 24 had a three-column picture of the B-1 at the top of page one. In flight. The news was fit to print: "B-1 Bomber Flies for First Time; Air Force Hails Test."

Below this, there was a short story and then another three-column picture, of the French F.1, also high in the sky. There is no connection, of course, between the two aircraft, other than the fact that both of them fly. From the standpoint of news evaluation, the way the *Times* editors handled the B-1 first flight story is as inexplicable as the way the *Post* failed to handle it.

If anyone is to be faulted in this situation, he is among the editors at the *Post*, an editor whose own Pentagon reporter and wire services had handed him the news, only to have it unrecognized as such.

There are daily examples demonstrat-

ing that our free press is put together by hundreds of news executives motivated in their work by diverse and mysterious influences. The concept that all newspapers come out of the same machine, like so many sausages, is fallacious.

\* \* \*

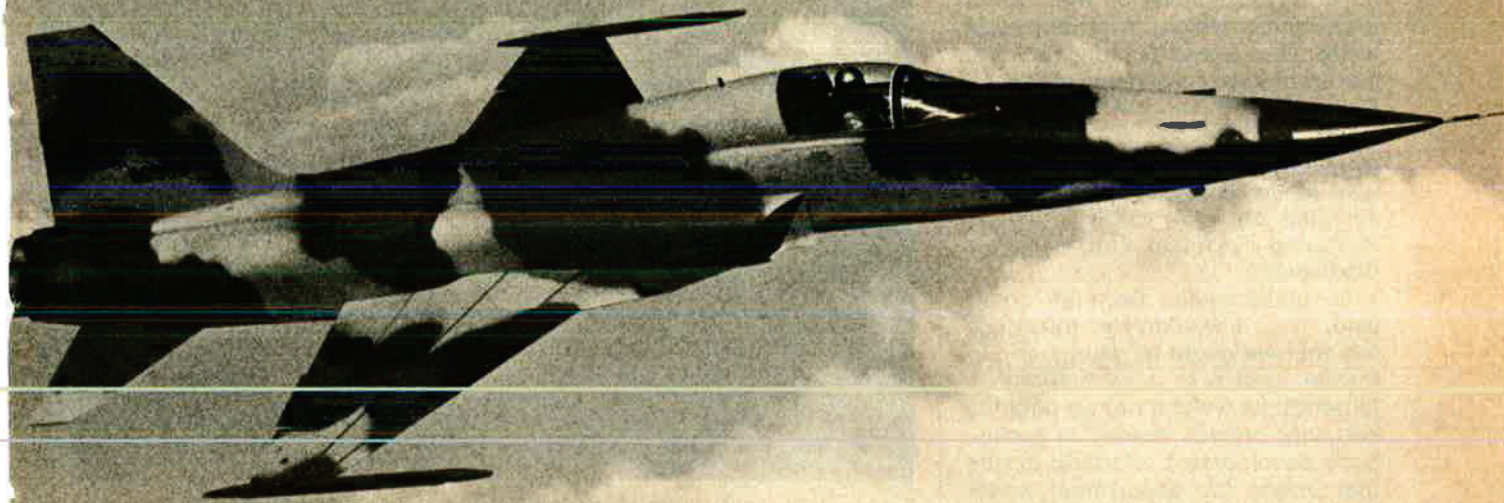
Among the popular television showbiz formats, disguised as news features, is the talk show. It is a recitation of opinions by journalists who, in their regular occupation, feel an obligation to criticize people in any other line of work, but not newspapermen.

On the evening of Saturday, January 4, we witnessed one of these talk shows on a major network. The details are as unimportant as the participants. But it must be reported that during the broadcast one reporter, accredited to the White House and the Capitol as correspondent of a major US newspaper, made this statement:

"I don't know what it reflects, but what it reflects is . . ."

The man went on to tell his TV audience what he had just said he did not know.

If he wrote this kind of nonsense for his newspaper, some copyreader would keep it out of print. That's one certainty. A second is that if the President pulled such a howler at a White House press conference, our reporter moonlighting as a TV star would be among the first to turn out a column ridiculing the rhetoric of the Chief Executive.



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

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

# NORTHROP

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

Washington, D. C., Jan. 2

"We ought to maintain the options" of developing an M-X with a larger throw weight or an airmobile ICBM, Gen. David C. Jones said at his first news conference as USAF Chief of Staff (see also p. 72).

His response was in answer to a question about Air Force policy in light of the latest US/USSR understanding on arms control, agreed to during President Ford's visit to Vladivostok.

In clarification, General Jones said, "... I wouldn't at this stage say that we ought to deploy an airmobile system or a system with a larger throw weight, but we ought to certainly provide money in preliminary development efforts to assure that option for deployment sometime in the future. We do not need to make the decision on its need today, but I think we ought to keep the option open."

A key weapon system on which a production decision is still very much in the future is the B-1 bomber, the Chief of Staff said. "We're not making a decision today to buy the aircraft. . . . We should continue it in development, do what is necessary to maintain a good program, and then if we're able in our continuing work to demonstrate to the Administration, to [Capitol Hill], and the public that it is a necessary part of our defense establishment, then we think we should go ahead."

In discussing the major modernization and realignment program currently under way throughout USAF (see *January '75 issue*, p. 14), General Jones said that Hq. PACAF, Hickam AFB, Hawaii, will be disestablished, with TAC assuming responsibility for Air Force units in the Western Pacific. (USAF had announced earlier that this move will mean a cut of 2,400 spaces, part of a \$300 million annual saving announced by General Jones. The disestablishment will reduce overhead but not combat forces, which will remain under the operational con-



The Joint Chiefs of Staff gather with the JCS Chairman, Gen. George S. Brown, USAF, right. They are, left to right, Gen. Frederick C. Weyand, Chief of Staff, US Army; Adm. James L. Holloway, III, Chief of Naval Operations, US Navy; Gen. David C. Jones, Chief of Staff, USAF; and Gen. Robert E. Cushman, Jr., Commandant, US Marine Corps.

trol of CINCPAC. The action is in line with DoD policy to cut costs wherever possible, officials said. MAC, among other things, will be charged with running Hickam, which will remain fully operational.)

Regarding R&D efforts, General Jones said that Air Force Systems Command is being reorganized. Aeronautical Systems Division, Wright-Patterson AFB, Ohio, will have surveillance over all that is aeronautical, while Electronics Systems Division, Hanscom AFB, Mass., will oversee all command and control efforts, "as opposed to the more independent action of our laboratories and centers in the past." Systems Command's test aircraft sites will be reduced from six to three.

At the news conference, General Jones also outlined a new Air Force concept called "double-duty crews," whereby rated people in nonflying jobs would log time in, say, C-141s, making them eligible for crew augmentation status.

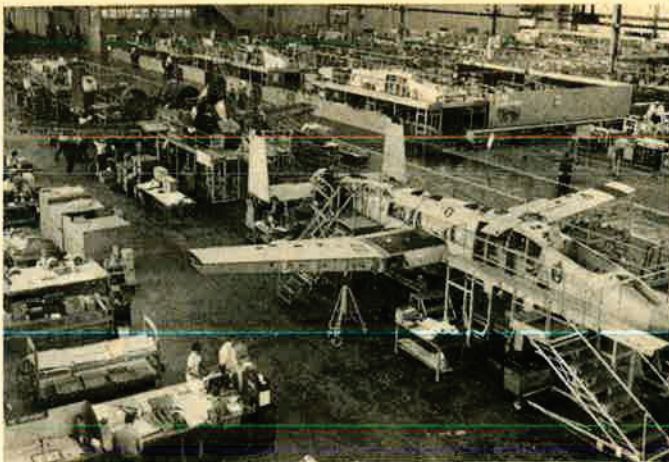
In other comments, General Jones said that:

- Arming a certain number of B-52s with the Harpoon antiship missile to give them a maritime patrol and strike role would not impact on our strategic nuclear strike capability, although both missions could not be conducted simultaneously by an individual aircraft.

- With the B-52 force on Guam reduced to air division size, the Eighth Air Force—an historically important unit—will move to Barksdale AFB, La., while the Second Air Force will be inactivated.

- Discussions have been held with the Israelis on modernizing their Air Force, but with no decision on type of aircraft. (Concerning the hypothetical issue of selling F-15s to Israel, General Jones said that the production rate of that aircraft "could increase, could double, with no additional tooling," so that if the new advanced fighter were sold to someone else, it wouldn't neces-





*Six A-10 close air support aircraft are under construction for test and evaluation at the Fairchild Republic plant in Farmingdale, N. Y. (see item below). Fairchild anticipates building some 700 A-10s.*

sarily have to come out of USAF's inventory.



In other Air Force news, the B-1 bomber made its maiden flight from Rockwell International Corp.'s facility at Palmdale, Calif., on December 23. The flight went smoothly, as the aircraft flew a triangular one-hour, sixteen-minute course over the Mojave Desert and landed at Edwards AFB, Calif. The aircraft attained an altitude of 10,000 feet and was kept at subsonic speeds.

DoD authorized the Air Force to initiate production of the A-10 close air support aircraft. Thus, USAF will

release \$99 million in FY '75 funds to buy twenty-two A-10s during FY '75. A purchase of thirty planes is scheduled for FY '76.

Also approved was procurement of 30-mm ammunition for the aircraft's GAU-8A gun system "upon successful completion of the critical design review currently under way, and verification of the propellant mixture."

Fairchild Republic Co. is building the A-10.



In mid-December, the Air Force Museum unveiled the latest important addition to its historical collec-

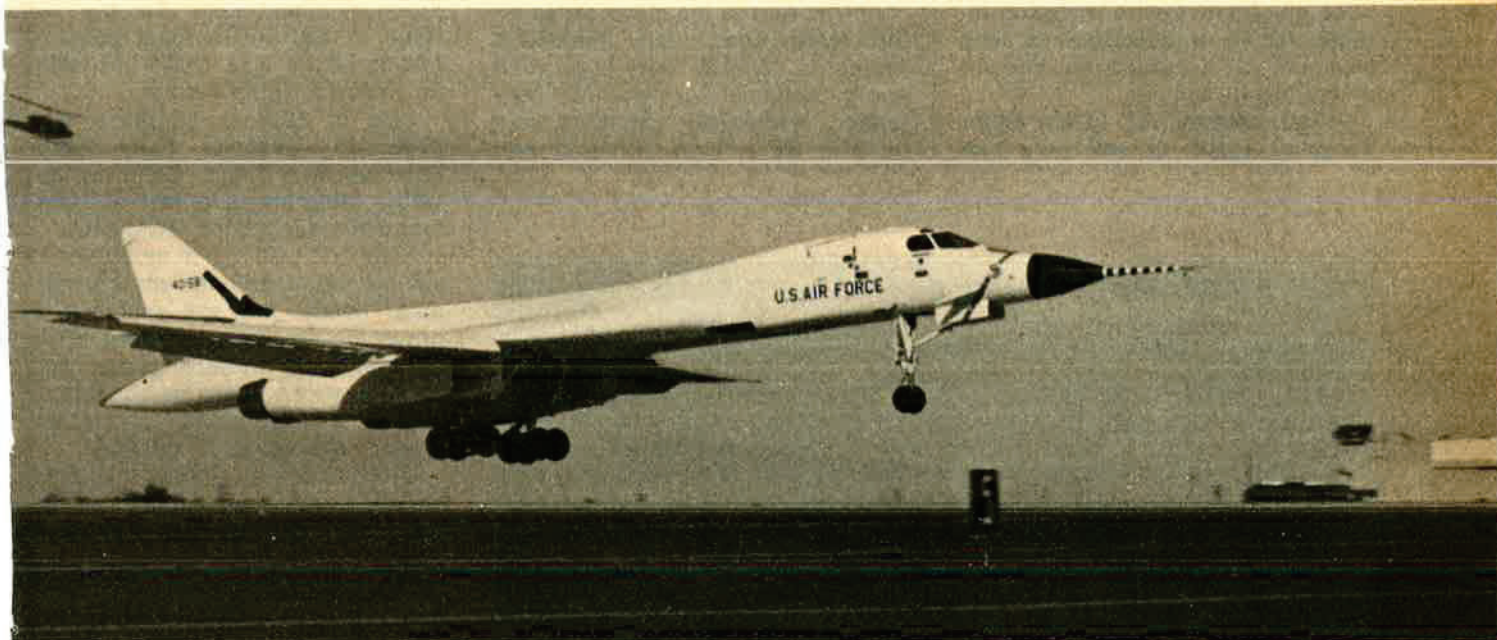
tion—an operational World War I Sopwith Camel.

In the past, restoration experts at the Museum have refurbished aircraft in all conditions—from dilapidated wrecks to others almost like new. But the Sopwith Camel was built from scratch over a ten-year span, from drawings dated 1917-18 and stamped "Secret and Confidential."

Only six original Camels are known to exist: Two in British museums, one in Belgium, one in a Canadian museum, and two privately owned in the US. As rarities, they are costly. Less than ten years ago one sold at auction for \$45,000, totally out of reach of the Air Force Museum, prohibited from using government funds to buy planes.

The meticulous and exacting care that went into the Camel's construction is astounding, even to the use of specified wood in particular parts; aircraft-grade spruce had to be procured from Alaska.

The restorers, headed by Charlie Gebhardt, welded where welding was called for, and used rivets where indicated. They made most metal parts by hand, and built tools to make others. In some instances, donors solved the problem. For example, the gunsight came from George Vaughn, of New York City, the second ranking surviving US ace of World War I, who flew



*Finally, it happened. The first flight of the B-1 bomber, so long-awaited by so many, took place without a hitch on December 23 (see item above). The flight from the Rockwell International plant at Palmdale, Calif., to Edwards AFB was made with gear extended. The B-1 rollout ceremony had taken place October 26 (see cover, November '74 issue, and p. 38, December '74 issue).*

## Aerospace World

Camels. The plane's original wheels and tires were donated, as were the authentic Vickers machine guns. The Museum's extensive collection yielded an original French Clerget rotary engine, found to be in operating order.

The Camel may never fly: "It simply represents too great a risk of loss after so much hard work," a Museum official said.



On the energy front, the National Science Foundation (NSF) has launched a major drive to harness solar energy. If its five-year, \$1 billion program is successful, spokesmen said, the result could be a saving of several million barrels of oil per day by the mid-1980s.

NSF—the government's leading agency in solar research—also plans to cooperate with twenty other federal agencies in the effort, called the National Solar Energy Program. NSF's commitment is broad in scope and includes:

- Utilizing the temperature differences between sun-warmed surface waters and cooler, deeper waters to drive generators. These would produce electricity for transmission directly ashore or convertible to such elements as hydrogen for storage or movement ashore.

- The creation of fuels—either gaseous, liquid, or solid—by bio-



With the Sopwith Camel behind him, World War I ace George Vaughn tells Air Force Secretary John L. McLucas, left, and Gen. David C. Jones, USAF Chief of Staff, what it was like to fly the famed fighter. Experts at the Air Force Museum built the Camel (see text on preceding page).

conversion of plant materials, plant wastes, marine growths, and municipal solid waste.

- Research into "solar cells," for the "photovoltaic" conversion of solar energy directly into electricity.

- Heating and cooling systems using solar energy for various size buildings.

- The concentration of solar energy to produce thermal energy of high enough temperatures to run generators.

Industry, the universities, and private research organizations will also participate in the energy program.

For its part in the cooperative effort, NASA has already initiated a project to develop "very large wind energy systems" for electricity generation. NASA/NSF contracts went to both GE's Space Division and

Kaman Aerospace Corp. to design windmills with rotor vanes of up to 200 feet in diameter, able to produce as much as 3,000 kilowatts of electricity for small communities. These would be the largest windmills ever built and, hopefully, would be economically competitive with present generating systems.

NASA already has under construction a 100-kw system in Ohio that should be ready for experimental operation by July 1975.



Remotely Piloted Vehicles (RPVs) have long been of interest to Air Force planners (see *October '74 issue, p. 22*) and a focal point of testing efforts. Now USAF has taken an important step further.

Late in 1974, a go-ahead was given to Teledyne Ryan Aeronautical, San Diego, Calif., to develop, integrate, and test a prototype RPV designated BGM-34C.

BGM-34C will be a modularized vehicle equipped with interchangeable "noses" that will enable it to prove the feasibility of using RPVs for electronic warfare, recce, and strike missions. It will be capable of both air and ground launch and recovery, according to officials.

USAF hopes for greatly improved reliability and maintainability of the BGM-34C through an updated avionics package.

In a related matter, two contracts were let to Lockheed Aircraft Service, Ontario, Calif., and Sperry Univac, Salt Lake City, Utah, for the development and test of a DC-130 Launch Aircraft that will be equipped to control and support RPVs

### SCAMP Scholarship Program in Full Swing

As announced in this magazine in August 1974, Scholarships for Children of American Military Personnel (SCAMP) is accepting applications for one-year college or university scholarships at a maximum of \$1,000. The first three recipients of these scholarships received their \$1,000 checks at an AFA-sponsored function in Beverly Hills on October 26 (see *AIR FORCE Magazine, January '75, p. 78*). One is the son of a Marine Corps officer killed in action in SEA, one the son of an Air Force officer listed as MIA, and one the son of an Air Force officer killed in action in SEA.

Eligible applicants under the SCAMP program are sons and daughters, no matter where they reside, of fathers who served in any of the military services in Southeast Asia and who are missing in action, were killed in action, or were prisoners of war. Applicants are to be judged on their scholarship qualifications, need, extracurricular activities, and potential.

Letters with information concerning the prospective applicants should be sent to Martin M. Ostrow, President, SCAMP, Suite 310, 280 S. Beverly Drive, Beverly Hills, Calif. 90212. June 1, 1975, is the final date for applications for the 1975 fall term.

# Model ML-1. The latest member of IBM's family of militarized computers.

The Advanced System/4 Pi Model ML-1 evolved from the 4 Pi technology base, in place since 1965. The result of this technology has been System/4 Pi computers for a variety of military and space programs such as A-7, F-111, EA6B, A-6, F-15 and Shuttle. It's IBM's solution — here today — for the next generation of avionic processing requirements. Using a typical avionic instruction mix, the Model ML-1 can perform more than 400,000 operations/sec.

This new general-purpose, stored program, digital computer is a militarized processor that utilizes large scale integration (LSI) circuitry and advanced packaging techniques. Tied to the LSI technology are high volume manufacturing methods that produce low-cost, high-reliability logic circuits and monolithic memories. What's more, microprogrammed control makes the Model ML-1 readily adaptable to a wide variety of applications such as guidance and navigation, weapons delivery, digital flight control and communications.

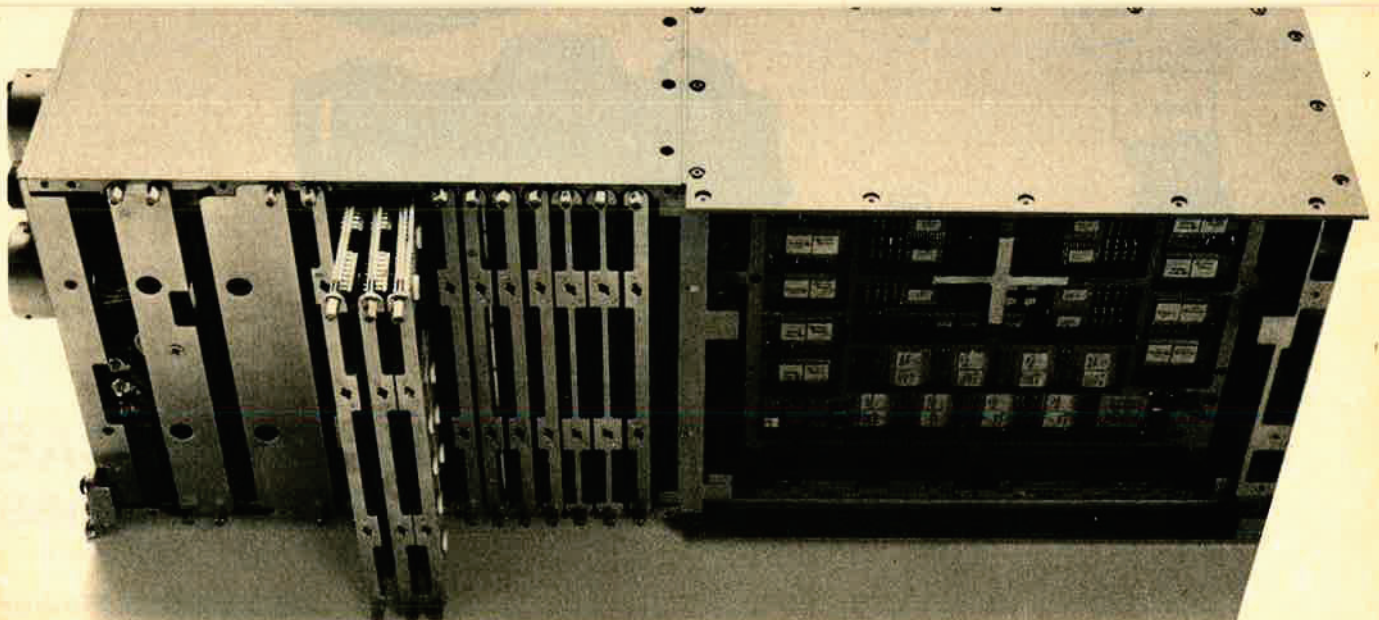
While the Model ML-1 retains commonality with other System/4 Pi computers, it takes full advantage of the newest technology developments and offers a variety of options. Users can choose hardware floating point, core or monolithic memory, various microprogrammed instruction sets, proven support software packages, and others.

And it's all wrapped up in a compact little package — a half ATR case weighing 28 pounds with up to 32K words of storage. The fact is, the Model ML-1 offers the latest in advanced technology and cost effective computing capability in minimum size, weight and power.

To learn more about this highly sophisticated processor and how it can be personalized for your applications, write or call the Director of Avionics Marketing, IBM, Federal Systems Division, Owego, New York 13827.  
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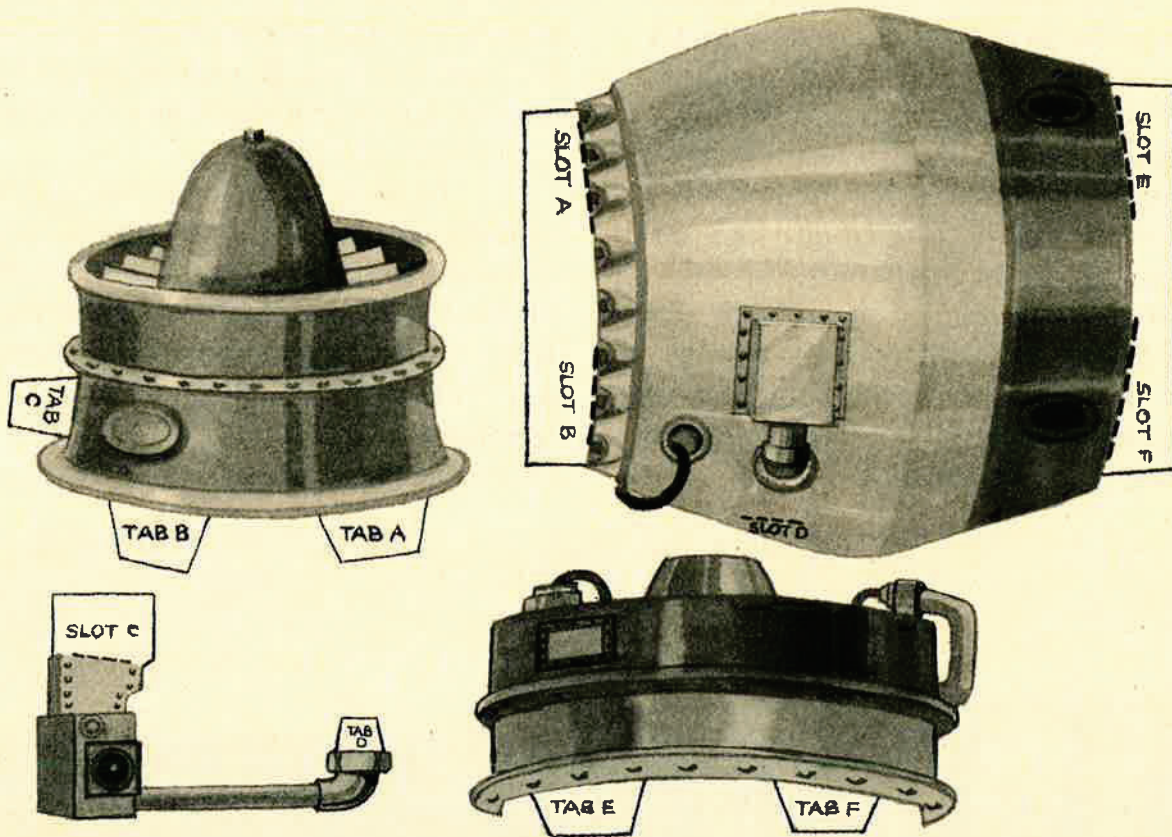
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**Ideas With Power**

## Aerospace World

during the test program, scheduled to begin in January 1976 at Hill AFB, Utah.



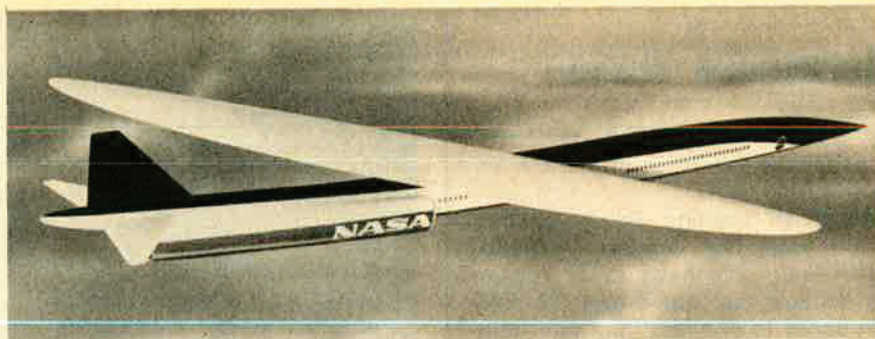
After several years of wind-tunnel tests and computer analyses, NASA has concluded that its scissors-like swingwing aircraft design has revolutionary potential for jet transports.

The straight wing mounted above the aircraft fuselage would be turned to various angles for optimum performance at different flight speeds. And for landings and take-offs minimizing power and noise, the wing would be centered at right angles to the fuselage.

Dr. Robert T. Jones, an internationally known aircraft designer at NASA's Ames Research Center, Mountain View, Calif., developed the unique concept.

In wind-tunnel tests of a model developed by Boeing under NASA contract, a remarkably high lift-to-drag ratio of twenty-to-one was achieved. The wing angle was forty-five degrees to the fuselage at 640 mph (almost Mach 1).

A key element of the radical new design is its fuel-conservation po-



*Lift will be increased, noise reduced, and fuel saved in NASA's swingwing design—the entire wing "scissors"—which can be adapted for use on jet transports (see text at left). Wind tunnel and other tests are promising.*

tential. At high speeds, fuel use would be half that of the Concorde or Soviet SST.



The Coast Guard has tested and hopes to have operational by the summer of 1975 "Super Lights" for airborne nighttime search and rescue missions.

A 30-kilowatt light—from the Army Night Vision Labs—has been installed aboard a C-130 Hercules. Switched on at 3,000 feet, the light lit up an area three quarters of a mile in diameter and "enabled persons on the ground to read a newspaper," USCG said.

Aircrews of whatever service have long expressed a need for a more effective alternative to the common flare.

For one thing, flares are dangerous. Helicopter crews teamed with fixed aircraft dropping them during search and rescue missions are particularly wary of having them fall through the chopper's rotors. In Southeast Asia, a number of times flares were ignited inside aircraft—which meant big trouble. In peacetime, flares are useless over inhabited areas and woodlands because of their fire-starting potential.

One crewman said of the Super Light: "The light is always constant and much more intense than flares" and "is far more effective in a one aircraft illuminating, one aircraft searching situation."

USCG has already made lifesaving use of a two-kilowatt version of the light, officials said.



The Soviets hailed as a complete success the six-day mission of their two-man Soyuz-16 spacecraft in early December.

The mission, which included ninety-six earth orbits, was proclaimed by the USSR as a dress rehearsal for this coming July's joint US/USSR orbital rendezvous.

While the actual launch of Soyuz-16 was not allowed to be viewed via television by the general public, the Soviets were far less secretive about the details of the mission than is their usual policy. This was interpreted by Western observers as an attempt to assure US officials that the Soviet Union is fully capable of fulfilling its responsibilities during next July's cooperative venture. (In recent times, the USSR has suffered a series of failures in its space program, including the aborted Soyuz-15 mission last August.)

Following Soyuz-16, the man in



*The Army's newest aircraft, the YUH-61A, made its first flight recently. Developed under the Boeing Vertol's Utility Tactical Transport Aircraft System program, the YUH-61A is a twin-engine, single hingeless rotor system helicopter in the 15,000-pound weight class. It boasts of reliability, safety, low vibration and noise levels, and economy.*

# Aerospace World

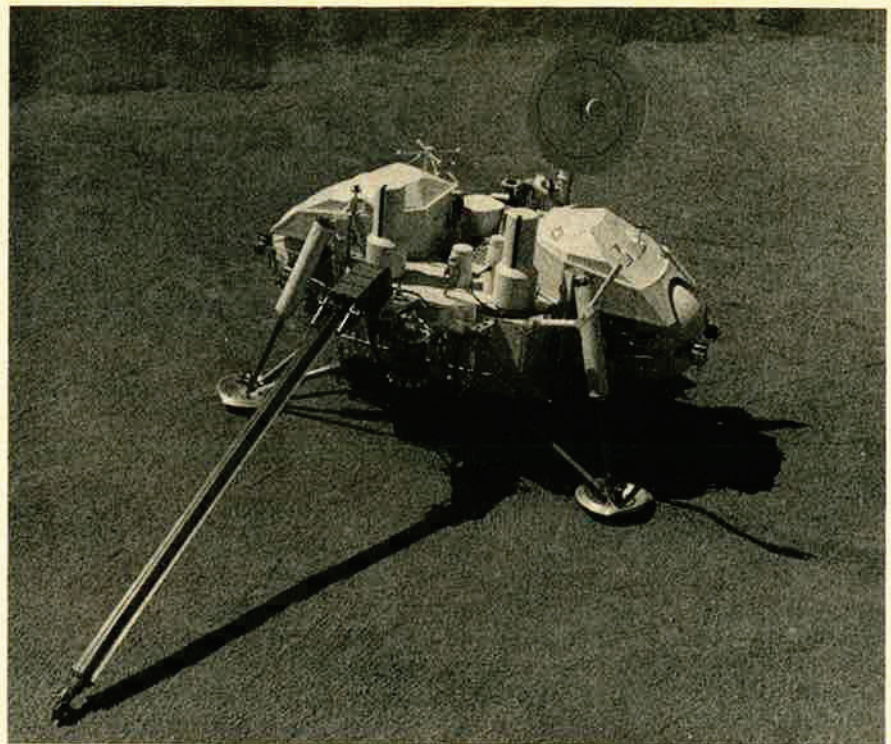
charge of training Soviet cosmonauts—Maj. Gen. Vladimir A. Shatalov—said: "We have every reason to declare that our crews are fully prepared to conduct" the joint mission.

Nevertheless, NASA officials made it clear that the US is prepared to carry out an alternate mission on its own should the Soviets experience difficulties.



**NEWS NOTES**—A careerist in military history and national security affairs—**Dr. Stanley L. Falk**—has been appointed **Chief Historian of the Air Force**. Previously, he was a professor of international relations of the Industrial College of the Armed Forces, Washington, D. C.

Currently under way is the



A NASA spacecraft similar to this prototype leaves this year on an eleven-month journey to Mars, taking along life-detection experiments and equipment to study atmospheric conditions, soil properties, and terrain features. Two cameras aboard will take color, stereo, and infrared photos. Martin Marietta is the prime contractor for the landing system.

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**Scholarship Campaign** sponsored by the Air Force Enlisted Men's Widows Home Foundation, Inc. Officials said that the campaign is designed to benefit **young people and widows** of Air Force enlisted men. The scholarships are to be awarded in April 1975. For contributions and other information, contact the Widows Foundation, Box 4044, Bolling AFB, D. C. 20332, or call 202-767-5817.

Effective in March 1975, **Edwin C. Kilgore** has been named **Director for Management Operations**, Langley Research Center, Va. Formerly, he was Deputy Associate Administrator for Center Operations, Headquarters, NASA.

General Electric's **TF34-GE-100 engine**, built for the **A-10 close support aircraft**, has been accepted by the Air Force as fully qualified.

The **XQM-103 research RPV** had

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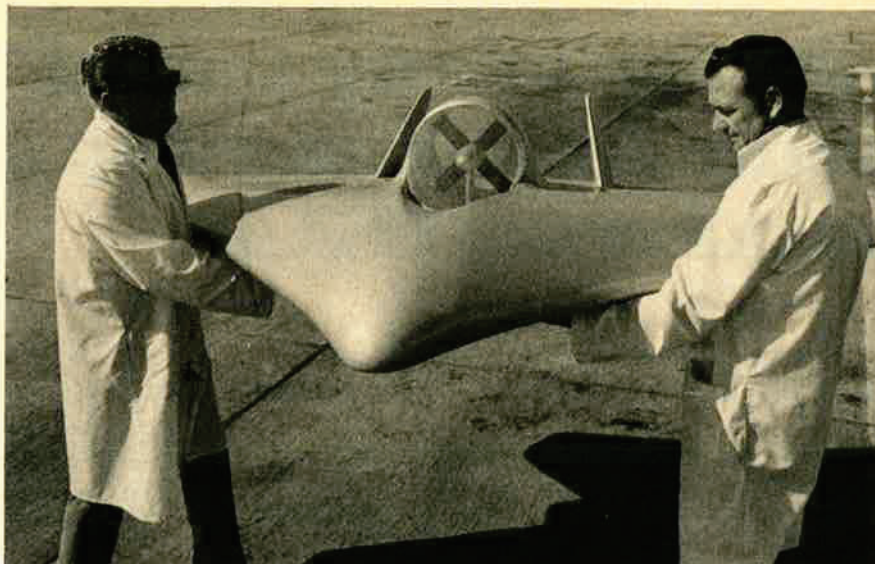
## Aerospace World

its first powered flight when air-launched from a DC-130 at Edwards AFB, Calif., late last year. The vehicle was then air-recovered by a CH-53 helicopter. Twenty-four such test flights over a two-year span are scheduled. The XQM-103 is designed to withstand a sustained ten Gs (although manned aircraft have reached a sustained nine Gs, they are usually limited to about six).

Specially instrumented commercial jetliners have begun NASA's **Global Air Sampling Program**, which will reach its peak in 1976. The object is to learn to what extent and how the upper atmosphere is polluted.

For the first time, **NASA-proposed life sciences experiments** will be lofted aboard a **Soviet biological satellite**, according to a recent agreement. The US experiments will be completely autonomous from Russian ones.

The **first nuclear-powered science station** put on the moon in November 1969 has passed its fifth working anniversary (it was designed to operate for only a year),



*Not only is Teledyne Ryan's new prop-driven Mini-RPV highly portable, but its advanced technology limits enemy detection through low radar cross section, visual, acoustic, and infrared signatures. The system uses conventional landing gear or short rail launch and automatic net recovery.*

sending back much data about the lunar environment. Bendix Corp. built it.

A milestone test—the first firing of a **Space Shuttle main engine preburner**—was announced in December 1974 by the Rocketdyne Division of Rockwell International.

Lockheed aircraft designer **Clarence L. "Kelly" Johnson** was recently presented the **Exceptional Service Award**, USAF's highest civilian award.

**Died: Maj. Gen. James McCormack**, USAF (Ret.), at Hilton Head, S. C., January 4. A West Point graduate and Rhodes Scholar, General McCormack retired from his post as USAF's DCS/Research and Development in 1955 to become first head of the Institute for Defense Analysis. From 1958-65, he was a vice president of MIT, then became Chairman and Chief Executive of the Communications Satellite Corp. (COMSAT), a position he held until his retirement in 1970. He was sixty-four years old.

**Died: David T. Griggs**, geophysicist known for his work in the military application of radar. Mr. Griggs suffered a heart attack while skiing at Snowmass, Colo., December 31. He was sixty-three. He had helped found the RAND Corp. and the Lawrence Radiation Laboratory, Livermore, Calif., and in 1951-52 served as USAF's Chief Scientist.

**Died: Samuel Taylor Moore**, a newsman, writer, and retired Air Force colonel, in Washington, D. C., in November 1974. He was eighty-one. Colonel Moore served in **World Wars I, II**, and in **Korea**. He was an occasional contributor to AIR FORCE Magazine. ■

*The Air Force Academy finished second to West Point for the second consecutive year in the National Collegiate Parachute Championships at De Land, Fla., this time 110 to 104. In this photo, a USAFA cadet hits the target after free-falling from 2,000 feet. In the meet were thirty-eight US college teams, plus groups from Canada and Japan. The Air Force Academy held the national collegiate title for five years in a row before being outscored by Army last year.*





# MIA/POW Action Report

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

## US Hits Lack of Cooperation in MIA Search

The search for the missing American servicemen in Southeast Asia remained stalemated into the new year.

Late in December, the US—through its embassy in Saigon—presented a sharply worded note to

the Viet Cong and North Vietnamese delegations accusing them of “blatant and shameful disregard for the basic principles of humanity” in their refusal to cooperate in the effort to discover the fate of the US MIAs.

Specifically, the note mentioned the eighty-seven Americans about whom it is believed the Viet Cong

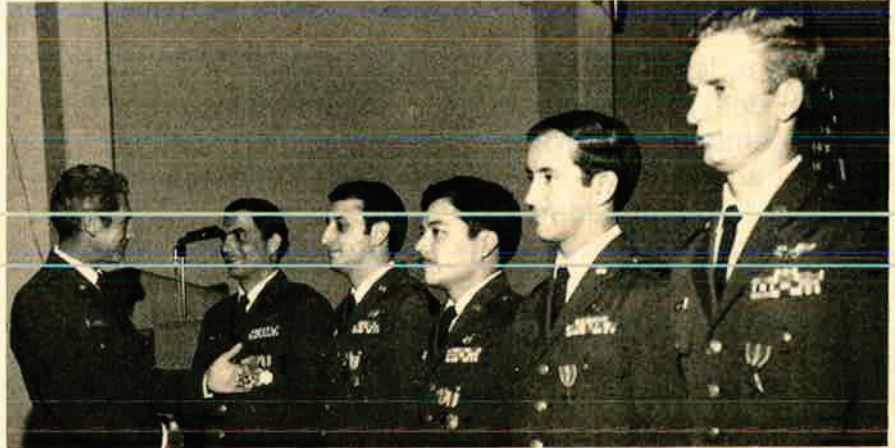
and North Vietnamese are withholding information.

In separate replies, the VC and North Vietnamese said that no progress on the MIA matter could be expected until US military aid to South Vietnam ended and South Vietnam's President was ousted.

On the ground in South Vietnam, the fighting continued unabated. ■



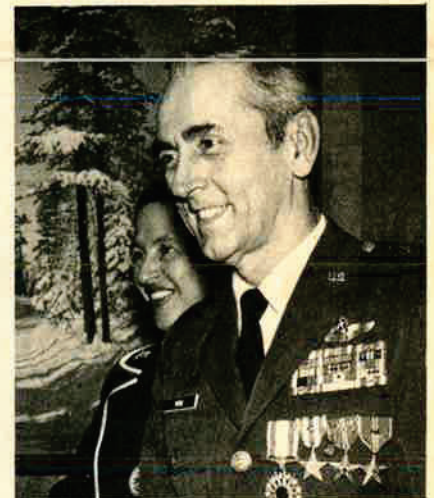
Among a number of USAF personnel decorated for conduct while POWs in SEA was Lt. Col. Arthur W. Burer, now stationed at Webb AFB, Tex. Here he receives medals, among them the Silver Star, from Brig. Gen. Robinson Risner, himself a former prisoner of war.



At Mather AFB, Calif., five officers earned decorations for their behavior under the trying conditions of captivity in Southeast Asia. Here, Brig. Gen. Robert W. Bazley, 323d Flying Training Wing Commander, congratulates, from left, Capt. Gerald Venanzi, Ralph Galati, Hector Acosta, Paul Granger, and Michael Martini. The five officers are now serving as instructors at the navigator training base.



Two officers currently serving as instructors at the Air Force Academy were recently awarded second Silver Stars, among other medals, for POW conduct. Doing the honors, Commandant of Cadets Brig. Gen. Hoyt S. Vandenberg, Jr., left, congratulates Lt. Col. Ben M. Pollard, center, and Capt. Leroy W. Stutz, right, both former POWs.



In Colorado Springs, Colo., Brig. Gen. David W. Winn and his wife, Mary, smile broadly as the General is presented the Distinguished Service Medal—among others—for POW heroism. A senior ranking prisoner in SEA for four years and eight months, General Winn is now Deputy Commander of the 22d NORAD Region, North Bay, Ontario, Canada.

The US has learned important lessons about strategic airlift from the Southeast Asian and the 1973 Yom Kippur wars. The results are comprehensive changes in techniques, hardware, and training that, combined, assure a . . .

# New Look in USAF's Strategic Airlift

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

A dependable US capability to deliver large-scale reinforcements to Europe quickly, according to Defense Secretary James R. Schlesinger's FY '75 Annual Defense Department Report, "could not only be decisive in preventing a NATO defeat—it could also be decisive in deterring the attack in the

first place."

In line with current emphasis on flexible options to deter wars at various levels of intensity, Secretary Schlesinger's report stressed that there seemingly is "no more impressive a deterrent to a Warsaw Pact attack on NATO than a clearly demonstrable US capability

to put down in Europe a fully equipped combat division [including its supporting forces] every few days. That is why I am convinced that a major expansion of our strategic airlift capacity deserves a very high priority in the allocation of resources among our general-purpose force program."



**S**TRATEGIC airlift expansion is a central concern for the Air Force and the Defense Department, although its timing and extent, as the Chairman of the Joint Chiefs of Staff, Gen. George S. Brown, told AIR FORCE Magazine, are not immune to inflation damage.

Reconciling the requirement for significantly increased strategic airlift with severe financial restraints is the task of the Military Airlift Command (MAC). "We have today a definite shortfall in terms of capacity and capability, not only with regard to Europe but also in the Pacific and elsewhere," Gen. Paul K. Carlton, Commander of MAC, told AIR FORCE Magazine.

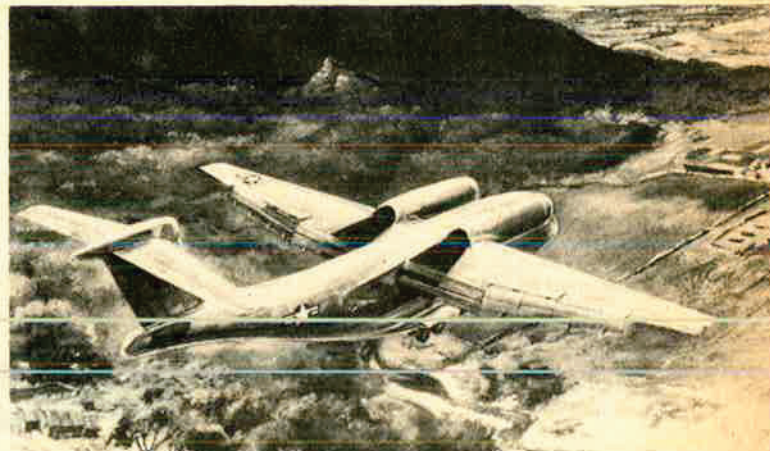
As he puts it, almost all political and military trends converge on one pivotal need, "to get to more places, with more supplies and people, faster than we can today." Strategic airlift capacities will have to be roughly doubled and considerably streamlined within the next few years. The Air Force and the Defense Department have developed comprehensive plans to do just that.

### Merger of Strategic and Tactical Airlift

MAC has total responsibility for the nation's strategic airlift requirement, and the Command recently acquired additional aircraft and personnel to perform this mission. Each of the Tactical Air Command's C-130s, for example, is capable of hauling an eleven-ton payload from the United States to Europe, and has other capabilities that contribute appreciably to strategic airlift, according to General Carlton.

"The Air Force, therefore, has now assigned all airlift C-130s as well as all C-123s and C-7s to MAC," he disclosed. This means bringing into MAC not only an additional 531 tactical airlift aircraft, but also some 13,000 active-duty people and the 28,000 Reservists and Air National Guardsmen who manage, fly, and maintain them.

Thus, since absorbing the tactical airlift mission last December 1, MAC's aircraft in the active force operational units now number seventy-four C-5s, 240 C-141s, 231 C-130s, and, on a contingency basis, the 248 long-haul jetliners of the US commercial carriers that can be "called up" under the CRAF (Civil Reserve Air Fleet) arrangement, as well as the 340 C-130s, C-7s, and C-123s of the Reserve Forces. MAC's manpower



McDonnell Douglas' YC-15 (top) and Boeing's YC-14 (lower photo) vie for USAF's future AMST mission. The aircraft, which will serve primarily in a tactical role as a replacement for the C-130, is in essence a "miniature C-5."

strength, not counting CRAF, is approximately 125,000, of whom some 81,000 are active-duty personnel and 44,000 are Reservists and Guardsmen. The Command operates equipment worth about \$8.1 billion at a current annual budget of about \$2.2 billion.

Putting all airlift under MAC, General Carlton said, cuts down on management and data automation overhead and streamlines airlift operations from start to finish. (Even under the previous two-command setup, a common tactical doctrine permitted the joint use of uniform support equipment, the 463-L palletized loading system.)

Operating the Air Force's C-130s jointly with C-5s and C-141s is beneficial also because strategic airlift does not start at one central point, but from several pickup sites in the United States, some of which contribute only a portion of a C-5 or C-141 payload. It is more efficient for the C-130s to shuttle between these points and coastal aerial ports, with the large aircraft carrying full payloads on nonstop overwater routes. Comparable conditions prevail at the other end, involving, in the case of NATO, some forty delivery points.

Concentrating all airlift capabilities under MAC would become even more significant with an Advanced Medium STOL Transport (AMST) (see October '74



Gen. Paul K. Carlton, a World War II combat pilot, assumed command of MAC in September 1972.

issue, p. 22). The proposed wide-body AMST, air-refuelable and carrying a larger payload than the C-130, "is really a miniature C-5. Although AMST is being designed primarily to move outsized cargo within a theater, any aircraft with enough power to meet STOL requirements has good long-range capabilities with in-flight refueling or by using external tanks," General Carlton said.

MAC's absorption of tactical airlift will not affect the basic assault concept of US armed forces. He added: "We will continue to put whatever airlift elements are required under the theater command. We will continue to practice with the Army through airdrops and in other ways, and there won't be any changes in tactical doctrine. The only change is that the Air Force will furnish all airlift functions as one package, instead of two."

### The Air Refueling Revolution

The dramatic performance of the Military Airlift Command during the Arab-Israeli war of 1973 demonstrated the responsiveness of US strategic airlift. It helped a US ally and outperformed its Soviet counterpart by moving half again as much cargo, over three

These limitations can be overcome without unreasonable cost or operating penalties through in-flight refueling. The C-5 already has an air-refueling capability and one can be added to the C-141, according to General Carlton. Beginning in May 1974, MAC started to exercise the C-5 fleet's refueling capability and to train crews in aerial refueling. In a recent exercise, a C-5 carried a payload of 100,000 pounds nonstop from Dover AFB, Del., halfway around the world to Clark Air Base, in the Philippines, with two in-flight refuelings—off the coast of California and near Guam. The Air Force has requested funds to equip its C-141s with an in-flight refueling system as part of a basic modification of the aircraft.

General Carlton terms the impact of aerial refueling on strategic airlift "revolutionary." Using a cobased wide-body tanker and with no fuel available at the destination, the radius of a fully loaded C-5 (200,000 pounds) jumps from 1,910 nautical miles to 3,973 nautical miles, with one in-flight fuel transfer of 200,000 pounds. Under the same conditions but with one refueling outbound and one inbound, the radius of action is boosted to 5,640 nautical miles, far enough to reach the Caspian

*This C-130 Hercules, of the type now all assigned to MAC, here shows its tactical cargo delivery versatility during the South-east Asian war.*



and a half times the distance, in little more than half the missions, and in a week less time. But the Israeli experience also brought out the extreme fragility of the present operating mode.

"The success of the Israeli airlift is apt to lead us down a primrose path because it is so tempting to forget that we benefited from two conditions that we may not be able to count on in future crises," General Carlton pointed out. One was the availability of appropriate en route bases. The other was the Israeli ability to handle the vast fuel requirements of the 145 C-5 and 421 C-141 missions over thirty-two days. "Let us not forget that for every 100,000 pounds of payload our C-5s brought into Israel, we took out 100,000 pounds of fuel," General Carlton told AIR FORCE Magazine.

The range of current transport aircraft automatically precludes most unrefueled, two-way missions to overseas points with full payloads. The operating radius of a C-141 with 50,000 pounds of cargo is 2,230 miles; that of a C-5 with a 200,000-pound payload, 1,910 miles; and that of a 747, also with 200,000 pounds of payload, 2,800 miles.

Sea from the East Coast and Korea from the West Coast of the United States.

Less dramatic but still invaluable range extensions can be attained for the C-141. With one outbound and one inbound refueling, and no fuel at the destination, it would have a radius of action of 4,930 nautical miles carrying a payload of 50,000 pounds, enough to place Europe, North Africa, Korea, and China within the C-141's nonstop radius. (These MAC statistics are predicated on the existence of a wide-body tanker aircraft operating from the ZI.)

Even assuming fuel availability at the destination, aerial refueling will increase the capability of the C-5/C-141 fleet by "up to ten percent in operating to Europe, and by almost twenty percent to the Far East. Aerial refueling makes it possible to optimize our missions and deck loads by putting maximum fuel on the most critical leg of the trip," General Carlton said.

If aerial refueling had been available for the Israeli airlift, with both tankers and transports operating on a buddy system out of East Coast bases, no en route base would have been needed. The deck loads of the C-5s



*MAC's singularly effective strategic airlift operation during the Yom Kippur war was dependent on two conditions, not necessarily available elsewhere: an en-route base and fuel at the destination.*



and C-141s could have increased from an average of 74.3 tons to 107.4 tons and from 27.6 to thirty-two tons respectively. The number of missions could then have been cut by about thirty and fifteen percent respectively. Fuel consumption, including that of the tankers, could have been reduced from 42,000,000 to 37,000,000 gallons.

Aerial refueling, according to MAC analyses, is also a prerequisite for such airlifts as "Operation Highlift," a plan to transport F-5 aircraft aboard a C-5 to Clark AB or a similar destination. "This method is significantly cheaper than flying the F-5s with individual refuelings. We disassemble the F-5s in the US, fly eight of them aboard a single C-5 to the receiving airport, where we have maintenance centers, and reassemble them there, which requires about 200 man-hours each. From there, the aircraft are flown to their final destination." General Carlton added that aerial refueling "is

*A vitally needed tank rolls out of a C-5 at Israel's Lod Airport while the plane is being refueled for its return flight.*

as essential to global aerial mobility as are the Navy's oilers to global naval mobility."

### "Stretching" the C-141s

The current shortfall in US strategic airlift concerns mainly "oversize" cargo that is more dependent on cubic feet of load space than on payload weight. This type of cargo is not of the same "outsize" equipment category as heavy tanks, which only the C-5 can handle. MAC planners have come up with two basic schemes to prevent a future "cubing out" of US strategic airlift. One involves greater utilization of the wide-body, long-range CRAF jetliners. The other would stretch the C-141 fuselage by 280 inches, increasing interior space by about thirty percent and capacity from ten to thirteen standard USAF pallets. That increase in cargo space would boost MAC's C-141 airlift capacity by thirty percent with no appreciable impact on range or cruise speed, General Carlton said.

According to Secretary Schlesinger, stretching all MAC C-141s is tantamount to adding ninety standard C-141s to the airlift force. The cost of ninety C-141s, he estimated, would be about \$1.4 billion plus \$135 million in annual operating expenses. The proposed modification of the C-141s—including the 280-inch stretch, adding air-refueling capability, and improving the aircraft's navigation system—is estimated to cost about \$666 million. It would not significantly increase operating costs.

### C-5 Wing Modification

Another key element in MAC's Strategic Mobility Enhancement program is modification of the C-5's wing to enable the aircraft to reach its designed service life of 30,000 hours. A number of Air Force reviews, begun after structural weaknesses were detected, concluded that the 30,000-hour goal cannot be met without wing modification and somewhat restrained use of the aircraft, nor without incorporating a special "load distribution" system into the wing.

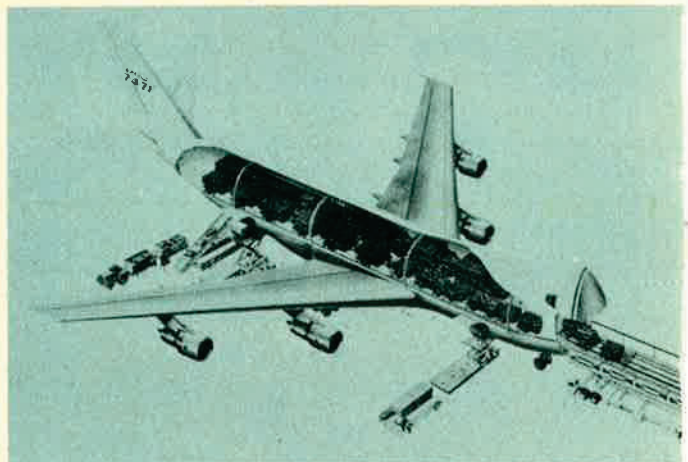
The requirement for restrained use, General Carlton explained, is being met by "generally—but not in emergencies—limiting payloads to fifty tons, by air refueling, and by touch-and-go landings in training our crews." (Basically, landings shorten wing life more than flying. So do full-stop landings, compared to touch-and-go. Even with these precautions, current estimates place the service life of the C-5 at between 11,000 and 17,000 hours, unless the wing is modified.)

Based on present utilization rates, General Carlton said, wing modifications will begin to be necessary in mid-1979. Otherwise, MAC will have to "start patchwork fixes that can be expected to be far more costly than a single major wing modification." The Air Force requested \$15.5 million to start engineering and planning for this modification, which DoD spokesmen estimate will "cost more than \$600 million." The modification would extend the service life of the aircraft to "at least 30,000 hours."

In spite of the structural deficiency, MAC rates the C-5 as "a great and reliable airplane." Worldwide dispatch reliability—the ability of the aircraft to take off and complete missions on schedule—"has increased from seventy-five percent last year to eighty-nine per-



*Strategic mobility could be boosted drastically through a new tanker/cargo carrier, a project currently in preliminary research. Among the candidates are a DC-10 derivative (above) and a 747 modification (below).*



cent this year, and is still improving. It is now roughly on a par with the commercial airlines, although not quite as good as the 747, which has wider parts availability," according to General Carlton.

To prolong the C-5's life span even more, MAC currently operates it at the minimum utilization rate required to maintain crew and maintenance proficiency. This low figure can be maintained safely by using the "C-141s as a sort of training device for the C-5 and increasing reliance on flight simulators," the MAC Commander said.

### Crisis Conversion

MAC planners expect the biggest boost in strategic airlift capacity through "crisis conversion" of wide-body commercial jets operated by US airlines and available to the Air Force under CRAF. The MAC Commander has operational planning responsibility for the Civil Reserve Air Fleet Program and is the executive director for the single manager, the Secretary of the Air Force.

CRAF, under an Executive Order of October 1969, is managed by the Department of Defense with the Secretary of Transportation having "definite responsibilities with regard to transportation matters that affect national defense." The Secretary of Transportation initiates actions and recommends incentives to stimulate govern-

ment and industry improvement of the transportation system for use in an emergency.

CRAF is structured to respond to defense requirements in measured steps, or stages. Stage I, called "committed expansion," can be invoked by the MAC Commander and, at present, includes twelve passenger and sixty-three cargo aircraft, forty-eight of them passenger/cargo "convertibles." The aircraft are long-range transports and must be available for military missions within twenty-four hours.

CRAF's Stage II may be activated by the Secretary of Defense in case of an "airlift emergency" short of national mobilization. Stage II includes twenty-six passenger and eighty-five cargo and convertible aircraft of the long-range type, and sixty-one other commercial jets suitable for the domestic, Alaskan, and short-range international segments of CRAF. These aircraft must also be available within twenty-four hours.

Stage III includes all CRAF elements and can be called up only after the President or Congress has declared a national emergency. At present, Stage III involves ninety long-range passenger, and 158 cargo or convertible aircraft, as well as ninety-one other aircraft suitable for shorter-range CRAF missions. These aircraft include all the nation's long-range cargo capability but only about eighteen percent of its long-range turbine engine passenger capacity, and must be available within forty-eight hours after call-up.

CRAF has never been called up formally because US carriers have responded to special requirements on a voluntary, *ad hoc* basis. In addition, civil air carriers, under peacetime contract to MAC, fulfill about ninety percent of DoD passenger movement requirements, as well as limited cargo service. Commercial augmentation has declined sharply, from a peak of 3,600,000,000 ton-miles in 1969 to about 900,000,000 this fiscal year. This contract airlift, General Carlton explained, costs "about \$276 million annually, not a very significant amount for an \$11 billion industry. Allowing for the complications our type of business causes the airlines, we don't wag a very big stick any more."

CRAF now represents about half of the nation's wartime strategic airlift capability and can produce 17,000,000 cargo ton-miles and 7,500,000 passenger ton-miles a day, compared to about 12,500,000 ton-miles that MAC's active-duty fleet can produce and 8,000,000 ton-miles available from the Reserve and Guard.

General Carlton told AIR FORCE Magazine that a current strategic airlift enhancement proposal recommends a significantly increased CRAF capability to carry cargo. He explained why building up the standby capability of CRAF, rather than the Air Force's organic airlift, makes sense:

"In straight oversized cargo hauling, where we have our principal deficiencies, the commercial cargo jets, designed for unencumbered high cruise speed and maximum range, are more efficient than military airlifters that are tailored for air drop, off-loading in remote areas, operation from semiprepared, short fields, and other conditions peculiar to military contingency missions.

"In considering wartime deployments, we find that a great many of them could be handled by these crisis-convertible civil aircraft. Our emergency plans already

draw on 100 percent of the existing CRAF capability, and we are still short of our potential needs. In addition, it costs less to develop this standby capability through CRAF than to buy and operate more military aircraft, and, once bought and paid for, no continuing O&M costs are involved. The airlines have all the required support and maintenance capabilities for these aircraft.

"Our basic objective is to create incentives for the airlines either to buy more cargo-capable aircraft or to modify wide-body passenger aircraft to meet emergency cargo needs—but not necessarily boost the utilization rate of the present cargo aircraft in our behalf. Our challenge is to take the tremendous asset represented by CRAF and put it to work efficiently and equitably for the nation's military defense requirements.

"Unfortunately, many of the factors involved in creating such a situation are outside the purview of the Military Airlift Command and DoD."

### The CRAF Enhancement Program

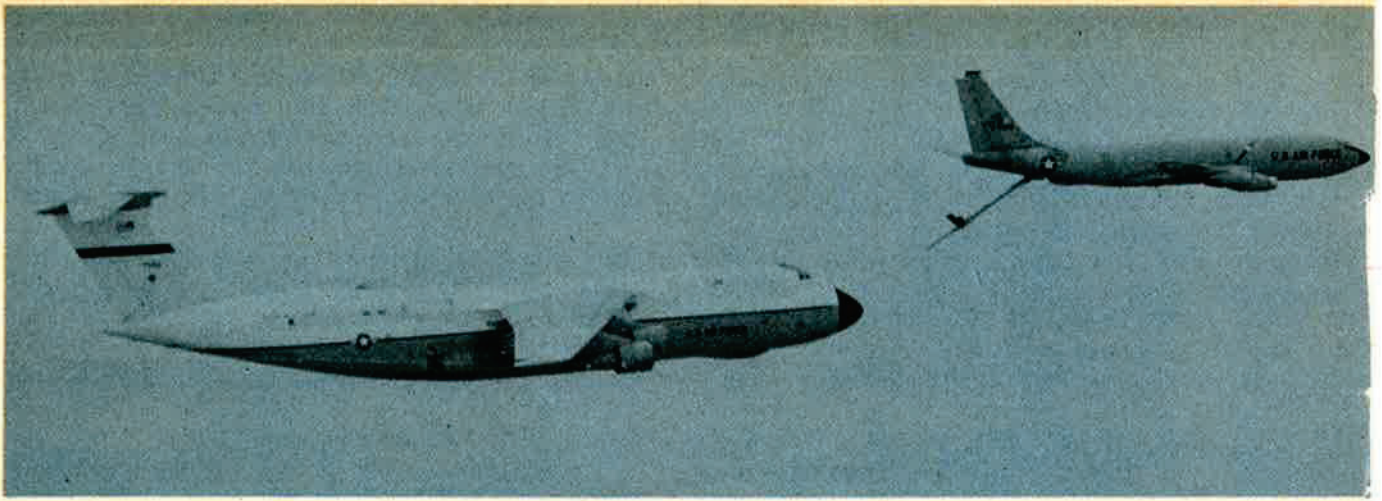
Early last year, DoD and the Air Force developed a plan to modify the wide-body 747s—or their equivalent in slightly smaller DC-10s or L-1011s—for CRAF use, thereby adding a total of about 6,800,000,000 ton-miles a year to the present CRAF standby capability at a total cost of about \$715 million.

Congressional opposition has caused the Air Force to "refine" the plan, with the help of the manufacturers and the airlines, to come up with a minimum-cost approach.

"We are thinking of modifying some of the aircraft to what we call the El Al approach; that is, removing galleys, seats, and sound-proofing and using the aircraft as is. During the Yom Kippur War, Israel's El Al airline used its 747s in this manner to transport high-density cargo such as ammunition by hand-loading through the existing passenger doors. Of course, this technique won't work if cargo is flown from multiple points to multiple points.

"We, therefore, would like to have the capability in the case of most of these aircraft to handle 463L palletized units that can be assembled and accounted for in the US and routed to a common delivery point in order to minimize the disruption and lost equipment that are likely to occur in a wartime environment. This would require the addition of either a visor nose or large side cargo doors on 747s, or a side cargo door on DC-10s or L-1011s, in order to accommodate palletized cargo and some oversized equipment. In addition, it will be necessary to strengthen the upper-deck flooring of the aircraft," General Carlton said.

Cost of these modifications, covering the useful life of the aircraft (calculated at ten years), is expected to range from about \$3.9 million to \$7 million per aircraft depending on the extent of the changes. In addition, the modifications will add between 2,500 and 7,000 pounds to empty weight, and increase landing fees, fuel costs, and crew salaries, which are based on operating weight. General Carlton pointed out that "somebody will have to pay for this as well as for the modification and loss of revenue incurred during the time the aircraft are being modified. We will try to modify these aircraft during a relatively quiet period in order to minimize the downtime penalty."

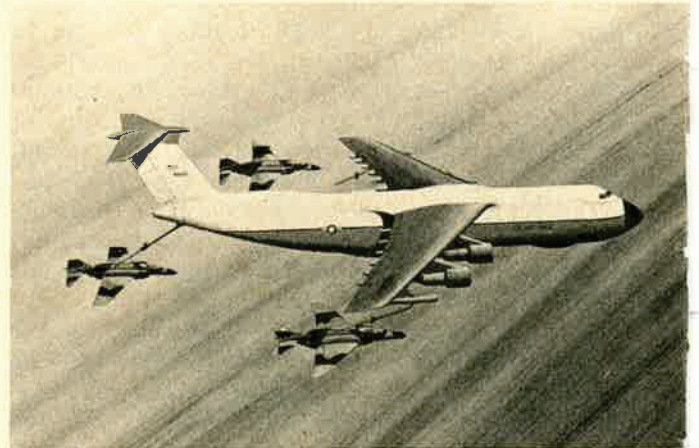


The Air Force believes that covering the costs of an enhanced CRAF capability by increasing the airlines' military business is neither feasible nor desirable, and is not cost-effective in terms of fuel consumption. The DoD and USAF, therefore, recommended to the Administration and the Congress the enactment of a Federal Airlift Expansion Act similar to the Marine Act covering the shipping industry. "What we need is for the Air Force, the Department of Defense, the Department of Transportation, the FAA, and the Civil Aeronautics Board to provide jointly the framework and the incentives that can sustain and expand CRAF in spite of the airlines' shrinking DoD business," the MAC Commander explained.

Under study are tax breaks and incentives to include specific CRAF-related requirements in designing commercial aircraft without impairing their peacetime operation. "We can't expect the manufacturers and the airlines to do these things strictly on patriotism; we must find ways to make increased CRAF participation possible at no extra expense to the corporations," General Carlton explained.

### The Merits of a Wide-Body Tanker

A wide-body tanker aircraft, in MAC's view, could enhance US strategic mobility "decisively" and at the same time ease some current deficiencies of MAC's current cargo capacity. The FY '75 budget, although below



USAF's original request, provides for preliminary research on such an aircraft. (See September '74 issue, p. 65.) The proposed aircraft's role would resemble that of the KC-135—primarily a tanker with the ancillary cargo capability a serendipitous fallout.

The case for a wide-body tanker rests on the assumption that in future conflicts US airlift might have to operate without access to foreign bases. The tanker and the "receiver," therefore, would have to "buddy" out from the US, which only makes sense if the tanker has significantly greater range and offload capacity than the KC-135.

Any modern wide-body, long-range jetliner with high bypass ratio engines, according to General Carlton, who helped develop USAF's aerial refueling doctrine, "is inherently capable of serving as a good tanker. Back in 1966, when SAC and the Air Staff first researched the characteristics of a follow-on tanker, we concluded that what's needed is an aircraft in the 1,000,000-pound weight class. The wide-body aircraft we are looking at right now comes very close to that target; for reasons of cost, we are obviously held to an aircraft that is already in existence."

The Air Force is exploring the potential of various versions of the 747, DC-10, L-1011, and C-5 in the tanker role. All these aircraft have the necessary payload, range, and volume, and, like the KC-135, offer economical "double mileage" as cargo carriers at minimum added cost, the MAC Commander said.

If the first refueling is to take place about 1,500



*This artist's conception shows a DC-10 launching an advanced type intercontinental missile. Making our missiles airmobile makes them less vulnerable to any possible preemptive knockout strike.*





Upper left, a C-5 Galaxy prepares for refueling from a C-135. At left, a C-5 tanker derivative is shown in an artist's conception with three refueling stations. Above, another artist's conception shows a McDonnell Douglas DC-10 tanker/cargo aircraft refueling a B-52 bomber.

nautical miles out, on the first leg of the mission, the following off-load capabilities appear feasible, according to MAC's and the manufacturers' assessments:

- A 747-100 (the oldest model of the 747) in a tanker version could offload 250,000 pounds of fuel, or roughly five times the refueling capacity of a KC-135;
- A late version 747, with a gross takeoff weight of up to 880,000 pounds, could offload more than 350,000 pounds;
- A C-5 with a modified wing, and with some 40,000 pounds of special cargo version features deleted, could deliver 250,000 pounds;
- A DC-10 optimized for long-haul international service could offload 235,000 pounds.

(Similar capabilities can be expected for the L-1011, if a long-haul version with uprated engines becomes available.)

Tankers derived from commercial aircraft enjoy advantages in both cruise speed and altitude over the specialized C-5, according to General Carlton. The 747, for instance, can cruise at speeds up to Mach .89 and offload fuel at 32,000-foot altitude, whereas the C-5's maximum speed is Mach .82 and its altitude is about 10,000 feet lower. (Both speed and altitude are important. In the case of the SR-71, for instance, the difference between refueling from a 747-type tanker operating at optimum altitude and speed, or a lower-flying C-5 derivative, is about 900 miles of range for the reconnaissance aircraft, which cruises near 80,000 feet.)

Even though the proposed new tanker will have significant cargo capabilities, there are no plans at this time to change SAC's role as the single tanker manager for the Air Force. "We don't need tankers in MAC as long as we have ready access to them. SAC is meeting all outside needs fully and efficiently, including more and more refueling of Navy aircraft," General Carlton said.

### Increasing Aircrew Ratios

The final element in the master plan for improving

strategic mobility turns on increasing aircrew ratios and maintenance manning, expanding the global spares network of the C-5 and C-141, and acquiring additional C-5 and C-141 visual training simulators. These proposals would increase total force (active and Reserve) crew ratios for the C-5s and the C-141s to four crews per aircraft, with a commensurate increase in maintenance personnel and in the war-reserve stocks of replenishment spares.

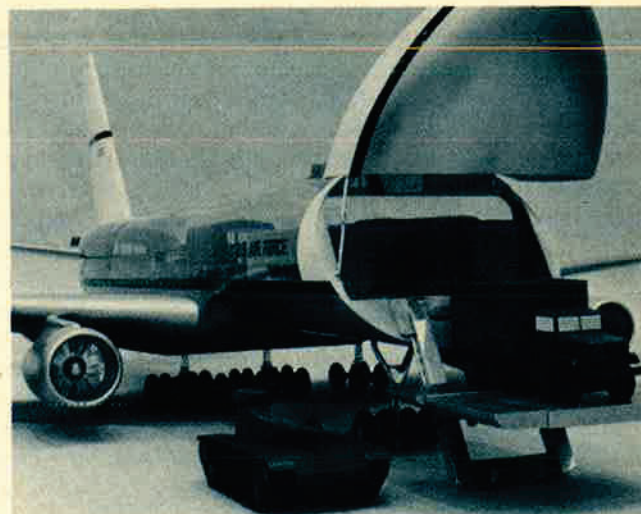
These increases, Secretary Schlesinger told Congress, "would permit a sustained wartime aircraft utilization rate of ten instead of eight hours per day and an initial surge wartime utilization rate—for a period of forty-five days—of twelve and a half instead of ten hours per day. That would be equivalent to a twenty-five percent increase in the wartime capability of the MAC strategic airlift forces." He added that this increase, by itself, "could reduce the average deployment per division from the US to Europe from about nineteen days to somewhat less than fifteen days." The long-term overall objective, realizable through the comprehensive airlift improvement package, is to reduce deployment time to seven days.

### The Long-Term Prospects

Although it is slower in coming than prophesied, some aviation planners and logisticians are confident that the civilian air cargo market stands on the threshold of a revolution. If that happens, MAC hopes to take advantage of the upswing, according to General Carlton.

Pointing out that huge austere cargo carriers with payloads of 500,000 pounds or more are now on industry drawing boards, he said: "It will be our challenge to find ways to incorporate into these designs the nation's military requirements, thereby assuring that we go a long way toward solving the military airlift requirement of the future."

The proposed Federal Airlift Expansion Act looks to an orderly, mutually profitable joining of the nation's commercial and military aviation goals. If this happens, MAC's capability in the decades ahead will be assured. ■



Huge future civilian cargo aircraft, such as the proposed McDonnell Douglas DC-XX design shown here, offer payloads twice that of the C-5. The challenge is to incorporate military requirements into these designs.

**I**T'S LIKE the Mona Lisa with acne. That's South Vietnam. Blemished beauty.

And the red blotches are spreading.

Solemnly signed agreements are scraps of paper for the North Vietnamese. Their actions prove that Stalin's cynicism still prevails: "A promise is like a pie crust—made to be broken."

South Vietnam's President Thieu, in accordance with the cease-fire agreement, dutifully established his air and sea ports of entry. He set up a system for the one-for-one replacement of equipment, subject to scrupulous audit, also in strict accord with the agreement. And, above all, he returned 28,000 North Vietnamese prisoners of war.

And the North Vietnamese? They refuse to expose their supply system to surveillance by the International Control body. Refuse to designate ports of entry. Refuse to return a single South Vietnamese POW.

In shocking violation of the agreement, they poured into South Vietnam hundreds more tanks, field pieces, and sophisticated weaponry. They massively stockpiled munitions. Enormously strengthened their logistic networks. And built a formidable air defense.

In addition to a SAM regiment and more than a half dozen different anti-aircraft weapons, with some of the 57-mm and all of the 85-mm and 100-mm guns radar-controlled, they also have the hand-held SA-7 Strela. As a result, more and more airspace is being conceded to them.

After 400 days of siege, Tom Le Chan, the football-field size South Vietnamese Army (ARVN) Ranger camp in the Saigon River corridor, was evacuated. Air landing was impossible, and the SA-7 prevented airdrop from lower than 10,000 feet. In the bloody division-size battles at Thyong Duc, southwest of Da-nang, the radar-controlled AA more than doubled this altitude.

Restricting the South Vietnamese Air Force (VNAF) with anti-aircraft weapons is bad enough. But restricting the ARVN, which the VNAF supports, is worse. For the ARVN has virtually no reserves. While its strategic air mobility is intact so far, its tactical aerial mobility is suffering. Against the enemy anti-aircraft weaponry, the ability to shift ARVN striking power with choppers under an umbrella of VNAF fighters is weakening.

Because of US budget cuts, not one of the 250 or so aircraft lost since the so-called cease-fire has been replaced. About half were helicopters.

Since the US has turned the supply spigot to an agonizing trickle, saving gun platforms—whether winged, wheeled, or tracked—as well as their costly ordnance, is the harsh order of the day. Thus, other outposts encircled with ack-ack thickets, or threatened with them, have succumbed or been conceded to the enemy.

The record poignantly shows that this kind

**A recently retired US Defense Attaché to South Vietnam reports on the disastrous effects of the North's cease-fire violations, coupled with cuts in US military assistance and with inflation. Saigon is being forced to trade lives for dollars while conceding territory to the enemy...**

# VIETNAM:

## The Map Turns Red

**BY MAJ. GEN. JOHN E. MURRAY,  
USA (RET.)**

of economy costs lives. As ammunition usage goes down, casualties go up. But the South Vietnamese have no recourse. They must live—or, rather die—with their impoverished supply system. And it is impoverished, contrary to the myth. That myth was born of the frantic pre-cessate-fire infusion of materiel in late 1972 and early 1973. The fact is, at the cease-fire which set their inventory in concrete, they were short of ammunition, spare parts, tools, and the things that let an army move and communicate, as well as shoot. Consumables are the oxygen of an army.

Inflation has made it all that much worse. Take, for instance, batteries. Forty-five thousand basic field radios use 100,000 batteries a month, at a price soaring toward ten dollars each.

### The Changing Pattern of Warfare

The pattern of warfare immediately after the cease-fire was largely one of small unit probing by the NVA. Rather cautious probing to test the US temper. Our spokesmen warned them against crossing an uncertain "threshold of aggression." What was the threshold? Apparently strong US interest in Vietnam dwindled when the US prisoners left Hanoi. It declined further with impeachment preoccupations, the Arab-Israeli war, inflation, and pontifications by pundits on the limit of our wisdom and power in foreign affairs.

It was not the use of power, but the hobbling of power—the withholding of force rather than the use of it—that cost so many US and allied lives and left South Vietnam with wretched economic troubles and in a declining military state.

Now, two years after the so-called cease-fire, the NVA, with its vastly expanded logistic base, has escalated to division-size attacks, centered

recently against the two largest cities in the South—Danang and Saigon.

And what of the level of aggression that we would not tolerate? Our threshold of tolerance has proved about as formidable a weapon as a frisbee in a windstorm. Despite outrageous provocations by the North, we draw down our forces in Thailand, reduce the B-52 force on Guam, cut back in the fleet, and go to the conference tables in Paris and Saigon with few cards except the discards of emetic rhetoric. No chief executive, in our land or in South Vietnam, could escape ridicule, castigation, and blame for an avalanche of events that has thundered down from the heights of past folly, perfidy, and accident.

But Thieu is not the Draconian dictator that the prophets of his downfall (who curse the delay in it) would have us believe. The street mobs that deplore his leadership are proof of the democratic aspects of his government. With a million-man military force, he could easily halt the protests and even more easily stop the typewriters of the reporters who dramatize it.

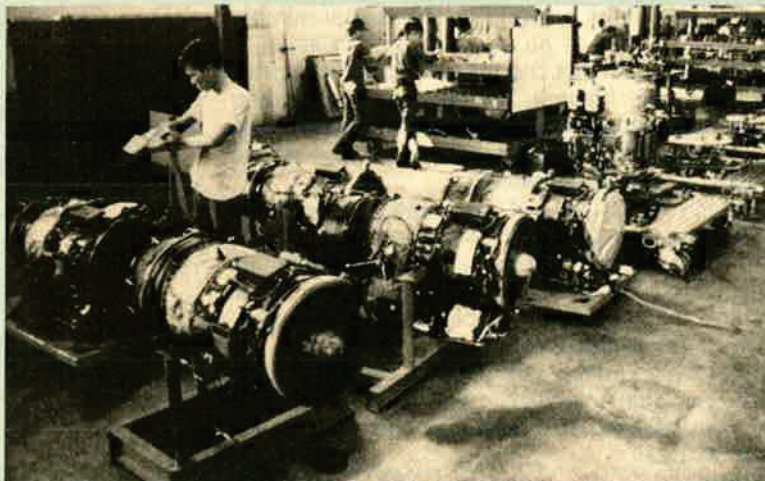
The root cause of safety-valve disturbances in the streets of Saigon is not Thieu. It is the war. The killings, the privation, and the seeming on-and-on endlessness of both. And we aren't helping.

South Vietnam will prevail only if we supply the logistics. Their tactics, leadership, gallantry, and fervor have proven out. But we're compromising the cause by cutting our military assistance to them.

### Money vs. Lives

How are the armed forces of South Vietnam managing to survive?

By cannibalizing equipment. Consuming inventories. Deferring maintenance. Denying themselves the spoiling attacks they should



The South Vietnamese have mastered the basic techniques of logistics and now routinely overhaul both jet and reciprocal engines.



Last August, General Murray, left, was US Defense Attaché in Saigon. He is shown here with General Nam, then 7th Div. CG, now CG of IV Corps in the Delta.

The author, Maj. Gen. John E. Murray, joined the US Army in 1941, serving in the artillery during World War II. Much of his postwar career was in transportation and logistics, including a tour as Director of Logistics at Hq. MACV. He was the US Defense Attaché in Saigon before he retired last August. General Murray is a graduate of the Army War College. He holds a master's degree in international affairs and is an attorney, admitted to practice before the US Supreme Court. He is now Vice President of the Association of American Railroads in Washington, D. C.

make on enemy concentrations. Trading blood to conserve ammunition. And still proudly and sadly, in the American image, duping themselves with semantics, referring staunchly to a perilous shrinking of their military strength as "streamlining."

Inflation, budget cuts, the SA-7, and the rest of a growing family of enemy AA weapons are reducing the VNAF. Few outsiders realize what an air force costs. Exclude ammunition, and the VNAF has been costing more to operate than the rest of the Vietnamese armed forces—Army, Navy, and Marine Corps—combined.

Since the cost of the Navy and Marines is relatively negligible, the choice of what to do with less money narrows. Budget cuts must come from the ARVN or the VNAF. Given the enemy's buildup of sophisticated antiaircraft weaponry, reducing the VNAF by administrative decision may be preferable to reducing it by combat attrition. Theoretically, it costs less that way.

So the money will be saved. But lives won't. The ARVN GI will pay a bloody price for the loss in VNAF close support, softening of forward strong points, protection of logistic pipelines and storage bastions, and the battlefield mobility it furnishes the Army. Money shortages will perhaps be the proximate cause of more ARVN casualties than will the NVA.

Among the tripe that belongs on the scrapheap of provable nonsense, along with the "uncompromising" label attached to Thieu, is the alleged inability of the South Vietnamese to technically support its Air Force.

The South Vietnamese are resilient. Despite the loss of considerable middle and top management support, and technical assistance from the US Defense Attaché and defense contractors, they have braced themselves and faced up to budget scourgings just as well as they've faced the enemy.

To counter the growing MiG threat, they have improved their ground-based air defense and their interceptor capability. While flying hours were down more than 100,000 hours in the first nine months of 1974, the accident rate was down, too. This key indicator of professionalism in war dropped from 9.9 accidents per 100,000 flying hours to 6.8.

The VNAF is compensating for fewer tactical sorties with larger bomb loads and the kind of blood-tingling valor that cheers the ground troops and frazzles the enemy.

The basic technique of logistics in supporting the virtual museum of old aircraft we left them—supply management, warehouse location accuracy, and refusal rates—all are improving. They now overhaul both jet and reciprocal engines. They have mastered com-

## US MILITARY ASSISTANCE TO SOUTH VIETNAM

(millions of dollars)

	FY '73	FY '74	FY '75
Requested by DoD	\$2,924	\$1,185	\$1,450
Appropriated by Congress	2,562	907	700
Amount cut by Congress	\$ 362	\$ 278	\$ 750

puters, and control a 300,000-line inventory.

The air-ground team in South Vietnam is a valiant, proficient, achievement-proud force.

One satisfying thing—if no more—can be said about us Americans in Vietnam. The South Vietnamese were ready when we withdrew our forces. But we are cutting back our bets on a food-rich and promisingly oil-rich land. That's where we should be putting our money.

That leads to another thing that can be said about Americans. We're fateful gamblers. There are more Americans obsessed with the dice that are cast on the crap tables of Las Vegas than with the dominoes tipping in the rice paddies of Southeast Asia.

Gambling is in our blood. And in the long run, that may cause more of it to flow. ■

## LUCKY NUMBER THIRTEEN

Some people think that the number thirteen is a bad omen. Not for me. It was my lucky number in a series of strange coincidences during World War II.

I was an eighteen-year-old ball-turret gunner on a B-17 crew. Our Fortress, *Bucket of Bolts*, arrived at a base near Foggia on Friday, the thirteenth of October 1944, where we became members of the 353d Bomb Squadron, 301st Bomb Group, Fifteenth Air Force. We soon became accustomed to the monotony of overseas life, broken only by the excitement and misery of bombing missions. Then seven members of my crew were shot down on a night mission. I couldn't go on that one. The ball-turret position was replaced by radar gear for night bombing.

One afternoon, after being assigned to another crew, I read the Ops Order for the next day's mission. Our B-17's position in the formation was in flight element 1-3. The last two digits of the aircraft's serial number were 13. Suddenly, I realized that this was to be my thirteenth mission.

At briefing the next morning, we learned that the target was oil refineries at Vienna, heavily defended by flak and fighters. As we began our bomb run, the B-17 was buffeted by flak explosions. I anxiously awaited the magic words, "Bombs away." Instead, there was a terrific explosion above my head, and I was knocked cold by the concussion.

When I came to, we had left the target area. I was able to signal the waist gunner that I was okay, and decided to stay in the turret until we had let down to 15,000 feet. Then I opened the turret hatch, and looked up through a gaping five-foot hole in the top of the fuselage near the turret support column. The piece of flak that had torn the hole and whose concussion had knocked me out lay against the turret.

With hands that trembled a bit, I picked up this wicked piece of metal that could cut a man in half. It was still hot. Then on its shiny machined side, I noticed an inscription. You guessed it. There was the number 13, clearly and boldly stamped into the metal.

—Contributed by Maj. Irving J. Linden, USAF (Ret.)

(AIR FORCE Magazine will pay \$10 for each anecdote accepted for publication.)

Those who think that the Europe of 1975 is turning into 1937 delude themselves. Lacking the overt threat of a Hitler, European perception of danger is dimmer today. But there is hope from an almost forgotten source . . .

# Will MFR Awaken Europe?

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

Brussels, London, and Paris are in subarctic latitudes, and this fact alone makes for short and gloomy winter days, even in the best of times. Since this winter is clearly not the best of times, things are a little gloomier than usual. Inflation, unemployment, memories of last winter's spooky empty streets during the oil embargo, and just the general state of things all contribute to the gloom. Some, with memories long enough, see history repeating itself. Nineteen seventy-five is turning into 1937. *Déjà vu*.

Their memories, I think, are playing them tricks. In 1937, Hitler's Germany was the clear and unequivocal threat to Europe, and all of Europe knew it. Britain and France, resignedly, were rearming to deal with Germany when the inevitable showdown came.

This time things are different. The Western nations are not rearming. The chilling news of force cuts announced by British Defense Minister Roy Mason in November, while more or less expected, still came as a shock to all of us who have been accustomed, all our lives, to thinking of Britain as a first-class military power. And while it has been some years since that was literally true, the structure, the leadership, and the professionalism were there to make it true again when the time and circumstances were right. But not now. No more.

The only saving note in Mason's new budget is the expressed determination to maintain the NATO commitment.

France is having its own military difficulties, and they are beginning to surface. The conventional forces have long been neglected in favor of the Force de Frappe—the nuclear forces—and now this neglect has begun to show. The discontent in the professional French forces is dramatized by the conservative newspaper *Figaro's* estimate that fifty percent of the regular military

voted for the leftist Mitterand in the last election. And here, if you like, is one small similarity with the late 1930s. The Force de Frappe, in some respects, has become the latter-day Maginot Line.

Two years ago, the United States was trying to steer its allies on a middle course between complacency—that NATO had enough forces and the Russians were no longer up to anything sinister—and dependency—that no matter what NATO had it would not be enough. The extreme view in this latter camp was probably best expressed by the Danish politician who advocated replacement of the Danish armed forces by a tape recording that would be triggered by a Russian attack and announce, in Russian, "We surrender, we surrender."

In any case, the United States is no longer, presumably, worried about allied complacency. The Secretary of Defense, Dr. James Schlesinger, told the BBC of his alarm over the British defense cuts: "It gives me," he said, "the gravest concern. The effect of the attempt to cut these forces, if widely practiced, will gradually eliminate the military balance which has given Europe a sense of security."

And that is just the point: the military balance. It is a complex thing, and there is a lot more to it than can be dealt with in SALT.

The President, in his press conference following the Vladivostok meeting, mentioned the Mutual Force Reduction negotiations and said that he and Brezhnev had agreed on their continuance. For a lot of reasons, it is important to continue these talks. One reason, and not the least important, is that these negotiations between NATO and the Warsaw Pact keep the facts out in the open as to the sizable, and growing, disparity between NATO and the Warsaw Pact. And while these force-reduction talks have inevitably produced a whole

new school of disarmament experts, the very nature of the talks does require them to concentrate their energies on the problem at hand.

Unfortunately, these Mutual Force Reduction negotiations have not gotten much visibility. They have not made much headway either, but no one expected them to, at least not in the early stages. The negotiations are complicated by the fact that, in sheer numbers at any rate, the two sides are quite unequal in the agreed negotiating area. This area, generally referred to as the Central Region, takes in the Federal Republic of Germany and the Benelux countries on our side, and East Germany, Czechoslovakia, and Poland on the Warsaw Pact side.

Whether these talks get anywhere or not is a matter of great political but little military interest. The disparity between the two sides is considerable and, short of some kind of negotiating coup equal to getting the best of a rug dealer in a Mideast bazaar, it will continue. The important thing is for everyone to know the facts, with the hope that once this disparity is generally understood, our side will make sure it grows no larger. If, in short, the respective negotiating positions were better known, there would come an understanding of the deepening peril Europe will face if the military balance, already tenuous, is destroyed.

Meanwhile, the NATO nations muddle along. In 1937, Hitler was clearly visible as the enemy. European vision is a little dimmer in 1975. And, while our own perception of things is clearly better than it was in the thirties, we still have our moments. Witness, for example, Congress' denial of further aid to that most useful and loyal ally, Turkey.

Maybe NATO needs a new motto, and Pogo has already coined it: "We have met the enemy and he is us." ■

Scientists, especially in the USSR, are working on methods for altering weather and climate. This branch of science has a vast potential for good—or for catastrophe . . .

# WEATHER MODIFICATION

## A Pandora's Box?

BY ALAN M. HORTON



*Among the less exotic but effective systems for gathering weather data is the WC-130B, recently modified to meet the needs of the late 1970s.*

**W**EATHER experts wonder if the cold war ever will become a wet or windy one with nations deliberately, or even inadvertently, steering storms or droughts at each other.

No such weather-controlling technology exists today. But most experts believe a breakthrough in weather and climate knowledge may be near, thanks to the latest computers and satellite sensors. Man is starting to gather and process enough weather and other climatological data to begin to understand what makes weather tick.

The potential for good and evil from such knowledge is enormous. And the pressure to try weather-modification schemes is growing dramatically.

The last couple of years have pro-

vided alarming examples of how much the world's food supply can be affected by bad weather and climate change: The Sahara Desert is shifting southward, causing famine. The 1972 Soviet wheat-crop failure continues to affect world grain markets. The temporary disappearance of cold surface ocean waters from the Humboldt Current virtually destroyed Peru's anchovy fishery. India's monsoon rains started late and ended early.

The future may be worse. Many meteorologists warn that the climate is shifting toward another cold, glacial period. Others say the world is on the brink of a tropical era caused by man-made carbon dioxide.

One stark fact is certain: Whatever the climate's course, population is increasing faster than food production.

Retired Air Force Col. Joseph A. Fletcher, now an official of the

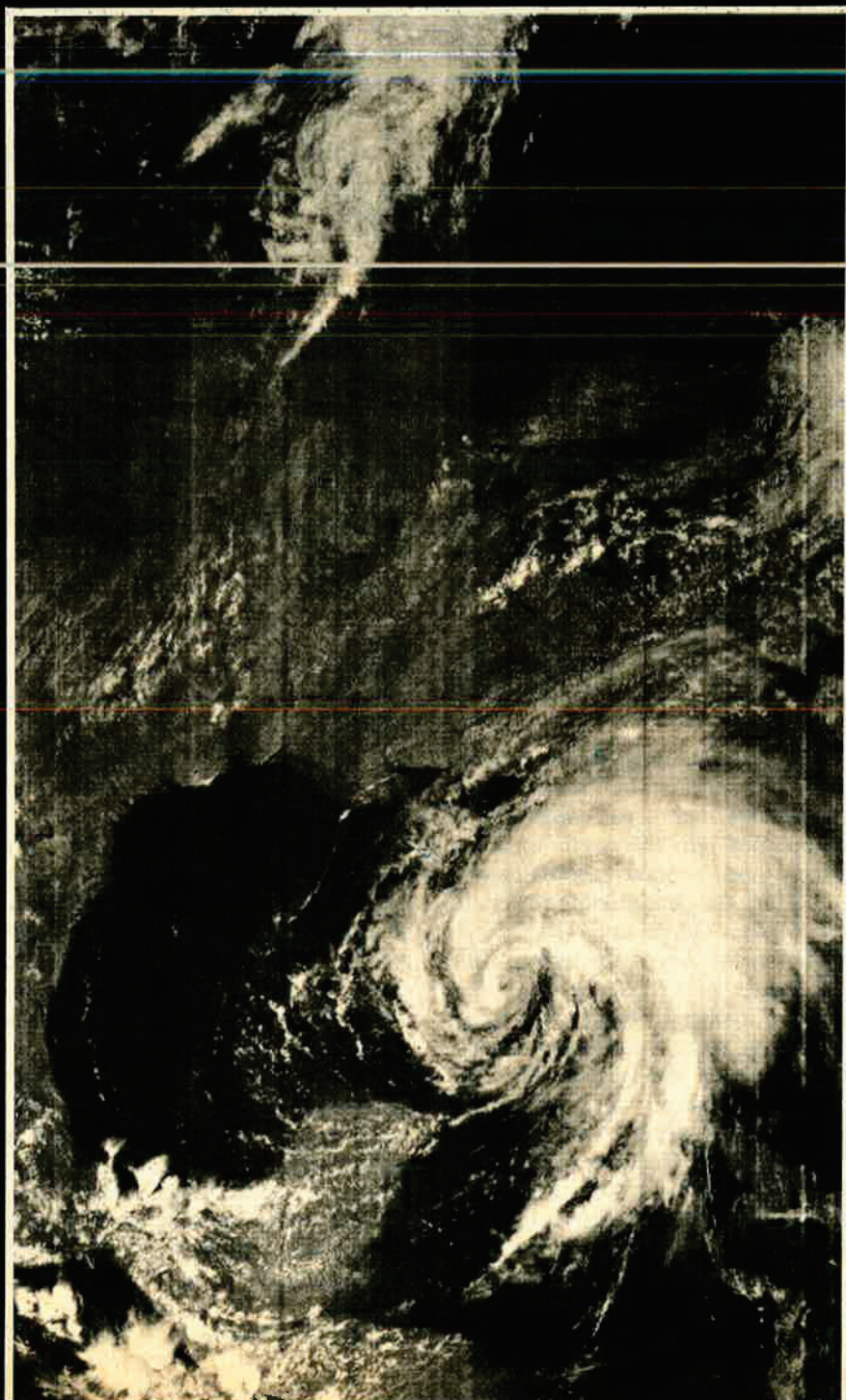
National Oceanic and Atmospheric Administration (NOAA) and one of the world's climate experts, says, "Further expansion of the world's arable and grazing lands is principally limited by the availability of cheap water for irrigation, but many of the world's rivers have been tapped almost to the limit and receding glaciers have drawn down reserves. . . . The world's most productive fisheries are at or near their maximum sustainable levels.

"There is a growing volume of evidence that the extraordinary warmth of the early twentieth century is drawing to a close," he says. "Snow and ice-pack boundaries have been advancing in northern latitudes. Warmth-loving animals are shifting their ranges southward. Hardwood forests are encroaching southward in North America. Careful analyses of both surface and upper air temperature records indicate a distinct global cooling trend since about 1940."

If he's right, British, West German, and Icelandic fishermen will have even more pack ice spoiling fishing and shortening tempers. The US, European, and Soviet growing seasons will shorten, robbing the world's great breadbasket. The Soviet northern fleet will be iced in more often.

Colonel Fletcher warns that decreasing food supplies could disastrously disrupt world order. (The absence of food surpluses already has affected the US balance of trade.)

A recent report published by the Interdepartmental Committee for Atmospheric Sciences flatly said—



after predicting “cooler conditions” —that “the future reliance of mankind on a stable and temperate climate is a bald fact of life that cannot be minimized. The disparity between our well-fed prosperity and the hungry masses of the underdeveloped world is already a focus of world tension.”

#### **Soviet Weather Modification**

Russia is the busiest weather modifier in the world, devoting millions of rubles to the effort and claiming dramatic successes. (Some sixty countries have used weather modification techniques, according to Dr. Edith B. Weiss of the Brookings Institution.)

But it's not what Russia is doing so much as what she is considering that worries US experts. Recent Soviet scientific literature is full of grandiose geophysical projects, some of which potentially could change the world's climate. Although some knowledgeable American observers say Russian scientists are “hesitant” and “cautious” about such schemes, no one knows how seriously they are being contemplated, according to Prof. Louis J. Battan, Director of the Institute for Atmospheric Physics at the University of Arizona. Stephen J. Lukasik, former Director of the Defense Advanced Research Projects Agency (ARPA), told Congress last year the Soviet “predilec-

*Satellites and computers have revolutionized the collection and analysis of weather data. This is a satellite photo of Hurricane Agnes (1972) over the Gulf of Mexico.*

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The author, Alan M. Horton, is a 1965 graduate of Yale University. He has been a reporter for two Scripps-Howard newspapers—the Cincinnati Post & Times-Star and the Cleveland Press. As a Scripps-Howard Washington correspondent, he has covered Capitol Hill and, since May 1972, the Pentagon.

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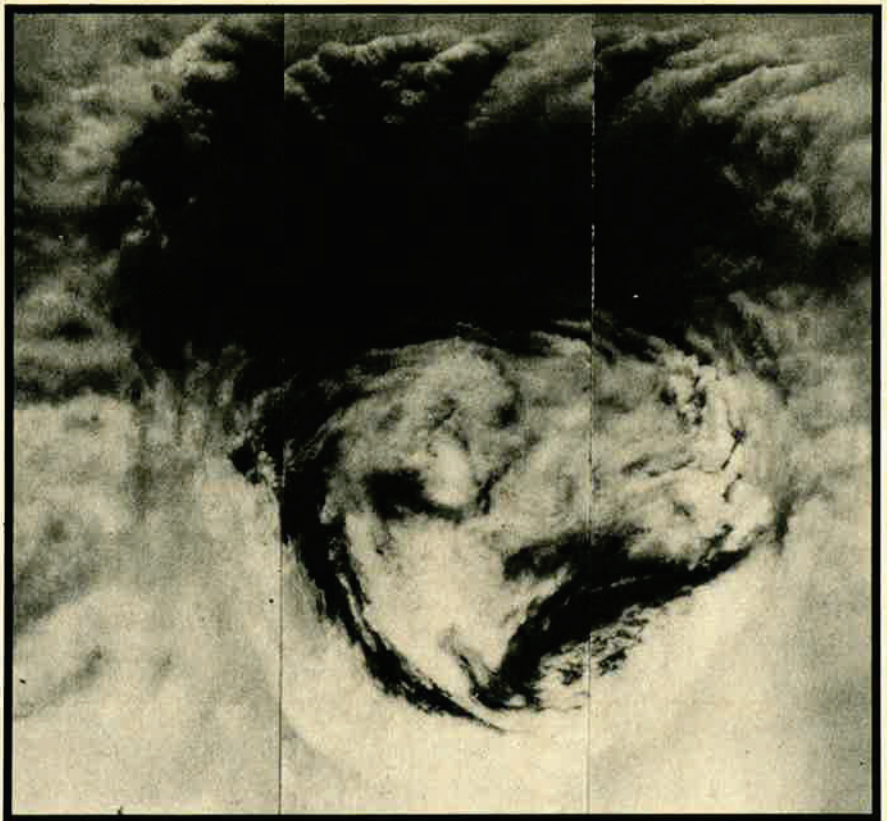
tion” for “massive” climate modification schemes is of “particular concern.”

For example, Soviet climatologists apparently are seriously considering plans to divert at least one of a number of rivers that flow northward toward the Arctic to the south in order to raise the level of the Caspian Sea and permit more irrigation in southwest Russia. One plan calls for a seventy-mile-long canal, part of which would be dug with nuclear explosives, from the Pechora River to the Kama, a Volga River tributary.

I. A. Gerardi, chief engineer for the river diversion, has described another plan for an Ob'-Caspian Canal to start at the confluence of the Irtysh and Tobol Rivers at about 58° N latitude and 68° E longitude and, through a series of pumping stations, locks, reservoirs, and branch canals, reach southwest Turkmenistan to the east of the Caspian Sea. The system would be 1,800 miles long and eventually deliver many cubic miles of water southward each year.

Either canal would substantially reduce the flow to the Arctic of fresh water, which helps maintain the polar ice cap. Once melted, Arctic ice would never return, some experts believe.

One US official says, “Reducing the ice pack could well do wonders for the Russian Navy, reducing winter ice that hems in the northern fleet and affects submarine operations as well. And Siberia might be warmer. But the major concern here is a reduced temperature difference between the pole and the



This striking photograph of Hurricane Carla, which devastated the coasts of Texas and Louisiana in September 1961, was taken from a U-2 reconnaissance plane flying at about 65,000 feet—15,000 feet above the cloud tops.

tropics that would change worldwide rainfall patterns, the strength of the jet stream, and the spacing between low-pressure weather systems, and thus the economies of many nations.”

Other mind-boggling projects mentioned by Russian scientists in recent literature studied for ARPA include:

- A multibillion-dollar, forty-four-mile dam across the Bering Strait so that warmer ocean water could be pumped into the Arctic to warm Siberia and increase rainfall there.

- Huge air-conditioning towers in the Medeo Gorge and Lake Issyk Valley in the Alma-Ata region, near the border of China's western Sinking Province, literally to spray cool water piped from nearby mountains into hot, dry summer air. The same spray would warm winter air as it turns to snow.

- An orbiting solar power-station satellite by the year 2050 that would generate enough electricity to supply Moscow.

According to a March 1974 re-

port prepared for ARPA, Russia already claims:

- A five to ten percent precipitation increase in the Ukraine and even larger ones elsewhere, thanks to cloud-seeding experiments. Soviet scientists contend, for example, they increased rainfall in Cuba and over Lake Sevan in Soviet Armenia.

- An annual savings of one to two million rubles, by putting out forest fires with rain-making techniques.

- A dramatic decrease in the number and intensity of hailstorms over hundreds of thousands of acres. Professor Battan says Russia fires rockets and artillery shells loaded with lead iodide into hailstorm clouds in Moldavia and the Crimea, causing rain before hail forms.

“They claim sixty to ninety percent hail damage reduction, and, until recently, didn't admit that a single hailstorm beat the system,” Professor Battan says. “They have few statistical controls, which is why American scientists look askance at their findings.”



Battan says the Soviets devote several times as much manpower as does the United States (70,000 workers at the Soviet Hydrometeorological Service alone) to weather and flood research, prediction, and modification.

One senior NOAA official in Washington who often deals with Soviet weather/climate experts here and in Russia says, "We know of activities that go on there we would like to know more about. They have a climate research institution at Vladivostok that we haven't been permitted to visit. We're pretty certain we know what goes on there."

Professor Battan, who has visited some Russian weather institutions, adds, "As far as I know, the Soviets never have let an American through the door of the Central Aerological Observatory in Moscow."

However, many Russian weather projects and experiments are described openly in Soviet scientific literature, including the use of:

- A laser to dissipate fog in a laboratory. Russia also blows liquid carbon dioxide into fog at important airports in freezing weather. The liquid CO<sub>2</sub> forms dry ice crystals that attract enough fog moisture to clear a runway. Planes equipped to dispense dry ice then use the runway to take off and "seed" the rest of the fog.

- High-frequency sound waves to spread fatty alcohol on the Kola Gulf to prevent evaporation from forming fog.

- Electricity that causes water droplets in clouds to form rain.

- Powdered cement or talc dropped on clouds to dissipate them.

(Jets also fly into clouds at high angles of attack to create downdrafts and break up clouds. Anti-aircraft shells have been used to blow up clouds.)

- A "super-meteotron" (Professor Battan's word for a machine consisting of six connected gas turbine aircraft engines shooting a hot-air current nearly two miles up) to lift chemicals or small particles to create clouds or whirlwinds.

### US Weather Research

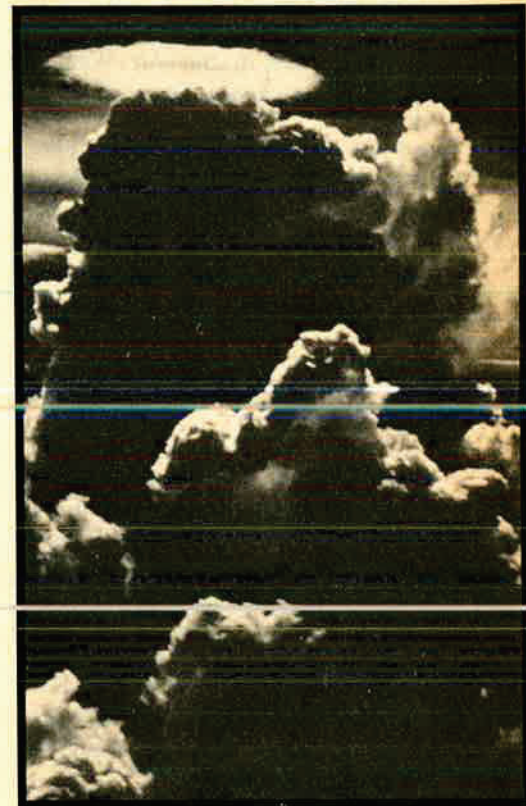
Compared with Russia, weather modification research in the US is disjointed, unfocused, and underfunded.

Last August 23, the General Accounting Office (GAO) said, "For nearly a decade, studies of the administration of federal weather modification research have identified common problems hindering progress:

- "No central authority to direct federal departments' efforts;
- "Ineffective coordination;
- "Insufficient resources to obtain timely, effective results."

The report said seven federal departments and agencies—Agriculture, Commerce, Interior (Bureau of Reclamation), Defense, Transportation, National Science Foundation, and NASA—conduct weather modification research, spending about \$20 million a year. (Although the fiscal 1974 budget included \$275 million for atmospheric sciences, only \$17.4 million was for weather modification.)

The federal research falls into six basic areas—rain and snow-making;



*A spectacular cloud development photographed twenty minutes after the clouds had been seeded by MAC's Air Weather Service aircraft.*

removal of cold and warm fog; hail suppression; lightning elimination; hurricane taming; and study of pollution's effects on weather.

None of the US weather modification research projects is going as planned: The Navy and Air Force have pulled out of Project Stormfury to modify hurricanes; there are no funds to speak of for lightning research; the national fog modification project hardly has started; the Army failed to provide helicopters, and the Army and Air Force did not supply enough people for hail-suppression experiments.

Malcolm R. Currie, Director of Defense Research and Engineering, says the Pentagon's interest in weather modification mostly involves protecting personnel and resources against weather hazards and guarding against "technological surprise."

According to Col. Patrick J.

Breitling, the main Air Force weather modification project now is use of liquid propane at Elmendorf AFB, Alaska, Fairchild AFB, Wash., and Hahn AB, Germany, to turn cold fog into snow. Before liquid propane systems were developed, the Air Force sprinkled fog with dry ice from WC-130 planes, a much more costly technique. Colonel Breitling is No. 2 man in the Air Weather Service's Aerospace Sciences Directorate.

(The Army's laboratories at Hanover, N. H., spending Air Force money, are evaluating substitution of compressed air for propane for fog clearing. Commercial airports hire private companies to seed fog with dry ice or silver iodide. Paris' Orly Airport is the only civilian airport using liquid propane to clear fog.)

Colonel Breitling said the Air Force also is studying—at its Air Force Cambridge Research Laboratories, Hanscom AFB, Mass.—various systems to clear warm fog. He said the Air Force may get into the hail-suppression business as well since hail damage is a frequent threat at some bases.

Fading into history are the Air Force typhoon chasers. Satellites can do that job better.

Already past, apparently, is Air Force rain-making. From 1967 through 1972, American pilots flew 2,602 cloud-seeding sorties in Southeast Asia to bog down Communist logistics. There is no solid evidence that rain-making did much good although some say rainfall increased ten to thirty percent.

Military cloud-seeding also has

yielded mixed results in producing rain in Texas and the Philippines and in reducing hurricane winds. The winds of one tropical storm, Hurricane Debbie in 1969, did slacken substantially after Project Stormfury cloud-seeding.

The Navy continues cloud-seeding and fog modification research at the Naval Weapons Center, China Lake, Calif., where rain-making "pyrotechnics" are developed.

ARPA spends about \$3 million annually to develop computers to analyze weather data, sponsor university weather/climate research, pay RAND Corp. for its weather expertise, and analyze Soviet weather programs. The National Science Foundation gradually is taking over ARPA's weather/climate research.

### Limiting Weather Modification

Last July, former President Richard M. Nixon and Soviet Communist Party leader Leonid I. Brezhnev signed a statement calling for "the most effective measures possible to overcome the dangers of the use of environmental modification techniques for military purposes." US and Soviet diplomats met in Moscow last November 1-5 to implement the July statement. "We had discussions—I wouldn't call them negotiations," says one of the US diplomats involved.

But there is hope.

Soviet Foreign Minister Andrei A. Gromyko wrote the United Nations last August 7 urging the "prohibition of action to influence the environment and climate for military and other purposes incompatible

with the maintenance of international security, human well-being, and health."

Russia's Ambassador to the United Nations, Jacob A. Malik, said unless weather war is outlawed, nations one day could create "windows" in the ozone layer of the upper atmosphere letting deadly ultraviolet rays through to "selected parts of our planet"; create tidal waves by blowing up parts of the polar ice caps; and build walls of sound on the oceans.

The UN Political Committee voted 102 to 0 for the Soviet proposal. The United States abstained, but supported the thrust of the Soviet language. US witnesses have told Congress that America will not use climate modification schemes as weapons, but have refused to rule out all weather modification techniques, carefully distinguishing between climate and weather.

The proposal will be considered this spring at the thirty-nation Geneva disarmament talks.

But writing an agreement prohibiting military weather modification is not so simple. How would one nation detect enemy violations? Should a country be banned from making or dispersing fog to rescue encircled troops?

Man has come a long way since that famous comment, variously attributed to Mark Twain and to Charles Dudley Warner, that "everybody talks about the weather, but nobody does anything about it."

Now mankind must insist, "Everybody must talk about the weather, and work together to do something about it, safely." ■

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## SOUTHPAW

During one of the nuclear-weapon training exercises at Carswell AFB in the early '50s, the security requirements were such that cooks, bakers, and bean-counters were pressed into service as security guards.

Riding in a jeep with a West Point major, I noticed the gate sentry keep his rifle on his right shoulder as he sighted the badges that cleared us into the weapons assembly stockade. Once we were all set, he waved us through the gate and saluted smartly with his left hand.

"Stop the jeep!" my fellow passenger shouted. "Now, back up."

"Private," he asked curtly, "anyone ever show you how to salute when you're carrying a rifle?"

The sentry's response was quick and earnest. "No, Sir," he said, "and I sure wish somebody would. I've been catching hell all day!"

—Contributed by Capt. A. H. Vito, Jr., US Navy (Ret.)

(AIR FORCE Magazine will pay \$10 for each anecdote accepted for publication.)

# JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT



*This view of a JA 37 development aircraft shows well the underfuselage 30 mm gun installation on this interceptor version of the Viggen*

#### **SAAB-SCANIA**

*SAAB-SCANIA AKTIEBOLAG; Address: S-581 88 Linköping, Sweden*

#### **SAAB 37 VIGGEN**

The first of seven prototypes of the Saab 37 flew for the first time on 8 February 1967, and by April 1969 all six single-seat prototypes were flying. The seventh Viggen was the prototype for the two-seat SK 37

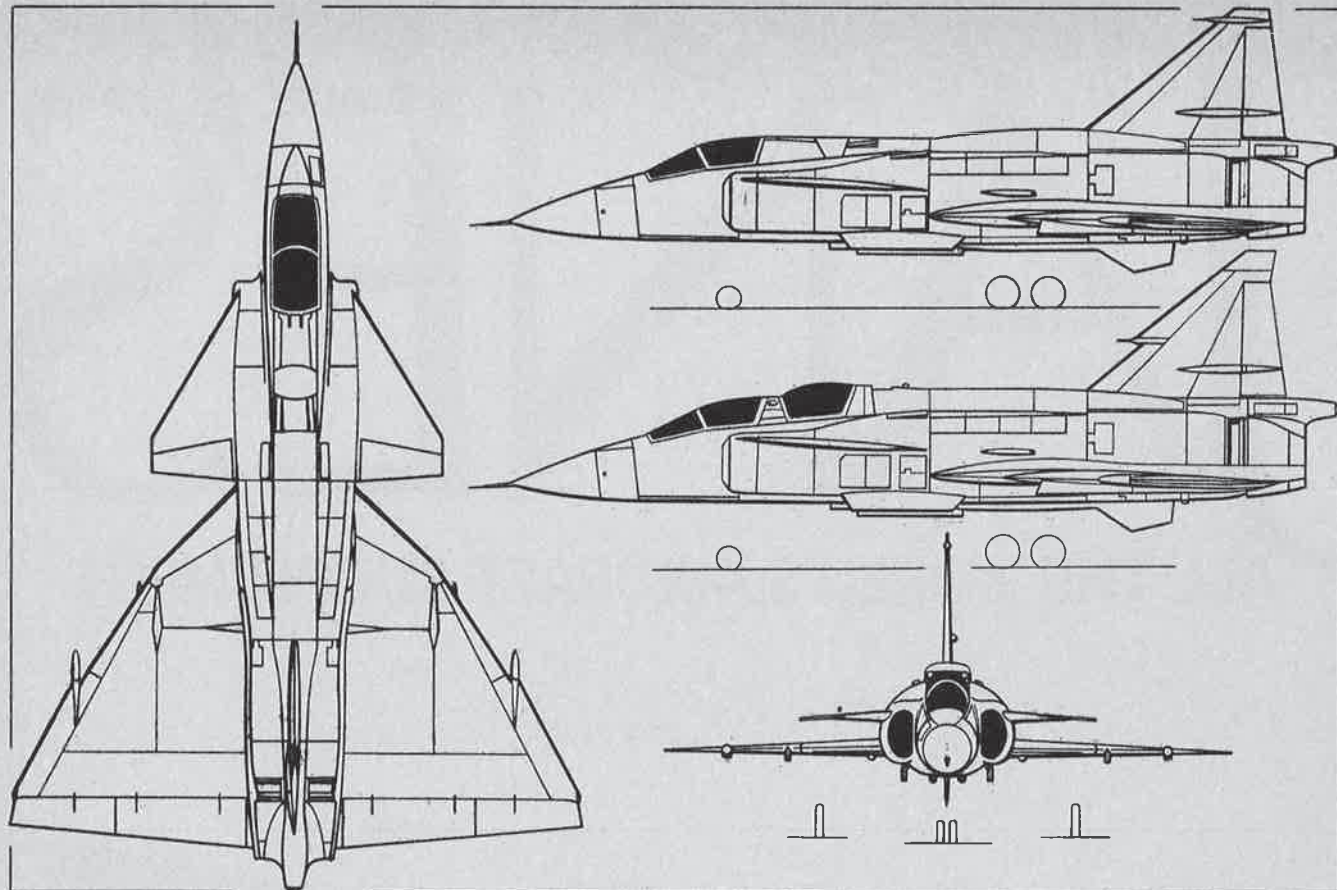
operational trainer. A number of airframe parts were also completed for static testing.

The following versions have so far been announced:

**AJ 37:** Single-seat all-weather attack version, with secondary interceptor capability. Initial production version, which began to replace the A 32A Lansen from mid-1971. First production AJ 37 flew on 23 February 1971 and deliveries began on 21 June

1971. First AJ 37 unit was F7 Wing at Sätenäs; by the end of 1974 all three squadrons of F7 were equipped with the AJ 37 (and some SK 37s for training), and deliveries had begun to F6 at Karlsborg and F15 at Söderhamn.

Initially, 175 aircraft of the AJ 37, SF/SH 37, and SK 37 versions were ordered for the Swedish Air Force; in December 1973 it was announced that five more aircraft (AJ



Saab AJ 37 Viggen single-seat attack aircraft, with additional side view (centre) of SK 37 two-seat training version (Pilot Press)

37s) were to be built within the same overall budget cost.

**JA 37.** Single-seat interceptor, with Smiths electronic head-up display, Volvo Flygmotor RM8B engine, of improved performance, and secondary capability for attack missions. Preliminary design work began in 1968. Flight testing of selected systems, including the radar, was initiated in early 1973 in a modified Saab 32 Lanser development aircraft. Four modified AJ 37s are being used in the JA 37 development programme. The first of these, for control system tests, flew for the first time in June 1974. The second, for engine tests, made its first flight with an RM8B engine on 27 September 1974; this aircraft was also fitted with a 30 mm Oerlikon KCA long-range cannon, installed in an underbelly pack, aft of which is a redesigned ventral fin. The third and fourth development aircraft are for electronics and armament system tests respectively. The fifth development aircraft, scheduled to fly in mid-1975, will be built from the outset to JA 37 standard. The JA 37 has four elevon hydraulic actuators under each wing, instead of three as on other versions.

An initial batch of 30 JA 37s was ordered in September 1974, out of a planned total procurement of 150-200 to re-equip eight or more Draken fighter squadrons of the Swedish Air Force in 1978-85. Production began in late 1974.

**SF 37.** Single-seat all-weather armed photographic reconnaissance version to replace the S 35E Draken. A production contract was awarded in early 1973. Intended normally for overland reconnaissance, the SF 37 has a modified nose containing cameras, and other equipment permitting reconnaissance at any hour of the day or night, at high or low altitudes, and at long distances from the target. First flown on 21 May 1973.

**SH 37.** Single-seat all-weather maritime reconnaissance version, to replace the S 32C version of the Lanser. Production ordered at same time as the SF 37. Primarily intended to survey, register, and report activities in the neighbourhood of Swedish territory. Can also be used for attack missions. Prototype first flown on 10 December 1973.

**SK 37.** Tandem two-seat dual-control training version, in which the rear cockpit takes the place of some electronics and the forward fuselage fuel tank, and is fitted with bulged hood and twin periscopes. Modified, taller tail-fin of increased area. Capable of secondary attack role, with full range of attack armament as in AJ 37. Prototype first flown on 2 July 1970. First production SK 37 delivered in June 1972. In service with F7 Wing at Sätenäs; being delivered also to F6 and F15.

**Saab 37E Eurofighter.** Export version, essentially similar to JA 37. Under consideration in latter half of 1974 as a potential F-104G replacement by Belgium, Denmark, the Netherlands, and Norway, to whom industrial offsets, including licence production, have been offered.

The following details refer generally to all versions of the Viggen, except where specific versions are indicated:

**TYPE:** Single-seat all-weather multi-purpose combat aircraft and (SK 37) two-seat operational trainer.

**WINGS, FUSELAGE, TAIL UNIT, AND LANDING GEAR:** As described in 1974-75 *Jane's*.

**POWER PLANT (AJ 37, SF/SH 37, SK 37):** One Volvo Flygmotor RM8A (supersonic development of the Pratt & Whitney JT-8D-22) turbofan engine, fitted with a Swedish-developed afterburner and thrust reverser. This engine is rated at 14,735 lb (6,685 kg) st dry and 25,970 lb (11,780 kg) with afterburning. Thrust reverser

doors are actuated automatically by the compression of the oleo as the nose landing gear strikes the runway, the thrust being deflected forward via three annular slots in the ejector wall. The ejector is normally kept open at subsonic speeds to reduce fuselage base drag; at supersonic speeds, with the intake closed, the ejector serves as a supersonic nozzle. Fuel is contained in one tank in each wing, a saddle tank over the engine, one tank in each side of the fuselage, and one aft of the cockpit. Electrically-powered pumps deliver fuel to the engine from the central fuselage tank, which is kept filled continuously from the peripheral tanks. Pressure refuelling point beneath starboard wing. Provision for jet-tisonable external auxiliary tank on under-fuselage centreline pylon; this tank is normally a permanent fit on the SK 37.

**POWER PLANT (JA 37, Saab 37E):** One Volvo Flygmotor RM8B turbofan engine, rated at 16,190 lb (7,345 kg) st dry and 28,085 lb (12,740 kg) st with afterburning. Thrust reverser and fuel system details similar to other versions.

**ACCOMMODATION:** Pilot only, on Saab-Scania fully-adjustable rocket-assisted ejection seat beneath rearward-hinged clamshell canopy. Cockpit pressurisation, heating, and air-conditioning by engine bleed air, via Delaney Gallay heat exchangers, cooling turbines, and water separator. Bird-proof windscreens. JA 37 cockpit redesigned and optimised for interceptor mission. SK 37 has twin periscopes and tandem ejection seats.

**SYSTEMS:** Two independent hydraulic systems, each of 3,000 lb/sq in (210 kg/cm<sup>2</sup>) pressure, each with engine-driven pump; auxiliary electrically-operated standby pump for emergency use. Three-phase AC electrical system supplies 210/115V 400-

Hz power via a General Electric 60kVA liquid-cooled brushless generator, which also provides 28V DC power via 24V nickel-cadmium batteries and rectifier. Emergency standby power from 6kVA turbogenerator, which is extended automatically into the airstream in the event of a power failure or when the landing gear is extended. External power receptacle on port side of fuselage. Graviner fire detection system.

**ELECTRONICS AND FLIGHT EQUIPMENT:** Altogether, about 50 avionics packages, with a total weight of approx 1,323 lb (600 kg), are installed in the Saab 37. Flight equipment includes an automatic speed control system, a Svenska Radio (Marconi-Elliott; in AJ 37) or Smiths (in JA 37) electronic head-up display. AGA aircraft attitude instruments and radio, Philips air data computer and instruments, L.M. Ericsson radar, Honeywell radar altimeter, Decca Doppler Type 72 navigation equipment, SATT radar warning system, Svenska Radio radar display system and electronic countermeasures (ECM), and AIL Tactical Instrument Landing System (TILS), a microwave scanning beam landing guidance system. Most of the electronic equipment in the Viggen is connected to the central digital computer which is programmed to check out and monitor these systems both on the ground and during flight. The JA 37 has a ram-air intake on the underfuselage centreline, for cooling of the avionics compartment.

**ARMAMENT AND OPERATIONAL EQUIPMENT (AJ 37):** All armament is carried externally on seven permanent attachment points, three under the fuselage and two under each wing, with standard 30 in (75 cm) store ejection racks. Each wing can be fitted with an additional hardpoint if required. Primary armament is the Swedish RB04E air-to-surface homing missile for use against naval targets, or the Saab RB05A air-to-surface missile for use against ground, naval, and certain airborne targets. To these can be added pods of Bofors 13.5 cm air-to-surface rockets, bombs, or 30 mm Aden gun pods. The attack version can be adapted to perform interception missions armed with RB24 (Sidewinder) or RB28 (Falcon) air-to-air missiles. Computations in connection with various phases of an attack, including navigation, target approach, and fire control calculations, are handled by a Saab-Scania CK-37 miniaturised digital computer. This computer,

which performs 48 specific tasks within the aircraft and is capable of 200,000 calculations per second, also provides data to the head-up display in the cockpit, thus freeing the pilot for concentration on other aspects of a flight. For a typical attack mission, the pilot would feed into the computer the position of the target and flight-path waypoints; the exact time of the attack; details of intended and alternative landing bases; and the type and method of delivery of the weapons to be carried. The computer would then calculate and present to him information regarding engine start and take-off times, navigation and approach to the target (including any deviations from the time schedule), weapon aiming and release, climb-out, return flight path, and landing. Continuous monitoring of the flight paths and fuel situation is provided throughout the mission, and the computer can also, when required, release the weapons automatically.

**ARMAMENT AND OPERATIONAL EQUIPMENT (JA 37):** Permanent underbelly pack, offset to port side of centreline, containing one 30 mm Oerlikon KCA long-range cannon with a muzzle velocity of 3,445 ft (1,050 m)/sec, a rate of fire of 1,350 rds/min, and a projectile weight of 0.79 lb (0.36 kg). Improved insight. This gun installation permits retention of the three underfuselage stores attachment points, as in the AJ 37, in addition to the four underwing hardpoints. Advanced target search and acquisition system, based on a high-performance long-range L.M. Ericsson X-band pulse-Doppler radar which is unaffected by variations of weather and altitude. This radar is not disturbed by ground clutter, and is highly resistant to ECM. Singer Kearfott central digital computer. Weapons system includes provision for long-range homing air-to-air missiles.

**ARMAMENT AND OPERATIONAL EQUIPMENT (SF 37, SH 37):** Both reconnaissance versions can carry two air-to-air missiles, on the outboard wing stations, for self-defence. Equipment in the SF 37 includes a special optical sight, data camera, tape recorder, and other registration equipment. The data camera collects and stores on its film co-ordination figures, aircraft position, course, altitude, target location, and other data. Four vertical or oblique low-level cameras and two long-range vertical high-altitude cameras are installed in the nose, together with the camera sight, an infrared sensor, and ECM registration equip-

ment. Systems configuration also makes possible the detection of camouflaged targets and horizon-to-horizon (180°) photo coverage. Typical external mission equipment, in addition to air-to-air missiles, includes a drop-tank and two night reconnaissance pods (night cameras and illumination equipment) on the underfuselage stations, and an active or passive ECM pod on each of the inboard underwing pylons. Internal equipment of the SH 37 includes a nose-mounted surveillance radar similar to that of the AJ 37, a camera for photographing the radar display, ECM registration equipment, and various other registration systems, including a data camera and a tape recorder. The inboard and outboard wing pylons can be occupied, respectively, by active or passive ECM pods and air-to-air missiles, as on the SF 37. The underfuselage attachments can carry a drop-tank on the centreline pylon, a night reconnaissance pod on the port pylon, and a long-range camera pod on the starboard pylon.

**DIMENSIONS, EXTERNAL:**

Main wing span 34 ft 9¼ in (10.60 m)  
 Main wing aspect ratio 2.45  
 Foreplane span 17 ft 10½ in (5.45 m)  
 Length overall, incl probe:  
 except JA 37, Saab 37E 53 ft 5¾ in (16.30 m)  
 JA 37, Saab 37E 53 ft 10¾ in (16.43 m)  
 Length of fuselage:  
 except JA 37, Saab 37E 50 ft 8¼ in (15.45 m)  
 JA 37, Saab 37E 51 ft 1½ in (15.58 m)  
 Height overall (except SK 37) 18 ft 4½ in (5.60 m)  
 Height overall, main fin folded 13 ft 1½ in (4.00 m)  
 Wheel track 15 ft 7½ in (4.76 m)  
 Wheelbase (c/l of shock-struts) 18 ft 2 in (5.54 m)

**AREAS:**

Main wings, gross 495.1 sq ft (46.00 m²)  
 Foreplanes, outside fuselage 72.12 sq ft (6.70 m²)

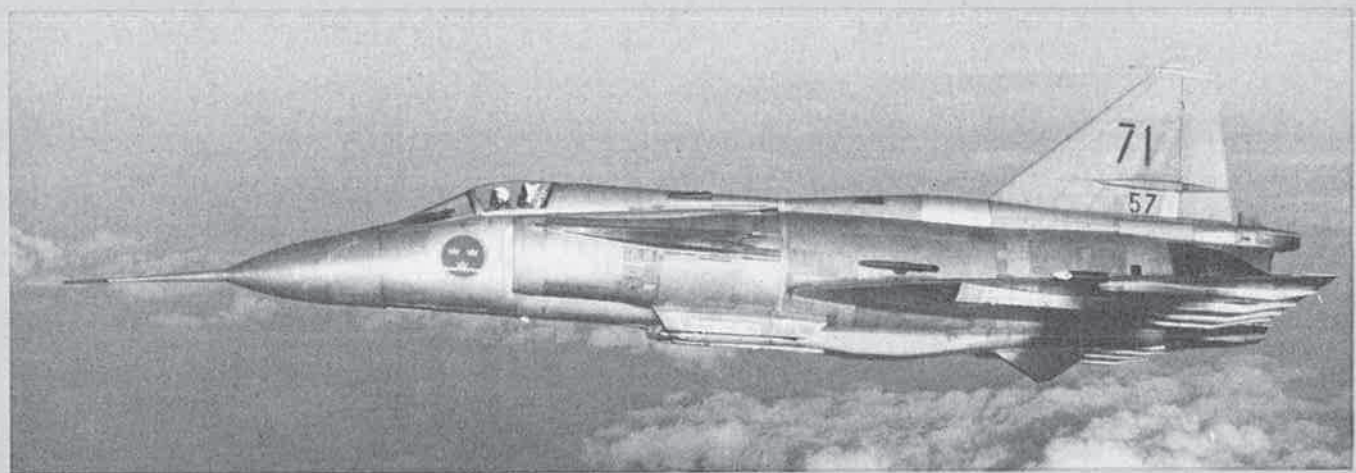
**WEIGHT (AJ 37):**

T-O weight with normal armament approx 35,275 lb (16,000 kg)

**PERFORMANCE (AJ 37):**

Max level speed:  
 at high altitude Mach 2  
 at 300 ft (100 m) above Mach 1.1  
 Approach speed approx 119 knots  
 (137 mph; 220 km/h)  
 Time to 36,000 ft (11,000 m) from brakes off, with afterburning approx 2 min

Another view of a Saab JA 37 development aircraft. Thirty of the single-seat interceptors were ordered in September 1974 out of a planned total of 150-200



T-O run approx 1,310 ft (400 m)  
 Landing run approx 1,475 ft (450 m)  
 Required landing field length:  
 conventional landing 3,280 ft (1,000 m)  
 no-flare landing 1,640 ft (500 m)  
 Tactical radius with external armament:  
 hi-lo-hi over 540 nm (620 miles; 1,000 km)  
 lo-lo-lo over 270 nm (310 miles; 500 km)  
 g limit +12 (ultimate)

**ANTONOV**  
 GENERAL DESIGNER IN CHARGE OF  
 BUREAU: Oleg Konstantinovich Antonov,  
 USSR

**ANTONOV An-26**  
 NATO code name: "Curl"

Photographs published in October 1974 in the magazine *Skrzydłata Polska* indicate that a squadron of An-26 twin-turboprop short-range transports is now in service with the Polish Air Force.

**SHIN MEIWA**  
 SHIN MEIWA INDUSTRY CO LTD;  
 Head Office: 1-5-25 Kosone-Cho, Nishino-  
 miya-Shi, Hyogo-Ken, Japan

Shin Meiwa's US-1 STOL amphibious flying-boat flew for the first time on 16 October 1974, and is being developed for search and rescue duties with the Japan Maritime Self-Defence Force.

**SHIN MEIWA SS-2A**  
 JMSDF designation: US-1

In the late 1950s Shin Meiwa began design studies and research for a large multi-purpose flying-boat that might meet future requirements of the Japan Maritime Self-Defence Force. This led, in January 1966, to the award of a contract covering development of an anti-submarine version, under the company designation SS-2 and JMSDF designation PS-1.

The first prototype SS-2 (5801) flew for the first time on 5 October 1967, followed by the second on 14 June 1968. Both aircraft were delivered to the 51st Flight Test Squadron of the JMSDF at Iwakuni in the

second half of 1968, and the SS-2 received JDA type approval in the Autumn of 1970.

Fourteen production PS-1s were ordered under the 3rd national defence programme, and 12 of these had been delivered to the 31st Squadron of the JMSDF by the Spring of 1964. Funds for 9 more have been allocated under the 4th national defence programme, covering the period 1972-76.

In June 1970, Shin Meiwa started work on an amphibious version of the same basic design to satisfy the JMSDF's requirement for a large search and rescue aircraft. Three examples of this new version were ordered under the 4th national defence programme. These have the company and JMSDF designations of SS-2A and US-1 (originally PS-1 Mod) respectively. All three are scheduled for delivery during 1975 and will be operated from the JMSDF base at Omura.

To make possible very low landing and take-off speeds, the PS-1 and US-1 have both a boundary layer control system and extensive flaps for propeller slipstream deflection. Control and stability in low-speed flight are enhanced by "blowing" the rudder, flaps, and elevators, and by use of an automatic flight control system. They can land on very rough water, in winds of up to 25 knots (29 mph; 47 km/h). Take-offs and landings have been made successfully in seas with wave heights of up to 13 ft (4 m).

The following description applies specifically to the US-1:

**TYPE:** Four-turboprop STOL air/sea rescue amphibian.

**WINGS:** Cantilever high-wing monoplane. Conventional all-metal two-spar structure with constant-chord centre-section and tapered outer panels. High-lift devices include leading-edge slats extending over nearly 17% of the span, and large inner and outer blown trailing-edge flaps extending 80° and 60° respectively. Two spoilers are located forward of the outer flap on each wing. Powered ailerons. Leading-edge de-icing boots.

**FUSELAGE:** All-metal semi-monocoque hull structure, with high length/beam ratio. Vee-shaped single-step planing bottom, with curved spray suppression strakes extending around nose and along each side of forward portion of hull. Spray suppression slots in underside of hull aft of in-board propeller plane. Double-deck interior.

**TAIL UNIT:** Cantilever all-metal T-type structure, with large dorsal fin. Tailplane has slats and de-icing boots on leading-edge. De-icing boots also on leading-edge of fin and dorsal fin. Blown rudder and elevators.

**LANDING GEAR:** Hydraulically-retractable tricycle type, with rearward-retracting twin wheels on each unit. Oleo-pneumatic shock-absorbers. Main units, housed in bulged fairings on each side of hull, have size 40 x 14-22 tyres, pressure 113 lb/sq in (7.95 kg/cm<sup>2</sup>). Nosewheel tyres size 25 x 6.75-18, pressure 300 lb/sq in (21 kg/cm<sup>2</sup>). Three-rotor hydraulic disc brakes. No anti-skid units.

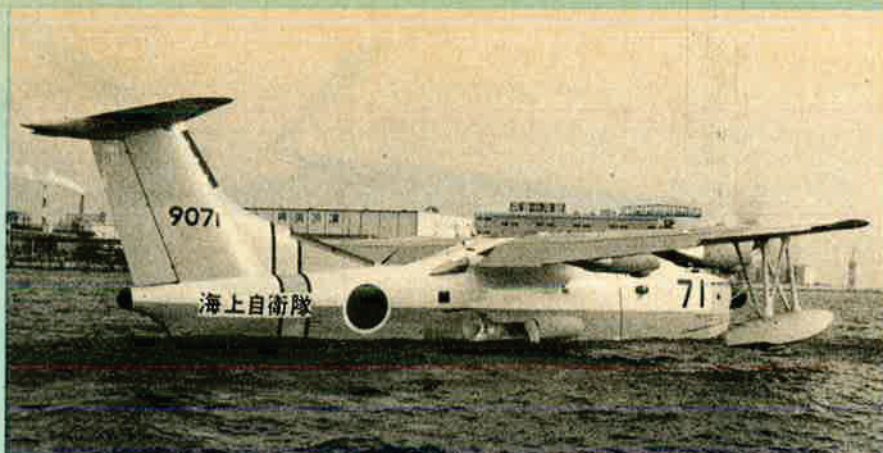
**POWER PLANT:** Four 3,060 ehp Ishikawajima-built General Electric T64-IHI-10 turboprop engines, each driving a Hamilton Standard 63E60-19 three-blade constant-speed reversible-pitch propeller. Additionally, one 1,250 ehp Ishikawajima-built General Electric T58-IHI-10-M1 gas-turbine is housed in upper centre portion of fuselage to provide power for boundary layer control system on rudder, flaps, and elevators. Fuel tanks in wings, capacity 2,387 Imp gallons (10,851 litres), and fuselage, capacity 2,563 Imp gallons (11,649 litres). Total fuel capacity 4,950 Imp gallons (22,500 litres). Refuelling point near bow hatch. Oil capacity 22.3 Imp gallons (101 litres).

**ACCOMMODATION:** Basic flight crew of two pilots and flight engineer. Wide-visibility bulged window on each side of flight deck. Provision for six more crew members and 12 survivors, with 12 stretchers, one auxiliary seat, and two observers' seats. Rescue hatch on port side of fuselage, aft of wing.

**SYSTEMS:** Cabin air-conditioning system. Two independent hydraulic systems, each 3,000 lb/sq in (210 kg/cm<sup>2</sup>). Oxygen system for all crew and stretcher stations. AiResearch GTCP85-131J APU provides power for starting main engines, and shaft power for 40kVA emergency AC generator. BLC system includes a C-2 compressor, driven by T58-IHI-10-M1 gas-turbine, which delivers compressed air at a flow of 30.9 lb (14 kg)/sec and pressure of 27 lb/sq in (1.9 kg/cm<sup>2</sup>) for ducting to inner and outer flaps, rudder, and elevators. Electrical system includes three-phase 400 Hz constant-frequency AC and converted 27V DC. Two 40kVA AC generators,

The first Shin Meiwa US-1, a STOL air/sea rescue amphibian development from the PS-1 anti-submarine flying-boat





*Shin Meiwa US-1, afloat but with its landing gear still extended*

driven by Nos. 2 and 3 main engines. Emergency AC generator driven by APU. Anti-icing, air-conditioning, and fire detection and extinguishing systems standard.

**ELECTRONICS AND EQUIPMENT:** HIC interphone, HRC-107 HF, N-CU-58/HRC antenna coupler, HGC-102 teletypewriter, HRC-106 radio, HRC-100 radio, HRN-101 ADF, AN/ARA-50 UHF/DF, HRN-105 TACAN, HRN-104 Loran, HRN-3 marker beacon receiver, AN/APN-171 (N2) radar altimeter, HPN-101B wave height meter, AN/APN-153 Doppler radar, AN/AYK-2 navigation computer, A/A24G-9 TAS transmitter, N-PT-3 dead reckoning plotting board, N-OA-35/HSA tactical plotter group, AN/APS-80N search radar, AN/APA-125N indicator group, AN/APX-68N IFF transponder, RRC-15 emergency transmitter, and N-ID-66/HRN BDHI.

**OPERATIONAL EQUIPMENT:** Marker launcher, 10 marine markers, 6 green markers, 2 droppable message cylinders, 10 float lights, pyrotechnic pistol, parachute flares, 2 flare storage boxes, binoculars, 2 rescue equipment kits, 2 droppable life-raft containers, rescue equipment launcher,

lifeline pistol, lifeline, 3 lifebuoys, portable speaker, hoist unit, floating mat, lifeboat with outboard motor, camera, and 12 stretchers. Stretchers can be replaced by troop seats.

**DIMENSIONS, EXTERNAL:**

Wing span	108 ft 8 $\frac{3}{4}$ in (33.14 m)
Wing chord at root	16 ft 4 $\frac{1}{4}$ in (5.00 m)
Wing chord at tip	7 ft 10 in (2.39 m)
Wing aspect ratio	8
Length overall	109 ft 11 in (33.50 m)
Height overall	32 ft 1 in (9.78 m)
Tailplane span	40 ft 6 $\frac{1}{2}$ in (12.36 m)
Wheel track	11 ft 8 $\frac{1}{4}$ in (3.56 m)
Wheelbase	27 ft 4 in (8.35 m)
Propeller diameter	14 ft 6 in (4.42 m)
Rescue hatch (port side, rear fuselage):	
Height	4 ft 7 $\frac{1}{2}$ in (1.41 m)
Width	2 ft 7 in (0.79 m)

**AREAS:**

Wings, gross	1,462 sq ft (135.8 m <sup>2</sup> )
Ailerons (total)	68.9 sq ft (6.40 m <sup>2</sup> )
Inner flaps (total)	101.18 sq ft (9.40 m <sup>2</sup> )
Outer flaps (total)	
Leading-edge slats (total)	152.85 sq ft (14.20 m <sup>2</sup> )
	64.7 sq ft (6.01 m <sup>2</sup> )
Spoilers (total)	22.60 sq ft (2.10 m <sup>2</sup> )
Fin	189 sq ft (17.56 m <sup>2</sup> )

Dorsal fin	68.03 sq ft (6.32 m <sup>2</sup> )
Rudder	75.5 sq ft (7.01 m <sup>2</sup> )
Tailplane	248 sq ft (23.05 m <sup>2</sup> )
Elevators	94.5 sq ft (8.78 m <sup>2</sup> )

**WEIGHTS AND LOADINGS:**

Weight empty, equipped	56,218 lb (25,500 kg)
Max oversea operating weight	79,365 lb (36,000 kg)
Max T-O weight on land	99,200 lb (45,000 kg)
Max wing loading	67.9 lb/sq ft (331.4 kg/m <sup>2</sup> )
Max power loading	8.11 lb/ehp (3.68 kg/ehp)

**PERFORMANCE (estimated):**

Max level speed 260 knots (299 mph; 481 km/h)	
Cruising speed at 10,000 ft (3,050 m)	230 knots (265 mph; 426 km/h)
T-O to 50 ft (15 m) at max T-O weight	2,165 ft (660 m)
Landing from 50 ft (15 m) at 79,365 lb (36,000 kg) AUV	2,950 ft (900 m)
Runway LCN at AUV of 94,798 lb (43,000 kg)	42
Minimum ground turning radius	69 ft 6 $\frac{1}{2}$ in (21.20 m)
Radius of search operation at AUV of 99,200 lb (45,000 kg), including 2.3 hr search 900 nm (1,035 miles; 1,665 km)	

**LET**

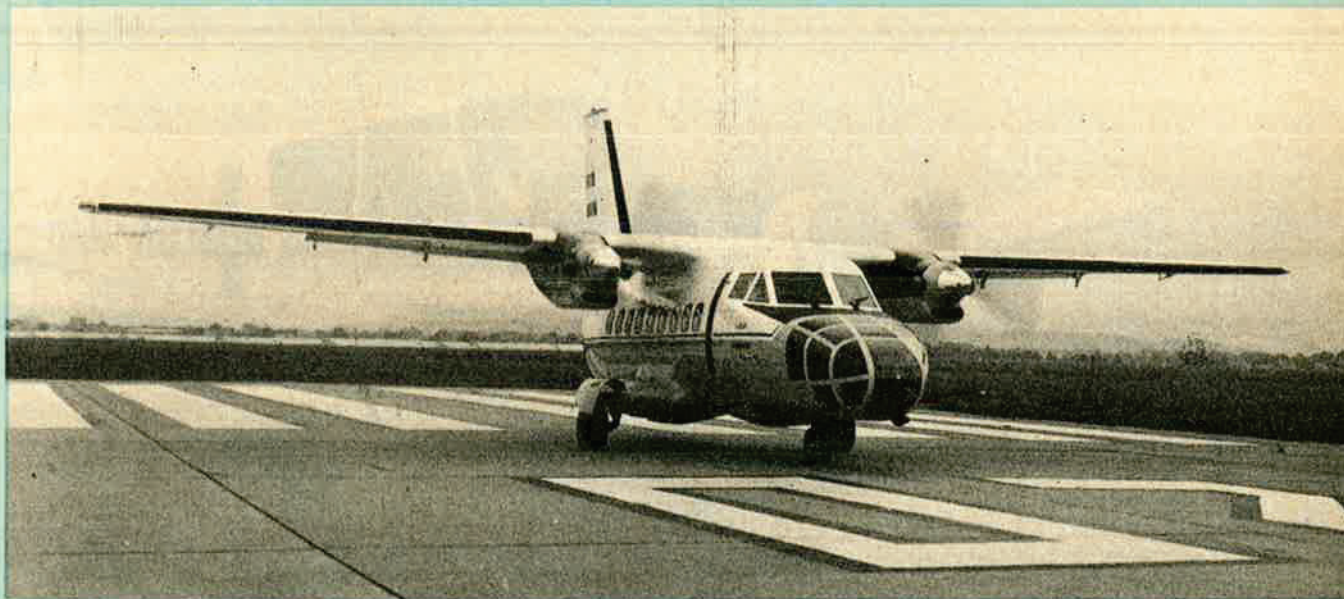
**LET NARODNI PODNIK** (Let National Corporation); Address: Uherské Hradistice-Kunovice, Czechoslovakia

**LET L-410 TURBOLET**

The L-410 is a twin-turboprop light transport, intended primarily for use on local passenger and freight services. It is suitable also for executive, aerial survey, radio/navigation training, ambulance, and other duties, and can operate from airfields with a natural grass surface.

Design of the L-410 was started in 1966. The first prototype (OK-YKE), powered by United Aircraft of Canada PT6A-27 turboprop engines, was built by the national corporation of Let, at Kunovice, and flew for the first time on 16 April 1969. Three additional PT6A-engined prototypes were completed subsequently. Five L-410s underwent hot and cold weather trials, and route eval-

*Let L-410AF, the new aerial survey version of the Turbolet (two 715 ehp United Aircraft of Canada PT6A-27 turboprop engines)*



uation, in the USSR between Spring and Autumn 1973.

Twenty Turbolets had been sold by the beginning of 1974. It is planned eventually to introduce a version powered by M 601 turboprop engines of Czechoslovak design and manufacture.

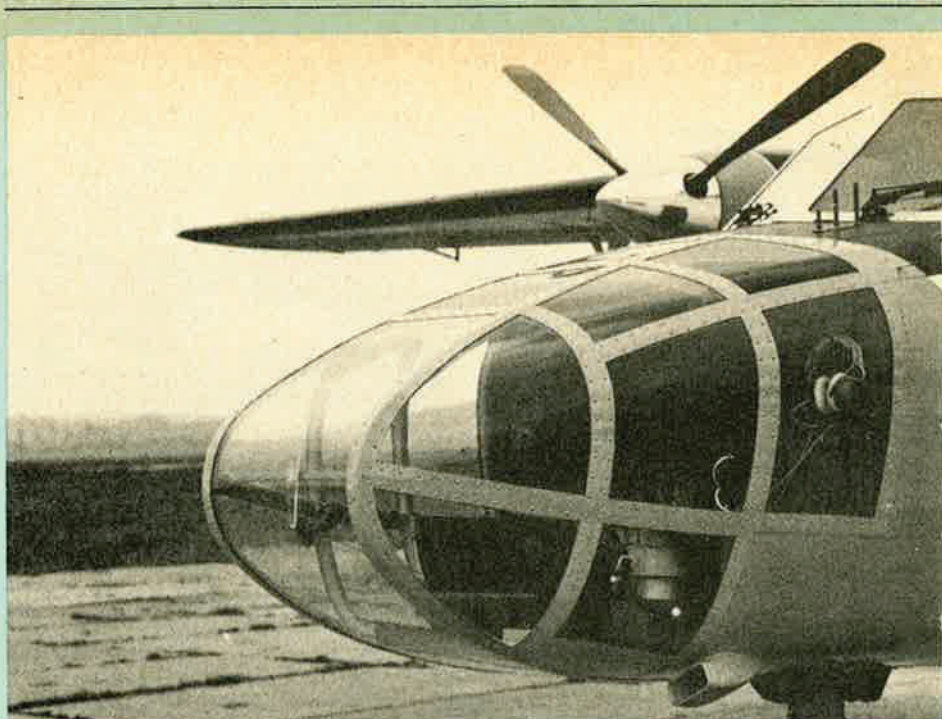
The following versions have so far been announced:

**L-410A.** Initial passenger/cargo production version, powered by United Aircraft of Canada PT6A-27 engines. First deliveries were to the domestic operator Slov-Air, with which it entered service in late 1971 on scheduled, non-scheduled, and charter services. Since adopted also by Aeroflot instead of the now-abandoned Beriev Be-30. The detailed description in the 1974-75 *Jane's* applies to this version.

**L-410AF.** Aerial survey version, announced in mid-1974 and displayed at the 16th International Engineering Fair at Brno during that year. Generally similar to L-410A, but has a larger, wider, and extensively glazed nose section in which are located a vertically-mounted camera and inward-facing operator's seat.

The following details concerning the standard L-410A amend those given in the 1974-75 *Jane's*:

**ACCOMMODATION:** Crew of one or two on flight deck. Standard accommodation in main cabin for 15 to 19 passengers, with pairs of seats on starboard side of aisle and single seats opposite, all at 30 in (76 cm) pitch. Alternative layouts include de luxe seating for 12 passengers in individual chairs, or an executive layout with eight individual seats, four work desks, and a wardrobe. Baggage compartment in nose with two separate doors; toilet and additional baggage compartment at rear. Double upward-opening doors aft on port side, right-hand door serving as passenger entrance and exit; both doors open for cargo loading. Downward-opening crew door, forward on starboard side, serves also as emergency exit. All-cargo version has protective floor covering, crash nets on each side of cabin, and



The side-facing photographer's seat is visible in the glazed nose of this L-410AF

tie-down provisions; floor is at truck-bed height. Standard passenger version can be quickly and easily converted to all-cargo configuration, and vice versa. Cabin heated and ventilated by engine bleed air.

**WEIGHTS AND LOADINGS:**

Max fuel load 2,425 lb (1,100 kg)  
Max T-O weight 11,905 lb (5,400 kg)  
Max landing weight

11,464 lb (5,200 kg)

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

Max cruising speed at 9,845 ft (3,000 m)

205 knots (236 mph; 380 km/h) TAS  
Max rate of climb at S/L

1,811 ft (552 m)/min

Rate of climb at S/L, one engine out

433 ft (132 m)/min

Service ceiling 26,575 ft (8,100 m)

Service ceiling, one engine out

13,615 ft (4,150 m)

T-O to 50 ft (15 m) 1,791 ft (546 m)

Landing from 50 ft (15 m) at max landing weight 1,640 ft (500 m)

Landing run, with propeller reversal, at max landing weight 794 ft (242 m)

First photograph of a Zlin 43 equipped to carry a stretcher for air ambulance duties







**ZLIN**  
**MORAVAN NÁRODNÍ PODNIK** (Zlin Aircraft Moravan National Corporation);  
 Address: Otrokovice, Czechoslovakia

**ZLIN 43**

The following details amend those given in the 1974-75 *Jane's*:

**POWER PLANT:** One 210 hp Avia M 337A inverted six-cylinder aircooled in-line engine, with supercharger for take-off and climb, driving an Avia V 500A two-blade constant-speed metal propeller (wooden



propeller on glider-towing aircraft). Fuel tanks in each wing leading-edge, with total capacity of 28.5 Imp gallons (130 litres). Standard additional tanks in each wingtip, each of 12 Imp gallons (55 litres) capacity. Fuel and oil systems permit inverted flight (restricted to maximum of 5 consecutive seconds with negative load factors).

**WEIGHTS AND LOADINGS:**

Basic weight empty, equipped:  
 Normal and Utility 1,609 lb (730 kg)  
 Max T-O weight:  
 Normal 2,976 lb (1,350 kg)  
 Utility 2,204 lb (1,000 kg)

**PERFORMANCE** (at max Normal category T-O weight except where indicated):

Max never-exceed speed:  
 Normal 147 knots (169.5 mph; 273 km/h)  
 Utility 157 knots (181 mph; 292 km/h)  
 Max level speed at S/L 127 knots (146 mph; 235 km/h)  
 Cruising speed 113 knots (130 mph; 210 km/h)  
 Max permissible manoeuvring speed:  
 Utility 120 knots (138.5 mph; 223 km/h)  
 Stalling speed, flaps up 63.5 knots (72.5 mph; 117 km/h)  
 Stalling speed, flaps down 56 knots (64 mph; 103 km/h)  
 Max rate of climb at S/L 689 ft (210 m)/min  
 Service ceiling 12,465 ft (3,800 m)  
 T-O to 50 ft (15 m) 2,297 ft (700 m)  
 Landing from 50 ft (15 m) 1,936 ft (590 m)  
 Max range (standard fuel) 325 nm (375 miles; 610 km)  
 Max range (with wingtip tanks) 620 nm (714 miles; 1,150 km)  
 g limits:  
 Normal + 3.8; - 1.52  
 Utility + 4.4; - 1.76

**BOEING VERTOL**

**BOEING VERTOL COMPANY;** Head Office: Boeing Center, PO Box 16858, Philadelphia, Pennsylvania 19142, USA

**BOEING VERTOL CH-147 CANADIAN CHINOOK**

The first two examples of this advanced version of the standard US Army CH-47C Chinook were handed over to the US Army on 30 September 1974. Under an agreed military sales arrangement, they were then to be transferred officially to the Canadian Department of National Defense for primary use in support of ground forces. Their secondary roles will include long-range search and rescue, as well as giving assistance to other government departments.

Of the eight CH-147s ordered by Canada, four have been allocated for service with the 450th Transport Helicopter Squadron, CFB Ottawa, Ontario, and four to the squadron's detachment based at Edmonton, Alberta.

While the basic structure of this version is similar to that of the US Army's latest CH-47Cs, it has a number of improvements which provide a significant advance in flying qualities, payload, and range capability.

Key to the improvement in aircraft handling is the Advanced Flight Control System (AFCS), which provides pitch stability including airspeed and altitude hold, gives heading hold, and has the capability to perform co-ordinated turns to a pre-selected heading. It can also take in pitch, roll, and airspeed changes. Advantages of AFCS include reduced pilot workload on low-level

missions, greater manoeuvrability, more precise hover hold during external load operations, and improved stability for long-range flight with potential IFR conditions. A cruise guide gives the pilot an indication of control loads, thus allowing him to utilise the maximum capability of the aircraft in respect of manoeuvrability and gross weight.

The improvement in payload capability stems from the installation of two 3,750 shp Avco Lycoming T55-L-11C turboshaft engines, which have a contingency rating of 4,500 shp at S/L ISA, plus a transmission system uprated from 6,000 to 7,200 shp. This gives the CH-147 a hovering in ground effect gross weight of 50,000 lb (22,680 kg), compared with the 46,000 lb (20,865 kg) of the US Army's CH-47C. In operations from water the Canadian Chinook has an emergency gross weight of 46,000 lb (20,865 kg), representing a major increase over the 28,500 lb (12,928 kg) water operations gross weight of the CH-47C. In addition, the capacity of the external cargo hook has been uprated from 20,000 lb (9,072 kg) to 28,000 lb (12,701 kg).

Standard in the CH-147 is the Crashworthy Fuel System (CWFS), which was introduced on US Army CH-47Cs by means of retrofit kits when these first became available in March 1973. This system provides a standard fuel capacity of 1,042 US gallons (3,944 litres), which can be supplemented by the five 600 US gallon (2,271 litre) palletised cabin fuel tanks of a long-range ferry kit. This includes provision for the storage of additional engine oil, pressure refuelling for each fuel tank, and a capability to refuel other aircraft on the ground.

Accommodation is provided for 44 troops in the main cabin, and the combination of a rear-fuselage power-operated ramp and a cabin water dam permits sustained operations from water, including the unloading of inflatable boats, and of troops with their equipment.

Other improvements incorporated as standard in the CH-147s include an Integral Spar Inspection System (ISIS) for rotor blades, a forward door rescue hoist with 240 ft (73 m) of cable and 600 lb (272 kg) capacity, a fuel flow meter to give cross checks on fuel management and power, and the provision of modern electronics and navigation equipment comprising a small light-weight avionics system, plus VOR, FM, VHF, UHF homers, and ILS capability.

**TYPE:** Twin-engined medium transport helicopter.

**ROTOR SYSTEM:** Two three-blade rotors, rotating in opposite directions and driven through interconnecting shafts which enable both rotors to be driven by either engine. Blades have cambered leading-edge, a strengthened steel spar structure, integral spar inspection system, and honeycomb-filled trailing-edge boxes. Provision for a chemical de-icing system. Two blades of each rotor can be folded manually. Rotor heads are fully articulated with pitch, flapping, and drag hinges. All bearings are submerged completely in oil.

**ROTOR DRIVE:** Power is transmitted from each engine through individual overrunning clutches, into a combiner transmission, thereby providing a single power output to the interconnecting shafts. Rotor/engine rpm ratio 64:1.

**FUSELAGE:** Square-section all-metal semi-monocoque structure. Loading ramp forms undersurface of upswept rear fuselage. Fuel pods along bottom of each side are made of metal honeycomb sandwich and are sealed and compartmented, as is the underfloor section of the fuselage, for buoyancy during operation from water.

**LANDING GEAR:** Non-retractable quadricycle type, with twin wheels on each forward



Boeing Vertol CH-147 Chinook, an advanced version of the US Army CH-47C for the Canadian Armed Forces

unit and single wheels on each rear unit. Oleo-pneumatic shock struts on all units. Rear units fully castoring and steerable; power steering installed on starboard rear unit. All wheels size 24 x 7.7-VII, with tyres size 8.50-10-III, pressure 67 lb/sq in (4.71 kg/cm<sup>2</sup>). Two single-disc hydraulic brakes. Provision for fitting detachable wheel-skis.

**POWER PLANT:** Two Avco Lycoming T55-L-11C turboshaft engines, mounted on each side of rear rotor pylon. Crashworthy fuel system in external pods on sides of fuselage, total fuel capacity 1,042 US gallons (3,944 litres). Optional long-range ferry kit includes five 600 US gallon (2,271 litre) palletised cabin fuel tanks and pressure refuelling system. Total standard oil capacity 3.7 US gallons (14 litres), with optional additional storage capacity provided in long-range ferry kit.

**ACCOMMODATION:** Two pilots on flight deck, with dual controls. Jump seat is provided for crew chief or combat commander. Seating for 44 troops in main cabin. Extruded magnesium floor designed for distributed load of 300 lb/sq ft (1,465 kg/m<sup>2</sup>) and concentrated load of 2,500 lb (1,136 kg) per wheel in tread portion. Floor contains eighty-three 5,000 lb (2,270 kg) and eight 10,000 lb (4,540 kg) tie-down fittings for varying cargo loads.

**SYSTEMS:** Cabin heated by 200,000 BTU heater-blower. Hydraulic system provides pressures of 3,000 lb/sq in (210 kg/cm<sup>2</sup>)

for flying controls, and 4,000 lb/sq in (280 kg/cm<sup>2</sup>) for engine starting. Electrical system includes two 20kVA alternators powered from transmission drive system. Solar T62 APU powers accessory gear drive, for ground operation of all hydraulic and electrical systems.

**ELECTRONICS AND EQUIPMENT:** Lightweight avionics equipment, plus VOR, FM, VHF, UHF homers and ILS capability. Blind-flying instrumentation standard. Special equipment includes advanced flight control system, cruise guide, fuel flow meter, forward door rescue hoist of 600 lb (272 kg) capacity, and external cargo hook of 28,000 lb (12,701 kg) capacity. Polyurethane camouflage paint scheme.

**DIMENSIONS, EXTERNAL:**

Diameter of rotors (each):	60 ft 0 in (18.29 m)
Main rotor blade chord	2 ft 1 1/4 in (0.64 m)
Distance between rotor centres	39 ft 2 in (11.94 m)
Length overall, rotors turning	99 ft 0 in (30.18 m)
Length of fuselage	51 ft 0 in (15.54 m)
Width, rotors folded	12 ft 5 in (3.78 m)
Height to top of rear rotor hub	18 ft 7 in (5.67 m)
Wheelbase	22 ft 6 in (6.86 m)
Passenger door (fwd, stbd):	
Height	5 ft 6 in (1.68 m)
Width	3 ft 0 in (0.91 m)
Height to sill	3 ft 7 in (1.09 m)

**Rear loading ramp entrance:**

Height	6 ft 6 in (1.98 m)
Width	7 ft 7 in (2.31 m)
Height to sill	2 ft 7 in (0.79 m)

**DIMENSIONS, INTERNAL:**

**Cabin, excluding flight deck:**

Length	30 ft 2 in (9.20 m)
Width	7 ft 6 in (2.29 m)
Height	6 ft 6 in (1.98 m)
Floor area	226 sq ft (21.0 m <sup>2</sup> )
Usable volume	1,474 cu ft (41.7 m <sup>3</sup> )

**AREAS:**

Rotor blades (each)	63.1 sq ft (5.86 m <sup>2</sup> )
Main rotor discs (total)	5,655 sq ft (525.3 m <sup>2</sup> )

**WEIGHTS:**

Weight empty	21,985 lb (9,972 kg)
Max useful load	27,328 lb (12,396 kg)
Max T-O weight	50,000 lb (22,680 kg)

**PERFORMANCE:**

Max speed at S/L, normal rated power	165 knots (190 mph; 306 km/h)
Average cruising speed	140 knots (161 mph; 259 km/h)
Max rate of climb at S/L, ISA, normal rated power	3,670 ft (1,118 m)/min
Service ceiling, normal rated power, ISA	15,000 ft (4,570 m)
Hovering ceiling out of ground effect, ISA, max power	13,600 ft (4,145 m)
Mission radius 160 nm (184 miles; 296 km)	
Max ferry range, with max auxiliary fuel, at optimum altitude, ISA, no payload, 10% fuel reserve	1,032 nm (1,188 miles; 1,912 km)

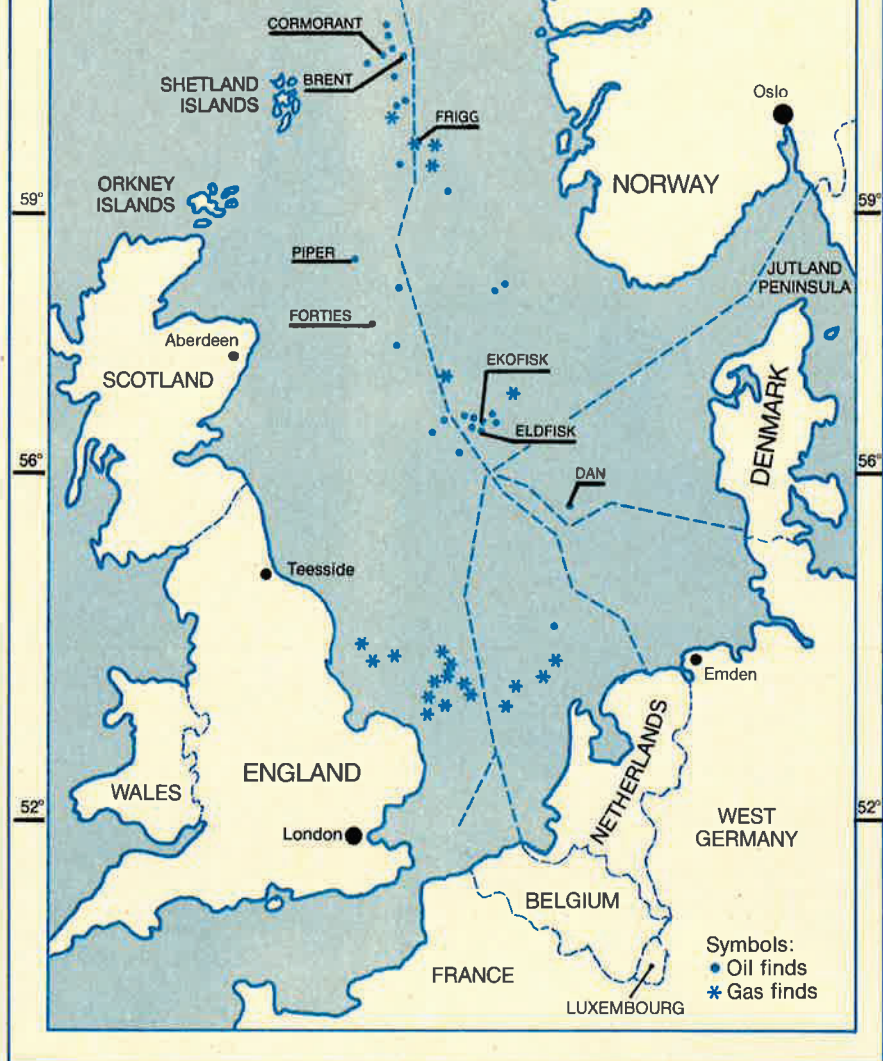


# NORTH SEA OIL:

NATO's Refuge  
or Ruin?

BY LAWRENCE GRISWOLD

## PETROLEUM FINDS IN THE NORTH SEA AREA



*Within the next three years, North Sea oil could relieve NATO nations of dependence on Middle East petroleum.*

**A**LONE in a Western Europe frustrated to the verge of panic by energy shortages, and apprehensive of a fifth Arab-Israeli war and another oil embargo, Norway and England will soon be riding high. They are the new oil-rich kingdoms. Their wildcatting in the North Sea is about to pay off.

Before 1980, the United Kingdom will have more fossil fuel than it needs, and the Kingdom of Norway, never a major oil importer, will have a large exportable surplus, even after the massive social and industrial development programs now being planned. Already immersed in pipeline networks, tanker construction, and earth-moving plans for future complexes of oil storage "farms," petroleum condensates, and liquefied natural gas, brand-new Ministries of Energy are also trying to make room for refineries and new petrochemical industries.

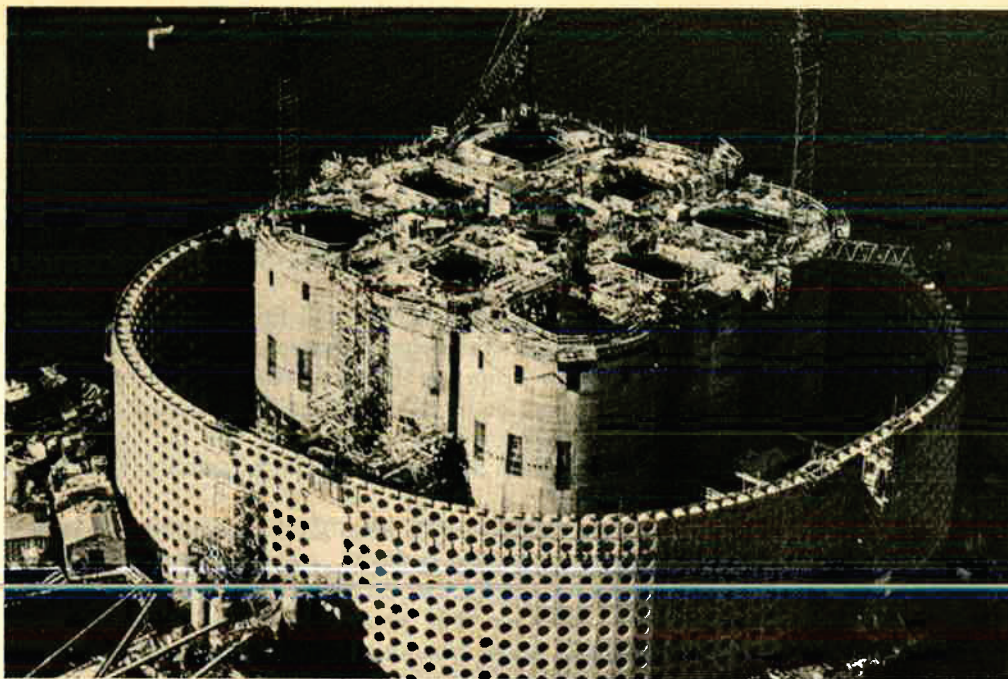
That is the good news. The bad news comes later.

The oil boom on both sides of the North Sea is unparalleled in European history, even though both beneficiaries are—not quite successfully—doing their best to

keep the news within cautious limits. In official reports to the Norwegian Storting and the British Parliament by their respective Ministries of Industry, Finance, and Energy, all dated between January and July 1974, the brilliance of the outlook seems muted by incredulity. The Royal Norwegian Ministry of Finance announced in Report No. 25 (1973-74) to the Storting: "The petroleum finds in the North Sea mean that as a nation we shall become RICHER." But a few words later the soft pedal is pressed: "... rapid and uncontrolled growth in the use of material resources should be avoided, lest the social structure be substantially changed."

And across the sea from Oslo, British Prime Minister Harold Wilson, addressing a Trades Union Congress (TUC) meeting on October 7, 1974, said the UK could expect an annual income from North Sea petroleum, exclusive of natural gas, amounting to "one hundred thousand million pounds."

In view of the fact that natural gas yields about eighty-three percent of the energy contained in oil, and that there are substantially greater quantities of natural



*This immense structure, resembling a medieval fortress, stands on the seabed in Norway's Ekofisk complex. Its tanks can store 1,000,000 barrels of oil during rough weather when tankers can't load. The surrounding breakwater is 270 feet high. Sometimes called a North Sea Hilton, the \$25 million structure also has living accommodations and office space.*

gas than of petroleum below the floor of the North Sea, to say nothing of substantial amounts of natural gas condensates, Mr. Wilson's claim may have been modest. Barring natural or political catastrophes, it is reasonably certain that neither kingdom is headed for the poorhouse, at least after 1978. It must be added that North Sea oil is of high quality, with a low sulfur content and a specific gravity of thirty-seven to thirty-eight.

### **Davy Jones's Saline Locker**

From the Shetland Islands almost to the Norwegian coast and from the east coast of Scotland to the Jutland Peninsula, the relatively shallow waters of the North Sea cover a once heavily forested valley to an approximate average depth of ninety meters. In 1958, when natural gas was discovered near the Dutch town of Groningen, an international conference met at Geneva to regulate ownership and exploitation of the continental shelves. The floor of the North Sea was laid out in "blocks" of 250 square kilometers, an enormous convenience in later years when Oslo and London granted licenses to American and native oil companies to explore and develop areas within their separate national territories.

The floor of the North Sea was partitioned among the UK, Norway, Denmark, West Germany, the Netherlands, and Belgium, as shown on the accompanying map. The UK and Norway share the greater part of the seabed and, moreover, the lion's share of North Sea petroleum. Just north and east of the point near the 56th parallel, where the territorial lines of all six North Sea littoral nations converge, sprawls Norway's great Ekofisk complex, possibly the richest find of them all, and safely within Norway's territorial shelf.

None of the four countries south of the magic 56th parallel is entirely cheerful about this lack of equity. Denmark has one proven oil field at Dan, and the Neth-

erlands one to the southeast, as well as four producing gas fields. Ironically, West Germany and Belgium, two industrial nations in serious need of fuel, have found nothing. In fact, the dozen or so fields on the UK side of the line and south of the 56th parallel are gas producers. No significant oil finds east of Jutland have been reported in the Baltic Sea.

Meanwhile, the North Sea is a busy place. Work ships scuttle from one mobile platform to another, and tugboats with sections of drilling rigs in tow or heavy scows laden with piping and cables, along with fishing trawlers and the usual fairly heavy merchant traffic, clutter up the seascape. Even submarine traffic is threatened. When Norway begins drilling operations in the deeper waters of the Norwegian Sea above the 62d parallel, there may be congestion there.

### **The Ubiquitous American**

Although the Phillips (California) Group appears to have pioneered the seismic survey, Esso Exploration (Norway), Inc., received six of the first eight drilling licenses issued by Oslo, with Phillips obtaining the fourth and Amoco/Noco the seventh. Thereafter, the Texaco-Social Group, Conoco-Gulf, Shell, Mobil, Petronord (French), and others of lesser fame got into the act on the Norwegian side and usually in conjunction with state-owned companies. The present American preponderance among the operators was a Norwegian tribute to American experience in technology and marketing.

On the British side of the median line, serious exploration began in 1968. Shell-Esso holdings began to produce in July 1971 at the "Brent" field northeast of the Shetland Islands. Signal, Mobil-Gas Council (British), Conoco-Gulf, Union Oil Co. (California), Ranger, and Total, followed by British Petroleum, were all in production by the end of 1973, with the Shell-Esso com-



One of the UK's North Sea production platforms under construction at Methil, Scotland. Upon completion, it will be towed to a location west of Ekofisk.

bine the major shareholders. In July 1971, the Petro-nord (which includes Total) tapped the Norwegian gas field called "Frigg," but on the British side of the line. Five other gas fields were found south and west of the Frigg field. Thus far, the British gas fields all lie between the 54th and 53d parallels; all of their oil fields are north of the 56th.

As of June 1974, on both sides of the median line, twenty-six oil fields and eighteen gas and gas condensate fields were producing through about 140 well-heads. Official figures of drilling activities up to the end of 1973 show 536 wells drilled on the British side and ninety-seven on the Norwegian side. Official figures for Danish, Dutch, and West German activities are unavailable. However, an educated guess puts the overall total of drillings since 1958 at about 800. Most of the wildcat-tings were unsuccessful.

Three pipelines are now laid or are under construction on the British continental shelf. The northernmost links the Brent-Cormorant fields to Sullum Voe in the Shetlands. Another is between the Piper field and Flotta in the Orkneys, and the third runs from the Forties field to Cruden Bay, north of Aberdeen.

The Norwegians are laying two pipelines from the Ekofisk complex, one to Teesside in northern England and another to Emden in West Germany. Due probably to the rugged, mountainous coast of Norway and the poor land transportation facilities, Norway has announced a major dependence on tankers and a substantial building program to supply its needs.

Without dwelling on the grandeur of Norway's social and industrial plans, it is obvious that its oil bonanza will produce instant benefits to construction workers in every branch of industry, from shipyards through transportation and communications, to refineries and gas liquefaction plants. Norway has already launched a small tanker construction program, but, with the development of its export trade, longer keelways may be needed for transoceanic supertankers.

Both countries have their eyes on new theaters of operation. Norway has already sponsored seismic surveys of the Svalbard area of the Norwegian Sea north

of the 62d parallel, and above the Arctic Circle from north of Bear Island to Spitzbergen. The UK has made preliminary investigations, with promising success, in the Irish Sea. Both Scotland and Wales are claiming shares, if not outright ownership, of finds on their respective continental shelves.

### Some Bad News

As in the case of most windfalls, the positive side is the least complicated. Suddenly there is an asset of tremendous value appearing in an unlikely area at a time when it is most needed. Miraculous? Doubtful. Fortuitous? Certainly.

In 1967, when OPEC (Oil Producing and Exporting Countries) was being organized, Oslo already had assurances from its licensed American oil-exploration teams that both gas and oil had been located and, within a year or so, London also knew that the median zone of the North Sea contained a large quantity of the essential fuel.

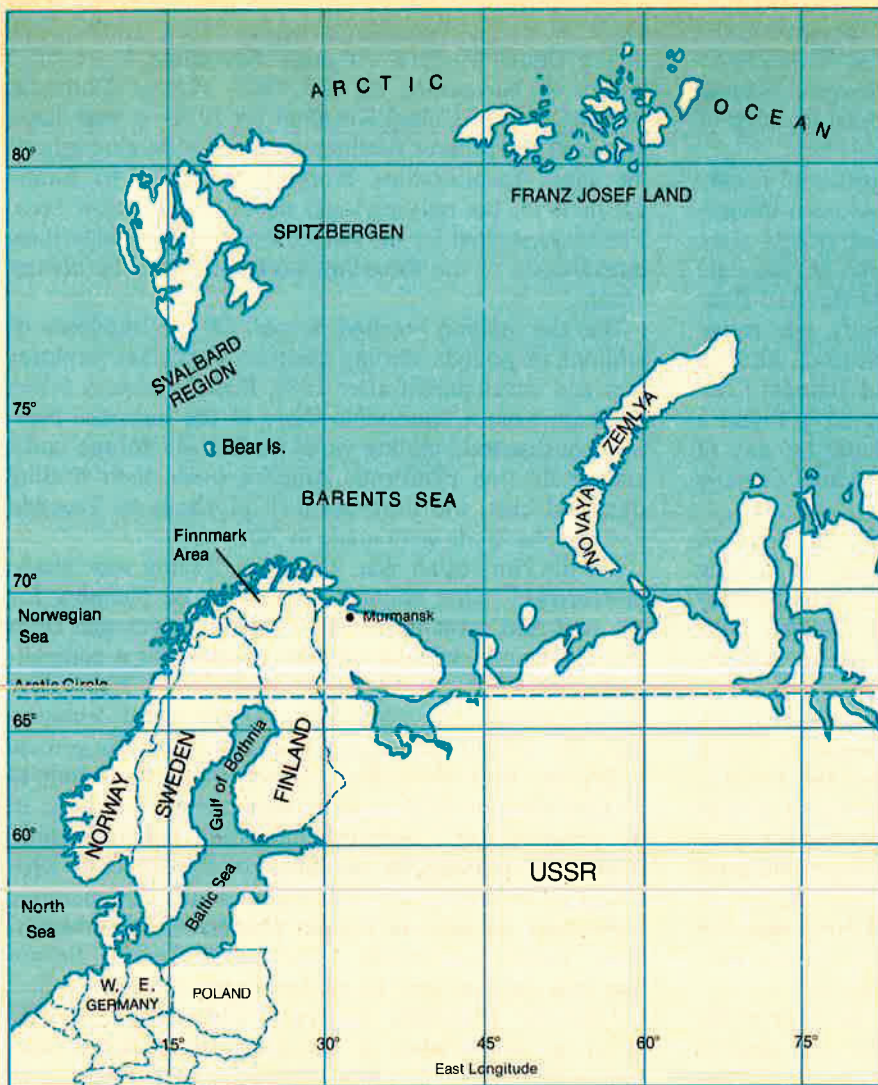
By October 1973, when OPEC announced its embargoes, production cutbacks, and price boosts, it was reasonably certain that if Western Europe could hold out for three or four years until enough wells could be tapped, major reliance on Middle Eastern sources would be a thing of the past.

By that time, of course, the rocketing oil prices launched by the Islamic states had been matched by oil producers in North Africa, Asia, and Latin America. It was cost, not availability, that posed the undeniable threat of bankruptcy to Western industry. However, with the mounting prospect of adequate oil and natural gas supplies (and gas condensates) close by, it seemed reasonably certain that inevitable competition would result in falling prices.

It was shocking, therefore, when the governments of Norway and the UK announced that their future petroleum exports would be pegged to "world" (*i.e.*, OPEC) prices. True, the cost of transportation from North Sea oil fields would be negligible in contrast to the half-world-away distance from the Persian Gulf around Africa to Western Europe, or even the much shorter route from North Africa or the Caribbean. But the cost of the fuel itself, at OPEC levels, would soon mean socio-economic disaster.

By mid-1974, when official reports from London and Oslo cautiously cited annual totals of 150 million tons for each country, without reckoning even larger totals (in cubic meters) of natural gas and gas condensates, everyone knew that North Sea fuels could relieve all Western Europe of dependency on the Middle East—or, for that matter, the rest of the world. Either competition would bring artificial ceilings down to rational levels, or the threat of a bankrupt market and unsalable petroleum would bring it down, carrying both Britain and Norway with them.

Perhaps neither London nor Oslo intends to invite so dire an alternative, but the prospect of sudden wealth and power has produced a degree of political exuberance, dazzlingly augmented by improved prospects of tenure in governments such as that of the UK, sorely harassed by hitherto incurable economic decline. Despite strong resistance by Scottish nationalists, Harold Wilson's Labor Party government intends to nationalize



Both Norway and the USSR are doing exploratory work in the Svalbard/Barents Sea area. Oil and gas finds in that area would have both economic and strategic significance.

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UK fuels. So does the more moderate labor government of Norway.

Both nations also have announced their determination to restrict production to levels well below capacity on the grounds that restraint will extend the life of oil reserves. Many Europeans suspect the real reason is that unrestricted production would encourage competition with established OPEC sellers and a salutary price war. Thus, at least three years before North Sea oil field output can reach exportable volume, the seeds of European resentment are being sown.

### Friction With the USSR

Fundamentally, neither Britain nor Norway considers itself an integral part of the European continent. Geographically, England is separated from the continent by the Channel, Norway by its peninsular location. And in the icy north, the frontiers of Norway and the Soviet Union march together along 122 barbed-wire-strung miles, a physical association of incompatible neighbors.

Under present socio-political circumstances, however temporary, Norway is the more reliable of the two NATO members, but also the ally with the greatest potential for trouble. That fact is heightened by Oslo's plans for the petroleum exploitation of her Svalbard

region, that continuation of Norway's continental shelf at the junction of the Norwegian and Barents Seas. It extends some 500 miles north to Spitzbergen Island and includes a substantial section of the Barents seabed east of Spitzbergen. Exploitation of this area could become an explosive issue between Norway and the USSR. Negotiations now being conducted in Moscow are expected to continue well into 1975.

Until 1920, the islands in the Spitzbergen region belonged to no nation. Inhabited largely by transient crews of whalers and fishing vessels of many nations, they were literally no man's islands and constituted, in the view of a post-Versailles Europe, a politically untidy situation. This was corrected by the Treaty of Paris in February 1920, when Spitzbergen and contiguous islands were handed over to Norway, but with the reservation that all facilities, advantages, and sources of wealth, from fishing to mining, would accrue equally to each of the signatories of the Treaty. They number about forty, including the Soviet Union, most countries of Europe, and even Latin American nations.

Only the Soviet Union, however, has made claims to Spitzbergen's mineral resources, mainly coal, and the territorial facilities to work it. Norway installed a radar tracking station for the European space program some

years ago and has recently agreed to permit Russia commercial use of an airfield on West Spitzbergen. Normal port facilities and communications are open to ships of every nation.

Russian interest in Finnmark, the rugged and deeply indented Arctic coast of Norway, also has been intensified since 1945, when Soviet occupation troops were withdrawn after the German surrender. In the late 1960s, the naval and naval air strength of the Red Banner Fleet, formerly stationed in Baltic ports, was transferred to the Murmansk area, the Novaya Zemlya Islands, and the ports of the White and Barents Seas. Adm. Sergei Gorshkov's impressive new navy found a relatively open route to the North Atlantic by way of the warmer and ice-free waters used by Allied convoys to Murmansk during World War II.

Flanked only by Arctic ice at the north and the bleak coast of Norwegian Finnmark at the south, the inviting width of the waters between Spitzbergen and Norway opened a broad waterway to a sallying Russian High Seas Fleet without potential interference by politics, narrow waters, or climate.

But now, even this opening appears compromised. Instead of an unrestricted gateway at least 250 miles wide and clear for any foray into the top of the Atlantic, there is suddenly the threat of a picket fence of oil rigs reaching to the sea bottom, a line of production platforms on the surface—all outfitted with electronic communications, including radar—and a busy stream of miscellaneous work boats and tankers. Secrecy essential to any Soviet naval or air operation under wartime conditions, real or presumed, would be impossible.

Russian engineers have been probing the floor of the Barents Sea between Spitzbergen and Novaya Zemlya for years in the hope of increasing an exportable surplus of oil to the Warsaw Pact satellites. It is likely that a "Svalbard Line" of petroleum and gas installations cutting across the single unhampered access route to the Atlantic Ocean is the most unsettling prospect to Russian naval strategists.

As a strategic asset of great value to NATO, the Norwegian position must be supported by the Western alliance. And, although Norway is not a full member of the European Economic Community, the EEC must throw its weight behind NATO, possibly for the first time in its history. Basically, the two Western alliances are interdependent.

### **Oil and the Future of NATO**

Even without another Arab embargo, OPEC prices are too high to sustain the industries upon which the Western alliances depend. After 1978, when the North Sea oil fields begin to reach peak production, NATO and the EEC nations may be relieved of their dependence on Middle Eastern petroleum. But they will be relieved only if North Sea oil prices are significantly reduced, either as a result of competition or voluntarily in the spirit of the Community's Treaty of Rome or NATO's Ottawa Declaration of 1951, wherein all signatories agreed to "economic collaboration." Norway refused to sign the subsequent Ottawa Declaration of 1974.

In contrast to Norway's bright economic picture, that

of the United Kingdom is grim. According to an EEC report of November 26, the GDP (Gross Domestic Product) of the United Kingdom for 1974—a year characterized by general declines in production throughout the EEC membership—dropped from 5.6 to minus 0.9 in 1973, the only national figure to fall below zero. The reasons cited for the failure were widespread strikes, introduction of the three-day workweek, and the energy crisis.

But the malaise reached deeper. Of the hundreds of millions of pounds sterling spent in North Sea exploration and development after 1968, British industry failed to attain even a reasonable share of the business. Norway constructed building yards for British storage tanks and production platforms. America made their drilling rigs, and even the thirty-six-inch pipelines to Teesside and the Shetlands were made in Japan.

On the Norwegian side, almost everything was "made in Norway." That country appears to be planning for the best and most immediate material advantage from its oil bonanza, without obvious concern for a confrontation with the Soviet Union over future Norwegian Sea operations, at which time self-imposed isolation from its NATO obligations would be most dangerous.

Britain, with thirty-five percent more bankruptcies in 1974 than in 1973, appears determinedly euphoric in its program for continued industrial nationalization, apparently pinning its optimism on "free" fuels produced by British-owned oil companies and immoderately high taxes on sales of foreign producers. Disturbingly, some British economists wonder if industrial Britain can hold together until its oil flow begins to peak.

Like the European Economic Community, NATO is an *ad hoc* alliance of disparate and in some cases unfriendly nations driven to teamwork by circumstances whose force has been dulled by time and familiarity. Of the two, the economic alliance perhaps has the better prognosis, but the exorbitant cost of the elemental fuel that supports Western industrial civilization is beginning to destroy them both.

Obviously, the discovery of huge quantities of petroleum and other fuels in the North Sea would prove a reviving tonic to NATO and the European Economic Community, but only if those vital fuels are equitably parceled out according to need on a "cost-plus" basis of about \$5 or less per barrel. Both the United Kingdom and Norway have refused to consider that price.

Disregarding the perhaps devious motives of Britain's Labor government as politically opportunistic, Norway's rejection of such rationale appears suicidally myopic. Oslo is now challenging Moscow's strategic control of Russia's solitary open route to the North Atlantic, and the intensity of the negotiations may be counted upon to increase. Oslo needs the backing of a strong NATO alliance, not its antagonism. The two new oil-producing nations, in fact, need both NATO and the EEC for mutual protection and for markets. A bankrupt Europe is not only a useless military ally, but also a penniless customer.

Finally, to a continent scrambling for a firmer foothold, North Sea oil may prove a fatal lubricant. It is a situation offering a far more tempting invitation to military solutions than the distant Middle East. ■



Hap Arnold and Curtis LeMay knew that Japan could be defeated by bombing and blockade—without invasion and *without using the atomic bomb*. General LeMay recently talked with the author about crucial decisions that made victory possible . . .

# The B-29, the A-Bomb, and the Japanese Surrender

“Finally, World War II has ended.”

—Comment of Japanese Ambassador to United States Takeshi Yasukawa on December 7, 1974, reflecting on President Gerald R. Ford's meeting in Japan with Emperor Hirohito in November 1974.

**I**N JUNE 1940, though an election was near, President Franklin D. Roosevelt was thinking of ways to forge closer liaison with the embattled British and to generate more realistic American plans. Despite his dislike for long-range planning, he secretly estimated that in six months Britain would still be much in the fight against Nazi Germany and the United States would be “active in the war,” with air and naval forces only. In December 1940, the President had mentioned—in view of the savage war Japan was waging against China—that he hoped to see Japan bombed. And in January 1941, he estimated there was one chance in five that Germany and Japan might jointly launch a sudden attack on the United States. In that event, he said, the United States should have under consideration the possibility of bombing Japanese cities.

The months immediately after Pearl Harbor were grim. Japan achieved unrelenting successes, interrupted only on April 18, 1942, by a surprise attack on Tokyo with carrier-launched B-25s led by Lt. Col. James H. Doolittle. Although the US was engaged in global conflict, Roosevelt continued to emphasize that the Allies “will hit them [Japan] from the air heavily and relentlessly.” At the Casablanca conference in January 1943, Roosevelt suggested basing heavy bombers in India. With refueling in China, Japan could be bombed.

During the 1930s, the Army Air Forces (AAF) had been developing a very long range (5,000-mile requirement) four-engine bomber. In October 1940, Maj. Gen. Henry H. (Hap) Arnold, Chief of the Air Corps, wrote to the Assistant Secretary of War that this bomber—the B-29—was the only weapon with which the Air

Corps could “hope to exert pressure against Japan without long and costly preliminary operations.” The B-17 did not have enough range.

General Arnold informed Gen. George C. Marshall, Army Chief of Staff, that if B-29s were “first employed against targets other than against Japan, the surprise element will be lost, and the Japanese will take the necessary actions to neutralize potentially usable bases and secure additional bases in China that will prevent the operation of these airplanes against Japan, until the all-out attack is made.”

The first production model B-29s were completed in July 1943. In August, when Roosevelt and British Prime Minister Winston Churchill met at Quebec, Arnold submitted an “Air Plan for the Defeat of Japan,” prepared by Brig. Gen. Kenneth B. Wolfe, who had headed B-29 development. Arnold’s plan recommended operating B-29s from central China.

Despite these plans to bomb Japan, the Allies’ first priority had always been to defeat Germany. In May 1943, the US and Britain reaffirmed in Washington their first objective of “bringing about at the earliest possible date the unconditional surrender of the Axis in Europe.” They also pledged “to maintain and extend unremitting pressure against Japan with the purpose of continually reducing her military power and attaining positions from which her ultimate surrender can be forced.”

Once Germany surrendered, the full weight of Allied power—joined, “if possible,” by Russia—would be concentrated to bring about “at the earliest possible date the unconditional surrender of Japan.” The first Ameri-

**BY HERMAN S. WOLK**

can overture to gain Soviet entry into the war against Japan had been made on December 8, 1941. At the same time, the AAF emphasized its desire to have access to Siberian air bases.

### **Debate Over Invasion**

In August 1943, at Quebec, the Combined Chiefs of Staff agreed that the target date for Japan's unconditional surrender should be within twelve months of Germany's downfall. This overall objective also included the possibility of invading Japan "if this should prove to be necessary." Subsequently, this was publicly announced in the Cairo Declaration on December 1, 1943, by the United States, Britain, and China.

Meanwhile, at the Teheran conference in late November 1943, Marshal Stalin had promised Russia would enter the war after Germany had capitulated. Returning to Cairo from Teheran, the Combined Chiefs approved, for additional preparation, a plan that considered the possibility that Japan might be defeated by blockade and bombing without invasion of the home islands. Nevertheless, provision was made for invasion, should this prove necessary.

In January and February 1944, American amphibious forces assaulted the Marshall Islands; in April, Allied forces landed in New Guinea; on June 4, the Allies took Rome; and on June 6, 1944, Allied forces successfully stormed the Normandy beaches. Then, on July 11, the

Joint Chiefs of Staff concluded that sea and air blockade and intensive air bombardment could not guarantee early unconditional surrender: "While it may be possible to defeat Japan by sustained aerial bombardment and the destruction of her sea and air forces, this would probably involve an unacceptable delay."

The necessity for invasion would have to be accepted. Thus, for planning, JCS approved an amphibious assault on Kyushu, the southern Japanese home island, to be followed by "a decisive stroke against the industrial heart of Japan by means of an amphibious attack through the Tokyo plain assisted by continued pressure from Kyushu."

Invasion of Kyushu was scheduled for October 1, 1945; the attack on the Tokyo region of Honshu for late December 1945. Estimated date for Japan's defeat was revised to eighteen months after Germany's surrender. The Combined Chiefs, Roosevelt, and Churchill approved this in September 1944 at another Quebec conference.

Meantime, on April 10, 1944, the JCS had approved establishment of Twentieth Air Force to operate directly under JCS with the AAF Commander as executive agent. This unique organization provided the basis for the strategic bombing offensive against Japan. Thus, with Operation MATTERHORN (approved at the Cairo conference) from the Chengtu Valley of western China, AAF's XX Bomber Command under General Wolfe began softening up Japan. The first attack by B-29s on June 15, 1944, against the Imperial Iron and Steel

*Between March 9 and 19, 1945, Japanese cities experienced an extraordinary eleven-day incendiary blitz by B-29s of the XXI Bomber Command.*





Pipe or cigar—it didn't matter: Curt LeMay (left) was a "rugged commander" either way. He replaced Brig. Gen. H. S. (Possum) Hansell at XXI Bomber Command.

Works at Yawata on Kyushu—as Saipan was stormed—was not successful. It was a start, however, and the Japanese realized war was being carried to their homeland.

But Arnold was not satisfied. He wanted Wolfe's B-29s to intensify their attacks, beginning with a 100-plane raid against Anshan. Wolfe did not consider Arnold's assessment of his maintenance and logistics realistic, and he countered with a plan to send from fifty to sixty aircraft. As a result, Arnold directed Wolfe—whom he had chosen to head XX Bomber Command—to return immediately to the US to head Materiel Command, a two-star post. On August 29, 1944, Maj. Gen. Curtis E. LeMay (whom Arnold, in England in 1943, described as a "rugged commander") replaced Wolfe.

But faced with tremendous logistical problems (supplies had to be flown in over the long "Hump" route), bombing from interior Chinese bases proved preliminary to the offensive from the Marianas. From China, B-29s could reach Kyushu, but not Honshu. Once Saipan was secured, the Superforts could strike the industrial heart of Japan.

Also on August 29, 1944, Brig. Gen. Haywood S. (Possum) Hansell, Jr., had taken command of XXI Bomber Command to direct strategic bombing from the Marianas, directly under General Arnold, executive agent for the Joint Chiefs. Consequently, Adm. Chester Nimitz, theater commander, did not have control of the B-29s, though Hansell would be dependent on him for logistic support.

### B-29 Enters Battle

On October 12, 1944, the first B-29 Superfortress (*Joltin' Josie, The Pacific Pioneer*) landed at Isley Field, Saipan, piloted by General Hansell. An architect of high-altitude precision daylight bombing tactics, Hansell had been instrumental in planning the bomber offensive against Japan.

In October and November 1944, Hansell's crews hit Truk and Iwo Jima. But Arnold, with new intelligence, felt the time had come to strike the Japanese aircraft industry. Also, President Roosevelt was deeply concerned over casualties that would result from invasion

and was anxious for something decisive to be accomplished.

Between November 1944 and mid-January 1945, XXI Bomber Command struck the aircraft plants. As Hansell himself put it, results generally were not outstanding. XXI Bomber Command had not accomplished what Arnold had anticipated. Consequently, Arnold replaced Hansell with LeMay in the same abrupt manner he had replaced Wolfe.

Prior to taking command in the Marianas, General Hansell had distinguished himself in selective bombing planning and operations. "My heart," he recalled, "had always been with selective bombing." But his forces had been plagued by bad weather, maintenance difficulties, and poor bombing accuracy. The Pacific jet stream could produce winds of up to 200 miles per hour at 30,000 feet. And cloud cover usually obscured targets. LeMay recalled that "you could go on forever, trying to get up to a target in such a wind." Even in a good month, American airmen could expect only seven days of bombing; in the worst month, three days. Under these conditions, it was difficult to conduct sustained high-altitude daylight precision bombing.

LeMay, the hard-driving perfectionist who had innovated bombing tactics in England while serving as a group commander under Hansell, took command on January 20, 1945. He didn't have much time. He knew why he was in the Marianas: Arnold and Maj. Gen. Lauris Norstad, Chief of Staff of Twentieth Air Force, wanted an incendiary offensive. And they wanted immediate results. LeMay described the situation:

"General Arnold, fully committed to the B-29 program all along, had crawled out on a dozen limbs about a thousand times, in order to achieve physical resources and sufficient funds to build those airplanes and get them into combat. . . . So he finds they're not doing too well. General Arnold was absolutely determined to get results out of this weapon system."

### LeMay's Decisive Gamble

Hansell had experimented with fire raids, but they had been few in number and of limited effectiveness. LeMay now ran a few incendiary attacks, but generally stayed with high-altitude precision missions. In late February, Norstad reminded him of the necessity for a major incendiary attack. LeMay now knew he had to deliver without delay.

"The turkey," he recalled, "was around my neck."

By his own admission, he had run more than a month of "indifferent operations," and not much had been accomplished. "We were still going in too high, still running into those big jet-stream winds upstairs. Weather was almost always bad."

As LeMay put it, he "came to" after six weeks. Incendiaries had always been on his mind. At the urging of Maj. Gen. Claire L. Chennault, Commander of Fourteenth Air Force in China, he had conducted a successful fire raid against Hankow, China, on December 18, 1944, wrecking the Yangtze dock area. Fires had burned for three days, and Chennault called it "the first mass fire-bomb raid" by B-29s. Japanese cities were built much the way Hankow was.

But what tactics would be most effective? The Han-

*North Field, Guam, was home base for these Superforts of the 314th Wing's 29th Bomb Group—just part of the force on Guam, Tinian, and Saipan that finally grew to include some 1,000 B-29s.*

low raid had been conducted at from 18,000 to 20,000 feet, lower than the usual high-altitude mission. However, this would not be low enough to be free of bad weather. Determined "to get us to be independent of weather," LeMay decided on planes shorn of guns and ammunition, flying low at night when cloud and wind conditions were less formidable. The questions were, did the Japanese have low-altitude flak? Night fighters?

"My reasoning," LeMay recounted, "told me that I was heading toward a correct decision." After discussions with his staff (some opposed his idea) and wing commanders, he became convinced the enemy did not have a low-altitude defense.

Would Arnold accept this gamble? He asked Norstad, who gave the impression it would be all right: "General Arnold was for going in and getting the war won." According to General LeMay, Norstad then explained: "If you don't get results, you'll be fired. . . . There'll never be any Strategic Air Forces of the Pacific—after the battle is finally won in Europe, and those ETO forces can be deployed here. If you don't get results, it will mean eventually a mass amphibious invasion of Japan, to cost probably half a million more American lives."

LeMay went ahead. He didn't inform Arnold (who had been hospitalized since January with a heart attack) in advance. The AAF Commander, therefore, would not have to share responsibility should things go wrong.

In scope and daring, this was one of the great calculated risks of modern military history. Lives of dedicated crews, fate of the bombing campaign, and LeMay's career would be staked on a night fire-bomb offensive from 5,000 to 9,000 feet.

The great fire-bomb raid on Tokyo of March 9–10, 1945, in which 334 Superforts from Guam, Tinian, and Saipan dropped 2,000 tons of bombs, resulted in a holocaust of staggering proportion. Conditions were almost perfect for the attackers. The weather was good. Pathfinders with napalm bombs marked the heart of Tokyo with its profusion of home factories and wooden structures. The big bombers swept in at low altitude. The Japanese were caught unprepared. In this respect, it was like Pearl Harbor. Antiaircraft guns were not effective. There was little fighter opposition.

The area under attack measured about three by four miles. Winds spread fires with hurricane force, creating an inferno. Thousands were trapped. Flames leaped rivers. Tremendous updrafts of heat flung some of the B-29s several thousand feet upward. Firefighters could not contain the conflagration, and within thirty minutes it raged out of control. B-29 crewmen reported the glow could be seen for 150 miles. The official casualty report listed 83,793 dead and 40,918 wounded. It was the most destructive raid in history.

LeMay's bombers then slammed Osaka, Kobe, and Nagoya. The results confirmed the effectiveness of his



tactics. From March 9–19, XXI Bomber Command flew 1,595 sorties and delivered 9,365 tons of bombs in an incendiary blitz that proved the destructive capability of the B-29. While also supporting the Okinawa campaign during the spring, between March and June 1945, LeMay's forces dealt crushing blows to the six most important industrial centers of Japan. General Hansell observed in retrospect that the "pressure of time had been enormous. . . . Considering this and the insistence on invasion, fire bombing was right."

### **Intricacies of Planning**

Meanwhile, during the spring of 1945, the Joint Chiefs of Staff continued to review the overall plan for the defeat of Japan. These deliberations turned on the question of whether or not an invasion of the home islands was necessary. A decision had also been reached on command for the war's final phase. Gen. Douglas MacArthur was chosen Commander in Chief, US Army Forces in the Pacific, and Admiral Nimitz was named Commander of Naval Forces. The JCS would exercise strategic direction over the theater. General Arnold retained command of the strategic bombing effort directly under the Joint Chiefs.

Maj. Gen. Laurence S. Kuter, Assistant Chief of Air Staff, Plans, had been instrumental in planning for air command in the Pacific. In late 1944, he had proposed that all land-based aircraft committed against Japan should be assigned to the Twentieth Air Force. And in the spring of 1945 he had recommended establishment of the US Army Strategic Air Forces in the Pacific. Subsequently, he served as Deputy Commander of the Army Air Forces in the Pacific under Lt. Gen. Barney M. Giles.

On May 8, 1945, the European war ended. General Arnold now had to complete plans for redeploying airpower from Europe to the Pacific. He had hoped to move a large force of B-17s to Okinawa, using Guam, Saipan, and Tinian for B-29s. Also, he planned to have Gen. Carl A. (Tooe) Spaatz command this force from headquarters on Guam. Then, less than three weeks

after the German surrender, the JCS dispatched a directive to MacArthur, Nimitz, and Arnold, scheduling an invasion of Kyushu with a target date of November 1, 1945, in order to intensify blockade and bombardment of Japan prior to a decisive invasion of Honshu.

In early June, Arnold flew to the Pacific to complete command arrangements and to find out from LeMay how much longer Japan could hold out. For Arnold and the Army Air Forces, this would be a significant journey. After discussions with naval leaders about establishment of the Strategic Air Forces in the Pacific under Spaatz, Arnold talked with General LeMay about the B-29 campaign.

Arnold asked for LeMay's best judgment on when the war might end. After consulting with his staff, LeMay told him that by October 1, 1945, Japan's industrial centers and cities would be destroyed and Japan would no longer be able to continue the conflict. The invasion of Kyushu (OLYMPIC) would not be necessary. The XXI Bomber Commander added that his units had enough supplies to sustain them at a high level until December 1. At that time, they would have to apply the brake and resupply.

On the heels of this startling judgment, Arnold, while on Guam, received a preliminary report of the US Strategic Bombing Survey (USSBS) on the effects of bombing Germany. This report emphasized that strategic bombing had a disastrous effect on Germany. What result would bombing have on Japan? To Arnold, the answer was clear:

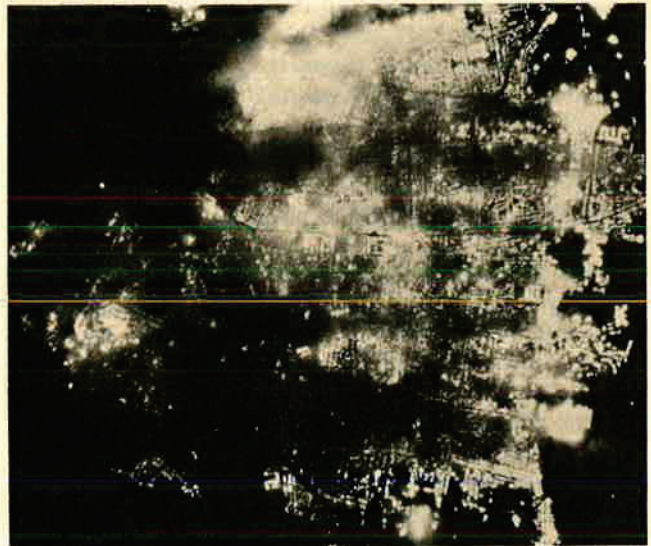
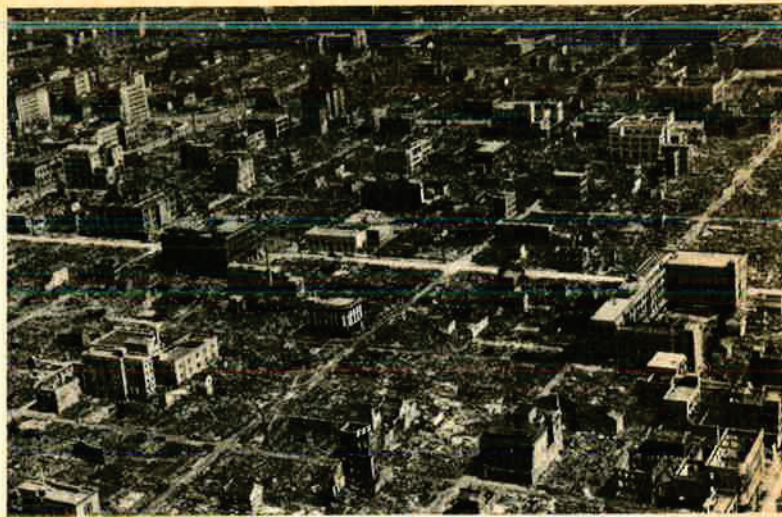
"If we could win the war by bombing, it would be unnecessary for the ground troops to make a landing on the shores of Japan. Personally, I was convinced it could be done. I did not believe Japan could stand the punishment from the air that Germany had taken."

Also, while Arnold was in the Pacific, a group of USSBS officials in Washington told leaders that, based on what they had seen in Germany, there would be no need to invade Japan.

On the same day Arnold was given the preliminary bombing survey report, he received a cablegram from General Marshall saying the Joint Chiefs would meet with President Truman on June 18 to discuss whether an invasion would be necessary, and to prepare Truman for the Potsdam conference with Churchill and Stalin, scheduled for mid-July. General Arnold immediately sent LeMay to Washington to brief the JCS on the strategic bombing offensive.

### **Doubts About the A-Bomb**

At that time, General Arnold was aware of development of the atomic bomb. He had known about it since May 1943 and had directed B-29 modification and organization and training of the 509th Composite Group. Establishment of this special unit under Col. Paul W. Tibbets, Jr., began in the summer of 1944. (See "Training the 509th for Hiroshima," by Paul Tibbets, August '73 issue.) By the end of 1944, a list of possible Japanese targets had been selected. But no one knew for certain when the bomb would be ready or if it would work. Even in 1945, Adm. William D. Leahy, Chief of Staff to Roosevelt and Truman, was convinced the bomb would never work.



Three photos attest to the B-29s' destructive power. At the top is Osaka's ruined business district. Center photo shows Hiroshima after the A-bomb. The lower photo is of Toyama's aluminum plants during an incendiary raid by the B-29s.

"This is the biggest fool thing we have ever done," he told Truman. "The bomb will never go off, and I speak as an expert on explosives."

For these reasons—and the secrecy of the Manhattan

Project—the atomic bomb had not entered into major deliberations. It was, Leahy observed, “the best kept secret of the entire war.” On June 1, 1945, the so-called Interim Committee on the atomic bomb recommended to Truman that the bomb be used against Japan as soon as possible, against a military target surrounded by other buildings, without prior warning.

After sending LeMay to Washington, Arnold dispatched a message to General Marshall. The AAF Commander emphasized his support for OLYMPIC “to get additional bases for forty groups of heavy bombers.” Based on his talks with LeMay, he recommended an all-out bombing offensive to complete the destruction of Japan. He also agreed with planning for the Honshu assault, but proposed keeping this on “a ‘live,’ but postponed basis.”

Meanwhile, General LeMay had arrived in Washington, but was not able to brief the Joint Chiefs prior to their June 18 meeting with the President. Lt. Gen. Ira C. Eaker, AAF Deputy Commanding General, represented Arnold at this meeting. Mr. Truman stressed that he was deeply concerned about heavy casualties sure to result from invasion. He was also concerned about time and casualties in the effort to defeat Japan by “isolation, blockade, and bombardment by sea and air forces.”

Though the JCS had accepted invasion on a planning basis since May 25, final preparations awaited Truman’s approval. All were aware that although the Japanese were reeling from recent blows (Manila and Iwo Jima had fallen, success of the Okinawa invasion was no longer in doubt, and B-29s were wrecking Japan’s industry and cities), they were not ready to surrender unconditionally.

General Marshall told the President the situation was “practically identical” with that after Normandy. The Kyushu operation was “essential to a strategy of strangulation.” Marshall’s view was that “airpower alone was not sufficient to put the Japanese out of the war. It was unable alone to put the Germans out.” His position was firmly supported by MacArthur, who had sent Marshall a lengthy message justifying the necessity for invasion.

General Eaker, noting he had just received a cable from Arnold, stated that the blockade of Honshu was dependent on Kyushu air bases. The AAF plan that called for forty groups could not be implemented without Kyushu bases.

Adm. Ernest J. King, Chief of Naval Operations, Nimitz, and Leahy approved OLYMPIC, all emphasizing that taking Kyushu would “bring increased airpower against Japan.” Later, King and Leahy stated they had not supported invasion. Secretary of the Navy James V. Forrestal thought the Kyushu concept sound. Secretary of War Henry L. Stimson and his Assistant Secretary, John J. McCloy, stressed the large number of Japanese who wanted out of the war. Stimson agreed with OLYMPIC, but hoped for an end by other means. His position was based on an earlier proposal by Acting Secretary of State Joseph C. Grew that the President warn Japan and give it a chance to surrender, indicating the US did not seek to destroy the Emperor. The A-bomb was also discussed on June 18. Though it had

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not been tested, all agreed with the Interim Committee that no prior warning should be given.

President Truman then approved OLYMPIC and directed that preparations be completed. Meanwhile, bombing and blockade would be intensified. Planning for the Honshu assault would continue, but no final decision would be made until later. Truman wanted to prevent “an Okinawa from one end of Japan to the other.”

On June 19, 1945, LeMay recommended to the JCS a “wraps-off” bombing offensive along the lines specified by Arnold in his message to Marshall. As LeMay recalled, this session was somewhat of “a fiasco,” since a course of action had already been approved by the President.

The next day, in Tokyo, Emperor Hirohito told the inner Cabinet: “You will consider the question of ending the war as soon as possible.” The fact was that in September Japan had indirectly begun to feel out the Allies on peace terms. At the end of June 1945, Japan approached the Soviets directly. The US intercepted and decoded these messages. The Japanese made clear that unconditional surrender was unacceptable. The Russians, however, refused to consider these approaches until the Potsdam conference.

In June and July 1945, as Truman (and Arnold) prepared for Potsdam, the AAF position was to go along with Marshall’s advocacy of invasion on the basis that OLYMPIC would secure vital bases. However, Arnold, LeMay, and other airmen were convinced an invasion would not be required because Japan could be knocked out prior to November 1. Though they went along with Marshall—who had told Arnold he would support an independent Air Force after the war and to whom the AAF owed its quasi-autonomous status—they relentlessly pressed the bombing.

### **A-Bomb Not Needed: Arnold**

And, finally, Gen. Hap Arnold also thought it was not necessary to drop the A-bomb. He had accompanied Truman to the Potsdam conference. On July 16, 1945, the bomb was successfully tested at Alamogordo, N. M., and the news was flashed to Potsdam. Again Truman convened his advisers—Secretary of State James Byrnes, Stimson, Leahy, Marshall, Eisenhower, King, and Arnold. General Arnold declared that in his view it was not necessary militarily to drop the atomic bomb. Under conventional bombing, Japan would capitulate by October.

Marshall and the others disagreed. The President



*The giant B-29s were a lovely sight unless you were on the receiving end of their bombs. These Superfortresses are over China, on their way to targets in the Japanese homeland.*

thought bombing and blockade would take months, maybe as much as a year. And Marshall felt invasion of the Tokyo plain (CORONET), scheduled for March 1946, would cost at least a quarter million American casualties with as many Japanese. Should Japan reject an ultimatum, Truman decided to drop the bomb.

On July 25, orders were issued to General Spaatz, commanding the Strategic Air Forces in the Pacific (Arnold insisted a directive be issued to Spaatz), to drop the "first special bomb" as soon after August 3 as weather permitted. On July 26, the Potsdam Declaration was made of the future status of the Emperor. "The only alternative for Japan," it stated, "is prompt and utter destruction." Japan ignored this declaration, which the Allies interpreted as rejection.

Coming back from Potsdam, Truman ordered that the bomb be used. On August 6, it was dropped on Hiroshima. On the eighth, the Soviet Union presented a declaration of war to the Japanese ambassador in Moscow, effective August 9. On the ninth, a second A-bomb was dropped, on Nagasaki. The next day, Japan asked for peace.

It had been a long, difficult road from the early days when all news was grim. On September 1, 1945, the surrender was signed aboard the *Missouri* in Tokyo Bay. Gens. Carl Spaatz, George Kenney, Barney Giles, and Curtis LeMay were there. B-29s roared overhead. It was a fitting end.

The atomic bombs, Arnold wrote, "did not cause the defeat of Japan, however large a part they may have played in assisting the Japanese decision to surrender." Japan surrendered, in Hap Arnold's view, "because air attacks, both actual and potential, had made possible the destruction of their capability and will for further resistance . . . those . . . attacks . . . had as a primary objective the defeat of Japan without invasion."

Had the bomb not been used, would Japan have surrendered prior to the scheduled November 1 invasion of Kyushu? One cannot determine for certain.

Truman and Marshall thought it would take many months. Arnold, LeMay, and King were convinced Japan could be knocked out before invasion. LeMay had told Arnold the war would end by October 1. After the war, some Japanese leaders said that even without the atomic bombs, they couldn't have held out much longer. The USSBS concluded that, without the A-bomb and invasion, Japan would have accepted unconditional surrender probably by November 1 and definitely by the end of the year.

Nonetheless, it is difficult to fault Truman's decision to drop the bomb. He was determined to use it to save lives. Given the situation, his rationale was sound. It was bound to generate controversy. But the war ended after the second bomb was dropped. Despite having substantial Army forces ready to defend the home islands, Japan had already been defeated, but was not willing to surrender.

Strategic bombing was decisive in *victory without invasion*. Navy, Army, and Marine forces also made magnificent contributions as did air forces under Gen. George C. Kenney, Commanding General, Allied Air Forces in the Southwest Pacific, MacArthur's top air commander. Of relatively short duration but furious in its intensity, the B-29 offensive was one of the most extraordinary campaigns of military history. Also, complementary to strategic bombing, B-29s made an important contribution to the blockade of Japan by flying more than 1,500 sorties to mine Japanese waters. Called Operation STARVATION, this very successful campaign sank or damaged about 700,000 tons of Japanese shipping from April to August 1945.

"Airmen believed that airpower could do the job," remembered General LeMay. "We did do the job, but it wasn't easy." ■

**T**HE Defense Department, its own leaders lament, is suffering from a wasting disease that can be cured only by a firm decision by the American people not to accept the status of a second-class military power.

The odds are against any rapid reversal of present budgetary trends because, as Defense Secretary James Schlesinger commented recently, the military services "are faced with a crueler fate [now than during the Southeast Asian war], which is indifference rather than hostility."

The extent of this indifference is easy to measure, he told newsmen: ". . . We have the smallest share of the GNP since prior to the Korean War. . . . We have the smallest share of manpower since the postwar demobilization. . . . Our budget in constant dollars has been reduced in excess of forty percent since FY 1968 . . . [and] in terms of the share of the total public spending, we are down to seventeen percent . . . which is the lowest level since before Pearl Harbor."

Meanwhile, spending for actual military muscle continues to decline. The Soviets, by contrast, a senior Defense Department official told AIR FORCE Magazine, "invest half again as much as we do" in combat capabilities and increase their investment rate by between three and five percent each year, while ours is falling off slightly more than one percent annually. The difference, if permitted to continue indefinitely, is sufficient to turn into a "hollow cry" the White House's pledge to keep this country militarily second to none.

These discouraging assessments are borne out by a new Defense Department index, called Real Program Value, or RPV. This index is computed by subtracting from the total DoD budget the cost of consumables and expendables contributed to allied forces, dependent benefits, and retirement pay. The latter figure is of special concern to DoD leaders. Retirement benefits account for about \$7 billion of the current budget and will grow to about \$14.5 billion within ten years.

The trend in US defense spending, compared to that of the Soviet Union, is discouraging at best. A new, analytical index developed by Defense Department planners brings out more precisely the gravity of the situation, but also points the way toward remedies. Here's a special report on how DoD budget planners are . . .

# Waging War On

# INFLW

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



AIR FORCE Magazine was told, DoD spend as much or more on military benefits than we will be spending on research and development. Regardless of whether we have served our nation in the past, we do not contribute to present or future US military capability." DoD does not seek a curtailment of retired pay, but at the same time is not opposed to public and congressional debate of this issue.

The Defense Department sees the effective-ness of its budget limited in another way. About 70 percent of its money goes to personnel and O&M (operations and maintenance) and 30 percent to research and development, procurement for modernization. In contrast, the Soviet defense budget appears to allocate about half its funds to R&D and weapons production.

The effects of declining Real Program Value and the mounting military personnel and O&M costs can be expressed in concrete statistics. Compared to the US, the USSR is producing the following in 1974:

- Five to six times as many tanks,
- Four times as many armored personnel carriers,
- More than twice the number of military aircraft,
- Artillery pieces at a "high rate," while almost none are being produced in the US for our own inventories.

Some US defense planners now are more concerned about the Soviet lead in conventional capability than they were when the United States held a clear lead in strategic weaponry. With the Soviets having roughly matched US strategic nuclear might and working furiously to pull ahead, this country can no longer risk a pronounced mismatch in conventional capability. Parity in nonnuclear forces is, therefore, considered imperative.

Gen. George S. Brown, Chairman of the

Joint Chiefs of Staff, said recently that, with neither side capable of executing a disarming first strike, nuclear forces cannot be expected to deter lesser forms of conflicts and the need to improve the general-purpose forces becomes acute. These forces, he said, are forty percent below the 1968 level and almost twenty percent below the level of 1964.

There are no illusions about the difficulty of matching investments with the Soviet Union, which is relatively free from inflationary pressures and is strengthening its economic posture through energy exports. The Soviet Defense Budget, according to General Brown, appears to be the equivalent of \$96 billion this year and over the past three years, has grown by about three to five percent annually. (The Soviet defense budget does not include such items as the cost of military retirement pay.)

### No Easy Remedies

An obvious answer to inflation is to get a better return from each defense dollar, but, as a high-ranking DoD official put it, the maneuvering space is getting very tight. Linchpin for DoD's budget-stretching is a program to boost the teeth-to-tail ratio of the military forces by reducing headquarters and support forces exemplified by the just-announced deactivation of PACAF Headquarters (see p. 14). This is being coupled with hard-nosed drives to cut down on the number of flying personnel, stem grade creep, and reduce the number of civilian employees, AIR FORCE Magazine was told.

Pentagon managers plan to economize also by assigning new jobs to the Guard and Reserve under the "Total Force" policy. A first step toward capitalizing on Total Force was the recent joining of the Air National Guard and Reserve with the Strategic Air Command's regular forces in the strategic refueling mission. The Defense Department plans to entrust additional tasks, equally crucial and demanding, to

# ATTENTION

the Reserve Forces, "if they show that they are able to do them." Some planners hope that the active-duty force can be cut in direct proportion to increases in the Reserve components' effectiveness in those missions predicated exclusively on a full-mobilization scenario. These pending changes will be put into effect "cautiously and slowly" to prevent breaks in combat effectiveness.

### More Consolidation

Attractive targets for expense cutters are jobs that now are being duplicated in different agencies. The recent absorption of tactical airlift into the Military Airlift Command (see p. 24) is an example. It may be followed by the partial absorption of Navy airlift into MAC. This consolidation, the Pentagon claims, will save about \$700 million over a five-year period.

Merging the aviation activities of the US Navy and the Marine Corps is not favored by the DoD hierarchy at this time because of its effect on *esprit de corps*, AIR FORCE Magazine learned. There are proposals under consideration to reduce separate carrier forces somewhat by operating more Marine air from Navy carriers under maximum threat conditions. Air defense is earmarked for fundamental change, with senior DoD officials seemingly bent on re-aligning interceptor forces and mobile support units under the general-purpose forces (presumably TAC) or the unified overseas commands. Under this plan, allied forces are expected to assume greater responsibility for their own air defense.

Underlying the new concept is the fact that most air defense systems can now become fully mobile and the assumption that the Soviets at this point appear more likely to use, or likely to threaten to use, their strategic bombers, including the "Backfire," against naval targets, NATO, or other allies rather than against the US mainland. The Soviets have not built up a large tanker force that would be required for long-range Backfire use.

Also in the offing may be a revamping of military training, especially flight training. With a shrinking force, the proportion of people and units assigned solely to training is "beyond the level we can afford at a time when we are suffering from an acute wasting disease." A case in point, a senior DoD official said, is that about one-quarter of the Navy's twenty-seven aviation squadrons are assigned exclusively to training, and are not counted as combat capable.

The intent to economize on training is evidenced also by a proposal to merge some training with allies. The latter development would "take time" and presupposes shedding parochial and nationalistic predilections, a condition that could be hurried along by the impact of worldwide inflation.

Economizing through international cooperation

tion is also behind the Pentagon's interest in arranging common R&D efforts and forming joint equipment standards with its allies. This area receiving special attention, this report was told, is the potential incorporation into the US inventory of certain surface-to-air missiles developed by allied countries. On the other hand, the Pentagon believes, the US lead in air-to-air and guided weapons should make them the standard for allied countries.

The Air Combat Fighter—at this writing still in source selection—is seen by the Defense Department as another candidate for standardization, the inventory of the US and its allies. But even without this potential, the new lightweight fighter, as part of a high/low mix, can be expected to produce savings of about twenty percent, compared to USAF and naval forces consisting of only F-14s and F-15s.

### Improving R&D Productivity

Central to DoD economy efforts is the fullest possible exploitation of technologies and products developed for the civilian market. Starting with electronic components, this search reaches all the way to such aircraft as the Air Force's proposed new, large tanker (see p. 24) and wider use of the nation's commercial jetliners under a new, more comprehensive Civil Reserve Air Fleet concept.

The Defense Department will demand that the services avoid duplication in research and development, but there is no intention of resurrecting the extreme devotion to commonality practiced unsuccessfully in the 1960s. The Defense Department, for instance, will insist on free and full technological cross fertilization between the Air Force's M-X program and the Navy's two new Trident SLBMs. But this coordination is to stop well short of a joint program, since the two systems are sufficiently different in guidance requirements and basing mode "to lose rather than gain" from a common development program.

### Better Budget Planning

It is a miracle, a senior DoD official observed with considerable frustration, that "this country has survived for almost 200 years" in spite of the luxury of authorizing and appropriating its defense budget on a year-to-year basis. In presenting its budget request for FY 1976, the Defense Department will seek a "new partnership" with the Congress in establishing continuity for DoD's five-year planning cycle. The hope is that the Congress will adopt policies that couple budgetary planning of the nation's long-term social objectives with those of defense, and thereby reduce costly and disruptive funding fluctuations. The US is one of the few nations that have not accepted the concept of approving multiyear defense planning funding.

The Defense Department is also moving cautiously toward increasing the period covered by its plans. At present, only a limited number of special studies and some "crude planning" look as much as ten years beyond the five-year planning cycle. Yet, a fifteen-year cycle appears possible and probably would prove economically beneficial. Pentagon planners don't believe that the rapid advance of technology poses an insurmountable problem for long-range budget prognoses because lead times between scientific breakthroughs and their translation into operational weapon systems often take more than a decade.

Also, the Pentagon's planning is arranged by functional areas. If the potential for high-energy weapons, for instance, were to include ground-based air defense, it would be simple to shift funds from the currently planned SAM-D missile system to laser or other high-energy weapons, a senior DoD official explained. This could apply also to radically new basing techniques for fixed-site ICBMs. Innovative concepts that could make land-based missiles virtually invulnerable are under active investigation by the Air Force and could bring about significant changes in strategic weapons funding.

### Keeping Industry Informed

The Pentagon and the individual services have often failed to keep defense industry informed of long-term requirements and plans, to the detriment of both sides. This communications gap is being closed at a time when industry-DoD relations approach a critical level, this reporter was told. The present trouble arises because some industries with growing civilian markets are withdrawing from defense business, while others, without access to consumer markets, are being stifled by DoD's shrinking volume of industrial contracts. The shipbuilding

and electronics industries are seen by DoD as being in the former category with most of the aerospace industry in the latter.

Sen. Lawton Chiles (D-Fla.), Chairman of the Senate's Subcommittee on Federal Procurement, has said that unless present trends to centrally manage the defense industry by "bureaucratically" allocating resources and contracts rather than by relying on competitive market forces are reversed, the nation may find itself "pressed to nationalize" the defense industry. The Senator cited the fact that a defense contractor may be forced to work under "twelve hundred separate management systems and hundreds of government regulations, audits, and accounting standards."

DoD hopes to improve its relationship with industry by a number of actions. Foremost is the currently practiced "design-to-cost" policy that grants the contractor greater design and production latitude yet protects the government in the crucial areas of cost and performance. Funding continuity and knowledge of proposed funding levels and long-term plans are expected to strengthen the defense industry position and permit it to function in greater harmony with the services. Finally, both the government and its contractors must be prevented from going into production too fast, and from setting production rates higher than are needed.

DoD leaders harbor no illusions that these measures, singly or combined, can cure the wasting disease that afflicts national defense. But they can provide relief and complement what the Pentagon considers its central short-term and long-term need: the American people's willingness to halt the decline in the Real Program Value of DoD's budget and to restore it to a very modest annual growth rate of about two or three percent, necessary to finance the most pressing R&D and force modernization requirements. ■

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### WHO GOES THERE?

It was dry, dusty, and hot at Port Moresby, Papua, in August 1942. At Seven-Mile Airstrip, activity was high in support of the first effort to start the long road back to the Philippines. Ground troops were being ferried across the Owen Stanley Mountains in C-47s to a jungle strip near the Japanese-held airbase at Buna Bay.

My outfit, the 35th Pursuit Group (Fighter), was furnishing top cover in P-400 airplanes (British version of the P-39).

We had a little black, curly-haired dog named General on whom much affection and little discipline was lavished. One of our sergeants saw General scramble up the steps into a C-47 that was loading troops headed for combat in the jungle.

He ran to the door of the airplane and shouted into the dark interior, "General, you get your G-- D--- A-- outta that airplane!"

After a moment a soldier dressed in green appeared at the door and fixed the sergeant with a stern look—the stars on his shoulders declaring him to be a major general. He addressed the sergeant in a carefully controlled voice, "Did someone call me?"

—Contributed by Lt. Col. Robert McWherter (Inactive Reserve)

(AIR FORCE Magazine will pay \$10 for each anecdote accepted for publication.)

*One on the ground and one in the air, they fought as a team for 162 trying missions from England to Africa, Sicily, and Italy. Mutual trust and respect—and a warm, special, human bond—grew from the experiences shared by . . .*

# The Sergeant, His Pilot, HIS Plane

BY BRIG. GEN. HARRISON R. THYNG, USAF (RET.)

Illustration by Robert Altemus

**H**IS EYES were glued on the airplane high in the Italian skies above us. A huge bull of a man. His feet were planted solidly on the ground, but I knew that every straining muscle, tense nerve, and excited heartbeat in his body was in that cockpit. Sergeant Buck, crew chief in the Army Air Forces—a man without wings.

I recalled the first time I saw him. I was a new second lieutenant at Selfridge Field, Mich. An infrequent duty of the “newies” was to march the squadron mechanics to the flight line in the early morning. One crisp October day, I was late for roll call and dashed from my car to fall in with a unit already marching along. I led them smartly to the ramp and gave the order to “fall out.” Hardly had the words left my mouth when the first sergeant bellowed, “Fall in,” and promptly paraded the men to their proper outfit. I’ll never forget the snickers at a young shavetail’s discomfiture or the loud guffaw from a big, burly sergeant in the rear ranks.

One memorable day, my squadron commander informed me I was to be a flight leader and, as such, entitled to my own airplane. Walking on air, I made my way to the ramp and the sleek P-35 that awaited

me. No plane had ever seemed so bright and silvery as I proudly ran a possessive hand along its wing.

A man emerged from under the aircraft. I immediately recognized the burly sergeant with the loud guffaw, standing at easy attention before me. My marching incident still rankled a bit, and I brusquely demanded, “What’s the name, Sergeant?”

“Sergeant Buck, Sir. Your crew chief, if it pleases the Lieutenant.”

My crew chief! Knowing full well my dependence on him, I asked, “Have I got a good airplane, Sergeant?”

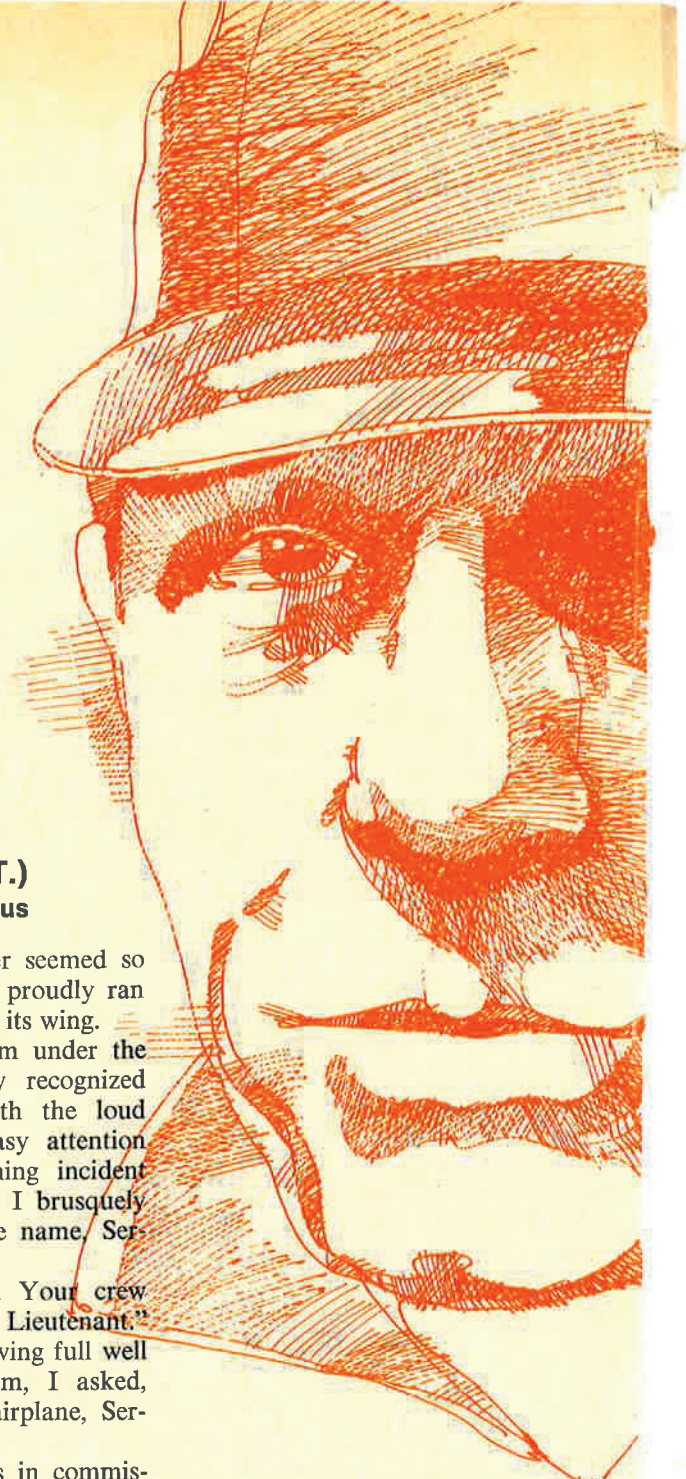
“My plane is always in commission, Sir,” came the flat reply, “and I just hope no young flyer ever cracks her up.”

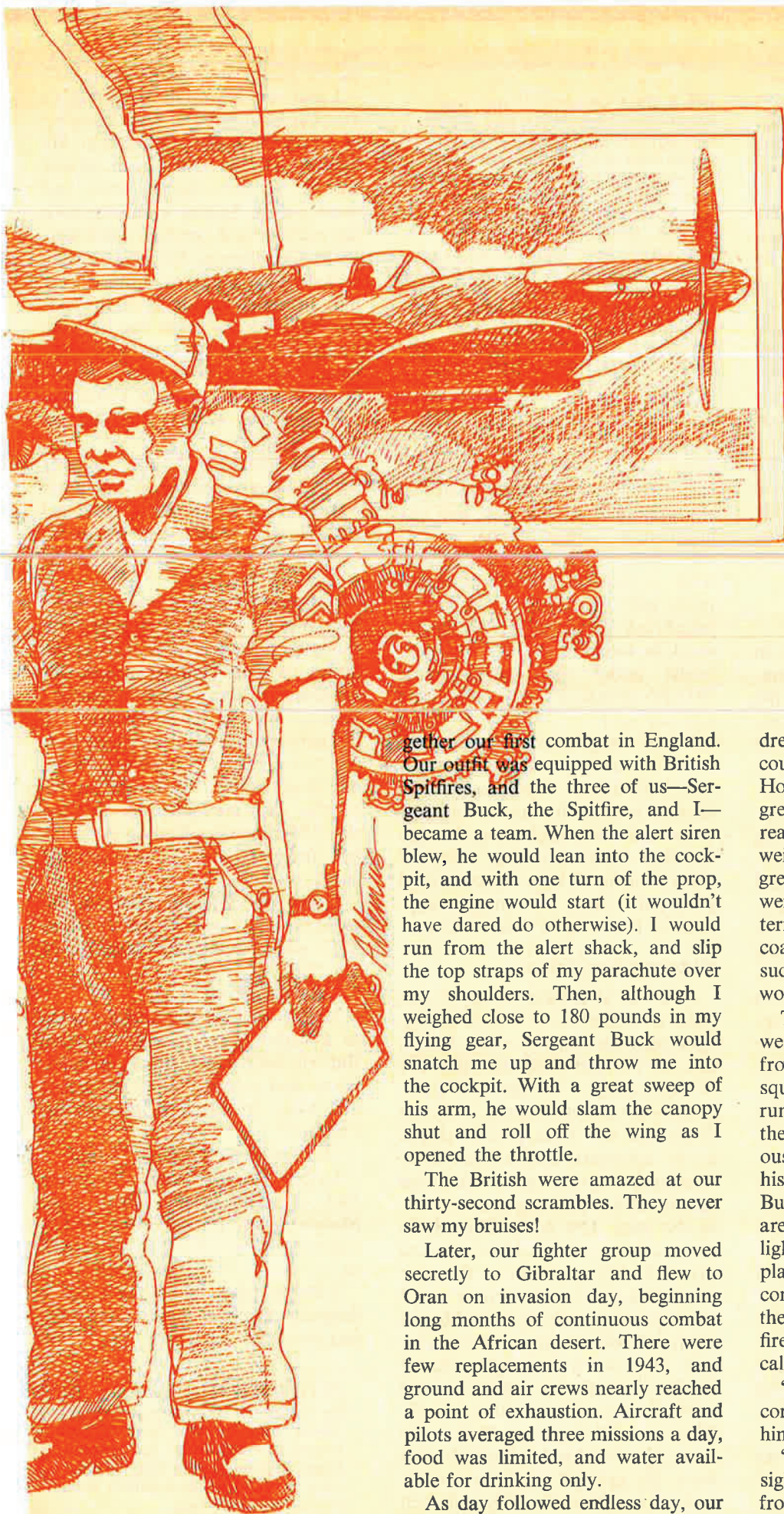
## Ready for Duty

Slowly we adjusted to one another, and I learned that Buck was single, a “loner” in many respects. Hardened as a youngster in the Pennsylvania coal mines, he had enlisted in the service at an early age. Buck spoke laconically and only when the occasion demanded. He was faithful to duty and loyal, but there was one custom I found not even a war could interrupt. Where-

ever we were—in Michigan, London, or the African desert—he fortified himself on payday from any liquid supply available. Resignedly, I would hand him a three-day pass at each month’s pay call and hope for the best. He always reappeared on time—often battered, but always ready for duty.

Early in 1942, we experienced to-





gether our first combat in England. Our outfit was equipped with British Spitfires, and the three of us—Sergeant Buck, the Spitfire, and I—became a team. When the alert siren blew, he would lean into the cockpit, and with one turn of the prop, the engine would start (it wouldn't have dared do otherwise). I would run from the alert shack, and slip the top straps of my parachute over my shoulders. Then, although I weighed close to 180 pounds in my flying gear, Sergeant Buck would snatch me up and throw me into the cockpit. With a great sweep of his arm, he would slam the canopy shut and roll off the wing as I opened the throttle.

The British were amazed at our thirty-second scrambles. They never saw my bruises!

Later, our fighter group moved secretly to Gibraltar and flew to Oran on invasion day, beginning long months of continuous combat in the African desert. There were few replacements in 1943, and ground and air crews nearly reached a point of exhaustion. Aircraft and pilots averaged three missions a day, food was limited, and water available for drinking only.

As day followed endless day, our

dreams focused on a time when we could bathe and wash our clothes. Hope of victory in North Africa grew as the cold and bitter campaign reached a climax in April. The weight of Allied armor was having great effect, and Rommel's Germans were being pushed into the Mediterranean. Bizerte, Cape Bon, the coast could become a reality. By such hopes and dreams are wars won.

The battle lines fluctuated, and we were rarely more than ten miles from the front. One morning, my squadron landed on a makeshift runway that had been scraped from the bleak Tunisian desert the previous day. Each pilot taxied toward his waiting crew chief. Sergeant Buck carefully directed me into the area he had reserved for us. Pride lighted his fatigued face, for his airplane had just completed its 150th combat sortie. This stoic man with the strength of ten patted his Spitfire lovingly, then swiftly ran a critical hand over its surface.

"Lot of flak on that bomber escort, but no enemy fighters," I told him.

"She ain't got a hole in her," he sighed gratefully as he helped me from the cockpit.

Sergeant Buck had been my crew chief for nearly three years now, and I had long ago learned that the airplane ranked first with him. He spent hours sanding and polishing that Spitfire, tuning the engine to get its utmost power, and patching flak holes that he felt I had "carelessly" acquired. I was sure he wanted the commanding officer to have that little extra, and I was well aware that he loved that plane more than any human being. Yet, I remember vividly the fog-shrouded morning at Kasserine Pass when the Germans shelled the field. Buck voluntarily remained behind and stood on my wing, hoping to get me off the ground. The enemy tanks were in sight when the sun broke through the mist, and I swooped down the runway toward safety. Sergeant Buck caught the last truck out.

### Foxholes and Cradles

It was a miserably cold winter in the desert, but the previous summer's sun had baked the sand to the hardness of cement in some places. Each time we moved, equipment and personnel had to be dug in. It was no easy task.

Sergeant Buck never wanted to be far from his plane and would dig a slit-trench close beside it. However, his trenches got smaller and more shallow with each move. One day, after a particularly difficult move, I noticed he had not yet dug in, and mentioned it to him. In distinctive and earthy language, I was told exactly what he thought of digging another foxhole and just where anyone could be located who ordered him to dig one.

A few minutes later, we scrambled as Me-109s began strafing our strip. Dogfights raged right over the troops, and men ran for any available cover as bullets whistled around them. Out of ammunition, I landed a short time later. Sergeant Buck was nowhere in sight. My heart sank as I wondered if he was among the wounded. But as I climbed out onto the wing, I saw great shovelful of sand flying out of a deep hole, and then a familiar face, dripping with perspiration. There were no further one-sided discussions of foxholes.

Sergeant Buck knew my wife was expecting our second child and worried with me as the appointed time

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*The author, General Thyng, has flown more than fifty types of military aircraft and is one of only seven men who are aces in both conventional and jet aircraft. He commanded a squadron and a group during World War II in Europe, Africa, and the Pacific, and led the 4th Fighter Wing in Korea. He served in Vietnam before his retirement in 1966. A native of New Hampshire, General Thyng is President Emeritus of the New England Aeronautical Institute, and part owner of Yankee GMC, Inc., in Center Ossipee, N. H.*

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came, but no news arrived. Because of our frequent moves, the mail was always slow in catching up, and any information, unless official, was always delayed. One day, I taxied in from a mission to find Sergeant Buck with a can of paint and a paintbrush in his hand. Without a word, he began to sketch a tiny pink cradle under the plane's name "MARY-JAMES" (for my wife and our son).

"Your daughter's a month old," he informed me tersely.

I don't know where he got his information, for it was several days before the news reached me through the Red Cross. For that matter, I often wondered how he concocted pink paint from our meager supplies in the isolated desert camp.

### Midnight Requisition

Late one afternoon, on my fourth mission of the day, I was in a dogfight with an Me-109 when British flak hit me and blew me right out of the cockpit. Though my parachute was severely "holed," I floated down and was subsequently picked up by apologetic Englishmen. They bandaged me up, fortified me with rum-laced tea, and rigged a stretcher in the jeep. The driver floored the gas pedal as we started back toward my unit. Moments later, the jeep hurtled over an embankment and I was again catapulted out, adding a fractured ankle to my earlier injuries.

It was nearly midnight when I finally reached my squadron and hobbled into the operations shack. There stood Sergeant Buck. His dark eyes suddenly flooded with tears. He grasped my hand firmly, and then bellowed, "What in hell

did the Major do with my airplane?"

I was sure he would never forgive me, but at dawn the next morning he was back at the briefing tent. He picked me up bodily and carried me out to our parking area, and there was a Spitfire complete with my number and personal markings. I was speechless as he put me in the cockpit and fitted my injured leg into a sling he had made on the rudder bar. He did lower me into the cockpit a little more gently than usual, but one thing was certain: We weren't going to miss a mission.

"Take care of her, Sir," he ordered gruffly.

Later that day, I stood silently by as the commander of my sister squadron across the strip, reddened with chagrin, reported to the group commander that someone had stolen one of his airplanes.

We finally reached the Mediterranean and Cape Bon, scrubbed our sand-ingrained bodies, reveled in the luxury of clean clothing against our roughened skin, and hopefully awaited word of replacements.

There were none. There were new fronts to conquer: Pantelleria, Sicily, and Anzio Beach. We fought on until the day my superiors decided that 162 missions added up to "combat fatigue," and I was shipped home.

I last saw Sergeant Buck on the morning that I silently watched him "fly" with the new commander in my "Spit."

"Thanks, Buck," I said.

He wheeled around and the trace of a smile flickered over his face. But his only farewell was a quick salute and a terse, "Sergeant Buck, Sir. Your friend, if it pleases the Colonel."

"It pleases the Colonel," I said.

I never saw him again. We knew each other better than most men. Mutual trust, respect, and shared experiences were the bonds between us.

I like to think that my son has a Sergeant Buck to look after him and the swift jet he flies. ■

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EDITOR'S NOTE: "Buck" is not the sergeant's real name, General Thyng tells us. For reasons best known to the Sergeant but, it seems to us, quite in keeping with the character of the man, he wouldn't have wanted his name used.

# HIGHLIGHTS

## 1975

### MARCH AIR FORCE MAGAZINE

Soviet Aerospace Almanac Issue—for the first time anywhere, a comprehensive examination of Soviet aerospace forces, including organization, mission and concepts . . . Soviet R&D Military Space Applications—Statistical data on Soviet aerospace forces and budgets. A "Jane's" prepared Gallery of Soviet Weapon Systems, plus many other exclusive articles and features . . . a must for military planners . . . a year-round reference Issue.

### MAY AIR FORCE MAGAZINE

Annual Air Force Almanac Issue—exclusive articles by the Secretary and Chief of Staff, USAF . . . in-depth reports on all major Commands . . . complete Gallery on USAF Weapon Systems. Must reading . . . important reference issue throughout the year.

### JULY AIR FORCE MAGAZINE

"The Electronic Air Force"—special editorial coverage on what is happening now and plans for the future. Must reading throughout the Air Force, particularly in AFSD, ASD and the Labs as well as all user Commands.

### SEPTEMBER AIR FORCE MAGAZINE

Annual Convention, Fall Briefings and Displays Issue—Bonus distribution at event, including all military and civilian executives attending by special invitation for briefings. Marketing plus . . . inclusion of advertisement in "Industry Salutes the Air Force" display at show.

### NOVEMBER AIR FORCE MAGAZINE

Convention Briefings and Displays Report Issue—Widely read for its comprehensive reports on seminars, industry briefings on latest technical developments, and addresses by key USAF leaders.

### DECEMBER AIR FORCE MAGAZINE

"The Military Balance"—The major report from the International Institute for Strategic Studies, London, England which documents, country-by-country, the world's military force and equipment. A desk-top reference sought after and referred to by military decision-makers in the U.S. Air Force, DoD, NASA, the Congress and other military services.

**AIR FORCE**  
PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

## Return of Soviet POWs

*The Last Secret*, by Nicholas Bethell. Basic Books, Inc., New York, N. Y., 1974. 224 pages. \$8.95.

If it were possible for one to poll the population of the world about the atrocities committed during World War II, Adolf Hitler would emerge as the No. 1 villain. Hardly anyone would accuse the Allies, "The Good Guys," of any such wrongdoing. But this book is the saga of just such a "wrongdoing." It is the tragic and little known epic which Nobel Prize winner Alexander Solzhenitsyn, in his best seller *The Gulag Archipelago*, describes as the "last secret of the second World War." It is about the repatriation of more than 2,000,000 Soviet men, women, and children who were transferred by the Allies, many of them forcibly, back to Russia, because of a secret protocol agreed to at Yalta.

Should these victims have been repatriated? Were they traitors? The author responds with a resounding NO.

The core of the book is a series of incidents relating the plight of these repatriates. Although some of the victims had fought willingly on the German side, the majority were simply prisoners of war who had collaborated because they had been forced at gunpoint to do so. Some had not lived in Russia since the Revolution and no longer even held passports. Many were confirmed anti-Stalinists, and wanted above all to remain in the West. Knowing that their return would mean either execution or imprisonment, they went to great lengths to avoid repatriation. Countless among them chose suicide.

The central theme is that Mr. Solzhenitsyn saw the repatriates at their worst (in prison with him). Therefore, he related the issue strictly as a moral one and did not comprehend the problem from the perspective of western diplomats and statesmen.

The author points out that the only way the story could be placed in its proper context was for a re-

searcher to have had access to the papers of the Allies, which were closed to Solzhenitsyn and other scholars until 1972. It is here that Mr. Bethell, who was born in 1938, educated at Cambridge, and is a student of World War II, makes his major contribution to the scholarship of the period.

Through the use of heretofore unavailable papers, the author is able to depict the political and intellectual climate of the time, and place the story into proper perspective.

Although there were mitigating circumstances, Bethell concludes the real tragedy was that the Allies, in their haste to appease Stalin and keep the wartime alliance viable, neglected their tradition of asylum. They coldly and uniformly treated 2,000,000 men, women, and children as traitors.

In the wake of My Lai and the emergence of détente (lest we forget what happened and what could happen again), the book is well worth reading. As Hugh Trevor-Roper so ably put it in the introduction, this is a book not for judgment but for reflection.

—Reviewed by Lt. Col. Donald M. Goldstein, USAF, Research Associate and Visiting Lecturer, University of Pittsburgh.

## Night Bombing—End of an Era

*The Nuremberg Raid: The Worst Night of the War, March 30-31, 1944*, by Martin Middlebrook. William Morrow, New York, N. Y., 1973. 316 pages plus appendices. \$9.95.

This book compresses the tactics and spirit of RAF Bomber Command, a truly great military organization, into the capsule of a single night of battle. Most of it is told by the crew members themselves (360 RAF and twenty German crewmen were interviewed by the author) with enough tactical and technical description to explain the tragic and bitter experiences of the raid on Nuremberg.

Nine hundred and ninety British and ten US aircraft took off for the

night attack. Bomber Command lost ninety-five bombers beyond the coast of England, and eleven crashed beyond repair on return. Every bomber was a separate command once it had left the coast, and every crew had to strive, on its own, to reach the target at a precise time and altitude in the face of powerful opposition. An unexpected wind change at high altitude led many of the bombers astray. The disappointing results capped the tragic loss of crewmen.

Mr. Middlebrook points out that Nuremberg marked the end of an era for Bomber Command. The Strategic Air Forces, both US and British, were by then subordinated to the commander of the approaching invasion, General Eisenhower. But Bomber Command had come full cycle for other reasons. The Command had had to abandon daylight operations early in the war because British bombers could not cope with German day fighters, and there were no long-range escort fighters. The alternative was night operations against feeble resistance, at the expense of accurate bombing. Now, four years later, the situation had changed. German night defense had improved enormously. Their night-fighter system had become far more complex and advanced than that of RAF Fighter Command during the Battle of Britain. British losses on deep penetrations at night were mounting to the point where they exceeded those of daylight operations by the Eighth Air Force.

Strenuous efforts were made to improve night bombing, but progress had not kept pace with the German defenses. Night bombardment was losing its primary attraction. Fortunately, command of the air in daylight was rapidly becoming more positive for the Allies. Daylight operations for Bomber Command, with fighter escort, were becoming attractive.

Mr. Middlebrook is a painstaking researcher and a skilled writer. He has produced an absorbing narrative and a highly creditable contribution to the history of air warfare. This fine book is not only a much deserved tribute to the valor of



Bomber Command; it is also a thought-provoking contribution to future air strategists.

—Reviewed by Maj. Gen.  
Haywood S. Hansell, Jr.,  
USAF (Ret.).

### Once Again, Jane's Yearbook

*Jane's All The World's Aircraft 1974-75*, edited by John W. R. Taylor. Franklin Watts, Inc., 730 Fifth Ave., New York, N. Y. (US distributor). 830 pages, large format. \$65.

For those who are familiar with *Jane's All The World's Aircraft*, that definitive encyclopedia of aerospace equipment, no review is needed. Only an announcement that the 1974-75 edition is off press. The new *Jane's* is the largest in the history of its sixty-five years of publication, with coverage expanded in breadth and depth.

For those who have not had the privilege of acquaintance with *Jane's*, the publisher's dust-jacket blurb is a start:

Containing the essential details of every aircraft—military, civil or homebuilt—in production or under development in 38 countries, JANE'S ALL THE WORLD'S AIRCRAFT remains the foremost reference book available on the subject.

That we consider to be typical British understatement. In addition to all classes of aircraft, the book covers RPVs and drones, sailplanes, airships, air-launched missiles, spaceflight and research rockets, and aero-engines. Some idea of the depth of coverage may be gained from two examples. About 6,000 words of text, three photos, and two sets of three-view drawings are devoted to a technical and operational description of the Boeing 747 and its variants. The section on Soviet aircraft runs for forty-two large pages and has more than 100 photographs and three-view drawings. That section contains much new information on the USSR's Tu-28P, MiG-21, MiG-23, MiG-25, Su-15, and Yak "Brewer" fighters, plus the Backfire super-sonic bomber.

The accuracy of information is assured by the fact that—with the exceptions of the Soviet and Chinese sections, the US SR-71, and the European consortium's Multi-Role Combat Aircraft—all data is officially authenticated. The ability of Editor John W. R. Taylor's organization to gather information on the aerospace

industry and products of the Communist nations must be the envy of all but the most sophisticated intelligence systems.

A classic within a classic is John Taylor's Foreword to each edition of the book—an essay on the state of the aerospace industry worldwide, and on its relevance to strategic and tactical military affairs.

While the price of this seven-pound, twelve-ounce volume is high, a comparable amount of detailed, accurate information could not be gleaned from any collection of aerospace books costing ten times as much. And it is one of the few major publications that hasn't increased in price since last year.

If cost-effectiveness is your standard, buy *Jane's All The World's Aircraft 1974-75*.

—J. L. F.

### New Books in Brief

*Astronautics and Aeronautics, 1972*, National Aeronautics and Space Administration. NASA's twelfth annual chronology is a day-by-day account of astronautics and aeronautics developments during the year that saw the end of the Apollo program, announcement of the development of the Space Shuttle, and the launch of the ERTS 1 observation satellite. The book's extensive documentation includes not only the space program itself, but also press accounts and editorials, government agency actions, statements by world leaders, congressional legislation, and accounts of international cooperation. US Government Printing Office, Washington, D. C., 1974. 583 pages. \$4.85.

*Congressional Decision Making for National Security*. The Committee for Economic Development (CED), which produced this brief report, is a private organization of business and university executives. The booklet contains suggestions by CED's Research and Policy Committee on how Congress might make better decisions on defense. Some of the recommendations are that Congress be given classified military information to assist in evaluating Administration proposals and long-term projections of the need for strategic nuclear weapons, and that it be provided a technical research institute. Committee for Economic Development, New York, N. Y., 1974. 64 pages. Paper, \$2.

*Flight of Eagles*, by Robert F. Karolevitz and Ross S. Fenn. In the aftermath of World War I, the newly

recreated state of Poland had to fight to preserve its borderlands against the Russian Bolsheviks. This is the story of the Kosciuszko Squadron, a group of volunteer American pilots who formed an escadrille and flew for Poland in the 1919-20 Polish-Russian War. A major contribution to the history comes from the private papers of the late Brig. Gen. Merian C. Cooper, who conceived the idea for the volunteer unit and who later became prominent as a movie producer. Brevet Press, Sioux Falls, S. D., 1974. 281 pages with index. \$11.95.

*Ghost of the Java Sea*, by Walter G. Winslow. At the outbreak of World War II, the USS *Houston* was the only heavy cruiser of the Asiatic Fleet. The author, who was a pilot aboard the *Houston*, chronicles life on the ship and the action the flagship saw in the battles of Flores Sea, Banda Sea, and Java Sea, until it was sunk in the Battle of Sunda Strait in February 1942. Coral Reef Publishers, Satellite Beach, Fla., 1974. 184 pages. \$7.95.

*Goggles, Helmets & Airmail Stamps*, by Georgette Vachon. This is a brief history of Canada's aviation pioneers who helped to develop that nation's planes, flew in World War I, opened the Canadian expanse with exploratory expeditions, and established mail and air transport routes. Clarke, Irwin & Co., Toronto, Canada, 1974. 150 pages with index. \$8.50.

*111th Squadron 1923-1973*. This book commemorates the fiftieth anniversary of the 111th Fighter Squadron, Texas Air National Guard. It follows the "Ace-In-The-Hole Squadron" from the time it flew Jennys to today's F-101s. Illustrated with more than 2,000 pictures. Special Activities Committee, 147th FIG, Texas ANG, Ellington AFB, Tex. 304 pages. \$15.

*Pioneer Bush Pilot*, by Ira Harkey. The author, a Pulitzer Prize-winning journalist, has written this biography of Noel Wien, an aviation pioneer in Alaska. Beginning in 1924, Wien braved the Alaskan terrain and weather without charts or radio communications to establish commercial aviation there. He later founded Wien Air Alaska Co. Much of the story is told in Wien's own words. University of Washington Press, Seattle, Wash., 1974. 307 pages with index. \$12.95.

—By Kathryn Foxhall

# The Bulletin Board

By John O. Gray

MILITARY AFFAIRS EDITOR, AIR FORCE MAGAZINE

## Chief Outlines Retrenchment Moves

Another cut in various Air Force headquarters, a sharp drop in star promotions, and a clampdown on use of administrative aircraft—these are among the retrenchments USAF is invoking in response to the budget squeeze.

That's the word from Chief of Staff Gen. David C. Jones at his first Pentagon press conference since becoming USAF's top military executive. He said the many unit and headquarters cuts and consolidations recently announced, together with far fewer personnel transfers, will save \$300 million annually plus 15,000 military and 5,000 civilian personnel. The savings in transfers (PCS) alone should hit \$60-\$80 million.

The organizational streamlining the Chief described covers the closing of ten different headquarters. They include elimination of Pacific Air Force Headquarters and Air Force Communications Service Headquarters, two numbered Air Forces, and six other headquarters. These actions, when completed next fiscal year, will have reduced headquarters manning USAF-wide by fifty percent since 1968, General Jones said.

He revealed that the recent brigadier general selection board chose only forty-two colonels for advancement, "a very substantial reduction" from the average of seventy each year heretofore. He called the BG selection slowdown "an example of how the [promotion] system is quietly changing," adding that Air Force officer promotions overall are down. Meanwhile, the annual temporary major generals panel recently picked a lower-than-usual thirty-seven for promotion.

The Chief explained the significance of the upcoming takeover of Tactical Air Command airlift aircraft by the Military Airlift Command. He also reported that all USAF administrative aircraft—T-39s, T-29s, C-118s, etc.—now scattered at many

bases, will be assigned to MAC (except for 400 being phased out).

Getting a trip in one will be much harder from now on. General Jones said that "if a general . . . or anyone else . . . needs to go some place . . . he will make a request [to MAC]. . . ." If he's turned down, alternatives are "not to travel or to go by commercial air." He sees improved efficiency in the use of the smaller administrative "aircraft pool." The aircraft will be kept at "far fewer bases than today."

This "central airlift organization," together with centralized control and elimination of the 400 aircraft, will save USAF about \$100 million, a million and a half barrels of fuel per year, and more than 6,000 people, he said.

On other points, General Jones said:

- He expects USAF military personnel strength to level off soon, though he acknowledged it will probably fall below the 600,000-member mark in FY 1976, which begins next July 1. This compares with about 625,000 at the end of last December and more than 900,000 in 1968 when Vietnam-era strength peaked.

- "We are doing well in the All-Volunteer Force era. . . . We have a great group of young men and women coming in. We are totally pleased. . . ."

## Reserve Personnel Bills

The plan to drop the retirement age of Reservists from sixty to a minimum of fifty tops a group of major Pentagon-sponsored proposals being readied for Congress that affect Reserve Force members.

But the Reserve retirement measure has run into opposition from individuals and Reserve organizations. They won't buy the "actuarially reduced rates"—29.5 percent of "normal" retirement pay for retirement at age fifty, for example—Defense has recommended to reduce costs.

The retirement plan at press time

was awaiting Office of Management and Budget approval before going to Congress. It also contains a modest lump-sum bonus for survivors of Reservists qualified for retirement pay but who die before reaching pay eligibility. A typical bonus would range from about \$5,000 to \$8,000.

Though the proposal has been years in the making, informed observers give it little chance of clearing Congress in its present form.

Other significant Reserve personnel proposals moving forward include:

1. The Reserve Officer Personnel Management Act. This would overhaul the long-operating Reserve Officer Personnel Act (ROPA) that provides the basis for the various Reserve-Guard promotion, separation, and mandatory retirement systems.

The new proposal is, naturally, called ROPMA. It contains changes for the Reserve establishment similar to those written into DOPMA for the Regular establishment. That's short for the Defense Officer Personnel Management Act, long stalled in Congress, but given a good chance of passage this year.

If DOPMA indeed flies, it's logical that ROPMA would sail through, too, although the Pentagon will have to hurry. ROPMA at press time was still being coordinated among the services.

2. A plan to remove the sixty-point ceiling on annual retirement credits that can be earned via non-active-duty training for members performing more than the normal forty-eight drills, such as flyers. This is important because the more points a Reservist accumulates, the more his retired pay. This measure was waiting OMB's blessing late last year.

3. Defense's request for authority to recall up to 50,000 Reservists for ninety days' active duty without prior approval or declaration of a national emergency. It was sent to Congress late last year but too late for action. The proposal, which remains the Pentagon's top-priority

legislative item for the Reserve Forces for 1975, was to be resubmitted early this year.

4. The Reserve Tuition Assistance Bill. Reserve organizations and Air Force, among other agencies, have long supported education subsidies to attract new Reservists and improve their retention. Different plans have been considered. The latest report from Defense is that "officials are still working on it, trying to develop evidence to show that tuition aid is really needed, will do the job, and is cost acceptable. . . ." There is still some hope a plan can make it to Capitol Hill early this year, however.

There is no serious proposal in the Pentagon to create an enlistment or reenlistment bonus for members of the Reserve Forces.

### Six Groups Vie for Regular

Non-Regular active-duty USAF officers in six year groups—2, 3, 4, 7, 10, and 16—will be considered for Regular commissions by a series of boards starting in March and extending through August. With the RIF threat continuing, these selections represent a "last chance" for some non-Regular officers. Young Regular Air Force officers are immune from RIF. Regular Army officers are now vulnerable, and 1,000 of them are expected to receive pink slips this year. Only Navy plans no officer RIF this year.

### Officer Input Plunges

USAF has more new officers coming out of the AFROTC system than its dwindling force can use, so it is cutting back production to 3,600 next fiscal year and to 3,000 in FY 1977. And Officer Training School,

the second largest source of new Air Force officers, is scheduled to turn out a mere 1,282 new lieutenants in FY 1976. This compares with an estimated output of 1,794 this year and a record-breaking 7,894 in FY 1967.

The cuts are in addition to early-out and RIF programs Air Force has laid on to meet the government's reduced force levels.

To help in the AFROTC cutback, Headquarters allows nonscholarship students to resign and newly commissioned officers to elect three-month instead of full-time active-duty tours. Also, a board met recently to consider students and recent graduates who might not be called to extended duty.

Headquarters, meantime, estimates that 535 minority officers will join the active-duty force this fiscal year, compared with 537 last year. The new acquisitions by source fol-

low (last year's figures in parentheses): Academy 29 (24), AFROTC 331 (201), OTS 85 (237), medical 78 (65), legal 6 (6), and chaplain 6 (4).

### JAG Hikes Improved

Air Force has taken a new tack in its attempts to improve JAG officer retention and lift the sagging experience level of its 1,200-member commissioned legal corps: improving their promotion chances.

The effort was scheduled to start January 27 with the convening of the temporary lieutenant colonel selection board. JAGs were to be considered separately from line officers for the first time. They, and JAG captains and LCs when their boards come up, will receive promotion consideration a year earlier than line officers.

They will continue to enjoy a

better selection opportunity than line officers in the primary zone. In the secondary zone, their chances, heretofore slim, will improve.

A JAG spokesman said the new program is beamed squarely at company-grade lawyers, where the dropout rate has been severe. It currently accounts for the forty-four percent shortage in field-grade JAGs.

Air Force's main thrust for improving JAG retention for at least the past fifteen years was seeking special pay or bonuses. Late last year, the service endorsed still another JAG pay bill, but, like earlier ones, it got nowhere.

One potential JAG experience-building project, under which twenty-five carefully selected line officers enter civilian law schools each year at government expense, does show promise, the JAG spokesman told *AIR FORCE Magazine*.

Fifty officers—two classes—are now enrolled and "doing very well," he said. Another twenty-five will be selected soon for entry next fall, under provisions of new AFR 36-7. Captains and lieutenants with two to six years of service may apply March 1 through May.

Since new JAGs from this route take on six-year commitments (in addition to any other commitments they may have), the program will add some maturity to the legal force. But probably not enough. Still needed, the JAG office insists, is extra compensation.

### Civilian Corner

Nudge more USAF civilian employees and their families into participating in base morale, welfare, and recreational activities. That, in essence, is what Vice Chief of Staff



Martin M. Ostrow, AFA Board Chairman, speaks at a meeting of AFA, AFROTC, Arnold Air Society, and Angel Flight officials designed to explain how those groups interface. Barbara Rowland, California AFA Vice President, and Col. Wendal L. Busboom, Western Area AFROTC Commandant, listen.



The Los Angeles meeting—first of its kind ever between the four groups—perked the interest of, left to right, Leonard Foster, Brigham Young University AAS Commander; Anna Marie Grana, Angel Flight Area I Commander; and Angel Flight Little General Rae Louise Anderson.

## The Bulletin Board

Gen. R. H. Ellis told major air commanders in a recent letter in which he underscored the important role civilians play in carrying out the Air Force mission. General Ellis cited instructional classes, workshops, clinics, and other controlled-type activities as lending themselves to larger participation. "Effect procedures to permit use [of MWR activities] by DoD civilians whenever practicable," the Vice Chief said.

While antialcohol and antidrug training is required for USAF military members, it is voluntary for civilian employees below the supervisory-managerial levels (to avoid conflict with Civil Service rules). A new message that defines managerial personnel, however, says lower-ranking civilian workers are urged to attend the training programs voluntarily.

Defense has put out a new housing directive. It could result in fewer civilian employees occupying military quarters on base. Normally, the directive makes clear, civilians are expected to find accommodations off base.

### CAP, AFR Strengthen CD Ties

The Civil Air Patrol and the Defense Civil Preparedness Agency signed a Memorandum of Understanding in a recent Pentagon ceremony. The move assures CAP support for the agencies during emergencies, civil defense training for CAP members, and related projects. State support of CAP wings has increased from \$450,000 for twenty-seven states in 1964 to more than \$1 million in thirty-three states in 1973.

*At the National Guard Association's conference in Puerto Rico were, left to right, Martin M. Ostrow, AFA Board Chairman; Maj. Gen. Duane Corning, NGA President; the Hon. de Hernandez Colon, Governor of Puerto Rico; James B. Deerin, NGA Ex-Vice President; and John G. Brosky, AFA National Director.*



*Gen. William V. McBride, AFLC Commander, and Brig. Gen. David B. Easson accept the AFA Citation of Honor from Joe L. Shosid, AFA President. The award lauds AFLC's Memorial Affairs Division for its identification and disposition of aircraft accident victims for more than twenty years.*

Air Force Reservists strengthened their ties with local CD agencies last fiscal year via the Mobilization Designee Civil Defense (MOBDES) program; 671 members were participating, double the number of the previous year. These are Reservists who gain participation points by working directly with their civilian counterparts of the DCPA units throughout the country.

AF Reserve MOBDES participants also may volunteer their services during earthquakes, floods, and other disasters. Sixteen did so during FY 1974 and racked up eighty-seven man-days' duty in the process.

### Manpower Unit Seeks Views

The Defense Manpower Commission has scheduled public hearings this year in Los Angeles, Atlanta, Chicago, New York, and Boston, and in several areas with sizable military populations. The first one was scheduled for Los Angeles January 28. Commission staff members plan trips to the San Antonio area, a Minuteman silo, and a nuclear submarine site. Views from the grass roots, including service members and their families, will be sought.

The high-level group is looking into a variety of issues in its search for ways to save military dollars

and promote manpower efficiencies (see November '74 issue "Bulletin Board"). The Commission plans to concentrate on gathering data the first half of this year, "develop recommendations" the second half, and hammer out its final decisions in early 1976. By congressional mandate, the Commission must submit its final report and disband by April 1976.

### CHAMPUS Switches, Savings Eyed

The office of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) has been formally removed from Army jurisdiction and placed under the Assistant Secretary of Defense (Health and Environment) Dr. James R. Cowan. Management of the program, often criticized in the past, will improve as a result, Pentagon authorities contend. It's necessary—the Defense Department earlier sought more than \$500 million for CHAMPUS outlays this fiscal year, but Congress approved only \$489 million.

### AF Education Keys on GI Bill

The GI Bill's education grants, with the recently increased rates, has become what USAF officials call the "backbone for growth" of the graduate education program. Thousands of USAF members were studying under the GI Bill before the benefits were raised in December when Congress overrode President Ford's veto of the new measure.

Actual USAF course enrollments under GI Bill sponsorship have been running more than 34,000. These include 10,000 at the high school and remedial level, 2,000 technical, 8,000 undergraduate, and 14,000 at the graduate level. Many other Air Force people take courses under the government's off-duty education assistance program.

Air Force education authorities expect further increases in the number of active-duty members studying under GI Bill grants, but mainly because new courses continue to become available at more sites on or near bases.

With Congress resisting Pentagon requests for more graduate officer schooling funds, the GI Bill program will come into more prominence, officials say. Most participants should be fully covered, unless tuition rates are boosted sharply.

While the new program raises monthly benefits for veterans with families sharply (e.g., a married vet with one child now receives \$366 instead of the previous \$298 per month), the military GI payment is based on the bachelor's rate, now \$270 (up from \$220). Thus, a typical USAF member taking courses might receive half that figure, or \$135 monthly. The rationale for the "half rate" is that, unlike many civilian veterans, the military member receives a full salary and entitlements.

Still eligible for GI education benefits at the higher rates are retired service people. Opposition to this entitlement, on the basis that the retired are amply rewarded with pensions and base entitlements, does surface from time to time, however.

The original GI Bill, enacted June 22, 1944, provided payment directly to the university for tuition, books, and fees, plus \$50 to \$120 a month depending on dependent status. The latter went directly to the vet-

## Ed Gates . . . Speaking of People

### Beware the Shadows of the Past

Right now is an excellent time to examine the "worst" military personnel policy decisions rendered over the years if for no other reason than to help assure they won't be repeated again.

High on any such roster of no-no's would have to be the "terminal-leave" promotions given tens of thousands of officers during demobilization following World War II. These were outright gifts, based on time in grade without an earned promotion and attainment of modest effectiveness-report levels. Lieutenants and captains by the carload, and even a few majors and light colonels, found themselves going home a grade higher.

The gratuitous promotions were doubtless prompted by the purest of motives. But they were a slap in the face to officers who had recently earned promotions, and warrant officers, flight officers, and enlisted members; none of them enjoyed terminal-leave advancements.

The order, furthermore, diluted and undermined the commissioned rank structure, played hob with grade authorizations in the Reserve, and created unfortunate problems associated with recalls to active duty. Fortunately, the debacle of nearly thirty years ago has not been repeated, nor is it likely to be.

But what about another candidate for the list of "worst" personnel policy decisions of yesteryear—Uncle Sam's move to "bring the dependents home" from overseas? That action emerged from the Eisenhower Administration's concern, more than fourteen years ago, about "gold flow"—the outflow of dollars from this country caused by excessive spending abroad.

The White House dropped the bombshell on November 16, 1960. It ordered an end to dependent travel, effective the following February, to Japan, Germany, Great Britain, and other highly industrialized countries. Earlier-than-normal withdrawals of families then overseas also were directed.

US dependents abroad were to be reduced gradually from 500,000 to 200,000 and the dollar drain cut substantially. But no curbs were placed on other groups. Accordingly, State Department and other government agency employees, civilian jet-setters, and US tourists in general continued their foreign travels—and heavy expenditures. US firms contributed to the gold-flow dilemma by building plants abroad.

Service members and their families were furious at being made the main target of the antidollar drain campaign. And they sounded off as never before—or since—their outcries touching off alarm and hastily convened conferences at the highest Pentagon levels. Congress and the White House were deluged with angry protests.

What puzzled many persons was how a career

serviceman like General Eisenhower could bless such an inequitable ruling. Despite the avalanche of complaints from the military community, Ike refused to budge; he left office a few weeks later without revoking the despised order.

President Kennedy, in early February 1961, shortly after his inauguration, did so, erasing the order before it had really gotten into operation. But for the nearly three months from its announcement to its termination, the "overseas kin curb" edict caused unprecedented turmoil throughout the military establishment.

Lifting of the ban was hailed far and wide, and most authorities felt that, except for combat zones and difficult remote tour areas, it would never be reinstated.

So far it hasn't been. The services support a broad with-dependents overseas policy. And they are pressing for funds to extend travel-transportation allowances to low-ranking enlisted families who need the payments more than any other service group, but have always been denied them.

Air Force authorities, meanwhile, hold that it would be costly and disastrous morale-wise to adopt a bring-the-dependents-home rule today. Tours would have to be shortened. That would mean more PCS transfers, not the lower number that USAF is now straining to attain.

Yet the threat appears to remain. Various congressional circles apparently aren't giving up on reducing dependent strength overseas. They cite the high cost of maintaining schools, housing, and other support facilities needed for the dependent population. It's also interesting to recall that the Eisenhower order of November 1960 was precisely what the House Appropriations Committee, complaining about the expense of maintaining dependents abroad, had recommended in May of that year.

The Army, in a related move, is reshuffling some of its forces in Germany to a six-month rotational plan under which the families involved will remain Stateside. And the Defense Manpower Commission, looking in many personnel areas for economies, has the question of dependents overseas under study.

These steps do not necessarily suggest that a blanket order barring service wives and children from going or remaining abroad is about to surface. Still, they are worth contemplating in these far-from-ordinary times. Virtually all personnel programs are getting the most severe budgetary examination in years.

Some programs that appeared untouchable have already been scuttled or slashed. The fact that Air Force favors or opposes an action doesn't automatically mean that higher authority will always accept its views. ■

## The Bulletin Board

eran. That law provided a maximum entitlement of forty-eight months.

That figure was lowered to thirty-six months for veterans of the Korean War, where it remained until the recent change boosted it to forty-five months. The new law also created low-interest loans of up to \$600 a school year.

GI Bill enrollments reached 1,500,000 last October, nine percent above the previous October and twenty-one percent above October 1972.

Congress late last year approved and sent to the White House two other veterans' bills. One increases by twenty-two percent benefits for disabled vets taking college or vocational rehabilitation programs. The other expands the government guarantee on home and trailer loans.

### AAS Unit Helps Red Cross

Four members of the Arnold Air Society, Newberry College, S. C., raised \$500 for the Red Cross Relief Fund recently when they staged a ping-pong marathon lasting more than forty-five hours. It was a world's record, according to AAS Headquarters. Combined, the quartet—Randy Harmon, Steve Mature, Bernie Lee, and Macky Green—hit that little ball 125,000 times.

### Short Bursts

Amid all the heat about reducing commissary stores and increasing the surcharge on groceries, Air Force says it is conducting a new survey of prices charged at its stores. The surcharge will go up two percent, officials say. Navy, meanwhile, reports that its commissary customers average 21.3 percent savings over commercial store patrons. And at Army-Air Force exchange stores, customers save approximately twenty percent, the Pentagon reports, compared to 22.6 percent savings registered by persons shopping at Navy exchanges.

USAF women are barred from enrolling as students at the AF Academy, but not as professors. Headquarters, via a WAF newsletter, recently urged qualified female captains to seek a mathematics instructorship at the school. . . . USAF's nurse corps is slightly more than

twice as large as the WAF officer corps, yet the nurses enjoy a far superior grade structure: 52 (nurse) to 13 (WAF) colonels, 223 to 29 lieutenant colonels, and 636 to 85 majors.

A great deal of work, particularly in preparation of selection folders, has gone into USAF's annual E-8 and E-9 promotion cycle now under way. If the schedule is maintained, the E-9 board will convene February 18 and the E-8 panel March 31. Public release of both lists is not until May 19, with first promotion increments scheduled for June 1.

Late last year nearly 6,500 US Savings Bonds belonging to USAF members were stashed away in vaults at the Air Force Finance Center in Denver; needed are current addresses, their owners having failed to notify local finance offices after they moved. Persons due bonds should contact AFAFC/MPAB, 3800 York St., Denver, Colo. 80205.

The Secretary of the Air Force's Office of Information (SAFOI) has come out solidly for "action line" columns in base newspapers, though some field commanders don't agree. One hundred and eight base papers use an action line; forty-three do not.

The State Department has jobs overseas available for former service members who are teletypists or communications technicians,



*TSgt. Robert Malnate of Rickenbacker AFB, Ohio, follows his own "go get 'em" advice. As the national recruiting leader for the Air Force Reserve, he won four awards at the Reserve's annual recruiting workshop recently in Chicago.*

and interested persons should send résumés to Recruitment Branch, Employment Division, US Department of State, Washington, D. C. 20520.

### Senior Staff Changes

**PROMOTIONS:** Nominated to be temporary Major General: John G. Albert; Benjamin R. Baker; Charles C. Blanton; Richard C. Bowman; James L. Brown; William C. Burrows; Walter D. Druen, Jr.; Cecil E. Fox; Lovic P. Hodnette, Jr.; Kermit C. Kaericher; Harrison Lobdell, Jr.; James P. Mullins; John J. Murphy; Paul W. Myers; Carl D. Peterson; Don D. Pittman; Gerald J. Post; Robert A. Rushworth; Malcolm E. Ryan, Jr.; Thomas M. Ryan, Jr.; Robert E. Sadler; Thomas M. Sadler; Richard H. Schoeneman; Winfield W. Scott, Jr.; John R. Spalding, Jr.; Benjamin F. Starr, Jr.; George H. Sylvester; Lucius Theus; Robert C. Thompson; Charles L. Wilson; Robert M. White; Wayne E. Whitlatch.

Nominated to be permanent Major General: Timothy I. Ahern; Jack Bellamy; Charles E. Buckingham; James E. Hill; Howard M. Lane; Edward P. McNeff; Travis R. McNeil; James E. Paschall; George Rhodes; Kendall Russell; Brent Scowcroft; Howard P. Smith, Jr.

Nominated to be permanent Brigadier General: John G. Albert; Frank G. Barnes; Richard C. Bowman; Rupert H. Burris; James B. Currie; Bohdan Danyliw; Cecil E. Fox; Norman C. Gaddis; Kermit C. Kaericher; James P. Mullins; William C. Norris; Carl D. Peterson; Jack I. Posner; Thomas F. Rew; Carl G. Schneider; Richard H. Schoeneman; John R. Spalding, Jr.; Benjamin F. Starr, Jr.; Henry B. Stelling, Jr.; George M. Wentsch; David W. Winn; Donald N. Vivlan.

**RETIREMENTS:** M/G George W. McLaughlin.

**CHANGES:** B/G William R. Coleman, from Asst. DCS/Maintenance, to DCS/Maintenance, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G Herbert J. Gavin. . . . B/G Robert H. Gaughan, from V/C, Eighth AF, SAC, Andersen AB, Guam, to Dep. Dir., J-3 (NMCC), Joint Staff, OJCS, Washington, D. C. . . . M/G Herbert J. Gavin, from DCS/Maintenance, Hq. AFLC, Wright-Patterson AFB, Ohio, to Cmdr., Sacramento ALC, AFLC, McClellan AFB, Calif., replacing retiring M/G George W. McLaughlin.

—Compiled by Kathryn Foxhall

Coming in May . . .

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**AIR FORCE**

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MAGAZINE

AFA's Symposium on "New Dimensions in Strategic Deterrence," held in Shreveport, La., November 13-14, highlighted the mounting Soviet strategic momentum and the challenge we face in maintaining parity. This second, and concluding, report on the event describes the difficult choices that must be made in planning . . .

# TOMORROW'S US STRATEGIC POSTURE

BY EDGAR ULSAMER  
SENIOR EDITOR, AIR FORCE MAGAZINE

The Strategic Air Command, its Deputy Chief of Staff for Operations, Maj. Gen. Billy J. Ellis, told AFA's Symposium on "New Dimensions in Strategic Deterrence," performs reliable long-range strategic reconnaissance with "RPVs, U-2s, RC-135s, and SR-71s [which] taken together, constitute a most sophisticated reconnaissance capability essential to our deterrent role." The quest continues for improved designs that will ensure even "greater accuracy and completeness of intelligence data."

To complement satellite reconnaissance, SAC plans to maintain manned strategic reconnaissance forces, General Ellis said. SAC also intends to provide its recce vehicles a real-time photo/ELINT capability using digital data links to ground receiving stations. While there are no plans to develop a specific follow-on to the SR-71 for the 1980s, General Ellis acknowledged that the Command is examining "probable, reasonable, and feasible requirements" that, "hopefully," will include a "substantial platform similar to the SR-71."

## B-1 Status Report

"We are doing everything we can to bring the B-1 development program to a successful conclusion—leading then to an objective decision, to include the question of whether we can afford to buy it, or,

indeed, whether we can afford not to," Maj. Gen. Harry M. Darmstandler, Special Assistant to the Chief of Staff for B-1 Matters, reported. The B-1 program the Air Force will present to the Congress for production funding, he said, "will be for a mission-essential aircraft—nothing more; but it must also be for nothing less." While the development program is in "excellent shape," he said the production decision, as a "practical matter . . . will be one of priorities as seen within the overall economy and as influenced by the specter of inflation, which is stalking every major program."

Gen. Samuel C. Phillips, Commander of the Air Force Systems Command, also discussed the B-1 program and acknowledged that "some influential people [are] arguing that the B-1 is subject to question at this time of détente when there are so many demands on the federal budget." The success of a development program is usually measured in terms of technical performance and cost, he said. "So far, we have been very happy with the performance of the B-1; but we have not been very well pleased with the rise in cost, even though primarily occasioned by inflation . . . [which] threatens successful completion of the program."

Underscoring the manned bomber's cost-effectiveness because of its unlimited reusability, General Phillips said that among the variety of technologies "aimed at maintaining and improving our high confidence in the survivability and pene-

trativity of our bomber force are a short-range attack missile, probably an air-launched cruise missile and a bomber defense missile, and advanced propulsion systems."

Crisis management and command and control as key elements of deterrence were discussed at AFA's Symposium by the Director, J-3, of the Joint Staff, Lt. Gen. Ray B. Sitton. He asserted that the present system is basically capable of "executing and controlling the strike forces of the US." This might not be true, however, in a post-attack environment depending "on the escalation level and what's left" after the US has absorbed a first strike. He added, however, that once WWMCCS (Worldwide Military Command and Control System) is fully operational and integrated with an Advanced Airborne Command Post, "we expect" to maintain survivability of the US command and control system "across the spectrum" of nuclear conflict.

The Military Airlift Command's Deputy Chief of Staff for Plans, Maj. Gen. Thomas A. Aldrich, discussed the contributions of strategic mobility to US deterrence in a report that closely paralleled the article on p. 22. General Aldrich reported that the Russian equivalent of the C-5,





Maj. Gen. H. M. Darmstandler reported that the B-1 bomber program is in "excellent shape" technically



AFSC Commander Gen. Samuel C. Phillips warned that the longer the nation delays funding important defense programs, the more vulnerable "we become to Soviet advances" and the greater the risk of strategic imbalance

the 600,000-pound turboprop An-22, has had "a very bad accident record" and that of the about sixty aircraft built "we have never seen more than twenty . . . operate at any one time."

The Soviets' Il-76, which "looks like they got the plans for our C-141 and [which has] about the same capacity," he said, apparently is about to be deployed in quantity. Although the aircraft was observed first in flight test more than four years ago, only three Il-76s are believed to be operational.

Gen. T. R. Milton, USAF (Ret.), a former US Representative to NATO's Military Committee, discussed the alliance's contributions to strategic deterrence, stating that "NATO's strategy is keyed to flexible response, meaning that it will use anything necessary to avoid defeat. This must include nuclear weapons, and the Soviets know this." With some 7,000 nuclear weapons at its disposal in the form of air defense missiles, land mines, short-range missiles, and tactical aircraft bombs, NATO, in spite of the political strains it is exposed to, continues to fulfill its deterrence function effectively, General Milton said.

#### Deterrence at the Tactical Level

"While tactical forces have both the capability and the responsibility for nuclear operations, they also have a vital role in deterring, or blunting, conventional warfare in or-

der to forestall the likelihood of escalation to nuclear conflict at any level. Thus, we have a foot in both camps—and a primary concern for deterring war of any kind." With this preface, Lt. Gen. Charles W. Carson, Jr., Commander of TAC's Twelfth Air Force, reported to the AFA Symposium on the interaction of tactical and strategic deterrence and the link that ties one to the other—namely "airpower."

TAC's operational requirements for global tactical deterrence differ considerably according to geographical areas, he said. In Europe and the NATO area there are in-place general-purpose forces and facilities. Comparable forces and facilities are lacking in other parts of the world.

In the case of NATO, tactical air forces and additional ground forces from the US can be deployed in time of crisis. In the other areas, "our tactical air forces must be packaged for immediate deployment and projection into any conceivable situation. The packaging can be in a number of configurations—ranging from a single squadron to an entire numbered air force." This deployment of tac air as the first line of defense of an ally represents TAC's "greatest challenge" and increases in importance as US forces stationed abroad are reduced, he pointed out.

General Carson said that because of rapidly growing Soviet tac air capabilities, NATO is strengthening its own airpower and decreasing its vulnerabilities: "Shelters are being

built at a cost of between \$250,000 and \$400,000 each to protect tactical aircraft." Backing up the shelter program is a new dispersal plan as well as streamlined methods for incorporating reinforcement aircraft from the US into the NATO forces.

Capping these measures, General Carson said, is the development of an integrated command and control system for NATO's tactical air forces "with the ultimate aim of fully exploiting the speed, range, and flexibility of our tactical aircraft."

#### The Technology Potential

"We have today," General Phillips told the AFA Symposium, "the technical and engineering capabilities, the labs, and the industrial capacity to build strategic forces that are superior [to those of any other nation] in quality and quantity and which could provide any degree of deterrence that may be required in the future." But he cautioned that two conditions are requisite to development of these forces: the national will to bring new weapon systems into being, and the will to sustain the technological base at a level required to assure the adequacy of future strategic weapons.

*Lt. Gen. Ray B. Sitton, Director, J-3, of the Joint Staff, discussed crisis management problems.*



AFSC's current ICBM improvement programs, he said, are keyed to survival and retaliation and include upgrading silos, developing new reentry vehicles—which involves replacing the currently used Mark 12 with the Mark 12A higher-yield warhead—and improved guidance. He said that inertial guidance is “approaching the limits of the attainable—[our systems] are very good, better than anything the Soviets have.” USAF's Advanced Ballistic Reentry System (ABRES) seeks to overcome this hurdle through terminal guidance. This “includes sensors that read characteristics of the target area, update the reentry vehicle's position, and guide it to the target. With this type of guidance, we could expect considerable improvements in total system accuracy.”

Other techniques the Air Force is pursuing as part of its ABRES program, he said, involve a wide range of reentry angles, including both “low and steep” reentry, and improved ballistic efficiency to increase the warhead's terminal speed.

Silo improvements include “more reliable electronics and ground support systems to withstand the buffeting our missiles would be subjected

to during a nuclear strike. They also include better suspension for the siloed missiles to dampen the vibrations they might undergo prior to launch.”

At present, General Phillips said, Minuteman III has three independently targeted reentry vehicles, but AFSC's Pave Pepper program could increase that number to “bolster our deterrent and give us more flexible options against any increase in Soviet launch sites or missile accuracy. Along with more reentry vehicles per missile, we are attempting to increase the yield, the explosive power of each nuclear warhead. Higher yield is a safeguard against degradations in our own accuracy. It acts as an antidote to the increased hardening of Soviet missile launchers and raises confidence in our ability to destroy the targets we aim at.”

USAF's contingency planning for a follow-on ICBM, the so-called M-X program, centers on developing the propulsion, reentry vehicle, and guidance technology required to build an ICBM with “more than double the Minuteman III payload” without increasing silo size, according to General Phillips. Associated improvements involve the option to launch from more survivable fixed sites or to make the missile either land-mobile or air-launchable. The technologies required to satisfy the M-X options are “in hand,” he reported.

Land-mobile ICBM systems currently under study are based on:

- Random movement of mobile

missiles within large operating areas, requiring an enemy to use barrage or saturation attacks.

- Multiple hard points—such as shelters or pools—enabling the missile system, including an appropriate transporter-launcher, to move from shelter to shelter using “shell-game” tactics that force the aggressor to attack all of the hardened shelters.

- Hardened lines, such as tunnels or deep trenches, where the location of the missile system within the line is unknown to the attacker.

Discussing USAF's recent test launch of a Minuteman I missile from a C-5, General Phillips said that the propellant burn of about thirty seconds, with ten seconds at full thrust, was “long enough to provide the basic data we need to evaluate the requirements for designing an ICBM that could be operationally air launched.” He stressed that use of the C-5 in the test launch does not mean that other large aircraft could not be modified for the missile-carrier role.

The AFSC Commander foresaw broad potential for advanced missiles launchable from strategic bombers, including growth versions of SRAM, to extend the range and improve the accuracy of that weapon. “We also have the technology for an advanced ALCM [air-launched cruise missile], using terminal guidance, that would operate supersonically—at speeds between



*Lt. Gen. Charles W. Carson, Jr., Commander of TAC's 12th AF, highlighted tactical deterrence.*

Mach 3.0 and Mach 3.5—and could have a range of several hundred miles,” he said.

In improving the Air Force's future strategic deterrent, “greater effectiveness, flexibility, and economy are the guideposts of our planning activities,” according to General Phillips. “In the near term, we are concentrating on modernizing the existing force of strategic bomb-

ers and missiles. Our long-term objective is to maintain technological superiority,” he said, adding “for these technologies to be translated into operational systems, however, takes both time and money. We are doing our utmost to economize, but inflation eats into our budget. The longer we delay funding important programs, the more vulnerable we become to Soviet advances and the less certain we are of maintaining equivalent strategic power.”

This warning epitomized the message of AFA's 1974 Symposium on “New Dimensions in Strategic Deterrence,” which illuminated the central dilemma of US national security: The need to maintain adequate, comprehensive deterrent capabilities in the age of uncertain détente and double-digit inflation. ■

## FORMATION FLYING—LESSON I

In February 1944, Avon Park, Fla., was a final-phase training base for B-17 crews heading for Europe. Navigation and gunnery missions over the Gulf were part of the routine training. Toward the end of our training schedule, we took off for a three-ship formation, gunnery-practice mission—our first. Our crew was given the lead slot. An instructor pilot was along to render whatever assistance might be needed.

The tow-target B-26 was spotted. Our flight was cruising at assigned altitude, getting ready for our first round of fire at the target. The wing ships moved into appropriate slots, and all signals were on “go” when over the intercom we learned of a malfunction in the belly turret. When the copilot slipped out of his seat to go back to lend a hand, I filled the spot.

After five minutes or more passed and the problem was no nearer to solution, the pilot went back to see what he could do. At that point, the instructor pilot got into the left-hand seat. When another ten minutes passed and the ball turret gunner was still in a precarious state, the instructor pilot went aft. As several gunners, the pilot, copilot, and instructor pilot feverishly worked to free the turret gunner, someone asked, “Who's flying the plane?”

I had noticed that my wingmen were spread out a little more loosely than they had been when I had inherited the stick. After about 200 hours of navigation, that was my first stick time, as well as my first lesson in formation flying.

—Contributed by Col. R. Frank Harwood, USAFR

(AIR FORCE Magazine will pay \$10 for each anecdote accepted for publication.)

By Don Steele

AFA AFFAIRS EDITOR



Irving L. Burrows, Jr., left, chief test pilot for the McDonnell Aircraft Co. and the guest speaker at a recent meeting of the Langley Chapter, Va., discusses the design concepts of the F-15 Eagle, the newest fighter aircraft to enter the Tactical Air Command (TAC) inventory, with TAC Commander Gen. Robert J. Dixon, right, and Chapter President H. B. "Buzz" Henderson.



Following his Induction into the Oklahoma Hall of Fame by the Oklahoma Heritage Association, Brig. Gen. Robinson Risner, Commander, 832d Air Division, was the guest of honor at a reception sponsored by AFA's Thomas P. Gerrity Chapter of Oklahoma City. Among the more than 100 guests present were, from left, Maj. Gen. James G. Randolph, Commander, Oklahoma City Air Logistics Center; General Risner; Hon. Wm. W. Woodruff, USAF Assistant Secretary (Financial Management); and Chapter President Ivan H. Nelson.



The newly chartered Chuck Yeager Chapter of Huntington, W. Va., held its second formal meeting in December. A former Presidential pilot, Col. Ralph Albertazzi, who recently retired from the Air Force and has been appointed Commissioner of West Virginia's Department of Commerce, was the guest speaker. Shown welcoming the Colonel are, from left, Chapter President Nelson Paden; William E. Richards, State Director of Aeronautics; Colonel Albertazzi; Chapter Secretary Evelyn Richards; Chapter Vice President Charles Lewis; and Chapter Treasurer Berkle Blas.



Gen. David C. Jones, USAF Chief of Staff, was the guest speaker at a dinner cosponsored by the Middle Georgia Chapters of AFA and ROA to observe the 27th anniversary of the Air Force. AFA Chapter President Don Allen, left, and AFA's Assistant Executive Director, John O. Gray, right, a guest of the two sponsoring organizations, unfurled the Chapter's first copy of the new AFA flag, which was approved and authorized by the delegates to AFA's 1974 National Convention.

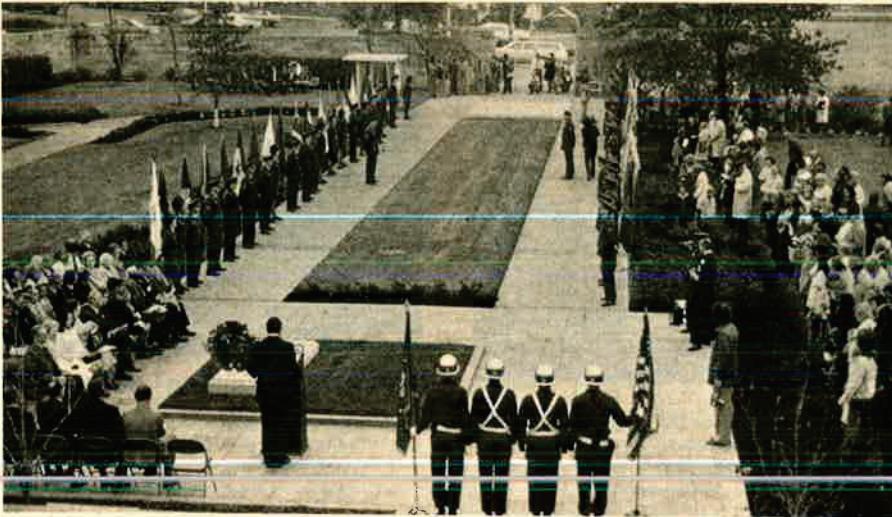


At a recent dinner meeting cosponsored by AFA's Connecticut and Northern Connecticut Chapters, Maj. Gen. Benjamin N. Bellis, Commander, 17th Air Force, and former Commander, Electronic Systems Division, AFSC, spoke on "Air Force Weapon Systems Procurement—Past, Present, and Future." After his presentation, General Bellis, left, discusses a point with Northern Connecticut Chapter President Henry Ramm; Past President Frank Fennessy; and Gen. James Ferguson, USAF (Ret.), Vice President, United Aircraft Corp., and formerly Commander, AFSC.



More than 300 members and guests attended a recent dinner meeting sponsored by AFA's Alamo Chapter at the Oak Hills Country Club in San Antonio, Tex. During the program, the guest speaker, Adm. Noel Gayler, USN, Commander in Chief Pacific, right, received a commission as an Admiral in the Texas Navy. Making the presentation is Chapter President Frank Manupelli.

## CHAPTER AND STATE PHOTO GALLERY



In recent ceremonies at the Harry S. Truman Library in Independence, Mo., AFA's Harry S. Truman Chapter presented to the library a flag from each of the fifty states. On holidays and special occasions the flags will line the courtyard walkway leading to the former President's grave. Program participants included Dr. Benedict K. Zobrist, Library Director; Maj. Gen. Donald L. Worbeck, Air Force Communications Service Commander; Chapter President Howard N. McHenry; master of ceremonies Jack R. Curry; and Chapter Chaplain Brian J. Packer. Other participants were the 1840th Security Police Squadron color guard and the Military Airlift Command Band from Scott AFB, Ill., and volunteer flag bearers from Richards-Gebaur AFB, Mo.



AFA's Ak-Sar-Ben Chapter and the Military Affairs Committee of the Omaha Chamber of Commerce recently cosponsored a reception to introduce Gen. Russell E. Dougherty, the newly assigned Commander in Chief of the Strategic Air Command, to more than 140 business and AFA leaders in the Greater Omaha area. In the photo, Chapter President Robert Runice, left, welcomes Nebraska AFA President Lyle Remde. Others in the receiving line are General Dougherty, center, and Omaha Chamber President Dale Tekolste.



Head-table guests at the Hawaii Chapter's recent luncheon meeting included, from left, Gen. Hunter Harris, USAF (Ret.), Past President of the Chapter; Gen. Louis L. Wilson, Jr., Commander, Pacific Air Forces, the guest speaker; and Chapter President Larry Ronson. More than 275 members and guests attended the luncheon.



AFA's Orange County Chapter, Calif., recently was renamed the Gen. Curtis E. LeMay Chapter. During a recent Chapter luncheon, Chapter President Lee Marshall, right, named General LeMay the Chapter's Lifetime Military Chairman and presented the new charter to him for safekeeping. Lt. Gen. William F. Pitts, Commander, 15th Air Force, was the guest speaker.



Trading war stories at a recent dinner meeting sponsored by AFA's Huron Chapter at Oscoda, Mich., are, from left, Lt. Col. James C. Ince, USAF (Ret.), World War II ace; Chapter Secretary Lt. Col. Sigvard C. Swanberg, USAF (Ret.); Brig. Gen. L. O. "Doc" Ryan, USAF (Ret.); Chapter President Lt. Col. Lawrence Thompson, USAF (Ret.); Brig. Gen. Donald M. Davis, Commander, 40th Air Division (SAC), Wurtsmith AFB; and Col. Donald W. Webster, Commander, 379th Bomb Wing, also at Wurtsmith AFB.



More than 50,000 people attended the 23d annual Kiwanis-Air Force Kids' Day open house at Charleston AFB, S. C. During the program, four Junior ROTC drill teams competed for trophies that were provided by AFA's Charleston Chapter. The photo shows the first-place Carlisle Military Academy team performing in front of the aircraft of the US Air Force Thunderbirds.



Salt Lake City Mayor Jake Garn was the guest of honor and speaker at the Salt Lake City Chapter's recent quarterly dinner meeting. Shown with Mayor Garn, left, is Chapter President Leigh Hunt.



AFJROTC Cadet Michael H. Hall, left, a sophomore at Burlington High School, receives an AFA Certificate of Merit and a \$100 US Savings Bond as the first-place winner in the Laurence G. Hanscom Chapter's annual "I Love My Country Because" essay contest. Making the presentation is Col. Hugh M. Miller, Deputy Commander of L. G. Hanscom AFB, Mass. Runners-up in the contest were Cadet James B. Cahill, also from Burlington High School, and Cadet Samuel J. Gravina of Quincy Vocational Technical High School.



During the Colonel Stuart E. Kane, Jr., Chapter's recent Awards and Appreciation Supper, the Pennsylvania Mirror was cited for its "continuous outstanding support of the air-minded community within Centre County." The paper's publisher, Blair M. Bice, left, accepted for his paper. With Mr. Bice is Chapter Treasurer Franklin Dimmick. A Chapter citation also was presented to the Centre Daily Times. The function was held in the Logan Grange Hall at Pleasant Gap, Pa.



More than 190 AFA members and guests attended the Delaware AFA's recent charter night. AFA National Director Joe Higgins was the guest speaker. Distinguished guests included Rep. Pierre S. duPont, 4th (R-Del.); Lt. Gov. Eugene Bookhammer; Delaware Secretary of State Robert Reed; AFA National Director William W. Spruance; and Pennsylvania AFA President Deane Sterrett. In the photo, Delaware AFA President George Chabbott, left, accepts the AFA Charter from Richard C. Emrich, Vice President for AFA's Central East Region.



Head-table guests at the Reno, Nev., Chapter's recent meeting were, from left, AFA National Director Robert S. Lawson, the guest speaker; Chapter President James L. Murphy; Mrs. Smith; Maj. Gen. Dale O. Smith, USAF (Ret.), the founder and first President of the Chapter; MSgt. Larry Lower, Air Force Recruiter in Reno; and Mrs. Lawson.

# AFA State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

**ALABAMA** (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma, Tuscaloosa): **Cecil Brendle**, 3463 Cloverdale Rd., Montgomery, Ala. 36111 (phone 281-7770, ext. 28).

**ALASKA** (Anchorage, Fairbanks, Kenai): **Vernon R. Johnson**, c/o Peat, Marwick, Mitchell & Co., 736 G St., Anchorage, Alaska 99501 (phone 272-7401).

**ARIZONA** (Phoenix, Tucson): **Robert E. Poston**, 4818 E. Scarlett, Tucson, Ariz. 85711.

**ARKANSAS** (Blytheville, Fort Smith, Little Rock): **Robert M. Tirman**, 1801 Hill Rd., Jacksonville, Ark. 72076 (phone 372-8361, ext. 383).

**CALIFORNIA** (Apple Valley, Burbank, Edwards, Fairfield, Fresno, Harbor City, Hawthorne, Long Beach, Los Angeles, Marysville, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, Santa Barbara, Santa Clara County, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **John W. Lee**, Box 5305, Fullerton, Calif. 92635 (phone 879-3951).

**COLORADO** (Aurora, Boulder, Colorado Springs, Denver, Ft. Collins, Greeley, Pueblo): **James C. Hall**, P. O. Box 30185, Lowry AFB Station, Denver, Colo. 80230 (phone 366-5363, ext. 459).

**CONNECTICUT** (East Hartford, Torrington): **Margaret E. McEnerney**, 1476 Broadbridge Ave., Stratford, Conn. 06497 (phone 377-3517).

**DELAWARE** (Dover, Wilmington): **George H. Chabbott**, 33 Mikell Dr., Dover, Del. 19901 (phone 421-2341).

**DISTRICT OF COLUMBIA** (Washington, D. C.): **George G. Troutman**, 1025 Connecticut Ave., N. W., Washington, D. C. 20036 (phone 785-6500).

**FLORIDA** (Bartow, Broward, Daytona Beach, Ft. Walton Beach, Gainesville, Homestead, Jacksonville, Key West, Miami, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tallahassee, Tampa, West Palm Beach): **Wayne A. Hilton**, 1338 Stratford Dr., Clearwater, Fla. 33516 (phone 531-4611, ext. 3006).

**GEORGIA** (Athens, Atlanta, Savannah, St. Simons Island, Val-

dosta, Warner Robins): **Dan Callahan**, 134 Hospital Dr., Warner Robins, Ga. 31093 (phone 923-4288).

**HAWAII** (Honolulu): **Larry Ranson**, 21 Craigsides Pl., Apt. 7A, Honolulu, Hawaii 96817 (phone 525-6160).

**IDAHO** (Boise, Burley, Pocatello, Twin Falls): **Paul F. Carl**, 1879 San Larue Ave., Twin Falls, Idaho 83301 (phone 733-4411).

**ILLINOIS** (Belleville, Champaign, Chicago, Elmhurst, O'Hare Field): **Charles Delrich**, 711 East D St., Belleville, Ill. 62221 (phone 233-2430).

**INDIANA** (Indianapolis, Lafayette, Logansport): **C. Forrest Spencer**, 910 W. Melbourne Ave., Logansport, Ind. 46947 (phone 753-7066).

**IOWA** (Des Moines): **Ric Jorgensen**, P. O. Box 4, Des Moines, Iowa 50301 (phone 255-7656).

**KANSAS** (Topeka, Wichita): **Albin H. Schweers**, 7221 Woodward St., Overlook Park, Kan. 66204 (phone 374-4267).

**LOUISIANA** (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Ruston, Shreveport): **Louis Kaposta**, 6255 Carlson, New Orleans, La. 70122 (phone 581-3663).

**MAINE** (Limestone): **Alban E. Cyr**, P. O. Box 160, Caribou, Me. 04736 (phone 492-4171).

**MARYLAND** (Baltimore): **James W. Poultney**, P. O. Box 31, Garrison, Md. 21055 (phone 363-0795).

**MASSACHUSETTS** (Boston, Falmouth, Florence, Lexington, L. G. Hanscom AFB, Taunton, Worcester): **Arthur D. Marcotti**, 215 Laurel St., Melrose, Mass. 02176 (phone 665-5057).

**MICHIGAN** (Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Sault Ste. Marie): **Richard Mossoney**, 17356 Eddon, Melvindale, Mich. 48122 (phone 928-3482).

**MINNESOTA** (Duluth, Minneapolis, St. Paul): **Daniel W. Priedeaux**, 4620 W. 77th St., Minneapolis, Minn. 55435 (phone 922-2922).

**MISSISSIPPI** (Biloxi, Columbus, Jackson): **Wm. Browne**, P. O. Box 2042, Jackson, Miss. 39205 (phone 352-5207).

**MISSOURI** (Kansas City, Knob Noster, Springfield, St. Louis): **Robert E. Combs**, 2003 W. 91st

St., Leawood, Kan. 66206 (phone 649-1863).

**MONTANA** (Great Falls): **Jack K. Moore**, P. O. Box 685, Great Falls, Mont. 59403 (phone 761-2555).

**NEBRASKA** (Lincoln, Omaha): **Lyle O. Remde**, 4911 S. 25th St., Omaha, Neb. 68107 (phone 731-4747).

**NEVADA** (Las Vegas, Reno): **Cesar J. Martinez**, 4214 Grace St., Las Vegas, Nev. 89121 (phone 451-3037).

**NEW HAMPSHIRE** (Manchester, Peace AFB): **R. L. Devouaux**, 270 McKinley Rd., Portsmouth, N. H. 03801 (phone 669-7500).

**NEW JERSEY** (Andover, Atlantic City, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Inseph J. Bendetto**, 2164 Kennedy Blvd., Jersey City, N. J. 07305 (phone 420-6154).

**NEW MEXICO** (Alamogordo, Albuquerque, Clovis): **Harry L. Gogan**, 2913 Charleston, N. E., Albuquerque, N. M. 87110 (phone 264-2315).

**NEW YORK** (Albany, Bethpage, Binghamton, Buffalo, Catskill, Chautauqua, Elmira, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Gerald V. Hasler**, P. O. Box 11, Johnson City, N. Y. 13760 (phone 754-3435).

**NORTH CAROLINA** (Charlotte, Fayetteville, Goldsboro, Greensboro, Raleigh): **Elton Edwards**, P. O. Box 37, Greensboro, N. C. 27402 (phone 275-7616).

**NORTH DAKOTA** (Grand Forks, Minot): **Kenneth A. Smith**, 511 34th Ave., So., Grand Forks, N. D. 58201 (phone 722-3969).

**OHIO** (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Toledo, Youngstown): **Robert L. Hunter**, 2811 Locust Dr., Springfield, Ohio 45504 (phone 255-5304).

**OKLAHOMA** (Altus, Enid, Oklahoma City, Tulsa): **David L. Blankenship**, P. O. Box 51308, Tulsa, Okla. 74151 (phone 835-3111, ext. 2207).

**OREGON** (Corvallis, Eugene, Portland): **John G. Nelson**, 901 S. E. Oak St., Portland, Ore. 97214 (phone 233-7101).

**PENNSYLVANIA** (Aliquippa, Allentown, Chester, Erie, Homestead, Horsham, King of Prussia, Lewistown, New Cumberland, Philadelphia, Pittsburgh, State College, Washington, Willow Grove, York): **J. Deane Sterrett**, 110 McMillen Ave., Beaver Falls, Pa. 15010 (phone 843-4589).

**RHODE ISLAND** (Warwick): **Matthew Puchalski**, 143 SOG RIANG, Warwick, R. I. 02886 (phone 737-2100, ext. 27).

**SOUTH CAROLINA** (Charleston, Columbia, Greenville, Myrtle Beach, Sumter): **A. M. Hendry, Jr.**, 837 Gordon St., Sumter, S. C. 29150 (phone 469-2883).

**SOUTH DAKOTA** (Rapid City): **Kenneth Roberts**, P. O. Box 191, Rapid City, S. D. 57701 (phone 342-0191).

**TENNESSEE** (Chattanooga, Knoxville, Memphis, Nashville, Tullahoma): **James W. Carter**, 314 Williamsburg Rd., Brentwood, Tenn. 37027 (phone 834-2008).

**TEXAS** (Abilene, Austin, Big Spring, Corpus Christi, Dallas, Del Rio, El Paso, Fort Worth, Houston, Laredo, Lubbock, San Angelo, San Antonio, Sherman, Waco, Wichita Falls): **Vic Kregel**, P. O. Box 9495, San Antonio, Tex. 78204 (phone 266-2242).

**UTAH** (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Gil F. Friederichs**, P. O. Box 486, Clearfield, Utah 84015 (phone 825-9511, ext. 2363).

**VERMONT** (Burlington): **R. F. Wissinger**, P. O. Box 2182, S. Burlington, Vt. 05401 (phone 863-4494).

**VIRGINIA** (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **Lester J. Rose**, 177 Corinthia Dr., Denbigh, Va. 23602 (phone 877-4372).

**WASHINGTON** (Port Angeles, Seattle, Spokane, Tacoma): **Theodore O. Wright**, P. O. Box 88850, Seattle, Wash. 98188 (phone 237-2887).

**WEST VIRGINIA** (Huntington): **Nelson Paden**, 1641 Wiltshire Blvd., Huntington, W. Va. 25701.

**WISCONSIN** (Madison, Milwaukee): **Kenneth Kuenn**, 3239 N. 81st St., Milwaukee, Wis. 53222 (phone 747-5300).

**WYOMING** (Cheyenne): **Edwin J. Witzemberger**, Capitol Bldg., Rm. 116, Cheyenne, Wyo. 82001.



# AIR FORCE ASSOCIATION

with Life Insurance Protection up to \$100,000 for USAF Personnel  
Two Great New Plans! Choose Either One . . . AND Get Big, Strong Coverage.



## The Standard Plan (\$66,000 Maximum)

Insured's Age	Coverage	Extra Accidental Death Benefit*	Monthly Cost	Optional Family Coverage		Monthly Cost Family Coverage
				Spouse	Each Child**	
20-24	\$ 66,000	\$12,500	\$10.00	\$6,000	\$2,000	\$2.50
25-29	60,000	12,500	10.00	6,000	2,000	2.50
30-34	50,000	12,500	10.00	6,000	2,000	2.50
35-39	40,000	12,500	10.00	6,000	2,000	2.50
40-44	25,000	12,500	10.00	5,250	2,000	2.50
45-49	15,000	12,500	10.00	4,050	2,000	2.50
50-59	10,000	12,500	10.00	3,000	2,000	2.50
60-64	7,500	12,500	10.00	2,250	2,000	2.50
65-69	4,000	12,500	10.00	1,200	2,000	2.50
70-75	2,500	12,500	10.00	750	2,000	2.50



## The High-Option Plan (\$100,000 Maximum)

Insured's Age	Coverage	Extra Accidental Death Benefit*	Monthly Cost	Optional Family Coverage		Monthly Cost Family Coverage
				Spouse	Each Child**	
20-24	\$100,000	\$12,500	15.00	\$6,000	\$2,000	\$2.50
25-29	90,000	12,500	15.00	6,000	2,000	2.50
30-34	75,000	12,500	15.00	6,000	2,000	2.50
35-39	60,000	12,500	15.00	6,000	2,000	2.50
40-44	37,500	12,500	15.00	5,250	2,000	2.50
45-49	22,500	12,500	15.00	4,050	2,000	2.50
50-59	15,000	12,500	15.00	3,000	2,000	2.50
60-64	11,250	12,500	15.00	2,250	2,000	2.50
65-69	6,000	12,500	15.00	1,200	2,000	2.50
70-75	3,750	12,500	15.00	750	2,000	2.50

\* In the event of an accidental death occurring within 13 weeks of the accident, the AFA plan pays a lump sum benefit of \$12,500 in addition to the benefit, except as noted under AVIATION DEATH BENEFIT, above.

\*\* Each child is covered in this amount between the ages of six months and 21 years. Children under six months are provided with \$250 protection once they are 15 days old and discharged from the hospital.

**AVIATION DEATH BENEFIT:** A total sum of \$22,500 under the High-Option Plan or \$15,000 under the Standard Plan is paid for death which is caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage.

### CHECK THE ADVANTAGES OF THESE AFA PROGRAMS

**Wide eligibility!** If you're on active duty with the U.S. Armed Forces [regardless of rank], a member of the Ready Reserve or National Guard [under age 60], a Service Academy or college or university ROTC Cadet, you're eligible to apply for this coverage [see exceptions].

**Keep your coverage at the low, group rate to age 75, if you wish.**

**Full conversion privilege.** At age 75 [or at any time, on termination of AFA membership] the amount of insurance shown for your age group at the time of conversion may be converted to a permanent plan of insurance, regardless of your health at that time.

**Disability waiver of premium,** if you become totally disabled for at least nine months, prior to age 60.

**Convenient premium payment plans.** Pay direct to AFA or by monthly government allotment.

**Reduction of cost by dividends.** Net cost of insurance to AFA insured persons has been reduced by payment of dividends in eight of the last eleven years. However, dividends cannot, of course, be guaranteed.

**Administered by insurance professionals on your Association's staff,** for excellent service and low operating cost.

### EXCEPTIONS:

**Group Life Insurance:** Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane shall not be effective until your coverage has been in force for 12 months.

**The Accidental Death Benefit and Aviation Death Benefit** shall not be effective if death results: [1] From injuries intentionally self-inflicted while sane or insane, or [2] From injuries sustained while committing a felony, or [3] Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or [4] During any period a member's coverage is being continued under the waiver of premium provision, or [5] From an aviation accident, military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minneapolis as trustee of the Air Force Association Group Insurance Trust. However, because of certain limitations on group insurance coverage in those states, nonactive-duty members who reside in Ohio, Texas, Florida, and New Jersey are not eligible for AFA group life insurance coverage.

### EFFECTIVE DATE OF YOUR COVERAGE

All certificates are dated and take effect on the last day of the month in which your application for coverage is approved. Coverage runs concurrently with AFA membership. AFA Military Group Life Insurance is written in conformity with the Insurance Regulations of the State of Minnesota.

Yes, now the Air Force Association offers members of the United States Air Force their choice of two great new life insurance plans, both designed to meet the special requirements of Air Force personnel.

### Planned for You

Both plans have been specifically designed to fill your particular needs. This is full-time, worldwide protection. There are no clauses—no hazardous-duty restrictions, or geographical limitations on AFA life insurance protection. At AFA, our policy is to provide the broadest possible protection to our members, including those in combat zones.

### Low Group Rates

And, as a member of AFA, you are able to secure this outstanding protection at low group rates. What's more, there's no increase in premiums for flying personnel. In fact, in most cases, flying personnel are entitled to full death benefits. Only when death is caused by an aircraft accident in which the insured was serving as pilot or crew member does the special Aviation Death Benefit take effect.

### Higher Benefits for Young Families

The higher benefits for younger members make both plans particularly outstanding buys for the young family. The young family breadwinner can make a substantial addition to his life insurance estate at a time when his family is growing up—when his financial obligation to his family is at its greatest!

**CHOOSE EITHER OF THESE GREAT PLANS! MAIL THIS APPLICATION TO AFA TODAY!**



# BREAKS THE BENEFIT BARRIER!



## APPLICATION FOR AFA MILITARY GROUP LIFE INSURANCE



Group Policy GLG-2625  
United Benefit Life Insurance Company  
Home Office: Omaha, Nebraska

Full name of member \_\_\_\_\_  
Rank \_\_\_\_\_ Last \_\_\_\_\_ First \_\_\_\_\_ Middle \_\_\_\_\_

Address \_\_\_\_\_  
Number and Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP Code \_\_\_\_\_

Date of birth Mo. Day Yr.	Height	Weight	Social Security Number	Name and relationship of primary beneficiary
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Please indicate category of eligibility and branch of service.

Extended Active Duty       Air Force  
 Ready Reserve or National Guard       Other \_\_\_\_\_ (Branch of service)  
 Air Force Academy       \_\_\_\_\_ Academy  
 ROTC Cadet \_\_\_\_\_  
 Name of college or university \_\_\_\_\_

Name and relationship of contingent beneficiary \_\_\_\_\_

This insurance is available only to AFA members

I enclose \$10 for annual AFA membership dues (includes subscription (\$9) to AIR FORCE magazine).  
 I am an AFA member.

Please indicate below the Mode of Payment and the Plan you elect.

HIGH OPTION PLAN		Mode of Payment	STANDARD PLAN	
Members Only	Members and Dependents		Members Only	Members and Dependents
<input type="checkbox"/> \$ 15.00	<input type="checkbox"/> \$ 17.50	Monthly government allotment. I enclose 2 months' premium to cover the period necessary for my allotment to be established. Quarterly. I enclose amount checked. Semiannually. I enclose amount checked. Annually. I enclose amount checked.	<input type="checkbox"/> \$ 10.00	<input type="checkbox"/> \$ 12.50
<input type="checkbox"/> \$ 45.00	<input type="checkbox"/> \$ 52.50		<input type="checkbox"/> \$ 30.00	<input type="checkbox"/> \$ 37.50
<input type="checkbox"/> \$ 90.00	<input type="checkbox"/> \$105.00		<input type="checkbox"/> \$ 60.00	<input type="checkbox"/> \$ 75.00
<input type="checkbox"/> \$180.00	<input type="checkbox"/> \$210.00		<input type="checkbox"/> \$120.00	<input type="checkbox"/> \$150.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth			Height	Weight
		Mo.	Day	Yr.		

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes  No

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanitarium, asylum or similar institution in the past 5 years? Yes  No

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes  No

IF YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid. I understand United reserves the right to request additional evidence of insurability in the form of a medical statement by any attending physician or an examination by a physician selected by United.

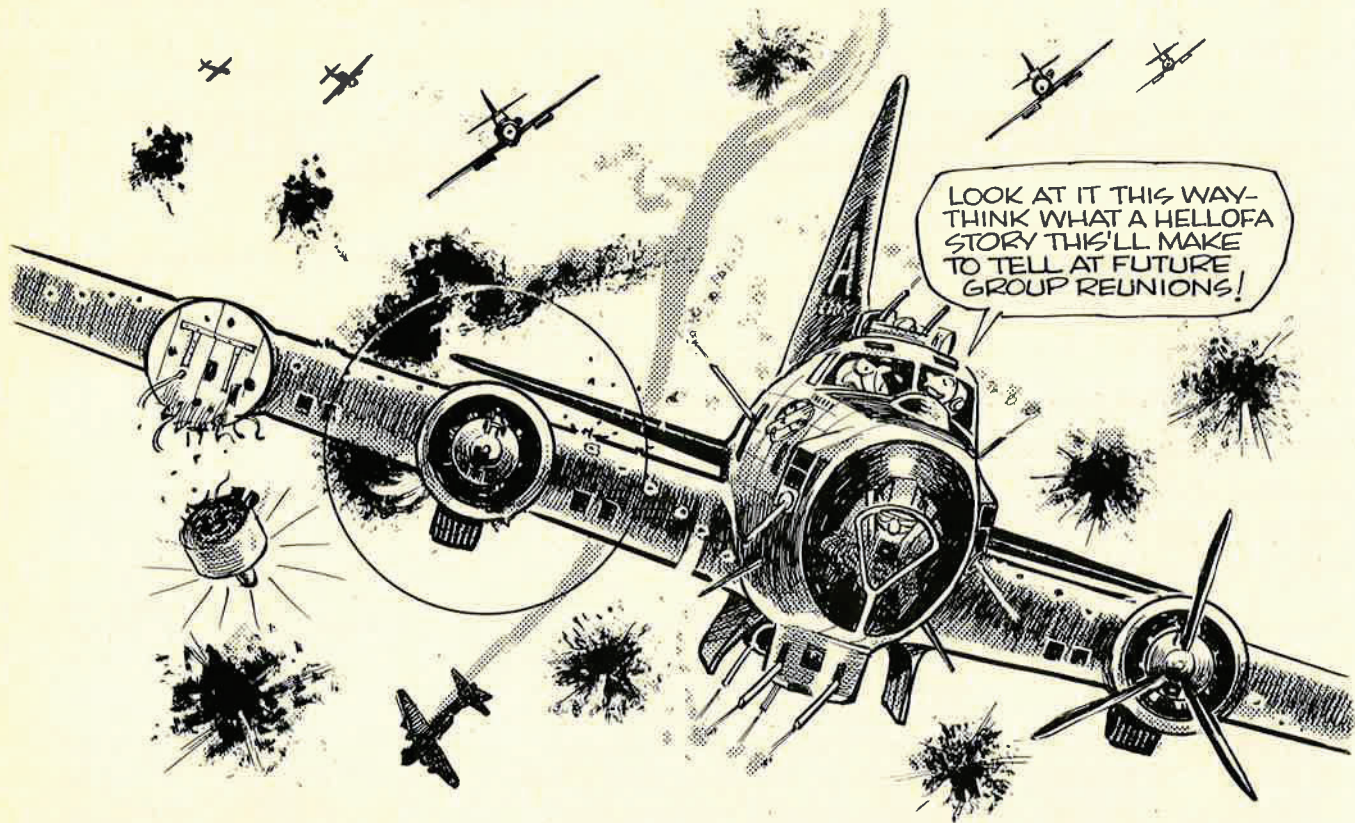
Date \_\_\_\_\_, 19 \_\_\_\_\_ Member's Signature \_\_\_\_\_



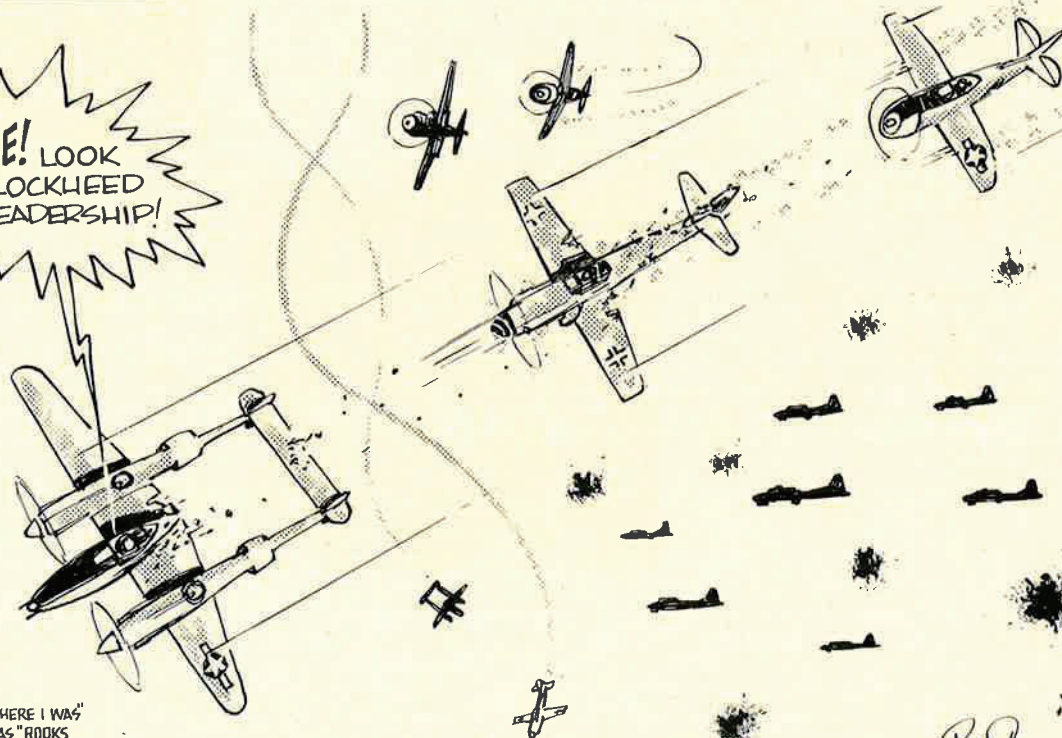
Bob Stevens'

# "There I was..."

SCENES LIKE THIS RAISE THE "PUCKER FACTOR" TO ITS ZENITH and MAKE A FELLER A TRIFLE EDGY (THE CO-PILOT JUST CAUGHT HIS SLEEVE IN THE THROTTLE QUADRANT JUST AS A CANNON SHELL BURST IN THE COCKPIT and HAS BEEN SCREAMING, "I'M PARALYZED!").

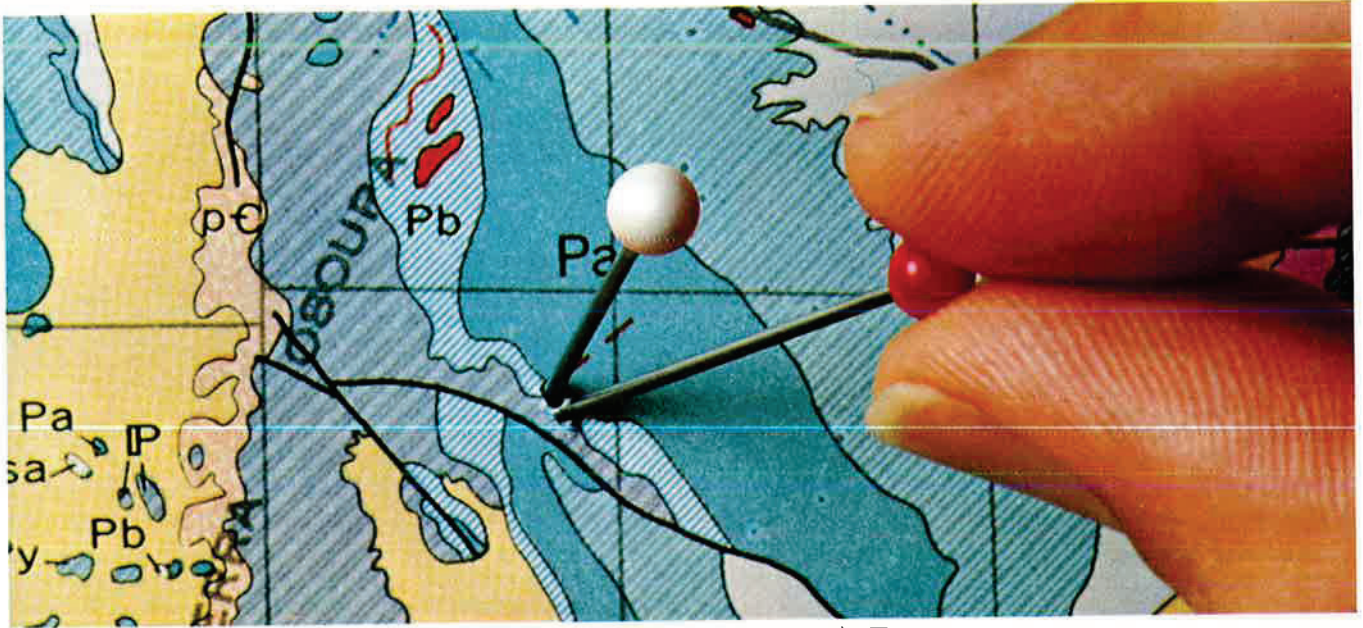


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*Bob Stevens*



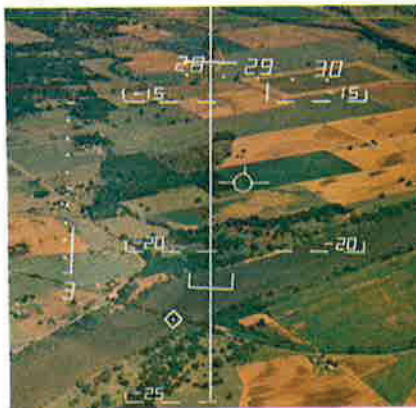
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It provides air support that's always better than close.**

**The A-7 has the most accurate navigation and weapons delivery system in the world for close air support.**

A digital computer is the heart of the system. It analyzes and coordinates data from forward looking radar, Doppler radar, inertial measurement set, air data computer and pilot commands. This data supports a navigation capability that's completely self-contained and automatic, eliminating any reference to ground-based aids.

The computer-driven Head-Up Display helps insure accurate navigation.

It provides a continuous representation of aircraft attitude, heading, altitude, velocity and steering cues to selected destinations. The computer also drives a projected map display



that continually shows aircraft geographical location.

For automatic weapons delivery, the computer instantly solves ballistic prediction problems—

targets can be approached



from almost any attitude or airspeed.

Close air support by the A-7 depends on a navigation and weapons delivery system that's totally integrated and computerized.

Because "close" isn't good enough when you're depending on pinpoint accuracy.

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The tighter the turns, the hotter the action . . . the more a fighter pilot needs our new high-acceleration cockpit. You put your fighter into a screaming turn to get inside your adversary. Your belly muscles tighten.

You roll it over and rack it. Break off suddenly and go into a gut-pulling climb. You feel the strain as you work to lock him up. Fatigue begins to get to you.

Your machine is built tough. It can take it. You're built tough, too — but there's a limit to what a body can stand.

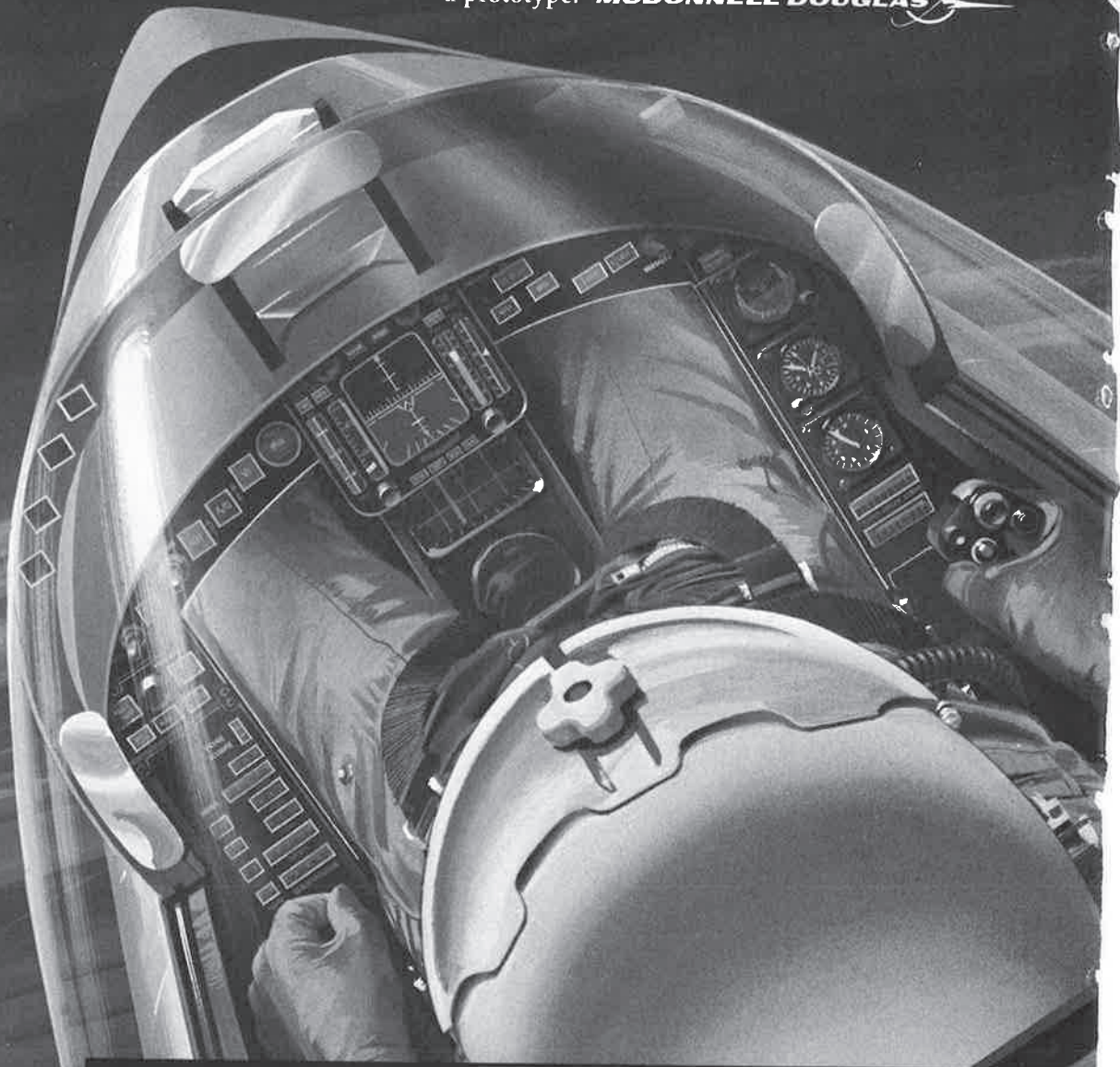
That's why McDonnell Douglas is developing a unique new high-acceleration cockpit for the Air Force. We're finding that there is a way to put

those tight turns to work more often — to use power and airframe to accelerate and come back around as never before — in today's airplanes or tomorrow's.

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