

FEBRUARY 1974 / \$1

AIR FORCE

MAGAZINE

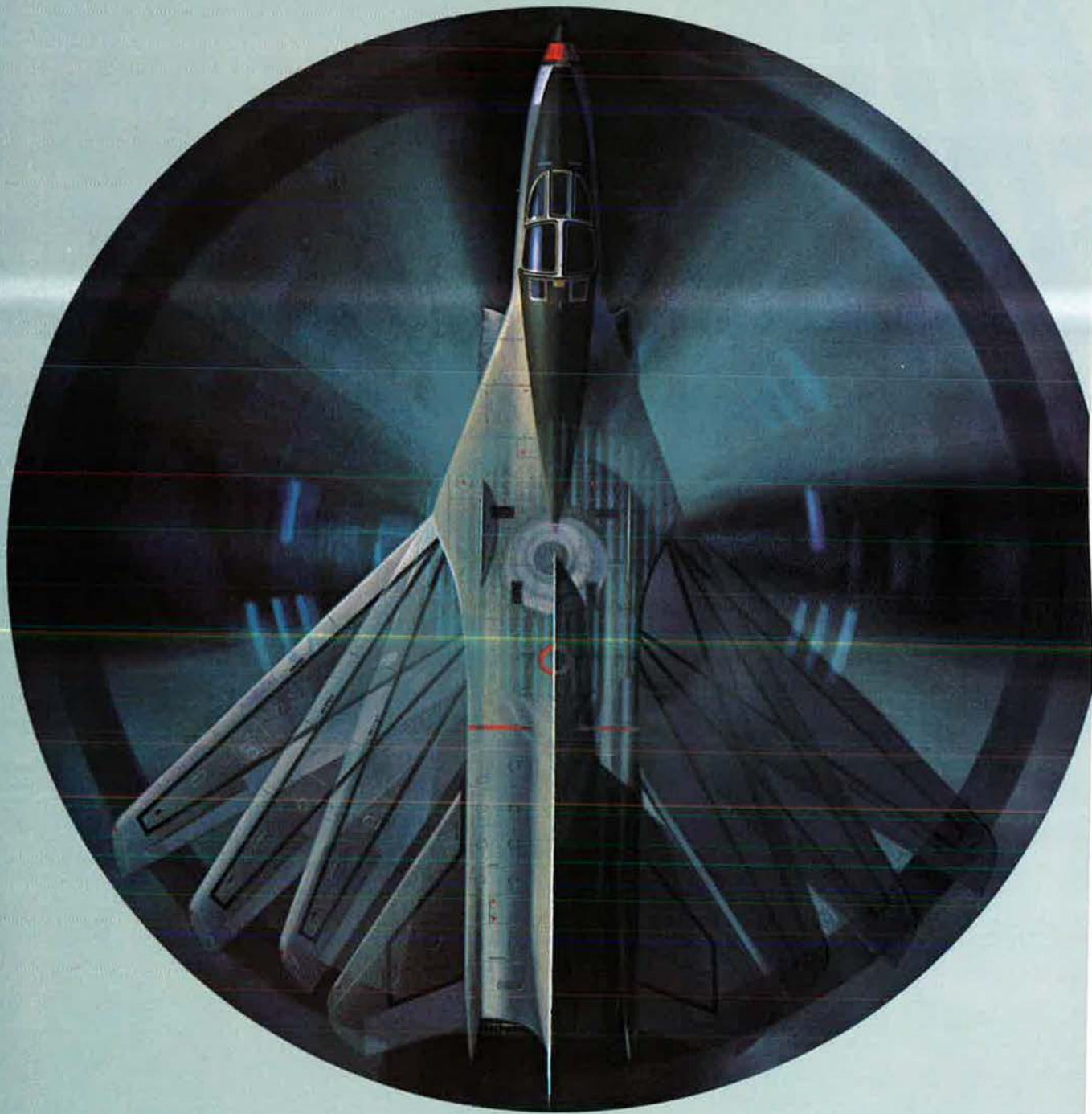
PUBLISHED BY THE AIR FORCE ASSOCIATION

FLYING THE F-15

In an exclusive report,
a veteran fighter pilot
describes what it's like
to fly USAF's newest,
hottest fighter . . .



Garrett considers the possibilities



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AIR FORCE Magazine's own pilot-in-residence—Capt. Don Carson—reports on his experiences with the new F-15 Eagle. It's a "fighter-pilot's fighter," according to Carson's appraisal, beginning on p. 23.



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Publisher: James H. Straubel

Editor and Ass't Publisher: John F. Loosbrock

Executive Editor: John L. Frisbee

Senior Editors:
Claude Witze, Edgar Ulsamer

Contributing Editor ("Jane's Supplement"):
John W. R. Taylor

Contributing Editors:
Ed Gates, Don Steele, Capt. Donald D. Carson, USAF

Regional Editors:
Stefan Geisenheyner, Editor for Europe, Sonnenberger Str. 15, D-6200 Wiesbaden, Germany. Tel: (06121) 37 23 97
Irving Stone, West Coast Editor, 10000 Santa Monica Blvd., Los Angeles, Calif. 90067. Tel: (213) 879-2447

Managing Editor: Richard M. Skinner

Ass't Managing Editor: William P. Schlitz

Production Manager: Robert T. Shaughness

Art Director: James W. Keaton

Special Assistant to the Editor: Nellie M. Law

Special Assistant to the Executive Editor:
Catherine L. Bratz

Editorial Assistants:
Pearlie M. Draughn, Grace Lizzio, Ethel L. Mellin

Administrative Assistant to the Publisher:
Ethel J. Vernon

Assistant for Editorial Promotion:
Robin Whittle

Advertising Director:

Charles E. Cruze
1750 Pennsylvania Ave., N.W.
Washington, D.C. 20006
Telephone: (202) 298-9123

Advertising Service Manager:
Patricia Teevan

Area Sales Managers:

Bayard Nicholas, New York (212) 687-3544
James G. Kane, Chicago (312) 296-5571
Harold L. Keeler, Los Angeles (213) 879-2447
Yoshi Yamamoto, Tokyo 535-6614

European Sales Representatives:

Richard A. Ewin
Gordon Marley
Overseas Publicity Ltd.
214 Oxford St.
London W1N 0EA, England
Telephone: 01-636-8296

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COUNTERFORCE REVISITED

By John L. Frisbee

EXECUTIVE EDITOR, AIR FORCE MAGAZINE

FROM all indications, a quiet revolution in strategic thinking is under way in the Pentagon. For the first time in a decade, the word "Counterforce" has appeared in the vocabulary of senior Defense officials, both in and out of uniform, as may be seen elsewhere in this issue of AIR FORCE Magazine.

Since Counterforce has been in limbo for the last ten years, perhaps we should define what it is we're talking about. The Counterforce idea was developed by Air Force strategists in the late 1950s and early '60s. It was a product of the then-dawning missile age, an attempt to avoid the massive, sometimes indiscriminate, destruction caused by World War II bombing—now vastly compounded by nuclear weapons—through a return to the classic military doctrine that the proper objective of military action is the destruction of an enemy's military forces. Essentially, it was a targeting concept, relating to the long-range nuclear forces of a potential enemy, principally his missile forces, against which there was no available defense.

Counterforce was regarded primarily as a deterrent strategy, but potentially a war-winning concept if deterrence failed. It was applicable only to the Air Force. Neither the Navy nor the Army had weapon systems with enough range to strike directly at the nuclear-armed forces of our only potential nuclear opponent—the USSR.

In 1960, the Air Force accepted Counterforce as the most rational and humane strategy for deterring or fighting nuclear war. It was not adopted as an operating strategy, however, because of then-existing technical limitations. But Counterforce did remain an Air Force *objective* well into the 1960s.

Ironically, Secretary of Defense Robert McNamara adopted Counterforce as *the* US operating strategy, and so announced in a speech at Ann Arbor, Mich., on June 16, 1962. Six months later, he abandoned Counterforce both as a strategy *and as an objective*.

Opponents of Counterforce argued against the concept, not only on technical grounds, but also for economic and political reasons. Given the relative inaccuracy of missiles in those days, several missiles would have to be targeted against each of an opponent's ICBMs. This meant large, expensive forces and the latent ability to launch a US first strike, which allegedly would generate instability in the military balance and lead to an inconclusive arms race. So Counterforce was succeeded by Assured Destruction—a "deterrence-only" strategy based on the ability to destroy an enemy's cities and millions of his people in response to an attack on the US.

Now, eleven years after the US abandoned Counter-

force both as an operating strategy and as an objective that strategy is technically feasible for both the US and the USSR. But unlike the US, Counterforce apparently has been a Soviet objective for many years. If they choose to do so (and as pointed out by Sen. Henry M. Jackson on p. 30, there is no evident self-restraint in Soviet military planning), the Soviets can have in place within the next five years 300 super-size missiles, each able to deliver six MIRV warheads with a yield of two megatons. That is a bona fide counterforce capability vis-à-vis our Minuteman I silos.

Under present Air Force programs, we will confront that awesome Soviet force with 550 Minuteman IIIs (our principal hard-target missile) of great accuracy, but each carrying three warheads believed to be of less than 200 kilotons. Against Soviet missile silos reportedly hardened to withstand more than 3,000 pounds per square inch overpressure, we will have virtually no counterforce capability. And US submarine-launched missiles have less accuracy and smaller warheads than Minuteman III.

President Nixon has said repeatedly that no US President should be left with the sole option of responding to an attack on this country by destroying the attacker's cities. That option, almost too horrible to contemplate, inevitably would bring down an attack on our own cities by Soviet sea- and land-launched missiles, with casualties in the millions. It is questionable whether any President would order a counter-city response to an attack that clearly was limited to our strategic forces. His alternative would be acquiescence to the attacker's demands—or even to demands backed by a credible threat of a counterforce attack.

So far, there has been no clearly discernible trend toward providing a missile force with the only other option to which the President could have been referring—a counterforce, or hard-target missile capability. The B-1, of course, is a partial answer to our counterforce dilemma, but it must be supplemented by hard-target missiles with a response time measured in minutes. Initially, this may be achievable through some of the modifications of Minuteman III mentioned by Gen. Samuel C. Phillips on p. 56.

Our failure, in the early 1960s, to retain Counterforce as an objective has put the US in a disadvantageous position that, if not corrected, could lead to disaster by the end of this decade. We believe it is essential that accelerated development and deployment of systems that will make our missile force effective against extremely hard targets should be undertaken immediately.

SCIENCE/SCOPE

A new liquid crystal pictorial display system, developed by Hughes for the U.S. Air Force Avionics Laboratory, promises performance superior to that of the cathode-ray tube for displaying symbolic, graphic, and pictorial television images in real time. The liquid crystal display produces no light of its own, but is viewed by natural or artificial light. The brighter the ambient light the more brilliant the display -- a distinct advantage for airborne systems. It consists of 10,000 elemental liquid crystal cells per square inch of display. A cell appears black when no voltage is applied; increasing voltage produces tones ranging from black to white. The liquid crystal display offers high resolution, is compact and lightweight, requires little power, and needs only a simple electrical interface with sensors or video signals.

The U.S. Navy's Tomcat fighter and Phoenix missile made aviation history recently off Pt. Mugu, CA, when the F-14 launched six missiles in 37 seconds and simultaneously guided them at separate drones 50 miles away. One of the drones suddenly veered off course and left a radar signature too weak to be tracked at such long range, but the Phoenix missiles scored direct hits on four of the remaining five. This first six-missile multiple launch was designed to test the full capability of the Hughes-built AWG-9 weapons control system and Phoenix missile.

Enemy mortar shells will be spotted in flight and tracked back to their firing point by the Mortar Locating Radar (MLR) now being developed by Hughes for the U.S. Army Electronics Command. The new system will meet a critical Army requirement for automatic first-round location of hostile mortar launchers, historically difficult to counter because of their easy transportability. Major problem: the high level of radar interference in combat -- caused by adverse weather, ground clutter, birds and insects that show up on radar returns, and enemy jamming -- plus high-density enemy volley fire. Hughes' solution: an automatic radar that includes an electronic-scanning antenna, a computer, and a sophisticated signal processor. The MLR consists of two lightweight units that can be airlifted by helicopter.

The first airborne fire control radar antenna with a 180° horizontal scanning angle has been developed by Hughes for its ATLAS (Advanced Tactical Lightweight Air Superiority) radar system, a company-funded program. Tests of the six-pound planar array antenna have shown higher gain and better side lobe control than predicted. ATLAS demonstrations have been witnessed by representatives from the armed forces, all major U.S. aircraft manufacturers, and 15 foreign countries.

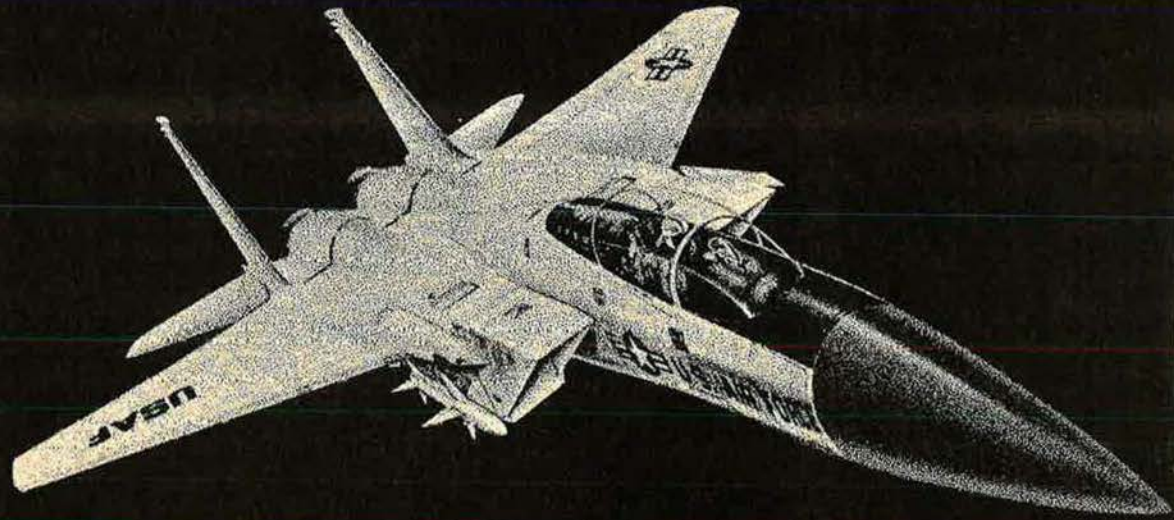
Sharply reduced spare parts requirements and maintenance costs have been achieved for the U.S. Navy's Trident Strategic Weapon Control System. Although the system requires 2500 plug-in modules, only 25 different types of modules are used. Hughes is developing the fire control unit under contract to General Electric Company, and will design and produce a brassboard and two production prototypes of the central processing and memory units for Trident's digital control computer, as well as computer software and two computer test sets.

Creating a new world with electronics

HUGHES

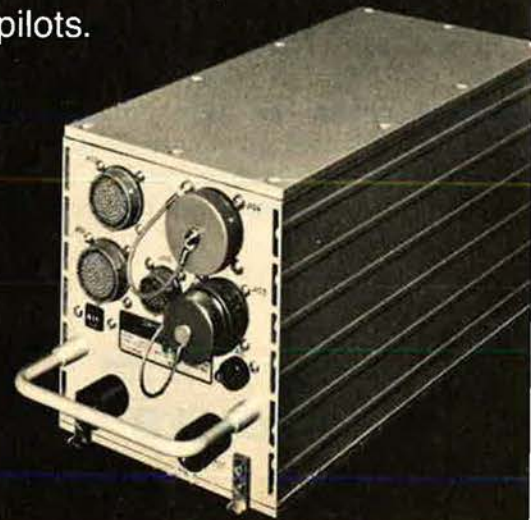
HUGHES AIRCRAFT COMPANY

Four reasons why the F-15



1. Airframe by McDonnell Douglas, builder of more than 4,200 F-4 Phantoms, the great fighter for the U.S. Air Force, Navy and Marines – and the leading nations of the Free World. Just as the F-4 set a new standard of performance where it counts, so the new F-15 Eagle, incorporating quantum advances in technology and materials, will establish itself as the new air superiority fighter from America.

2. There's Sperry's solid-state digital air data computer. With our highly accurate vibrating diaphragm sensor, it will rapidly compute airspeed, altitude, Mach number, vertical speed and other air data parameters for F-15 pilots.

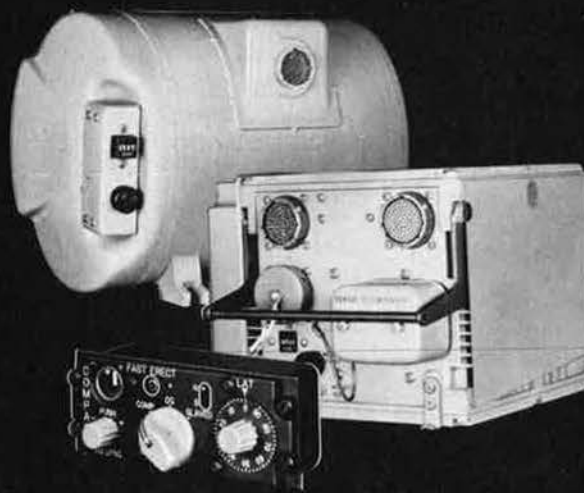


a fighter pilot's fighter.

4. Add to that Sperry's attitude and heading reference set. Our AHRS will provide the F-15 pilot reliable all-attitude and heading information as a backup to the fighter's inertial system. Complementing this system on the ground is the Sperry plug-in compass calibrator to greatly reduce maintenance crews' compass swing time.



3. Fighter pilots will be amazed at the clarity and sharpness of the Sperry vertical situation display presentation in the F-15. Our experience in developing cathode ray tube type instruments has enabled us to produce a display unequalled on the avionics market.



The F-15. Sperry's there with the latest avionics to help make it truly a fighter pilot's fighter. Sperry Flight Systems, Phoenix, Arizona 85036.

 **SPERRY**

Airmail

Valuable Source

Gentlemen: Once again you are to be complimented on your fine December issue featuring "The Military Balance 1973/74." The Marine Corps Command and Staff College has found this to be a most valuable source document for both our faculty and students.

Lt. Col. R. R. Powell, Jr., USMC
Head, Strategy Division
USMC Command and Staff College
Quantico, Va.

Significant Omission

Gentlemen: Re the Air Force Association's 1973-74 Statement of Policy, this is a commendable Statement of Policy, to be applauded by all of us who are dedicated to the Air Force—past, present, and future.

One glaring omission, especially significant in view of "The central defense issue of today is people," is that not a word was mentioned about retirement benefits.

Have we already forgotten the struggle for recomputation?

It is difficult for some of us to do anything but remain silent when a bright young man asks us about the military service as a career.

Brig. Gen. John M. Schweizer, Jr.,
USAF (Ret.)
Los Angeles, Calif.

Need to Know

Gentlemen: Your magazine is one of the best in the entry of aviation publications. I am very disappointed in the standing the enlisted members of the Air Force, the people who actually have their hands on experience, are regarded in relation to the magazine coverage. It gets to be tiring reading about the generals, admirals, and colonels. I have never in my career been told so often that I am a professional and treated more like an idiot.

We in the Air Force are approaching the point of no return as true technicians. It is almost to the point where you cannot find a mechanic or manager who knows enough about the weapon systems used by the Air Force to be effective as a superior or manager. We are told the systems are too com-

plex. As a C-5 flight engineer, I find this a cop-out and a product of mediocre leadership. Training, the guts of mission accomplishment, is relegated to a need-to-know level with no clear definition. Example: When a question is asked during the training, you are told you don't need to know. When a system malfunctions in flight, the pilot asks: What's wrong and how long will it take to fix?

How about AFA taking on some real issues! Here's my \$10 for one more year and hopes for the future.

Name Withheld

George AFB—Alive and Well

Contrary to the report in Contributing Editor Ed Gates's December column, "Base Closings and Retiree Benefits" (page 141), George AFB, Calif., is *not* closing. In fact, the base recently was assigned an additional fighter squadron. Our apologies to those who have been disturbed by this erroneous report.—THE EDITORS

Eighth Air Force Museum

Gentlemen: Recently a number of individuals and groups, carrying out research into the history of the Eighth Air Force, formed a society to coordinate their efforts. Our eventual aim is the formation of a museum dedicated to the Eighth Air Force.

Our research covers the whole spectrum of Eighth Air Force activities on the ground and in the air. We would appreciate group histories, documents, photographs, artwork, details of missions, names of aircraft and crews, duties and organization of ground staff, location of buncher beacons, and general memorabilia.

My own special interest is the 401st Bomb Group (H), stationed at Deenethorpe from 1943 to 1945, and I would like to take this opportunity to thank AIR FORCE Mag-

azine, the USAF, Gen. H. W. Bowman, Lt. Col. L. P. Davison, W. A. Decker, Ralph Trout, and many others for their outstanding efforts in my research.

S. V. Maslen
7, Byron Road
Corby
Northants, England

312th Bomb Group History

Gentlemen: I am writing a history of the 312th Bombardment Group which served with distinction in the Southwest Pacific during World War II. I am interested in hearing from all former members who wish to contribute stories and photos regarding the group known as "The Roarin' 20s."

Dr. Russell L. Sturzebeck
503 Owem Rd.
West Chester, Pa. 19380

Aircraft Display

Gentlemen: The city of Pueblo, Colorado, at the Pueblo Memorial Airport, has initiated an Outdoor Aircraft Museum. We currently have on display an F-100D on loan from the Air Force Museum and an A-26C (B-26C) purchased from a private source.

We have communicated with many organizations, individuals, and private corporations in an effort to locate restorable (for display) World War II aircraft. The aircraft need not be flyable, only in good enough condition that the exterior may be reasonably restored.

In less than thirty years, these planes are almost nonexistent. Further, since aircraft models seem to disappear rapidly after retirement, we are interested in older newer aircraft for at least exterior restoration and preservation.

We plan, in the not too distant future, to construct a large building for display of fabric-covered and fragile aircraft not suitable for exterior display. We will accept a craft on a donation, loan, or purchase basis within the limits of our budget.

Any consideration . . . will be greatly appreciated. We feel sure that somewhere there are a few such aircraft sitting on an airfield.

in a hangar that would be ideal for our purpose.

We wish further to express publicly our appreciation to the US Air Force Museum for their excellent cooperation in our venture. They have not only loaned us one aircraft, but have provided valuable technical information in restoring our A-26C (B-26C).

Lyle C. Sharp
Director of Aviation
City of Pueblo
Airport Box 32
Pueblo, Colo. 81004

Wise Decision

Gentlemen: The service you have provided me under the provisions of my Flight Pay Insurance policy has been absolutely superior. The swiftness of your reaction to my letter of notification could not have been better and the regularity with which you responded to the monthly certification of continued grounding is equally perfect.

Several times over the years, I had debated with myself on the wisdom of carrying such a policy and very nearly let it expire. However, my better judgment prevailed, and, as a result, the compensation received over the past year far surpasses the sum expended on premiums. Needless to say, your printed guidance to me as a policyholder was one of the prime factors influencing my most appropriate decision.

I appreciate very much the personalized attention our Air Force Association provides its members and extend my heartfelt gratitude to everyone involved, not only in the insurance business but in the publication of the AIR FORCE Magazine as well. Keep up the good work.

Col. Claude C. Mitson
APO San Francisco

490th Bomb Group

Gentlemen: Several people are trying to update the addresses of former members of the 490th Bomb Group, Eighth Air Force, which was based in England in 1944-45.

The respondents should contact:

Joseph L. Milliken
933 Tamarack St.
Eugene, Ore. 97401

Gerald Leland
Dayton, Ohio

118th Air Aces

Gentlemen: I am currently preparing a work about the P-38 air aces

of World War II. There are several units that I would like to contact for the purposes of verifying research details and obtaining background material. I would be grateful if you could be of any aid to me in locating associations formed for any of the following units:

Fifth Air Force

8th Fighter Group
35th Fighter Group
49th Fighter Group
475th Fighter Group

Eighth Air Force

55th Fighter Group
479th Fighter Group

Ninth Air Force

367th Fighter Group
474th Fighter Group

Tenth-Fourteenth Air Force

51st Fighter Group (449th Sqn.)
80th Fighter Group (459th Sqn.)

Twelfth-Fifteenth Air Force

1st Fighter Group
14th Fighter Group
82d Fighter Group

Thank you for your kind attention and for any help or source of help that you may provide.

John Stanaway
4006 Washburn Ave., N.
Minneapolis, Minn. 55412

UNIT REUNIONS

Ex-POWs

American Ex-Prisoners of War 1974 National Convention will be held in Las Vegas, Nev., July 24-28, at the Stardust Hotel. All ex-POWs are invited. Reservations should be made by writing to the Stardust Hotel, Las Vegas, Nev. The hotel has a camp ground for trailers and campers and requires reservations also. For more information write

Herman E. Molen
X.P.O.W.s
P. O. Box 895
Henderson, Nev. 89015

Military Honor Society

The tenth-year anniversary party of the AeroSpace Officers Military Honor Society will be held in early March in Miami, Fla. All alumni members are invited. For further information contact

Cadet Dean A. Colello
AFROTC Det. 155
P. O. Box 8164
Coral Gables, Fla. 33124

11th Bomb Group Ass'n

The '74 National Reunion of the 11th Bombardment Group (H) Association

will be held in Kansas City, Mo., July 24-28. For further information contact

Robert E. May
P. O. Box 11
Perrysburg, Ohio 43551

12th Tac Recon Sqdn.

All former members of the 12th Tactical Reconnaissance Squadron of World War II fame are requested to get in touch re a reunion in 1974.

M. Leo Elliott
5444 Bay Center Dr.
Suite 125
Tampa, Fla. 33609

Phone: (813) 879-0958

34th Air Depot Group

The 1974 reunion of the 34th Air Depot Group Association will be held August 16-18 in Denver, Colo. Contact

Joseph D. Myers
2729 Ostrom Ave.
Long Beach, Calif. 90815

OCS Class 48-B

The OCS Class 1948-B reunion will be held in June in San Antonio, Tex. For specific details contact

Col. Phillip E. Nathanson, USAFR
103 Biltmore Dr.
San Antonio, Tex. 78213

Classes 54-G and 54-K

All members of Pilot Training Classes 54-G and 54-K interested in a combined twenty-year reunion in Las Vegas, Nev., June 7-9, please contact

54-G Robert Wearley
Chief Pilot
Corporate Air Transport
Summa Corp.
P. O. Box 309
Las Vegas, Nev. 89101

54-K John S. McIver
Hughes Aircraft Co.
Corporate Flight Operations
Bldg. 25 M 127
Centinela & Teale Sts.
Culver City, Calif. 90230

366th Tac Fighter Wing

The second annual 366th Tactical Fighter Wing reunion is scheduled to be held at the El Tropicano Motor Hotel, 110 Lexington, San Antonio, Tex., May 10-12. Further information from

David Poli
Box 4038
Mountain Home AFB, Idaho 83648

466th Bomb Group (H)

The 466th Bomb Group (H) will hold its third annual reunion, along with the 2d Air Division Association, at Timme Plaza, Wilmington, N. C., July 24-28. Contact

Lt. Col. John H. Woolnough
7752 Harbour Blvd.
Miramar, Fla. 33023

Phone: (305) 961-1410

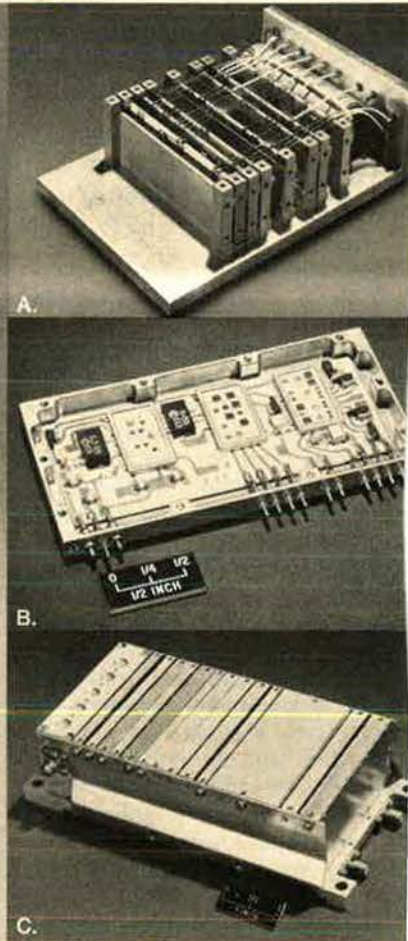
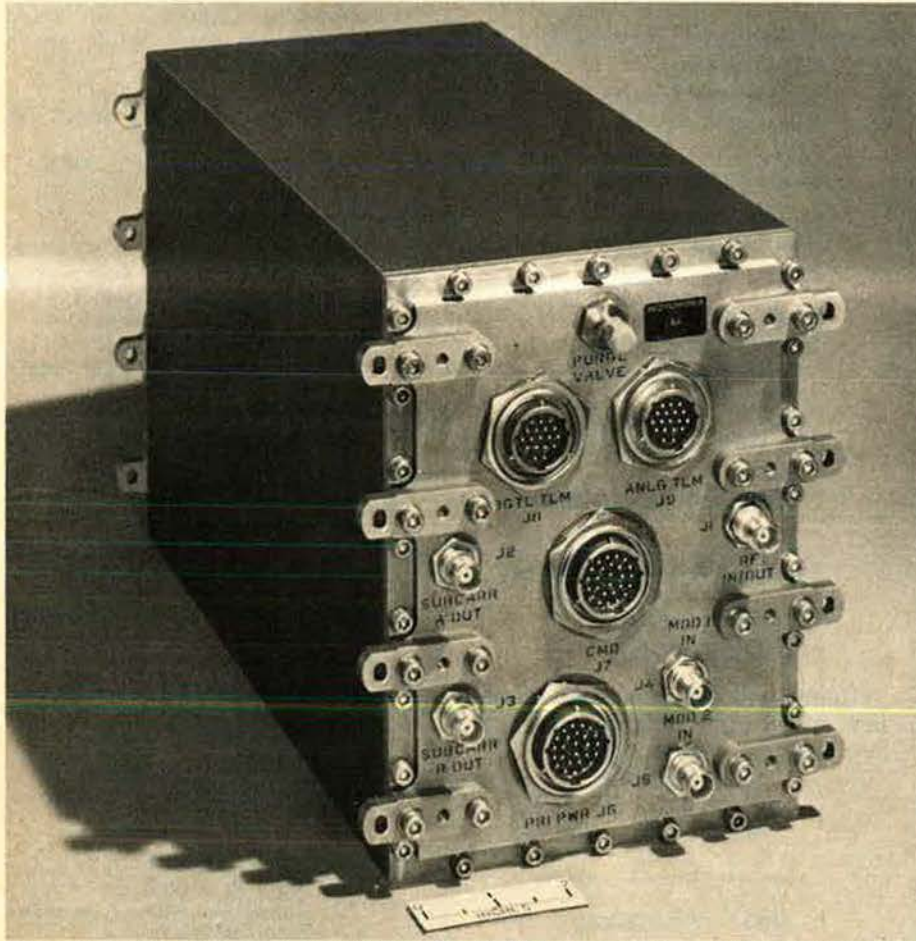
586th Bomb Sqdn.

A reunion of the 586th Bomb Sqdn. will be held in Dayton, Ohio, August 1-4. Please get in touch with

Col. Joe M. Silk
139 Point Circle
Jupiter, Fla. 33458

CHALLENGE:

Keeping space technology moving



Our ugly-duckling is a great-grandfather. The ERTS transponder, the son of Apollo, has provided the genes for a number of transponders being used on current space programs. And, Motorola is providing the creative power to keep space technology moving

by developing a new multi-mission miniature transponder. a. e breadboard, b. typical module illustrating technological innovations, c. receiver portion which is currently undergoing space qualification testing.

Many new missions demand new thinking.

A lot of people seem to think that since space program funding has dropped off, technology will slow down to the point where a standard line of products can be cranked out for years to come.

They're right... They're wrong.

It depends on your requirements. And the company you're talking to.

We look at it both ways. Some of our products are dandy for new programs even though they were designed some years ago. For example, the unified S-band transponders we supplied to the Apollo program evolved into the ERTS transponder which is the industry standard. It's size and weight-effective for several programs now in the works. But for the far reaches of the solar system and new near-Earth missions, new techniques are needed. So we've developed them. We've completed a miniature transponder that's now in testing. And we've

begun development work on a micro-miniature space transponder barely bigger than a pack of cigarettes designed to increase reliability through new techniques including beam lead technology. Which approach makes sense depends on your mission requirements and a variety of other factors.

Because we have a variety of solutions (to a variety of problems, not just transponders), instead of one item to push as a panacea, we'll recommend what's right for your requirements, after checking over the long line developed for programs ranging from Jupiter, begun in 1954, to Viking Orbiter 75.

The range of products we've provided and our history of pushing the state of the art to its limits are two of the reasons we've outlasted a lot of competitors. We intend to outlast a lot more. We keep moving ahead as fast as possible, under contract, with Independent Development Program funds and with Motorola-sponsored R&D so we can make leaps instead of small incremental steps. But we aren't out to make changes just for the sake of change. Our interest is meeting mission requirements.

When money's tight.

...ants at the lowest possible cost with assured reliability, whether what we sell is old or new.

Why we daily can change our answers to a single question without lying.

Component technology is still boiling, almost as hot as it was when "space" was a big enough word to get any stock skyrocketing. As a result, when you call to discuss a program you're planning, we'll give you several answers. We'll tell you what we've already done and what we can do the job. We'll tell you what we now can do. We'll tell you what we'll be able to do by the time your needs doing...even if we run into a snag or two along the way. We'll tell you what we expect to be able to do. And we'll tell you where we think the technology you're interested in is heading.

This won't be done as double-talk to confuse you. It is the only way to evaluate what you can reasonably expect to get. Without paying development costs beyond your budget. It's the best way to learn how to build a better system (in at least some aspects) than you could expect to be able to afford.

We're out to move up in the systems business.

A lot of people think of us as "nice, solid, reliable Motorola."

It's the old story. You don't get a reputation for being conservative in a business like ours by accident. If you "happen" to have years of high-technology experience, you end up looking conservative, with equipment that works every time you press the button.

And we're out to build larger and larger subsystems and complete systems. We have experience, capabilities including a unique inhouse IC shop, technology



inhouse IC shop (above) and our close working relationship with our Semiconductor Products Division permits speedy implementation of paper designs into custom IC's.

...everything else needed...except for one thing. A lot of people still think of us as an exclusively black box manufacturer. We left that stage long ago when we began tying black boxes together to perform system functions. Then we began putting several boxes in one box. Each one smaller, more reliable, more sophisticated than the one

before. We've built complete tracking systems and satellite communications systems. So the next time a requirement comes up, think of us as what we are: the people that are here to stay, making their living by solving your system and subsystem problems in space. Whether RF, digital, or an integrated system.

Deep space would be a lot quieter if we shut up.

It's easier to count space programs we weren't on than those we've been involved with by supplying tracking, telemetry and command, ground communica-



Moving digital data at a gigabit rate is not a challenge anymore at Motorola, it's a common day-to-day reality, but our engineers are tackling the challenge of handling 2 and 3 gigabits of digital data.

tions, spacecraft communications, checkout equipment, and payload electronics including memory systems, secure communications and signal processing, plus special test equipment.

Just in case you're keeping score, a few of our latest programs include Skylab, Viking Orbiter, Mariner Venus Mercury, FleetSatCom, HELIOS, ERTS, GEOS Atmospheric Explorer, various military satellites. Along with the latest in space communications we've added some new wrinkles from radiation hardening to new levels of integrated packaging.

If some of the things we've been doing look even remotely like something you need, drop us a line at Aerospace Communications, Motorola Government Electronics Division, 8201 E. McDowell Rd., Scottsdale, AZ 85257 or call (602) 949-2277 and we'll kick it around with you. We'll give you data on the systems we've produced that might meet your need, or what it's likely to take in the way of new development to meet your requirement. Or contact one of our international offices.



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Airpower in the News

By Claude Witze

SENIOR EDITOR, AIR FORCE MAGAZINE

For Better or For Worse

Washington, D. C., January 7

A few days ago, at San Clemente, President Nixon signed the Fiscal 1974 defense appropriations bill. The final figure, reached in conference between the House and Senate, is \$73.7 billion. With supplemental funding and the outlay of funds appropriated in previous years, actual spending in the year—which ends June 30—will be closer to \$80 billion.

Three weeks from today, according to the White House, the Chief Executive will go back to Congress with a new request for the Pentagon for Fiscal 1975. The figure this time cannot be less than \$84 billion, and it may be in the range of \$87 billion. The first details will be released before this issue of AIR FORCE Magazine is delivered.

The Fiscal 1974 defense budget passed the Senate on a voice vote. In the House, the tally was 336 to 32. There was no serious opposition. The liberals have not only retreated on the defense issue; there is evidence that some of them, alarmed by Russian and Arab successes in the Middle East, are reversing their position on many aspects of national security.

In fact, for all the earlier screaming that weapon programs had to be cut in order to sustain welfare programs and provide milk for children, there were no massive procurement cuts. "After years of unsuccessful fights," the *New York Times* reported from Capitol Hill, "the critics of the Pentagon have grown weary. But in addition, as Senators privately acknowledge, the war in the Middle East in October had a profound impact here, raising questions about the security of Israel and the long-term intentions of the Soviet Union." They are apprehensions, the newspaper did not add, that somehow did not seem important when it was the security of South Vietnam that was threatened, also by munitions shipped in from Russia.

Differences between the House and Senate were settled in conference. So far as the Air Force is concerned, it came out with a budget of \$23.1 billion, down from an original request of \$24.3 billion. The total of \$73.7 for the entire Defense Department is only \$3.6 billion less than requested at the outset. Here is the final decision on some items of major interest:

- The \$151.6 million for twelve F-111 fighter-bombers was approved as authorized and voted by the House. The Senate had denied the money. The Pentagon never asked for it.

- There was no dispute about the B-1 bomber. Funding was set even before the conference, at \$448.5 million. \$473.5 million was requested. The cut is considered minor.

- There was a real compromise on the F-15. The House had voted \$876 million for sixty-eight aircraft.

The Senate version said \$826 million for sixty aircraft. The final version: \$848 million for sixty-two planes.

- The row about USAF's Airborne Command Post continued down to the wire. For continued R&D of the concept, there appears to have been agreement on a figure of \$33.1 million, instead of the requested \$37 million. Then, USAF wanted funds to start advance procurement of a third Boeing 747, out of a planned buy of seven. The House deleted the procurement funds. The Senate restored them. In conference, the Senate remained restored. The House, as the saying goes, receded.

- It was reported that the conferees spent more time on the Army's site defense antiballistic missile system than anything else. The Administration asked for \$170 million. The House refused any funding despite the fact that Congress had authorized \$130 million. The Senate Appropriations Committee recommended \$110 million, and that figure prevailed. The money is to continue development; it is viewed as a hedge against collapse of the SALT negotiations.

- The Navy's Trident submarine program took a cut of \$240 million from a request for \$1.5 billion. This will slow the effort. The cut was first approved by the House, and the Senate agreed to it.

- With manpower now accepted as the Pentagon's major financial burden, an important amendment was accepted from the Senate. It provides \$400,000 to set up a Defense Manpower Commission, appointed by Congress and the President, to study long-range personnel needs. There was debate about this on the Senate floor, some members arguing the Commission cannot learn anything not already known to the civilian management and the Joint Chiefs of Staff, but the amendment survived. It appeared to be preferable to another proposal, by Sen. William Proxmire already approved by the House, that would have placed an immediate ceiling on the number of top-ranking officers. In conference, the House receded on this issue. As signed, the bill will cut active-duty troop levels down to about 2,100,000.

- Another issue that was compromised was the funding for military assistance to South Vietnam and Laos. There was an initial request for almost \$1 billion. The House approved little more than \$1 billion. The Senate accepted another Proxmire amendment that limited the assistance to \$650 million, a figure that cut the House total by another \$358.5 million. The conferees settled on \$900 million, and that is in the law. It also says that this funding is to be handled in the future by the State Department, not Defense. For Laos, this will start in Fiscal 1975 and for South Vietnam in Fiscal 1976.

Special attention should be directed this year to the report of the Senate Appropriations Committee



The Senate Appropriations Committee, headed by Arkansas Democrat Sen. John L. McClellan, recently issued a 173-page report that notes with alarm that our defense posture is shrinking, while the strength of potential enemies is growing.

headed by Sen. John L. McClellan of Arkansas. It is longer than usual, 173 pages, and many of its observations were ignored by the press. The report includes a strong appeal for adequate defenses, full emphasis on the requirement for economy, yet also a fact sheet on the real magnitude of the defense budget.

Our posture, the report says, must reflect our treaty commitments and discourage aggressors. It cites again that we must fight with what we have on hand and hopes that international tensions will go down. But, the report adds, optimism must not result in a lowering of our guard. It says, "Those nations who in years past have amply demonstrated their desire for world dominance have more recently increased, rather than relaxed, their military potential. Under these conditions, it behooves this country to maintain a military strength commensurate with any anticipated threat, not merely as a bargaining agent, but rather as a condition of national survival."

As for economy, it tells the Pentagon to "tailor its procedures to the times" and calls for a focus on buy-before-you-buy, a curb on change orders, less gadgetry, multipurpose weapons, and, most important, the use of personnel, which takes fifty-six cents out of every defense dollar.

Our defense posture, the committee says with alarm, is shrinking. In addition to the military manpower problem, aggravated by the shift to an all-volunteer force, the Defense Department spends \$13.5 billion on civilian workers. The cost is double what it was in 1964, yet the Pentagon has the lowest number of such employees that it has had since 1951.

In the area of procurement and R&D, there also has been curtailment. The funds are only slightly higher than they were in 1964, despite inflation and increased sophistication. Figures are cited, showing that a ten-year increase in defense spending of \$28.2 billion provided \$27.2 billion for pay and operating costs and only \$1 billion more for procurement, R&D, and military construction.

This is reflected, the report says, in a Navy with 523 ships, as opposed to 1,129 in 1953. And a cutback in carrier wings from twenty-four to fourteen in ten years. For USAF, there now is support for only sixty-seven tactical squadrons. There were 144 at the height of the Vietnam War. The committee concludes the trends are disturbing, in view of the necessity for advanced weaponry in this era. It finds the requirement for technological superiority more compelling because of the cuts in manpower.

"The committee," the report says, "wishes it to be fully understood that in an era in which an international crisis may overnight replace a détente and when potential aggressor nations are continuing to augment their military forces, the present budget for the Department of Defense is, in many respects, at a lower level of preparedness than it has been for many years."

At this writing, there are high hopes for a settlement in the Middle East. Yet, only yesterday, Defense Secretary James R. Schlesinger, appearing on a television interview, warned that the Arab nations with their oil embargo are running a risk of encouraging the use of force against them. He was quoted as saying, "One should not tempt fate by pushing the concept of national sovereignty too far."

This is not the lone view of a man running a military complex. Only three days ago, Stephen S. Rosenfeld,

Facts to Paste in Your Hat

The Senate Appropriations Committee has summarized some truths about defense spending and its relation to other government costs. Main points are:

- In Fiscal 1964, defense absorbed 42.8 percent of federal outlays. The figure for Fiscal 1974 is 29.4 percent.

- Over the past decade, government costs have gone up 127 percent. Defense costs have gone up fifty-seven percent. As a percentage of total outlays, they have gone down thirteen percent.

- If we separate the costs of defense from the costs of the rest of government, the fifty-seven percent increase in defense compares with a 176 percent increase in costs for all other activity.

- Twenty years ago, defense spending was double that of all other federal agencies. Today, the other agencies spend more than twice what the Pentagon spends.

- Twenty years ago, defense spending was double that of all state and local governments combined. Today, the situation is reversed.

- Twenty years ago, about forty-nine cents out of every tax dollar—federal, state, and local—went for defense. Today, the figure is nineteen cents.

- Twenty years ago, total defense manpower was nearly equal to all other public employment—federal, state, and local—combined. Today, such other public employment exceeds defense manpower by nearly four to one.

- Defense spending, for the first time in American history, is today below prewar levels in terms of what the dollar will buy. That is true either after or during a war.

- The committee conclusion:

1. The defense budget does not dominate public spending.

2. The defense budget is not the primary cause of the high cost of government.

3. The defense budget has not deprived human resources programs of needed funds.

Airpower in the News

a liberal commentator on the staff of the Washington Post, looked at the oil crisis and posed this "unthinkable" question:

"Why should not some of [the countries hardest hit]

get together and work out a coup or an invasion of one oil country or another in order to assure themselves of a reliable source at a reasonable price?"

He is surprised, he writes, that war has not been suggested as a solution. He finds that much of Europe and certainly Japan have a more pressing grievance than the nations that have resorted to violence in Indochina, South Asia, the Mideast, and Czechoslovakia.

Nobody is trying to promote war as a solution. But anyone who promotes a reduction in our defense effort is blind to the potential in the mid-70s.

The Wayward Press

As we were saying, back in the summer of 1972, the performance of the press covering that year's Presidential campaign was deplorable. It has taken many months to get organized documentation for this, but now it is at hand. There are two recent books that examine the kind of professionalism shown by newspapermen that year, and, if you are interested in how political news is gathered and evaluated and presented, and what kind of people do it, they are required reading.

One is *US & THEM: How the Press Covered the 1972 Election*, by James Perry (Charles N. Potter, \$7.95). The author is a columnist and former political editor of the *National Observer*. His opinion of his subject is that "no group of reporters in the history of journalism has guessed so wrong so often."

A second book is *The Boys on the Bus*, by Timothy Crouse (Random House, \$7.95). He is a reporter for a publication called *Rolling Stone*, and his assignment was the same as James Perry's. His conclusion is about the same; he has little respect for the boys on the bus and writes about them with an irreverence that is refreshing. At times, he is funny.

Some commentators, no doubt, will view these two books as part of that conspiracy to discredit the press they believe started in the Nixon Administration. Well, both authors are highly critical of the Nixon Administration, as well as critical of the press. Mr. Crouse, who assails the Ron Ziegler operation with vehemence, also finds that the White House press corps won't do anything about it. The reason is that they work like a herd of sheep. Mr. Perry says President Nixon is disliked by most reporters. He is viewed as devious, introverted, inconsistent, opportunistic, humorless, and sanctimonious.

The two campaign observers share the opinion that Theodore H. White, who has written a series of books called *The Making of the President*, starting in 1960, and repeated each four years, has

had a profound influence on press coverage of the campaigns. If you hunt for the reason, it is that Mr. White has consistently scooped the newspapers on what should have been their story. He comes out, many months after the campaign, with all the interesting and sometimes gory details that make the story worth reading. It is a contribution to history and will be used by historians. The newspaper clippings will be near worthless.

Crouse says that Abe Rosenthal, managing editor of the *New York Times*, told his staff: "We aren't going to wait until a year after the election to read in Teddy White's book what we should have reported ourselves." He says that by 1972 most editors were giving pep talks to their staffs about the importance of getting inside dope. Then, Crouse, reporting on what he has seen and heard riding with the boys on the bus, demonstrates what kind of nonsense results.

Author Perry agrees that the influence of White has been bad. He argues that the regular press, trying to mimic White during a campaign and not after it is all over, has become a band of "nit-pickers, peeking into dusty corners, looking for the squabbles, celebrating the trivia. . . ." Thanks to White, he says, the coverage is out of focus. "Our who's-ahead mentality is reckless; more than anything else, in 1972, it helped

"Usually when the President [Nixon] takes a trip on Air Force One a pool of at least seven reporters, cameramen and television technicians fly on the plane with him."—Martin Arnold, in the *New York Times*, December 22, 1973.

"Unlike previous presidents, [Nixon] doesn't allow any reporters to ride in his plane. . . ."—Milton Viorst, in the *Washington Star-News*, December 22, 1973.

Which newspaper did you read on December 22, 1973?

to damage our credibility and confound our readers, because, quite simply, there was no way we could have been right."

Neither book offers a blanket indictment. They do single out a few reporters who are not guilty of deliberately shoddy journalism. But there are few of them and even they are handicapped by the lack of any accepted standard of excellence.

A few reporters get rough treatment. R. W. "Johnny" Apple of the *New York Times* is portrayed by Mr. Crouse as a smug stuffed shirt, roundly detested by many of his peers. Perry says Apple "used" by his sources when they wanted something in the *Times* for political purposes.

As might be expected, however, they do not agree on some other situation. One example is the conduct of Jack Anderson, the "investigative reporter" who went on the air in late July 1972 claiming he had "located photostats of half a dozen arrests for drunken and reckless driving" in which the principal was Sen. Thomas F. Eagleton, then the Democratic Vice Presidential nominee. Mr. Perry goes into the incident in detail, including Anderson's appearance on "Face the Nation" with Eagleton, where the reporter took one step toward an apology, then reneged and left the Senator speechless. Anderson, of course, had no photostats, any other kind of proof, and his performance was a disgrace to the newspaper business. Mr. Crouse, in his book dismisses the Anderson outrage with a footnote on p. 332. He is not critical of Anderson.

It is Perry who comes up with the best conclusion: "We can never be perfect, but we can be better. We cannot continue to do things the way we've always done them. . . . I detest floundering about the press, the pretty little speeches about the First Amendment, Peter Zenger, and the neighborhood carrier boy. We are not what some of us think we are, and we never were."

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C., JAN. 4
Air Force has received a long-awaited DoD go-ahead to conduct a series of four OBLs—operational base launches—from ICBM silos in Montana.

The four shots—scheduled for next winter—are to involve Minuteman II missiles with flight trajectories that will bring them down near the Phoenix Islands, southwest of the Hawaiian Islands—a flight of about 5,000 miles.

Shortly after launch, the unarmed missiles are to attain an altitude of up to 350 miles and pass over portions of Montana, Idaho, Washington, Oregon, and California. It is the passage of missiles over populated territory that has made OBLs politically unpalatable heretofore.



(Many missile test launches over the Pacific have taken place from Vandenberg AFB, Calif., however.)

The planned launches, under a project dubbed Giant Patriot, are to be the first from operational silos in the US. It is interesting to note, in contrast, that the Soviet Union has had a long history of OBLs: almost 100 in the last ten years, with more than half taking place within the past year.

The Minuteman IIs are to be fired from silos in open country near Great Falls, Mont. Air Force plans to thoroughly brief concerned state and local officials and other interested persons about the extensive safety precautions being taken in the program, including the destruction of in-flight missiles, should that become necessary.

"The spent first stage and four protective engine covers for the second stage would be jettisoned over land. The empty twenty-eight-foot first stage would fall on uninhabited land just west of the Montana/Idaho border," Air Force said. The four-by-five-foot metal engine covers are expected to impact near the border of Washington, Idaho, and Oregon—with a high probability of their landing on federal land, according to USAF.

For further discussion of the Air Force's OBL program, see p. 53.



The nation's military, as well as civilian community, has been hard hit by the Arab embargo on oil. Until shipments were shut off, DoD depended on Mideast sources for up to fifty percent—some 330,000 barrels daily—of its petroleum-product requirements.

Next winter, USAF plans to launch four Minuteman II ICBMs from silos in Montana in a series of operational base launches (see above). Here, a Minuteman II is gingerly lowered into its silo.



Lt. Col. Leo K. Thorsness, a Medal of Honor winner and the subject of a feature story in the December issue, recently retired from the Air Force to campaign for a US Senate seat in the state of South Dakota.

Under normal conditions, what part of the nation's energy supplies are used by the defense establishment?

According to DoD, the military uses about 2.5 percent of all energy consumed nationally. About three-fourths of the country's energy is derived from petroleum—a gigantic gulp of 17,000,000 barrels a day. The military consumes about 3.7 percent of this.

Of other sources that help power the country as a whole, electricity provides about 12.5 percent, coal about five percent, and natural gas and propane about seven percent.

By far, the biggest expenditure of DoD's share of the energy supply is in the operation of aircraft: sixty-five percent. Keeping ships at sea requires about fifteen percent, while all other uses—such as maintaining ground installations and the like—takes the final twenty percent.

As for saving fuel, a DoD spokes-

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man said, "We were involved in a conservation program well before the onset of the current crisis. We've always been energy-conservation-minded, if for no other reason than the budget process made us so." A plan had been in the works for some time prior to the pinch to cut energy consumption, DoD said.

To help out in the current shortage, the services have thus far cut flying hours by eighteen percent and ship steaming time some twenty percent. Military vehicles also have been ordered to reduce speeds to fifty mph or less, among other steps to stretch fuel supplies. And in Europe, a special \$25,000 fund has been set up by USAFE to reward those offering fuel-saving suggestions.

Getting top-priority consideration as far as operational elements are concerned is the US Sixth Fleet in the Mediterranean.



NASA has in the works a specially engineered building designed for experiments in harnessing solar energy for heating and cooling.

To be completed by mid-1975, the 53,000-square-foot Systems Engineering Building is under construction at NASA's Langley Research Center, Hampton, Va.

"This building, as far as we know, will be the first of its size in the world for which solar energy will provide a significant part of the heating and cooling load," said NASA Administrator Dr. James C. Fletcher.

The heating and cooling takes place essentially through the use of water-filled tubes inside "solar collectors" that absorb the sun's heat, "using it for direct hot-water heating and to operate an absorption refrigeration unit for cooling," according to NASA.

The new facility's central objective will be to evaluate the latest in solar-collector technology under realistic operating conditions. This technology is currently being worked on by NASA and other federal agencies.

Ultimately, experts believe, solar plants will be capable of heating



Maj. Gen. James R. Allen, formerly SAC's Chief of Staff, has been named to the newly created post of Special Assistant to USAF's Chief of Staff for B-1 Matters.

homes as well as factories and other large buildings.



More on the fuel-shortage front. The Federal Aviation Administration has put into effect a conservation plan aimed at saving about 840,000 gallons of jet fuel per day, or 2.7 percent of daily jet-fuel consumption in the US.

The plan is based on shoring up

the efficiency of jet aircraft and contains seven points:

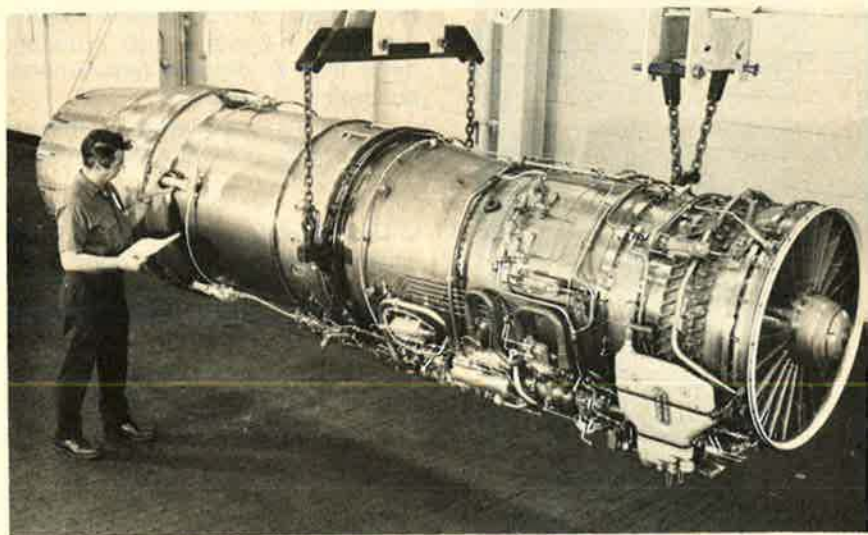
- Revise gate-hold procedures so that aircraft will burn a minimum amount of fuel waiting for takeoff.
- Revise air-traffic flow procedures to reduce the time aircraft remain aloft because of congestion.
- Hold aircraft at higher altitudes (where fuel consumption decreases) and minimize circuitous routings.
- Increase use of optimum cruising speeds.
- Taxi aircraft with fewer engines.
- Increase use of aircraft simulators.
- Accelerate improvements on runways and taxiways.



In late December, and for the first time in the history of space exploration, the US and the Soviet Union had manned missions orbiting the earth simultaneously.

The Soviet mission—Soyuz-11—with two rookie cosmonauts aboard—lasted eight days, and US experts think that there might have been at least a partial failure of some major equipment. The craft touched down safely, however, after some problems with heavy weather during landing.

Soyuz-13 was the second Soviet manned flight in less than three months, and indicates that the USSR is gearing up for the joint manned flight scheduled for 1974. (The Soyuz craft received a major redesign following a tragedy in 1970.)



The 25,000-pound-thrust Pratt & Whitney F100 turbofan, developed for General Dynamics' new YF-16 Lightweight Fighter, produces twenty-five percent more power per pound of engine weight than the best previous fighter aircraft engine, according to company spokesmen.



Charles H. Church, Jr., right, President of AFA's Harry S. Truman Chapter, receives the first contribution to the Paul Stoney-AFA Memorial Scholarship Fund from recently retired Major General Stoney. The fund, cosponsored by the General's former command, AF Communications Service, honors AFCS Vietnam dead. It will benefit AFCS people and their dependents.



Maj. Gen. Travis R. McNeil, right, Assistant DCS/Personnel, Hq. USAF, and Commander of AF Military Personnel Center, proudly admires plaque presented to the Center by Brig. Gen. John P. Flynn on behalf of the 4th Allied POW Wing. General Flynn was highest ranking USAF POW. The "Wing" recognized the Center's work for them and their dependents.

that killed three cosmonauts during reentry.)

For its part, the record-breaking second manned Skylab mission orbited merrily on its way, as the three US astronauts wished their Soviet counterparts "smooth sailing." The astronauts were busy with the arrival of the comet Kohoutek, which, during December and January, was at its peak for scientific study.

In a related matter, the Soviet Union reported publicly for the first time about the journey across the lunar surface of its Lunokhod-2, a vehicle remotely controlled from Earth that was landed in the moon's Monnier Crater early in 1973. The Apollo-17 astronauts explored some 140 miles away in the Taurus-Littrow Valley in December 1972.)

According to the Soviet scientists, the lunar roving craft was tracked with great precision through the use of lasers, in an experiment jointly run by France and the USSR. Again, some US space experts suspect a systems failure aboard Lunokhod-2 since, after a two-week "hibernation" during the lunar night on the third leg of its wanderings, the craft was not reactivated as the schedule called for.



Late in 1973, ten ADC weapons controllers and pilots were named Masters of Air Defense in recognition of excellence in their air-defense specialties.

The honor is a coveted one, since

in the ten years that the program has been in existence only forty-four weapons controllers and eighty-six pilots have been so acclaimed.

The ten are now entitled to wear the specially designed blue blazers, crests, and lapel pins that are presented to signify the award.

The ADC pilots are Maj. Robert L. Blair and Capt. Mark B. Foxwell and Rodney L. Martin, 4757th ADS, Tyndall AFB, Fla.; and Capt. Ronald D. Maness, 5th FIS, Minot AFB, N. D.

The weapons controllers are

Capt. Ron E. Ball, 4642d ADS, Malmstrom AFB, Mont.; Thomas Davenport, Jr., Hq. North American Air Defense Command, Ent AFB, Colo.; Robert J. Grady, 4757th ADS, Fort Lee AFS, Va.; Robert W. Hodgkinson, Electronic Systems Division, Hanscom Field, Mass. (formerly with the 4757th ADS at Fort Lee); Stephen W. Sutton, 4757th ADS, Tyndall; and David N. Williams, 4629th ADS, Luke AFB, Ariz.

To achieve master status, pilots and weapons controllers must pass a very rigid battery of written tests



Maj. Donald R. Cribb, left, operations officer for the 356th Tactical Fighter Squadron, and Lt. Col. Charles R. Copin, 356th TFS Commander, demonstrate the pride they have in their unit at Myrtle Beach AFB, S. C., with personalized license plates reflecting the squadron nickname: "Green Demons."

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and performance evaluations, for which the men have prepared themselves for the most part on their own initiative.



In years past, few people found it necessary to have on hand quantities of such flammable liquids as gasoline.

Now, with the shortage, more drivers will be tempted to store a can of the stuff in their garages or cellars against the emergency of a dry tank.

But the word is out: Don't do it.

Since accidents of this nature have been relatively rare, scant attention has been paid to the fact that gasoline fumes accumulating in an enclosed area can pack the explosive punch of an armload of dynamite sticks. Gasoline fumes are equally lethal in the trunk of your car. Any spark can set them off.



The Air Force has indicated that it means business as far as getting more women into technical jobs is concerned.

USAF has set its sights on enlisting 800 women during FY '74, about fifty percent of whom will enter mechanical and electronic career fields.

"We need women in the technical fields—nearly every phase of aircraft systems repair, electronic-communications equipment operation and repair, and civil engineering, *i.e.*, building trades," said 2d Lt. Betty Price of the 3500th Recruiting Operations Group. "Our major problem now is convincing young women of the desirability of becoming skilled in the technical areas."

Of the 276 separate Air Force specialties for enlisted personnel, only seven jobs are closed to women, she said. Three officer specialties are also closed. The exceptions are due to the combat nature of the jobs, forbidden to women under law.

The US Navy, for its part, has graduated the first women physicians from its Naval Flight Surgeon Training Program.



C4C Stephen Dee, twenty-one, of Toledo, Ohio, prepares for a soaring flight at the Air Force Academy. He is the first freshman cadet in the Academy's history to instruct cadets in the art of flying sailplanes.

Lts. Jane O. McWilliams and Victoria M. Voge graduated in the top half of their class and were awarded wings in late December.



On December 7, 1973—thirty-two years to the day after the start of a war that took their lives—the remains of a five-man B-24 bomber crew were interred in Arlington National Cemetery.

And, as they had manned an aircraft and shared the last moments of life together, they will now occupy a common gravesite and monument at the national cemetery.

As fate decreed, the aircraft they were flying on a gasoline haul mission over the "Hump" of the Himalayas between China and India went missing on August 7, 1945—just days before V-J Day.

Flight Officer Richard R. Franken, pilot; 1st Lt. James W. Cantrell, copilot; Flight Officer Francis P. Yuskaitis, navigator; SSgt. Harvey Brockmiller, radio operator; and Sgt. William J. Cannady, engineer, were declared presumed dead in August of 1946.

Sometime last year, the wreckage of their B-24 was found in dense jungle near Imphal, Manipur, India.

Medical and dental records on file since the war helped confirm the identities of the missing men.



They were little more than sheet-metal huts and were often reflective of the English weather: windy, cold, and damp.

But to thousands of American

airmen serving in Great Britain during World War II, Nissen huts were home-away-from-home and were made to do.

We can still remember the interiors: the sagging cots, the little coal-burning pot-bellied stoves, the curved ceilings and walls festooned with pinups of Grable, Hayworth and other beauties of the era. Some huts were made quite livable—with insulation and elaborate murals by their artist inhabitants brightening the olive-drab walls.

The men who lived in them were very young, very optimistic about the eventual future of the world, and very high spirited. (One of them remembers when pilots retiring to their racks after a nocturnal flight shot out the lights with their .45s.)

In any event, while many of the brethren are quietly rusting on abandoned airfields all over Britain, one treasured relic of a Nissen hut will be around as an eternal reminder of what England was like for those men in the early '40s.

Through the generosity of the RAF, an intact Nissen is to become a permanent exhibit at the Air Force Museum, located at Wright-Patterson AFB, Ohio.

Appropriately, the Nissen in question is tinged with a historical hue all its own. It served as a beer hall at Debden Airfield, a few miles south of Cambridge. Debden was home base for an elite Eighth Air Force unit: the 4th Fighter Group.



Dedicating ADC Vets' Memorial at Colorado Springs Memorial Park are, from left, Terrence Patterson, sculptor; K. G. Freyschlag, VP of the Park Ass'n; retiring ADC V/C, Lt. Gen. T. K. McGehee; and J. D. Ackerman, Ass'n Secretary-Treasurer.

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f the Eighth's Second Division. The th was formed of the three famous Eagle Squadrons—made up of American volunteer pilots who joined the RAF prior to America's entry into the war. The 4th earned its reputation with the most enemy aircraft destroyed of any American unit.



In recent months, an interesting device with all sorts of potential applications has been demonstrated in various parts of the country, including the nation's capital.

The vehicle is "the world's first portable two-seater" Pindair Skima "an inflatable hovercraft [that] carries two passengers at up to thirty mph on land or water—at twenty miles to the gallon," according to the promotional literature.

Uses for the machine "range from rescue operations and surveying to exploration or just fun."

The 200-pound portable hovercraft is the brainchild of Michael Pindair, a Briton who evolved the idea from his work for an American company in moving oil tanks on air cushions.

He has also built a four-seater version—the Skima 4—and the Skima 3, "a high-performance craft with speeds of up to fifty mph."

With something less than a hundred of the various Skimas having been built thus far by the fledgling company, a spokesman said that Pindair hopes for a big market in



One of a number of lightweight inflatable hovercraft designed and built in Great Britain, a Skima 4 shows its potential in rapids during a recent 300-mile journey on unnavigable waters in North America. The craft may be put to a variety of uses once fully proved out (see item below).

North America, and that various US agencies—including the Coast Guard, Marine Corps, and FAA—have already expressed a "keen interest" in the Skimas.

Pindair claims that the vehicles are easy and safe to operate and are virtually maintenance free. "They are racing them already in Britain," a spokesman said.



The Air Force is testing a new lightweight, air-transportable aircraft hangar that is cheap, rugged, and capable of being quickly erected on uneven ground.

The new shelter, called LocArch by developer Lockheed-Georgia Co., is to be evaluated by Air Force Systems Command's Civil Engineering Center, Tyndall AFB, Fla.

Under USAF specifications, the new hangar must be able to with-

stand temperatures from twenty-five below zero to 125 above "and require no special equipment," USAF said.

For shipping purposes, LocArch's specially designed sections are stowed in containers which themselves are used in erecting the facility.

The Air Force is hopeful that the principle that went into the design of LocArch can be applied to other large structures like aircraft maintenance hangars and general-purpose shops.



NEWS NOTES—The FAA is currently undergoing a major reorganization keyed "to the creation of a new **Office of Aviation Safety** as part of a continuing effort" to increase efficiency, it said. **Oscar Bakke**, a twenty-seven-year vet of CAB and FAA, was named to head the new office.

Lt. Gen. Otto J. Glasser, USAF (Ret.), former Deputy Chief of Staff for R&D, Hq. USAF, was named **Vice President - International** for General Dynamics.

C1C William J. Sims has become the seventeenth Air Academy cadet to be a **Rhodes scholarship** recipient. The Academy ranks fourth in the nation in such awards since 1959. Only Harvard, Princeton, and Yale precede it.

Died: Alexander G. "Sandy" Hardy, an aviation insurance executive and active **Iron Gate Chapter AFAer**, in Washington, D. C., in December. ■

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MIA/POW Action Report

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

Search-Team Member Killed

The effort to account for Americans missing in Southeast Asia was dealt another severe blow in mid-December when helicopters landing a search team were fired on and two men were killed. The men were unarmed.

According to survivors, Army Capt. Richard M. Rees was machine-gunned as he stood with his hands over his head in surrender (search teams are instructed to raise their hands to show they are unarmed in the event they encounter enemy forces). A South Vietnamese helicopter pilot also died, and three other South Vietnamese and four Americans were wounded.

The three distinctly marked helicopters on the mission to locate the

remains of an American who had been missing since 1966 were disembarking search-team members some twelve miles south of Saigon when the Communist force opened fire on them with machine guns, rocket launchers, and individual automatic weapons.

The men's uniforms were identified with special orange patches and other insignia, clearly indicating the searchers' nonmilitant status. US officials said that the practice has been to notify both the North Vietnamese and Viet Cong well in advance of a mission so that search teams are not fired on accidentally.

In a formal protest—the first of its kind since the establishment of the four-power peace-keeping force early in 1973—US officials branded the act “a deliberate attack by a

hostile force who had infiltrated into the area with the intention of ambushing the team.”

Prior to the mission, the area that have been searched was believed to be under South Vietnamese control and free of insurgents.

The tragic incident leaves out the chances of recovering our Southeast Asian MIAs even further in doubt.

On Behalf of US MIAs

The League of Families made use of a number of devices to publicize January 27 as the first anniversary of the cease-fire in Southeast Asia.

Officials asked the President to mention the unresolved question of MIAs in the annual State of the Union Message and encouraged US congressmen to bombard Le Du Tho—North Vietnam's chief negotiator and signatory of the Paris accords—with telegrams “reminding him of his country's pledge to make an accounting of US MIAs. In this regard, no word has come from North Vietnam concerning the League request for permission to send a group of family members to Hanoi to seek information about missing Americans.

As had been anticipated, the League's membership has declined considerably since last spring as now stands at about 1,650 compared to 3,190 then. With the decrease has also come a financial pinch as contributions continue to dwindle but the “beginning of a response to a plea for funds has been noted an official said.

* * *

Since the return of the American POWs early last year, 103 Air Force men previously listed MIA have been presumed to have been killed in action, and, accordingly, their status has been officially changed by the Air Force Secretary.

Of these, three were from the list of sixteen Air Force men believed to have been prisoners. Men



—Wide World Photos

The apprehensions of captivity are registered on the faces of these Syrian POWs, taken by the Israelis during the counterattack on the Golan Heights. According to Israeli officials, the POWs in their hands are being treated according to the Geneva Conventions, and a list of them has been turned over to the Syrian government.

Egyptian troops guard Israeli POWs captured in the Sinai during the Mideast war. While Egypt and Israel later exchanged prisoners, Syria continued to hold captured Israelis. See below.



—Wide World Photos

This list had been identified by photographs or seen alive on the ground.

The fates of the many men who were thought to be in enemy hands but for whom no accounting has been made are still unknown.

* * *

Thanking his lucky stars is Homer L. Elm, released by the Viet Cong in mid-December following two months of captivity. A civilian employee of a US contracting firm, Mr. Elm was taken prisoner October 6, 1973, along with two South Vietnamese at Thanh Tri, 110 miles southwest of Saigon.

MIAs in the Mideast

Charges of brutalization and murder of prisoners of war continue to be leveled in the aftermath of last October's fighting in the Mideast.

After the cease-fire had brought a tentative cessation to the hostilities (broken intermittently by an occasional flare-up), Israel cited what it termed conclusive evidence that Egyptian, Syrian, Iraqi, and Moroccan troops had tortured and slain Israeli prisoners captured early in the Mideast war. Israel also said that it feared for the safety of its men still in Arab hands.

So widespread were the alleged atrocities, Israeli officials contended, that the Arab forces must have been acting under orders.

In its turn, Egypt charged that a number of its troops captured by Israelis in the Sinai were abused, including not being given desperately needed drinking water.

The truce that brought the shaky

cease-fire, mediated by the US's peripatetic Secretary of State Dr. Henry Kissinger, did result in an exchange of prisoners between Israel and Egypt. But as the negotiations to arrive at a "permanent" accommodation in the Mideast dragged on into the new year, Syria had made no move to exchange those Israelis captured during the Golan Heights fighting, where, Israeli officials charge, many of the wounded and unharmed men were murdered (at least seventy all told, forty-two in Syria, the Israelis said, noting that particularly harsh treatment was meted out to captured Israeli pilots).

At this writing, Syria had not yet provided a list of Israelis held captive, believed to total more than a hundred. Nor had International Red Cross representatives been allowed to see them, Israeli officials said.

On the other hand, Israeli officials said that they had made available a list of Syrian POWs and had allowed the Red Cross to inspect them and the medical attention provided. (It was reported that some American medical volunteers who had gone to the Mideast to offer their services to Israel found themselves treating Arab wounded instead.)

And as the truce talks bogged down, many Israeli families asked a question all too familiar in the recent past to Americans: What was the state of their men missing in action? (To this there was at least a partially encouraging answer: Some forty Israeli POWs have been identified following their capture through photos and film taken by the news media.)

Israeli officials, concerned about

the long-term fate of the captives, offered several concessions to bring about a POW exchange with Syria: Israel would allow those villagers displaced by the fighting around the Golan Heights—now in Israeli hands—to return to their homes; and would return to Syrian control several strategically important positions overrun in the Israeli counter-attack on the Golan Heights. (For an on-the-spot analysis of the implications of the brief but significant Mideast conflict, see p. 36.) The Syrians refused.

As this is being written, the Israelis are confronted with the same kind of stalemate vis-à-vis its MIAs as that facing the US in Southeast Asia (see *January '74 issue*, p. 45). The other side has thus far balked at abiding by terms of the cease-fire; the application of armed force to bring about compliance is out of the question at this juncture.

In mid-December, the Israelis borrowed a technique from their American counterparts: They hoped to bring world opinion to bear by stressing the humanitarian aspects of the matter. Their bid was for at least a list of the POWs.

To that aim, several Israeli family members of missing men visited the US, and while in the nation's capital stated their case to the media and representatives of US veterans groups and the League of Families. (For security reasons and because of fear of reprisals against their men, they did not identify themselves. One young wife of an Israeli F-4 Phantom pilot took some comfort on learning from a Lebanese journalist that her husband was alive, though badly wounded. The Lebanese newsman reported that during a hospital bedside interview, the pilot said that he had been shot while parachuting following exit from his crippled aircraft.)

Whether a list of Israeli POWs is forthcoming, or the men exchanged, it is certain that the use of POWs as pawns in international political bargaining, which was brought to a new high by the North Vietnamese, now appears to have become a part of modern war, counter to a half-century of agreements aimed at reducing the brutality of conflict. ■

COLLINS DIGITAL TACAN

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For more information about Collins' new Digital TACAN, contact Collins Radio Company, Government Avionics Sales, Cedar Rapids, Iowa 52406. Phone: 319/395-2070.

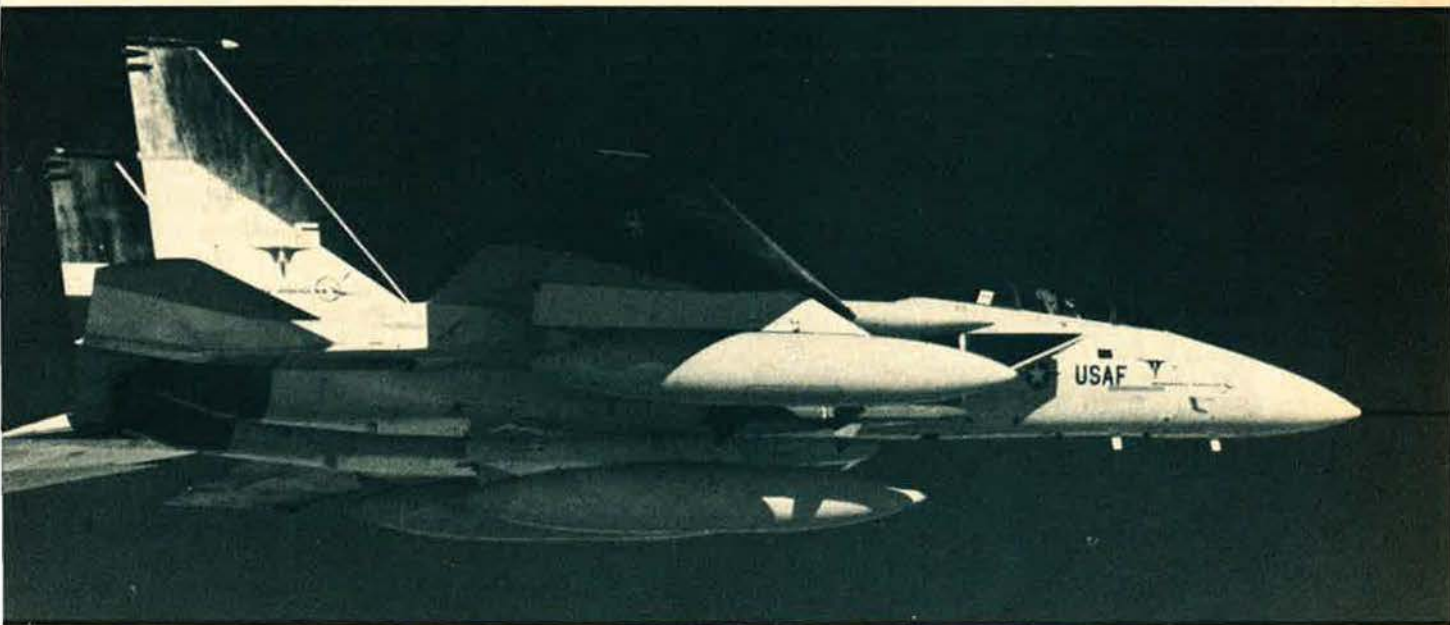


F-15 PILOT REPORT

Does the McDonnell Douglas F-15 live up to its advance billing? All the tables of data say it does, but it's the judgment of experienced pilots that really answers that question. The author, a veteran fighter pilot, recently flew the F-15 in simulated air-to-air combat during a test flight at Edwards AFB, Calif. He describes that mission in "the best maneuvering high-speed fighter in the world" and tells what it's like . . .

FLYING THE F-15

By Capt. Don Carson, USAF CONTRIBUTING EDITOR, AIR FORCE MAGAZINE



*Is the fighter-pilot's fighter
really as good as they say?*

EDWARDS AFB, CALIF.
MY LEG muscles tightened as I held the brakes and eased the throttles up to military power. Checking the gauges, I released the brakes and selected afterburner. The airspeed climbed rapidly. At 120 knots, I raised the nose ten degrees above the horizon, and we broke ground in about 1,000 feet.

Gear and flaps up, I quickly pulled back on the stick and climbed in a thirty-five degree pitch attitude while accelerating to 250 knots. At 10,000 feet, I pulled the throttles out of afterburner, as briefed, and rolled the aircraft over. I could not believe it. . . . We had not traveled even halfway down the 15,000-foot runway at Edwards AFB, Calif.

I have flown fast airplanes before, but nothing that could come near duplicating that takeoff in an F-15. With an irrestrainable grin beneath my oxygen mask, I climbed to 16,000 feet in military power to continue the mission.

I was flying in the TF-15A with Mr. Denny Behm, a McDonnell Douglas experimental test pilot. Denny was working the radar and would demonstrate the capabilities of the F-15 in its air-superiority role while I flew the bird. We were flying with a T-38 chase aircraft that was also serving as our target.

Heading to the Tehachapi Range area, Denny set up the radar for the intercept. The target was many miles away as we turned to meet him

head on. He appeared on the scope before we had rolled out. Denny locked on to the T-38 immediately, and we headed toward it. We broke the radar lock-on, as briefed, and instructed the target to descend and continue on the deck. When the T-38 called level, we again locked on to him in a "look-down" intercept.

The radarscope was completely clear of ground clutter. The only returns on the scope were those of the target and another aircraft passing through our flight area. I had been very skeptical of claims for the F-15 radar and its look-down capability. Every other radar set I have operated was always filled with the clutter of ground returns, making it

very difficult to pick out your target when looking down. Not so with the F-15. Anyone who could not pick out the target on this scope needed his eyes checked. This look-down capability gives a fighter pilot the needed ability to pick out his target from the weeds.

I pressed in to the target and, at five miles, I began following the captive AIM-9 air-to-air missile, steering on the scope as I swung around to the T-38's stern.

Pressing the Attack

There is never any doubt what is happening during an F-15 intercept. The Visual Situation Display (VSD) scope gives the pilot all the information he needs to complete an intercept. The target's range, altitude, speed, heading, closure rate, G-force, and aspect angle are displayed in easily read numerals right on the VSD. You always know if your target is climbing, diving, or turning to avoid you. Most of this information is also displayed on the Head-Up Display (HUD) once you have locked on to your target.

The HUD and VSD also indicate when you are in range for the missiles you have selected and the number of missiles remaining. Radar controls are easy to operate and conveniently located on the throttle and stick. There is no need to remove your hands from the flight controls when conducting an attack. This is a single-seat fighter, and was designed to make the job as easy as possible for the pilot.

We closed into range on the T-38 and the in-range indicator on the VSD and HUD told us we could launch missiles at any time. I continued steering the dot as we simulated launch and closed into gun range. Moving the weapons-selector switch on the inside of the right throttle, we placed the avionics in the gun mode. The HUD display now gave information for a gun attack. Displayed were gun rounds remaining, a gun cross showing the boresight line, sight reticle, radar range, and a box indicating target position.

The target designator box is especially valuable to a pilot during an intercept. If you have a radar lock on, the box will indicate where to look to pick the target up visually.

F-15 EAGLE—FACTS AND FIGURES

Designer and Manufacturer	McDonnell Aircraft Co. (A Div. of McDonnell Douglas Corp.).
Type	Single-seat, twin-turbofan air-superiority fighter.
Powerplant	Two Pratt & Whitney F100-PW-100 turbofan engines, each approximately 25,000 pounds of thrust.
Length	63 feet, 9¾ inches.
Height	18 feet, 7½ inches.
Wingspan	42 feet, 9¾ inches.
Weight	40,000-pound class.
Speed	Mach 2.5.
First Flight	July 27, 1972. (The TF-15 two-seat trainer first flew on July 7, 1973.)
Crew	One pilot in F-15A; two pilots in TF-15A.
Armament	4 AIM-7 Sidewinders; 4 AIM-9 Sparrows; 960 rounds of 20-mm ammunition for the General Electric M-61A1 six-barrel gun. Five weapons stations capable of carrying up to 12,000 pounds of munitions or additional ECM gear.
Major Subcontractors	Pratt & Whitney and Hughes Aircraft Co.
Avionics	Pulse Doppler air-to-air and air-to-ground radar; Head-Up Display; inertial navigation system, TACAN, and ILS.

You may be too far out to see the target, but the designator box will pinpoint his position, so you will know where to look for him when he comes into range. Closing on the T-38, we were given an in-range cue on the HUD when we were within gun range. I rolled off and pulled up as we reached minimum range and had completed the simulated gun attack.

The T-38 was now briefed to go into some hard defensive maneuvering as I attempted tracking him again. I slid into a comfortable six o'clock position at 800 feet as the T-38 afterburners lit and he began a series of five- and six-G turns to lose us. I easily maintained tracking position and, in fact, had to throttle back to about ninety percent rpm to keep from overrunning him. We followed him straight up and down and through every defensive turn he could make, and I never needed to use the afterburners once. Even in a hard turn, the F-15 is smooth and does not buffet.

The wing loading of the F-15 is fifty-three pounds per square foot. This is much lower than most fighters flying today and is the prime reason the F-15 can turn so well. The wings are large and do not require slats or any other lift device to help in a turn. The F100 engines enable the F-15, which weighs about 20,000 pounds at takeoff, to sustain turns far beyond the capabilities of any other aircraft flying. The F-15 can start a four-G turn at 20,000 feet and Mach 0.9 and, within 180 degrees of turn, can climb to more than 27,000 feet. For comparison, this is where an F-4 can just hold a level turn at four Gs.

Firmly convinced that I could easily handle a T-38 target without even using military power, I joined in his wing and flew some close formation. The F-15 is a delight to fly in formation. The flight controls and power response are excellent. The aircraft is very stable throughout its envelope and feels like a T-38 or F-106 in roll rate and pitch sensitivity.

The stick is fairly heavy and feels similar to an F-105. Most pilots who have flown the F-105, myself included, believe that the Thud has

the best stick feel and stability of any aircraft flying. The F-15 is equal to the F-105 in this respect and offers far better maneuverability. This stability is quite important when flying someone's wing in weather or in night formation when you really have to hang in close.

Nothing to Criticize

I could not find anything in the F-15's flight controls to criticize. The aircraft uses a system of hydro-mechanical linkage and a dual-channel Control Augmentation System (CAS) for roll, pitch, and yaw control. The ailerons are controlled by mechanical linkage only. CAS roll inputs are provided through the differential stabilator and the rudder. The CAS creates no noticeable changes in feel, and contributes significantly to the solid stability of the F-15 in flight. The excellent roll rate of the F-15 is accomplished by using the ailerons and differential movement of the stabilators. The stabilators work differentially in conjunction with the ailerons to produce roll and together to produce pitch.

Should the CAS system malfunction or be shot out, the aircraft is fully controllable by the hydro-mechanical flight-control system. The flight controls also incorporate an effective pitch-trim compensator (PTC). The PTC automatically adjusts for changes in pitch caused by speed transitions, speed-brake operation, and weapons release. This is very helpful when you extend the speed brakes while tracking a target.

The speed brakes currently used on the F-15 test aircraft are inadequate and are being changed before production models leave the factory. The speed brake now opens sixty degrees, but is not large enough to provide the needed deceleration. Speed brakes on the production models will have a larger surface area and open only forty degrees, while providing greater drag. The speed brake location behind the pilot on top of the aircraft has been criticized by some pilots flying the F-15. They believe that, when the speed brake is extended, visibility is somewhat restricted at six o'clock. The best answer to this was given by the TAC F-15 Project Director,

Col. Frank Bloomcamp. He said, with a smile, "If anyone is flying around with his speed brake out while he has a MiG at his six o'clock, he deserves to be shot down." I agree, and I did not find the speed brake to be a problem during my flights.

This is probably a good time to comment on the F-15 cockpit visibility. It is, by far, the best in any fighter ever owned by the USAF. That is a strong statement, but it is true. You sit high in a huge bubble canopy that extends down almost to your waist. You have enough room to move around and look over the canopy rails or turn around and see both rudders behind you. That gives all the visibility I could ever ask for. There is a slight blind spot in the rear caused by the seat rails. This is very small and does not pose a serious restriction. All you have to do is move your head a few inches, and you can see around the rails. Pilots testing the F-15 are not satisfied with this, but this is really picking at the fine points. The visibility, even with the existing rails, is at least twice that of any current fighter.

The ejection seat, however, does pose a problem. The seat is uncomfortable, and it is difficult to turn around to look behind due to the straps that attach the pilot to the seat-mounted parachute. The problem has been recognized, and a fix is on the way to lengthen the straps and permit pilots to more easily turn around and look behind. Comfort should be improved by changes to the seat cushion. These problems are minor and do not present any restriction to successful operations. Having someone at your six o'clock will not be a problem in the F-15. If he does manage to get there, he will not stay for very long.

Shooting an ILS Approach

After completing a couple more intercepts, we headed over to the Palmdale Airport, and I shot an ILS approach. The instruments are well located, and the entire cockpit is designed with the pilot in mind.

The author, Capt. Don Carson, is assigned to AIR FORCE Magazine for a year's training under the Education With Industry (EWI) program. A fighter pilot with 131 SEA missions to his credit, he's the author of the F-106 pilot report in our October '73 issue and last month's article, "What AFIT Has for You."

The radio, IFF, HUD controls, instruments, and weapons panel are all directly in front.

There has been a lot of planning in the cockpit layout, and it is set up for one-man operation. There will never be a need to bend over or turn to the side to change a radio or IFF frequency when you are flying in IFR conditions or on the wing of another aircraft. Even the systems and lighting controls on the right- and the left-hand consoles have different-shaped toggle handles so the pilot can feel which switch he is reaching without looking down. At last we are getting something fighter pilots have begged for over the years—a cockpit laid out for the man who is going to use it, not to satisfy an engineer sitting behind a desk.

Picking up the Localizer, I turned in for my ILS approach at fifteen miles and lowered the gear and flaps. There is no change in aircraft pitch feel as the gear and flaps go down. The approach may be flown on the conventional attitude indicator display, using the ILS steering bars, or by using the ILS display on the HUD. This is the preferred method and enables the pilot to check for the runway during poor visibility while monitoring the instruments. The HUD presents all information needed to successfully fly an ILS approach without looking down into the cockpit.

Intercepting the ILS glide slope, I extended the speed brake and noticed there was still no change in pitch. The F-15 flies a stable and easily controllable approach at about 140 knots and nineteen units'

angle of attack. If you allow the angle of attack to get to 20.5 units, you begin to get a very mild buffet that is remedied by adding about one percent rpm. The F-15 should be an excellent all-weather aircraft due to instrument location, stability, and the relatively slow speeds at which it flies final approach.

I executed a missed approach at ILS minimum and cleaned up the speed brake, gear, and flaps. We headed toward the high-speed corridor for a supersonic run. Climbing out, I did several rolls at low speed. The aircraft responded well and exhibited no adverse handling characteristics. Once in the corridor, I plugged in the burners and, with amazing acceleration, passed through the Mach. I tried several supersonic rolls at 20,000 feet and some very hard turns. The aircraft handles easily and turns exceptionally well even at supersonic speeds.

The performance of the F100 engines is fantastic. In military power, the F-15 will outperform almost anything flying today, and, with the afterburners going, it seems just too good to be true. Coming out of afterburner, I continued a very hard turn to bleed off the speed and let the aircraft go subsonic. This is a critical area in most fighters, where they dig in as the speed slows through Mach 1. To prevent overstressing an aircraft, pilots must ease off the Gs as they go through the Mach. This is a major problem when you are trying to outturn a target or track him. The F-15 slid back through the transonic area into subsonic flight with hardly a noticeable change in feel. There was little, if any, dig-in that I could feel.

The red bingo fuel light came on to indicate that we were at the fuel level we had dialed into the gauge. This light is set by the pilot and should prevent his running out of fuel during the heat of a dogfight. The entire fuel system is automatic. There is no tank selecting required by the pilot to get all of his fuel. The pilot can concentrate on the air battle until his bingo light comes on, indicating it's time to disengage and head home. More than one fighter has been lost during a dogfight because it ran out of fuel.

Back in the Edwards traffic pat-

tern, we lowered the gear and flap and slowed to final approach speed. The aircraft touched down at 110 knots and, with aerodynamic braking, rolled to a stop in plenty of time to turn off at midfield.

There was a significant problem with the crosswind landing stability during early testing of the F-15. The pilots had a feeling that they were going to roll over in a strong wind. This problem has been solved with a much stiffer landing gear. The aircraft now handles well in up to thirty knots of crosswind.

The F-15 does not use a drag chute since it has slow landing speed and excellent brakes. There is an operational tail hook for emergency barrier engagements. We taxied into the ramp, opened the canopy, and took off our masks. It is quiet in the cockpit, even with the canopy open. You can leave your mask hanging without blasting out the other pilot with the noise picked up in the intercom.

The nosewheel steering is continuous and has two modes. Normal steering is automatic and is available anytime the aircraft is running. To obtain more sensitive steering you must hold the nosewheel steering button on the stick. Both modes work well and give the pilot the stability of dampened steering for long straight taxiways and sensitive steering for tight turns.

I taxied back to the parking area and, with a signal from the crew chief, we shut down the engines and climbed out. I am sure that I was grinning like a possum as we talked to the maintenance men who were around the aircraft. As a matter of fact, I think I was still grinning when I went to sleep many hours later. The F-15 is quite an airplane.

The Test Program

The F-15 is now being flown by the USAF F-15 Joint Test Force. There are twenty pilots from TAFE, USAF Flight Test Center, and McDonnell Douglas who fly the aircraft and evaluate its systems. They are putting the aircraft through every phase of its flight envelope to define its performance and capabilities. This initial testing will be over next fall, and the first production

aircraft will be delivered to TAC in November 1974.

The test program has gone extremely well. There have been more than 1,100 flights of the eleven aircraft that have been delivered, and aircraft No. 1 has more than 300 flight hours on it.

There has not been an incident to mar the test program thus far. The aircraft has demonstrated its exceptional handling performance throughout its flight envelope. There is great confidence in the safety and reliability of the F-15.

Col. Bob Beale, Commander of the 6512th Flight Test Squadron, furnishes the pilots and aircraft who chase the F-15. He expressed his regard for the F-15 and its test program by remarking, "My biggest worry in the program is that we will lose a chase F-4 trying to keep up with the F-15 during the flight tests. We have nothing that can stay with it."

No one in the program seems to have any doubts about the reliability of the F-15. Aircraft No. 1 flew three missions the last day I was at Edwards, and that is not unusual.

Engines

The Pratt & Whitney F100 engines received some undeserved bad publicity when an engine failed during a 150-hour endurance test early last year. The engine has since passed this 150-hour endurance test. Col. Wendell Shawler, F-15 Joint Test Force Commander, explained: "This was the most demanding test ever given to any engine. The engine ran at maximum operating temperatures for more than ninety of the 150 hours. The F100 engine passed this test, which was at least six times more severe than any test that has ever been attempted for an engine. We now have had more than 2,000 flight hours on these engines, and there is no reliability problem."

The F100 is an afterburning fan engine and has some problems that are inherent in fan engines. The acceleration was relatively slow on the first engines tested. Changes in the fuel controls have since reduced acceleration from fifteen seconds to five. This should be even better with later-production fuel controls sched-

uled to be tested soon. There is also a problem with the afterburner failing to light at high altitude and in low-speed conditions. This is being solved by changes in the fuel control and inlet ramp scheduling.

While I was at Edwards, successful afterburner lights were made throughout the entire flight envelope, including the high-altitude, low-speed regime. According to Maj. Roger Smith, of the Joint Test Force, "It is now just a matter of fine-tuning the engines to the point where they meet our requirements. There is no question of the reliability or performance of the F100 engine. It just needs some small adjustments."

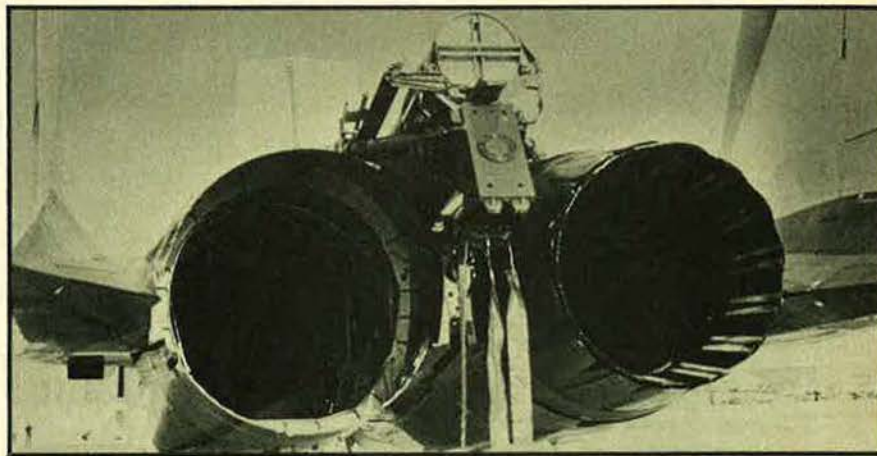
Colonel Bloomcamp also commented on the engines: "This en-

We have had no problems that we did not anticipate during the flight-test phases, and there are no problems that we feel cannot be solved. If we did not have some problems, there would not be a need for our being here. We are testing the aircraft and engine to get these problems out before it gets to the operational squadrons."

The engines performed very well on the missions I flew in the F-15, and I have no doubt that they will be completely ready by the time TAC gets its first F-15.

Maintenance

I spent many hours watching and talking to the men who maintain the F-15. Without exception, they liked



Aircraft No. 8 has been fitted with a spin chute and will be used to test the stall and spin characteristics of the F-15.

gine is still in the testing phase, as is the airplane. It is the first time we have tested an airplane without using an older and proven engine. There is no doubt in our minds that the F100 engine will be ready by the time we receive production airplanes. This engine is a great breakthrough in fighter performance. We are getting thrust in the 25,000-pound class out of a 3,000-pound engine. The closest a turbojet could come to that power-to-weight ratio was in the J75, which put out 24,500 pounds of thrust and weighed more than 5,000 pounds. I expect even more thrust from these engines once we get the new fuel controls and finish fine-tuning them.

"This engine is rugged and has been very reliable during flight tests.

working on the Eagle and believe that it is really built with the mechanic in mind. Everything is easy to get to during servicing and inspections. The high wing makes it easy to work under the aircraft and even gives the pilot a place to hide if he gets caught in a rain shower during preflight. All components are designed for a quick turnaround. An engine can be removed in about thirty minutes and without special tools.

There is little ground-support equipment needed for the F-15. It contains a hydraulically powered jet-fuel starter to power the accessory drive section that gives ground power and starts the engines. There is no need for external electric or air carts to start an F-15; it is all

MAJOR SUPPLIERS TO MC DONNELL AIRCRAFT CO. FOR THE F-15 EAGLE

Abex Corp., Aerospace Div. Oxnard, Calif.	Hydraulic Pump, Emergency Electric Power Generating System	Honeywell, Inc. Gov't and Aeronautical Products Div. Minneapolis, Minn.	Avionic Depot Test System
AiResearch Manufacturing Co. of Arizona Phoenix, Ariz.	Jet-Fuel Starter/Aircraft Mounted Accessory Drive System	Hughes Aircraft Co. Culver City, Calif.	Radar Set
AiResearch Manufacturing Co. Los Angeles, Calif.	Air Cycling Air-Conditioning System	Hydraulic Research & Mfg. Co. Div. of Textron, Inc. Pacoima, Calif.	Modular Hydraulic Packages
Aeronca, Inc. Middletown, Ohio	Fairings	Hydro-Aire Div., Crane Co. Burbank, Calif.	Wheel Braking Skid Control System
Aluminum Company of America Cleveland, Ohio	Aluminum Products—Castings, Forgings, Sheet, Plate, Extrusions	IBM Electronic Systems Center Owego, N. Y.	Central Computer
Automation Industries, Inc. Abilene, Tex.	Major Machined Parts	Kaiser Aluminum & Chemical Co. Oakland, Calif.	Aluminum Products—Forgings, Sheet, Plate, Extrusions
Bendix Corp. Teterboro, N. J.	Avionic Intermediate Shop	Lambert Tool Specialties St. Louis, Mo.	Major Machined Parts
Brunswick Corp. Skokie, Ill.	Nose Radome	Lear Siegler, Inc. Cleveland, Ohio	Electrical Power Generating System
Cleveland Pneumatic Co. Cleveland, Ohio	Nose and Main Landing Gear	Litton Systems, Inc. Van Nuys, Calif.	IFF Reply Evaluator
Collins Radio Co. Cedar Rapids, Iowa	UHF Communications Receiver Transmitter Unit, Instrument Landing System, Automatic Direction Finder, Horizontal Situation Indicator, UHF Auxiliary Receiver	Litton Systems, Inc. Woodland Hills, Calif.	Inertial Navigation Set
Dorne and Margolin Aviation Products Long Island, N. Y.	Glide Slope Localizer Antenna	McDonnell Douglas Electronics Co. St. Charles, Mo.	Head-Up Display, Interference Blanker
Douglas Aircraft Co. Long Beach, Calif.	Ejection Seats, Honeycomb	Moog, Inc. East Aurora, N. Y.	Control Stick Boost and Pitch Compensator
Douglas Aircraft Co., Tulsa Div. Tulsa, Okla.	External Tanks, Aft Fuselage, Pylons	National Water Lift Co. Div. of Pneumo Dynamics Kalamazoo, Mich.	Actuators—Ramp and Stabilizer
Dynamic Controls Corp. South Windsor, Conn.	Armament Control Set	N.C.I. Corp. Tulahoma, Tenn.	Major Machined Parts
Dynasclences Corp. North Hollywood, Calif.	Windscreen Anti-icing Valve	Ozone Metal Products Ozone Park, N. Y.	Outboard Aileron Actuators
Electro Development Corp. Lynnwood, Wash.	Transformer-Rectifier	Parker Hannifin Corp. San Gabriel, Calif.	Fuel Tank Valves and Check Valves
Ellanef Manufacturing Co. Corona, N. Y.	Major Machined Parts	Plessey Airborne Corp. Hillsdale, N. J.	Feel Trim Actuators
Essex Cryogenics Industries, Inc. St. Louis, Mo.	Emergency Oxygen Assembly, Rain-Repellant Sight Gauge, 5-Liter LOX Converter, Aft Grip Control Stick	Reynolds Metals Co. Richmond, Va.	Aluminum Products—Castings, Forgings, Sheet, Plate, Extrusions
General Electric Co. Binghamton, N. Y.	Automatic Flight Control Set, Lead Computing Gyro Unit	Ronson Hydraulic Units Corp. Durate, Calif.	Rudder Servo Actuators and Hydraulic Valves
General Electric Co. Burlington, Vt.	20-mm Gun Accessory System	SCI Electronics, Inc. Huntsville, Ala.	Integrated Communication Navigation and Identification Control Set
Goodyear Aerospace Corp. Akron, Ohio	Flight Simulator	Sierracin Corp. Sylmar, Calif.	Canopy and Windshield
Goodyear Aviation Products Div. Rockmart, Ga.	Fuel Tanks	Simmonds Precision Products, Inc. Vergennes, Vt.	Fuel Gauge System and Liquid Oxygen Indicator
Goodyear Tire and Rubber Co. Akron, Ohio	Wheel and Brake Assembly, Main Landing Gear Wheel Assembly, Nose Landing Gear	Sperry Rand Corp. Sperry Flight Systems Div. Phoenix, Ariz.	Air Data Computer, Attitude Heading Reference Set, Vertical Situation Display, Magnetic Azimuth Detector
Hamilton-Standard Div. United Aircraft Corp. Windsor Locks, Conn.	Electronic Air Inlet Controller	Sundstrand Aviation Div. of Sunstrand Corp. Rockford, Ill.	Constant Speed Drive, Emergency Hydraulic Monofuel Power Unit
Harvey Aluminum Torrance, Calif.	Aluminum Products—Forgings, Sheet, Plate, Extrusions	Teledyne Electronics Newbury Park, Calif.	IFF Transponder
Hoffman Electronics Corp. El Monte, Calif.	Tactical Air Navigation System	Titanium Metals Corp. of America West Caldwell, N. J.	Titanium Sheet and Plate
		Vap-Air Div. of Vapor Corp., the Singer Co. Chicago, Ill.	Fuel Tank Pressure Regulators
		Wyman-Gordon Co. Worcester, Mass.	Forgings

SUPPLIERS OF GOVERNMENT-FURNISHED EQUIPMENT

Hallcrafters Co. Chicago, Ill.	Internal Countermeasures Set	Philco-Ford Newport Beach, Calif.	25-mm Gun Development, AIM-9E Guidance and Control
Loral Electronic Systems Bronx, N. Y.	Radar Warning Systems	Pratt & Whitney Aircraft East Hartford, Conn.	Engine
Magnavox Fort Wayne, Ind.	Electronic Warfare Warning Set	Raytheon Co. Bedford, Mass.	AIM-7F Missile

on board the aircraft. The only battery on the F-15 is a small one for the inertial navigation system. The jet-fuel starter supplies everything needed for starting.

The built-in-test (BIT) display group gives the pilot and ground crewman indications of systems status on board the aircraft. The pilot's BIT control panel enables him to initiate a BIT and indicates the results of that test. The ground-crew panel gives indication of a malfunction and tells the location of the problem. Each avionics component is responsible for its own BIT and must operate independently of other systems. This BIT capability greatly reduces turnaround times and minimizes the need for ground-support equipment. Needless to say, this is one of the favorite items of the maintenance man.

USAF maintenance personnel from the Tactical Air Command are working hand in hand with the F-15 specialists of McDonnell Douglas and Pratt & Whitney to gain valuable on-the-job training. When the first aircraft are delivered to TAC, these men will form the USAF nucleus of F-15 maintenance. They are actively involved in the flight-testing program and are helping to get the bugs out of the maintenance program before TAC gets the aircraft. It is the first time this approach has been taken with a new aircraft, and it is working very well.

The maintenance experts from McDonnell Douglas and TAC believe that the F-15 will be a real winner in the maintenance area. Almost every USAF maintenance specialist with whom I talked raised the ease of maintaining the F-15 and the accessibility to components. They say it is the easiest aircraft they have ever worked on.

McDonnell Douglas claims the F-15 will require only half as many maintenance man-hours as the F-4. Results of the flight-test program bear out this claim, and the maintenance is steadily getting better as the men learn the aircraft. In a time of reduced manpower and emphasis on economy of force, this factor is of great importance to USAF. The F-15 should have the lowest main-

tenance costs of any fighter flying today.

Avionics

The AN/APG-63 fire-control radar set is built by the Hughes Aircraft Co. It is a pulse Doppler radar with many automatic features. I tested its many modes against hard maneuvering targets and found that they work exceptionally well. There is absolutely no need for a fighter pilot to ever look away from his target to get a radar lock-on during a dogfight.

The aircraft has a wide selection of channels, frequency bands, and track modes that will give it an excellent capability against ECM-emitting targets. The F-15 also has a self-contained Tactical Electronic Warfare System (TEWS), which will enable it to operate in a heavy ECM environment without externally mounted transmitter/receivers. I am not permitted to say much about the capabilities of the TEWS system. You will have to take my word for it—the systems are excellent and offer greatly increased capabilities for a fighter aircraft. Hughes has built a very high level of reliability into this fire-control system. The system has been almost trouble-free during the test program and needs only one-fourth the maintenance required on current F-4 avionics systems.

Weapons

The F-15 has successfully fired AIM-7 and AIM-9 missiles and the M-61 20-mm Gatling gun against drone targets. In a combat configuration, the F-15 can carry four AIM-9 dogfight missiles on wing pylons, four AIM-7 medium-range missiles on the lower corners of the fuselage, and 960 rounds of 20-mm ammunition.

The F-15 also has an air-to-ground capability and can deliver an ordnance load of up to 12,000 pounds. Air-to-ground testing will come later in the test program, and, so far, only air-to-ground gunnery has been attempted. Major Smith completed several air-to-ground mis-

sions on the gunnery range while I was at Edwards and said, "The airplane strafed quite well. It was the first time I have strafed in several years, but I was able to get hits on every target."

It is nice to know that the F-15 has an air-to-ground capability, but this aircraft is built as an air-to-air dogfighter, and I hope that it will be allowed to stay that way.

Future Growth

The F-15 has been flown successfully at more than 66,000 feet and has demonstrated its capability to intercept targets flying well above the speeds and altitudes of any existing threat aircraft. Follow-on missiles could give the F-15 the ability to handle any threat in the foreseeable future.

External fuel tanks and conformal pallets that would attach to the fuselage of the F-15 could greatly extend its range and ordnance or ECM capability. The aircraft presently has a range capability one and a half times that of the F-4. This could be extended significantly with the use of fuel pallets, if needed.

The F-15 is the best-maneuvering high-speed fighter in the world today. It is an honest and stable aircraft that can be flown to its limits throughout its flight envelope with no adverse handling characteristics. Spin tests are being conducted in conjunction with NASA three-eighths-scale models. The models have demonstrated no tendency to spin, and the F-15 has been flown down to 100 knots and was completely controllable. The aircraft may well be the first fighter we have ever had that will not spin. Aircraft No. 8 has been fitted with a spin chute and will be used for spin evaluations in coming weeks.

The total weapon system of the F-15—airframe, engines, and avionics—is designed for the fighter pilot. Together, they make up the finest fighter the USAF has ever owned.

Would I like to be one of TAC's first F-15 pilots? Well, I will give you one guess what is No. 1 on my next Form 90 assignment-preference sheet. ■

Sen. Henry M. Jackson
(D-Wash.)



IN THE period since November 1969, the strategic balance between the United States and the Soviet Union has undergone a radical transformation: American superiority in the numbers of strategic launchers, their throw weight, and their ability to deliver independently targetable warheads has given way to Soviet superiority in the first two categories and to competition in the third—competition that, by the nature of the base upon which each of us is building, must be assumed to lead eventually to Soviet superiority in numbers of warheads consistent with the Soviet advantage in numbers of missiles and their size.

A few weeks ago, the Soviet Union proposed a draft treaty at the SALT talks in Geneva. This Soviet proposal, which is so one-sided as to be completely unacceptable to the United States, actually represents a step backwards in the search for a more stable strategic balance and a more peaceful world. With this unfortunate step in the wrong direction, the SALT talks have reached an impasse. . . .

We ought to make a determined effort to end this impasse by moving from arms-control proposals that serve the interests of one side only to a proposal for serious and far-reaching disarmament that would leave both sides in a position of strategic equality. To accomplish this objective, I have formulated a specific proposal—one that would mean an immediate reduction in the strategic arsenals of both the United States and the Soviet Union so that the combined intercontinental strategic forces of the two countries would be reduced by about one-third. . . .

If the rewards of caution are obvious, the price of undue haste is great. Decisions that directly affected the outcome of the SALT I interim agreement were often taken in less time than a prudent man would devote to the question of whether to purchase a new home, and sometimes with a good deal less analysis of the alternatives. Ambiguities in the interim agreement that might have been resolved after a good night's sleep in Moscow and an additional day of negotiation have come back to haunt us. And assumptions that underlay the Administration's sanguine assessment of SALT I, so often characterized as a "first step," on the potential for a broader "second step" agreement in SALT II, have been predictably upset by subsequent Soviet behavior. Whatever the virtues of the "first step," it is better to make it onto solid ground than into quicksand. . . .

I know of no way to obtain a clear indication of the Soviet interest in SALT except to evaluate very care-

In a widely quoted address delivered on the Senate floor last December—excerpts from which appear below—Sen. Henry M. Jackson reviewed the imperfections of

SALT

fully (1) the arms limitations that they are prepared to accept and (2) the strategic weapons they continue to deploy. On both these measures—Soviet arms-control proposals and Soviet deployment programs—current indications are not encouraging.

The Soviet Strategic Buildup

In recent months, we have seen the development by the Soviet Union of a significant number of new weapon systems incorporating an impressive range of new and costly technology. Not only have the Soviets achieved a genuine MIRV capability, but they have done so by developing two quite distinct MIRV technologies. They have tested a whole new generation of intercontinental ballistic missiles, land- and sea-based, incorporating new technologies as well as new launch techniques. They have developed a mobile, land-based ICBM. They have moved to increase by a very substantial factor the throw weight of their missile forces despite the fact that they already enjoy a threefold advantage in this area. These developments, all of which have come to light since the SALT interim agreement designed to limit offensive weapons, have, individually and in combination, added significantly to the offensive potential of the Soviet missile forces.

What is disturbing in these developments is not simply that the Soviets are modernizing and improving their strategic forces—prudence requires the sort of regular modernization that the US also engages in—but rather the unrestrained accelerating pace at which the Soviet development is proceeding, a pace that has seen the production of four entirely new ICBMs simultaneously this year alone. . . . The spectacularly increased throw weight demonstrated in their recent tests . . . would allow them ultimately to double their already vast advantage over the US in this most critical of all categories. . . .

In the final analysis, an arms-control agreement would not be stable if it freezes for one side an advantage in quantity while the other has to rely on an edge in quality that it cannot maintain. In the interim agreement, we agreed to inferior numbers, but the Soviets did not agree to inferior technology. . . .

In the current SALT II negotiations, the Soviets are seeking to consolidate the advantage they obtained in the interim agreement while pressing for limits on the freedom with which we might maintain the compensating advantage of superior technology. . . .

SALT I and implications of the Soviet strategic buildup, and offered a plan for revitalizing the stalled SALT II negotiations in . . .

ANALYSIS OF A PROPOSAL

By Sen. Henry M. Jackson

Far from viewing SALT II as an occasion to search for the sort of stable strategic balance that can result only from equality, the Soviets have actually hardened their position. . . .

In my judgment, the current position of the Soviet Union, with respect both to their arms buildup and their arms-control proposal, tends ominously to confirm our most profound apprehensions and to raise the most serious question of all: Do the Soviets in fact share our objective of stabilizing the strategic balance? . . .

The Jackson Proposal

I am persuaded that the time is ripe for the United States to put forward a bold and imaginative proposal for serious disarmament. . . .

In outlining this proposal, it is useful to begin by recalling the numbers agreed to under the terms of the SALT I interim agreement, according to which the United States may have no more than 1,054 intercontinental ballistic missiles. This force consists principally of Minuteman missiles that are termed "light" (in contrast to "heavy") under the definitions worked out in conjunction with the interim agreement. For their part, the Soviets are permitted 1,618 intercontinental ballistic missiles, of which approximately 1,300 are of the "light" variety. The other 300 Soviet ICBMs are "heavy"—so heavy, in fact, that these 300 alone carry as much "throw weight" as the entire permitted US force of 1,000 Minuteman missiles.

At sea, the agreement provides that the United States may have up to forty-four missile-firing nuclear submarines containing 710 launch tubes. The Soviets are permitted up to sixty-two comparable submarines, with 950 launch tubes, in addition to a number of older type submarines. The Soviets are now engaged in building up to these levels.

I believe that strategic forces on both sides are larger than they need to be, *provided* that we can negotiate with the Soviets toward a common ceiling at a sharply lower level. Therefore, I propose that we invite the Soviets to consider a SALT II agreement in which each side would be limited to 800 ICBMs and to no more than 560 submarine-launched missiles, equivalent to thirty-five missile-firing submarines of the *Poseidon* type. Long-range strategic bombers, which were not included under the interim agreement, would also be limited to 400 on each side. Because the throw weight of the Soviet missile force is so much greater than that

of our own, the two SALT delegations would be instructed to negotiate a formula for varying these basic numbers so as to bring the throw weight of the two intercontinental strategic forces into approximate equality. . . .

Because the strategic forces of the countries are structured differently at present and because we are always searching for ways in which to reduce the potential vulnerability of our deterrent, the treaty need not follow the precise numbers for each type of weapon system I have suggested—so long as the aggregate total of intercontinental strategic launchers was 1,760 or less. . . .

The Soviet Union has turned to the United States for economic assistance, for our capital, our agricultural produce, and our advanced technology. So long as the Soviets support the greatly exaggerated military sector of their economy at anything approaching current levels, an American program of subsidized transactions, whatever its intended purpose, will inevitably amount to aid to the Russian army, naval, and air forces.

At a time when the Soviet economy is in great difficulty, we ought to be able to persuade them that a re-ordering of their priorities away from the military sector is the best way to achieve economic well-being. . . .

Reductions on the scale I am proposing will encounter opposition, not least of all from those in the military services whose training, experience, and orientation are likely to militate against strategic-force reductions in general, and extensive reductions in particular. While it would be imprudent to discard the professional judgment of the military and irresponsible to ignore their advice, I believe that we must not allow their skepticism to stand in the way of a proposal that will enhance our security.

I am confident that American military planners can be persuaded of the advantages of bilateral cutbacks in strategic weapons and that they, too, in the final analysis, reflect the hopes we all share for a more stable strategic balance and a more peaceful world. I would hope that the Soviet military, which has been unresponsive to proposals such as this in the past, would give careful consideration to the promise of a better life for the Soviet people who could be freed from part of the enormous burden of the arms they now bear. Here the job of persuasion must fall to the Politburo, and to them I am simply saying: Let us break with the troubled past and seek a more fruitful and secure future for both our peoples. ■

In an exclusive AIR FORCE Magazine interview, Gen. George S. Brown talks about operational uses of the F-15, the fighter mix, impact of the fuel shortage, some lessons of the Mideast war, strategic requirements, and the issue of support costs as . . .

The Chief Discusses USAF's Prospects

By John L. Frisbee

EXECUTIVE EDITOR,
AIR FORCE MAGAZINE



Gen. George S. Brown

WHEN YOU look at the aircraft that are now under development or in testing, it's tempting to conclude that the Air Force is entering an age of specialization—particularly in fighter aircraft.

"Not so," said Chief of Staff Gen. George S. Brown in an interview with AIR FORCE Magazine. "The only single-purpose airplane we're building today is the A-10. The air-superiority role of the F-15 has been stressed almost to the exclusion of everything else, but we've always had in mind its attack capability."

This is a thought that causes many fighter pilots extreme distress, as they remember earlier Air Force fighters that have been loaded down with multirole equipment at the expense of performance. But General Brown doesn't see the F-15 going that route. "The F-15 already has built into it hard points for external ordnance loads, an inertial navigation system, the necessary wiring and an armament management panel, and a Head-Up Display—everything needed in a fighter-bomber. With its tremendous thrust and low wing loading, it's going to be one of the best aircraft we've ever had in the attack role," he said.

It's worth noting that when Air Force Lt. Gen. Daniel "Chappie" James, Jr., the Deputy Assistant Secretary of Defense for Public Affairs, flew the F-15 recently at Edwards AFB, Calif., his comments to the press related largely

to the F-15's ground-support capabilities. In a period of tight procurement funding, there's no doubt that an aircraft that can perform more than one mission—and the F-15 certainly can—is more attractive on the Hill and to DoD officials than is a highly specialized weapon system.

General Brown doesn't envision two distinct versions of the F-15—one for air-superiority work and one for close air-to-ground operations—but rather that the F-15 would be used as has been the F-4. Its combat load would be tailored to the particular mission for which it was fraged—bombs and rockets if the mission is to attack targets on the ground; air-to-air missiles for an air-superiority mission. And, of course, the gun for either one.

The Tactical Air Command's training program is going in that direction, with increased emphasis on air-to-air combat training for all aircrew members who fly aircraft that are capable of dual-mission performance.

"The A-10 is a special-purpose aircraft," General Brown continued. "Its concept is somewhat like that of the German Stuka of World War II. It is designed with armor plating, fire-suppression equipment, two engines and multiple paths for critical functions so it can take a lot of punishment. No other airplane has this degree of survivability.

"On the other hand, the A-10 doesn't have the speed of the F-4, or even of the A-7. Some people make a big thing of speed in ground attack work, especially in relation to the Soviet-built SA-7—the Strela surface-to-air missile that can be fired by an infantryman

I think it's pointless to expect to outrun that missile forever. It's only prudent to expect that the SA-7 will be given a new motor and that later models will go faster. What will pay off for us in the ground-attack role is ruggedness and maneuverability, and that's what we've got in the A-10."

The Lightweight Fighter

How does the Chief of Staff see the Lightweight Fighter fitting into the picture?

"Many people are jumping to the conclusion that either the YF-16 or the YF-17 will go into production as the low-cost fighter in a high-cost, low-cost mix," General Brown said. "They are looking for something to complement the F-15, which they see as the high-cost part of the mix. They want a low-cost fighter that can do air-to-air work and is inexpensive enough so you can have a lot of them.

"Well, I agree with the principle. The Lightweight Fighter program wasn't started with this in mind, but as a pure prototype development. From four or five competitors we took the two designs—those of General Dynamics and Northrop—that offered the most in aerodynamic innovation. We're building these two to see how well they perform. I'm sure that the contractors and others have not been overly concerned and have worked with a determination to build a full-development article. With the emphasis on the cost target, there has been much of the competitive aspects of the A-X development competition even though the contracts may not have been written as they were written in the A-X program.

"Remember that the development and support costs of the F-15 already are largely paid for. They are sunk costs. We now have to pay only procurement and O&M costs for the F-15, so it becomes the low-cost fighter in a high/low mix unless we were going to buy very large numbers of Lightweight Fighters. In that case, it may pay to buy a less sophisticated fighter to complement the F-15. But the F-15 didn't get to be sophisticated just to be sophisticated, but rather because of the job it has to do.

"So we have the F-15, which is performing extremely well in its test phase, with every indication that it will go into production, and a Lightweight Fighter program that is a prototype program with the question of production to be answered after flight testing. That's where the high/low mix situation stands."

Two Major Problems for '74

In General Brown's judgment, one of the major problems facing the Air Force is that

of getting its long-delayed modernization programs into production. With the exception of the F-15, production decisions are still in question on the others—the B-1, AWACS, A-10, and Airborne Command Post, all of which are in some stage of development. Whether, and how soon, any of them will be approved for production is contingent on public and congressional support.

Another serious problem of the moment is the fuel shortage. "In the absence of a solution, the Air Force and the other services face a tremendous challenge to reduce fuel consumption along with the rest of American society. We must do our part with acceptable risk to combat readiness and to safety. That's a fine line to draw," General Brown observed.

"We have already reduced Air Force fuel consumption by about a third," he said, "and that is acceptable in the short run. But after a couple of months, that degree of reduction may threaten both readiness and safety."

Fuel saving has been achieved in a number of ways—by reducing speed, consolidating travel, cutting administrative flights to a minimum, using more commercial transportation. The biggest single energy economy comes in training, and that's where the longer-term danger lies.

Will combat-readiness training be cut to as little as ten hours' flying time a month? General Brown hopes not, "but prudence demands that we plan for the worst, and it's entirely possible that we may have to go that low. Probably in some types of aircraft—the C-130, for example—that would be acceptable if we had to do it, but, in the case of F-4, F-111, or SAC crews, that would be lower than we would want to go, because of the safety aspect alone."

Some of the reduction in flying hours can be made up by greater use of simulators. "We don't have enough simulator capacity now," General Brown said, "but we're getting better use out of the simulators we have. In the past, we've looked at simulators as an additive, principally to teach procedures. Now, like everyone else in the flying business, we're using them more and more for the primary function of training. This trend has been driven by eco-

General Brown believes that the F-15, which was designed primarily as an air-superiority fighter and "is performing extremely well in its test phase," is also going to be "one of the best aircraft we've ever had in the attack role."



nomics—the lower cost of simulator operation compared to actual flying—and has been accelerated by the fuel shortage.”

The Middle East War

Military staffs all over the world are studying the most recent Middle East war to determine whether it foreshadows changes in tactics and equipment. It still is too early to expect definitive answers.

Two lessons that General Brown labeled as obvious are, first, that “we’ve got to accelerate work on standoff weapons to help suppress surface-to-air missile defenses”; and, second, “our emphasis on electronic countermeasures has been correct.”

Does the Chief of Staff believe that R&D budgets are adequate in these areas?

“No one ever feels that he has enough R&D money, but that’s not really the way to look at it. The problem is to identify the areas that we most need to work on and then make sure that lower priority programs don’t interfere. Standoff weapons and ECM are two priority areas.”

Another lesson of the Mideast war that General Brown touched on has had less conclusive attention by commentators. The media made much of the fact that several US allies were reluctant—or refused—to grant us overflight and in-transit base rights for the airlift that resupplied Israeli forces. “It’s no secret,” General Brown commented, “that all our military forces, but principally naval and air forces, are dependent on forward basing. In the airlift to Israel, we were limited to the bases we already had, and, without the base in the Azores, our job would have been a lot harder.”

“This current dependence on forward bases is a major factor in Air Force support for a very large tanker. That’s one of the lessons that really came home to us out of the recent Middle East crisis. In my judgment, the acquisition of a large tanker—much larger than the KC-135—will contribute greatly to the flexibility and capability of US airpower. If we had a force of large tankers, we would be far less base-dependent. We’re pushing for that concept and for approval of a statement of requirement.”

General Brown expressed complete satisfaction with the performance of the C-5 during the Israeli airlift. “It has been superb in two

crises,” he said. “The first was its role in helping to turn back the North Vietnamese invasion of South Vietnam in the spring of 1972; the second, the Mideast crisis of October 1973. In that second major airlift, the C-5 had no significant problems. There were a couple of diversions for minor maintenance to bases that are equipped to handle the C-5, but nothing more.”

Asked if the Air Force plans to request more C-5s, General Brown pointed out that there is a study in progress of future alternatives for the strategic airlift force. “We haven’t settled on a specific airlift solution yet. One option—but only one—would be additional C-5s.”

The General does not believe that the diversion of Air Force supplies and equipment to the Israeli Air Force has seriously degraded USAF combat capability. “The total impact of the Vietnamization Program and the Israeli Air Force supply activity has had some effect on our stocks, mostly on consumables and to a lesser degree on aircraft. That’s why there is support for a supplemental budget request to replace those stocks.”

Strategic Forces

General Brown showed considerable interest in missile warheads with a higher yield than those used in the MIRVed Minuteman III. (The yield of Minuteman III’s three warheads is known to total much less than one megaton.) “MIRVing is a very attractive option when you have the throw weight the Soviets do. It allows them to put several warheads, each with a reasonably high yield, in a missile. It’s a less attractive option when you have limited throw weight and smaller-yield warheads. We need larger MIRV warheads with sufficient accuracy to handle hard targets while preventing unnecessary collateral damage,” General Brown said.

(The Soviet SS-9 is reported to have a throw weight of 13,000 pounds and to be capable of mounting three MRV warheads, each with a yield of about five megatons. Their recently revealed SS-X-18 is said to have a throw weight of 16,500 pounds and the potential for carrying up to six warheads in the two-megaton class. As Soviet MIRV technology is refined, their large missiles will provide them a considerably greater hard-target kill capability than ours. In some scenarios, this could give the USSR a decided advantage.

(For example, in a future limited first strike against our strategic forces as they are now constituted, the USSR could feasibly take out a number of our missiles that do have a hard

target capability, thus placing limitations on our retaliatory options. On the other hand, if the US land-based missile force had an expanded hard-target capability, the Soviets could not knock out a sufficient number of our missiles that were suitable for use against hard targets, and therefore would have to expect a counterforce response to their attack. At best, this should deter such a Soviet attack; at worst, it would tend to limit an exchange to military targets.)

General Brown did not reveal whether he feels the Air Force should seek a hard-target capability through development of a new missile with greater throw weight, or through techniques to enhance the yield of the warheads without significantly increasing their weight.

Support Costs

General Brown said that the Secretary of Defense has asked each of the services to study the cost in operating effectiveness of cutting headquarters staffs by ten, twenty, and thirty percent. He said that all Air Force headquarters are now looking at ways to reduce manning by consolidating or eliminating functions or by the inactivation of headquarters staffs at some levels. The Air Staff is examining the problem concurrently with headquarters in the field, but results are not yet in.

Traditionally, critics of the military have charged that the manning and cost of support activities is too high in relation to the size and cost of combat forces. As General Brown observed, "It's always easy to say, 'Yes, they are too high,' but there's no very good yardstick to measure against.

"It also depends on how you define support functions. The Air Force combat force is basically the aircrews, so, by definition, our support costs are going to look higher than those of the other services. In the Army, for example, support units like the engineers and signal people are considered combat forces. Comparable functions in the Air Force aren't. On a Navy carrier, communications—which is comparable to communications on an Air Force base—is considered a combat function. We need to arrive at some common definition of support, so the Air Force support costs are looked at in a clearer and more consistent perspective.

"Another point. In the recent Mideast crisis, it was the support area that helped the Israelis. It was all support people, and they did a magnificent job. Maintaining the base in the Azores is a support cost, but resupply of the Israelis could have been hindered without it. Systems

Command, to take another example, is all support, yet it's our future. We would be shortsighted to cut that."

General Brown declined to say whether, in the interests of economy, a rumored merger of the Tactical and Aerospace Defense Commands is in the wind. "As the resources allocated to continental air defense are reduced, and as TAC gets a greater defense capability with the F-15 and AWACS, such a move might become a more attractive option," he said. "Tactical aircraft lack some of the equipment of ADC interceptors—things like Data Link—but TAC fighter forces have to do the air-defense mission in a theater of operations, so that mission isn't strange to them."

* * *

We came away from our fifty-minute interview with the conviction that here is a man of absolute integrity, great common sense, and the ability to go immediately to the heart of a problem.

If an operational requirement for a Chief of Staff had ever been written, it's hard to conceive of a background of experience that would satisfy it better than does that of General Brown.

A 1941 West Point graduate, General Brown was a B-24 pilot in World War II. For his part in the August 1, 1943, low-level attack on oil refineries at Ploesti, Romania, he was awarded the Distinguished Service Cross. In the years since World War II, he has commanded units of the Training Command, TAC, ADC, and MAC. During the Korean War, he was Director of Operations for the Fifth Air Force. He has served as Executive to the Air Force Chief of Staff, Military Assistant to the Secretary of Defense, Assistant to the Chairman of the Joint Chiefs of Staff, Commander of Seventh Air Force in Vietnam, and, most recently, as Commander of Air Force Systems Command.

He knows the Air Force from training through support to combat operations, and on into its future. He knows the Washington scene. Both, we think, are essential in this strange time of crisis-laden peace and of an uncertain détente, which may demand more of Air Force leadership than does a time of war.

"Some people make a big thing of speed in ground-attack work," but "what will pay off for us in the ground-attack role is ruggedness and maneuverability, and that's what we've got in the A-10."



A FROM-THE-SCENE REPORT

The author, a British military writer with long experience on the staffs of several leading aerospace journals, reports from the Mideast on the conduct and aftermath of the war, including IAF tactics against the SA-6, Arab errors in the use of airpower, helicopter operations, and Israeli-developed missiles and aircraft . . .

THE MIDEAST WAR: 'A DAMNED CLOSE-RUN THING'

By Robert R. Rodwell

PHOTOS BY THE AUTHOR

TEL AVIV, Nov. 8
AS THIS article was written, the prospects for a lasting peace in the Middle East, which some optimists predicted were higher than ever following the October 24 cease-fire, were slumping fast. Negotiations between the Israelis and their Arab neighbors were collapsing; there was skirmishing on the Israeli/Syrian front; both the Israeli and Egyptian forces had reverted to

states of full alert; and clouds were gathering over the scheduled Geneva peace conference. In reviewing the eighteen-day war of October, therefore, one may not be reading the conclusive chapter in a story of twenty-five years' conflict between Arab and Jew, for it may then have become merely the fourth Middle East war in that time, with the fifth already begun.

But whether the conclusive conflict or an on-running episode, the October war had numerous far-reaching effects. It precipitated a major energy crisis throughout most of the developed world and has, particularly in Europe, concentrated

governmental minds wonderfully on the question of the rapid diminution of the world's oil resources. Principally because of concern over energy, it has produced significant political realignments on the international scene. It has increased Israel's unhappy isolation among nations. It tested previously untried modern weapons in realistic, all-out war. Finally, it destroyed a myth.

A Myth Destroyed

The myth that was so rapidly demolished on October 6, and during the fast-moving days that followed, was that dangerous image in the Israeli mind of the Arab soldier who always runs rather than fights. Sure, Israel won a limited victory in



Although the Arab states, especially Egypt, had large numbers of these SA-2 Guideline missiles, they were less a threat to the IAF than was the highly mobile SA-6.

strictly military terms from an initial position of disadvantage, before a cease-fire was imposed by the collective will of the world's two superpowers. Certainly, the un doubted man-for-man fighting quality of her largely reservist forces was, once again, impressively demonstrated to a world that needed no convincing and did not doubt their kill.

Without doubt, Israel once again demonstrated her superior generalship and greater skill in command, communications, and supply—the military areas in which the Arabs have been, and still are, most noticeably weak. But for all that, it was for Israel what Wellington, Britain's Iron Duke, once called Waterloo—"a damned close-run

thing." For some days it really looked quite feasible that Israel would be beaten in military terms (she has, on balance, suffered a political defeat), and Egypt's President Sadat could, quite fairly, claim that the myth of Israeli invincibility had been destroyed.

The improvement in the Arabs' fighting quality is perhaps the most astonishing feature of the war, but even so, it may not be as great as some commentators would have it seem. By this I suggest not that the Arabs weren't as good as they appeared in October, but that they were not as bad as they were repre-

sented to be in the last all-out Arab-Israeli conflict—the Six-Day War of 1967.

Israel's lightning victory in that war—the Egyptians sued for peace ninety-four hours after the war began, and Syrian resistance lasted little longer—was itself the biggest contributing factor to the dangerous myth of gutless and useless Arab forces. This myth is no longer prevalent even in Israel itself. To one who was in the country during the Six-Day War in 1967 and immediately after the October war, the most striking feature was the complete contrast in the prevailing national mood.

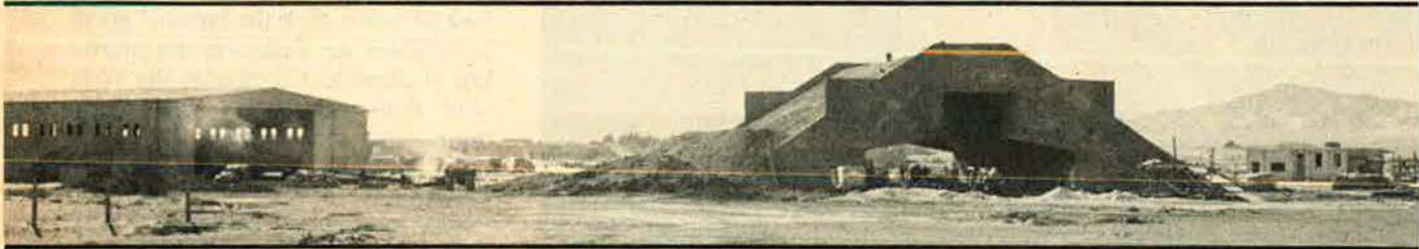
In 1967, the Arab forces never had a chance after the Israelis' great preemptive air strike on the morning of June 5. Effectively, the IAF won that war in the first three hours—the time it took to knock out the Arab air forces on the ground.

But on October 6, 1973, it was the Israelis' turn to be caught napping and the Arabs who put in the first, if not preemptive, punch. With an uncharacteristic lack of readiness for which a political witch-hunt is under way, the Israeli forces were caught in a state of low alert and, on the former cease-fire lines where they were face-to-face with enemy forces, of very low manning.

The Egyptians dealt an enormous blow to Israel's national psyche by successfully bridging the Suez Canal, breaching the defensive Bar Lev line, and establishing bridgeheads in Sinai. The Syrians were able to strike toward the plain of Hula beneath the by-then Israeli-held Golan Heights.

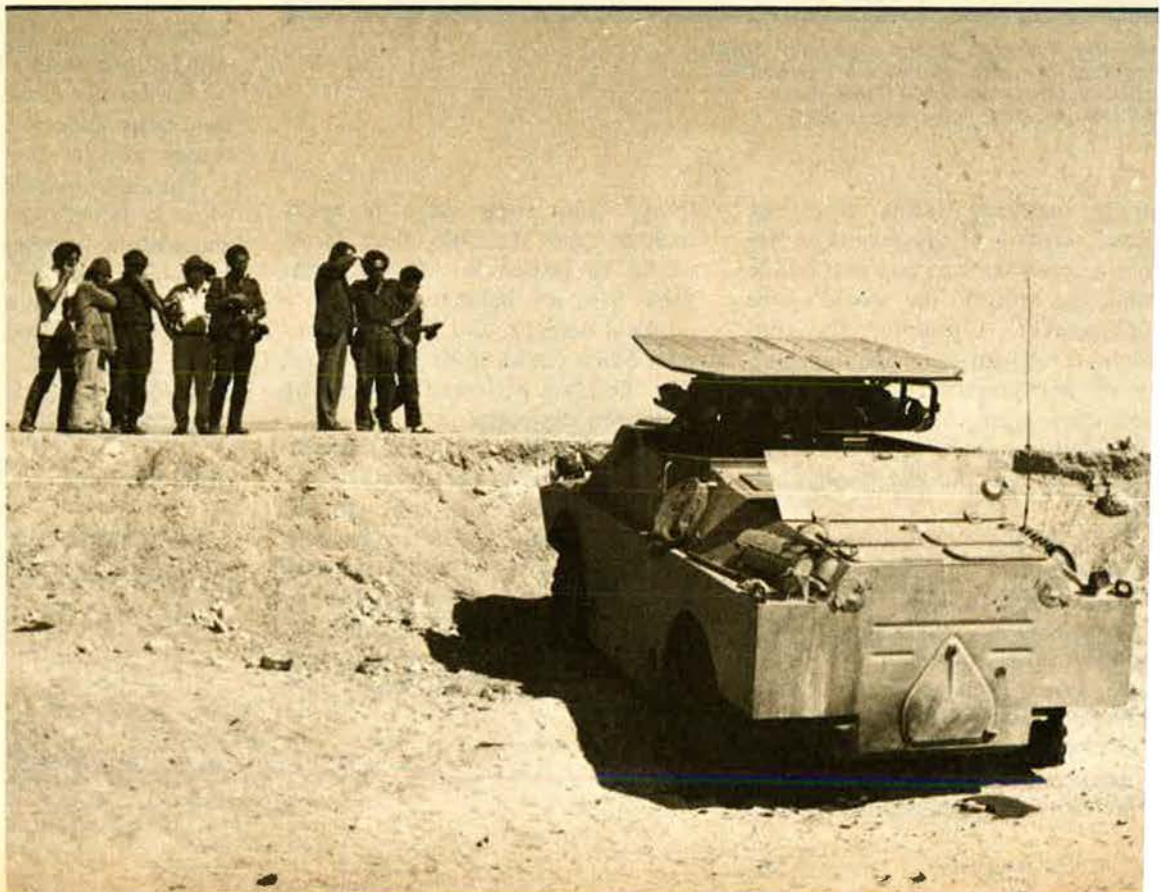
Arab Defenses

Two factors prevented the IAF striking in great strength against the



A hardened quick-reaction shelter for Egyptian Air Force MiG-21s at Fayid Airfield.

The Soviet-built AT-3 Sagger antitank system carries six missiles with a range of some 3,500 yards. More maneuverable than a tank, the Sagger destroyed much Israeli armor.





Over terrain similar to this raged tank battles that surpassed anything seen in the 1967 Mideast war or in the North African campaigns of World War II.

Arab airfields as they had done in 1967. One was the massive Soviet-supplied air defense missile screens, which the Arabs, and particularly Egypt, had installed in the years following the Six-Day War and which employed in great profusion SA-2 Guideline and SA-3 Goa missiles—supplemented, as events proved, with highly mobile SA-6 Gainfuls and SA-7 Grails.

The other was simply the lack of time and capacity to mount the great effort required. The bulk of the IAF's resources were so urgently required to support its hard-pressed ground forces in the opening phases of the war, and its aircraft losses to the new and wholly unexpected Arab competence with SAMs were so great, that it would have been quite impracticable to have mounted a major multi-airfield strike such as that flown in 1967.

In any case, such a sweep would not have achieved any significant short-term purpose as the Arab states chose not to commit their manned air forces to any great extent (particularly the Egyptians). As long as they were not committed, the Israelis were able to

ignore their presence on the ground. Instead, the Arab armies advanced, and later retreated in places, under a highly mobile screen of SA-6s, some SA-3s, and infantry-operated SA-7s, together with radar-directed AA guns, which gave them the aerial top cover that, in 1967, they were so catastrophically lacking.

Without doubt, the SA-6 was, for both Israel and the western world generally, the ugliest surprise of this war. Little was known about this highly mobile Soviet weapon before the war, although no doubt there is now a comprehensive technical appraisal available, if not to Western European nations at least to the United States who, alone among Israel's former allies, stood by that country as a supplier in its hour of great need.

It is known that at least one SA-6 round was made available for Pentagon analysis and was flown to the US, but the author does not, frankly, believe a report from the Pentagon that the Israelis did not succeed in capturing the all-important command and control elements of the tracked-vehicle-mounted system. (The Israelis, with their intense and effective security, have said nothing publicly about the air aspects of the war. Such reports as have appeared have, in the main, emanated from Washington together with some others, which must be regarded as more than ordinarily suspect, from the capitals of the Arab states.)

My own understanding is that several complete SA-6 systems were captured, particularly on the Golan front, together with incomplete systems. It would be quite in keeping with Israel's current mood and her sense of intense betrayal by most NATO nations and particularly by Britain, to let them go to hell as far as passing on information about the latest Soviet weaponry is concerned.

Countermeasures

Electronic countermeasures available to the IAF were inadequate to

span the very broad bandwidth of the SA-6's acquisition, tracking, and guidance radars, particularly in the higher bands, and this undoubtedly contributed to the IAF's heavy losses in the opening days of the war. It is thought that the IAF lost at least eighty aircraft, and possibly as many as 100, in the first three days, after which the loss rate dropped dramatically.

One ECM measure tried in desperation was to fill the airbrake recesses of F-4 Phantoms with radar reflective "chaff" in an attempt to jam the Arabs' missile-control radars, as even regular chaff dispensers were lacking from the IAF's inventory.

The most effective method of attacking SA-6 batteries was found, after heavy losses, to be almost vertical dives from height directly over the missile vehicles to exploit the fact that the weapon's initial launch trajectory, for maximum acceleration, is low.

The SA-7 Strela (in NATO parlance, the Grail), which had been used effectively against US helicopters in SEA, was used by the Arabs in conjunction with witheringly effective ZSU-23 quadruple 23-mm AA guns in the battle areas. Although the shoulder-fired infantryman's version was encountered, particularly in Sinai, the SA-7 was mainly used in a multilauncher form, mounted on light, cross-country vehicles.

From all accounts, Strela, a pursuit-course heat-seeker with a puny warhead, inflicted rear-end damage against Israeli attack aircraft, principally A-4 Skyhawks, rather than a high "kill" rate. Many aircraft hit by it survived to fight again. (This weapon, at least, is likely to be in NATO hands soon without dependence upon Israeli goodwill. On my return to Belfast, it became

The author, Bob Rodwell, a British free-lance writer and broadcaster, is no newcomer to the pages of AIR FORCE Magazine. He covered the 1967 Mideast war for us and has reported frequently on British military

affairs. Earlier in his career as a military writer, he was on the staffs of the British magazines Aeronautics and Flight International. Mr. Rodwell now lives in Belfast, in Northern Ireland.

known that the Provisional Irish Republican Army has obtained a small supply of SA-7s and has begun using the weapon against British military helicopters in Northern Ireland, so far without success. If previous form with the IRA's weaponry is any guide, it seems only a matter of time before the British Army captures some specimens intact.)

Israeli Air Defenses

The Arabs' failure to heavily commit their air forces meant that Israel's own air defenses were not severely tested. If they had been, they are likely to have been found wanting, with only thinly stretched Hawk batteries in place in Sinai, and otherwise a total reliance on air-to-air missile-equipped interceptors. When the long-perspective history of the war is written, it may well be seen that the Arabs lost the crucial initiative against Israel when they failed to exploit the IAF's heavy opening losses by mounting massive air attacks on Israeli territory.

Reluctance to commit their air forces to the full may well have sprung from a hard-headed assessment by the Arab high commands that those forces are not yet effective enough to be usefully employed against the supertuned IAF. Indeed, it is doubtful whether the Egyptian Air Force in particular has yet matched the striking improvement in quality, training, and determination that was shown by the Egyptian Army, particularly in the opening attacks across the Suez Canal. The generals are thus at least assured that their air forces remain substantially intact to fight another day.

But whatever the reason behind it, the relatively low level of manned aircraft effort on the Arabs' part led to relatively little dogfighting, particularly on the southern front, although in those encounters that did take place, the IAF demonstrated a clear superiority.

There are numerous eyewitness and filmed accounts from both the

Syrian and Egyptian fronts that Arab pilots showed no marked reluctance to enter those fights that did take place. Reports from Israel suggest that only two of the IAF's 120-odd aircraft lost were downed in aerial combat, a figure that I suspect is somewhat lower than truth. Nonetheless, there is little doubt that at least ninety percent of the IAF's losses were to SAMs and ground fire.

Missile Warfare

Because concerted pressure of the USA and USSR is politically irresistible, the cease-fire was imposed upon the warring states before they had reached the stage of bombarding each other's civil populations, save for two or three firings, by the Syrians, of the crude Frog vehicle-mounted bombardment missile against Israeli settlements, and some inaccurate IAF bombing of Damascus.

The October war did not, therefore, throw any light on the current status of Israel's top-secret Jericho ballistic missile program, which, begun with Dassault aid before the Franco-Israeli breach of June 1967, has since progressed unilaterally. Given the rapid buildup of the Israeli defense equipment industry in the intervening years, it seems likely that the Jericho is now operationally ready to strike the Arabs' major cities, but was deliberately not used.

There is no reason to doubt that the Egyptians, too, have their own bombardment missile capability, albeit Soviet-supplied and not indigenous. Russian track-mounted Scud B missiles are known to have been airlifted to Egypt after the war began, if some were not already there before the start.

Despite the Egyptians' relentless use, in their claims to have developed missiles, of the names Zafir

and Al Ra'ed, there is no reason to believe that the lath-and-plaster "missiles" that the late President Nasser used to parade through Cairo in the years before 1967 have now reached the stage of operational hardware. The Egyptian content of any bombardment missile that country now has is likely to be no greater than the markings.

There have been reports, which personally I do not discount, that the Egyptians did launch at least one long-range missile into the Sinai only minutes before the October 24 cease-fire came into effect, and that this caused some damage to installations at Israel's Bir Gifgafa base, the center of its Sinai military complex.

Israel herself made operational use of indigenous missiles and aircraft in the October war. The Arave light twin-jetprop STOL transport, now being vigorously marketed in Latin America, made its operational debut. The IAF requisitioned a civil model leased to the domestic oil company Netivei Neft, and two others were requisitioned from stock of the makers. One was used to evacuate civilians from the Abu Rudeis oilfield in Sinai, and then all were employed on casualty evacuation flights from unimproved patches of the desert immediately behind the southern front. The IAF has decided to retain the three Aravas and may order more.

The IAF's military transport fleet was increased by the addition of twelve C-130Es, which were flown in as part of US military aid deliveries during the war. They were heavily employed in the support of ground forces, together with the IAF's small fleet of ex-Pan Am Boeing Stratocruisers, some of which were modified by Israeli Aircraft Industries (IAI) during the 1960s to have heavy, rear, underside freight doors that can be opened in flight for paratropping.

The War at Sea

At sea, Israel's Gabriel ship-to-ship missile, claimed to be the sub

ject of multimillion dollar orders from foreign navies, made its combat debut. The Israeli Navy claimed to have sunk fourteen enemy vessels, mainly Soviet *Osa-* and *Komar-* class missile patrol boats, for no losses of its own. Of the fourteen sinkings, a total of ten were reportedly achieved with the twenty-mile-range Gabriel and the remainder by gunfire.

In the air, Israel's other domestically developed missile, the Rafael Shafir infrared homing air-to-air missile, which had already been used in a number of aerial skirmishes since it entered service about two years ago, was employed in combat between MiG-21s and the IAF's Mirage IIIs. The Israeli-built development of the French-supplied Mirage III, the General Electric J79-powered IAI Barak on which development began after the declaration of the French embargo on arms for Israel in 1967, is also thought to have been used operationally, with more than twenty having been delivered to the IAF.

One feature of the Egyptians' campaign was the extent to which they attempted infiltration with helicopter-borne special forces—no doubt taking a lesson from several bold Israeli incursions deep into Egyptian territory in the years since 1967 and, in that earlier war, from the Israelis' helicopter assault of Harm el Sheikh at the tip of Sinai.

One such helicopter raid, admitted by the Israelis only days after it occurred, was on the Abu Ghuweis oilfield in Israeli-held Sinai. The Egyptian Commandos did not receive any resupply—a recurrent weakness of their command—and after several days' action against eight Israeli forces around the oilfield, they were forced by thirst to

surrender. Later, helicopter-borne breakouts from the encircled Egyptian Third Army were attempted.

The Israeli Defense Minister, the charismatic former Gen. Moshe Dayan, himself had an extremely close call from an Egyptian helicopter crew on his first visit to the Israeli salient west of the Suez Canal. As he stood with staff officers in a date grove, leisurely stripping dates from a tree during his discussions, an EAF Mi-8 came in at treetop height to drop a small napalm bomb only a few yards away.

The fireball burst immediately behind the Minister and his party without engulfing them. A few seconds later, the Mi-8 was brought down by Israeli ground fire. The entire incident was captured in a photo sequence, which I was shown in Tel Aviv but which was suppressed by the Israeli censors.

Tank Warfare

The Israeli reliance on manned aircraft rather than on SAMs in their air defenses was also reflected in their tank warfare policy. The Israeli Defense Forces (IDF) relied almost exclusively on tank gunnery in the clash of armor against Arab armies heavily equipped with both wire-guided and unguided antitank missiles.

The scale of the devastation and the loss of armor on both sides, to be seen during an early drive through Sinai into the Israelis' west bank salient shortly after the cease-fire, beggared description. The tank clashes there undoubtedly surpassed in scale anything that occurred in 1967 or in the North African campaigns of World War II. The IDF entered the war with only a small stock of aged French SS-11 wire-guided antitank missiles to supplement the gunnery of its widely respected tank crews.

Within days, the Israeli High Command regretted the mistake. Hughes TOW antitank missiles were reported to be among the first high-priority cargoes airlifted

to Israel by USAF's Military Airlift Command, and were seen to be used in the Golan Heights.

Against the Israeli tanks, the Arabs fielded not only their own T-54, T-55, and brand-new Russian T-62 tanks, but also highly mobile antitank weapons mounted aboard lighter, faster, cross-country vehicles. Among these were the AT-1 Snapper missile, in a four-round launcher system used in the 1967 war, and the newer AT-3 Sagger system.

The latter employs six large missiles, with a range of more than 3,500 yards, mounted on a light armored vehicle beneath an upward extending "parasol." Each vehicle also carries eight spare rounds, and the indications both east and west of Suez were that the Egyptian Army had used the system skillfully and effectively. Able to outmaneuver conventional battle tanks, and to use smaller topographical cover, the Arabs' AT missile systems cost the gun-tied IDF heavily.

The unguided RPG-7 spin-stabilized antitank rocket, fired from the shoulder by Egyptian infantry, was also admitted by Israeli tank crews to have caused heavy losses. One Egyptian tactic, used during the Israelis' first counterattacks after the Arabs' opening offensive, was to leave well-concealed antitank men, with both wire-guided missiles and RPG-7s, behind the Israeli armor's forward rush. As tank chased tank, Egyptians were popping up behind the IDF, hammering its tanks from the rear.

The effective use of such tactics as these contributed to the somber Israeli mood so tangible in the first days after the cease-fire on October 24—a mood in which the neighboring Arab nations are still bitterly distrusted and execrated but are regarded, militarily, with a cautious new respect. ■

The Air Force A-7D
A classic in its own time



VOUGHT SYSTEMS DIVISION
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JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT



Antonov An-30, a new aerial survey aircraft developed from the An-24 twin-turboprop transport

ANTONOV
OLEG KONSTANTINOVICH ANTONOV;
Design Bureau Headquarters: Kiev, Ukraine, USSR

ANTONOV An-30

Described as the first specialised aerial survey aeroplane produced in the Soviet Union, the An-30 is evolved from the An-24 twin-turboprop transport, to which it is generally similar. The major modifications are made to the nose, which is now extensively glazed to give the navigator a wide field of

vision, and to the flight deck, which is raised to improve the pilots' view and increase the size of the navigator's compartment. There are fewer windows in the main cabin, the central part of which houses specialised survey equipment.

For the primary task of air photography for map-making, the An-30 is equipped with four large survey cameras. These are mounted in the cabin above apertures which are each covered by a door. The crew photographer uncovers the apertures, as required, by remote control from his desk

in the aircraft. A fifth window is provided for an exposure meter.

Details of the An-30 published in the Far East suggest that one of the survey cameras can be stabilised, in gimbal mountings, to ensure precise photographic coverage of the desired area in turbulent conditions.

The pre-programmed flight path of the aircraft over the area to be photographed is fed into an on-board computer which controls the speed, altitude, and direction of flight throughout the mission. If required,

the cameras can be replaced by other kinds of survey equipment, such as those used for mineral prospecting or for microwave radiometer survey, which measures the heat emission of land and ocean to obtain data on ocean surface characteristics, sea and lake ice, snow cover, flooding, seasonal vegetation changes, and soil types.

Speed, range, and field performance of the An-30 are identical with those of the An-24, as detailed in the current edition of *Jane's*.

MIKOYAN

ARTEM I. MIKOYAN DESIGN BUREAU; USSR

MIKOYAN MiG-25 (E-266)

NATO Code Name: "Foxbat"

Details of new speed and height records established by test pilot Alexander Fedotov in a standard production MiG-25 (described as an E-266 in official Soviet statements) were given in the annual "Aerospace Survey" article in the January 1974 issue of *AIR FORCE Magazine*. Three further records, in the time-to-height category, have been claimed by Pyotr Ostapenko and Boris Orlov, flying similar aircraft.

The only record so far confirmed is Fedotov's speed of 1,405.72 knots (1,618.73 mph; 2,605.1 km/h), set up in April 1973 during a tightly banked turn which began at a height of 52,500 ft (16,000 m) and ended at 65,600 ft (20,000 m). Fedotov has since claimed a world absolute height record of 118,897 ft (36,240 m), and a climb to 115,486 ft (35,200 m) carrying a 2,000 kg payload and qualifying also for the record with 1,000 kg.

In the time-to-height record attempts, Ostapenko claims to have reached 30,000 m (98,425 ft) in 4 min 3.5 sec, and 25,000 m (82,021 ft) in 3 min 12.4 sec. Orlov's claim is for a climb to 20,000 m (65,617 ft) in 2 min 49.8 sec. Rate of climb of the aircraft is said to have reached 320 m/sec (627 knots; 722 mph; 1,162 km/h; or 63,000 ft/min) during periods of Orlov's flight.

BOEING

BOEING AEROSPACE COMPANY; Head Office: PO Box 3999, Seattle, Washington 98124, USA

BOEING AWACS

USAF designations: EC-137D and E-3A

The E-3A AWACS (Airborne Warning and Control System) aircraft being developed for USAF service in the late 1970s will be equipped with extensive sensing, communications, display, and navigational devices.

In concept, an AWACS offers the potential of long-range high- or low-level surveillance of all air vehicles, manned or unmanned, in all weathers and above all kinds of terrain. Its data storage and processing capability would provide real-time assessment of enemy action, and also of the status and position of friendly resources. By centralising the co-ordination of complex, diverse, and simultaneous air operations, such an aircraft would be able to command and control the total air effort: strike, air superiority, support, airlift, reconnaissance, and interdiction.

The primary use of such an aircraft, as deployed by Aerospace Defense Command, will be as a survivable early-warning airborne command and control centre for identification, surveillance, and tracking of airborne enemy forces and for the command and control of NORAD (North American Air Defense) forces. Similar aircraft, operated by Tactical Air Command, will be used as airborne command and control centres for quick-reaction deployment and tactical operations.

Boeing's Aerospace Group was one of two competitors for the AWACS system (the other being McDonnell Douglas), and was awarded an initial contract as prime contractor and systems integrator for the programme on 23 July 1970. Boeing's submission was based on the airframe of the Model 707-320B commercial jet transport. In Phase 1 of the development programme, two of these aircraft, with the prototype designation EC-137D, were modified initially for comparative trials with prototype downward-looking radars designed, respec-

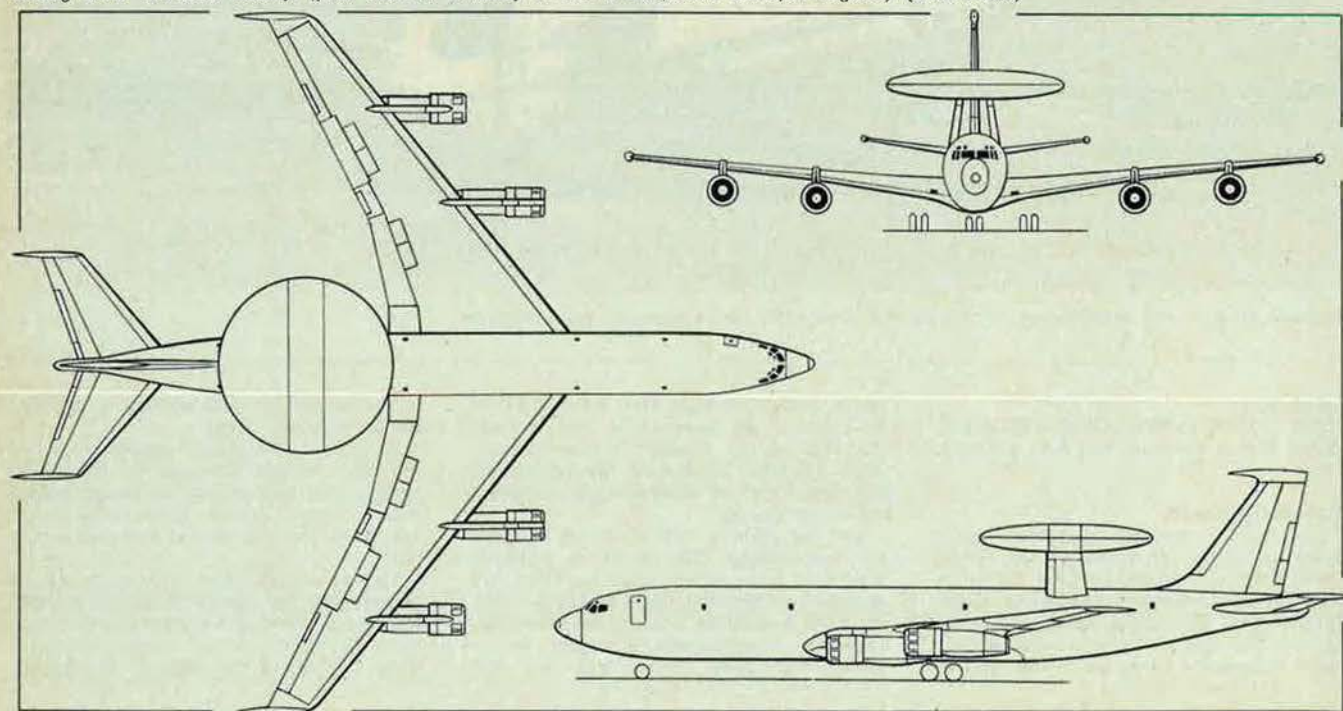
tively, by Hughes Aircraft Company and Westinghouse Electric Corporation.

The first flight by one of these aircraft was made on 9 February 1972. After more than five months of radar test flights, during which each radar accumulated over 290 hours of airborne operating time, Boeing completed its evaluation, and the Westinghouse radar was selected on 5 October 1972. Following successful completion of the radar competition, additional data processing equipment and two tracking displays were installed in the Westinghouse-equipment test aircraft, and a new series of flight tests was conducted to demonstrate the ability of the radar and data processor to detect and maintain continuous tracking of airborne targets. In addition, the capability of the system to maintain several simultaneous tracks was evaluated. These tests also proved successful, and were completed by 6 November 1972.

On 26 January 1973, the USAF announced that, following satisfactory completion of Phase 1, approval had been given for full-scale development of the AWACS aircraft under Phase 2 of the programme. To reduce costs, two major changes were made from the original Phase 2 proposal. The previously planned power plant of eight General Electric TF34-GE-2 turbofan engines was superseded by four Pratt & Whitney TF33-P-7 turbofans, each of 21,000 lb (9,525 kg) st; and only four test aircraft were ordered instead of the six originally envisaged.

Phase 2 of the development programme involves systems integration demonstration, and initial operational test and evaluation. Additional subsystems are being installed in one of the two existing EC-137D test aircraft, so that it can demonstrate full AWACS capability. At a later date the USAF plans to use three of the fully configured E-3A AWACS prototypes, together with the other one of the original EC-137D test prototypes, for a development/operational test and evaluation programme. Following successful demonstration of the full AWACS system, a production (Phase 3) decision is scheduled for December 1974. If production is approved, it is intended

Boeing E-3A AWACS aircraft (four Pratt & Whitney TF33-PW-100/100A turbofan engines) (Pilot Press)





Boeing EC-137D testbed aircraft for the USAF's Airborne Warning And Control System (AWACS) programme

that the four development/operational test aircraft shall be refurbished and will enter the operational inventory. Phase 3, if approved, will also cover the manufacture of production aircraft, of which 42 were due to be built under plans announced in 1970.

In addition to meeting military requirements, AWACS aircraft could be used in many civil applications. A large-scale emergency, such as posed by earthquake or flood, needs rapid air delivery of relief materials and produces immediately an air traffic control problem. The highly mobile AWACS would be able to cope with such a situation quickly. They could be used also for air traffic control operations over the busy North Atlantic traffic lanes that lack mid-ocean control, improving route efficiency and safety margins. Such aircraft might prove invaluable for tracking tornadoes and marshalling relief forces in their wake.

The existing Boeing 707-320 requires relatively minor adaptation to accommodate the AWACS system. External changes include the rotodome assembly, which is mounted on two large struts rooted into the fuselage structure aft of the wing, new engine pylon fairings, specially located windows, doors, and hatches, and provisions for in-flight refuelling. Essential antennae will be installed within the wings, fin, tailplane, and fuselage, and internal changes require floor reinforcement, provision of crew compartments, and revised cooling and wiring systems.

TYPE: Airborne early-warning and command post aircraft.

WINGS, FUSELAGE, TAIL UNIT, AND LANDING GEAR: Basically as Boeing 707-320B, with strengthened fuselage structure and installation of rotodome.

POWER PLANT: Prototypes retained their existing power plants during Phase 1. Pre-production and production aircraft will be powered by four Pratt & Whitney TF33-P-7 turbofan engines, redesignated TF33-PW-100/100A in their AWACS-modified configuration. Each rated at 21,000 lb (9,525 kg) st, they are mounted in pods beneath the wings.

ACCOMMODATION: Basic operational crew of 17 includes a flight crew complement of four plus thirteen AWACS specialists, though this latter number can vary for tactical and defence missions. Aft of flight deck on the System Integration Demonstration aircraft are the crew's rest area; test analyst/communications console;

computer operator's console; communications equipment; data processing functional group; multi-purpose consoles; test director and test conductor stations; radar control consoles; radar receiver and signal processor with radar transmitter, radar specialist's station, display engineer's station and seating for observers in the same area; communications equipment; navigation and identification equipment; flight test instrumentation; instrumentation engineer's seating and observers' seating.

ELECTRONICS AND EQUIPMENT: Prominent above the fuselage is the elliptical cross-section rotodome which is 30 ft (9.14 m) in diameter and 6 ft (1.83 m) in depth. It comprises four essential elements: a strut-mounted turntable, supporting the rotary joint assembly to which are attached slippers for electrical and waveguide continuity between rotodome and fuselage; a structural centre section of aluminium skin and stiffener construction, which supports the surveillance radar and IFF/TADIL C antennae, radomes, auxiliary equipment for radar operation and environmental control of the rotodome interior; liquid cooling of the radar antenna; and two radomes constructed of multi-layer glassfibre sandwich material, one for the surveillance radar and one for the IFF/TADIL C array. For surveillance operations the rotodome is hydraulically driven at 6 rpm, but during non-operational flights it is rotated at only ¼ rpm, to keep the bearings lubricated. The Westinghouse radar operates in the S band; by use of pulse Doppler technology, with a high pulse repetition frequency, this radar features long range and accuracy in addition to a normal downlook capability. Its antenna, spanning about 24 ft (7.32 m), and 5 ft (1.52 m) deep, scans mechanically in azimuth, and electronically from ground level up into the stratosphere. Heart of the data processing is an IBM 4 Pi CC-1 high-speed computer, the entire group consisting of arithmetic control units, input/output units, main storage units, peripheral control units, mass memory drums, magnetic tape transports, punched tape reader, line printer, and an operator's control panel. Processing speed is in the order of 740,000 operations/sec; input/output data rate has a maximum of 710,000 words/sec; main memory size is 114,688

words (expandable to 180,224), and mass memory size 802,816 words (expandable to 1,204,224). An interface adapter unit developed by Boeing is the key integrating element interconnecting functional data between AWACS avionics subsystems, data processing group, radar, communications, navigation/guidance, display, azimuth, and identification. Data display and control is provided by Hazeltine Corporation multi-purpose consoles (MPC) and auxiliary display units (ADU); in present configuration each AWACS aircraft carries nine MPCs and two ADUs. Navigation/guidance relies upon three principal sources of information: dual Delco Carousel IV inertial navigation sets; Northrop ARN-99 Omega navigation; and a Ryan APM-200 Doppler velocity sensor. Communications equipment, supplied by Collins Radio, Electronic Communications Inc, and Hughes Aircraft, provides HF, VHF, and UHF communication channels by means of which information can be transmitted or received in clear or secure mode, in voice or digital form. Identification is based on an AN/APX-103 interrogator set being developed by Cutler-Hammer's AIL Division. It is the first airborne IFF interrogator set to offer complete AIMS Mk X SIF air traffic control and Mk XII military identification friend or foe (IFF) in a single integrated system. Simultaneous Mk X and Mk XII multi-target and multi-mode operations will allow the operator to obtain instantaneously the range, azimuth and elevation, code identification, and IFF status of all targets within radar range.

SYSTEMS: A liquid cooling system provides protection for the radar transmitter. An air-cycle pack system and a closed-loop ram-cooled environmental control system ensure a suitable environment for crew and avionics equipment. Electrical power generation has a 600kVA capability. External sockets allow intake of power when the aircraft is on the ground; but the AiResearch auxiliary power unit has adequate capacity to allow operation from bases without suitable power generation facilities. Two separate and independent hydraulic systems power flight-essential and mission-essential equipment, but either system has the capability of satisfying the requirements of both equipment groups in an emergency.

BELL
BELL HELICOPTER COMPANY; Head
 Office: PO Box 482, Fort Worth, Texas
 76101, USA

BELL MODEL 206L LONG RANGER

First announced on 25 September 1973, Bell's Long Ranger is intended to satisfy a requirement for a turbine-powered general-purpose light helicopter in a size and performance range between the five-seat JetRanger II and 15-seat Model 205A-1.

Developed from the JetRanger II, it has a fuselage which is 2 ft 1 in (0.64 m) longer, an Allison 250-C20B engine with a take-off rating of 420 shp and continuous rating of 370 shp, new rotor, and up-rated transmission system. It is the first production helicopter to incorporate Bell's new Noda-Matic cabin suspension system. An increase of 22 US gallons (83.3 litres) in fuel capacity will extend range by over 39 nm (45 miles; 72 km) at maximum take-off weight. To be certificated at a maximum T-O weight of 3,900 lb (1,769 kg), and with a useful load of 2,039 lb (925 kg), this represents increases of 700 lb (318 kg) and 367 lb (166 kg), respectively, by comparison with the JetRanger II.

The company's latest developments in transmission technology provide a power rating increase of more than one-third over the present light-turbine transmission, while adding only 8 lb (3.6 kg) to component weight.

The Noda-Matic transmission suspension system not only gives a substantial reduction in rotor-induced vibration, particularly noticeable in high-speed cruise and manoeuvring conditions, but also, through the use of elastomers, isolates structure-borne noise from the cabin environment. This results in a standard of comfort comparable with that of turboprop-powered fixed-wing aircraft.

With a cabin volume of 83 cu ft (2.35 m³), compared with the 49 cu ft (1.39 m³) of the JetRanger II, utility is enhanced by innovations that will allow maximum use of this area. For example, the port forward passenger seat has a folding back to allow loading of a container measuring 8 ft x 3 ft



Bell Model 206L Long Ranger, a stretched seven-seat development of the JetRanger II

x 1 ft (2.44 m x 0.91 m x 0.30 m), making possible the carriage of such items as survey equipment, skis, and long components that cannot be accommodated in any other light helicopter. Double doors on the port side of the cabin provide an opening 5 ft 0 in (1.52 m) in width, for easy straight-in loading of litter patients or utility cargo; in an ambulance or rescue role two litter patients plus two ambulatory patients/attendants may be carried. With a crew of two, the standard cabin layout accommodates five passengers in two canted aft-facing seats and three forward-facing seats. An optional executive cabin layout has four individual passenger seats.

Detail improvements include a re-designed instrument panel, pedestal, and glare shield, to give the pilot improved visibility over the nose and through the lower forward windows.

A prototype of the Model 206L is flying, and initial deliveries of production aircraft are scheduled to be made in early 1975. Optional kits to be made available will include emergency flotation gear, a 2,000 lb

(907 kg) cargo hook, and an engine bleed air environmental control unit.

Preliminary specifications for the Model 206L Long Ranger is as follows:

DIMENSION, EXTERNAL:

Diameter of main rotor
 37 ft 0 in (11.28 m)

WEIGHTS:

Weight empty, standard configuration
 1,861 lb (834 kg)

Max T-O weight
 3,900 lb (1,769 kg)

PERFORMANCE (ISA at max T-O weight):

Max level speed at S/L
 125 knots (144 mph; 232 km/h)

Cruising speed at S/L
 118 knots (136 mph; 219 km/h)

Service ceiling at max cruise power
 12,700 ft (3,870 m)

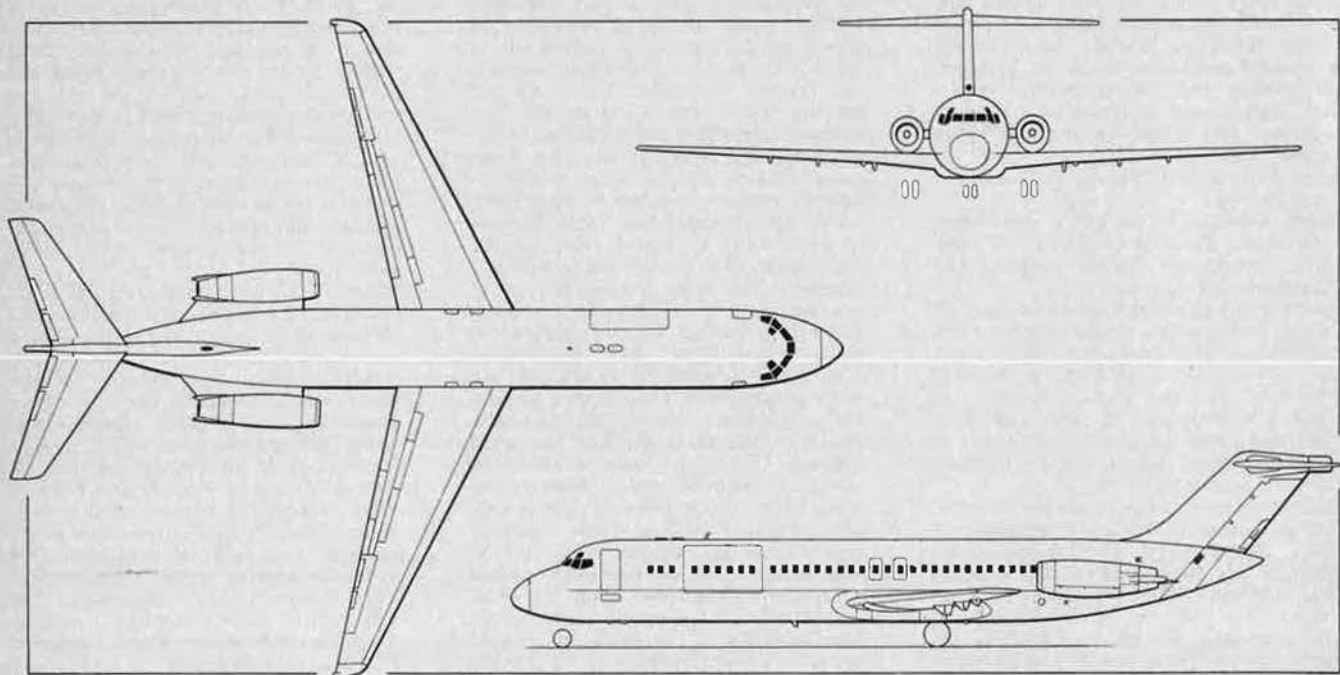
Hovering ceiling in ground effect
 8,200 ft (2,500 m)

Hovering ceiling out of ground effect
 2,000 ft (610 m)

Max range at S/L
 339 nm (390 miles; 628 km)

Max range at 5,000 ft (1,525 m)
 373 nm (430 miles; 692 km)

McDonnell Douglas C-9B Skytrain II convertible passenger-cargo transport (Michael Badrocke)





C-9B Skytrain II of VR-30 taxiing at Nellis AFB, Nev. (Robert L. Lawson)

McDONNELL DOUGLAS

McDONNELL DOUGLAS CORPORATION, DOUGLAS AIRCRAFT COMPANY; Head Office: 3855 Lakewood Boulevard, Long Beach, California 90801, USA

McDONNELL DOUGLAS C-9B SKYTRAIN II

The US Navy's C-9B Skytrain II is a special convertible passenger-cargo version of the DC-9 Series 30 commercial transport, named after the long-enduring Navy R4D Skytrain, a DC-3 variant of which 624 were procured by that service.

The contract for five (increased subsequently to eight) C-9Bs was signed by Naval Air Systems Command on 24 April 1972, and the first of these aircraft made its initial flight on 7 February 1973, two months ahead of schedule. The first two aircraft were delivered on 8 May 1973, to Fleet Tactical Support Squadrons 1 (VR-1) at NAS Norfolk, Virginia, and 30 (VR-30)

at NAS Alameda, California. All eight were delivered during 1973.

A compromise between the DC-9 Series 30 and 40, the C-9B has the overall dimensions of the former, and the 14,500 lb (6,575 kg) st Pratt & Whitney JT8D-9 turbofan engines of the latter, as well as the optional 11 ft 4 in (3.45 m) by 6 ft 9 in (2.06 m) cargo door, which is situated at the port forward end of the cabin. This allows loading of standard military pallets measuring 7 ft 4 in (2.24 m) by 9 ft 0 in (2.74 m), and in an all-cargo configuration eight of these can be accommodated, representing a total cargo load of 32,444 lb (14,716 kg). When loading, each pallet is first elevated to door sill height, and then rolled forward on to a ball transfer system before being positioned finally by means of roller tracks.

Normal flight crew consists of pilot, copilot, crew chief, and two cabin attendants, and standard accommodation is for 90 passengers on five-abreast seating at 38 in (97 cm) pitch, or up to 107 passengers at

34 in (86 cm) pitch. In a typical passenger-cargo configuration, three pallets are carried in the forward area, with 45 passengers in the rear section. A galley and toilet are located at each end of the cabin. In all-cargo or mixed passenger-cargo configuration, a cargo barrier net can be erected at the forward end of the cabin; in the latter configuration a smoke barrier curtain is placed between the cargo section and the passengers.

Normal passenger access is by means of forward port and aft ventral doors, each with hydraulically-operated airstairs to make the C-9B independent of ground facilities. The ventral door allows passengers to board while cargo is being loaded in the forward area. Two Type III emergency exits, each 3 ft 0 in (0.91 m) by 1 ft 8 in (0.51 m), are positioned on each side of the fuselage to permit over-wing escape, and four 25-man life rafts are carried in stowage racks. To complete the C-9B's independence of ground facilities, an auxiliary power unit provides both electrical and hydraulic services when the aircraft is on the ground. An environmental control system maintains a sea level cabin altitude to a height of 18,500 ft (5,640 m) and an 8,000 ft (2,440 m) cabin altitude to 35,000 ft (10,670 m).

A maximum fuel capacity of 5,929 US gallons (22,443 litres) provides a ferry range of 2,953 nm (3,400 miles; 5,472 km), the standard wing fuel tanks being supplemented by a 1,250 US gallon (4,732 litre) tank in the forward underfloor freight hold, and a 1,000 US gallon (3,785 litre) tank in the aft hold.

Advanced nav/com equipment is installed, including Omega and inertial navigation systems, and FAA certification has been received for both manual and automatic approaches under Category II weather conditions.

DIMENSIONS, EXTERNAL:

As for DC-9 Series 30

DIMENSIONS, INTERNAL:

Cabin: Length	68 ft 0 in (20.73 m)
Width	10 ft 0 in (3.05 m)
Volume (cargo)	4,200 cu ft (118.9 m ³)
Baggage holds (underfloor):	
Forward	298 cu ft (8.44 m ³)
Aft	135 cu ft (3.82 m ³)

WEIGHTS:

Operating weight, empty:	
passenger configuration	65,283 lb (29,612 kg)
cargo configuration	59,706 lb (27,082 kg)
Max ramp weight	111,000 lb (50,350 kg)

The US Navy's McDonnell Douglas C-9B Skytrain II combines the basic DC-9 Series 30 airframe with the power plant of the Series 40



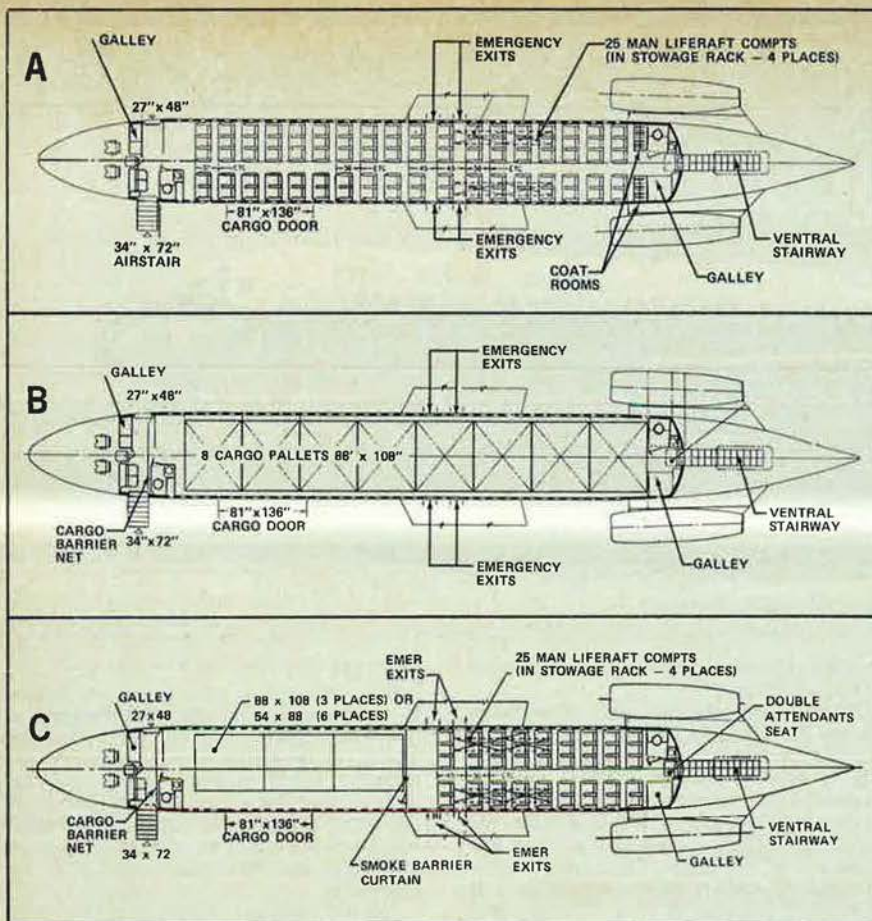


Diagram A shows US Navy/McDonnell Douglas C-9B in passenger configuration; B shows all-cargo configuration; and C shows combination cargo/45-passenger configuration

Max T-O weight 110,000 lb (49,900 kg)
 Max landing weight 99,000 lb (44,906 kg)
PERFORMANCE (at max T-O weight unless otherwise specified):
 Max cruising speed
 500 knots (576 mph; 927 km/h)
 Long-range cruising speed
 438 knots (504 mph; 811 km/h)
 Military critical field length
 6,400 ft (1,951 m)
 Landing distance, at max landing weight
 2,500 ft (762 m)
 Range, long-range cruising speed at
 30,000 ft (9,145 m) with 10,000 lb
 (4,535 kg) payload
 2,538 nm (2,923 miles; 4,704 km)

GRUMMAN AMERICAN
GRUMMAN AMERICAN AVIATION
CORPORATION; Head Office: 318 Bishop
Road, Cleveland, Ohio 44143, USA

Following upon Grumman Corporation's acquisition of the assets of the former American Aviation Corporation, a new subsidiary of the parent company, known as Grumman American Aviation Corporation, is continuing to build and market the AA-1 Trainer, Tr2, and AA-5 Traveler. Details of the 1974 models of these aircraft follow:

GRUMMAN AMERICAN
AA-1B TRAINER

Designed originally as a specialised trainer version of the American Aviation AA-1 American Yankee, the prototype AA-1A Trainer first flew on 25 March 1970; FAA certification in the Normal and Utility categories was granted on 14

January 1971. The 1974 model, which has the designation AA-1B, introduces new bucket seats. Flight instruments and other accessories are repositioned, and cabin noise is reduced by using new front and rear canopy seals and bonded windscreen/canopy bars. A durable polyurethane two-tone exterior finish and white vinyl interior trim are standard.

Three versions of the Trainer are available, differing in installed equipment, any item of which may be added as optional to the Standard Trainer.

Standard Trainer. As described below.

Basic Trainer. As Standard Trainer, plus sensitive altimeter, electric clock, dual controls, Narco Escort 110 nav/com radio with M-700 microphone, headset, and antenna, de-luxe propeller spinner, tinted windows, turn co-ordinator and rate of climb indicators.

Advanced Trainer. As Basic Trainer, plus vacuum system, de-luxe interior, landing light, omni-flash beacon, outside air temperature gauge, heated pitot, true airspeed indicator, turn and bank indicator, and tow-bar.

TYPE: Two-seat trainer/utility monoplane.

WINGS: Cantilever low-wing monoplane. Wing section NACA 64-415 (modified). Dihedral 5°. Incidence 1° 25'. No sweep. Alclad aluminium skin and ribs, attached to main spar by adhesive bonding. Tube-type circular-section main spar serves as integral fuel tank. Plain ailerons of bonded construction, with honeycomb ribs and Alclad aluminium skin. Electrically-actuated plain trailing-edge flaps of bonded construction, with honeycomb ribs and aluminium skin. Ground-adjustable trim tab on each aileron.

FUSELAGE: Aluminium honeycomb cabin section and aluminium semi-monocoque rear fuselage structure, utilising adhesive bonding. The use of honeycomb eliminates false floors, resulting in greater usable space relative to cross-sectional area.

TAIL UNIT: Cantilever adhesive-bonded aluminium structure. Movable surfaces built up of honeycomb ribs bonded to aluminium. All three fixed surfaces interchangeable. Combined trim and anti-servo tab in starboard elevator. Ground-adjustable trim tab on rudder.

LANDING GEAR: Non-retractable tricycle type. Nose gear of E6150 tubular steel, with large free-swivelling fork. Main legs are cantilever leaf springs of laminated glass-fibre. Main-wheel tyres size 17 x 6.00-6 standard. Wheel fairings optional. Single-disc hydraulic brakes. Parking brake.

POWER PLANT: One 108 hp Lycoming O-235-C2C four-cylinder horizontally-opposed air-cooled engine, driving a McCauley two-blade fixed-pitch metal propeller with spinner. Optional cruise propeller, for improved cruise performance, and de-luxe spinner available. Two integral fuel tanks in wing spar, with total capacity of 24 US gallons (91 litres), of which 22 US gallons (83 litres) are usable. Refuelling points at wingtips. Oil capacity 1.5 US gallons (5.7 litres).

ACCOMMODATION: Two individual seats side

The 1974 version of the Grumman American Trainer, available in Standard, Basic, and Advanced versions



by side in enclosed cabin, under large transparent sliding canopy. Aircraft certificated for open-canopy flight. Optional seat for child. Cabin heated and ventilated, with windscreen defroster for pilot's side. Centre console, between seats, accommodates trim wheel and electric flap operating switch. Space for 100 lb (45 kg) baggage aft of seats.

SYSTEMS: Hydraulic system for brakes only. Electrical system includes 60A engine-driven alternator and 12V 25Ah battery. Vacuum system optional.

ELECTRONICS AND EQUIPMENT: Standard equipment of Standard Trainer includes baggage straps, cabin air ventilators, canopy lock, chart holders, coat hook, glove compartment, dual seat belts and shoulder harness, aileron and elevator lock, flap position indicator, cabin dome, instrument and navigation lights, audible stall warning indicator, wing and tail tie-down rings. Optional equipment, additional to that shown in model listings, includes flight hour recorder, external power socket, canopy cover, canopy sun curtain, child's seat, cabin fire extinguisher, landing light, oil filler access door, cruise propeller, strobe lights, whitewall tyres, wheel fairings, wing-levelling system, winterisation kit, and an extensive range of avionics to customers' requirements.

DIMENSIONS, EXTERNAL:

Wing span 24 ft 6 in (7.47 m)
 Wing chord (constant) 4 ft 1¼ in (1.25 m)
 Wing aspect ratio 5.975
 Length overall 19 ft 3 in (5.86 m)
 Height overall 7 ft 7¼ in (2.32 m)
 Tailplane span 7 ft 8¼ in (2.34 m)
 Wheel track 8 ft 3 in (2.45 m)
 Wheelbase 4 ft 4½ in (1.33 m)
 Propeller diameter 5 ft 11 in (1.80 m)

DIMENSIONS, INTERNAL:

Cabin: Length 4 ft 6 in (1.37 m)
 Max width 3 ft 5 in (1.04 m)
 Max height 3 ft 9¼ in (1.15 m)
 Floor area 16.7 sq ft (1.55 m²)

AREAS:

Wings, gross 100.92 sq ft (9.38 m²)
 Ailerons (total) 5.20 sq ft (0.48 m²)
 Trailing-edge flaps (total) 5.44 sq ft (0.50 m²)
 Fin 4.76 sq ft (0.44 m²)
 Rudder, including tab 3.61 sq ft (0.34 m²)
 Tailplane 9.52 sq ft (0.88 m²)
 Elevators, including tab 7.22 sq ft (0.67 m²)

WEIGHTS AND LOADINGS:

Weight empty 980 lb (445 kg)
 Max T-O and landing weight 1,560 lb (708 kg)
 Max wing loading 15.4 lb/sq ft (75.1 kg/m²)
 Max power loading 14.4 lb/hp (6.5 kg/hp)

PERFORMANCE (at max T-O weight, with 53 in pitch propeller):

Max level speed at S/L 120 knots (138 mph; 222 km/h)
 Max cruising speed, 75% power at 3,000 ft (915 m) 108 knots (124 mph; 200 km/h)
 Stalling speed, flaps down 52 knots (60 mph; 96.5 km/h)
 Stalling speed, flaps up 54 knots (62 mph; 100 km/h)
 Max rate of climb at S/L 705 ft (215 m)/min
 Service ceiling 12,750 ft (3,886 m)
 T-O run 890 ft (271 m)
 T-O to 50 ft (15 m) 1,590 ft (485 m)
 Landing from 50 ft (15 m) 410 ft (125 m)
 Landing run 1,100 ft (335 m)
 Range, 75% power at 3,000 ft (915 m), with 45 min reserve 298 nm (343 miles; 552 km)
 Range, 75% power at 3,000 ft (915 m), with no reserve 378 nm (435 miles; 700 km)

GRUMMAN AMERICAN Tr2

Generally similar to the Grumman American Trainer, the Tr2 is intended to satisfy

a dual requirement: as an advanced trainer or as a sports aircraft with de-luxe equipment.

It is generally similar to the Advanced Trainer version of the AA-1B, but has in addition the following equipment as standard: carpeted floor to cabin and baggage area, de-luxe vinyl/fabric interior, and polyurethane external trim in five combinations; Narco Com 10A/Nav 10 radio in lieu of Escort 110, with M-700 microphone, headset, loudspeaker, and antenna. The 57 in pitch McCauley cruise propeller is standard on the Tr2, the climb propeller as fitted to the AA-1B being available optionally. A three-tone exterior finish is also standard on this model.

WEIGHTS:

Weight empty 1,035 lb (469 kg)
 Max T-O and landing weight 1,560 lb (708 kg)

PERFORMANCE (at max T-O weight, with 57 in pitch propeller):

Max level speed at S/L 125 knots (144 mph; 232 km/h)
 Max cruising speed, 75% power at 8,000 ft (2,440 m) 115.5 knots (133 mph; 214 km/h)
 Stalling speed, flaps down 52 knots (60 mph; 96.5 km/h)
 Stalling speed, flaps up 54 knots (62 mph; 100 km/h)
 Max rate of climb at S/L 660 ft (201 m)/min
 Service ceiling 11,550 ft (3,520 m)
 T-O run 890 ft (271 m)
 T-O to 50 ft (15 m) 1,590 ft (485 m)
 Landing from 50 ft (15 m) 410 ft (125 m)
 Landing run 1,100 ft (335 m)
 Range, 75% power at 8,000 ft (2,440 m), with 45 min reserve 315 nm (363 miles; 584 km)
 Range, 75% power at 8,000 ft (2,440 m), with no reserve 402 nm (463 miles; 745 km)

(Continued on following page)

Grumman American Tr2 two-seat light aircraft (108 hp Lycoming O-235-C2C engine)



**GRUMMAN AMERICAN
AA-5 TRAVELER**

This is an enlarged version of the AA-1B, with increased wing span, a more powerful engine, and an extended fuselage to provide accommodation for a pilot and three passengers. The first flight of the original AA-5 was made on 21 August 1970, and FAA certification was awarded on 12 November 1971.

The 1974 model of the AA-5 introduces the improvements detailed for the AA-1B. In addition, the occupants' visibility is improved as the result of a 1 ft 0 in (0.30 m) extension in the aft side windows; there is an enlarged baggage compartment with hat rack, an external access door to the baggage compartment on the port side of the fuselage, and a newly styled dorsal fin.

Two versions of the AA-5 are available as follows:

AA-5 Traveler. Standard version, as described below.

AA-5 Traveler Deluxe. As standard version, plus the following additional equipment: sensitive altimeter, omni-flash beacon, dual controls, vacuum system, landing light, outside air temperature gauge, heated pitot, tinted windows, turn co-ordinator and rate of climb indicators, and tow-bar.

The general description of the AA-1B applies also to the AA-5, except as detailed below:

TYPE: Four-seat cabin monoplane.

WINGS: Generally as for AA-1B, except that wing span and chord are increased.

FUSELAGE: As for AA-1B, except length increased.

TAIL UNIT: As for AA-1B, except general dimensions increased, and the addition of dorsal and ventral fins, and spin fillets on inboard leading-edges of tailplane. Combined trim and anti-servo tab in port and starboard elevators.

LANDING GEAR: As for AA-1B.

POWER PLANT: One 150 hp Lycoming O-320-E2G four-cylinder horizontally-opposed air-cooled engine, driving a McCauley fixed-pitch two-blade metal propeller with spinner. Two integral fuel tanks in wing spars, with a total capacity of 38 US gallons (144 litres), of which 37 US gallons (140 litres) are usable. Refuelling point in upper surface of each wing. Oil capacity 2 US gallons (7.5 litres).



Grumman American AA-5 Traveler Deluxe (150 hp Lycoming O-320-E2G engine)

ACCOMMODATION: Pilot and three passengers in enclosed cabin, on four individual bucket seats, in pairs, with baggage area aft of rear seats. Maximum baggage load 120 lb (54.4 kg).

SYSTEMS: As for AA-1B.

ELECTRONICS AND EQUIPMENT: AA-5 Traveler as for Tr2, plus armrests and two headrests. Optional equipment for both versions includes emergency locator transmitter, flight hour recorder, true airspeed indicator, turn and bank indicator, external power socket, canopy cover, dual defrosters, cabin fire extinguisher, rear seat ventilation, access steps, strobe lights, whitewall tyres, quick oil drain valve, wheel fairings, wing levelling system, and winterisation kit. The additional items of equipment detailed for the AA-5 Traveler Deluxe are also available optionally for the AA-5 Traveler.

DIMENSIONS, EXTERNAL:

Wing span 31 ft 6 in (9.60 m)

Wing chord (constant)

4 ft 5¼ in (1.35 m)

Wing aspect ratio 7.10

Length overall 22 ft 0 in (6.71 m)

Height overall 8 ft 0 in (2.44 m)

Tailplane span 8 ft 8½ in (2.65 m)

Wheel track 8 ft 3 in (2.51 m)

Wheelbase 5 ft 4½ in (1.64 m)

Propeller diameter 6 ft 1 in (1.85 m)

DIMENSIONS, INTERNAL:

Cabin: Length 6 ft 6 in (1.98 m)

Max width 3 ft 5 in (1.04 m)

Max height 4 ft 0¼ in (1.23 m)

Floor area 23.5 sq ft (2.18 m²)

AREAS:

Wings, gross 140.12 sq ft (13.02 m²)

Ailerons (total) 7.74 sq ft (0.72 m²)

Trailing-edge flaps (total)

16.26 sq ft (1.51 m²)

Rudder 3.61 sq ft (0.34 m²)

Tailplane 9.50 sq ft (0.88 m²)

Elevators, including tabs

10.68 sq ft (0.99 m²)

WEIGHTS AND LOADINGS:

Weight empty 1,200 lb (544 kg)

Max T-O weight 2,200 lb (998 kg)

Max wing loading

15.7 lb/sq ft (76.6 kg/m²)

Max power loading

14.7 lb/hp (6.67 kg/hp)

PERFORMANCE (at max T-O weight):

Max level speed at S/L

130 knots (150 mph; 241 km/h)

Max cruising speed, 75% power at 9,000 ft (2,745 m)

122 knots (140 mph; 225 km/h)

Stalling speed, flaps down

50.5 knots (58 mph; 93.5 km/h)

Stalling speed, flaps up

54 knots (62 mph; 100 km/h)

Max rate of climb at S/L

660 ft (201 m)/min

Service ceiling 12,650 ft (3,855 m)

T-O run 880 ft (268 m)

T-O to 50 ft (15 m) 1,600 ft (488 m)

Landing from 50 ft (15 m)

1,100 ft (335 m)

Landing run 380 ft (116 m)

Range, 75% power at 9,000 ft (2,745 m)

with 45 min reserve

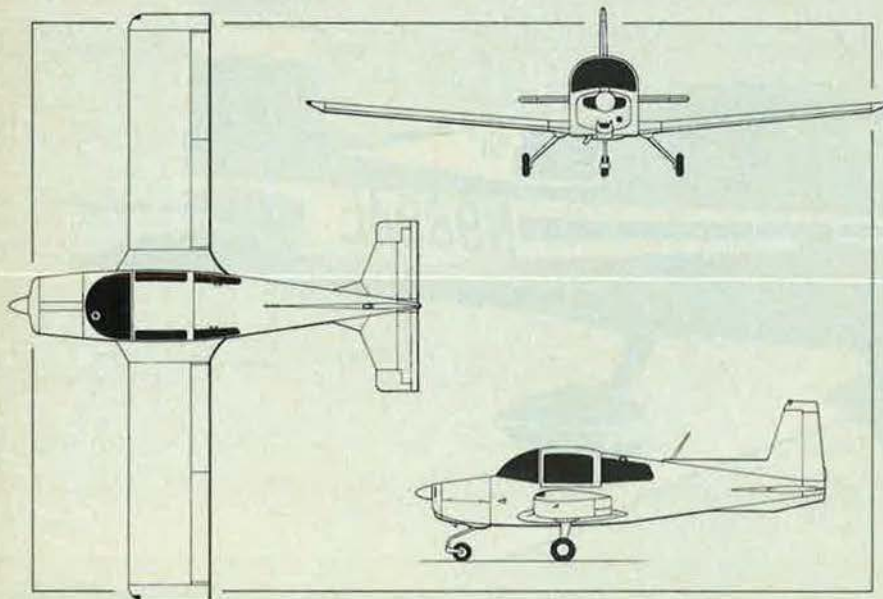
430 nm (495 miles; 797 km)

Range, 75% power at 9,000 ft (2,745 m)

with no reserve

521 nm (600 miles; 966 km)

Grumman American AA-5 Traveler four-seat light aircraft (Michael Badrocke)





United States
of America

Congressional Record

PROCEEDINGS AND DEBATES OF THE 93^d CONGRESS, FIRST SESSION

Vol. 119

WASHINGTON, WEDNESDAY, DECEMBER 12, 1973

No. 195

Senate

THE MILITARY BALANCE 1973-74

Mr. GOLDWATER. Mr. President, inserting lengthy articles in the CONGRESSIONAL RECORD is not particularly a habit of mine, but the Air Force Magazine for December of 1973 has placed the entire military balance in this world in such an understandable and relatively simple form that I think it would be of value for my colleagues to peruse. I ask unanimous consent that this excellent article be printed in the RECORD.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

THE MILITARY BALANCE 1973-74

FOREWORD

(By the Editors of Air Force Magazine)

For the third successive year, AIR FORCE Magazine is privileged to present "The Military Balance" as an exclusive feature of its December issue.

"The Military Balance," compiled by The International Institute for Strategic Studies, London, is an annual, quantitative assessment of the military power and defense expenditures of countries throughout the world.

The International Institute for Strategic Studies was founded in 1958 as a center for research and discussion in defense, arms control, disarmament, and related areas. It has earned worldwide recognition as the authority in its field.

As in the past, "The Balance" is arranged with national entries grouped geographically, with special reference to the principal defense pacts and alignments. Included in the section on the US and USSR is an assessment of the strategic nuclear balance between the two superpowers. There also is a separate section on the European theater balance between NATO and the Warsaw Pact.

In preparing "The Military Balance 1973/74" for our use, the staff of AIR FORCE Magazine has retained the Institute's system of abbreviating military weapons and units as well as British spelling and usage. A list of the abbreviations used in the text appears immediately after this introduction. Because of space limitations, some tabular material on defense expenditures of many countries, their expenditures by five categories, comparison of divisions, brigades, and military commitments negotiated since the "Balance" have been excluded. Appendix, "The Statistics Reductions."

"The Military Balance" of military power as they (before the October M projections of force level 1973 have been provided explicitly stated. The regarded as a comparison of military study does not "vulnerability" are touched.

Figures latest available

al currency figures were converted by the Institute into United States dollars at the rate prevailing on July 1, 1973, generally as reported to the International Monetary Fund (IMF). An exception is the Soviet Net Material Product, which has been converted to dollars at the rate of 0.72 roubles=\$1. (See p. 67 for more detail on Soviet defense expenditures.) Further exceptions are certain East European countries that are not members of the IMF and Rumania (which is), for which conversion rates used are taken from US Arms Control and Disarmament Agency publication ACDA/E-207, December 1971. In all cases, the conversion rates used are shown in the country entry, but may not always be applicable to commercial transactions.

The manpower figures given are, unless otherwise stated, those of regular forces. An indication of the size of militia, reserve, and paramilitary forces is also included in the country entry where appropriate. Paramilitary forces are here taken to be forces whose equipment and training goes beyond that required for civil police duties and whose substitution and control suggest that they be usable in support of, or in lieu of, regular forces.

Equipment figures in the cover total holdings, with combat aircraft, where strengths are normally stated. The contrary is made clear where less than 100 tons strength have been excluded. The term "craft" used in the count only bomber, fighter-bomber, reconnaissance, and armed trainer aircraft normally equipped and armed (ordnance).

Where the term "military" indicating the range or type of items, it means a statistical

The Institute assumes for the facts and judgment study that follows. The governments involved in many cases, receive equally cooperation, necessarily

Photo by

- Excl—Excluding.
- FB—Fighter-bomber.
- FGA—Fighter, ground attack.
- FPB—Fast patrol boat(s).
- GM—Guided missile.
- GNP—Gross National Product.
- GP—General purpose.
- Gp—Group.
- GW—Guided weapon.
- Hel—Helicopter(s).
- How—Howitzer(s).
- HQ—Headquarters.
- Hy—Heavy.
- ICBM—Inter-continental ballistic missile(s).
- ICBM—Inter-continental ballistic missile(s).
- Incl—Including.
- Indep—Independent.
- Inf—Infantry.
- IRBM—Intermediate-range ballistic missile(s).
- KT—Kiloton (1,000 tons TNT eq).
- LCT—Landing craft, tank.

IMPACT!

The entire sixty-five-page "Military Balance" read into the "Congressional Record" . . . only one of the many extracts from AIR FORCE Magazine to be inserted in 1973.

AIR FORCE
MAGAZINE

As national policy shifts from the inflexible Assured Destruction concept to a posture that matches Soviet capabilities—including the USSR's counterforce capability—through true strategic equality, corresponding changes in US weapons technology become mandatory. The range of hardware options currently under DoD scrutiny is discussed and assessed by Defense Secretary Schlesinger in a press conference and by Deputy Secretary of Defense Clements in an exclusive AIR FORCE Magazine interview . . .

THE PENTAGON LOOKS AT NEW STRATEGIC OPTIONS

By
Edgar Ulsamer
SENIOR EDITOR, AIR FORCE MAGAZINE

THE United States cannot afford to delay, until the conclusion of the current round of SAL talks, the exploration of new strategic options, including advanced and possibly mobile-based ICBMs and a medium-range cruise missile for its bomber fleet. "We have already lost several years, and we just can't waste four or five more," Deputy Secretary of Defense William P. Clements, Jr., told AIR FORCE Magazine.

Firmly committed to a strong US defense posture, Mr. Clements emphasized that Secretary of Defense James R. Schlesinger and he consider that the national policy on SALT pivots on a formula of "equal aggregates." Among other things, he explains with conviction, this means that "we match to some ex-

tent, although not necessarily by the same means, the counterforce capabilities of their SS-9, SS-X-18, and other new ICBMs." The Texan industrialist, who now holds the No. 2 slot in the Pentagon, points out that what's involved is not necessarily "moving toward IOC [Initial Operational Capability], but moving out on R&D and developing these options so that we have them available if we need them."

Dr. Schlesinger struck a similar chord when he told the Pentagon press corps recently that "I would not want the President, or any future President of the United States, to be in a position in which the Soviets are in a unilateral position of striking at US military forces with a degree of effectiveness which the Soviets do not perceive that we could achieve." A second element of strategic equality, he went on to explain, is predicated on "maintaining a posture in which no unilateral advantage in terms of strikes against military targets without necessarily striking cities on either side would be obtained by a potential foe."

The Assured Destruction concept, as it was understood in the 1960s, Secretary Schlesinger pointed out, "was not so much a strategy as a way of measuring, of testing US forces, particularly during a period of time when the United States enjoyed numerical superiority as well as qualitative superiority." During that period, Soviet counterforce capabilities were limited, compared with those of the United States, and, "as a matter of fact, they still are probably limited, relative to our own."

But the technological advantages of the United States, Dr. Schlesinger continued, will "tend to wane as the Soviets acquire improved warheads, improved guidance, and improved MIRVs. One of the characteristics [of the flight tests of four new missiles and MIRV-ing] of the last summer was that the Soviets are now making use of on-board computers for the first time," thereby portending not only a MIRVed ICBM force, but one with greater accuracy. "One can look at the period beyond 1976 . . . and with the marrying of these tech-

nologies to the throw weight available to the Soviet Union, it could create an imbalance in the strategic area." As a result, the Soviets "are beginning to acquire the potential for major counterforce capabilities," he added.

It becomes imperative, therefore, that the US "must be in a position with our R&D programs . . . to respond to a buildup of Soviet forces which would center around the period of 1980." Such steps aimed at maintaining true strategic equality with the Soviet Union, "in the early years, will not be large dollar consumers," Dr. Schlesinger said.

Dr. Schlesinger elaborated on the need to match Soviet counterforce capabilities—a new

USAF Gets Go-Ahead on Operational ICBM Test Launches

As a means of underscoring the reliability and effectiveness of Minuteman missiles, the Air Force will be given a go-ahead on the so-called Operational Base Launch program, Mr. Clements told AIR FORCE Magazine. (See December '73 issue, p. 46, "SAC's Commander Looks at the Future.") At present, Minuteman missiles are test-fired only from a special facility at Vandenberg AFB, Calif., not from the silos in which they are actually housed. "We tried to start the program this winter, but we weren't quite ready yet. We are definitely going to do it in 1974, certainly by next winter," Mr. Clements said. He explained that the number of launches "will be adequate to validate in a statistical sense the soundness of the system. As a matter of fact, we plan to have these launches on a continual basis."

(Present Air Force and DoD plans, AIR FORCE Magazine has learned, involve OBL tests of Minuteman II missiles from Malmstrom AFB, Mont. The missiles will cover a distance of about 5,000 nautical miles in their flights to the US-administered Phoenix Islands in the South Pacific. This flight path was chosen to avoid the danger of missile stages falling into populated areas. As in current tests from Vandenberg AFB, OBL will use unarmed reentry vehicles.)

departure from the traditional US policy of eschewing public discussion of this subject on grounds that it might be misconstrued by the Soviets and dovish members of Congress as a move toward a first-strike posture. He stressed that, "in order to maintain equality of strategic forces, we need not only that secure [assured destruction capability applicable against popula-

tion, urban, and industrial centers], but we will need to have symmetry with regard to the ability to have selected strikes against military targets. We would not desire to be in a position of inferiority with regard to the ability to inflict major damage on the military components of another state relative to the damage that that other state might be able to inflict on the military components we possess."

This interpretation of strategic equality, Dr. Schlesinger pointed out, does not supersede the policy of sufficiency. Instead, the new yardstick should be regarded as "representing my notions and the notions of the Department of Defense of what the term sufficiency truly represents." Describing sufficiency as "an elastic concept," the Defense Secretary said its scope "depends upon the strategy that may be chosen by a particular state. If the strategy that is chosen is a minimum assured destruction capability, then sufficiency represents a relatively small strategic force structure. If sufficiency represents the way I attempt to treat equality, it represents a much larger strategic force structure.

"I do not believe," Dr. Schlesinger added, "that the Soviets are necessarily reaching for strategic superiority. Certainly they cannot achieve it if the United States takes the appropriate measures to preclude that." These measures, he revealed, include the need to "be prepared to move ahead with the R&D on a larger payload . . . ICBM; we would be prepared to look at mobile missiles; we would be prepared to look at more reentry bodies on the existing missile fleet; we would be prepared to accelerate some of the newer programs; and we would be prepared for another assortment of armaments on board our bomber force."

Specific Options

Deputy Defense Secretary Clements, assessing the long-term meaning of the aggressive and adventuresome strategic weapon development program of the Soviets, did not expect that it will lead to the loss of this nation's second (retaliatory) strike capability in the near future, but conceded that it could, if unchecked, accord the Soviets unacceptable advantages. The result could be intolerable US vulnerability to political pressures and an erosion of the nation's credibility and resolve.

Mr. Clements rejected as unrealistic the fears occasionally aired by some critics that US moves to acquire counterforce capabilities against hardened military targets could, by themselves, lead to a first-strike capability or be realistically perceived by the Soviets as



Deputy Secretary of Defense William P. Clements, Jr., believes that the Strategic Cruise Missile will be "the best strategic buy for the dollar." It will have "counterforce capabilities against all but fully hardened military targets."

such. "For the foreseeable future, the possibility that either side could acquire a first-strike capability against the other, in the full sense of that term, can be ruled out. In the case of the US, the commitment to a triad of deterrence, which includes at present the Polaris submarines and, in the years ahead, Trident submarines, precludes this danger."

(While the nature of offensive strategic weapons capable of destroying hardened targets is identical to first-strike weapons, the quantities needed to achieve the latter pose seemingly insuperable economic and practical hurdles. Both US and Soviet ICBMs are protected in hardened silos. Such targets, especially the latest Soviet superhardened installations, must be hit essentially dead center and with good-sized warheads in order to destroy them. It is generally assumed that neither the US nor the USSR now has a broad and reliable hard-target kill capability with ballistic missiles. The Soviet supermissile, the SS-9, and its potential successor, the SS-X-18, come close to providing such a capability. Current US R&D programs are designed to balance off these Soviet capabilities. The problems of a potential aggressor are further complicated, of course, because he must somehow neutralize the US SLBM force simultaneously with his attack on the US ICBM fields and bomber bases. Further, the ABM treaty precludes the massive deployment of ABM defenses against surviving US ICBMs.)

Among the means for offsetting present and future Soviet counterforce capabilities, Mr. Clements told AIR FORCE Magazine, is the possibility of upgrading the entire Minuteman force to Minuteman IIIs. While he declined to disclose the Pentagon's plans for keeping the Minuteman production line open beyond 1975, Mr. Clements stressed that "it would be wrong to say that the line will not be open" after that date. Presumably a premature closing of Boeing's production line—reopening after shutdown would cost hundreds of millions of dollars and take more than a year—can be avoided by authorizing the manufacture of a limited number of test missiles.

More MIRVs for Minuteman

One of the options currently under consideration for upgrading the US ICBM force's deterrent capabilities is to increase the payload and number of reentry vehicles. "This is one of the many options we are looking at," Mr. Clements said, adding that present efforts are confined to trade-off studies of systems and techniques whose technological feasibility can be considered assured.

(One of the more promising approaches in-

volves boosting the number of warheads on Minuteman. Some planners are known to harbor reservations about the merits of additional MIRVs because it might reduce warhead size to a level below that required for certain counterforce missions. This potential disadvantage may be offset, however, by the fact that such a weapon would be well suited for barrage bombing, perhaps desirable against such targets as an adversary's missile-launching nuclear subs.)

A step beyond simply grafting greater capabilities onto the current Minuteman family is the potential for mobile-based missiles. Known as M-X, for Missile system X, this project was initiated by the Air Force about two years ago. Its principal objective was to establish the feasibility, optimal configurations, costs, and relative advantages and disadvantages of land-mobile and air-launched ballistic missile systems.

Technically, Secretary Clements told AIR FORCE Magazine, "both approaches are fully feasible options. But the basic question that underlies choosing one or the other is very complex, and we are not ready to make a final decision." What is certain, in Mr. Clements' view, is "the need to move forward and to develop these options" as a means for countering prodigious Soviet development programs.

"We are looking at the potential advantages of the land-mobile vs. the air-launched system, as well as at the possibility of the two systems augmenting each other. We certainly have not ruled out development of both systems."

M-X, in the Pentagon's view, should not be considered an eventual replacement of the Minuteman system but rather as the means for an orderly transition predicated on retention of the older system as long as it remains functional, but augmented by the new system or systems.

Secretary Clements emphasized that the Department of Defense plans to continue its policy of concentrating on accuracy and sophistication in weapons delivery, rather than on sheer size, as the Soviets tend to do. "We still lead in accuracy by a considerable margin, and we don't plan to dilute our efforts in this regard," he said. "It would not be prudent to let the Soviets pile up bigger and bigger weapons, proliferate the number of their warheads, and step up their technological capabilities without developing counter options."

The Strategic Cruise Missile

Sometime in 1977, if present plans jell, the United States will begin operational test-



Secretary of Defense James R. Schlesinger has warned that the USSR is "beginning to acquire the potential for major counterforce capabilities," to which our R&D programs must respond.

of what Mr. Clements views as "the best strategic buy for the dollar—the Strategic Cruise Missile." The lead element in what DoD views sanguinely as a new generation of armament for SAC's bomber fleet, the medium-range Strategic Cruise Missile would be equipped with a highly accurate guidance system to "give it counterforce capabilities" against all but fully hardened military targets.

Mr. Clements declined to describe the yield of its warhead, but suggested that the overall effectiveness of the system would approach that of SRAM. (Pentagon planners say the latter, the principal standoff weapon of the B-52, FB-111, and potentially of the B-1, is limited in range to just above 100 miles when operated in a semiballistic mode. Its warhead's yield is roughly equal to that of a single warhead of Minuteman III.)

The cruise missile will be "fully compatible with the FB-111, the B-52, and the B-1," according to Mr. Clements. Although premised on the basic concept of the Air Force's now-defunct SCAD program (*see Nov. '72 issue of AIR FORCE Magazine*), it would represent a "quantum jump" over the latter's technology.

If deployed, the Strategic Cruise Missile would likely first be mounted on bombers. But the system could also be launched from surface ships or from submarines, Secretary Clements said. The overriding operational merit of the proposed weapon is that "it would give us a new dimension in getting at targets. Its penetration mode requires a specialized [enemy] defense system."

Boosting Strategic Airlift Capabilities

The Middle East war of October 1973 "brought forcible attention to our strategic airlift capability and the need to carry out such missions over yet greater distances and on a more or less sustained basis," according

to Mr. Clements. Coming hard on the heels of DoD concerns with mounting airlift requirements, the Arab-Israeli war has triggered a broad Pentagon review of a range of options, which, Mr. Clements predicted, will lead to specific action "sometime during 1974." Because the review is not completed, no precise forecasts about expansion of the US strategic airlift capability can be made. Mr. Clements pointed out, however, that "it is obvious that we want to be able to operate to sites where no refueling capability exists. This would require that at least a portion of our fleet be air-refuelable."

Secretary Clements said any airlift expansion could involve "a mix of organic [direct military] and augmented [commercial airline] airlift capabilities." He suggested that both additional tankers and refuelable cargo aircraft could be part of the organic airlift, with the remainder provided by commercial carrier as part of the so-called CRAF arrangement. No decisions regarding the range of equipment choices for either tanker or cargo aircraft—in the main wide-bodied jetliners—have been made, he said. (Secretary Schlesinger, asked about options for augmenting airlift, replied that while this might include consideration of reopening the C-5 line, "I would not regard this as a very high probability option.")

Other requirements resulting from the Middle East war, Mr. Clements said, are the "pronounced need" for AWACS as linchpin for improved command and control capabilities, and a reevaluation of standoff weapons. Asked about the desirability of bolstering US space capabilities, he said, "space technology is an evolving technology, similar to command and control. There is always room for improvement." ■

VIVA!

For some time now, I have been wearing a POW bracelet with the name of Capt. Jose David Luna on it. Thank God, he is one of those who safely made it back. Just a few days ago, I had occasion to contact a company owned by a very cranky individual from Mexico City. I was talking with a secretary when, unfortunately, The Man himself came in and wanted to know what the hell was going on. He stared hard at me and even harder at my notebook and pencil. Suddenly his attitude changed, and he became a model of cooperation. He offered to provide more information, to call Mexico City if necessary, and so on. I was at a loss to understand his sudden good nature, but grateful for it. The whole thing was explained as I started to leave, and he called out, "*Hasta luego, Señor Luna. Mi casa esta su casa.*"

—Contributed by W. E. Dudley

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

The alarmingly high rate of Soviet strategic weapons development can be countered through a number of Air Force projects. Although confined to R&D efforts, these projects appear capable of blunting the increasing number of warheads and the technological advances of the Kremlin's offensive strategic systems. At the same time, this R&D work by the Air Force can serve as a roadmap to the development of broad and reliable counterforce capabilities on the part of this nation's ICBMs . . .

Upgrading USAF's ICBMs for the Counterforce Role



The ultimate in mobility, according to Gen. Samuel C. Phillips, Commander, AFSC, is attainable through air-launched systems such as the one depicted by this artist's conception.

By Edgar Ulsamer

SENIOR EDITOR, AIR FORCE MAGAZINE

FOR a variety of reasons, some obvious and others only hinted at, national policy on the nature and scope of future strategic deterrence needs is undergoing a gradual change. (See also the interview with Deputy Secretary of Defense Clements on p. 52 of this issue.) National policy in the past, beginning in the

late 1960s, inhibited the development of ICBM warhead yields and accuracies that, combined, make up a counterforce or hard-target weapon.

Presumably persuaded by Moscow's burgeoning strategic weapon development programs and the Kremlin's seeming recalcitrance in reaching accommodations at the current

SAL talks, the Administration is changing its stand on counterforce capability. Obviously, it is the Air Force's job to be responsive to these changing conditions.

CHANGES CONSIDERED FOR THE B-1

The Air Force is considering changes to the B-1 program to augment previously planned development and testing efforts and to ease the transition from development to production, Gen. Samuel C. Phillips, Commander of the Air Force Systems Command, told AIR FORCE Magazine.

The General declined to elaborate on program changes under consideration since final decisions have not yet been made, but said that they take into account the results of the comprehensive review of the B-1 program ordered by Air Force Secretary John L. McLucas (see January '74 issue, p. 38).

General Phillips said that "as the first aircraft nears completion and moves toward first flight later this year, it becomes clear that both the SPO and the contractor team have done an excellent job. The quality of the work that's going into the B-1, in all aspects, is most impressive."

The General added that "it was reassuring" that the special, independent committee of experts headed by the Deputy Director of the National Science Foundation, Dr. Raymond L. Bisplinghoff, which completed its review of the B-1 program late in 1973, "found no show-stoppers, either in terms of design or management, and reaffirmed that the basic design of the aircraft and its subsystems is sound."

bility does not represent an a priori commitment to its use; conversely, not providing such weapons categorically "denies the National Command Authority the use of counterforce weapons regardless of how badly they may be needed."

(In an all-out nuclear war, the Minuteman force, as presently constituted, would have only limited counterforce capabilities; USAF's strategic bombers do provide for comprehensive counterforce, but require a long response time.)

The key to maintaining the effectiveness of the US ICBM force as a major deterrent to strategic war is the Air Force's M-X (Missile system X) project. The M-X effort "is a logical progression of technologies and techniques" designed to boost ICBM capabilities in line with the increasing threat and more sophisticated requirements, according to General Phillips. "We start with the ICBM force in its present land-based mode, hardened and dispersed, and examine the possibilities for further upgrading that configuration," he said. "Concurrently, we are continuing to study mobile configurations for deployment of ICBMs either on the ground or in the air." M-X also examines the potential for, and the advantages of, designing new missiles, optimized for either ground mobility or air launch. Complementing these steps in the technology progression are research and development of associated requirements, such as command and control, launch and guidance techniques, propulsion, and survivability. "It's a well ordered set of R&D efforts that gives us the technological base to move out in any of the potential areas, if and when the decision to do so is made," according to General Phillips.

A common trait of all major options explored by M-X, from improved and encapsulated fixed-base systems to new air-launched ballistic missiles, is "the fact that we are in a position, technologically, to proceed at any time to build whatever is required," the AFSC Commander emphasized.

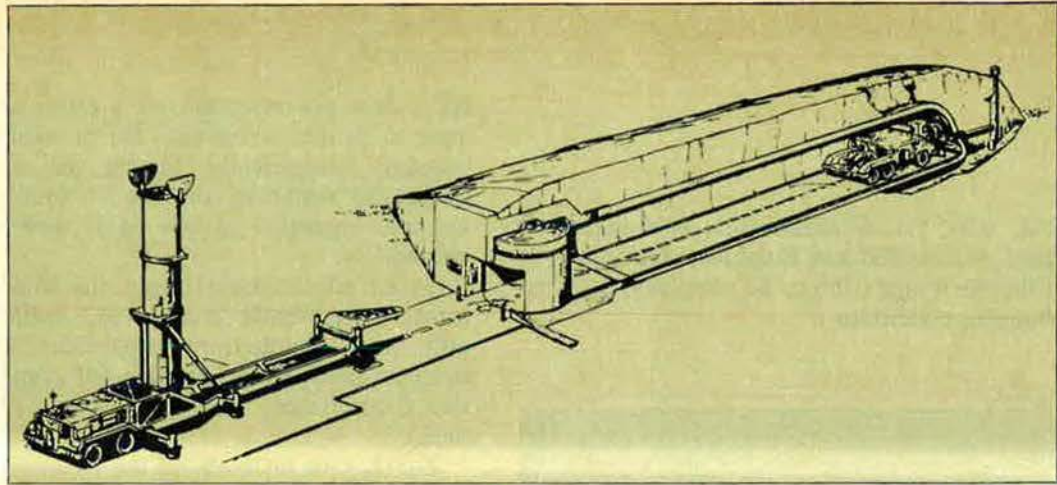
Increasing Minuteman's Counterforce Capabilities

In spite of rapid, broad progress in guidance technologies, the Air Force and its contractors believe that, for the foreseeable future, "there just isn't any question about the fact that the land-based system, such as Minuteman, represents the most accurate missile we know how to build." But there is considerable room for improvement, especially so far as counterforce missions are concerned. "For one, we know how to increase throw weight considerably.



Gen. Samuel C. Phillips, Commander of the Air Force Systems Command: "We are continuing to study mobile configurations for deployment of ICBMs either on the ground or in the air."

In an AIR FORCE Magazine interview, the Commander of the Air Force Systems Command (AFSC), Gen. Samuel C. Phillips, readily acknowledged that from the military point of view it is undesirable to constrain the nation's strategic deterrence so that it cannot be used realistically against an attacker's strategic weapons. He pointed out that having such a capa-



One of the mobile systems under study by USAF involves an on-road, truck-like system carrying an encapsulated missile.



Brig. Gen. Abner B. Martin guided the development of Minuteman III as Deputy for Minuteman at SAMSO until last year. Effective the first of this year, General Martin assumed the position of System Program Director and Deputy for the B-1 at Wright-Patterson AFB, Ohio.

The first-stage motor of Minuteman was designed in the late 1950s. It has not changed since then. Today's solid-rocket technology and the modernized silos that we now use permit vast improvements. Various additional gains can be made by redesigning the rocket propulsion systems of the missile's second and third stages. These improvements would allow us a choice of either additional reentry vehicles and warheads, larger warheads, or a combination of both. In other words, in place of the three RVs we can carry on Minuteman at present, we could have more and/or larger warheads," General Phillips explained.

Of at least equal importance is the readily attainable potential for increased accuracy of the missile's reentry vehicles. "We are certain that we can bring about significant increases in the accuracy of our warheads and thereby provide for very worthwhile improvements of Minuteman's effectiveness," General Phillips said. These advances are based mainly on providing the missile with a new inertial guidance system using technology such as that employed in "AIRS, the Advanced Inertial Reference Sphere [which consolidates the various gyro functions in a single reference sphere], that we have had under laboratory development for some time. AIRS technology, if applied, could give us a significant boost in RV accuracy," he said.

Additional advances can be realized through "encapsulation," meaning that the missile is shock-mounted in a steel cocoon that contains the missile's environmental system and provides it with its own hardening. In a silo, such a system would, in fact, be doubly protected. In addition, an encapsulated missile would seem to be ready-made for land-mobile application because it carries its own hardening and environmental support with it. Another way of improving the effectiveness of fixed, land-based

ICBMs is, of course, to build larger missiles, thereby increasing throw weight.

Mobile Systems

"The matter of mobility for ICBMs has been under study or development for almost as long as we have had ICBMs. In the early 1960s, the Air Force was well along in the development of a rail-mobile ICBM system when the decision was made to halt that program. Over the years, there have been many studies of a wide range of land-, water-, and air-mobile systems, and we have done a fair amount of related design and development work. We are in a position to build and deploy such a system, if so ordered.

"There are two basic options, either to modify and adapt Minuteman for such a mission or to develop a new system. The options include road-mobile, off-road mobile, or shelter-based missiles, so far as ground-based systems are concerned," General Phillips disclosed. In all instances, he said, the Air Force is "ready to demonstrate the feasibility of such systems." This is true also for air-launched systems where "we have examined and analyzed a number of potential carrier aircraft, ranging all the way from C-141s and C-135s to the C-5 and the commercial wide-bodied jets. Here, too, we are prepared to build and demonstrate—in terms of technology and hardware engineering—that capability in fairly quick fashion. We are convinced that Minuteman III, with some modest modification, could be launched from aircraft, and we are prepared to demonstrate this immediately," General Phillips said.

Analyses, tests, and other research carried out as part of the M-X project have provided equally convincing information "that we can, in a fairly straightforward manner, design and build a truly modern propulsion system and

guidance system, with both optimized for an air-launched missile," he said. While air-launched ballistic missile systems are potentially capable of providing the combination of accuracy and yield needed for direct attacks on hardened military targets, General Phillips suggested, "initial versions might not be configured for such a counterforce role."

One of the concerns about land-mobile systems being advanced by systems analysts involves escape speed, meaning the ability of the system to move out from under an attack in time to avoid destruction. "This consideration is always a factor, especially for those who postulate attack by hostile submarines standing off our shores and launching SLBMs with depressed trajectory, to reduce warning time. It would seem to me that these assumptions must also allow for the intelligence cycle—that is, the fact that a potential aggressor can't avoid a lag from the moment he decides to attack, and takes a fix on the location of our mobile systems, until the strike is actually executed. While we have a number of schemes under consideration to provide mobility on the ground, I believe the ultimate in mobility is attainable through air-launched systems," General Phillips said.

Midcourse and Terminal Guidance

The guidance problem of any mobile system is severe because fixing the launch point with the required high degree of precision is technologically difficult. The state of US guidance technology is sufficiently advanced to overcome most of the uncertainties of velocity, direction, and other problems introduced by mobility, and "to give us quite accurate position fixes for either air-launched or land-mobile systems."

This is not to say, General Phillips added, that a mobile system, using only inertial guidance, could replicate the accuracies of a silo-based ICBM. "But we do have a recourse, if that were needed. The optimum guidance of a mobile ballistic missile involves midcourse and/or terminal accuracy corrections. These steps could involve post-boost corrections through stellar fixes. We have done a great deal of work in this field, and we have demonstrated repeatedly that we can put into the guidance system up-dated navigational information from stellar seekers. The result of such midcourse corrections is that we take most of the initial position errors out of the system and assure an extremely high degree of accuracy of the reentry vehicle," he explained.

Equally effective means for compensating initial position fixing errors of mobile systems are attainable through a number of techniques for reentry corrections, according to General Phillips. ABRES, the Air Force's Advanced Ballistic Reentry System program, has led to

"great progress in inertial guidance during reentry all the way to the target. Such a system can provide reentry vehicles with corrective information based on inertial measurements all the way to impact. Our initial focus in the ABRES program, so far as such guidance systems are concerned, involved inertial guidance systems for maneuvering RVs, designed to evade ABM interceptors. It turns out that such a system is also effective when used for terminal inertial guidance," the AFSC Commander, who previously served as Minuteman Program Director, head of NASA's Apollo Program, and head of AFSC's SAMSO, pointed out.

Yet another guidance option available to the designers of mobile systems is terrain or map-matching, known as TERCOM. The underlying principle is that seekers aboard the RV—electro-optical, radar, or a combination—look for specific geographic or other measurable features of the target area and, in combination with the on-board digital computer, use these reference points to guide the warhead to a highly precise impact. (See March '73 issue of *AIR FORCE Magazine*, "M-X—Weapon System of the Year 2000.") General Phillips stressed that "the Air Force has thoroughly researched TERCOM. As a result, we know that such a system can be used effectively as a terminal guidance device for mobile ballistic missiles. I believe, however, that it will not be necessary to resort to such techniques; my personal experience with inertial guidance is such that I predict it will be possible to achieve high orders of accuracy with purely inertial systems."

Because of the work performed by the Air Force and its contractors under ABRES, starting in the early 1960s, and as part of the current M-X project, the lead times governing the development and IOC (initial operational capability) of the various options enumerated by General Phillips "can be compressed significantly, without undue technological risk or ballooning costs. Depending on the urgency with which such a system might be required, and the level of effort we therefore would be expected to expend, we could demonstrate hardware feasibility *conclusively* within one to two years from program go-ahead and come up with operational equipment within three to four years."

Short of the decision to start development of a new ICBM system, General Phillips believes that "the most logical decision for the country is to continue production of Minuteman III. I can only reiterate that this would be a logical national decision." The Minuteman production line is scheduled to close next year unless a decision is made to continue deployment past the presently programmed total of 550 Minuteman IIIs.



The potential for increased accuracy of the Minuteman warhead is significant, according to General Phillips.

Site Defense and Bolstered Penetration Capabilities

In addition to the area defense capability of the US Army's Safeguard ABM (antiballistic missile) system, the Air Force has consistently advocated development of a point defense ABM on grounds that the latter, facing a less complex task in terms of radar detection and tracking, might prove more reliable and effective than the more ambitious area system, which operates over a distance of hundreds of miles. After protracted intra-DoD wrangling, development of the so-called site defense system was assigned to the Army about two years ago.

Because of the constraints of SALT I, the Army's program is confined to the development and test of a prototype system. At the same time, Congress has been chary in allocating funds for this effort. General Phillips rated the development of a site defense system as important and said that "we simply can't afford to ignore this area, which, intrinsically, is an element of the total ICBM picture. As the Soviets build model after model of new missile systems, we can't rest on complacency."

Existing and potential Soviet ABM systems must be taken into account as they threaten the penetration capability of US ICBM RVs. "I am quite satisfied with our ability to penetrate, as it is constituted at present. We have, as part of our ABRES effort, developed and tested a range of techniques and devices that could be used to enhance our penetration capability over and above what we have deployed already. Both in terms of what we can do now and what we know we can add in the future, we are in good shape in this regard," General Phillips suggested. He stressed the need for continued development and testing to ensure that we are not caught short in the future.

The AFSC Commander concurred with Deputy Secretary of Defense Clements on the potential of a nuclear-armed, strategic cruise missile as an augmentation of existing US deterrence capabilities and stressed that "the Air Force Systems Command is in good shape to undertake such a program on the basis of previous R&D programs." (See also p. 52 of this issue.) General Phillips cautioned, however, that it is questionable whether such a cruise missile should be built in a single configuration for air, shipboard, submarine, and ground launch.

Lessons of the October War

Although strategic deterrence represents a concern of overriding importance to the Air Force Systems Command, conventional war capabilities, especially those pointed up by the October 1973 Arab-Israeli war, are not being slighted. "The recent Mideast war, involving

sharply opposing tactics on the part of the two sides, demonstrated once again the ability of tactical airpower to decisively affect the outcome of ground warfare. Air was clearly capable of suppressing and defeating by active and passive means even the heaviest defenses. The experience of the Mideast war should have convinced those who doubted that airpower could remain effective in the face of increasing technological sophistication of air defenses. Not only was this notion disproved, but air showed itself clearly capable of preventing ground forces from being decimated," General Phillips believes.

In a technical sense, the October war vindicated the order of priorities set by the US Air Force, especially the emphasis on ECM, electronic warfare, and standoff suppression, General Phillips stressed. "In the past few years, the Air Force has placed maximum emphasis on perfecting our capabilities in the combined arena of intelligence and electronic warfare. One of the lessons of last October is that the range of measures that improves the survivability and effectiveness of aircraft in that kind of environment must receive further impetus."

Two types of aircraft now being developed by the USAF, the AFSC Commander believes, would have been particularly effective in a war of this type—the A-10 close-air-support aircraft and AWACS. In the case of the latter, he said, "a system of this type would have been ideal for the direction of the total air effort as well as for the coordination of air and ground operations."

In the case of the A-10, AFSC studies indicate that such a system would have been "effective during the Mideast war because of the A-10's speed, maneuverability, weapons-delivery capabilities, E-W potential, and armor protection, which boost its chances of survival in the ground-attack role to a level well above that of any other aircraft," according to General Phillips.

General Phillips believes that Remotely Piloted Vehicles (RPVs) could play a significant role in conflicts similar to the Arab-Israeli war "to the extent that they can contribute to battlefield intelligence and defense suppression—the two areas that we have emphasized in their development."

While AFSC views with confidence its technical capability to provide the Air Force with the kind of weapons needed in the years ahead, its Commander is obviously troubled by what he terms "the devastating effect on programs that are well laid out and progressing flawlessly by having them perturbed in a major and critical way by arbitrary withdrawal of financial support."



A key means for increasing the survivability of Minuteman is, according to General Phillips, the site defense system. This program at present is confined to a development and test status, because of the SALT constraints. Shown above, Minuteman at launch from USAF's West Coast site.

PCS—Permanent Change of Station. For some in the military, it heralds a welcome change of scene. Others shrug it off as just another part of military life. But for still others, it means uprooting house and home one more time and—too often—separating families. The energy crisis and congressional pressure notwithstanding, it is virtually impossible for the military to cut the huge sums spent annually on PCSs. Military personnel seem destined to continue moving around at about the pace they have in recent years, making . . .

LIFE IN THE AIR FORCE— A MOVING EXPERIENCE



By Ed Gates

CONTRIBUTING EDITOR, AIR FORCE MAGAZINE

CARTOONS BY "JAKE" SCHUFFERT

THE SUBJECT under discussion before a manpower symposium at the 1967 Air Force Association Annual National Convention was excessive permanent change of station (PCS) moves and the problems they create.

Escalating troop commitments to Southeast Asia at that time had increased the number of transfers and the accompanying turmoil. Some quarters were suggesting that later, surely when the Vietnam War wound down, moves

would drop off. Things would get back to "normal." Military people would stay in place longer.

It took symposium participant Gen. Gabriel Disosway, then head of Tactical Air Command, to puncture this bubble.

"All talk about things settling down on the move front," the outspoken General Disosway told the symposium throng, "is a myth. There will always be frequent moves in the military,

and people should understand this when they enter service. . . ."

That message is equally valid today.

While a large segment of the service population shrugs off frequent transfers as routine—indeed, numerous careerists welcome the changing scene—the move problem tops the list of negative factors associated with military life. A recent Air Force survey confirms this, showing moves that separate families as the leading unfavorable aspect of a career in uniform.

Yet, try as they may, military authorities have been unable to reduce personnel moves significantly. The matter has been studied and restudied and agonized over, year after year. But annually, PCS moves continue to exceed the size of the force.

If PCS transfers were dispensed equally, every member would transfer at least once a year, a few twice. Air Force in FY '73, for instance, transferred about 775,000 persons, although its on-board personnel strength averaged only 708,000 throughout the period.

The total cost piled up for those moves—they included family moves, dislocation allowances, household goods shipments, furniture storage, etc.—came to an estimated \$475 million. That was \$27 million more than was spent during the previous year.

And the outlays are increasing. This fiscal year, although troop strength and the number of programmed moves are dropping, USAF's PCS travel bill should top the half-billion-dollar mark. Specifically, for FY '74, Air Force anticipates 738,000 PCS moves for an average-year population of only 682,000 members. Cost: an estimated \$503.2 million.

It's the same story among the other services. The Navy's PCS budget has increased nearly \$100 million in each of the past two years, despite a slight reduction in personnel. The Marine Corps's PCS budget has remained constant, though that branch has reduced troop strength slightly.

The Army is the lone service invoking really heavy cuts in the number of transfers, though this is hardly surprising. Army is down to almost half its peak-Vietnam strength, reached in 1968. Even so, Army's estimated FY '74 PCS outlay of \$356 million, combines with the planned expenditures of the other services to create a PCS price tag Defensewide of \$1.26 billion.

Transportation costs associated with operations and maintenance, including funds for temporary-duty travel, add another \$170 million each year to the Air Force move budget, and almost half a billion dollars more in all the services.

The energy crisis, of course, will affect the military travel picture. Some TDY figures are

to be curtailed, thus saving dollars. Commercial moves may be more difficult to secure. Slower highway speed limits may require more Stateside PCS en route time, which would increase expenditures.

And while the nation's fuel shortage could lead to some PCS cuts, most indicators point to permanent transfers occurring in about the same order of magnitude as originally planned, Air Force authorities said late last year.

Congressional Concern

The rather astonishing number of moves—and their cost—that the services make year after year frustrate congressmen and Pentagon officials. The lawmakers, particularly those on the Defense Appropriations subcommittees, periodically rake over the services for their alleged failure to reduce moves.

Service witnesses are accused of many evils, from wasting funds on commercial storage of members' household goods, to deliberately failing to initiate policies that would curb PCS movements.

A recent meeting of service leaders with the House Defense Appropriations subcommittee, in which FY '74 personnel spending projects were examined in depth, proved no exception. USAF's Director of Personnel Programs Maj. Gen. Oliver W. Lewis and then-Director of the Budget Maj. Gen. Joseph R. De Luca were on the witness stand when Rep. John J. Flynt, Jr. (D-Ga.), declared:

"You gentlemen are well aware . . . that this committee has been concerned about the increasing cost for travel performed in conjunction with changes in assignments. . . . Despite repeated assurances from numerous witnesses before this subcommittee over the years [that reductions would be made], the cost for PCS travel has continued to climb at rates either in total or on an average cost per move basis which far exceed the rates of inflation for the economy in general."

A bit later, when advised that \$353 million of Air Force's FY '74 PCS budget is earmarked for rotational travel to and from overseas, Flynt said, "This indicates that you [the Air Force] are rotating people overseas too fast. . . . We frequently receive letters from people who say that they want to stay overseas and that the service . . . will not permit them to do so. . . ."

General Lewis countered that "we . . . approved some 13,000 extensions [abroad] last year, so we do honor the man who is there [overseas] and likes it."

Still, horror stories of members suffering incredible numbers of transfers, of persons uprooted prematurely for no apparent reason, no infrequently are hurled at service witnesses much to their embarrassment.

A report issued by the subcommittee's in



Commercial moves may be difficult to secure!!

vestigative staff, meanwhile, charged that the services have "failed to demonstrate any policy changes that resulted in a decrease in the number of gross PCS moves."

Air Force responded that "it continues . . . to strictly limit the number of PCS moves to those essential to meet valid military requirements." During FY '74, General Lewis said, "we will continue to pursue our efforts to encourage voluntary overseas tour extensions whenever service considerations permit."

This is typical of the inconclusiveness that normally results when legislators and military officials jawbone over the transfer issue: the former press their demands for fewer moves and reduced outlays; the latter promise to do their best. Which is about all they can do.

Unacceptable Alternatives

Reducing the size of household goods shipments Uncle Sam pays for at transfer time, especially for higher-ranking families or couples with no children—wouldn't that be a good way to pare travel-associated costs, critics at the recent session asked.

No, Air Force responded, noting that by the time people make higher rank they normally have accumulated larger families and more possessions. They should not be penalized, nor should other families just because they have no offspring.

Another question frequently put to the services concerns the movement of family members when the serviceman elects—or is given—a short, unaccompanied tour. Defense policy provides that, in such instances, wives and children will be moved, at government expense, to a Stateside site of their choosing. When the member's tour ends, Uncle Sam pays for uniting them at the new permanent-duty base.

This policy, the committee suggested, offsets most of the savings the services generated from their short- and hardship-tour programs. Should not the Pentagon limit the rights of servicemen to move their families and belongings prior to going on such tours, the lawmakers asked.

Definitely not, Air Force replied. "We wouldn't consider it," said General Lewis, adding that when families are split, "we have an obligation to permit the member to relocate his dependents, at government expense . . ." to a place of their choice.

But the committee was not about to back-track on the issue. Late last year, it told all the services they "should inform personnel selecting unaccompanied tours where his next duty assignment will be, and then encourage but not force him to move his family to that station immediately, rather than to select an interim location."

The critics' concern over the costs that go into the transfer budget is understandable.

Each military member's car when shipped abroad costs the government about \$300. Household goods shipments price out at about \$1,000–\$1,400 for each enlisted family, around \$1,600–\$1,700 per officer family.

Trailer allowances at PCS time average about \$750 each. Dislocation allowances average around \$150. Travel mileage costs average from \$200-plus to well over \$300 per move. So when these and still other move-associated costs are multiplied by well over 700,000 transfers annually (in USAF alone), it becomes an expenditure area of concern.

The services, it should be made clear, are as anxious as the critics to reduce PCS moves. A substantial reduction of moves would draw cheers from various elements of the military establishment. Periodic uprooting of families, pulling the kids from one school after another, taking a licking on rents and deposits, and all the rest—these can get awfully tiresome.

And some persons otherwise favorably inclined toward military life won't put up with it. Or their wives won't. Extended TDY travel that operational crews frequently take on adds to the problem in some commands.

Why So Many PCS Moves?

Despite the pressures on the services to cut people moves, and the services' desire to comply, significant reductions are not in the offing. Not as long as the US maintains its vast installation network in this country and abroad; all must be manned with the proper skills and periodic replacements provided.

Enlistment expirations, retirements, transfers to career schools, compassionate moves, hardship tours, involuntary elimination of sub-standard performers—these are just some of the necessary actions that create thousands of PCS moves every year.

Even in the traditionally popular overseas areas, attempts to keep personnel in place longer have sputtered. In 1972, for example, USAF extended normal "accompanied" tours abroad from thirty-six to forty-eight months. It was a bold attempt to hold thousands of families on station an extra year and realize travel money savings.

It was also a response to congressional arm-twisting.

The plan didn't work, however. It brought angry cries from many people involved; their plans to return home had been torpedoed. Raging inflation in Germany and other countries where USAF people serve also soured many of them on the idea of staying an extra year. It didn't save much, either.

So Air Force last year responded with plans to phase back to the previous thirty-six-month

The author, Ed Gates, became a Contributing Editor a year ago, after his retirement as Editor of Air Force Times. He comments regularly in AIR FORCE on Air Force personnel matters, and his column, "Speaking of People," appears in each issue.



Even in popular overseas areas, keeping personnel in place sputtered.



tour abroad. Officials in the Hq. USAF office of the DCS/Personnel said at press time that they expected to get early funding approval to implement the phase-back.

Still, what's wrong with an average of one PCS every three years? Wouldn't that arrangement, for all service members, be fair and equitable and save Uncle Sam considerable money to boot?

Indeed so. But an average of one transfer per person every three years—it would cut total Air Force PCS moves to around 240,000 this year—is a pipe dream. Nothing close to it will ever occur, because of the vast number of “unavoidable” moves that critics fail to consider or refuse to acknowledge.

First of the “unavoidables” is the “accession” move—it brings a person from civilian to military life, usually to basic training. Then there is the move from basic to technical training school, followed by one from tech school to a duty station.

This fiscal year alone, according to Hq. USAF, these three categories will account for over 300,000 Air Force PCS moves (see chart).

Add rotations to and from bases in the States and abroad. Add separation travel—there will be more than 118,000 such USAF moves this year. Finally, add some 200,000 associated dependent family moves, and you've got an annual half-a-billion-dollar program.

Living Standards and Larger Loads

It is much the same story in the other military services. And all are experiencing an associated impact brought on by changing lifestyles. Years ago, the typical service member was single, poor, and not burdened with personal possessions. He probably didn't own a car. Most of his gear fitted into a barracks bag. It cost the government very little to move him around.

No more. Now he has money to spend, to accumulate a civilian wardrobe, records, stereo equipment, maybe a recreational vehicle. There's much more to ship at transfer time, to say nothing of the inflated prices civilian movers charge to move it.

Storage costs of members' household goods is another item that has skyrocketed in recent years.

In short, nearly every ingredient that goes into determining overall people-move costs continues to escalate; the services are almost helpless to stop it. The principal exception is the recent cuts in troop strength, but these may have about run their course.

The government, meanwhile, hopefully will not invoke nasty little restrictions as it has done sometimes in the past. An example: In late 1972, Congress, with almost no advance notice, ordered a halt in government payments for shipment of service members' cars from abroad, if the vehicles were foreign-made. The

AIR FORCE PCS MOVES, EXPENDITURES FY '72 and FY '74 Compared

(Amounts in Thousands of Dollars)

	FY '72 Actual		FY '74 Estimate	
	No. Moves	Amount	No. Moves	Amount
Accession Travel	109,319	\$ 17,801	95,630	\$ 15,854
Training Travel	169,996	22,512	142,788	20,711
Operational, Duty Stations	61,923	55,333	72,868	69,226
Rotational, to and from				
Overseas	252,342	269,205	295,556	353,110
Separation Travel	135,271	51,307	118,562	43,967
Organized Unit Travel	3,961	2,482	12,465	8,089
Total Member Moves	732,812	\$418,640	737,869	\$510,957
Reenlistment Travel Payments		5,094		4,963
Total	732,812	\$423,734	737,869	\$515,920*

* Reduced to \$503.2 million per Pentagon's decision to delay granting full travel benefits to E-4s with two years' service, from July 1973 to January 1974.

Average USAF military personnel strength in FY '72 was 750,000, compared to an estimated average of 682,000 for the current fiscal year. Yet, FY '74 PCS outlays are slated to top those of two years earlier by at least \$80 million, although the actual number of moves is almost the same. In FY '73, Air Force PCSed about 775,000 persons, which, with about 177,000 associated dependent moves, cost \$475 million.

Defense Department quietly bowed to the congressional dictate.

The FY '74 military appropriations bill, as it was nearing final approval recently, fortunately contained no new PCS-related curbs.

Even as the services reexamine their transfer programs, searching for economies, a new factor that can only drive costs up attains prominence: extending full travel entitlements to lower-ranking enlisted personnel.

E-4s with less than four years of service, and below, normally have not received dependent travel, government-paid transportation of household goods, dislocation or trailer allowances, overseas station allowances, and movement of private cars.

Yet matrimony continues. Without these benefits, this low-salaried group suffers immensely. The resulting problems burden units, commands, and military missions, particularly overseas where young wives suddenly appear without funds.

Some quarters insist that continued withholding of these benefits from low-ranking members constitutes gross discrimination. And the pressures, from within and without military officialdom, to provide these benefits to all members is intensifying. But it's going to be very costly.

Already, extension of these benefits to E-4s with as few as two years of service has been authorized. Funds to carry out this program, beginning January 1, 1974, are contained in the appropriations bill cited above. Earlier plans to launch the program in July 1973 were scrapped, resulting in a \$12.5 million "saving" to the Air Force.

When and if the government extends full

travel entitlements to E-1s through E-3s, more—not less—money must be appropriated.

Air Force authorities, meanwhile, point out that a way does indeed exist whereby PCS moves can be reduced and enormous "savings" achieved. But they are not about to endorse it.

This "plan" recognizes that normally for every service member separated or retired, a replacement is required. Each recruit, of course, triggers three rapid-fire moves (accession, tech training, and duty station). Accordingly, by retaining rather than involuntarily separating misfits and second-raters, by barring retirements until twenty-five or thirty years of service, and by taking related steps to curb attrition, each military service could sharply curtail its input of new members. PCS moves would plunge.

And, just as certainly, the services would become saddled with disciplinary problems, curtailed promotions, and accompanying woes. Chaos would lurk just around the corner.

Military personnel and their families, it seems clear, will continue to move around at a fairly rapid clip. Those who are adaptable and adventuresome, who welcome a changing scene, thrive on new challenges, and disdain the same old routine, should find the prospects stimulating.

And those who cannot accept frequent movement as a condition of their role in the vital business of national security? As General Disosway indicated, they're in the wrong business. ■

SPARE PARTS

During World War II, high-ranking officers often had WACs as secretaries or personal assistants. Sometimes they would accompany their bosses to the forward areas. I remember one occasion when a general flew up to the front, leaving orders for his WAC secretary to be flown up the following morning.

Three or four DC-3s came in by noon, but no WAC. The general was understandably disturbed and visited the flight line to check on afternoon flights. Only one more plane was scheduled to arrive, with "urgently needed spare parts," but no passengers on the manifest.

The general had returned to his headquarters when the last plane landed. Off stepped a nattily dressed WAC major, the only "cargo" on the plane. With the WAC on her way, the operations sergeant began rechecking the manifest, since he still was short one item.

Sure enough, there it was on the manifest, intermingled with other listed spare parts by some clerk who apparently was bucking for a transfer to the Infantry:

"Item: 1. Weight: 122. Description: Complete tail assembly."

—Contributed by Col. (Dr.) James B. Hall, USAFR (Ret.)

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

USAF'S CHIEF SCIENTIST MUSTERS AN IMPRESSIVE
ARRAY OF FACTS TO EXPLODE . . .

THE MYTHS OF DEFENSE SPENDING

By Michael I. Yarymovych

MANY people believe that the military spends a disproportionate share of our national wealth. In addition, they believe that the military continually raises the specter of the threats to our national security just to obtain more money and to perpetuate themselves. This simply is not true.

On the other hand, we do recognize the very pressing needs that we have at home. National priorities have been reordered, and this reordering has had a tremendous effect on spending for national defense. But somehow, none of this has altered the public feeling about military spending.

No matter what yardstick one uses, be it percent of the federal budget or percent of the Gross National Product, defense spending is at its lowest point in real terms—people and hardware—since the Korean War. Let us not forget that this defense spending has prevented a nuclear war for twenty-eight years and has enabled the United States and the Soviet Union to agree on some strategic arms limitations without fear of catastrophic surprise.

In the past ten years, total federal spending has doubled, and, within that spending, aid to education has increased five times, public assistance has tripled, Social Security has tripled, and health care has increased from less than one-half billion dollars to over \$18 billion—a more than fortyfold increase. In the same period, defense spending increased by only fifty-eight percent in current-year dollars.

●

Myth: The peace dividend has been stolen.

Reality: The Defense Department spent \$51 billion in pre-Vietnam 1964 and is forecasting \$79 billion for Fiscal 1974. This represents a \$28 billion increase during a time manpower was reduced by eleven percent. Although the Vietnam War was phased down from its 1968 peak, major pay increases plus general price inflation have occurred. The all-volunteer force was one of the stimuli for the pay raises. Of the \$28 billion increase since 1964, pay raises have been about \$22 billion and price increases about \$6 billion. These two items, pay and inflation, account for the entire increase in the defense budget during the past decade.

Myth: The national defense budget continues to grow.

Reality: In 1973, spending was the lowest, in real terms, since Fiscal 1951. None of the real growth in the economy over the past twenty-two years is currently allocated to national defense.

Since the Southeast Asia wartime peak, defense manpower (military, civil service, and defense-related industry) fell by thirty-five percent or 2,800,000. Purchases from industry fell by forty percent or \$22 billion in constant prices.

Myth: In recent years, many additional billions of dollars have been poured into weapons systems and facilities.

Reality: Over the past nine years, funds for procurement, research and development, and military construction have increased by only four percent or \$900 million. In terms of real buying power, these funds have decreased by twenty-four percent in the same period.

Myth: The defense budget dominates public spending.

Reality: In 1973, defense accounted for about twenty percent of public spending, about twenty-one percent of all public employment, and just over six percent of the Gross National Product; the lowest shares in more than twenty years during which time about one-half of all taxes went for defense.

Myth: Defense squanders billions in weapons system "cost overruns."

Reality: Alleged "cost overruns" of tens of billions are arrived at by comparing current estimates of all-time (concept to completion of production) costs to very early "planning estimates." Only about half the money referred to in "cost-overrun" figures has ever been requested of Congress, much less appropriated or spent.

Myth: Defense is placing an inordinate drain on the nation's research and development resources.

Reality: Defense-related research and development is smaller in real terms in 1973 than in 1958 or any year since.

Unfortunately, there are those who do not view our national security needs as having the same urgency in light of the current East-West relationship. Under these circumstances, we have a genuine problem in ensuring that today's military research and development accomplishes its primary objective, superior deterrent defenses for the long haul.

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WORLD WAR I PILOT

Through the years, many have claimed that they flew with the legendary Lafayette Escadrille of World War I. Actually, only thirty-eight Americans ever belonged to that famous squadron. Here are some recollections of the men who made up the Lafayette Escadrille and of air combat over the Western Front—some reminiscences of . . .

CARL DOLAN

LAST SURVIVOR OF THE LAFAYETTE ESCADRILLE



In retirement and living in Hawaii is Carl Dolan—last survivor of the Escadrille.

By Capt. Paul E. Sjoldal, USAF

CHARLES H. "Carl" Dolan is the last surviving member of that legendary group of World War I pilots who flew with the Lafayette Escadrille. As we talked recently in the living room of his home in Hawaii, he recreated in absorbing detail events that occurred more

than half a century ago—events like a combat experience he shared with Raoul Lufbery.

It was on a brisk autumn morning in October 1917, during the height of the costly French Malmaison offensive of World War I. Dolan—then a sergeant—sometimes

flew as wingman with the great Lufbery, who, with thirteen confirmed kills, had already become a double ace in the Escadrille.

On this particular morning, the two pilots gunned their engines and lifted their Spad VII's off the rolling grass field at Chaudun.

Although Dolan had no official kills in the five months since joining the squadron, he had earned Lufbery's confidence, and he was conscious of the honor. For Lufbery, the flight was to be the continuation of a red-letter day: flying alone at sunup, he had already destroyed a German two seater.

Maneuvering their machines high above the mottled French countryside, Lufbery and Dolan spotted another enemy two-seater.

The German observation craft, intent on photographing details below from an altitude of about 6,000 feet, failed to see Lufbery when he dived out of the sun from a twelve o'clock position. A burst at very close range crumpled the observer in his cockpit, and the German machine shivered, bounced, and slipped into a spin.

The two Americans followed the crippled plane down to about 3,000 feet, where they lost it in a cloud bank. The kill went unconfirmed.

Dolan saw Lufbery down three of the five German planes he attacked that day. Officially, Luf was credited with only one.

To pilots on both sides, confirming kills left much to be desired. Witnesses—usually observers in balloons or ground troops—had to verify that an aircraft had indeed crashed. In the hell of World War I's Western Front, keeping your head down meant survival. Many kills went unconfirmed; those that took place deep behind enemy lines seldom were verified.

As Lafayette Escadrille pilots, Lufbery and Dolan were members of the first organized group of Americans to fly in combat—America's first in a continuing procession of courageous fighter pilots that was to come. The Escadrille, a squadron of the French Service Aéronautique, is still a part of today's French Air Force.

Over the years, thousands have claimed to have flown with the Lafayette Escadrille. Many of them did fly with the Lafayette Flying Corps (LFC), which included all American pilots who flew with the French in World War I. But only thirty-eight Americans and five

French officers ever belonged to the famous Escadrille. At any one time, the Escadrille's maximum strength was nineteen pilots. Of the thirty-eight, seven made it through the war. Some were captured, some suffered severe injuries or were transferred. For Lufbery and seven others who went down with their planes, time ran out.

As Dolan remembers that solitary man, Lufbery was deeply admired by all the Escadrille pilots, but no one was ever able to crack his outer shell. A loner, he kept his thoughts and feelings to himself. It was a characteristic unaccountably shared by many of America's early aces. They lived, fought, and died alone.

Lufbery had seventeen confirmed victories on his tally sheet when he jumped from a burning plane to his death in sight of Toul Aerodrome on May 19, 1918.

Today, of the thirty-eight who created the legend of the Lafayette Escadrille, only Carl Dolan remains.

The Long Road to Combat

Dolan's middle-class Boston family had a long military tradition—one forebearer died with Custer at the Little Big Horn. As a young idealist, Dolan felt a personal responsibility as the Great War raged in Europe, and wanted his country to take a stand. Following his studies in electrical engineering at MIT's Lowell Technical Institute, he grew impatient and hopped a cattle boat to England in hope of contributing to the war effort.

After several stints with British aero instrument and magneto firms, Dolan was sent to Paris as an installation engineer for Sperry Gyroscope Co. There, his job was to install automatic pilots—that's right, automatic pilots—in 1915-16.

His accidental encounter with pilots of the Lafayette Escadrille in a Paris bar was a case of mutual admiration at first glance. When Dolan learned that he was to be sent to Russia to replace an engineer who had been decapitated while tinkering with the anemometer of an airborne aircraft, he immediately decided to cast his fate

with his Escadrille friends. Dolan—Lufbery's complete antithesis in temperament—was anything but a loner. The only teetotaler in the Escadrille, the affable Irishman always kept a bottle in his locker for anyone in need.

"Before becoming a pilot, I had to join the French Foreign Legion to avoid losing my American citizenship," Dolan recalls. "The Legion was notorious for harboring the meanest, hardened killers in Europe and Asia. It was said that Legionnaires knew the true meaning of discipline. I really became a believer when I saw a Legionnaire killed by his captain for talking back. The captain and sergeant were arguing. I heard the captain say, '*Tegul pas notre mot!*' ('Not another word out of you'). The sergeant answered, '*Oui, mon Capitaine.*' and was shot dead in his tracks. I was glad to get out of that camp and into flight school."

Discipline at flight school was left pretty much up to the individual. The first time a student climbed into a cockpit he flew solo.

"We had no back-seat instructors in those days. We started out in the Penguin, a stubby-winged aircraft that couldn't fly. When we could taxi across the field at full throttle in a straight line, we changed to a plane that could fly. Well, fly somewhat. We flew five feet off the ground, then at twenty feet. That's all the plane could manage. But once we jumped into the cockpit of the Blériot, we quickly learned how to bank, turn, and fly 1,000-foot triangles.

"I got my brevet [license] and went to Avord for advanced flying in the Nieuport. We flew figure eights, landed crosswind, and went cross-country. Students were always crashing. One idiot crashed through the roof of a local bakery and walked out the front door, without a scratch, carrying a fresh loaf of bread."

The school of acrobatics and combat at Pau, France, was the next-to-the-last hurdle before pilots were sent to the front. The French believed a pilot should be fearless in the air or he wouldn't survive

combat. In just three days, loops, spins, rolls, and other acrobatic maneuvers were taught. Dolan bypassed the aerial gunnery school at Cazeau, because pilots were badly needed. He first fired a machine gun at a German.

The pilots of the Escadrille had varied backgrounds: seaman, social worker, adventurer, mechanic, racing and ambulance driver, son of a millionaire, high-goal polo player, flying scout for Pancho Villa, sheep-camp cook, and railroad publicity agent. But whatever background, they all had one thing in common: They preferred the individualism and hazards of flying to the trenches and death of Verdun.

Risky Proposition

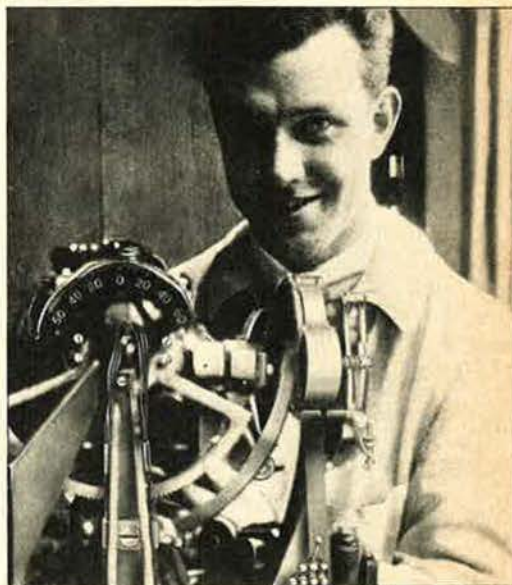
“Combat flying was a pretty risky proposition—in fact, none of us thought we would survive the war. But going down in flames was a lot better than having your head blown off in some godforsaken trench. Some of us thought that if we went at a certain pressure we might have a chance to survive. We considered ourselves aviators rather than fighters. There was enough danger without taking a lot of wild, crazy chances like the fighters did.

“We told the fighters that they had better bring down two Huns if they were going to fly into the sun with their guns blazing. In those days, pilots could be replaced quickly, but new planes were hard to come by. In fact, the reason the French didn’t give us chutes was to encourage us to stay with our ships. Our chute was a .45 pistol. If it got too bad with your aircraft on fire, you blew your brains out.

“We could always spot a fighter. We usually gave them three months to get themselves killed. Rickenbacker was a fighter. He lasted four months, and the war ended. Guys like Frank Luke and Courtney Campbell were nuts. Luke was a balloonatic.’ Instead of surrendering after crash-landing in Germany, he pulled out his .45 and was shot by the Germans. Campbell was always doing crazy stunts. One day, while trying to scare his assistant



Young Dolan worked for Sperry Gyroscope in France before his enlistment in the famed Lafayette Escadrille.



The Western Front in 1918: 1st Lieutenant Dolan, a flight leader in the 103d Aero Pursuit Squadron.



France 1917: Hangars of the Escadrille on Ham Airdrome, with a French-built Nieuport in the foreground.

The author, Capt. (Major selectee) Paul E. Sjoldal, is Chief of the Public Information Branch at PACAF Headquarters, Hickam AFB, Hawaii. A graduate of the University of North Dakota, Captain Sjoldal has served as an Information Officer at bases in the US and Far East during his ten years of active duty. He was a member of the task force established at Clark Air Base in the Philippines to receive the returning Vietnam POWs in the spring of 1973. Captain Sjoldal has recently been awarded a master's degree in Community Leadership by Central Michigan University.

squadron commander, he sank his wheels into the top wing of his commander's Nieuport. The two planes went once around the field before Campbell applied full throttle and flew free. Somehow both planes landed safely."

The American Army gave the Escadrille almost as much trouble as the Germans, according to Dolan. He recalls many difficulties in shifting from French to American control. When the Lafayette Escadrille became the 103d Aero Pursuit Squadron of the American Air Service on February 18, 1918, Dolan, who had been a sergeant in the Escadrille, was commissioned a first lieutenant.

"When General Pershing and the American Expeditionary Service arrived in France, many ninety-day-wonder colonels came along for the ride. Those cavalry-trained officers made it immediately clear they didn't need any crazy pilots to win the war for them. The West Pointers Pershing assigned to run our air

force knew everything about drilling, and nothing about airplanes.

"We called them ninety-day wonders because that was all the active-duty time they had. We went to Billy Mitchell, attached to the Embassy in Paris, and told him, 'Those fools don't know a prop from a tail skid; if you don't do something quick, they'll murder the entire American air force.' If it wasn't for Billy Mitchell and a few other good officers, they would have, too."

The height of stupidity early on was probably when the ninety-day wonders assigned newly promoted Maj. Raoul Lufbery to a desk. Dolan and the Escadrille were flabbergasted.

Piloting a Desk

"As I recall, Luf was first assigned as Commander of the 95th Pursuit Squadron and was delighted. Then he found out it was a paper outfit with no planes. Luf told the colonels what he thought, in no uncertain terms, and was reassigned to write a pamphlet on how to kill Boche by the dozens. Imagine, Luf could barely read and write. He was one of our top three aces, and those idiots made him a desk jockey.

"When some of the Escadrille pilots went to cheer Luf up, they found him in a small office, his feet propped up on a large rolltop desk. The desk held an ample supply of whiskey. Someone noticed that Luf had spurs on and asked what they were for. He said, 'Damned if I know, but Air Service regulations require pilots to wear spurs everywhere except in bed.' That's the cavalry mentality we faced on occasion. Luf was ready to resign from the service, but we talked him out of it, and Billy Mitchell got him back in a cockpit."

Before accepting the proven Escadrille pilots into the American Air Service, a delegation of top rankers was sent to examine their worthiness to wear an American uniform.

"They gave all of us physicals," Dolan remembers. "We were put through a series of ridiculous tests. Not one of us passed. I admit frequent visits to the bar to bolster courage didn't help, but we had flown hundreds of combat hours. With thirty-nine victories to our credit, we supposedly weren't fit to fly. Why, Dud Hill was blind in one eye. Bill Thaw had a crippled hand and bad eyes. Luf couldn't walk a crack backwards. My tonsils were beyond hope, and I was myopic. Hank Jones had flat feet. Several had various social diseases. Here we were, the *crème de la crème* of aviation—of course, we wouldn't be the cream today, maybe sour milk—but at that time we were the only experienced, combat-tested American fighter pilots. Besides, no doctor has an instrument that will test the guts of a man."

Gen. Billy Mitchell, General Pershing's air adviser, knew the American Air Service had to have the expertise and experience of the Lafayette Escadrille and the Lafayette Flying Corps pilots, despite any physical infirmities. He persuaded Pershing, but not all the pilots. Thirty-two pilots of the 152 from the Escadrille and the LFC elected to remain with the French. Twenty-six accepted commissions in the US Navy.

The Rubber Dutchman

Dolan remembers being ordered to fly in a raging blizzard, and once the Army sent up a 100-plane patrol mission.

"I was squadron leader and Harold Hartney lead the formation. The ninety-day wonders ordered it. We never did find out why. We did find out it took forever just to turn the fool formation, with the sky full of planes. We scared ourselves more than we did the Germans. We complained and insisted on smaller formations after that."

Dolan says he had two official kills, one with the Escadrille and one with the 103d.

"Of course, as did all World War I pilots, I had kills that went unreported. My colleagues used to kid



Raoul Lufbery, an ace fighter pilot and the epitome of the World War I aviator. Like many others, he was killed in aerial combat.

me about my rubber Dutchman. That was from a time when I filled a German plane full of lead, including its pilot, and the plane kept on flying. We all figured that Boche must have been made out of rubber.

"The greatest shock of the war came when the Armistice was signed. That piece of paper meant we were going to live. After being resigned to death for so long, it was a strange feeling."

Dolan summed up his World War I exploits with an understatement: "Hell, I didn't do anything. I'm just the last of the Mohicans—a survivor. I get a lot of reflected glory from the real heroes of the Escadrille. I'm proud to have served with them."

Following his service in France, Dolan went on to a wide and varied career in aviation: He flew the first airmail in China as Chief Air Adviser to the Chinese government, as that vast country began to emerge as a modern state.

Dolan also laid out runways throughout the world during the 1920s and acted as troubleshooter for fledgling airlines in trouble dur-

ing the early days of commercial aviation.

As a safety investigator and technical adviser to Senate and other congressional committees and commissions, Dolan helped write the original charter for the Civil Aeronautics Administration in the crash-filled 1930s.

Then, when World War II came, he directed the building of gliders for Allied landings in Europe.

In the postwar period, he rewrote civilian airline safety rules as Executive Director of the Joint US Congressional Aviation Policy Board.

Dolan, now a colonel, once again found himself in military harness when he was recalled to active duty by USAF's Air Materiel Command during the Korean War.

Life of Accomplishments

During his lengthy career, the former fighter pilot has flown more than fifty kinds of aircraft—from Blériots to jets.

Lt. Col. Phillip Flammer, formerly an instructor of history at the Air Force Academy and author of a book on the Lafayette Escadrille, has known Carl Dolan for many years. This is what he had to say of

a man whose place in the history of aviation is unique:

"A life full of accomplishments . . . and little monetary reward to show for it has been, in a way, the story of Carl Dolan's life. A personal fortune was virtually his for the taking, but Carl Dolan has always been too busy troubleshooting for others and extending the helping hand to every man he felt deserved it. No needful ex-Lafayette pilot, for example, was ever turned away from his door, and he personally, and at his own cost, succored and eventually laid to rest several tragic discards of society whose personalities had been hopelessly warped by the war."

Carl Dolan could be forgiven for living in the afterglow of a career filled with adventure and achievement. He doesn't. He remains as concerned with the problems of the world as he was more than fifty years ago when he joined the Lafayette Escadrille. In 1966, when asked to talk to the Air Force Academy cadets on Lufbery Day, he concluded his remarks this way: "I think you are about the luckiest Americans in the world. I would gladly trade my fifty years of experience to be with you, with what lies ahead." ■

KNOW YOUR CREW MEMBERS!

After having flown my Korean combat tour in B-26s, I served as the squadron adjutant while awaiting reassignment orders. To get flying time, I flew tow-target missions that enabled the Army antiaircraft crews to practice their art.

On one such mission, I was teamed with a Captain Jones, a replacement pilot who had just arrived from the States. We introduced ourselves and, without further conversation, proceeded directly to the aircraft. He took the left seat, and I took the right. After an uneventful takeoff, we made two routine runs through the target area. Captain Jones then asked if I'd like to fly the plane for a while. I nodded and took the controls. At the end of the next run, he advised me to make a turn to the left. After completing the turn, which carried us well outside the target area, I could tell Jones was looking at me in a strange way.

"Do I understand you've flown fifty-five missions?" he said.

Again I nodded.

"Well, Lieutenant," he remarked, "I don't want to sound critical, but that was a pretty sloppy turn for a combat pilot."

"Maybe so," I said, "but I thought it was pretty smooth, considering that I'm a bombardier!"

—Contributed by Lt. Col. Ernest N. Willard III, USAF

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

Airman's Bookshelf

A POW's Story

The Passing of the Night: My Seven Years as a Prisoner of the North Vietnamese, by Col. Robinson Risner. Random House, New York, N. Y., 1974. 264 pages. \$6.95.

Less than a year ago, our POWs came home. Since then, a curious, yet for the most part unintruding, American press has followed their family reunions, readjustments, medical problems, and demographics. We've read and heard of joy and sadness, courage and suffering.

Yet questions remain. These repatriated professionals were different from what their families and the public had been preparing for. In spite of record-shattering imprisonment, the enemy's total abrogation of the provisions of the Geneva Convention, and our knowledge of the Korean POW experience, their resilience was surprising. It was all the more surprising in view of the tremendous political and social changes in this country during their absence. Yet their post-liberation divorce rate is below the national average. Serious mental illness is less than expected; perhaps not even statistically significant. Their return to duty, especially flying duty, has been more rapid than anticipated. Why?

When a Korean ace and winner of the Air Force Cross in Vietnam, USAF Col. Robinson "Robbie" Risner—whose preprison combat exploits had made the cover of *Time* magazine—decided to write a book about his seven years as a prisoner in North Vietnam, long-awaited answers seemed sure to be coming.

The Passing of the Night is the answer of one man. It is a personal story of a seemingly endless nightmare that will make even those most familiar with the POW situation shudder. One cannot read it without cringing at the suffering and asking over and over, "How did he do it? How could he stand it?"

This book will leave its mark on

any reader. If it has a fault, it is that, for this reader at least, it does not answer some questions fully enough: What wellspring brought forth the emotional, intellectual, and physical guts to hang on—no, to do more than simply hang on—to function meaningfully? Is there something in the American ethic, Air Force training, Colonel Risner's or the others' personal backgrounds?

In his introduction, the author says that he wrote the book because, "I believe that today's young people are searching for a dragon to slay. I want to help them find the right dragon. I want our young people to be proud of the things that count. I want to show that the smartest and bravest rely on their faith in God and in our way of life. I hope to show how that faith has been tried by fire—and never failed. . . ."

Faith is most certainly the core of Colonel Risner's life, and prayer was the central manifestation of his faith. In explaining how that faith was formed and grew, he writes of his mother's prayerful example and of his family's spiritual solidarity and religious activity.

In order to resist the horrors of prison life, it was necessary, he says, to put everything in a "pretty simple package." He cites four "essentials": "We were fighting the common enemy of freedom—international communism. We were fulfilling our duty to our country. I was sure the American people were behind us. I believed God would bring me out of prison—better for my stay."

The book is a vividly recalled account of his imprisonment, except for three flashback chapters in which he writes of meeting his wife, a post-World War II episode in which he and his Oklahoma Air Guard P-51 were down and missing for days, and some highlights of his Korean air combat and acedom. He also takes the reader on several SEA missions, including his last one, and it's good fighter pilot narrative.

The Rabbit, Mickey Mouse, the

Cat—a few of his North Vietnamese guards, interrogators, and tormentors—all are described in a way that evokes images of some 1950s movie. And familiar names of other POWs are sprinkled throughout—Ev Alvarez, Jim Stockdale, Jerry Denton.

If one picks up this book expecting a Vietnam version of "Hogan's Heroes"—minus the humor—they are in for a disappointment. Colonel Risner doesn't try to show how the men, as a whole, foiled and frustrated the enemy, beyond some details of how they communicated and determined the SRO (senior ranking officer).

It is, after all, a personal book, and why shouldn't it be? When Colonel Risner describes his panic in the "sheer desolation" that "permeated the miserable dark cell I lived in twenty-four hours a day [during a ten-month stretch in solitary confinement]," he puts a capstone on his suffering. Doing as many as a thousand sit-ups daily or running twenty-five miles in place, he sought his only salvation—exhaustion.

One may be able to empathize with his physical suffering, but no one can possibly suffer with him through that emotional crisis.

One important insight the book does present deals with the united stand the POWs took in support of President Nixon. Colonel Risner writes that his captors respected strength. "Many times when we were reasonable, they would assume it was weakness and took advantage of us . . . they respected a person who was unyielding. . . ." Risner, and one assumes others saw Nixon as meeting that North Vietnamese model and influencing the enemy. When their release came, it is little wonder that they were grateful.

The Passing of the Night is an account of incredible personal suffering and an assertion of faith in the institutions that make up our society—a virtue that often seems in short supply these days. Colonel Risner's book should be read not only for its intended message, but

also as a reminder that most Americans have not fallen prey to the decadence that has destroyed other affluent societies.

—Reviewed by Maj. Robert W. Hunter, USAF, Deputy Assistant for Policy and Programs, Internal Information Div., Office of the Secretary of the Air Force.

Saga of the Airships

Giants in the Sky, by Douglas H. Robinson, University of Washington Press, Seattle, Wash., 1973. 376 pages, with bibliography, glossary, appendices, and index. \$15.00.

Here in 100,000 words is set forth a history of the rigid airship; it is, more particularly, an accounting of the 161 such airships built and flown, by the Germans principally, and by the British and Americans, in the 1897–1940 lifespan of these monsters of the skies.

Author Robinson is a physician with a demanding medical practice. Even so, he has labored long and diligently over the years to qualify himself as narrator of the rigid airship's history. (An earlier work, *The Zeppelin in Combat*, is now in its third edition.) Throughout this latest effort, he marshals a plethora of factual information, much of it technical and, for most readers at least, hardly material; the result is exhausting as well as exhaustive.

And yet, too often the reader is left hungry for more about the meaning of what did or did not happen—the *politics*, if you will, of crucial situations. For example, Robinson with a single sentence disposes of Capt. Zachary Lansdowne's determined protests against the Navy's 1925 ordering of the ill-fated *Shenandoah* to cruise the Midwest during the summer thunderstorm season. At the very least, Chief of Naval Operations Adm. Edward Eberle's pungent retort deserves inclusion: "If the limitations and apprehensions . . . are sound, it would appear that our airships are of little military or commercial value, and that the great cost of their upkeep and repairs would not be warranted . . . the CNO is not ready to concur in these opinions."

After reading the litany of airship catastrophes and failed expectations that was climaxed by the tragic loss of the *Hindenburg* in

1937, one must judge to be the longest of long shots Robinson's conclusion: "The obstacles [to further development of the airship] are not technical, they are psychological and financial; and if attitudes change and the money is forthcoming, we may still some day see again the giants in the sky which thrilled and enthralled our parents with their awesome size and majesty."

More clear-sighted was his assessment in the July 1961 *Airpower Historian*, summed up in two sentences: "From the war elephants of Carthage, through the galleons of the Invincible Armada, to the 'impregnable' Maginot Line, nations have pinned their faith on weapons which have symbolized their unique sense of national pride and power. The Zeppelins in World War I satisfied deep-seated emotional needs, yet disappointed the extravagant hopes and dreams of the German people."

—Reviewed by Walter T. Bonney, former Director of Information for NASA and for Aerospace Corp.

The Desert Fox

Rommel, by Charles Douglas-Home. Saturday Review Press, New York, N. Y., 1973. 224 pages. \$12.50.

This smoothly written and lavishly illustrated book by the military correspondent of the *London Times* represents the latest attempt to put into perspective one of the major enigmas of recent military history, Field Marshal Erwin Rommel. This is no mean task: biographers have found the character of the "Desert Fox" just as elusive as his opponents in the Western Desert found his armored columns.

Supported by some twenty superb illustrations, Douglas-Home takes us from Rommel's formative experiences in World War I to his untimely death in 1944, a suicide by Hitler's orders. Douglas-Home's attempt to divorce Rommel the man from the myth is sound in concept. Unfortunately, the book fails to produce a balanced appraisal. The author is undoubtedly correct in part in echoing criticisms leveled by Rommel's enemies on the General Staff that Rommel was a poor administrator, frequently unreachable by his staff in time of crisis.

But why, then, was Rommel

such an extraordinarily successful commander? Douglas-Home's explanation—Rommel's "constant movement and dynamism"—is unsatisfying. So also is the author's characterization of Rommel as "an instinctive rather than an intellectual fighter," a characterization contradicted by the admitted influence in the *Wehrmacht* of Rommel's book of 1937, *Infantry Attacks*, and his experience of almost four years in professional military education.

Much of the difficulty lies in Douglas-Home's disregard of the basic technical facts of mechanized warfare, the "disparities in equipment" that are lightly—and permanently—dismissed on p. 72. Characteristically, German tanks, from the five-and-a-half-ton Panzer I of 1935 to the seventy-ton Tiger II of 1944 are simply referred to as "the Panzers" with no attempt at differentiation. Such technical omissions might be forgivable in many military biographies; but in Rommel's they are crippling, for Rommel was first and foremost a technician. He gained fame through his superior understanding of the technical characteristics of mobile forces, both his own and his enemy's.

Any attempt to explain Rommel the man without understanding Rommel the technician and the tools of his trade is doomed to failure. A biography of Rommel that ignores tank technology makes no more sense than would a biography of Krupp that ignored cannon technology. Sadly, therefore, Douglas-Home's portrait of Rommel falls short by slighting a central part of the man's existence.

While *Rommel* provides a useful summation for the general reader, the student of military command will find Ronald Lewin's *Rommel as a Military Commander* (London, 1968) far more comprehensive and penetrating.

—Reviewed by Maj. John F. Guilmartin, Jr., Department of History, USAF Academy.

New Books in Brief

Air Enthusiast (Volumes One and Two), edited by Gordon Swanborough. These are hard-bound copies of the British aviation magazine, *Air Enthusiast*. Volume One contains issues for June through December 1971; Volume Two, January through June 1972. Although the emphasis is on aviation history, with

Airman's Bookshelf

many articles on long-forgotten airplanes—some written by test pilots who first flew them—there is extensive coverage of current aircraft, aviation books, modeling, and reports on air combat in large and small wars. Each issue is well illustrated in halftones and color. Doubleday, New York, N. Y., 1973. Volume One, 392 pages; Volume Two, 331 pages. \$14.95 each.

Airship, by Patrick Abbott. The author describes the theory of dirigibles and the many experiments that contributed to their development. Then, working from research in the records and the reminiscences of those members of the crew still living, he describes the design of the British R.34 airship, which crossed the Atlantic to America in 1909, the preparations for the Atlantic crossing, and the day-to-day story of the flight itself. Charles Scribner's Sons, New York, N. Y., 1973. 163 pages with index. \$10.00.

The Architecture of War, by Keith Mallory and Arvid Ottar. During the first half of this century, astronomical sums of money were spent on war and the preparation for war, including military construction. As this deeply researched and entertaining book shows, military architecture in its various manifestations both reflected and influenced the course of warfare to a surprising degree. The authors have limited their attention to military architecture within northwest Europe between 1900 and 1945, the focus of the most extensive and costly military operations the world has ever seen. Pantheon Books, New York, N. Y., 1973. 307 pages with index. Hardback, \$15.00, paperback, \$6.95.

Armor-Cavalry Part II: Army National Guard, by Mary Lee Stubbs, Stanley Russell Connor, and Janice E. McKenney. A new volume in the Army Lineage Series. The Organization Act of 1950 abolished the cavalry as a basic arm of the United States Army. That Act made armor one of the basic branches of the Army and specified that it would be a continuation of cavalry. *Armor-*

Cavalry thus deals with the units of the armored branch and with the development of that branch. All three components of the Army—the Regular Army, the Army Reserve, and the Army National Guard—are discussed; however, the lineages include only units of the Army National Guard. Superintendent of Documents, Government Printing Office, Washington, D. C. 20402, 1973. 297 pages with index. \$5.00.

Brassey's Annual: The Armed Forces Yearbook 1973, edited by Maj. Gen. J. L. Moulton. This is the eighty-fourth volume of *Brassey's Annual*, a standard reference work on defense policy and armed forces developments throughout the world. An end-of-year review and status report on current defense problems and achievements, both practical problems of strategy and the theoretical and professional issues involved are considered. Praeger, New York, N. Y., 1973. 350 pages. \$18.50.

The Causes of War, by Geoffrey Blainey. The author, professor of economic history at the University of Melbourne, Australia, has studied international wars waged since 1700. Among thirty-three sense-making conclusions are these two: "A balance of power, which is open to easy misinterpretation by either side, is a much more volatile situation than the clear superiority of one side or the other," and, "Warfare will continue until a better system of measuring the relative power of nations is found." The Free Press, New York, N. Y., 1973. 278 pages with notes, select bibliography, and index. \$7.95.

Exhibition Flight, by Robert C. Mikesh and Claudia M. Oakes, both with the Air Museum of the Smithsonian Institution. This booklet highlights heavier-than-air exhibition flight, which serves three major purposes: to entertain the public, to introduce and popularize flying, and to accelerate the technical development of aircraft. It is concerned with some of the exciting and famous people and, especially, the airplanes involved in exhibition flying through the years. US Government Printing Office, Washington, D. C., 1973. 51 pages. \$1.30 paperback.

The Great Battles of World War II, by Henry Maule. This volume,

first published in England in 1972, depicts thirteen crucial battles of the worldwide conflagration. Of these, seven are major engagements in which Great Britain provided the bulk of the armed forces on the Allied side. The book is copiously illustrated with more than 400 photographs, maps, and paintings of combat action. The author, Henry Maule, is British correspondent for the New York *Daily News*. Henry Regnery, Chicago, Ill., 1973. 448 pages with index. \$14.95.

Gunpowder and Galleys, by John Francis Guilmartin, Jr. Concentrating on the dominant fleets of the sixteenth century Mediterranean—those of Spain, Venice, and the Ottoman Empire—the author examines their system of warfare at sea in the age immediately following the introduction of effective gunpowder warfare. He analyzes all aspects of galley warfare: the galley itself; the strategy and tactics of galley warfare; the effects of gunpowder weapons; the impact of social, economic, geographic, and climatic factors. Major Guilmartin is a member of the Air Force Academy Military History faculty. Cambridge University Press, New York, N. Y., 1973. 486 pages. \$23.50.

Know Aviation, by F. K. Mason and M. C. Windrow. A compact reference dealing with the history of aviation, the world's air forces, the world's airlines, the principal civil and military aircraft of the past fifty years, and aviation's great personalities. A list of the military airmen receiving the highest awards for gallantry appears in the appendix. Doubleday, Garden City, N. Y., 1973. 244 pages with appendix and index. \$9.95.

The People's Liberation Army: Communist China's Armed Forces, by Angus M. Fraser. This monograph assesses the military strength and investment of China in terms of military utility. The author analyzes the makeup and growing power of the various land, naval, and air components of the PLA; their present and future military capability in a combat role; and the extent to which this growing power may overshadow vital US interests in Asia. Crane, Russak & Co., New York, N. Y., 1973. 62 pages, including bibliography. \$4.95

—By Catherine L. Bratz

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AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

SECOND ANNUAL AIR FORCE BALL

October 27 was the date and the Beverly Wilshire Hotel in Beverly Hills, Calif., was the place. There was a distinguished guest list, and it all added up to . . .

'AN EVENING OF ELEGANCE'

THE Second Annual Air Force Ball has set a tradition of elegance that other [Southern California] benefits are going to find hard to follow." So wrote Sharon Fay Koch of the Los Angeles Times.

Sponsored by the Air Force Association, with its Board Chairman, Martin M. Ostrow, serving as General Chairman, the Second Annual

Air Force Ball was held at the Beverly Wilshire Hotel in Beverly Hills, Calif., last October 27. More than 700 distinguished guests from the Los Angeles area and from all parts of the country were on hand. Net proceeds from the Ball go to Scholarships for Children of American Military Personnel (SCAMP) and the Aerospace Education Foundation—AFA's educational affiliate.

Heading the list of distinguished guests were Air Force Secretary John L. McLucas and Mrs. McLucas, and Air Force Chief of Staff Gen. George S. Brown and Mrs. Brown. Both the Secretary and the Chief made brief remarks.

Also present were the two military cohosts, Lt. Gen. Kenneth W. Schultz, Commander of Space and Missile Systems Organization, and Mrs. Schultz, and Lt. Gen. William F. Pitts, Commander of SAC's Fifteenth Air Force, and Mrs. Pitts. Present, too, were Lt. Gen. William V. McBride, Commander, Air Training Command, and Mrs. McBride; Lt. Gen. James C. Sherrill, Commander in Chief, Alaskan Command; Gen. Samuel C. Phillips, Commander, Air Force Systems Command, and Mrs. Phillips; and Walter LaBerge, Assistant Secretary of the Air Force (Research and Development), and Mrs. LaBerge.

Dr. Harold Brown, former Air Force Secretary, and Mrs. Brown were on hand, as were Lt. Gen. Jimmy Doolittle, USAF (Ret.), AFA's first National President, and Mrs. Doolittle; California Congressman Charles H. Wilson and Mrs. Wilson; and California's Attorney General Evelle J. Younger and Mrs. Younger.

Military, government, and industry guests, together with key AFA leaders, mixed with Beverly Hills society in dancing until 1:00 a.m. to the Fifteenth Air Force's official dance orchestra and the Michael Paige orchestra.

Television's George Gobel headlined the entertainment, and was backed up by the noted Mike Curb

Congregation, popular TV and recording artists.

The Third Annual Air Force Ball is scheduled for the Beverly Wilshire on Saturday evening, October 26, 1974. Air Force Reserve Maj. Gen. Gwynn Robinson, Vice Chairman for the Ball last October, will be General Chairman for next October's event, which again promises to be an "evening of elegance." ■



Mrs. James H. Doolittle reminisces with husband, retired Lt. Gen. Jimmy Doolittle, right, AFA's first President, and with AFA's Executive Director, James H. Straubel.



From left, Mrs. Martin M. Ostrow, Mr. Ostrow, Mrs. George S. Brown, USAF Chief of Staff General Brown, Mrs. Gwynn Robinson and Major General Robinson. Mr. Ostrow, AFA Board Chairman, was General Chairman of the Ball, and General Robinson was Vice Chairman. Robinson will take over in 1974 as the Ball's General Chairman.



Mr. and Mrs. Martin M. Ostrow, left, greet Secretary of the Air Force and Mrs. John L. McLucas as they arrive for the reception preceding the Ball.



Television and night club personality "Lonesome George" Gobel, right, relives some of his old Army Air Corps days with Air Force Chief of Staff Gen. George S. Brown.

The Bulletin Board

By Capt. Don Carson, USAF

CONTRIBUTING EDITOR, AIR FORCE MAGAZINE

Flight Pay

The House Armed Services Subcommittee No. 4 recently reopened hearings on flight-pay legislation at the request of DoD. Chairman Samuel Stratton (D-N. Y.) read a scorching opening statement. He summarized the subcommittee's work in gathering the facts about flight pay. "What we got in those earlier hearings was not in fact the whole truth," he said. "For example, what we learned in talking with pilots in the field did not square in many cases with what departmental [DoD] representatives had testified to here in September and October. Now today, once again, we have the spectacle of Department witnesses coming before us—after we have completed our hearings and virtually marked up our bill—to acknowledge that what they told us in September and October was not the full story.

"As I said several times in the early days of these hearings, I don't believe the Department of Defense still realizes what the real issue is here in the House of Representatives on the matter of flight pay. Perhaps if you had, this whole matter might never have developed to the stage that it has. If the Department had recognized a year ago, or example, when Section 715 was added to the 1973 Defense Appropriation Bill, just what was going on and had responded promptly with an alternative proposal, the devastating House vote of last June might never have occurred.

"Well, let's speak frankly. The cause of Representatives is not primarily concerned with the problem of pilot retention. The House of Representatives is concerned with eliminating the practice of paying flight pay to people who don't fly. They want it stopped, and they said so very emphatically last June. This is the one fact the Department of Defense still seems unable or unwilling to face up to honestly and squarely. It is high time they did."

Mr. Stratton further explained,

"The hearings last September and October did convince this subcommittee that under certain circumstances a good case could be made for paying flight pay to officers who weren't flying. It goes like this: Flight pay is properly regarded as incentive pay designed to encourage young men to embark on the relatively hazardous assignment of becoming aviators. One could easily argue (and this is in fact the procedure followed by a number of countries) that such incentive pay should be paid when the flying duty was being performed—as is already the case with submarine, parachute, and other forms of hazardous-duty pay—and not paid when those duties are not performed.

"However, our face-to-face interviews with service flight personnel finally convinced the subcommittee

that a more suitable and less cumbersome approach would be to pay this incentive pay, at a somewhat lesser rate, over an entire aviation career rather than paying a higher rate only during those years when the individual officer was actually assigned to flying duties. In this way, the pilot and his family could look forward to a relatively steady rate of pay, rather than the sharp income ups and downs that would be associated with a no-fly, no-pay approach. This was the basic rationale of the Department [of Defense's] bill, and the subcommittee accepted it and was prepared to recommend it to the House."

The Chairman continued, "Having accepted this basic principle of paying flight pay during an 'Aviation Career,' the next question was how long should this flight-pay

What AFA Is Doing About Flight Pay

We have received queries from a few AFA members expressing their concern over the present flight-pay system and asking AFA's views on this issue. AFA has been fighting strongly for flight pay and has constantly highlighted the inequity of Section 715. Listed below are some of the many actions taken by AFA in support of an equitable flight-pay bill.

- The August 1973 issue of AIR FORCE Magazine contained a complete rundown on the status of proposed flight-pay legislation.

- The September AIR FORCE Magazine editorial by Editor John F. Loosbrock strongly supported flight-pay legislation. This editorial has been quoted by other publications.

- The 1973 AFA Convention held in September unanimously approved as AFA's Resolution No. 1 a strong support of flight pay. This, together with other AFA resolutions, has been made available to DoD and the Congress.

- AFA President Joe L. Shosid testified before the House Armed Services Subcommittee on behalf of equitable flight-pay legislation.

- November AIR FORCE Magazine dedicated more than six pages to the flight-pay issue. Included were letters from Vietnam War ace Maj. Steve Ritchie and Capt. Jim Fleming (Medal of Honor winner) and interviews with members of the House Armed Services Subcommittee to determine their views on flight-pay legislation.

- AIR FORCE Magazine has printed all letters to the editor concerning flight pay. (We were, in fact, disappointed in the small number of aviators who have taken the time to write letters to us. And apparently few have written to their congressmen.)

- Each Representative and Senator has been mailed copies of all pertinent issues of AIR FORCE Magazine with correspondence attached indicating our support of equitable flight-pay legislation.

- AFA will continue to support flight-pay legislation that offers the stability, equity, and durability sought by all concerned aviators.

The Bulletin Board

career be? The DoD bill proposed that it last for twenty-five years. But recognizing that actual aviation duty occurred only rarely for most officers after the eighteenth year of aviation service, the Department proposed that flight pay be gradually reduced from the eighteenth to twenty-fifth year, and then eliminated.

"This proposal, too, the subcommittee bought, in spite of the fact that we clearly recognized that for the overwhelming number of flight-pay recipients it enshrined the principle of paying flight pay to people who weren't flying and wouldn't be flying again. We did this because we believed that after an officer had successfully completed an eighteen-year active flying career, he was entitled to be tapered off in special pay for an additional seven years.

"From the very start [of these hearings], we were assailed almost daily by a flurry of statistics which assured us that virtually every aviator spent from twelve to sixteen years 'in the cockpit' during his first eighteen aviation years, and in many cases this activity even continued on through the twentieth year."

On this basis, the subcommittee recommended two "gates" or checkpoints during an aviator's career to assure that he was indeed spending the majority of his early years as an aviator. This would satisfy the Congress that officers

completing a twenty-five-year flying career were spending at least twelve years in the cockpit. The two gates proposed would come at the twelve- and eighteen-year points of an aviator's career.

To pass the gate requirements, an officer would have to spend eight years in the cockpit by his twelfth year, and twelve years out of his first eighteen. Chairman Stratton emphasized, "It is hard for me, frankly, to see how the subcommittee could have proposed anything less. After all, twenty-five years of flight pay for only twelve years of flying means less than half of the total is spent in the air! So this is essentially the 'gate' system that the services now rail at so mournfully. . . . Does it really seem so unreasonable? Does the Department of Defense honestly think the House would willingly approve paying a man for twenty-five years of flight pay when he spends only five of those twenty-five years in the cockpit?"

The reference to an officer flying only five years during an aviation career was aimed at the Army. Subcommittee findings indicate that an Army officer typically spends only about five and a half years during his flying career assigned to operational flying duty. The subcommittee had based the gates upon the testimony of all the services that their flyers spend twelve to thirteen years of their first eighteen in flying jobs. Now some of the services are opposed to the gates and say that their aviators cannot meet those requirements. The Army says that none of its officer pilots would meet the gate requirements, as now proposed. The Navy says that the gates would have to be lowered to six out of twelve years, and nine

out of eighteen years in order to qualify all of their flyers.

The Air Force says that most of its pilots can meet the gate requirements as they are now, but it would be costly. The moves and assignment changes to meet the gates would disrupt the schooling and staff assignments of many officers. Maj. Gen. Kenneth Tallman, Air Force Director of Personnel Plans, explained that the twelve-year gate was the biggest problem. Changing the gate from eight to seven years would make the standard much easier to implement. General Tallman said that most Air Force aviators could now meet an eleven-year requirement at the eighteen-year gate; hence, the Air Force does not see an increased retention problem caused by the proposed standards. He assured the subcommittee that USAF could live with the program and favored it over the existing Section 715, which requires annual review of excusal authority.

The gates seem to be a workable solution to the flight-pay problem as far as USAF is concerned. This system will assure Congress that aviators are, in fact, spending a substantial portion of their careers in aviation duties. This assurance will negate the requirement for an annual review of excusal authority (Section 715) and give stability to the flight-pay system. The subcommittee's findings during visits to various military aviation units in the field demonstrated that aviators want stability more than anything. It is imperative that minimum performance standards be included in any proposed legislation—and that is what the gates are.

The subcommittee will take up flight pay again, early in the second session of the 93d Congress. It was to begin work on January 21 and will look deeper into the gate year points. There may be some adjusting in the years of flying required at the gates, but the subcommittee seems sold on the gate idea as the means of guaranteeing Congress that military flyers will meet the minimum standards of flying during their careers.

Prior to reopening the hearing in late December, the subcommittee was ready to draft a new bill. It is now almost back to where it was a year ago. Not only does it appear that DoD is at odds with the subcommittee recommendations; also appears that some of the services are at odds with each other as to what would make an acceptable bill on flight pay.

Prof. Gordon B. Baldwin, center, of the University of Wisconsin-Madison Law School, is presented the Air Force ROTC Outstanding Service Award by Lt. Col. Bernard Appel, Professor of Aerospace Studies. Campus Chancellor Edwin Young looks on. Professor Baldwin has long been associated with the Madison officer education program.



ROTC Scholarship

Brig. Gen. Robert M. White, AFROTC Commandant, officially recognized a \$51,000 scholarship donated by Robert G. Carr for Angelo State University, Tex. During a

recent visit to the campus, General White met with Mr. Carr of San Angelo to accept the Mr. and Mrs. Robert G. Carr Air Force ROTC Perpetual Scholarship Fund. "That kind of a gift is something that has to please everyone. It will be a

wonderful thing for the school and our people in the ROTC program," General White said.

Mr. Carr was an Air Force instructor stationed at the University of California during World War I and a lieutenant colonel during

Ed Gates . . . Speaking of People

The Service Club Crunch and What It Means

The Pentagon's top uniformed personnel executive suggested publicly late last year that merger of base officer and NCO clubs may be necessary to solve the growing financial woes many clubs are facing.

The suggestion—a trial balloon—got some immediate reaction. Service journals picked up the story. Considerable comment—much, but not all of it negative—developed. Air Force, meanwhile, has been asking its members, via a sample survey, whether they would support a "one-rank" club.

What prompted Lt. Gen. Leo E. Benade, the Deputy Assistant Secretary of Defense for Military Personnel Policy, to advance the possibility of consolidated base clubs is the alarming fiscal crunch hitting the majority of clubs.

The consolidated club idea is one alternative to an outright closing of certain facilities, a circumstance some officials fear is inevitable if present trends aren't altered. Not only clubs, but recreational and morale activities such as exchanges, hobby shops, swimming pools, golf courses, and day-care centers are facing a monetary squeeze. Many government officials are demanding reductions in appropriations for these activities.

General Benade, who has been resisting these demands, has no immediate plans to go the one-rank route. In fact, he advanced the one-club proposition mainly as a warning, to put commanders and club managers on firm notice that they may be forced to take drastic measures to save their current club setups.

Increasing prices and dues once again may be the only way to save some smaller clubs, short of effecting a consolidation, General Benade told AIR FORCE Magazine.

He explained that he is not advocating a mixing of social events, should consolidations occur. Rather, there would be a "sharing of a building, perhaps with the officers in one part and the NCOs in another." Maintenance and other operating costs could be reduced; one kitchen might serve both groups.

General Benade, in trotting out the one-rank alternative, was asked how it could be adopted at installations where existing officer and NCO clubs have large and quite active memberships. Cited as examples were Bolling AFB and the Army's Fort Myer, both in the Washington, D. C., area, where the officers' clubs are jammed with patrons.

"Large, profitable clubs like those two would not be affected. There's no problem at well-patronized facilities like those," he said. It's the numerous small installations that are finding it increasingly difficult to support multiple clubs without greater economies and boosting prices still further. And how much of an increase will members of such clubs put up with?

Many clubs, of course, have made management improvements in recent years. This has cut some wasteful practices and saved money. But all expense items shouldered by clubs have soared, particularly wages and salaries of employees. Overseas clubs are still reeling from the disappearance of slot-machine revenue starting in July 1972.

The Administration and Congress, meantime, grow less

and less inclined to cough up appropriated money to support clubs and other recreational and morale-building activities. Army, for example, recently went to the House Appropriations Committee in search of \$3.1 million to help it "manage" its clubs.

The Committee's response to the request mirrored a growing feeling throughout high government circles:

"The Committee does not see why American taxpayers should be required to pay for the management of an operation that is strictly for the pleasure and benefit of military personnel and their dependents."

Use profits generated by the clubs, the Committee declared.

Air Force has been getting \$18 to \$19 million annually in appropriated money to support its clubs and open messes. Navy receives around \$10 million. But the congressmen are angling for reductions, claiming that since "military salaries now compare favorably with civilian pay," all funds to support clubs should come from club profits.

But club profits are dwindling rapidly. Army, for instance, reports that its clubs' net profits tumbled from a total of \$11.3 million in 1970 to less than \$3 million in 1972.

Congressional pressure on the services to cancel government support of clubs and other recreational activities is nothing new. What's alarming are the increasing demands to do so from the civilian leadership within the Defense Department.

The Assistant Defense Secretary (Comptroller), Terence E. McClary, recently declared that government money spent on clubs, commissaries, exchanges, and other traditional programs is "an affront to private enterprise." He called these outlays "unwarranted benefits for career-committed members." McClary, in a memo to Defense Secretary James Schlesinger, did acknowledge that removal of such funds would increase prices in stores and clubs.

Many so-called nonappropriated fund activities, though operated in large part from their own profits, do receive government money. Army and Air Force exchanges, for example, receive more than \$50 million a year in appropriated funds.

But the heat is on. Congressional opponents and Administration civilian authorities undoubtedly will continue or step up their efforts to load more of the costs of club operations on the clubs themselves. General Benade and other uniformed leaders can be expected to keep pitching in behalf of the military community.

Air Force officials, meanwhile, are greatly disturbed over the club situation and the rocky financial road that lies ahead. One authority told AIR FORCE Magazine, "We're still in the black, and no clubs have been closed—yet. But it's getting tougher than ever to stay solvent."

What about eventually going the "one-rank" club route on Air Force bases? The official had no direct comment, though he noted that USAF has had such a setup for sometime at Taegu AB, Korea. And "it's worked out pretty well," he added. ■

The Bulletin Board

World War II. He has been a long-time supporter of the Air Force ROTC program and was instrumental in establishing an ROTC detachment at Angelo State University.

Early Out

In keeping with the philosophy of an all-volunteer force, the USAF Military Personnel Center announced that career airmen will be given the opportunity to separate before completing their reenlistment contracts. This test program does not guarantee separation; but airmen meeting certain criteria may request separation for personal reasons. Each application will be weighed against current and future Air Force needs.

The program is open to enlisted members who have completed six years of active USAF service and at least one year of service since their last reenlistment or permanent change of station. Airmen who separate under this program will be encouraged to seek affiliation with ANG or Reserve units in order to continue as members of the total

force. Interested persons should contact local CBPOs for further details and assistance in preparation of applications.

Medical School

Secretary of Defense James R. Schlesinger announced that a medical school—called the Uniformed Services University of Health Sciences—will be erected at Bethesda Naval Hospital, Bethesda, Md. The University was authorized by Public Law in 1972. Its purpose will be to train physicians and health-care professionals for the uniformed services. The University will graduate a minimum of 100 physicians a year by 1982. The University and the Armed Forces Health Professions Scholarship Program, which will have 5,000 scholarship students in medical training at any given time, are designed to provide the military services with the professional medical services needed to support current programs.

ANG and Reserves

When Hauser Industrial Enterprises, Inc., of Brooklyn, N. Y., signed a Statement of Support for the Guard and Reserve, Secretary of Defense James R. Schlesinger announced that more than half of the US labor force had been covered by employer statements adopt-

ing the goals of the National Committee for Support of the Guard and Reserve. By signing the statement, employers agree to provide their employees who are members of Guard or Reserve the necessary time to fulfill their drill and active-duty requirements and to give them equal opportunity for career advancement and job benefits. Under the President's All-Volunteer Force Policy, the Guard and Reserve provide almost thirty percent of the trained military manpower at a cost of less than five percent of the defense budget.

Personnel Programs

Personnel programs and policies are constantly changing. One of the surest ways of keeping abreast is to read "The Officer Career Newsletter." This newsletter is published by the Air Force Military Personnel Center's Officer Career Development Division and covers all of the latest personnel programs, career opportunities, and current problems. Recent editions have covered the Air Staff Training Program (ASTRA) selection boards, Palace Teams, Career Broadening/Education Opportunities, and many other areas of interest to USAF officers.

If you're not getting copies of the Newsletter, check your unit administrative section or local CBPO. ■

Senior Staff Changes

RETIREMENTS: B/G Chester J. Butcher; M/G Homer K. Hansen; M/G Frank M. Madsen, Jr.; M/G Albert R. Shiely, Jr.

CHANGES: M/G James R. Allen, from C/S, Hq. SAC, Offutt AFB, Neb., to Special Asst. to C/S for B-1 Matters, Hq. USAF . . . M/G Andrew B. Anderson, Jr., from Asst. DCS/Ops, to Dir., Ops Plans, DCS/Ops, Hq. SAC, Offutt AFB, Neb., replacing M/G Eugene Q. Steffes, Jr. . . . M/G John J. Burns, from Cmdr., 12th AF, TAC, Bergstrom AFB, Tex., to Cmdr., AF Test & Evaluation Ctr., Kirtland AFB, N. M. . . . M/G Woodard E. Davis, Jr., from Cmdr., USAFTAWC, TAC, Eglin AFB, Fla., to Dir., J-5, US Readiness Cmd., MacDill AFB, Fla. . . . M/G George M. Johnson, Jr., from C/S, Hq. AFLC, Wright-Patterson AFB, Ohio, to Chief, MAAG, Rome, Italy . . . B/G Abner B. Martin, from Dep. for Minuteman, SAMSO, AFSC, Los Angeles AFS, Calif., to Systems Program Dir., B-1, ASD, AFSC, Wright-Patterson AFB, Ohio, replacing M/G Douglas T. Nelson . . . B/G Richard E. Merklung, from Chief, Air Sec (CREAD), Ops Div., SHAPE, Brussels, Belgium, to DCS/Ops, 4th ATAF, Ramstein, Germany.

B/G Carl S. Miller, from Dep. ACS/Ops, AIRSOUTH,

Naples, Italy, to Dep. Cmdr., 5th ATAF, Vicenza, Italy, replacing retiring B/G Chester J. Butcher . . . M/G Douglas T. Nelson, from Systems Program Dir., B-1, to V/C, ASD, AFSC, Wright-Patterson AFB, Ohio, replacing retiring M/G Homer K. Hansen . . . B/G Gerald J. Post, from Asst. DCS/M Mgmt., to DCS/M Mgmt. Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G George Rhodes . . . M/G George Rhodes, from DCS/M Mgmt., to C/S, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G George M. Johnson, Jr. . . . M/G Alto D. Slay, from DCS/Ops, to V/C, Hq. ATC, Randolph AFB, Tex., replacing retiring M/G Frank M. Madsen, Jr. . . . M/G Eugene Q. Steffes, Jr., from Dir., Ops, DCS/Ops, Hq. SAC, Offutt AFB, Neb., to V/C, 2d AF, Barksdale AFB, La. . . . B/G Mervin M. Taylor, from DCS/Ops, 4th ATAF, SHAPE, Ramstein AB, Germany, to Asst. DCS/O for Combat Ops, J-3, NORAD CONAD, and Asst. DCS/O for Combat Ops, Hq. ADI Ent AFB, Colo., replacing B/G Henry L. Warren . . . B/G Henry L. Warren, from Asst. DCS/O for Combat Ops, J-3, NORAD/CONAD, and Asst. DCS/O for Combat Ops, Hq. ADC, Ent AFB, Colo., to DCS/Ops, Hq. ATC, Randolph AFB, Tex.

—Compiled by Catherine L. Bra

AFA ADVISORY COUNCILS FOR THE COMING YEAR

This month we complete the coverage of AFA Advisory Councils, Committees, and Specialized Advisers, by introducing the members of two of AFA's most active and productive advisory groups . . .

AIRMEN COUNCIL

This Council was first organized as a standing committee in 1961 by Convention resolution. It advises the President on all matters of interest to the enlisted men and women of the Air Force and includes both active-duty and Reserve component representation. Members are CMSgt. Harry F. Lund, Chairman, Brooks AFB, Tex.; SSgt. Robert Barry, Bolling AFB, D. C.; Sgt. Virginia Brazet, Washington, D. C.; SMSgt. Henry T. Davis, Vandenberg AFB,

Calif.; A1C Donald B. Francois, Lackland AFB, Tex.; TSgt. John E. Gafford, Montgomery, Ala.; CMSgt. Kenneth E. Holdren, Langley AFB, Va.; CMSgt. Raymond E. Jeffrey, San Antonio, Tex.; MSgt. Francis E. Nowicki, Wayne, Pa.; A1C David A. Ostrum, Andrews AFB, Md.; SMSgt. Elmer F. Williams, Offutt AFB, Neb.; Sgt. Dallas Y. Wilson, Washington, D. C.; and CMSgt. of the Air Force Thomas N. Barnes, Adviser, Washington, D. C.



Lund



Barry



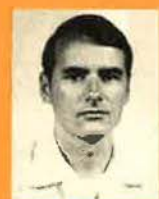
Brazet



Davis



Francois



Gafford



Holdren



Jeffrey



Nowicki



Ostrum



Williams



Wilson



Barnes

JUNIOR OFFICER ADVISORY COUNCIL (Executive Committee)

The JOAC was originally formed in 1967, to emphasize AFA's interest in officer career motivation, and to give the younger officer an opportunity within AFA to address those concerns of particular interest to this group. The Council advises the AFA President on all facets of Junior Officer activity. In 1972, the basic Council was expanded to include at least one representative from each major command and separate operating agency. The officers pictured form the Executive Committee of this larger Council. They are Capt. John H. Pronsky, Chairman, Wash-

ington, D. C.; Capt. Richard Farkas, Deputy Chairman, Offutt AFB, Neb.; Capt. Michael W. Crosby, APO New York; Capt. Larry Gill, USAFA, Colo.; Capt. James A. Miller, Washington, D. C.; Capt. Joann Neish, Wright-Patterson AFB, Ohio; Capt. Lloyd Newton, Luke AFB, Ariz.; Capt. Monroe S. Sams, APO San Francisco; Capt. Alan L. Strzemieczny, Reese AFB, Tex.; Capt. Dennis R. Walling, Ent AFB, Colo.; and Maj. Gen. Kenneth L. Tallman, Adviser, Washington, D. C.



Pronsky



Farkas



Crosby



Gill



Miller



Neish



Newton



Sams



Strzemieczny



Walling



Tallman



AIR FORCE ASSOCIATION

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Two Great New Plans! Choose Either One . . . AND Get Big, Strong Coverage



The Standard Plan (\$66,000 Maximum)



The High-Option Plan (\$100,000 Maximum)

Insured's Age	Coverage	Extra Accidental Death Benefit*	Monthly Cost	Optional Family Coverage		Monthly Cost
				Spouse	Each Child**	
20-24	\$ 66,000	\$12,500	\$10.00	\$6,000	\$2,000	\$2
25-29	60,000	12,500	10.00	6,000	2,000	2
30-34	50,000	12,500	10.00	6,000	2,000	2
35-39	40,000	12,500	10.00	6,000	2,000	2
40-44	25,000	12,500	10.00	5,250	2,000	2
45-49	15,000	12,500	10.00	4,050	2,000	2
50-59	10,000	12,500	10.00	3,000	2,000	2
60-64	7,500	12,500	10.00	2,250	2,000	2
65-69	4,000	12,500	10.00	1,200	2,000	2
70-75	2,500	12,500	10.00	750	2,000	2

20-24	\$100,000	\$12,500	15.00	\$6,000	\$2,000	\$2
25-29	90,000	12,500	15.00	6,000	2,000	2
30-34	75,000	12,500	15.00	6,000	2,000	2
35-39	60,000	12,500	15.00	6,000	2,000	2
40-44	37,500	12,500	15.00	5,250	2,000	2
45-49	22,500	12,500	15.00	4,050	2,000	2
50-59	15,000	12,500	15.00	3,000	2,000	2
60-64	11,250	12,500	15.00	2,250	2,000	2
65-69	6,000	12,500	15.00	1,200	2,000	2
70-75	3,750	12,500	15.00	750	2,000	2

* 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 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 exclusions—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 beneficiary 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!

REAKS 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

Please indicate category of eligibility and branch of service.
Extended Active Duty Air Force
Ready Reserve or Other _____
National Guard (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

STANDARD PLAN

- Members Only \$ 15.00 Members and Dependents \$ 17.50
- \$ 45.00 \$ 52.50
- \$ 90.00 \$105.00
- \$180.00 \$210.00

- Mode of Payment**
- 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.

- Members Only \$ 10.00 Members and Dependents \$ 12.50
- \$ 30.00 \$ 37.50
- \$ 60.00 \$ 75.00
- \$120.00 \$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 hereby 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 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.

Signature _____, 19____ Member's Signature

By Don Steele

AFA AFFAIRS EDITOR

THE WRIGHT MEMORIAL CHAPTER, OHIO . . .

cited for consistent and effective programming in support of AFA's mission, most recently exemplified in its cosponsorship of the Aeronautical Systems Division Awards Banquet.

AFA's Wright Memorial Chapter of Dayton, Ohio, and the Aeronautical Systems Division (ASD) of the Air Force Systems Command recently cosponsored the Second Annual ASD Engineering Awards Banquet at the Wright-Patterson AFB Officers' Open Mess.

More than 500 civilian and Air Force people attended the banquet at which Lt. Gen. James T. Stewart, Commander of ASD, presided, and Gen. Samuel C. Phillips, Commander, Air Force Systems Command, was the guest speaker.

Robert J. Patton, System Engineering Director for the B-1 strategic bomber, received ASD's Engineering Award and was designated "ASD Engineer of the Year." Mr. Patton was cited for "establishing the system engineering policies and management methods which give confidence that the B-1 will be an effective weapon system that can be produced at a price we can afford."

Six other ASD engineers also were honored and received awards

for Significant Engineering Achievements. They are: Maj. James E. Clifford, Chief System Engineer, AC-130 Gunship; Maj. Phillip L. Hughes, Senior Project Engineer, Directorate of Propulsion and Power Engineering; William D. Cowie, Aerospace Engineer, Directorate of Airframe Engineering; 1st Lt. William L. Curtice, Electronics Engineer, Directorate of Crew and AGE Engineering; Daniel J. Kolega, Aerospace Engineer, Directorate of Crew and AGE Engineering; and Mrs. Nancy L. Eaken, Electronics Engineer, Directorate of Avionics Engineering. The awards were presented by General Phillips, General Stewart, and Ed Nett, President of the Wright Memorial Chapter.

The distinguished guest list included Dr. Michael Yarymovych, USAF's Chief Scientist; Maj. Gen. Douglas Nelson, Director of the B-1 program (ASD); AFA National President Joe L. Shosid; W. J. Abernethy, Director of Civilian Personnel, USAF; Robert Watson, Director of Civilian Personnel (AFLC), and a

member of AFA's Civilian Personnel Council; Bernard D. Osborne, Vice President for AFA's Great Lakes Region; AFA National Director Jack Withers; and Ohio AFA President Robert L. Hunter.

Mr. Shosid summed up the evening: "This was a great program. I was very much impressed with the fact that it provided a platform for recognizing, at the command level, both military and civilian personnel before their families, friends, supervisors, and, most important, before their peers. I look forward to getting this type of program into being with all AFA units around the country."

Mr. Shosid congratulates the officers and members of the Chapter and, in recognition of their outstanding efforts, names the Wright Memorial Chapter as AFA's "Unit of the Month" for February.

(See following pages for Photo Gallery coverage of other AFA Chapter activities.)



The Aeronautical Systems Division Engineering Awards Banquet participants and award recipients included: back row, from left, Lt. Gen. James T. Stewart, Edward Nett, Gen. Samuel C. Phillips, and AFA President Joe L. Shosid; front row, from left, 1st Lt. William L. Curtice, William D. Cowie, Maj. Phillip L. Hughes, Daniel J. Kolega, Robert J. Patton, Mrs. Nancy L. Eaken, and Maj. James E. Clifford (see accompanying story for details).



Aeronautical Systems Division's "Engineer of the Year," Robert Patton, second from left, holds the trophy he received at the recent AFA Engineering Awards Banquet, which was cosponsored by ASD and AFA Wright Memorial Chapter. With Mr. Patton are, from left, Lt. Gen. James T. Stewart, Edward Nett, and Gen. Samuel C. Phillips (see accompanying story for details).

CHAPTER AND STATE PHOTO GALLERY



Lt. Gen. William Pitts, center, Commander, Fifteenth Air Force (SAC), holds the commission he received as "General of the Air Corp" during presentation of donations from the Fifth Annual Air Force Association Charity Golf Tournament. With the General are, from left, Col. Michael Perrone, Commander, March AFB, Calif.; H. A. Pitkin, Chairman, Administration Committee; Edward A. Stearn, Chairman, Executive Committee; Lee Derrick, Southern California Gas Co., one of the outstanding supporters of the tournament; and Terry Ireland, Tournament Director. This year's donation of \$7,000 brings the total to some \$25,000 donated by the tournament to Air Force- and community-oriented charities over the past five years. The annual tournament is cosponsored by AFA's San Bernardino Area and Riverside County Chapters, Calif.

Maj. Gen. Kendall Russell, center, Director of Development and Acquisition in the Office of the Deputy Chief of Staff for Research and Development, USAF, was the guest of honor and speaker at a recent joint meeting of the Lawrence D. Bell and Niagara Frontier Chapters, N. Y. Shown with General Russell are, from left, John P. Andes, Vice President, Aerospace Group, Calspan Corp.; Col. Salvatore A. Mauriello, Commander, Niagara Falls AFB; Lawrence P. Mordaunt, Executive Vice President for Operations, Textron's Bell Aerospace Div.; and G. Wayne Hawk, Executive Vice President, Moog, Inc.



Mary Barton, left, of Arlington, Mass., winner of the New York Chapter's "I'm Proud To Be An American" essay contest, receives a \$100 US Savings Bond from Maj. Gen. Hart R. Shiely, Jr., Commander, Electronic Systems Division (AFSC), Hanscom Field. The contest was open to thirteen- to seventeen-year-old children of military and civilian employees at Hanscom Field.



AFA National and State leaders joined with Maj. Konrad Trautman, a former POW, in helping celebrate the Olmsted, Pa., Chapter's twentieth anniversary at a dinner dance on December 7. Shown in the photo are, from left, William T. Lunsford, Jr., Program Chairman; Chapter President H. M. Eaton; Major Trautman; Don Steele, AFA's Director of Field Organization; AFA National Treasurer Jack B. Gross; and Pennsylvania AFA President Frank Nowlcki.

AFA News



AFA National President Joe L. Shosid, left, holds the interest of Gen. Robert J. Dixon, Commander, IAC, Langley AFB, Va., and Langley Chapter President Tom Fowler during the Chapter's recent reception and dinner dance honoring the new TAC Commander and his staff. More than 500 leaders of the Air Force, aerospace industry, AFA, and the local community attended the function.



During recent ceremonies in Omaha, Neb., the Mid-America Council of the Boy Scouts of America presented a Centur Club plaque to AFA's Ak-Sar-Ben Chapter in recognition of the Chapter's contributions to the annual Sustaining Membership Enrollment campaign. AFA National Director Arthur C. Storz, Sr., right, a founder of the Chapter, accepts the plaque from E. A. Crouchley, left, Boy Scout District Chairman, as Chapter President Paul W. Galliard, center, looks on.



Head-table guests at the Iron Gate Chapter's recent luncheon meeting in the Hunt Room of New York City's "21" Club included, from left, Maj. Gen. Robert N. Ginsburgh, Director of Information, USAF; Lt. Gen. Duward L. Crow, Assistant Vice Chief of Staff, USAF; the Hon. John L. McLucas, Secretary of the Air Force; Chapter President Herb Fisher; and Gen. John C. Meyer, Commander in Chief, Strategic Air Command. Dr. McLucas was the guest of honor and speaker.



Bernard D. Osborne, left center, Vice President for AFA's Great Lakes Region, presents an AFA Chapter Charter to C. Forrest Spencer, President of the newly organized Grissom Memorial Chapter, Ind., as Col. Lyle E. Stockton, left, Commander, Grissom AFB, and Col. Robert L. Nicoll, Wing Commander, look on. The presentation was made during the Chapter's recent Charter and Installation Banquet at Grissom AFB Officers' Club.

CHAPTER AND STATE PHOTO GALLERY



At the H. Goddard Chapter's second annual Benefit Golf Tournament, at Vandenberg AFB, more than \$450 for Air Force- and community-oriented charities. Winners in the tournament, which was supported by Chapter members and base and contractor personnel, were, from left, J. Hedge, third place; A. Neal and Capt. J. Hamilton, first place; A. Fogg and J. Hamilton, second place.



Stan Campbell

CORRECTION

Through an inadvertence, one of the members of AFA's Membership Committee was left off the list that appeared on p. 147 of the December issue of this magazine. The omitted member is Stan Campbell, whose picture appears at the left. Mr. Campbell is the dynamic President of the Texas AFA. AIR FORCE Magazine regrets the earlier omission of Mr. Campbell's name and photo from the listing of this committee.



At the Metropolitan "Key" Chapter's October dinner dance in New York City's Hotel Warwick, Dr. Michael Yarymovych, USAF's Chief Scientist, received a plaque in recognition of his contributions to aerospace power. Shown are, from left, Chapter Executive Vice President John Barnard, Dr. Yarymovych, Chapter Membership Chairman Chester Czajkowski, Chapter President John Dolan, Chapter Vice President (Public Relations) Robert Maglia, and Chapter Secretary Michael Ivanenko. A portion of Dr. Yarymovych's speech was printed in the New York Times and is reprinted on p. 66 of this issue.



Maj. Gen. Robert E. Hails, left, Commander, Warner Robins Air Materiel Area, Robins AFB, Ga.; and AFA National Director Dr. Dan Callahan admire a newly completed plaque that lists the names of all AFA Life Members who are affiliated with the Middle Georgia Chapter. The plaque, which contains 113 names, including those of Sen. Carl Vinson, General Hails, and Dr. Callahan, has been installed in the entrance hall of the Warner Robins City Hall.



"The Lone Eagle," Brig. Gen. Charles A. Lindbergh, USAF (Ret.), second from left, who in 1927 was the first man to fly solo from New York to Paris, was the guest of honor and speaker at the Birmingham Chapter's Veterans Day breakfast. Shown with General Lindbergh, recipient of the 1973 Distinguished National Veterans Award, are, from left, Jack T. Gilstrap, a former AFA National Director; Jack H. Haire, Vice President for AFA's South Central Region; and J. E. Hall, Alabama AFA Vice President.

AFA News



Lt. Gen. Clarence S. Irvine, USAF (Ret.), accepts an "Award of Honor" from Lt. Gen. Kenneth W. Schultz, right, Commander, Air Force Space and Missile Systems Organization. General Schultz presented the award on behalf of the San Bernardino Chapter's Airpower Council during recent ceremonies aboard the *Queen Mary* in Long Beach, Calif.



During the Civil Air Patrol's 1973 national convention in Las Vegas, Nev., AFA Board Chairman Martin M. Ostrow, left, presents AFA's "Outstanding Civil Air Patrol Cadet of the Year" trophy to CAP Cadet Jack B. Lynn. A 1973 graduate of Tuscaloosa High School, Ala., Brad now attends the University of Alabama where he is a member of the Air Force ROTC Detachment.



Lt. Gen. Ira C. Eaker, USAF (Ret.), was the featured speaker at a recent Magic Valley Chapter luncheon meeting in Twin Falls, Idaho. Shown in the photo are, from left, Idaho AFA Vice President Paul Cari; General Eaker; Magic Valley Chapter President John Conover; Boise Valley Chapter President Larry Leach; and Idaho AFA President C. E. Hall.

The Greater Seattle and Northwest Evergreen Chapters, Wash., recently cosponsored a "Fall Fun Fest" with AFA National Directors Joe Higgins and Jack Wilthers as the principal program participants. Joe Higgins, the TV Safety Sheriff and AFA's "Man of the Year" for 1973, was the speaker, and Jack was the master of ceremonies. In the photo, Jack, standing, apparently has just told one of his famous stories. Seated are, from left, Joe Higgins; Mrs. Maxwell (wife of the Greater Seattle Chapter President, retired USAF Maj. Gen. J. C. Maxwell); and John Gayton, Past President of the Washington AFA.



New Slide Presentation on Aerospace Technology Available to AFA Units

"A Better Tomorrow with Aeronautical and Space Technology," a one-hour slide presentation on the testimony given by Dr. James C. Fletcher, NASA Administrator, before the Aeronautical and Space Sciences Committee of the US Senate, emphasizes NASA's views concerning the direction the present programs will carry us fifteen years hence. Referring to the presentation, committee member Sen. Barry Goldwater (R-Ariz.) said, "I think this show is excellent. I would like to see this made available to schools, to TV, to service clubs; in other words, in the old saying, let's get this show on the road."

The presentation booklet, "Toward a Better Tomorrow with Aeronautical and Space Technology," including Dr. Fletcher's speech and fifty-seven 35-mm colored slides, is \$7.00 per copy and may be obtained from: Federation of Americans Supporting Science and Technology (FASST), 5842 Stevens Forest Road No. 13, Columbia, Md. 21045.

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 269-7252).

ALASKA (Anchorage, Fairbanks, Kenai): **Charles W. Lafferty**, 1045 Sedro St., Fairbanks, Alaska 99701 (phone 456-5167).

ARIZONA (Phoenix, Tucson): **H. J. Bills**, 50 S. 45th Ave., Phoenix, Ariz. 85031 (phone 272-3272).

ARKANSAS (Blytheville, Fort Smith, Little Rock): **Frank A. Bailey**, 605 Ivory Dr., Little Rock, Ark. 72205 (phone 988-3432).

CALIFORNIA (Apple Valley, Burbank, Edwards, Fairfield, Fresno, Harbor City, Hawthorne, Long Beach, Los Angeles, 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): **Ben F. Inell**, 11 Sharon Dr., Salinas, Calif. 93940 (phone 422-7571).

COLORADO (Boulder, Colorado Springs, Denver, Ft. Collins, Pueblo): **James C. Hall**, P. O. Box 30033, Lowry AFB Station, Denver, Colo. 80230 (phone 366-363, ext. 459).

CONNECTICUT (East Hartford, Torrington): **John McCaffery**, 117 Ridge St., Groton, Conn. 06340 (phone 739-7922).

DELAWARE (Dover, Wilmington): **Franklin R. Welch**, Greater Wilmington Airport, Bldg. 1504, Wilmington, Del. 19720.

DISTRICT OF COLUMBIA (Washington, D. C.): **George G. Troutman**, 1025 Connecticut Ave., N. W., Washington, D. C. 20002 (phone 659-3900).

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): **A. W. Haymon**, 1421 S.E. 3d Ave., Ft. Lauderdale, Fla. 33316 (phone 525-4161).

GEORGIA (Athens, Atlanta, Savannah, St. Simons Island, Valdosta, Warner Robins): **Donald L. Devlin**, 1651 McKinnon Dr., Savannah, Ga. 31404 (phone 234-0109).

HAWAII (Honolulu): **Campbell Palfrey, Jr.**, E. F. Hutton Co., Inc., 700 Bishop St., Honolulu, Hawaii 96813 (phone 521-2961).

IDAHO (Boise, Burley, Pocatello, Twin Falls): **Clarence E. Hall**, 3531 Winsdor Dr., Boise, Idaho 83705 (phone 344-7283).

ILLINOIS (Belleville, Champaign, Chicago, Deerfield, Elmhurst, O'Hare Field): **William A. Johnston**, 302 Harvard Dr., O'Fallon, Ill. 62269 (phone 632-2021).

INDIANA (Indianapolis, Lafayette, Logansport): **C. Forrest Spencer**, 910 W. Melbourne Ave., Logansport, Ind. 46947.

IOWA (Des Moines): **Ric Jorgensen**, P. O. Box 4, Des Moines, Iowa 50301 (phone 255-7656).

KANSAS (Topeka, Wichita): **Don C. Ross**, 10 Linwood, Eastborough, Wichita, Kan. 67201 (phone 686-6409).

LOUISIANA (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Ruston, Shreveport): **Louis Kaposta**, La. Superdome, 348 Baronne St., New Orleans, La. 70112 (phone 422-5140).

MAINE (Limestone): **Alban E. Cyr**, P. O. Box 160, Caribou, Me. 04736.

MARYLAND (Baltimore): **James W. Poultney**, P. O. Box 31, Garrison, Md. 21055 (phone 363-0795).

MASSACHUSETTS (Boston, Falmouth, Florence, Lexington, L. G. Hanscom Fld., Taunton, Worcester): **Arthur D. Marcotti**, 215 Laurel St., Melrose, Mass. 02146 (phone 665-5057).

MICHIGAN (Dearborn, Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Sault Ste. Marie): **Stewart Greer**, 18690 Marlowe Ave., Detroit, Mich. 48235 (phone 273-5115).

MINNESOTA (Duluth, Minneapolis, St. Paul): **Victor Vacanti**, 8941 10th Ave., Minneapolis, Minn. 55420 (phone 854-3456).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Wm. Browne**, P. O. Box 2042, Jackson, Miss. 39205 (phone 352-5077).

MISSOURI (Kansas City, Knob Noster, Springfield, St. Louis): **Robert E. Combs**, 2003 W. 91st St., Leawood, Kan. 66206 (phone 649-1863).

MONTANA (Great Falls): **George Page**, P. O. Box 3005, Great Falls, Mont. 59401 (phone 453-7689).

NEBRASKA (Lincoln, Omaha): **Lyle O. Remde**, 4911 S. 25th St., Omaha, Neb. 68107 (phone 731-4747).

NEVADA (Las Vegas, Reno): **Floyd White**, 3578 Algonquin Dr., Las Vegas, Nev. 89109 (phone 384-8077).

NEW HAMPSHIRE (Manchester, Pease AFB): **R. L. Devoucoux**, 270 McKinley Rd., Portsmouth, N. H. 03801 (phone 669-7500).

NEW JERSEY (Andover, Atlantic City, Belleville, Camden, Chatham, E. Rutherford, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Amos L. Chalif**, 162 Lafayette, Chatham, N. J. 07928 (phone 635-8082).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **John J. Dishuk**, 8204 Harwood Ave., N.E., Albuquerque, N. M. 87110 (phone 298-0788).

NEW YORK (Albany, Bethpage, Binghamton, Buffalo, Chautauqua, Elmira, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchoque, 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): **Monroe E. Evans**, 607 Tokay Drive, Fayetteville, N. C. 28301 (phone 488-6008).

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): **Edward McFarland**, Atlas Life Bldg., Suite 808, 414 So. Boston, Tulsa, Okla. 74103 (phone 743-4118).

OREGON (Corvallis, Eugene, Portland): **John G. Nelson**, 901 S. E. Oak St., Portland, Ore. 97214 (phone 233-7101).

PENNSYLVANIA (Allentown, Beaver Falls, Chester, Erie, Homestead, Horsham, Lewistown, New Cumberland, Philadelphia, Pittsburgh, Washington, Willow Grove, York): **Frank E. Nowicki**, 280 County Lane Rd., Wayne, Pa. 19087 (phone 672-4300, ext. 62).

RHODE ISLAND (Warwick): **Matthew Puchalski**, 143 Sog Riag, Warwick, R. I. 02886 (phone 737-2100, ext. 27).

SOUTH CAROLINA (Charleston, Columbia, Greenville, Myrtle Beach, Sumter): **Burnet H. Maybank**, P. O. Box 126, Charleston, S. C. 29402 (phone 722-4735).

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): **Stanley L. Campbell**, 119 Bluehill, San Antonio, Tex. 78229 (phone 342-0006).

UTAH (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Verl G. Williams**, P. O. Box 486, Clearfield, Utah 84015 (phone 777-5370).

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): **Orland J. Wages**, 210 W. Bank St., Bridgewater, Va. 22812 (phone 828-2501, ext. 91).

WASHINGTON (Bellevue, Port Angeles, Seattle, Spokane, Tacoma): **V. Lee Gomes**, P. O. Box 88850, Seattle, Wash. 98188 (phone 543-3860).

WISCONSIN (Madison, Milwaukee): **Kenneth Kuenn**, 3239 N. 81st St., Milwaukee, Wis. 53222 (phone 757-5324).

WYOMING (Cheyenne): **Elmer F. Garrett**, 109 E. 19th St., Cheyenne, Wyo. 82001 (phone 632-9314).

Bob Stevens'

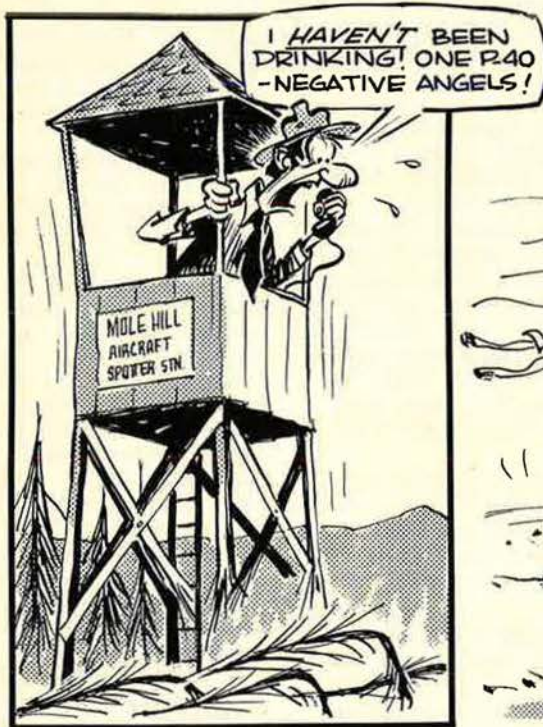
"There I was..."

WE'VE HAD FUEL SHORTAGES BEFORE. FOR A WHILE IN WWII THERE WASN'T ENOUGH 100/130 TO FILL A ZIPPO. HIGHER HQ-IN ITS INFINITE WISDOM-SUBSTITUTED 91 OCTANE FOR 100/130 IN THE STATES. DUBBED "OPERATION PRANG" BY PILOTS, IT SCATTERED MEN AND MACHINES FROM BANGCO TO BAJA.

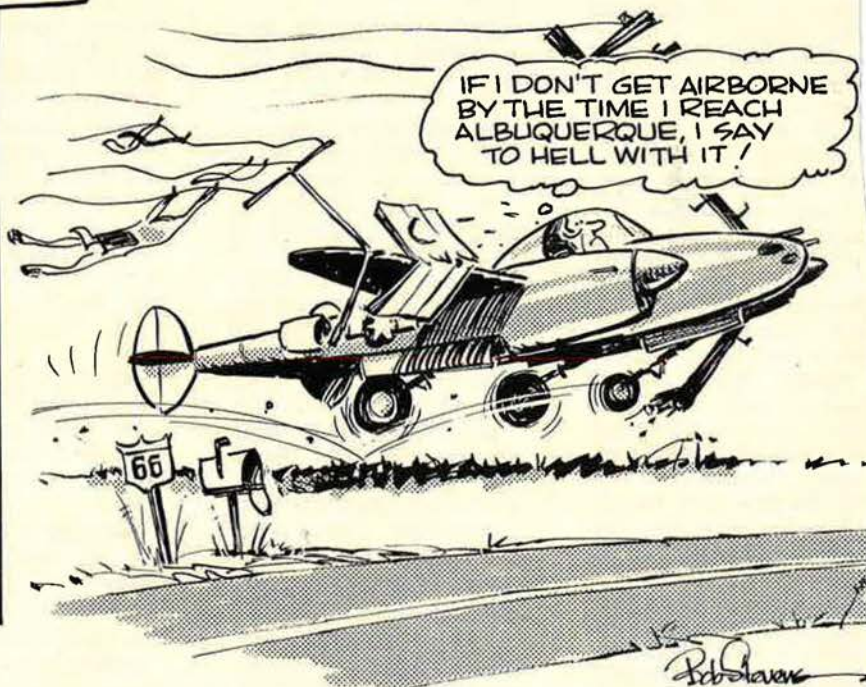
WE COULDN'T PULL FULL POWER-



MAXIMUM CEILINGS WERE SOMEWHAT LOWER-



TAKEOFF RUNS WERE EXTENDED-



TO MY LOYAL FRIEND AND FAN, BRUCE WILSON

12/20/15 Bob



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We expect great things from this tiger. Well, we should. It's a part of the creative technology that spawned the F-5. The T-38. The Cobra P-530. The USAF YF-17.

The toughest family of light fighters in the entire world.

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F-15 test pilots are finding they have an airplane that's built to win.

It has a versatile mix of air-to-air armament combined with performance and staying power to engage and beat any adversary. It has the acquisition systems needed

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Test flights are proving that the F-15 can acquire,

identify, engage, and defeat any type of enemy aircraft, in any weather—not only in the projected combat environment of the theorist but in the real world where the fighter pilot must do his job.

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