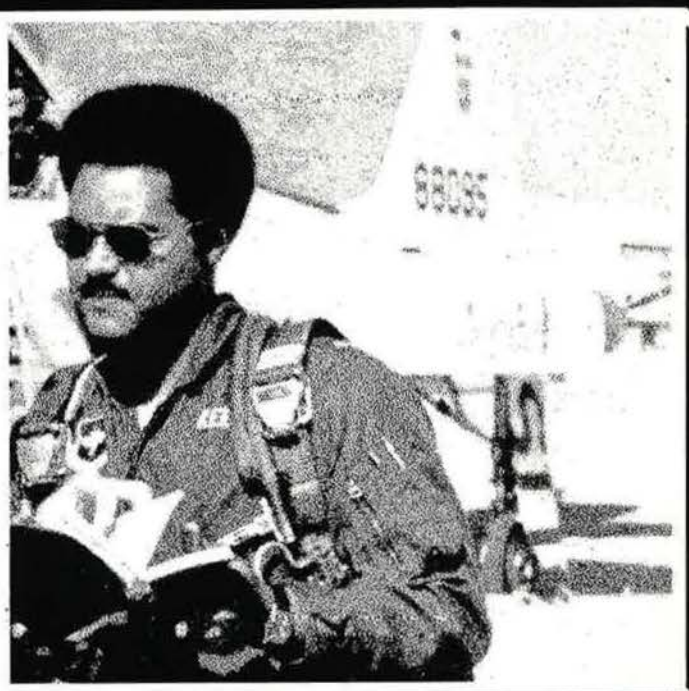
JUNE 1972/$1

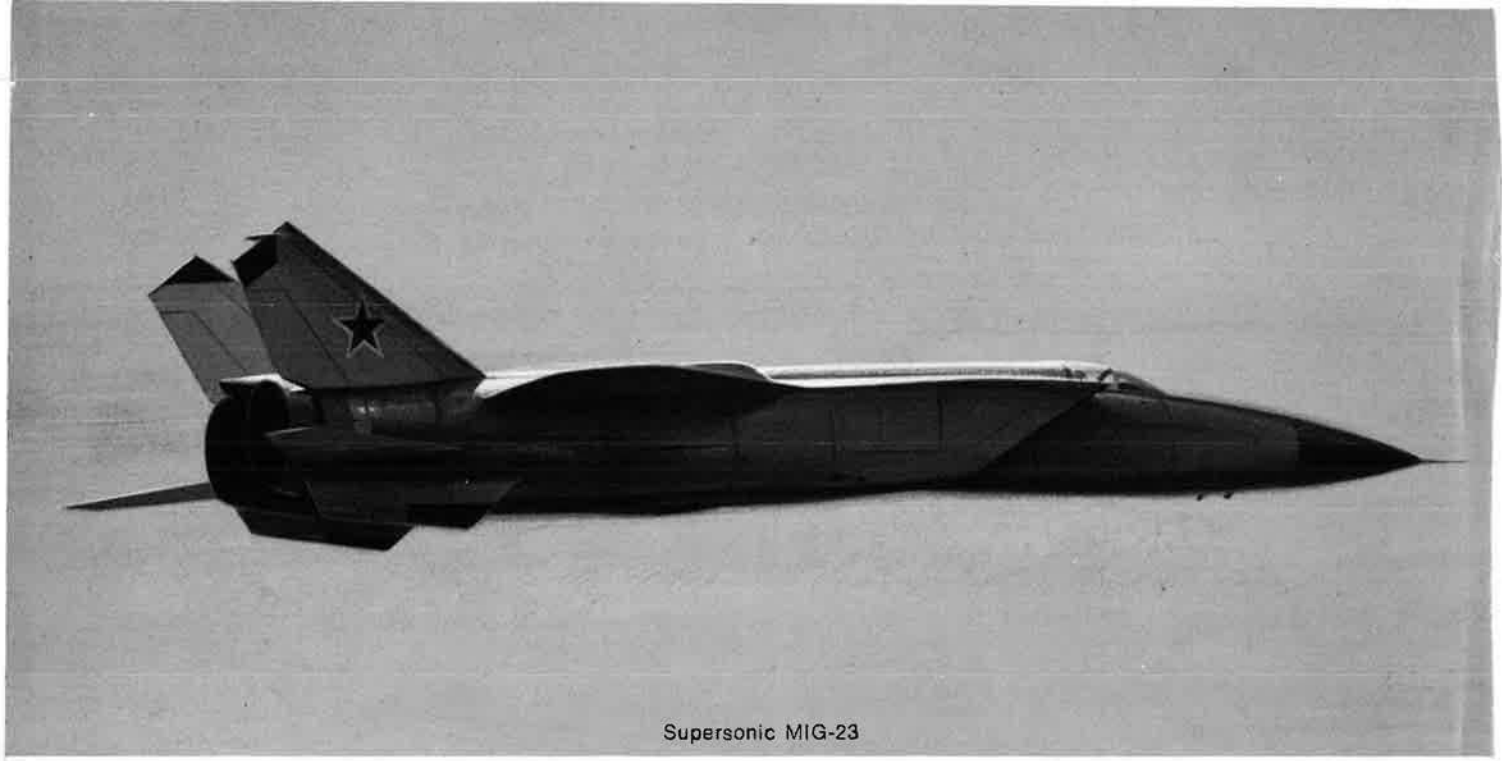
AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

A Better Deal for Blacks in Blue





Supersonic MIG-23

Supersonic BQM-34E/F—Newest U.S. jet target

There are 2 ways to prove you're as good as you think you are.

FIREBEE II

TELEDYNE RYAN AERONAUTICAL
SAN DIEGO, CALIFORNIA 92112

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

VOLUME 55, NUMBER 6

JUNE 1972

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BPA Circulation audited by Business Publications Audit

AIR FORCE Magazine (including SPACE DIGEST) is published monthly by the Air Force Association, Suite 400, 1750 Pennsylvania Ave., N.W., Washington, D.C. 20006. **Phone:** (202) 298-9123. Second-class postage paid at Washington, D.C. **Membership rate:** $10 per year (includes $9 for one-year subscription). **Subscription rate:** $10 per year; $2 additional for foreign postage. Single copy $1. Special issues (Spring and Fall Almanac Issues) $2 each. **Change of address** requires four weeks' notice. Please include a recent mailing label. Publisher assumes no responsibility for unsolicited material. Trademark registered by Air Force Association.

An Editorial

Half Past the Eleventh Hour

By John L. Frisbee

EXECUTIVE EDITOR, AIR FORCE MAGAZINE

VIETNAM has provided stacks of documentation on the use, misuse, and nonuse of airpower—with heavy emphasis on the latter two. Now, after nearly seven years, airpower is being used in Southeast Asia as we believed from the start it should have been.

Let's look at the record.

We know full well that decisions on the employment of airpower must be interdisciplinary. Political, economic, social, and military judgments have to be blended in deciding how best to put it to work.

We have long felt, however, that patterns for the employment of airpower in Vietnam, set during the first three years of active Air Force participation, were flawed—overbalanced in favor of nonmilitary factors and often based on inaccurate appraisals of military considerations. The essentially political doctrine of gradualism—a slowly increasing application of airpower pressures to persuade the enemy to quit—is a prime example.

The Air Force Association's March 1969 Statement of Policy scored the failure of gradualism "to evoke the kind of response from our adversary that it was expected to evoke."

The effectiveness of airpower, already diluted by gradualism, was further reduced in 1968 when the US traded away its blue-chip ability to use airpower in the North in return for Hanoi's vaguely qualified promise to open meaningful negotiations in Paris.

Writing about "The Evolution of Air Warfare" in the March-April 1972 issue of *Air University Review,* Maj. Gen. Robert N. Ginsburgh and Maj. Edd D. Wheeler observed that "the need to employ airpower in force, in time, and at points of our own choosing [demonstrated by air operations of the past decade] holds special meaning today, as the Air Force assumes the residual-element role in protecting our forces as they withdraw from Vietnam."

To that we say, Amen.

Two-thirds of this prescription for the proper use of airpower is evident in the President's response to the North Vietnamese invasion. The pattern set between 1965 and 1968 has been broken. Right now, we are using airpower "in force" and "at points of our own choosing."

In this eleventh-hour conversion, airpower has been given no less a job than that of redressing the increasingly adverse balance of North-South military strengths, created by a stepped-up flow of heavy military equipment from the USSR to North Vietnam and by Hanoi's months of freedom to stockpile huge quantities of supplies near the DMZ in preparation for the invasion.

The big question is, Have we begun the proper use of airpower "in time"? If we have, the results will refute much of the superficial criticism leveled at the effectiveness of airpower in Vietnam. If not, then inevitably—though not in fairness—airpower will once more be the fall guy.

Whatever the outcome, certain truths—some venerable, others newly demonstrated—about airpower have emerged as undeniable during the weeks that the invasion has been going on.

First, when the chips are down, as they are now, it is airpower that the political and military leadership calls for.

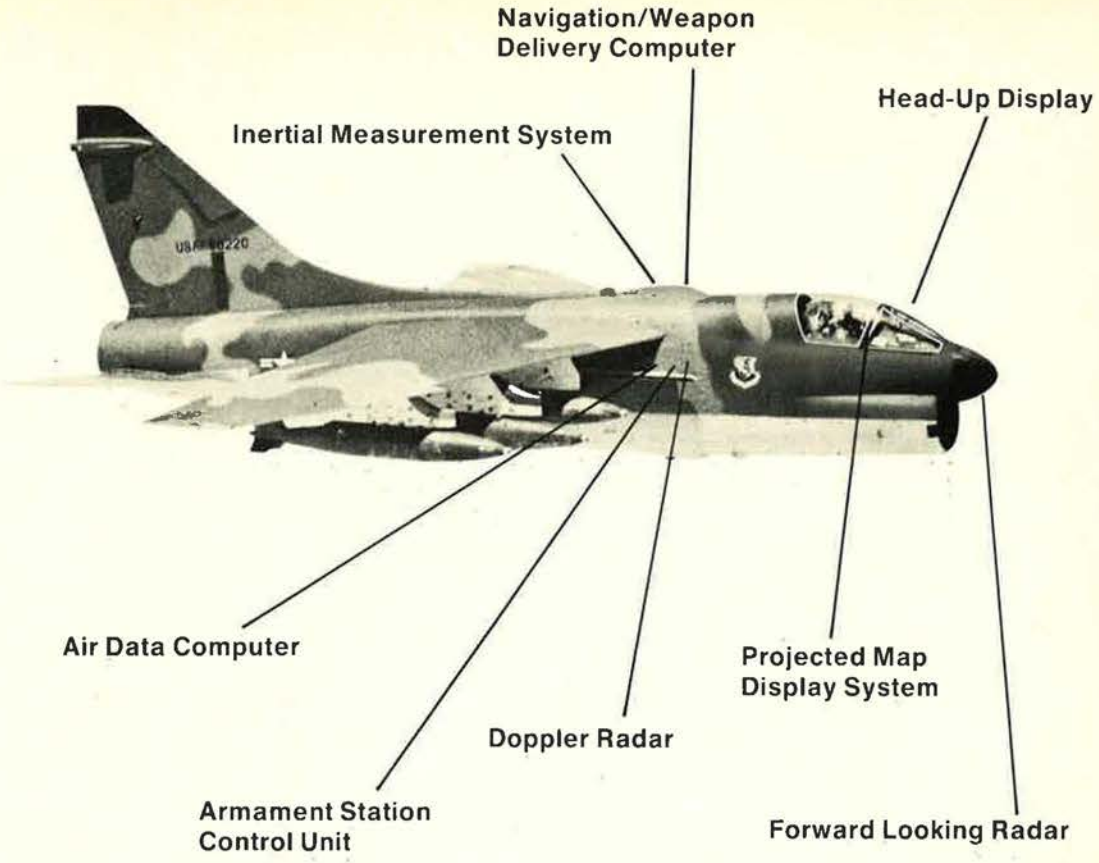
Next, the responsiveness of US airpower, on which the Nixon Doctrine rests, has been proved again. USAF B-52s and tactical fighters were in Southeast Asia, ready to fly combat missions, only seventy-two hours after they were alerted at their home bases in the US. Three weeks after the alert call, the aircraft carrier *Midway* arrived on station in the Tonkin Gulf and the *Saratoga,* too large to pass through the Panama Canal, was en route around the Cape of Good Hope.

Third, any doubt about the ability of manned bombers to survive in an enemy defense environment dominated by surface-to-air missiles has been removed. B-52s have flown repeated strikes in the North, some against the most heavily defended targets in the history of warfare—those in the Hanoi-Haiphong area. Only two B-52s have been hit by SAMs, and neither was seriously damaged. Clearly, far deeper penetrations of enemy defenses could be made by B-52s, using highly refined tactics and standoff weapons—and by the vastly more sophisticated B-1.

Finally, it has been recognized that, to be fully effective, air interdiction must begin at the wide end of the enemy's logistics funnel, whether that is his own military industry or the ports and railways that bring military supplies in from the outside.

The aerial mining of North Vietnam's ports and attacks on rail lines to China that are choking off supply lines from the USSR and China are far riskier ventures today than they would have been seven years ago, when they would have been backed up by clear US strategic nuclear superiority. That is the price we now pay for letting our nuclear superiority slip away.

How much different might have been the course of the war—and of the domestic tensions it has produced—if, in 1965, we had not feared to use airpower "in force, in time, and at points of our own choosing." But history's clock cannot be turned back. It is half past the eleventh hour, not too late to retrieve some of what has been lost, but a point in time that is most unforgiving of further mistakes and equivocation. ■



The whole is greater than the sum of its parts.

This simple definition of synergism is the best way to describe today's A-7. Its advanced electronic systems are so skillfully integrated that they out-perform each of their individual capabilities. Together they make the A-7 the most versatile and effective close air support and interdiction aircraft in the world.

Vought Aeronautics is the first aircraft manufacturer to produce an operational navigation and weapons delivery system that equals or betters unprecedented performance and accuracy guarantees.

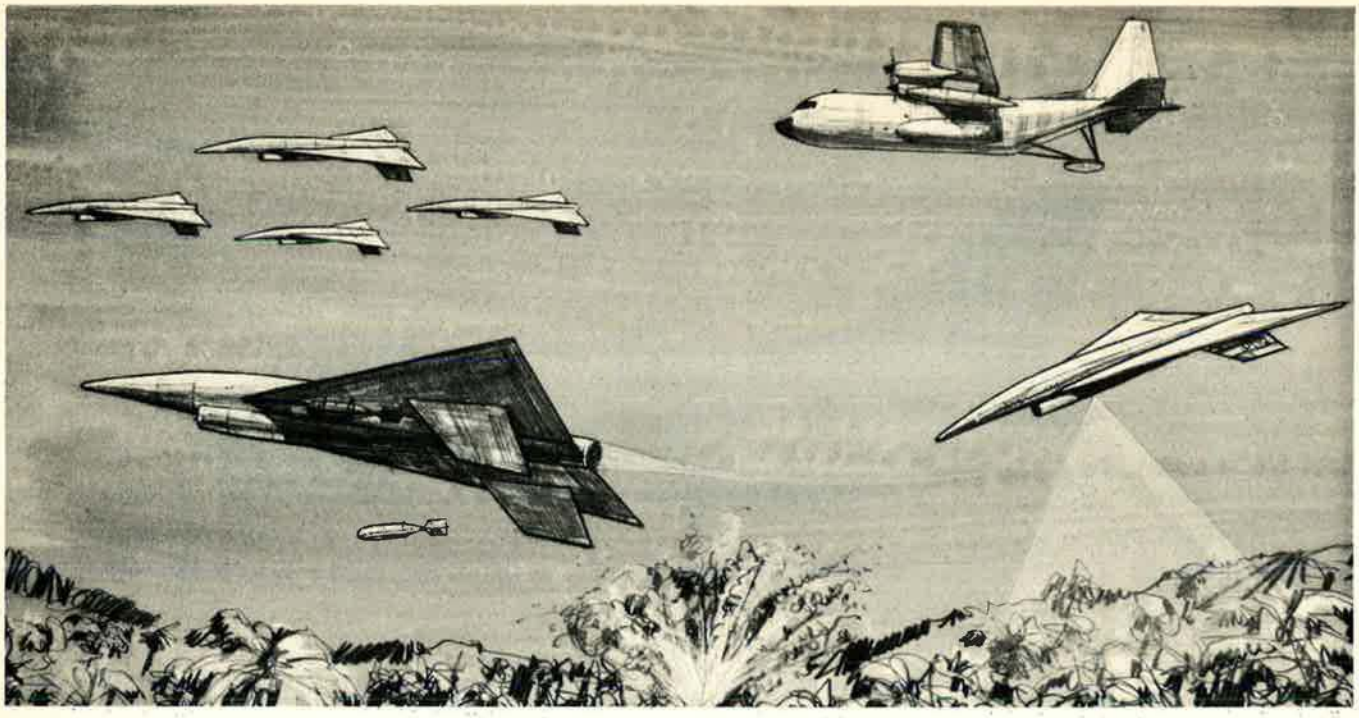
Successful development of these systems took almost five years. Vought began with a proven air frame. Then we worked closely with the U.S. Air Force and U.S. Navy to design a superior avionics package that would meet the most exacting operational requirements. System interfaces were resolved with component suppliers. And computer software was developed to ideally coordinate these components.

In all, more than 4½ million man hours were invested. Plus thousands of simulation and flight test hours. Over ten thousand pieces of ordnance dropped. A quarter of a million 20MM rounds fired. Under rigorous test conditions.

As a result, today's A-7 delivers up to 15,000 pounds of varied payload with better than 10-mil accuracy. Destroying hard targets in one-third the sorties required by other systems.

Other aircraft today contain many of the same components found in the A-7. But the A-7 is the only weapons system in operation with demonstrated proof that its integrated whole is greater than the sum of its component parts.

LTV AEROSPACE CORPORATION
VOUGHT AERONAUTICS



multi-RPV

Motorola's all-new drone control system is the only one designed from the ground up that will successfully provide full IFR capability for multi-RPV command, control and housekeeping data on spatial orientation. The system simultaneously controls dozens of unmanned Remotely Piloted Vehicles.

Motorola's is the *only* system with a built-in Mil-Spec computer compatible with graphic displays used for multiple drone control missions. Further, a PCM data format keeps multiple control from becoming a controller's nightmare. If that were all Motorola's system offered, it would be the finest system available. But there is more.

The AN/TSW-10 control station commands multiple RPV's at more than 250 nautical miles. It is one of five Motorola-built control stations, part of an integrated drone control system, AN/USW-3.

The system is also compatible with ECCM equipment, wide-band sensor links and a variety of other capabilities your future requirements may dictate. Remember, this is the *only* proven, solid-state system you can buy today. It is cost effective; it was developed by the government agencies to fly both single and multiple drones. Choose from a variety of both ground and airborne control stations currently in use.

If you have a requirement to operate multi-RPV's, ask us for a briefing. We can probably save you R & D time and money—with a system which represents today's "art." For a system overview brochure write: Motorola Government Electronics Division, Drone Electronics Group, 8201 E. McDowell Rd., Scottsdale, AZ 85257. Or phone (602) 949-3263.

MOTOROLA

Airmail

Campaign Issue

Gentlemen: I agree with John Loosbrock in "The Political Climate Is Unfriendly" [April issue] when he states that it is the voters who determine what the top issues are in an election.

I would like to point out, however, that on January 29, 1972, in a speech at the Palmer House in Chicago, Gov. George C. Wallace stated that the number one issue in this election is national defense, and that we are now talking about regaining rather than retaining our position of number one power.

Governor Wallace went on to praise Gen. Curtis LeMay and his role in the 1968 election, referring to him as the "most misunderstood man in history." He noted that if it were not for LeMay's tactics in Japan, many of those in the audience would not be alive today.

Now where do the other candidates stand on the important issue of national security?

LARRY E. NAZIMEK
Champaign, Ill.

Gentlemen: May I take friendly exception to the statement in John F. Loosbrock's editorial in the April issue, in which he said: "With rare exceptions, defense is either being ignored or treated with demagogic unreality keyed to the prevailing antimilitary sentiment spawned by Vietnam. Except for the President himself, and Senators Jackson and Humphrey, none of the announced or *de facto* candidates knows very much about defense matters or has seen fit to equip himself with staffers who do."

I would like to point out that Rep. John M. Ashbrook, Republican contender for the Presidency, after quoting from the Presidential Blue Ribbon Panel Report of September 30, 1970, states in his speeches and literature:

"The decline of our national defenses has prompted the President's own Blue Ribbon Defense Panel to warn, 'It is not too much to say that in the '70s neither the vital interests of the United States nor the lives of its citizens will be secure.'

"It is because the promise and hope of the 1968 campaign have been so largely abandoned that I am running in this primary. I ask the support of all those who seek a Republican Party dedicated to a strong national defense, a realistic foreign policy, economy in government, and the growth of free institutions at home."

Here is one candidate to whom the voters may safely entrust the defense posture of our nation. Even if his bid for the Presidency does not succeed, his candidacy will have the effect of forcing the Administration further toward the objective of closing the defense gap with the Soviet Union.

ROBERT N. BLUM
San Francisco, Calif.

They Sure Have!

Gentlemen: I enjoyed Captain Ryan's article on the wonders of the SLUF, the amazing A-7D [April issue]. The Air Force's second wing of A-7s is here at Davis-Monthan AFB, Ariz., and, like the guys at Myrtle Beach, S. C., we have our regular turkey shoots.

On the first of March, Capt. Charles R. Harr (*see photo*) of the 357th TFS "Long Tongued Dragons" had a good day on the range, dropping his six bombs for six consecutive bull's-eyes on a CEA of 0. They used to say "Nobody's perfect," but then that was before the A-7 came along.

We don't want to disparage the accomplishments of our brothers at the Beach, but we've had flights when the thirteen-foot CEA mentioned would have been last in a flight of four.

The 357th's Captain Harr, who zeroed in six out of six bombs center target. (For more on the 357th, see p. 13.)

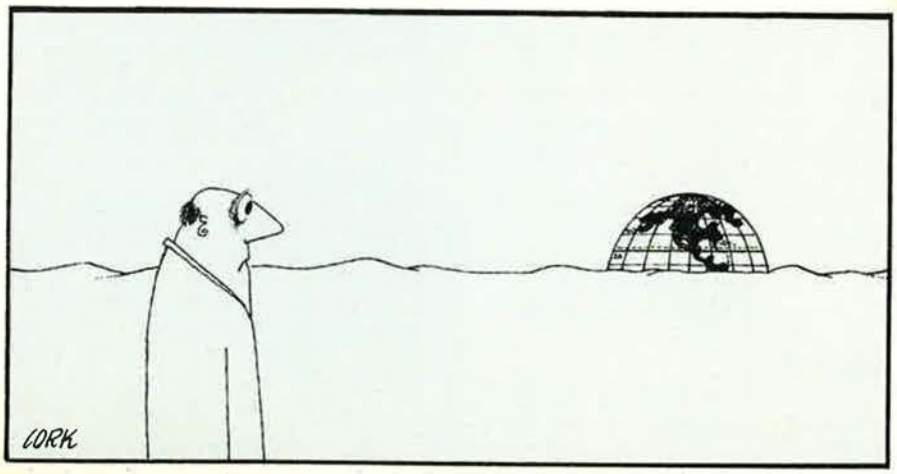
We'll grant that when you start talking real bombs anything within twenty feet is good for obliteration of the target, but we're talking capabilities, and, like they say, "When you've got it, flaunt it!"

We've got it!

CAPT. JOSEPH L. HODGES, III
357th TFS/IO
Davis-Monthan AFB, Ariz.

Kwai Survivors

Gentlemen: Reference my article, "About That Bridge on the River Kwai," in your February issue. My research reveals that twenty-seven Americans died and were buried at the Kanchanaburi cemetery. They



Airmail

were later exhumed and sent to the States.

Many Americans who worked on the bridges and the railroad survived. I would appreciate hearing from survivors or hearing from anyone who can give me information on living survivors.

I would also be grateful for information from other Allied former POWs as well as Japanese who were at the Tamarkan, Chung-kai, and Kanchanaburi camps.

LT. COL. WILLIAM A. HENDERSON
120 Shreveport Rd.
Barksdale AFB, La. 71110

Journey to the Bridge

Gentlemen: With reference to the comment of Mr. Pierre Boulle [April issue "Airmail"] on Colonel Henderson's article about the River Kwai Bridge, as to the selection of a "not too far from Bangkok tourist attraction," it is obvious that Mr. Boulle never took the "convenient" journey from Bangkok to the bridge site. It is usually a lengthy four-hour taxi ride of approximately 115 miles in unair-conditioned and perspiring conditions over a terrible road with a driver that is unbelievably intent on committing hara-kiri on himself and his passengers.

The view at the bridge and the adjacent Allied cemetery with the thought-provoking impact of the area, real and/or imagined, makes the trip worthwhile. Interesting but not convenient! For convenience, there are many bridges closer to Bangkok—perhaps the Thai government could arrange a location as convenient as Eiffel is to Parisian tourist hotels?

LT. COL. H. R. (RAY) FINFER, USAF (RET.)
Dallas, Tex.

437th TC Group History

Gentlemen: In 1951, I wrote and published a book entitled *Action of the Tiger*, relating the history of the 437th Troop Carrier Group in World War II. (I was Assistant Operations Officer, 84th TC Squadron, 437th TC Group.) The 437th participated in seven campaigns in the ETO, including the D-Day invasion.

As far as I know, this is the only book that tells of the use of gliders on D-Day and other campaigns.

There have been requests to have the book republished. If any readers are interested in a copy, please contact me. No money should be sent. If the book is republished, those interested will be notified.

FRANK GUILD, JR.
Box 7
Lindale, Tex. 75771

Writing Two Histories

Gentlemen: I am writing as an aviation historian in need of some help. For the past four years I have been writing a definitive history of the Messerschmitt 163 Komet, the German rocket fighter of World War II. At present, the combat history of the aircraft is coming to a close, and I would like to hear from anyone who might have encountered the 163 in combat. These recollections would be used in the last chapter of the book.

I am also beginning a full history of the 14th Fighter Group (48th, 49th, and 50th Squadrons) and would like to hear from any former members, both pilots and ground personnel, who could help in providing photos or personal experiences with the unit. At present, this is slated for publication.

By the way, Keith Ferris, a major contributor to the Air Force Art Collection, is doing my cover art.

JEFFREY L. ETHELL
P. O. Box 5192
Richmond, Va. 23220

Raid on Nuremberg

Gentlemen: Here's an item for former RCAF bomber crewmen:

A book is being written about the RAF Bomber Command raid on Nuremberg, March 30–31, 1944, in which ninety-six British bombers were lost.

The author knows there were many Canadian aircrews in this raid. He would like to hear from them. Anyone involved is asked to write to him giving your name, address, and the squadron. All letters will be answered.

MARTIN MIDDLEBROOK
48 Linden Way
Boston, Lincolnshire, England

WW II Flight Officers

Gentlemen: I am trying to locate men who graduated from the United States Army Air Forces Aviation Cadets as flight officers rather than second lieutenants. I think I have a fine book in the making, but need to reach more people than I have so far. There are a few simple questions to ask and I know they will enjoy answering them.

RABBI LEONARD WINOGRAD
1322 Lincoln Way
McKeesport, Pa. 15131

Young Reader

Gentlemen: Last week for a class in reading I was assigned to read an article in AIR FORCE Magazine, March issue. The title was "Lost in the Traffic Pattern," written by Col. Cal Carpenter, USAF (Ret.).

I found the article fun and informative. Colonel Carpenter's style of writing is easy to read and understand.

I enjoy your magazine because I like to read about flying. When I grow up I would like to be an Air Force pilot.

Keep up the good work.

SCOTT JENNINGS
Hill AFB, Utah

UNIT REUNIONS

Dodge City AAF

All personnel of the Dodge City Army Air Field are invited to join in the August 18–20 reunion, to be held in conjunction with the 100-year celebration of Dodge City, Kan. Contact

Joe Berkely
Dodge City Air Base Reunion
Box 760
Dodge City, Kan. 67801

49th Fighter Squadron

All "Hangmen" who flew P-38s in World War II are invited to a reunion in Fort Worth, Tex., over Labor Day weekend. The Confederate Air Force will give a daily airshow with WW II airplanes, including the P-38. For details contact

Revis Sirmon
P. O. Drawer C
Abbeville, La. 70510

57th Bomb Wing

The fourth annual reunion of the 57th Bomb Wing will be held at the San Francisco Hilton Hotel, July 13–16, 1972. All former members and their families are invited. Contact

Harold G. Lynch
Springfield College
Springfield, Mass. 01109
Phone: (413) 787-2050 (office)
783-0709 (home)

358th Fighter Squadron

A unit reunion of the 358th Fighter Squadron, 355th Fighter Group, Steeple-Morden, England, is being planned. All former members are urged to contact me as soon as possible and to forward all known recent addresses.

Douglas B. Warden
P. O. Box 123
Plainville, Conn. 06062

388th Bomb Group

The 388th Bombardment Group will be holding a reunion at The Dayton Inn, Dayton, Ohio, August 17–20. During the reunion, the Air Force Museum will be presented with the original group and squadron plaques from our Knettishall, England, days. Further information from

Edward J. Huntzinger
863 Maple St.
Perrysburg, Ohio 43551

NADGE is the first major real-time air defense system to be implemented with a high-level compiler language (JOVIAL) using two Hughes-built processors in a multiprocessing mode. Hughes developed software programming for the 37 computer sites in the NADGE (for NATO Air Defense Ground Environment) system around common modules that can be adapted to solve problems peculiar to the various locations. Eighteen of the computer sites have been tested and accepted without any delay due to software programming problems. The entire NADGE system is scheduled for completion by the end of the year, except for some site work in Greece.

NASA's Earth Resources Technology Satellite, scheduled for launch this summer, will carry an experimental multispectral scanner developed by Hughes. The scanner's single optical system will record signal data in four separate bands of the electromagnetic spectrum and convert the light emissions into photo-like images. The resulting "signatures" of the solar energy emitted by agricultural crops, forests, and rivers will indicate their environmental health. The scanner will "see" a swath 100 nautical miles wide during each polar orbit over the U.S.

The U.S. Navy's AWG-9 weapon-control system which launches the Phoenix missile, both built by Hughes for the F-14 fighter, has a "look down" capability that enables it to pick out moving targets from the ground clutter that normally obscures conventional radar signals. A Phoenix missile demonstrated its ability to combat the anti-ship missile threat when it was launched from a test platform at 10,000 feet and hit a cruise-missile target flying at 800 feet, while another launched from 29,000 feet "killed" two targets flying close together at 10,000 feet. The AWG-9 can also launch the F-14's Sparrow and Sidewinder missiles and direct the firing of its M-61 Vulcan 20mm cannon.

The first long-life hydrazine thruster systems, which Hughes developed for NASA's ATS-4 and 5 satellites, have proved superior to the conventional hydrogen peroxide thruster for making the radial and axial corrections that keep a synchronous satellite on its precise orbital station. The hydrazine thruster is safer, more reliable, longer lived, easier to restart in space, and less costly. Two new hydrazine engines, in 1- and 5-lb. thrust, are now available. Hughes is using the 1-lb. thruster on Canada's Anik 1 domestic communications satellite.

Nine TOW fire-control systems for the AH-1G HueyCobra are being built by Hughes for testing under contract to Textron's Bell Helicopter Company. The TOW system will be integrated into the attack helicopters under the U.S. Army's Improved Cobra Armament Program, giving them the capability to knock out field fortifications and moving or stationary tanks and armored vehicles. In operation, the HueyCobra gunner will simply hold his target in the crosshairs of the gyrostabilized sight system and press a trigger to launch the wire-guided TOW missile. During the missile's flight, the pilot can take evasive action if necessary.

Airpower in the News

By Claude Witze
SENIOR EDITOR, AIR FORCE MAGAZINE

Quotation Marks, Anyone?

WASHINGTON, D. C., MAY 8

It is only a little more than a month since the North Vietnamese sent almost all of their army, well equipped with Russian hardware, across the demilitarized zone into South Vietnam. The New York *Times* reported, on April 5, that the Nixon Administration accused Hanoi of launching an "invasion," carefully putting quotation marks around the word, invasion. It was the newspaper's intention to portray this new phase of an old war as an escalation provoked by the United States, if it could—the quotation marks implying that the invasion possibly was not an invasion. The *Times* headline that day said: "U.S. SAYS HANOI 'INVADED' SOUTH, KEEPS ALL REPRISAL OPTIONS OPEN."

The story reported what the State Department had to say and called the Administration statement "justification" for air strikes if they were found necessary. There were no quotation marks on justification, however. The *Times*, of course, knows justification when it sees it, but does not know an invasion when it sees one.

Well, invasion no longer appears in quotes, but the germ of the idea flourishes, nowhere more persistently

THE WAYWARD PRESS

The Board of Trustees of Columbia University last week announced that the 1972 Pulitzer Prize for meritorious public service in journalism was awarded to the New York *Times* for publication of the Pentagon Papers. Also, that columnist Jack Anderson won the award for national reporting for his disclosures of Nixon Administration policy-making during the India-Pakistan war.

This requires no comment from us, partly because the Columbia trustees themselves said they "had deep reservations about the timeliness and suitability of certain of the journalism awards." Why? Because, the *Times* says it learned, "in both instances, there was argument over the way that official government documents had fallen into journalistic hands."

It has been made clear in this space before that we do not consider that a newspaper, or reporter, is practicing "investigative journalism" if he writes a story from a document dropped over the transom, even by so elite a courier as Daniel Ellsberg. As Mr. Anderson has discovered to his greater professional glory, the woodwork is full of malcontents and victims of alleged injustice who have rifled confidential files.

As recently as April 12, Jack Anderson appears to have used one of these sources to compile a report on the recent visit of the Chiefs of Staff of the NATO Air Forces to the United States. Gen. John D. Ryan, USAF Chief of Staff, served as host.

Mr. Anderson wrote in his column that the generals were accompanied by their wives and took a sort of fun-and-games tour of our country. The truth is that the generals were alone, there were no ladies in the party, and the tour was for strictly business purposes. The Defense Department announced the event before it took place and said the men would visit Eglin AFB, Fla.; Edwards AFB, Calif.; Nellis AFB, Nev.; and the Space and Missile Systems Organization in Los Angeles.

Jack Anderson, the Pulitzer Prize winner, was wrong.

* * *

At the daily Pentagon news briefing of April 17, a reporter asked about reports that a US destroyer had been attacked by a North Vietnamese vessel. Jerry Friedheim, who conducts the sessions, replied that there were some reports of this nature, possibly involving enemy motor torpedo boats, "but that hasn't been confirmed and I don't want to get into it very deeply here until we see what the facts are." He added that reports of fire at a couple of our warships were unconfirmed.

Within the next several hours, while Pentagon spokesmen repeated that they had no conclusive information, both the Associated Press and United Press International, as well as the New York *Daily News*, carried reports of a gunboat attack on the USS *Worden* in the Gulf of Tonkin. One American was reported killed. The Defense Department was accused of withholding information.

Actually, the USS *Worden* limped to port in the Philippine Islands. When it got to the Subic Bay Naval Base, it was disclosed that the ship had been hit by missiles, fired from US aircraft, that appeared to have malfunctioned.

The payoff was that when the Washington *Evening Star* finally got the story straight, its headline said that an Air Force rocket had hit the destroyer. The story following did not confirm this, and the airplanes known to be in the Tonkin Gulf area were carrier-based, as any competent copy desk employee should have known.

* * *

Some months ago, it was pointed out in this space that the decisions made on newspapers are made by people, and some people are no good. Or they have prejudices, or axes to

than on Capitol Hill. Sen. J. W. Fulbright, Chairman of the Foreign Relations Committee, is doing what he can to keep the germ alive. He has held two long public sessions to question Secretary of State William P. Rogers and Secretary of Defense Melvin R. Laird. The Senator, keeping in step with the *Times*, where invasion is fit to print in quotation marks, is persistent in his effort. He charges that the renewed bombing in Vietnam and the Administration's foreign aid request, which includes $585 million for economic aid to South Vietnam, demonstrate that President Nixon is determined to continue the war. The Fulbright definition of White House intentions is worth having in the record, so we know what the argument is all about. Here is the Senator's reasoning:

"The reescalation of American combat involvement in Vietnam . . . shattered the carefully created illusion that the United States' direct role in the Indochina war is nearing an end. . . . The Administration's massive military response to the North Vietnamese offensive indicates two things to me: First, the Administration's own lack of confidence in South Vietnam's ability to defend itself and, second, the Administration's continued willingness to expend additional American lives and resources in an effort to control the outcome of the war among the Vietnamese people.

"The magnitude of the request before this committee today . . . provides yet another indication of the magnitude of the investment that the Administration is willing to make in the pursuit of a policy which we thought it had disavowed.

"Such expenses certainly are not required just to protect the lives of less than 100,000 troops there, and I seriously doubt whether the American people are willing to pay $8 billion in order to defend the Saigon government.

"Perhaps we should have known all along that the President's underlying objectives in Vietnam were identical to those of his predecessors. . . . Apparently, President Nixon believes that we can accomplish with airpower alone what President Johnson failed to do with airpower and more than 500,000 American soldiers."

The hearings at which Mr. Rogers and Mr. Laird appeared, on April 17 and 18, recalled similar sessions in the Lyndon Johnson Administration, when Dean Rusk spent long and torrid hours defending his State Department before a hostile committee. There were the same television cameras, the same packed hearing room, the same questions, designed more for harassment than to elicit information:

- What do you expect to achieve by bombing North Vietnam?
- Why was Congress not consulted?
- Why was the decision to bomb Haiphong made at this time?

grind, or editorial viewpoints they want to promote. In this age of advocacy journalism, the urge to exercise this power, which properly belongs to the publisher and the publisher alone, has descended into the ranks of what we used to call the working press. That's a label you don't hear much these days, as more and more copy boys and reporters on the police beat and inexperienced columnists try to shape the news and the way it is presented to the public. It's getting so that not even the "Constant Reader" can tell who is to blame for outrages in print.

Now, it is no secret that the highly esteemed New York *Times*, and a great many people on its staff, hold this country's foreign policy in contempt, with particular focus on the executive branch of the government. They are not treating President Nixon any better than they treated President Johnson in this respect. And both men, facing the complexities of the war in Vietnam, inherited from their predecessor, have found the *Times* anything but sympathetic.

In its issue of last January 21, the *Times* disclosed it had circumvented the State Department and the White House to put some questions directly to Premier Pham Van Dong of North Vietnam. The queries, it appears, were cabled to Hanoi by A. M. Rosenthal, managing editor of the *Times*.

Mr. Rosenthal, who has no background in these matters worthy of note, sought what the *Times* defined as "clarification of Hanoi's negotiating position, specifically whether the prisoners would be released in return for a firm withdrawal date." According to the *Times*, "critics of the Administration's policy believe the setting of such a date would result in the release of the prisoners."

Well, as the *Times* admitted, Mr. Nixon already had said, in a TV interview on January 2, that Hanoi had rejected such a proposal. Then, Sen. George McGovern accused the President of deceiving the public. It was Mr. Rosenthal who decided to settle this issue.

The reply he received from Hanoi did not answer his questions directly, the *Times* reported. The answer came from Ngo Dien, director of the Press and Information Department, Hanoi's version of our White House spokesman.

"At the present time, placed in the obligation of carrying out a gradual withdrawal of United States troops, President Nixon has, nonetheless, not resigned himself to putting an end to his war of aggression," Mr. Dien told Mr. Rosenthal.

In short, Hanoi's reply to the *Times* was precisely the same as Hanoi's reply to President Nixon, which had been published in the *Times* more than once.

So Mr. Rosenthal replied with thanks, but reported to Hanoi that, "after much consideration," the newspaper decided not to publish the answers it had received to its queries.

The decision not to print this adamant stand again was reversed, however. The reversal came about because Hanoi, not appreciating how important the *Times* is in our American scheme of government, permitted a copy of the reply to come into the hands of the Administration in Washington. Out of the Foreign Broadcast Information Service, a bureau of the Central Intelligence Agency, it was made available to reporters covering the State Department.

According to the *Times*, the government summary said:

"The Vietnamese news agency's service channel to Paris on [January] 15th carried Rosenthal's questions along with a message from Ngo Dien. Ignoring Rosenthal's specific questions, Dien implied that Point I, on United States withdrawal and prisoner release, could not be separated from Point II, on a political settlement in South Vietnam."

The point is not obscure that if the *Times* had received a reply from Hanoi that supported its own editorial view, and that of Senator McGovern, it would have been page-one news, fit to print, on January 15. The newspaper's thrust remained highly classified for five days, until it was forced into the open. On page 10.

Who did they say is managing the news these days, and misusing that blanket of secrecy? ■

Airpower in the News

• What would happen if the United States removed its forces?

• Why do you feel a resumption of bombing of military targets will succeed?

• What authority does the President have to resume bombings?

It takes a good deal of patience to put up with this line of attack from legislators who do not really have to face the problem of the hour and who profess to be skeptical that there was an invasion in the first place.

What the committee did, a couple of days later, was to approve an authorization bill with an amendment that would cut off funds for our combat operations in Indochina after December 31, 1972. The vote in committee was nine to one, with the dissent coming from Republican George D. Aiken of Vermont. Long an opponent of the war, like everyone else, he contended he voted against accepting terms laid down by the North Vietnamese. Mr. Aiken, a man old enough to know an invasion when he sees one, said the enemy is the aggressor and they will butcher people if they succeed. The amendment, sponsored by Sens. Clifford P. Case, Republican of New Jersey, and Frank Church, Democrat of Idaho, was attached to a budget bill for the State Department and the United States Information Agency, two branches of the government that do not fight wars.

At the moment, it appears that the doves are confined to their nest, because a Senate showdown has been delayed. The White House is known to be apprehensive and hoping that the issue will not come up again until after Mr. Nixon's contemplated trip to Moscow. The immediate excuse was the absence of Sens. Mike Mansfield and Hugh Scott, the majority and minority leaders, respectively, who were away on a visit to Communist China.

The debate in the Senate has been long and heated—it ran more than five hours on April 19 alone—with extreme views coming from both sides. The GOP's Sen. Barry Goldwater said Russian ships have no business being in Haiphong and if they get hit, "that's too damned bad." Alan Cranston, the California Democrat who organized the debate, said he senses that Lyndon B. Johnson is back in the White House, and "we're seeing what almost amounts to a win-the-war attitude rearing its head again."

One performance worthy of note was put on by Alaska's unpredictable Sen. Mike Gravel, who came up with a couple of reports compiled by dissenters and put them in the *Congressional Record*. One was from Project Air War, a left-wing operation arguing that Nixon, not North Vietnam, has escalated the fighting. The other comes from the Ad Hoc Military Buildup Committee of Cambridge, Mass. This is an outfit with its own spy network in the military ranks. Staffed by what it calls "antiwar reporters," the committee claims it was first to put out news about the B-52 raids in North Vietnam. Mr. Gravel's sense of responsibility as a US Senator is questioned by many of his peers.

Over in the House of Representatives there has been an equal amount of activity. The House Democratic Caucus voted a resolution condemning the bombing, and its members seem to want a vote on the war issue to help them in their campaigns for reelection. The caucus vote probably will not prevail.

A more meaningless exercise was started by New York's Rep. Bella S. Abzug, who offered a resolution ordering the executive branch to furnish "full and complete information" on the specifics of military operations under way in Indochina. This proposal was put on the desk of Rep. F. Edward Hébert, and he called a hearing so that his Armed Services Committee could examine the proposal. Mrs. Abzug pleaded her case and was joined on the stand by Rep. Michael Harrington of Massachusetts, himself a member of Mr. Hébert's committee. Mr. Harrington proceeded to insult his colleagues and suffered reprimands. Mr. Hébert inflicted his gently, informing Mr. Harrington that he was free to leave the committee if he doesn't like it. Rep. Charles S. Gubser of California was less polite. After demonstrating that Mr. Harrington did not read the reports of his own committee, Mr. Gubser made it clear he resented being classified as an "intellectual prostitute" by a junior member of the group.

The Abzug resolution was tabled by the House by a vote of 270 to 113. The argument against it was that the information already is available and Mr. Hébert has control of it. The Chairman was disturbed by the fact that his time and that of his committee was wasted by the aberrations of the lady from New York.

The basic idea of the New York *Times*, that the invasion is an "invasion" and a gimmick designed by hawks to mislead the American people, is not widely accepted. But it has enough believers to devour thousands of working hours and hundreds of pages in the *Congressional Record*.

The First Signal on Money

As we go to press, the Defense Department's Fiscal 1973 budget request is in the mill on Capitol Hill, and the wheels grind behind closed doors. Both Senate and House are spurring action, with the pressure on to clear both authorization and appropriation measures.

So far, there has been only one report of solid news, and it comes from Sen. John C. Stennis, Chairman of the Senate Armed Services Committee.

His group has turned down the Army's request for $58.6 million to continue research and development work on the Cheyenne helicopter gunship, discussed in this space last month. The vote in the committee was nine to seven.

The vote by no means kills the Cheyenne. The House Armed Services Committee is expected to disagree, and the issue is almost certain to be settled in conference. Then the appropriations committees will have another crack at the issue. In related action, the Stennis group also voted, nine to seven, to curtail procurement of the Harrier V/STOL fighter used by the Marine Corps. The intention is to limit the Leathernecks to sixty aircraft. Rejected was a request for $115 million for thirty more Harriers.

Funds for the Air Force's A-X close support fighter were approved, as was funding for the F-15 air superiority fighter, the F-111, and the lightweight fighter (LWF).

The committee voted unanimously to delete the $309.9 million requested for procurement of an Airborne Warning and Control System (AWACS). But it voted to increase research and development money for this project by $83 million, for a net reduction of $226.8 million. Mr. Stennis explained that the only net effect of the committee action would be to cut the USAF request for three aircraft to two, funded entirely as R&D.

There also was a cut of $2.3 million from a request for $110.4 million for the F-5E international fighter. Another $10.2 million was slashed from the Navy's proposed $617.9 million for the S-3A Viking, and action was deferred on another Navy proposal that sought $24 million to develop a V/STOL prototype. ■

PROCRUSTEAN:

WHAT DOES IT MEAN?

Once upon a time (or so the story goes), there was a Greek named Procrustes who did some funny things with a bed. If you were staying at his place and found the bed too big, for example, Procrustes would say, "No sweat," and stretch your aching frame with ropes and weights until it was big enough for the bed. If the bed were too short for you, Procrustes had a simple solution: he'd cut off your legs until they just fit into the bed.

Understandably, Procrustes' customers spread his name throughout the land. It has come down to us today as a word: *procrustean,* harsh or inflexible in fitting (someone or something) to a preconceived idea, system, etc.

Some companies are procrustean—they take your problem and stretch it or chop it off to fit the solution they happen to have available. At TRW, however, the technology is broad enough to let us deal with *your* problem, not *our* solution.

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Aerospace World

News, Views & Comments

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C. MAY 8

For B-52 crews in Southeast Asia, the war they have been waging can generally be summed up as "routine." Their missions usually go like clockwork and with little deviation (if you'll overlook an occasional SAM encounter or MIG scare).

This wasn't so recently, when one B-52 on its way to its target picked up a "Mayday" followed by that distinct beep-beep that indicates a distressed pilot has punched out.

The bomber crew noted the general position and continued to its target.

But over that area on the return leg, the B-52 crew again heard weak "Maydays" from the downed pilot.

The bomber aborted its return to U-Tapao RTN Airfield, Thailand, "and set up an orbit with our navigator taking and updating our position based on the strongest voice signal," the B-52's pilot, Capt. Edward Petersen, related later.

Once improved vocal communication was established, the downed pilot, Capt. John S. Murphy out of Korat AB, Thailand, reported he was in good condition and had had no contact with the enemy. He also said that his backseater had gotten out of the doomed F-4 all right, but now they were separated.

The B-52 soon made contact with the F-4 navigator, 1st Lt. Thomas W. Dodson, and called in rescue aircraft.

Despite an AC-130 gunship acting as on-scene commander, the B-52's job still wasn't over. It stayed in the area patching up communications difficulties until fuel got low. Murphy and Dodson were later retrieved successfully.

Needless to say, the bomber crewmen think they have a first: a search and rescue mission initiated and participated in by a B-52.

☆

The 8th Tactical Fighter Wing, Ubon Airfield, Thailand, has won the 1971 Daedalian Maintenance Trophy.

The award, one of several granted annually by the Daedalian Foundation, was established in 1960 to recognize the most efficient and effective maintenance organization in the Air Force.

Presentation of the trophy will occur this month at the Daedalians' annual convention, Wright-Patterson AFB, Ohio.

The award citation particularly emphasized that despite the unusual amount of activity "on the flight line under combat conditions, maintenance and safety discipline was equal to or better than other units" in a noncombat environment.

☆

The government last month began a test program utilizing computer-generated voice messages to alert pilots operating under visual flight rules to potential traffic and terrain obstructions.

The warnings will be produced automatically through a system of voice synthesis and broadcast over a specially reserved radio frequency to aircraft participating in the tests at Knoxville, Tenn. FAA and the Department of Transportation are the sponsors.

The object is twofold: to develop a system to reduce the potential for midair collisions while at the same time relieving air traffic controllers of the burden of VFR monitoring.

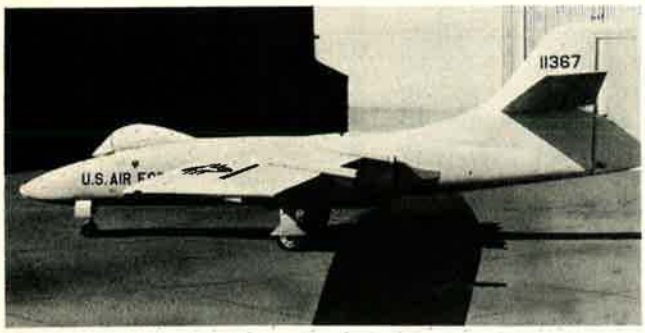
During the Knoxville tests, computers will analyze air traffic and provide VFR advisories to all participating aircraft. Controllers will closely watch the operation and take over manually if inaccuracies occur.

Knoxville's McGhee-Tyson Airport has been serving as an FAA test-bed for advanced traffic control concepts.

☆

NASA selected the Kennedy Space Center in Florida and Vandenberg AFB, Calif., as the sites from which the space shuttle will operate.

The Kennedy Space Center, with its existing complex of facilities managed by NASA for the Apollo and other programs, will be used as the initial launch and landing site. Beginning in 1978, space shuttle research and development flights, as well as all operational flights launched into



Shown here are two aircraft prototypes that are soon to compete in a flyoff at Edwards AFB, Calif., to determine which will be the Air Force's new A-X specialized close air support aircraft. Above left is the A-9, built by Northrop Corp.'s Aircraft Division, Hawthorne, Calif. It measures 53.5 feet in length, seventeen feet in height, and has a wingspan of fifty-eight feet. Above right is the A-10, built by Fairchild Industries' Republic Division at Farmingdale, N. Y. It is fifty-two feet, seven inches in length, fourteen feet, 5.5 inches in height, and has a wingspan of fifty-five feet. USAF's Aeronautical Systems Division at Wright-Patterson AFB, Ohio, manages the A-X program.

easterly orbits, are scheduled to take place from the center.

Then, near the end of the decade, the second operational site at Vandenberg will go into operation for shuttle launches requiring high-inclination orbits. The facilities at Vandenberg will be supplied by DoD.

It was announced in March that the space shuttle will utilize water-recoverable, solid-fuel rocket boosters.

NASA studied about 150 prospective sites before selecting Kennedy and Vandenberg as having the best cost, operational, and safety advantages of any combination.

(For details on how the shuttle will operate vis-à-vis the Air Force mission, see p. 35 for Senior Editor Ulsamer's interview with Grant L. Hansen, Assistant Secretary of the Air Force for Research and Development.)

☆

In two other space-related matters, the US and the USSR seem to be on a course of closer cooperation.

The USSR's Academy of Sciences and NASA announced in late April that they have approved several joint reports concerning compatible rendezvous and docking systems for manned spacecraft.

Such compatible systems would make possible emergency assistance in space as well as joint undertakings by the two countries.

And while there have been several reports quoting Mstislav Keldysh, president of the Soviet Academy, as saying it "is likely" that agreement will be reached on a plan to dock a US Apollo manned spacecraft at a Soviet manned Salyut space station, NASA's official word is that "no decision has been taken that would commit either the US or the Soviet Union to a joint manned space mission" at this time.

The approved reports, as outlined by NASA, dealt with such essentials as life-support systems, communications links, and all the hardware and guidance systems that necessarily would involve compatibility between spacecraft of the two nations.

"Joint Working Groups" of US and Soviet technicians have scheduled additional meetings.

In another area, the Soviet Academy and NASA have agreed on the conditions of future exchanges of medical and biological data on their experiences in manned spaceflight.

Suggested meetings of a Joint Working Group on an annual basis or more often when required would "include the exchange of pre-, post-, and in-flight data in sufficient detail to assure a full understanding of the flight experience of each country from a physiological and medical viewpoint. Directly related research will also be discussed when it is pertinent," NASA said.

☆

The Air Force picked Boeing Co., Seattle, Wash., as the avionics subsystems interface contractor for the new B-1 bomber, currently under development by North American Rockwell Corp.

Maj. Gen. Douglas T. Nelson, System Program Director for the new

As a gesture of solidarity and support, all thirty-one A-7D pilots of the 357th Tactical Fighter Squadron at Davis-Monthan AFB, Ariz., have joined the Air Force Association. Achieving 100% membership on April 1, the pilots endorsed the aims and ideals of the organization, which has been a crusader against the inhumane treatment of prisoners of war.

The 357th "Long Tongued Dragons" were formerly stationed at Takhli, Thailand, flying F-105s, and many of their members are either missing in action or confirmed prisoners of the North Vietnamese.

Squadron Commander Lt. Col. Boyd L. Van Horn, a veteran of two combat tours at Takhli, expressed his appreciation for AFA's continuing concern for the maintenance of adequate national airpower and for the humane treatment of American prisoners.

The Dragons are hopeful that other active-duty units will give the Air Force Association the same support, Colonel Van Horn said.

All pilots of the 357th Tactical Fighter Squadron based at Davis-Monthan AFB, Ariz., are AFA members. Top row, left to right, are Mook, Van Horn (the 357th's CO), Harr, Jones, House, McClain, Dickens, Paape, Christensen, Ulrich, Phillips, Kuebler, Huot, Furtak, Nuber, Gonzales (unit Ops Officer), Brown, and Senac. Kneeling, from left, Brown, Parent, Hodges, Weekes, and Penney. Not pictured are pilots Lacey, Ferguson, Vulkoff, Bruce, Barrett, Peterson, Alder, and McDermont. Men of the 357th have many comrades either missing in action or known prisoners in enemy hands.

Champagne was the reward for crews of a Northrop T-38 Talon (right) and a Cessna T-37 (left) for achieving the 200,000th accident-free flying hour at Reese AFB, Tex. From left are Reese Wing Commander Col. Walter H. Baxter III; SSgt. Gary E. Adams, crew chief; 2d Lt. Floyd A. Peede, student pilot; Capt. John R. Sullivan, instructor pilot; Capt. James E. Alexander, instructor pilot; 2d Lt. Reed J. Hall, student pilot; and SSgt. James E. Thompson, crew chief.

bomber at Aeronautical Systems Division, Wright-Patterson AFB, Ohio, said that Boeing, under the $62.5 million contract, will have responsibility for integrating all B-1 electronic subsystems and for providing those avionics not government-furnished.

The electronic subsystems consist of displays, inertial navigation gear, computers for the offensive subsystems, and software for navigation and weapons management. Most of the offensive avionics are off-the-shelf items.

Boeing edged out four other original bidders to win the contract: General Dynamics Corp., Hughes Aircraft Co., IBM, and NR's Autonetics Division.

No production decision has been made as yet on the B-1. The work currently under way involves three prototype aircraft.

☆

McDonnell Aircraft Co. has received the first Pratt & Whitney prototype F100 turbofan engine destined for the new F-15 air-superiority fighter.

The engine will be used in "propulsion integration tests with the aircraft's engine-driven accessories, simulating" the speeds and loads of the accessory systems encountered during a typical F-15 mission, P&W said.

Pratt & Whitney also recently noted that the Dash 7 version of its JT9D engine, which produces 45,500 pounds of thrust, "has compiled an unsurpassed performance record in its first 75,000 hours of operation aboard the Boeing 747B transport."

The company is now testing a new, even more powerful version rated at 56,000 pounds of thrust. This engine has been proposed as a possible powerplant for the larger new transports, such as the growth models of the 747 and DC-10. The engine's high-thrust characteristics may be a deciding factor in new military applications for the 747, such as a tanker.

In another matter, USAF awarded General Electric's Aircraft Engine Group a $10.1 million contract for the development of GE's YJ101 advanced turbojet engine.

Designated the YJ101-GE-100, the 15,000-pound-thrust afterburning engine has been designed to go into a variety of aircraft including trainers and remotely piloted vehicles, and particularly air-superiority fighters in the time period from 1975 to 1980.

First application for the engine will be in the new Northrop P-600 lightweight fighter, recently selected by USAF as one of two designs in that prototype competition. The P-600 will be powered by twin YJ101 engines.

Like some jet-aged Flying Dutchman, an Air Force HC-130P Hercules seems to be laboring in a turbulent ocean of clouds as it prepares to refuel a USAF helicopter over Southeast Asia. The scene was captured by Sgt. Michael Q. Rogers, 601st Photo Flight, Udorn Airfield, Thailand, and earned him a PACAF Photo of the Month award.

☆

This spring, USAF initiated a policy of assisting the nation's small businesses by providing greater access to technology advances and new inventions developed under USAF contract.

The data will be available in the form of condensed descriptions. The first of these—which are called Abstracts of New Technology—was accepted in April by the Small Business Administration. The abstract describes a new computer program developed by a California company having only

Another AWA Award for Senior Editor Edgar Ulsamer

Senior Editor Ulsamer

The Aviation/Space Writers Association (AWA) has named Edgar Ulsamer, Senior Editor, AIR FORCE Magazine, the winner of AWA's 1972 writing award in the space category for aviation/space magazines.

The award was in recognition of articles appearing in AIR FORCE Magazine during 1971: "Minuteman—First Among Equals" (March '71); "How the USSR Is Headed Toward Technical Superiority" (August '71); "The Shuttle: US's Airline Into Space" (September '71); "Coming: A New Series of Hypersonic Scramjets?" (October '71); and "ABRES . . . The Cutting Edge of the US Nuclear Deterrent" (December '71).

Previously, Mr. Ulsamer was the recipient of the 1970 James J. Strebig Memorial Award, AWA's principal award for the best aviation writing in any print media during a given year. Also, Mr. Ulsamer was awarded an AWA citation in 1971 "in recognition of his excellence in aviation writing."

This is the ninth Aviation/Space Writers Association award won by AIR FORCE Magazine editors in the past decade.

four employees, ART Research Corp. of Los Angeles.

The Air Force's new program—dubbed Technology Application and Utilization (TAU)—is to be administered jointly by USAF and SBA, with SBA responsible for distributing the abstracts throughout the small business community. TAU was devised by the Air Force Systems Command.

Interested small businesses may contact SBA's Technology Utilization Division.

☆

This summer, government scientists plan to fire the opening shots in what they hope will eventually be a successful war against one of nature's most destructive forces—hailstorms.

There is a lot at stake: The storms cause an annual loss of about $400 million in crop and property damage in this country alone.

Aircraft will fire specially designed rockets containing chemicals into potential hail-producing thunderclouds to try to deter hail formation.

The site of the tests, to take place May through July, will be what is known as "Hail Alley," the juncture of Nebraska, Colorado, and Wyoming, and parts of Kansas and South Dakota.

Air National Guard and Air Weather Service personnel and equipment will participate.

☆

Now that the Bamboo Curtain has been raised, there is much outside interest in the customs and society of mainland China.

Considerable conjecture surrounds the ancient Chinese medical practice of acupuncture—the insertion of pins at strategic points in the body to control pain.

But don't scoff. A Chinese doctor in Peking made a believer out of USAF's MSgt. William H. Jablonski, the first American military man to experience acupuncture in China in more than twenty-five years.

Sergeant Jablonski, of the 30th Military Airlift Squadron, McGuire AFB, N. J., was a member of the handpicked crew of a C-141 Star-Lifter that transported equipment and newsmen on President Nixon's celebrated trip to China.

As Sergeant Jablonski relates the story, he was suffering from arthritis in one arm and asked the "Chinese traditional doctor" at the hotel where he was billeted to have a look at it.

Before you could say "fortune cookie," the doctor had inserted pins behind Jablonski's elbow and beneath one knee. The Sergeant attests to no pain or bleeding from the pins—just mild pressure. Following four more treatments, the pain from his arthritis was gone. "It feels completely different now, like a new arm," the Sergeant says.

Still, we suspect that many unconvinced Occidentals will stick with aspirin to relieve minor aches and pains.

☆

The Peacemaker Foundation of Fort Worth, Tex., is currently engaged in a project of some educational and historic note: It is converting a surplus B-36 into an airborne museum.

The foundation is a nonprofit educational organization made up of aerospace engineers, ex-Air Force personnel, and aviation enthusiasts. It is

Sara Ciccoli Appointed AAS's Executive Secretary

Sara Ciccoli

Cadet Gen. Larry Tackett, National Commander of AFA's affiliate, the Arnold Air Society, recently announced that Mrs. Sara Ciccoli has been appointed the Society's Executive Secretary.

Mrs. Ciccoli assumes this position, formerly held by her late husband, Lt. Col. Louis J. "Chick" Ciccoli, USAF (Ret.), who died on Thanksgiving Day, 1971 *(see AIR FORCE, Jan. '72, p. 66)*. From November 30 until the Society's National Conclave late in March of this year, the position was filled on a voluntary basis by James H. Straubel, AFA's Executive Director.

Mrs. Ciccoli served for many years as an assistant to Colonel Ciccoli. AFA extends its congratulations and wishes her success.

The Air Force has awarded contracts to both General Dynamics Corp. and Northrop Corp. for each to build two lightweight fighter (LWF) prototype aircraft. Object of the cost-plus-fee contracts, each for nearly $40 million, is to determine the feasibility of developing a small, low-cost fighter, what the aircraft can do, and its operational utility. Artist's concept of the General Dynamics' design is on the left, and Northrop's above. With first flights scheduled within eighteen to twenty-six months, a twelve-month series of flight tests totaling about 300 hours per aircraft will follow.

Aerospace World

racing against time, since the aircraft resides at the Greater Southwestern Airport, slated for industrial development next year when the new Dallas-Fort Worth Regional Airport opens.

The central problem is to get the B 36 into flyable shape and obtain permission to fly it to a new home. It is not feasible to move it any distance overland.

The B-36 bomber, a huge ten-engine aircraft, was the US's first truly intercontinental bomber. The foundation's B-36 itself is of historic merit. It was the last model off the Convair (now General Dynamics) assembly line and the last operational B-36 retired by the Air Force.

As a museum, the B-36 would be dedicated to the history of flight and as a tribute to USAF. If all goes well, foundation plans call for the restored B-36 to tour the nation during 1976's bicentennial celebration as a means of "bringing our aviation heritage to the American people," the foundation says.

Volunteer work on the airplane began in the fall of 1970. Currently, four of its six piston engines are operational.

☆

Admissions officials at the Air Force Academy inform us that appointment applications are mushrooming, with an increase of about 500 over the 1971 figure.

By the end of February, 7,253 had applied to enter this summer for the class of 1976, compared to 6,763 last year.

This is no surprise to the Academy: in each of the last six years the number of candidates has increased over the previous year. Officials estimate that 1,500 candidates will be accepted for the class of '76.

Reasons for the increase in entrance applications can't be pinpointed, Academy officials say, but the skyrocketing cost of higher education throughout the US may be one consideration.

☆

NEWS NOTES—USAF **Lt. Gen. Samuel C. Phillips,** currently Commander of the Space and Missile Systems Organization, will become the new Director of the National Security Agency on August 1, 1972.

The Navy has picked its first woman to be Admiral: **Capt. Alene B. Duerk,** Commander of the Navy Nurse Corps.

Mrs. Betty Worley accepts a portrait of her husband, Maj. Gen. Robert Worley, killed in SEA in 1968. Presenting the painting are, left, Lt. Gen. Paul K. Carlton, 15th AF Commander, and Maj. Gen. Ernest C. Hardin, Jr., Commander of the USAF Inspection and Safety Center, who had served with General Worley in Southeast Asia.

Dr. Chester M. Alter, Chancellor Emeritus of the University of Denver, has been named Director of the civilian/military Interim Education Center at the Air Force Academy.

The Fifth **Military History Symposium,** set for October 5–6, 1972, at the USAF Academy, will have the theme "The Military and Society." John F. Loosbrock, Editor of AIR FORCE Magazine, will be a member of one of the discussion panels.

An A-7D wing will be activated at **England AFB, La.,** in July. Designated the 23d TFW, it will consist of three twenty-four-aircraft squadrons. The F-100 and C-123 aircraft now at England will be reassigned to Air Reserve Force units.

Fighter-interceptor elements of major USAF commands, the Canadian Forces, and the US Air National Guard are preparing for ADC's **William Tell '72 Weapons Meet,** set for September 18–29 at Tyndall AFB, Fla.

The **FAA** is researching special gel jet fuels that will reduce fire hazards in aircraft involved in ground crashes.

Air Force has established a **Senior NCO Academy** at Gunter AFB, Ala. E-7s through E-9s are encouraged to apply. Send queries to Air University (DPRA), Maxwell AFB, Ala. 36112.

Gen. Bruce K. Holloway, former Commander of SAC and recently retired from USAF, will serve as consultant in the area of **strategic weapon systems** to **Dr. John S. Foster, Jr.,** DoD's Director of Defense Research and Engineering, beginning in June.

The **381st Strategic Missile Wing,** McConnell AFB, Kan., has won the Blanchard Perpetual Trophy in SAC's 1972 Missile Combat Competition, held this spring. The 381st is a Titan wing. ■

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Pilots feel lost without it.

You're keeping low, real low — flying the contours. Up ahead everything looks the same. No landmarks. And worse, it's getting dark.

But you're not worried because in one glance at your Projected Map Display you know exactly where you are, how far your target is, and the steering data to get you there.

Pilots who've flown with our AN/ASN 99 Projected Map Systems in the U. S. Navy operational squadron service consider it the most reliably effective navigation display system ever devised for tactical aircraft. In fact they tell us, "We feel lost without it."

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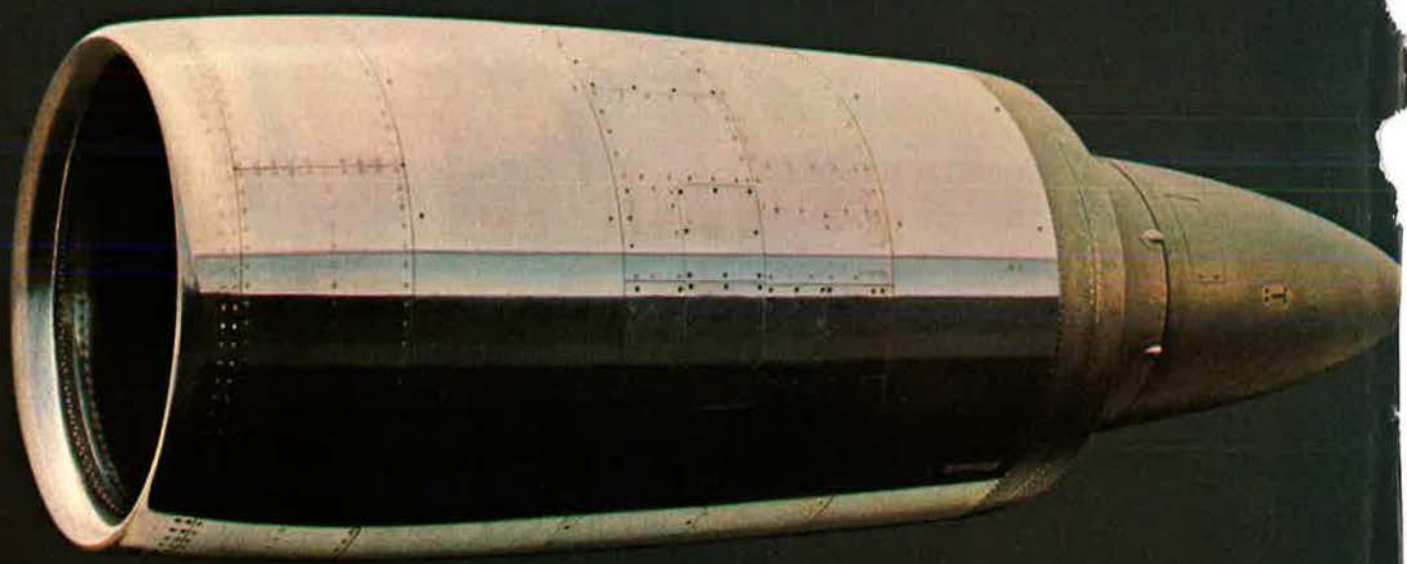

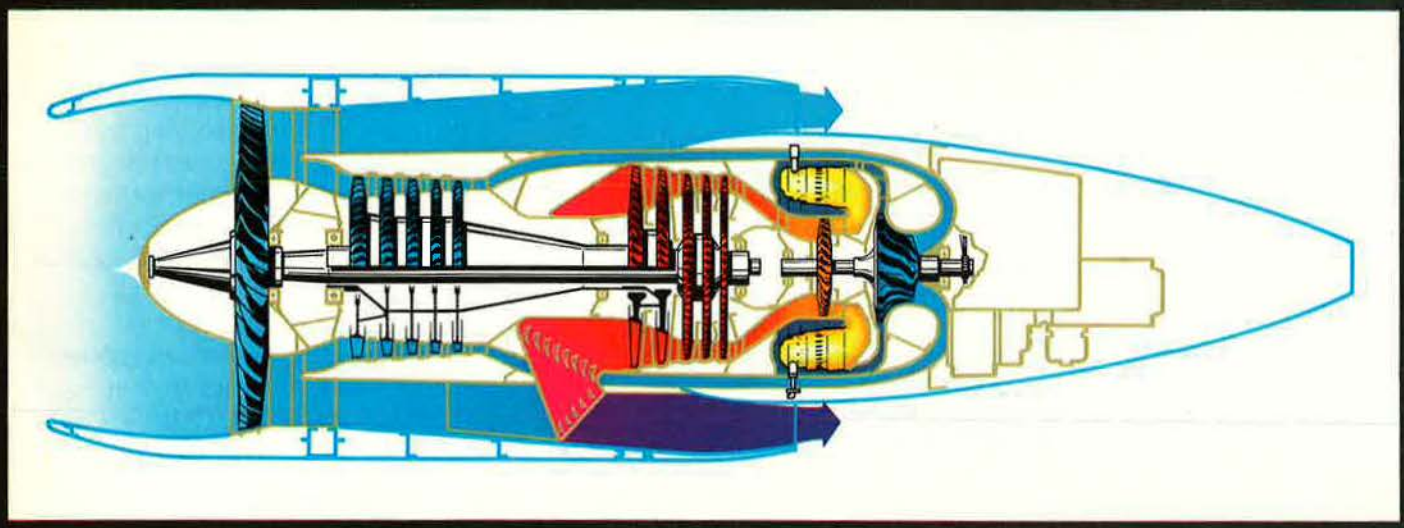

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The ATF 3 turbofan is the product of a five year Garrett-funded development program. It incorporates technologies and components developed by Garrett AiResearch over the past 30 years.

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The engine is designed to develop over 5000 pounds thrust and has a pressure ratio of 23:1. Physical characteristics of the engine: diameter 32″, length 92″ (including accessory cone at rear of engine), and weight less than 950 pounds.

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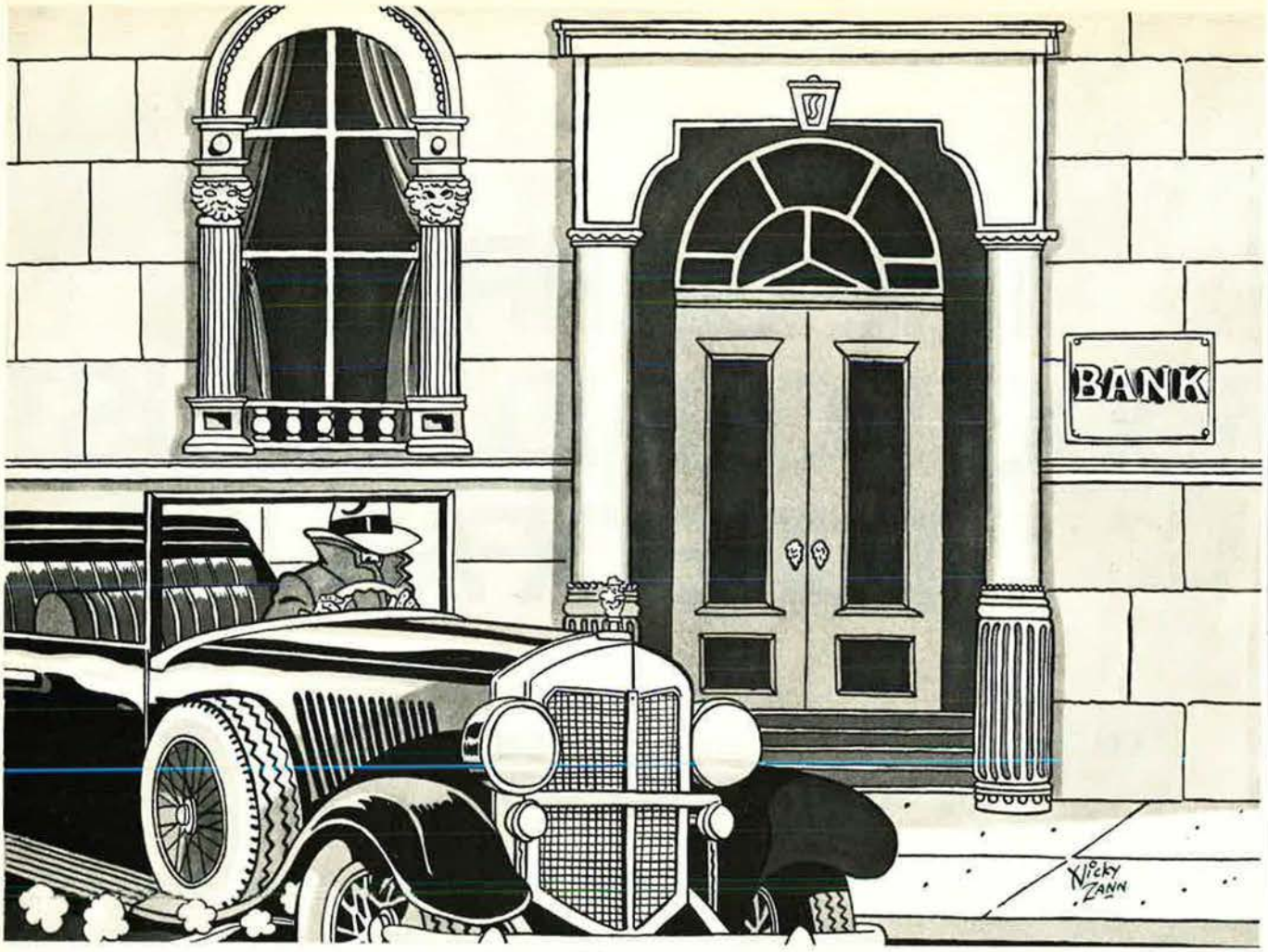

You don't need a financial background to pull off a bank job.

To get a job at Chase, first you need to be able to communicate. Banking is something we can teach you. The ability to communicate effectively with people is something we can't. So we're looking for junior military officers who have at least an undergraduate degree in Liberal Arts, Science, or Business Administration and who have decided to leave the service.

If you qualify, you can have a career at Chase in a wide variety of fields, and you pick your field, not us. We'll start you off with excellent training, that will let you progress as rapidly as possible. After you complete your training, you'll be equipped with a unique expertise in such areas as corporate and personal loans, trust, real estate, investment planning, operations management, just to name a few. And you'll have as much authority and responsibility as you are capable of handling.

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MIA/POW Action Report

By William P. Schlitz
ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

Ad Campaign

In what has been proclaimed a priority project, the League of Families has zeroed in on the nation's information media to help publicize its appeal to Hanoi to open the prison camps to impartial inspectors.

In a recent newsletter, the League has blueprinted how members can induce TV/radio stations, newspapers, and transit systems to carry various ads on the subject. The ads have been prepared for the League by the Advertising Council of New York. The Council has also graciously consented to distribute the ads.

In a concise and motivation-stimulating format, the newsletter details how League members can approach the media about using the ads, created by the Council free of charge except for production costs of about $29,000 paid by the League.

The newsletter lists those states of the union from which so far no requests have been made for the free ads, those making a poor showing, and those states with impressive tallies (Iowa, for example, outranked in size by twenty-five other states, leads as the front runner with requests for the ads from forty-four of its cities).

All inclusive, the newsletter instructs volunteers on how to compile lists of media to visit; the type of appeal to make; and even how to conduct follow-up encouragement to use the ads.

In straightforward language that advises stressing the nonpolitical viewpoint of the ads, League members are urged to "explain that the League's goals are based solely on the humanitarian aspects of the issue, and that the advertising also focuses entirely on the humanitarian aspects. Remind [media personnel] that the message of the ads is an appeal for Hanoi and her allies to open their prison camps to neutral observers—and that this is a requirement of the Geneva Convention."

The newsletter is the work of Louis Stockstill, who assumed the post of News and Information Director of the League of Families on April 1, 1972. Mr. Stockstill is the author of "The Forgotten Americans of the Vietnam War," a special report on the POWs which appeared in AIR FORCE Magazine in October 1969. This was the article that brought national attention to bear on the plight of the MIA/POWs and led to much of the subsequent organized action on their behalf.

During the recent National Week of Concern for the MIA/POWs, Mrs. Carole Hanson addresses an assembly at Brea-Olinda High School, Brea, Calif. The school was dedicated to her husband, Marine Capt. Steven Hanson, missing in action in Southeast Asia since 1967. Brea-Olinda is the first high school in the country to adopt a MIA/POW. Mrs. Hanson, President of the League of Families, has a five-year-old son, Todd, who has never seen his father.

The League's May Meeting

As this is being written, the League of Families is in the midst of a three-day meeting, held in Washington, D. C., that has several specific and general goals.

Concerning the national political arena, a full report has been prepared on the activities of the League's recently formed Non-Partisan Political Action Committee *(see April 1972 issue, p. 81).*

Concerning overall MIA/POW family interests, a major event during the meeting is to be a symposium-discussion featuring panelists from both League and non-League organizations representing various viewpoints. The panelists will answer questions from the floor, and the discussion, while sponsored by the League, will follow its own direction. Through this medium, the League hopes to bring incisive insights and possible solutions to problems facing the MIA/POW families. The symposium-discussion may also serve to produce new League targets for later policy developments. Non-League family members have been encouraged to participate.

Members of Air Force families included on the panel are:

- Robert J. Brudno, League board member and brother of Capt. E. Alan Brudno, prisoner in North Vietnam since October 1965.
- Mrs. Donnie Collins, League member and wife of Maj. Thomas E. Collins III, POW in the North since October 1965.
- Mrs. Dottie Hughes, Director of Rescue Line Inc., Santa Fe, N. M., and wife of Col. James L. Hughes, POW in the North since May 1967.

Other panelists are:

- Mrs. Sybil Stockdale, founder of the League and permanent board member, who is the wife of Navy

THE POW/MIA BRACELET

A simple metal band engraved with the name of a POW or MIA and the date he was lost.

Don't wear it unless you want to get involved. When one assumes the one-to-one bond with a stranger who is unable even to ask for your concern, and to enter the pain of his family, something happens to you.

You are taught new lessons about old concepts. Unity. Caring. Brotherhood.

The bracelet is worn with the vow that it will not be removed until the day that his real status is determined or that he returns home.

The bracelet is distributed by VIVA, a nonprofit, nonpolitical volunteer student organization, maintained solely by individual contributions. Donations are used to print and distribute the necessary material throughout the nation to alert all Americans to the tragic plight of the POW/MIAs.

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I WANT TO GET INVOLVED.

Please send me ____ buttons (Free)

Please send me ____ brochures (Free)

Please send me ____ nickel-plated bracelets. (Requested donation $2.50 each)

Please send me ____ solid copper* bracelets. (Requested donation $3.00 each)

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* For those who feel copper has a therapeutic value, we have left it unlacquered, hence it will tarnish.

MIA/POW

Capt. James B. Stockdale, POW in the North since September 1965.

• Mrs. Phyllis Galanti, League member and wife of Navy Lt. Cmdr. Paul E. Galanti, POW in North Vietnam since June 1966.

• Mrs. Doris Hallberg, of POW/MIA International, Tustin, Calif., mother of Army SSgt. Roger Hallberg, missing in South Vietnam since March 1967.

• Miss Sheila Cronin, Washington, D. C., coordinator of Families for Immediate Release and sister of Navy Lt. Cmdr. Michael P. Cronin, prisoner in North Vietnam since January 1967.

Family members have also been invited to participate in smaller "caucuses" to debate and formulate recommendations applying to their major concerns, the League said.

The meeting, in May because of the long lead time before the elections in November, is an adjunct to the League's annual convention, which is to take place in the early fall.

Tax Exemption

By the time you read this, President Nixon undoubtedly will have signed into law a measure exempting all MIA/POWs from the payment of income taxes. The bill was passed by the House and Senate and sent to the White House in April.

The new law should have appreciable financial benefit to the MIA/POW families, since it excludes from taxation the entire compensation of the prisoners and missing in action and is retroactive for those in that status as far back as the last ten months in 1961. Also covered by the legislation are civilian employees who are missing, prisoners, or in a detained state during the Vietnam War.

The measure's retroactivity to 1961 is indicative of the official beginning of the US involvement in the Southeast Asian hostilities.

If taxes were paid by the families for these men during the time period involved, refunds or tax credits should be forthcoming. MIA/POW family contacts in the Department of Defense will be able to help secure further details about the new law.

This photo was one of several released in Poland by North Vietnamese sources in mid-April. It purports to show captured American pilots taking a singing lesson in a POW camp. Identified as leading the group is USAF Capt. Norman A. McDaniel, shot down in August 1966.

—Wide World Photos

On Behalf of MIA/POWs

The Pennsylvania State Senate has passed a bill that would provide a $1,000 bonus to state servicemen who became POWs during the Vietnam war. In case of death, the bonus would go to their beneficiaries. House action is pending on the measure.

Concern for Prisoners of War Inc., an organization in San Diego, Calif., plans a mobile POW museum to center attention on the MIA/POW issue. To be housed in a manufacturer-donated mobile home, the museum "will display graphic proof of the existence of numerous POWs currently being held captive by the Communists who have never appeared on the official Hanoi list," the group said. ■

Why is it so hard to discuss the POW question?

NOT only is the prisoner-of-war question a thorny problem at the peace talk sessions in Paris. It seems an explosive issue in homes around the world, even here in America.

Why?

Because we are in a complicated and baffling and frustrating war.

Because it is an "unofficial" war and many people wonder what rules apply. Or possibly, if any rules apply.

Because nobody wants the war but the two sides can't agree how to end it.

The prisoner-of-war issue is caught up in this maelstrom of intellectual confusion and emotional voltage.

It's a pity that it is.

It's a pity for the men who are being held prisoner. It's a pity for their families who live in fear and doubt.

Indeed, it's a pity for the nations involved and those who only watch.

They have allowed the multiplicity of issues to cloud the human issue.

This message speaks not of the political side of the prisoner-of-war issue but of the human side.

It speaks for the families of the prisoners and for all the peoples of the world whose conscience hasn't been covered over by the smog of confusion.

Of course, we all want the war to end and the prisoners of war to be released as soon as possible.

But meanwhile there is no need for Hanoi and its allies to delay even a day in answering this plea:

Open your prison camps in North Vietnam, South Vietnam, Laos and Cambodia to official neutral observers. Let the world know who the prisoners are, where they are and whether they are being humanely treated in accordance with the standard of civilized nations.

That's all. Certainly there can be agreement on that part of the POW question.

In fact, there is no need for consultations. Hanoi, unilaterally and without consultation, can solve the problem.

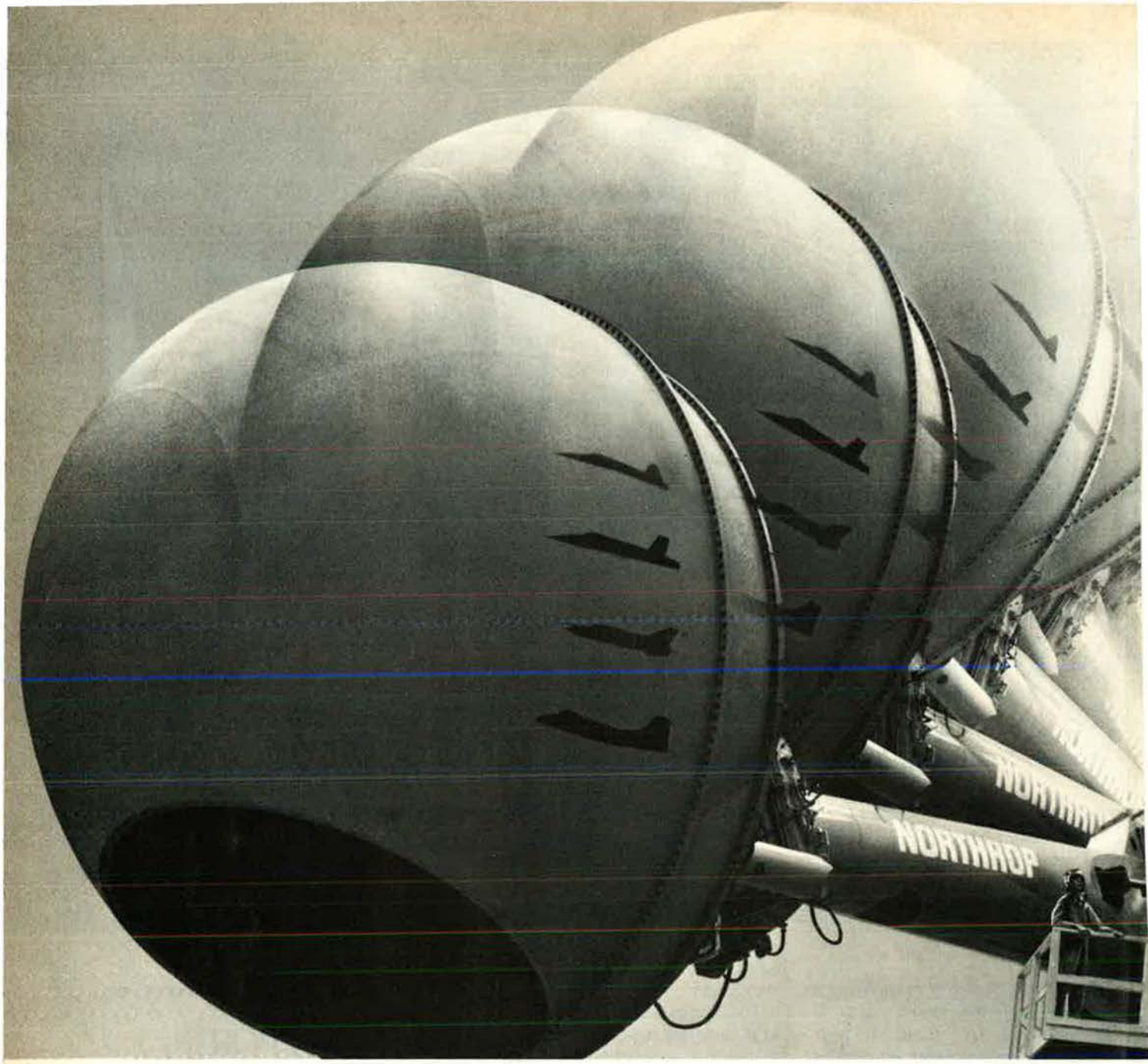
Then, at least, the minds of millions in America would rest easier.

And perhaps those in other parts of the world, too.

SUPPORT OUR PLEA TO HANOI AND ITS ALLIES:

Clear away the doubts—
Open your prison camps to
neutral observers...
now!

We ask no more than we give. All American and South Vietnamese prison camps are inspected regularly by official neutral observers—The International Committee of the Red Cross.



Our aircraft designers have a ball.

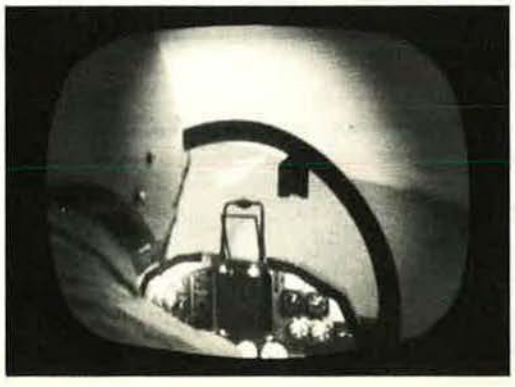
They can "fly" new concepts while they're still on paper.

This ball is the business end of our new advanced aircraft simulator. Test pilots say it has uncanny abilities to reproduce flight conditions.

Sitting inside (see photo right) they "fly" proposed fighter designs programmed on our computers. They engage realistically maneuvering targets projected on the screen before them.

Ideas get thoroughly wrung out. Proven or debunked. We're already "flying" our Cobra, A-9A and Lightweight Fighter. Just think of the savings in time and money.

Northrop is famous for doing this kind of homework. In exhaustive wind tunnel testing. In detailed studies of actual combat histories. We apply our heritage of fighter technology not just to simplify, but to make more effective.



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NORTHROP

AIR FORCE
JUNE 1972 MAGAZINE

New Air Force equal-opportunity standards point toward more minority officers, a better chance for minorities to advance, and improved racial balance in career fields. The objective is to assure . . .

USAF plans to increase minority representation in its officer force to 5.6 percent by 1980. Other measures will attack racial disparity in such areas as promotion and job assignments.

A Fair Share For USAF Minorities

By Capt. John T. Correll, USAF, CONTRIBUTING EDITOR, AIR FORCE MAGAZINE

THE Air Force has set in motion a new strategy to guarantee blacks and other minorities an equal opportunity in every facet of Air Force life. This is a giant step forward in defining more precisely USAF equal-opportunity objectives, and it revolves around two specific standards the Air Force is adopting.

The first is a *representational* standard. USAF has decided that minorities in its ranks should be a reasonably accurate reflection of the pertinent demographics of the US population from which it is drawn. That isn't entirely the case now, especially in the officer force.

The second standard is one of *equal selec-*

tion. In personnel actions, such as promotion, the selection rate for minorities ideally should be equal to that for all eligibles considered. That isn't the case now, either.

Anticipated results of the new standards include more minority officers, a better chance of advancement for both minority officers and airmen, and a better racial representation in all career fields. Minority groups are presently clustered in the lower grades—to a large degree, a result of increased minority airman procurement in recent years—and in non-technical career fields.

The new USAF objectives respond to many of the frustrations of the minority airman as expressed by two black officers and a black NCO in an interview with the editors of AIR FORCE Magazine (*see p. 30*).

The new approach builds on the Air Force's existing race-relations programs (*see box, p. 28*), which are working effectively to expose and eliminate prejudice, but which cannot, by themselves, result in parity for minority members.

The master plan to implement these new standards is still emerging, but the Air Force has already launched the first phase of its effort.

More Minority Officers

The first major push will be to increase the minority percentage of the USAF officer force to 5.6 percent by 1980, or sooner. At present, 1.7 percent of all Air Force officers are black, and another one-half of one percent are categorized as other minority.

"Minority airmen look for—and do not see—tangible evidence of the Air Force's commitment to equal opportunity in the form of minority officers," says Col. David L. Thomson, chief of USAF's Social Actions Division in the Pentagon.

Black college graduates, ages twenty-one to twenty-nine—the group from which black officers must be recruited—constitute 4.6 percent of the US college-educated population, Colonel Thomson says. Adding other identifiable minorities to that, and projecting demographic growth ahead to 1980, USAF established 5.6 percent as its minority officer objective.

So far as numbers go, the Air Force does not have a problem in its enlisted ranks. With 12.6 percent of the enlisted force black and 0.8 percent other minorities, the total minority representation already exceeds the ratio in the general population.

USAF intends to achieve the 5.6 percent minority officer objective on an accelerated procurement schedule, peaking in 1980 when eleven percent of the input from each commissioning source should be from minority groups.

The four commissioning sources vary in how rapidly they can respond. The Air Force Academy, with its four-year curriculum, has the longest lead time of all, and is scheduled to begin graduating more minority officers in 1976. AFROTC can begin producing more minority officers by 1974. Officer Training School can respond immediately, and plans to triple its minority commissioning rate to six percent next year. The direct appointment program for medical officers, lawyers, and chaplains can also begin responding immediately.

Minority input from all commissioning sources (AFROTC is shown here) will be accelerated.

The Air Force is aware of the difficulty of meeting these goals. The other services, as well as private industry, are also competing for minorities with leadership potential, and, during the period of accelerated procurement, the Air Force will be seeking to attract college-educated minorities in numbers disproportionate to their probable availability. The problem is compounded by the impending end to the military draft a year from now, leaving the armed forces without one of the traditional pressures that has motivated young men to volunteer.

"There are ways to solve this problem without compromising quality standards," Colonel Thomson says. "One of the things we are looking into is an officer preparatory school. All of the services have prep schools for the academies, but these, by and large, are for people who can get into a college—they just can't get into the Academy. The new prep school

The author, Capt. John T. Correll, USAF, is currently assigned to AIR FORCE Magazine under the Education With Industry (EWI) program.

would provide airmen with demonstrated potential help in qualifying for further schooling."

A primary source for prep school students would be disadvantaged and minority airmen, including new recruits. There are three ways a prep school graduate might earn a commission. He could qualify to enroll in a college and receive an AFROTC scholarship. Or he might stay in service and apply for AECP (Airman's Education and Commissioning Program). AECP sends active-duty airmen to civilian colleges for their degrees, then to Officer Training School for commissions. He could also qualify for an Air Force Academy appointment.

Both the Air Force Academy and AFROTC have added minority recruiting specialists to their staffs, and a minority recruiting function is being established in Air Force Recruiting Service.

Neutralizing Racial Factors

Recruiting a representative number of minority people will be no easier than the second half of the problem: to ensure that race is not a factor in job assignments, performance evaluation, selection for schooling, and promotion. The existing disadvantage is felt most keenly at promotion time, when minority officers and airmen lag behind their white contemporaries.

It is difficult to sort out the tangle of reasons that account for the disparity in promotions. Officers and airmen are promoted under dissimilar systems, so the remedy will be different in each case. Past management patterns have set the stage for minority promotion differences. For example, in the most recent Weighted Airman Promotion System (WAPS) cycle, eighteen percent of the white eligibles were promoted, while only eleven percent of the black eligibles made it.

The Weighted Airman Promotion System works on the basis of a total score awarded for points in six areas: Airman Performance Reports (APRs); Specialty Knowledge Test (SKT); Promotion Fitness Examination (PFE); decorations; time in service; and time in grade.

The meaningful difference for minorities comes on the two tests—the SKT and the PFE—which can determine as much as forty-two percent of an airman's promotion score. Minorities do less well on these tests, and their difficulty is chiefly in the area of verbal skills.

"These tests *do* discriminate," Colonel Thomson admits. "They discriminate positively for what the Air Force wants. We need people with verbal skills. We don't want to degrade the tests so they no longer discriminate for these factors. What we need to do is to qualify minority airmen to pass the tests."

The Air Force hopes to improve the situation by some modification of the Career Advancement Program, developed by the US Air Forces in Europe, and now in operation there.

[redacted]

"This is a training program for people who are deficient in communication skills," Colonel Thomson explains. "It's on the clock, not after duty hours. And they're having very good success."

For example, he says, some individuals who have difficulty expressing themselves when they begin the program are able to write much better when they finish.

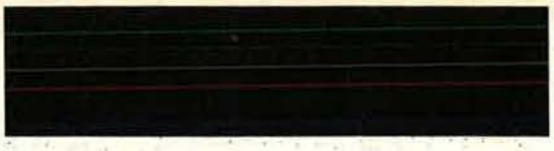
Officer Promotions

The task ahead is somewhat different in the area of officer promotions. To advance, an officer must be chosen by a selection board which reviews the records of all eligible officers and decides which of them, on balance, are most qualified for promotion.

The Air Force intends to ensure that prejudice does not keep qualified people out of good jobs.

There is no precise formula like WAPS for officer promotion, but selection boards can make distinctions among officers based on several criteria, including Officer Effectiveness Reports (OERs), education, the level of responsibility the officer has shown he can handle, versatility, and combat achievements. Furthermore, the selection rate for pilots is usually somewhat better than for other officers—significant, because there are comparatively few black pilots. (*See "Everything You Always Wanted to Know About Promotions,"* AIR FORCE *Magazine, February '72.*)

A small black-white discrepancy exists in OER rating means, although this has diminished over the past few years, and is now even smaller than the difference in APR means for



black and white enlisted men. (For airmen, the difference is less than a third of a point on a nine-point scale.)

There are other discrepancies that demand attention, too. Minorities trail in selections for Air Force-sponsored graduate study and in assignment to Professional Military Education —especially to the senior service schools like the Air War College. Minority officers also fare more poorly than whites in selection for regular augmentation. (Except for Academy graduates, all officers are commissioned as Reservists and later compete for regular status, which is important for advancement to the higher grades and assignment to the most desirable jobs.)

The Air Force plans to correct the situation by striking at the factors that cause promotion inequity rather than by arbitrarily assigning minority selection quotas to promotion boards.

"You aren't doing the Air Force or the minority officer any favor by setting an arbitrary promotion quota," says Capt. Lee Scarbrough, a black officer in the Pentagon. "If you do, then people are going to think he was promoted because of his race and not because of his capability. When that happens, he loses his ability to command troops and, hence, his effectiveness to the Air Force."

Instead, USAF is going to use a technique it calls "flight following," a metaphor deriving from the air traffic control practice of monitoring the progress of a particular flight.

Special Attention

If a selection board fails to select minorities at a rate equal to that for all eligibles, then the Air Force will identify the near-misses for flight following. If, for example, an overall selection rate is fifty percent, but the rate for minorities is forty percent, then the top ten percent of the minority nonselectees will be singled out for flight following—training or schooling—to improve their chances next time.

What does that flight following consist of?

"Look," says an officer with several years of experience as a career monitor at the Air Force Military Personnel Center, "I can't define flight following exactly, but you show me a specific guy's record, and I can tell you what it means in his case. You can look at his training and see if there are any gaps. You can reassign him to career-broadening assignments, outside his regular specialty, or at different levels in the hierarchy. You can make an extra effort to put him where he can demonstrate his potential."

The Air Force also intends special monitoring for young minority officers, even before they meet their first selection board. Career monitors already flight follow the upper half of minority majors—the half with the most longevity, thus nearest to consideration for lieutenant colonel—and will shortly extend the practice to include the upper half of minority captains. This can result, for example, in an extra, pointed effort to see that a black captain has had a chance to attend Squadron Officer School, giving him a better qualified background when he competes for major.

More Technical Assignments

The Air Force is now working on ways to implement an appropriate feed of minority officers and airmen into technical skills.

"The distribution of officers and airmen in the various career fields is skewed toward the nontechnical end," Colonel Thomson says. "For officers, this means they're not in the operations fields. As for airmen—twenty-six

USAF's Commitment Against Bigotry

A pervasive equal-opportunity program implements USAF's commitment to conduct its affairs in a manner free from racial discrimination.

Equal-opportunity officers and NCOs are assigned to Air Force installations with a population of 500 or more. Their primary job is to assure compliance with Department of Defense and Air Force equal-opportunity policies. They also work to build an awareness and understanding of problems that lead to racial tension and disturbances.

Every Air Force installation is required to have a Human Relations Council. Membership includes a wide range of ranks, ages, and ethnic groups.

The Air Force recently instituted the most ambitious base-level training effort it has ever attempted, with an ultimate goal of eighteen hours a year of race-relations education for each member of the Air Force. (See *"The Bulletin Board," January 1972 issue.*) The first of the instructors for these courses graduated from the Defense Race Relations Institute, Patrick AFB, Fla., in December. When fully constituted, the program will employ 481 instructors.

The heavy commitment to race-relations education reflects USAF's conviction that such instruction is needed to relieve latent fears and suspicions based on ignorance, to generate understanding, and to modify prejudicial behavior patterns.

Air Training Command conducts human-relations courses in basic military training, technical training, and basic flying schools. The Air University seminar for

percent of the people in food service are black. That's double the expected rate. We're going to put minorities into technical fields up to the limits of their capabilities."

Colonel Thomson points out that statistics can sometimes be deceiving because of "the law of small numbers." For example, one of the figures the Air Force is watching is the number of minority officers in command assignments.

"Field-grade pilots hold the operational command jobs in the Air Force," Colonel Thomson continues. "When you line up the number of field-grade pilots against those jobs, only about three percent can be in one of them at any given time. Black pilots are in them at a rate of 2.6 percent, but that represents the wing commander at Spangdahlem and two other guys. When you can talk about all of them by name, you're talking about small numbers."

Discharges and Confinement

A particularly difficult facet of the problem comprises involuntary separations and confinement. The black percentage of those receiving administrative and less than honorable discharges is high.

"We have a problem when a group of our people wind up getting a high number of involuntary discharges," Colonel Thomson says. "That doesn't necessarily mean that it's just discrimination. There are many causes, but the fact remains that it's our problem and we've got to work it."

Two years ago, blacks were receiving three-fourths of all punitive discharges, but last year the number of blacks separated in this way dropped drastically, and they accounted for only fourteen percent of the punitive discharges. During the first half of this year, sixty-five percent of those punitively discharged were white, and thirty-five percent were black.

Furthermore, while the Air Force has relatively few people in confinement—less than 500—the ratio is racially unbalanced, with the confinement rate for blacks higher than for whites.

Colonel Thomson explains: "The statistic has its origin in past procurement, training, and assignment practices, and in minority preparation for adaptability to service training and military life."

Colonel Thomson's Social Actions Division is working with the Judge Advocate General to isolate the causes of both the confinement and involuntary separation problems.

"We're searching these cases to see if there is a common thread running through them, and, if so, what it tells us," Colonel Thomson says.

The vehicle for putting the new equal-opportunity standards into operation is the recently published USAF Personnel Plan, the first truly comprehensive systems approach for managing people the Air Force has ever had. The plan covers everything from procurement through retirement. Its working parts are 344 numbered personnel objectives, each assigned to an action agency with a specific officer who is held strictly accountable for making sure it is achieved. Every objective has been scrutinized, and, wherever applicable, modified to reflect the new standards. Where there were gaps, new objectives have been written.

This thoroughgoing approach, and the inherent visibility of its success or failure, give an impressive credibility to the Air Force's determination to have parity for all. ■

wing and base commanders includes sessions on race relations, as do all of Air University's professional military education courses. The Air Force Academy curriculum includes minority-oriented courses. A number of commands have their own race-relations education programs.

The USAF Information program—base newspapers, Commanders Call, and other media—emphasizes equal opportunity. Many bases have established telephone hot lines or other quick-reaction procedures for dealing with complaints and grievances.

Housing referral offices are in operation at all USAF installations stateside, in Europe, or in the Middle East, with 100 or more military personnel assigned. These agencies investigate complaints of racial discrimination in housing. A 1967 survey of off-base housing found only twenty-two percent of the landlords willing to comply with nondiscrimination policies. A 1970 survey revealed 98.2 percent compliance. Housing referral officers are working toward 100 percent.

There is no longer any geographic area to which the Air Force avoids assigning minorities. If USAF has people there, then minorities can be posted there, too.

The Air Force's determination to purge any remaining bigotry is made clear by Air Force Regulation 30-1, the basic statement of USAF standards: "Discrimination—by act or inference—against military personnel or their dependents on or off base will not be tolerated. Personnel who cannot practice this standard are not fit to command or supervise."

Equal Opportunity

The need for USAF's new equal-opportunity standards (p. 2 becomes apparent as the editors of AIR FORCE Magaz talk with two black officers and a black NCO about

THE Air Force policy has long been one of equal opportunity, and a profusion of programs has been launched over the years to rid USAF of racial prejudice. But vestiges of prejudice still remain. So does the frustration of the black airman.

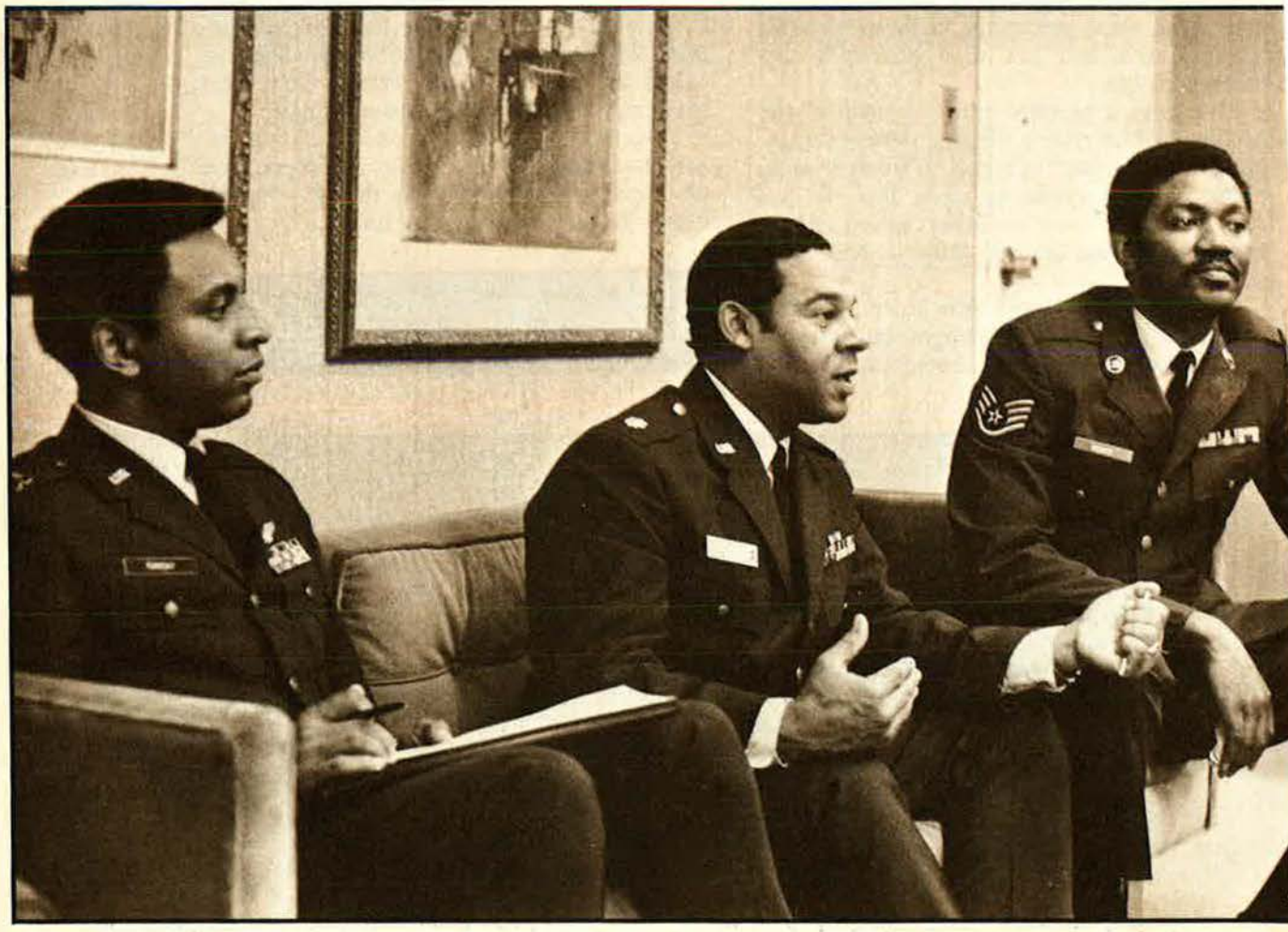
Recently, two black officers and a black NCO met with the editors of AIR FORCE Magazine to explore the black experience in the Air Force, and to talk about racial anxieties, both black and white. The men were:

- **Lt. Col. Belmer J. Addison,** a student at the National War College in Washington, D. C.
- **Capt. Robert B. Ramsay,** assistant director of the Candidate Advisory Service and minority recruiter for the Air Force Academy, Colorado Springs, Colo.
- **SSgt. Willis C. Cooper,** Social Actions NCO at Andrews AFB, Md.

The three, for openers, reinforced each other in their opinion that the Air Force—like other institutions—has a race-relations problem. Together, they identified the shortage of blacks in the top ranks and in the better jobs as one manifestation of it. Too many black airmen still perceive inequity in promotions, unfair treatment by some in positions of authority, and insensitivity to minority problems. (USAF is seeking to redress many of these grievances by means of new equal-opportunity standards. *See p. 25.*)

"A lot of young black officers elect to get out of the Air Force because they can't see much future

From left, Captain Ramsay, Colonel Addison, and Sergeant Cooper.



The Black Experience in Air Force Blue

An
AIR FORCE Magazine
Staff Study

in it," Captain Ramsay said. "They look around, and they don't see any Stateside wing commanders or base commanders who are black. They begin to wonder if there is any chance for them."

Grade, Job Differences

Blacks are statistically underrepresented in the top grades, both commissioned and enlisted, the three pointed out. Blacks are also clustered in nontechnical career fields.

"You can't convince me," Sergeant Cooper said, "that there isn't a sufficient number of blacks to go into these very highly sophisticated jobs. You can't convince me that there aren't some young blacks who qualify. Yet they're not there. Until

[redacted]

you get representation in all of these areas for blacks, you're going to have a problem. You can't just say, 'We'll let you through this door for awhile and see how you do; we'll try once.' That might not be the guy for the job."

Colonel Addison pointed out that blacks constitute only 1.7 percent of the USAF officer force, and most of them are in the junior grades.

"It is often said that the military is nothing more than a microcosm of our society," he commented. "If this is true, it would appear to follow that the percentage of blacks

Manifestation of the problem: too few blacks at the top.

in all grades would be more closely aligned with what the overall percentage is—the most austere estimates being ten or eleven percent. Here we are with fractions in the top grades. We have a long way to go. But I hasten to add that the problem is being recognized."

New Standards

Colonel Addison is working on a race-relations study in cooperation with the Air Force Social Actions Division. Captain Ramsay is developing, in cooperation with the Major Command equal-opportunity offices, an overall Air Force Academy minority recruiting program that will provide for a larger input of minority airmen. Both had been briefed on the new USAF equal-opportunity standards. They said that they found the standards impressive, and that they are convinced that key high-level officials are extremely concerned about the situation of the black airman.

"Maybe," Sergeant Cooper observed, "people at high levels are concerned about the black airman and maybe things are happening, but by the time it channels down to one in my position, there's no great impact felt. Young black airmen are suffering from decisions that people at higher levels never know about."

Colonel Addison agreed: "Key officials formulate policies, but by the time they get down to the unit level, they sometimes get diffused, or they don't reach there at all."

The frustration and resentment is often keenest among young blacks. Sometimes, those who express their frustration are labeled as militants. "You never hear blacks referring to other blacks as militants," Captain Ramsay said. "This is a term that some whites apply to blacks who are outspoken."

"My opinion is that traditional standards are in conflict with contemporary attitudes," Colonel Addison said. "The young black serviceman's increasing awareness of his own cultural heritage triggers resentment of those standards that would deny him his racial identity. This rejection, as I see it, is manifest in varying degrees as a modulated dissent among black officers or as explosions between black and white enlisted personnel."

The three said that such explosions of violence would occur more often except for behind-the-scenes action by responsible blacks.

"The Air Force is fortunate in that it has a lot of level-minded blacks, young as well as older blacks," Sergeant Cooper related. "When there is dissension stirring, they go to the people involved and try to talk them out of it. A lot of level-minded blacks have saved the Air Force a lot of grief by moving in, unknown to a squadron commander, to calm things down. I've done it myself. You tell them, 'You can't accomplish anything like this —let's do it another way.' They say, 'Well, hell, we've tried.' You say,

Cooper: "Honky" is an attitude, not a skin color.

'Let's try some more.' Sometimes if you talk to them long enough, you can talk them out of it."

"The older black man—the guy who came in service before 1960—can chart his progress," Colonel Addison said. "He's been promoted in the system. He was able to survive. The new black serviceman's whole life style has taken place after the proclamation that there is going to be equal opportunity for everybody. If he runs into any kind of discrimination at all, he stands off and says, 'Wait a minute. This is not the way it's supposed to happen.' He's not *asking*. He's *demanding* his rights as an American citizen. The older black man plays a vital role. He very quietly goes to this person we call a belligerent—frustrated, I think, is a better word—and talks to him, tries to get to the cause of what's rubbing him the wrong way."

A Code Among Blacks

The interviewees doubted that any black claiming racial prejudice as a pretext to avoid unpleasant duties would do so very long before being hauled in by his peers.

"There is a code that seems to exist among a large number of black service personnel," Colonel Addison explained. "This code seems to be that blacks will not tolerate this type of response. An individual would be ostracized among the blacks if he ever tried to use race without justification."

The code also extends to such things as vandalism and picking fights.

"I've heard of a few instances of this, but, if it happens, it will only happen for short periods of time," Sergeant Cooper said. "Even if the authorities don't do anything about it, other blacks will."

Colonel Addison added: "We so frequently investigate an incident in regard to punishing the offender without addressing the causes, and this is what disturbs me."

"Every time there's an incident of black-hurts-white, there's an issue made out of it," Sergeant Cooper said. "But it's never reversed. Countless times I've been verbally attacked by whites. A gang of whites riding down the street in a car and yelling out the window, 'Hey, nigger!' Or I go to a squadron commander and tell him that they're telling racial jokes in the barracks and I wish he'd stop it. You might get the response that he's heard worse words than 'nigger.' "

Addison: Minorities must have a stake in the system.

Colonel Addison supplied an example of what he means by addressing the cause rather than just the incidents:

"I was on an Air Force installation in the subarctic where the things we are discussing were taking place. White individuals were getting bloody heads. If you investigated one of the incidents and you were fortunate, you might find the individual who hit him over the head.

Lt. Col. Belmer J. Addison is a student at the National War College in Washington, D. C., which is also his home town. Previously, he was Executive Officer of 8th Tactical Fighter Wing, Ubon, Thailand. He earned his commission through AFROTC, graduating from Howard University in 1954. His assignments have included personnel and administrative posts, and he has seen duty in England, Labrador, the Pentagon, and at Lockbourne AFB, Ohio. At Lockbourne, he was also a squadron commander. He graduated from Air Command and Staff College in 1964, and is presently working on a master's degree in international affairs at George Washington University. He is a thirty-third degree Scottish Rite Mason, and has been president of the Bren Mar Civic Association, located in Springfield, Va.—the first black to head one of these groups in northern Virginia.

Capt. Robert B. Ramsay is Assistant Director, Candidate Advisory Service, and minority recruiter for the Air Force Academy. A Boston native, he enlisted in the Air Force in 1960, was selected for the US Military Academy prep school in 1962, and was commissioned at West Point in 1966. After pilot training at Laredo AFB, Tex., he was a B-52 copilot at Dyess AFB, Tex., and at Westover AFB, Mass. He served two Arc Light

By investigating the causes, we were able to resolve the problem before the commander even knew it existed. It concerned two factors: economic and social. Girls were on the base, but there were no girls for the blacks. If they attempted, at least according to their story, to date the girls or see the girls, they were punished in certain ways. The blacks were getting off from work, going to bed, setting their alarm clocks and taking sticks and going out at night to have confrontations. This was the result of, number one, their social needs not being met, and two, economics. They weren't of a high enough grade that they could afford any entertainment outside the environment where this took place —the service club. So we developed programs for the blacks. We took money out of our own pockets. This gives you a feeling of what we're talking about."

More Incidents

The three doubted that the Air Force has seen the end of racial incidents.

"The Air Force," Captain Ramsay allowed, "is supposed to be sort of the panacea, but, when black people come in, they run up against the same problems they faced in the civilian community."

"A flare-up is inevitable if a guy knows the system is against him," Sergeant Cooper said. "He isn't going to tolerate it. He figures that if he spits out the window, he can get an Article Fifteen with a suspended bust. They're not going to say, 'Be careful next time.' He's not going to get a briefing. If a black airman is detained in traffic on his way to work, some supervisors regard this as no excuse. A white can be five minutes late, and there'll be no action taken."

Ramsay: Rap sessions alone won't do the job.

Situations in which blacks associate with other blacks are sometimes referred to as "black clannishness," with the implication that this is bad, if not downright sinister.

"But," Colonel Addison asked, "how many times do whites invite a black to go to lunch or to go bowling? If he can't mingle with other blacks, what is expected of him? To be alone? It's a misconception to regard two or three blacks together as a threat. On the other hand, no one believes that any conspiracy is taking place when two whites get together—or five or six whites."

Sergeant Cooper added: "I am completely frustrated by the idea that you have to be conspiring to overthrow the government or your squadron commander or burn a barracks down because you get together in your room and just rap about a lot of things you laughed about as kids. You can walk up and down the barracks and see fifteen or twenty white guys sitting there doing the same thing, and nothing is said.

"You could be in there trying to read a book or watch TV, and several white guys can be raising all kinds of hell. There's nothing said about it. But let two or three blacks get together and, first of all, you're told you are too loud. You play cards or laugh or crack a joke, and some guy in that barracks is going to walk down there and say, 'Keep the noise down.' They just have to do it."

Improvements in the barracks situation are long overdue, Sergeant Cooper believes. "You put a man in a dilapidated building and tell him to shine the floor," Cooper related. "The more you wash it, the more dirt comes up through the floor, and the more you sweep it, the more dirt is there. It becomes frustrating. I think most blacks coming into the service today come from a fairly decent home and life style. Not all blacks come from the ghetto and sleep with rats."

Words and Symbols

A symbol, a gesture, or a word—the Confederate flag, the clenched-

tours in Southeast Asia, flying 102 combat missions. Before coming to the Air Force Academy in 1971, he spent a year at SAC headquarters in contingency plans under SAC's junior officer staff training program, Palace Spotlight. His brother, Capt. David L. Ramsay, a 1964 West Point graduate, was killed in action as an F-4E commander in Southeast Asia. The Ramsays were the first black brothers to graduate from USMA.

SSgt. Willis C. Cooper is Social Actions NCO at Andrews AFB, Md. His home is Cleveland, Ohio. After enlisting in the Air Force in 1956, Sergeant Cooper served in the communications field at Francis E. Warren AFB, Wyo., Carswell AFB, Tex., Travis AFB, Calif., and Lowry AFB, Colo. He has served overseas in Japan, Germany, and Labrador, and was assigned as a communications and crypto specialist in Vietnam, 1961–63. Before coming to his present job last October, he worked in computers at the Pentagon and at Andrews. He earned his B.A. in political science at Miami University of Ohio in 1965, and is now working on his master's degree in Human Relations through University of Oklahoma extension courses in Washington. Soon after this interview, Sergeant Cooper began a six-week course as a student at the Defense Race Relations Institute, Patrick AFB, Fla.

fist salute, "nigger," "honky"—is often the spark for racial confrontation.

"Number one cause for resentment," Colonel Addison said, "is the rebel flag displayed on private vehicles on Air Force installations. Or the rebel flag worn as part of the uniform. Or the rebel flag being worn as a part of a hat that is also a part of the uniform. I've observed units that allowed this. Or the song, 'Dixie.' It's like deliberately trying to let you know that the individual who is doing it feels superior to you. Many of the things whites do, in many cases, aren't deliberate racial slurs. But in some cases, individuals deliberately do these things to provoke. It's like a black using the word "honky" in retaliation for the word "nigger."

Sergeant Cooper commented: "The word 'honky' is used quite often in the enlisted ranks—but a black doesn't call you 'honky' just because you're white. It's your attitude. I have heard white enlisted people, friends of mine, refer to other whites as 'honkies.'

"The rebel flag has been tolerated by the Air Force as long as I've been in. But I've known guys to get Article Fifteens for giving the clenched-fist salute or for wearing a black wrist band.

"The black has finally said that all this garbage you've been giving me all these years—that I don't have any culture, that I can't get along with my black brother—he's calling that a lie. He's saying that I like my black brother, and I want to get along with you if you'll let me. But if you don't want me to get along with you, I don't need you. I've got enough background now. I know that I'm somebody. It could have been clicking your heels, but it just so happened that it was the clenched fist that came out, and it came out as a symbol."

Pride in Culture

"If I were to walk down the street right now in my uniform," Captain Ramsay maintained, "people wouldn't look at me and say there goes an Air Force captain. They'd say there goes a black guy. It's here, so you might as well make it good. Just look at what has happened: You once thought of 'black' as being bad and 'white' as being good. This thing has been turned around all of a sudden from a bad connotation to a good connotation. This is fantastic. Black history and culture are something to be proud of."

"If I were a commander," Colonel Addison said, "I would make sure that everyone is aware of what the rules of the game actually are. I would encourage interaction between black and white service personnel. I would use every tool available to me to ensure a high state of morale, to make sure that I could do the job I'm there for. A commander has at his disposal human-relations councils, he can have rap sessions, he has his military police, he has his OSI, he has his own intelligence systems, he has his complaint system, he's got his IG, he's got his equal-opportunity officer, he's got his chaplain. If that commander can't cause all of those people to work together as a team to search out what problems—if any—exist, then some question comes to mind as to whether or not he should be a commander."

"Rap sessions are good," Captain Ramsay declared, "but if the commander calls in black guys and white guys and says, 'Let's have a rap session,' he's not going to find out what the heck is going on. What he needs to do is get in his car, drive down the street, pick up the first black guy he sees, buy him a cup of coffee, and talk to him. That's how he's going to find out what's going on or what can be done."

"The commander should visit work areas," Colonel Addison agreed. "That's essential. Better than this, he should visit the local community, the bars, those that are polarized and those that are not polarized, to see and be seen, to show that he is interested. If you're going to select all 'yes' men for your human-relations councils, then dissolve them. Go out and find what you consider to be your most 'militant' black and put him on the council."

"What Colonel Addison is saying, I think, is Utopia," Sergeant Cooper disagreed. "What commander is going to get in his car and ride down the street and talk to me?"

Some Commanders Do

"I just came from a base where the commander did, and there are a lot of others," Colonel Addison replied. "But the majority of the commanders do not do this."

"I'll tell you what commanders are doing," Sergeant Cooper continued. "They ride around the base and say, 'Hey, go shine your shoes,' or, 'You need a haircut,' or, 'What squadron are you in?' or, 'I'm going to have your NCO up here tomorrow morning!' That's what they're doing. This other thing you're talking about—that would be beautiful, and I hope to see it come about, and if they're talking like this at the Air Staff, I think there should be more publicity about it. Because I tell you, the guy down here where I am hasn't got any faith in the Air Staff."

Colonel Addison said, "I realize and I recognize that a significant number of blacks have lost faith in their supervisors—not the system, now, but their supervisors. They don't think it's possible for them to get a fair shake."

An Economic Problem

Basically, Colonel Addison concluded, the problem is economics:

"The majority of the black service personnel are in the lower grades. If you only earn $100 a month, you can't enjoy the same social activities as another individual who earns $300 a month. If you've got twelve years in grade and the other guy has five years in service, this is not equality. Promote people into the positions they are qualified for, or give them remedial training so they can qualify. The basic cause I'm advocating is economics, translated into terms of more promotions, more money, entering into the takeoff point. A man cannot exist with satisfaction if he has only the basic essentials of life. He wants to share in the wealth. He wants to be a part of the decision-making mechanism. Once he becomes a part of the system, he's going to protect it. He's going to fight for it. He's not going to let anybody else mess up the system." ■

Interview with USAF's Assistant Secretary for R&D

A host of crucial military and intelligence functions can be performed better in space than in the air or on the ground. Consequently, more and more of the strategic warning, surveillance, communications, and related functions that tell the United States what goes on on earth, in the air, and in space are being entrusted to space-based systems. Because these functions are crucial to national security, the survivability of our space satellite systems becomes paramount. While the specifics of how the Air Force provides protection for its spacecraft cannot be revealed, here a ranking expert on military space answers the question:

How Vulnerable Are USAF Military Space Systems?

Assistant Secretary of the Air Force for R&D Grant L. Hansen has broad responsibility in the management of USAF space programs.

By Edgar Ulsamer
SENIOR EDITOR, AIR FORCE MAGAZINE

TO KNOW, in a strategic sense, what goes on around the world at any given moment, to be able to act on such intelligence effectively and instantly, and to have the means to assess the results of such actions rapidly and accurately—these are the functions of command and control.

Command and control, essentially a communications system, is as important to the US deterrent capability as the weapon systems of the strategic Triad themselves. Yet none of its functions can be performed adequately without the unique capabilities of space satellite systems.

"This is why the Air Force plans to invest almost $350 million in space technology in the coming fiscal year," according to Assistant Secretary of the Air Force for Research and Development Grant L. Hansen.

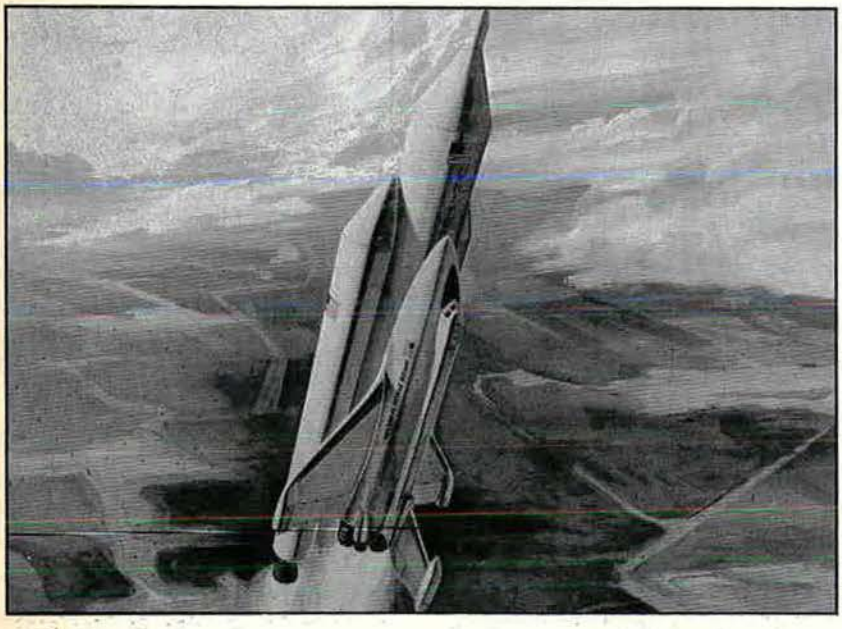
Because the survival of the United States can depend on its eyes and ears in space, military satellite systems must themselves be highly survivable and dependable. This applies whether they are assigned such tasks as surveillance and early warning of missile firings, communications, strategic command and control, navigation, or a combination of these functions, Mr. Hansen told AIR FORCE Magazine. The flow of information is crucial during periods of crisis or war when an aggressor might attempt to blind the United States by direct attack on its extraterritorial, space-based command, control, and communications systems. But progress to date, Mr. Hansen said, "is making it more and more difficult to put [US military space systems] out of commission."

In part, the Air Force is solving the problem of survivability and continuity of operation through redundancy: "Just like the phone company on the ground, we provide for multiple electromagnetic and radio paths in various frequency arrangements." Other techniques of increasing the survivability of Air Force satellites also are being studied, Mr. Hansen said.

In addition, nuclear shielding, or hardening, can protect a spacecraft and its electronic sensors and subsystems against the radiation effects of nuclear weapons, mainly the electromagnetic pulse (EMP), which can inflict either temporary or permanent damage on a "soft" satellite. The effect of shielding, Mr. Hansen said, is to "contain and circulate the energy of the pulse in the outer shell of the spacecraft, to keep it from entering the sensitive inner parts."

A by-product of shielding is that it increases the weight of the spacecraft. But the Assistant Secretary pointed out that "as our payload capabilities increase, we can be freer in the use of heavy structures that give us good shielding."

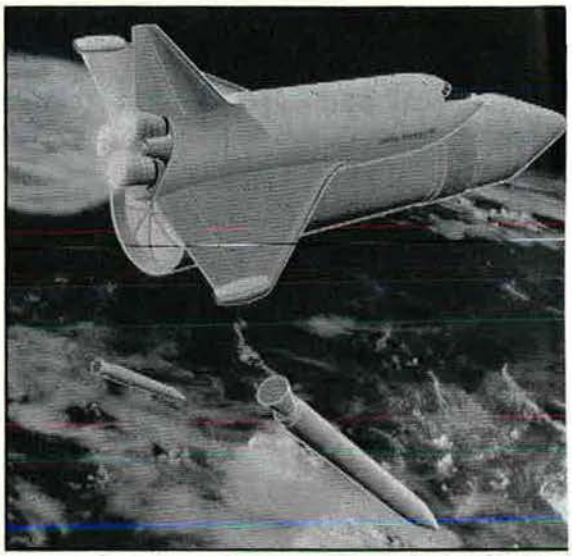
There has been speculation that satellites could be put out of commission by ground- or space-based laser weapons, which propagate their destructive thermal energy with the speed of light and, therefore, might deprive the United States of all warning. Most scientists do not believe that laser technology has yet reached such sophisticated levels. In addition, hardened satellites automatically enjoy a degree of protection against lasers. That protection could be increased further through such countermeasures as reflective surfaces and rotating the satellite to minimize the exposure of any surface area to a laser beam.



NASA has selected a space shuttle configuration consisting of two solid-rocket boosters, which are water-recoverable, and a three-engine orbiter. The boosters as well as the orbiter provide liftoff thrust.

Fringe Benefits of Operating in Space

Compared to airborne or ground-based systems, satellite systems enjoy a degree of automatic protection because of the nature of space, Mr. Hansen pointed out. An important advantage is derived from the fact that systems operating in the vacuum of space are not exposed to the overpressure effects of nuclear weapons, as are systems that operate in the atmosphere. Sheer distance also provides protection to space systems, especially those in geosynchronous orbit, 22,300 miles from the surface of the earth, or in high-energy orbit. The flight time to synchronous orbit, Mr. Hansen pointed out, "is between six and seven hours, and usually the operation involves two stages—one to get the vehicle into low-earth orbit, and a transfer step to attain synchronous orbit."

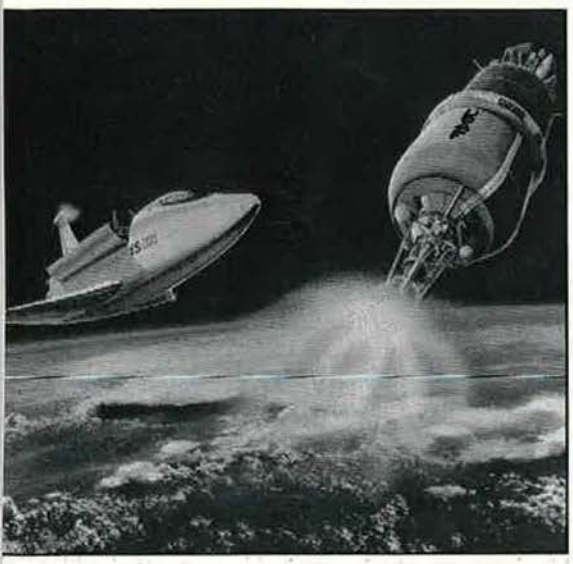


Spent booster rockets separate at an altitude of about 100,000 feet and, with the aid of parachutes, are lowered to a water landing.

He added that "our boost phase early warning systems [those that detect a missile launch while the booster rocket is burning] are getting more sophisticated all the time." The early warning system and its various subsystems are designed to monitor areas of the globe's surface of strategic interest to the United States. The early warning satellites will provide "near-real time alerting at our national command centers, based fundamentally on a heat-seeking principle of sensing ICBM and SLBM launches, as well as nuclear bursts," Mr. Hansen said. These warning satellites would give near-real time warning of an ICBM attack on a target in the US. Flight time of an ICBM launched against the United States would be about thirty minutes.

The Early Warning Satellite System (EWSS) senses the direction and energy content of the plume of a missile's rocket motor with extreme accuracy and speed and communicates this intelligence to sophisticated, high-speed computers, which translate the information into specifics, such as the vehicle's precise trajectory and its basic nature. DoD officials have acknowledged to this reporter that EWSS is essentially a real-time system that can project the point of impact of an enemy ICBM within about one minute from the time of launch.

One compelling reason why the Air Force is "pressing so hard on the boost-phase early warning system," he said, "stems from the possible threat of Soviet FOBS [Fractional Orbital Bombardment System] and MOBS [Multiple Orbit Bombardment System] capabilities. If the Soviets were to deploy such systems, they would represent a most serious threat to the United States. FOBS and MOBS threats also make it mandatory that we do a good deal of work on midcourse detection and tracking because such a capability would enable us, in case of actual FOBS or MOBS deployment by the Soviets, to get at such systems earlier in their trajectory." (*See April '72 issue of* AIR FORCE *Magazine, "The Question of Soviet Orbital Bombs."*)



Orbiter stage is shown here deploying a USAF space tug, which delivers payloads to geosynchronous orbits and is reusable.

Mr. Hansen emphasized that "undoubtedly, we now have the capability to build almost any space system we want, including FOBS or MOBS, but the United States has not, and is not, engaged in any such effort. Development of FOBS would violate the space treaty this country has signed."

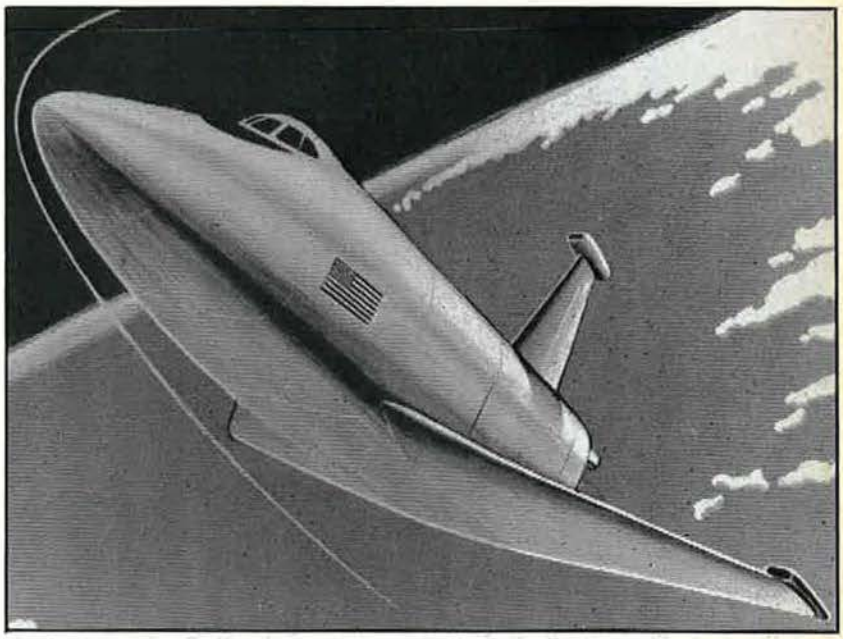
Important Space Communications Systems

One of the most pressing national needs, the Assistant Secretary pointed out, is "to be able to communicate with our strategic forces anywhere in the world."

For this reason, he added, the Air Force participates in the US Navy's Fleet Satellite Communications System, which allocates a number of channels to exclusive Air Force use. Lt. Gen. Otto J. Glasser, USAF's Deputy Chief of Staff for Research and Development, recently told the Senate's Committee on Armed Services that the Air Force's "communications satellite programs include a system for command and control of our strategic nuclear strike forces and a relay satellite system to communicate data directly from mission satellites that are out of view of the CONUS, to CONUS ground stations without dependence on intermediate overseas ground stations.

"The Air Force will use the Navy Fleet Satellite Communications System for communications with our aircraft in lower latitudes and supplement this capability with a family of piggy-back communications packages placed on appropriate mission satellites to provide communications in the north polar region. This system will increase the availability of vital communications with our strategic forces prior to and during hostilities," General Glasser said.

The distinction between communications satellites and satellites with other missions—intrinsically ambiguous because in one form or another all communicate or relay information—is being further obscured by the present trend toward multipurpose satellites. "Initially, our satellites were designed to perform only specific single tasks. The trend now is toward multipurpose systems—a satellite bus, which performs the housekeeping functions of providing power through solar panels, attitude stabilization, station keeping, and related services, and which accommodates various combinations of payload. This provides us with a far more effective utilization of our space hardware."



The orbiter, which will spend seven days in 100-mile orbit during a typical mission, returns to earth in airplane fashion, using initially a 60-degree angle of attack but leveling at about 60,000 feet.

The range of functions entrusted to communications satellite systems is both broad and crucial, Mr. Hansen explained. In a chronological sense, their information flow begins at the sensor level. Sensors are usually located aboard mission satellites and perform such tasks as keeping ocean and land areas of the world under surveillance to provide early warning of missile launches.

Ground-based seismic sensors, of the type used in Southeast Asia, could also transmit digital data to a satellite overhead. The massive and steady information stream from all sensors, as well as other data sources, must be relayed reliably, accurately, quickly, and—in the majority of cases—securely to high-speed computers. The computers assimilate the information, extract what is relevant, and process that information for display at such command centers as SAC's Airborne Command Post in a way that the decision-makers can clearly understand and act on. The decision-makers, in turn, must be able to communicate their orders to the armed forces of the United States anywhere in the world. This may involve strategic, tactical, airlift, support, or other military tasks.

The third function of satellite communications involves informing decision-makers that their orders have been executed.

Navigation Satellites

The US Navy has in operation a navigation system called Transit, which, Mr. Hansen said, "works very efficiently in locating slow-moving targets on the earth's surface." The Air Force and the Navy, he disclosed, are now cooperating in the preliminary design of an improved satellite navigation system for the Department of Defense, which "we believe can cover all of the earth's surface as well as the airspace above, and which can provide any properly equipped vehicle with information about its location, in a three-dimensional sense, with accuracies much better than those obtainable with our present systems, such as Omega, TACAN, or LORAN. Present air traffic control systems depend on two-way communication with the aircraft involved. If, on the other hand, we have on-board equipment that automatically informs the crews of the vehicle's location with high accuracy and on a three-dimensional basis, we can cut down on the electromagnetic traffic enormously and open up promising and militarily vital potentials.

President Richard M. Nixon and Dr. James C. Fletcher, NASA Administrator, are shown at the "Western White House" in San Clemente, Calif., where Mr. Nixon announced that the United States will proceed at once with the development of a national space transportation system.

"There is the intriguing possibility of blind bombing capability, requiring only a kill radius of the aircraft's weapons" sufficient to compensate for the initial position error, the Assistant Secretary stressed. The potential of such a system for air traffic control is equally revolutionary, he added.

The concept of this navigation satellite system, which is currently undergoing tests through ground-based simulation, is premised on "having four satellites continuously in view of a user any place in the world."

Pinpointing locations of fixed points on the surface of the earth is the task of the geodetic satellites. Before the advent of the geodetic satellite, Mr. Hansen explained, "the best we could do in determining distances, say, for example, the distance from the Washington Monument to the Eiffel Tower in Paris, was with an error margin of several miles. But with the triangulation capabilities of our geodetic satellites, we are now able to determine relative locations very, very accurately to meet national security requirements."

The Air Force's Role in Space

The Department of Defense and the Air Force do not view space "as a mission, but rather as a place that offers more effective ways of accomplishing certain defense missions than do the other media of land, sea, and air." For this reason, neither USAF nor any other element of DoD has a "space program in the sense of NASA," Mr. Hansen told AIR FORCE Magazine. For many years, during the initial phase of exploring and utilizing space for national defense purposes, the Air Force was assigned the role of DoD's executive agency for military space efforts, ranging from operation of the Joint DoD/Atomic Energy Commission Vela space surveillance system, which checks on violations of the Limited Test Ban Treaty, to launches of space payloads for the other military services.

But about a year ago, Dr. John S. Foster, Jr., DoD's Director of Defense Research and Engineering, issued new instructions. Premised on the assumption that USAF's role as DoD's executive agency, combined with the Air Force's singular record in space achievements, might "inhibit the other services somewhat with respect to their own space efforts," Mr. Hansen said, the new DoD policy encourages all military services to "look for ways of using space systems to perform their jobs better and cheaper, and to submit such proposals for DoD approval.

"The Air Force will continue to be respon-

sible for launching all military hardware into space, because we are the service that has the experience, facilities, and launch vehicles for that job. But the Air Force will no longer operate space systems of the other services, nor will there be the requirement to develop their systems for them. The cooperation among the services on space matters is excellent, and, I believe, this change, which recognizes that space as a military medium has reached maturity, benefits everybody," Mr. Hansen said.

USAF and the Space Shuttle

Early this year, the President instructed NASA to proceed with the design and development of a space shuttle consisting of a fully reusable and "flyable" upper stage and an unmanned but recoverable lower-stage booster. (*See March '72 issue of* AIR FORCE *Magazine, "Almost All Conditions Are 'Go' for the Space Shuttle."*)

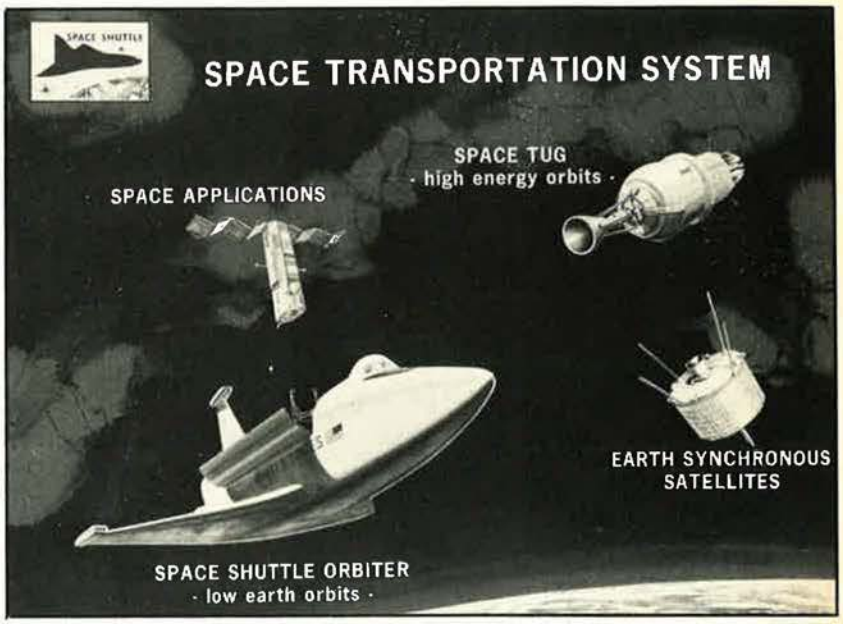
In March 1972, NASA announced that the booster stage of the shuttle will consist of two 156-inch solid-propellant rockets derived from an Air Force program initiated in 1960 and managed by AFSC's Space and Missile Systems Organization. (The SAMSO 156-inch rocket motor program demonstrated thrust outputs of up to 3,000,000 pounds in nine static firings.)

NASA's shuttle program, Mr. Hansen told AIR FORCE Magazine, "is good for the country and can be of great potential benefit to the Air Force and our ability to carry out our mission. The Air Force supports what NASA is doing." He conceded, however, that "the Air Force would have rather seen a fully recoverable system, consisting of a fly-back booster as well as orbiter.

"At the same time, we recognize that NASA has to live in the real world and that, because of economic realities, the compromise involving the booster configuration was necessary," said Mr. Hansen. (Air Force witnesses have testified that during the 1980s and 1990s, the number of DoD shuttle launches is expected to average about twenty per year, assuming there will be no "radical change in the role of military space programs as we know them today.")

But the Air Force's support of the space shuttle program is tempered with a cautious wait-and-see attitude, expressed by Mr. Hansen in the comment that "we operate our own development programs on a fly-before-buy principle. It follows that we can't permit ourselves a different point of view concerning a program managed by somebody else. At the moment, all indications are that it is a good program. But just as we can't put the B-1 into production until we have actual flight-test data to convince ourselves and everybody else that it is the right design, so must we wait to make a commitment to the shuttle until we have sufficient flight-test data to support such a decision."

Mr. Hansen emphasized, nevertheless, that "the shuttle is a step in the right direction because it gives us a paramount capability, which we do not have at present: two-way, instead of one-way space traffic. This means that we will be able to reuse our space payloads after maintenance, repair, and refurbishing. But even if the shuttle were to realize no direct cost reductions in our national space effort, I believe it will prove invaluable because it will let us do things that we could not otherwise do."



The shuttle's orbiter stage, flown by a flight crew of two and able to accommodate twelve passengers, can spend up to thirty days in low-earth orbit. In due-east orbit, its payload can be as high as 65,000 pounds and will include a reusable space tug.

(Air Force Secretary Robert C. Seamans, Jr., recently told Congress that the shuttle is not expected to lead to "significant initial reductions in overall cost of DoD space operations. The potential payload savings are offset by the costs of ground facilities, operations, and shuttle procurement associated with the proposed vehicle configuration. But the shuttle should be cost competitive with present expendable systems even in the short run; in the long run, we believe the shuttle could result in considerable savings. And the system does offer the potential for improving our mission flexibility and capability."

Secretary Seamans also stated that in the Air Force's view, "the shuttle should be as autonomous as possible, with the ultimate objective of having space operations more like those associated with aircraft rather than like past space launches. . . . Based on our present data, the shuttle configuration and design characteristics as proposed by NASA can meet the DoD mission needs forecast for the 1980–1990 time period.")

Mr. Hansen said that the shuttle is expected to correct the "incongruous condition of having to dunk our astronauts in the ocean at the end of their journey, in sharp contrast to such

superlative technological achievements as letting them ride around on the surface of the moon in the Lunar Rover."

USAF—The Eventual Shuttle Operator?

Assuming the NASA shuttle can meet the Air Force's cost and performance criteria, "it would seem likely that the Air Force eventually will conduct some of the shuttle operations. Initially, I would expect, however, that Air Force payloads will be placed into orbit by shuttles serving principally NASA space programs," Mr. Hansen said.

Another possibility that is being examined, the Assistant Secretary disclosed, is "operation of the shuttle by the Air Force in the manner of a Military Airlift Command for space operations. Such an arrangement would go into effect only after the operation of the shuttle has matured to a routine status. NASA management may not be opposed to the eventual transfer of shuttle operations to the Air Force, because its primary interests are in research and development, and not in the field of operations.

"Of course, some consideration has been given to NASA operating the system on a permanent basis, but the fact that in the event of war the system might have to be operated by the military weighs against such an approach, in addition to detracting from NASA's R&D tasks."

Mr. Hansen cautioned, however, that "our plans in this area are still evolving, mainly because we simply don't have to make any binding decisions as yet."

A Reusable Third Stage?

More than half "of the planned DoD payloads will have to be delivered to high-energy orbits," Dr. Seamans told the Senate recently. NASA's space shuttle operates only in low-earth orbit, at altitudes of about 100 miles. The Air Force and NASA, by means of a joint shuttle task force on which Mr. Hansen is the ranking DoD representative, have explored several design approaches for a third stage, called a space tug. Its purpose would be to transfer payloads from the shuttle's low-earth orbit to high-energy orbits, involving altitude differences of more than 22,000 miles.

During the initial period of space shuttle operations, this task is likely to be performed by the present systems, the Centaur and Agena upper stages, which can be modified to operate in conjunction with the shuttle. Eventually, as traffic increases, the Air Force might develop a fully reusable space tug, Mr. Hansen said. Preliminary studies "show that approximately $5 million per launch could be saved on a high-altitude mission if the upper stage were reused rather than expended. This does not include savings from recovering the satellite itself, which also may offer a potential advantage."

One of the most crucial questions, as yet unresolved, is what role military requirements should play in manned space operations. NASA's space station program, to be launched next year, can "be expected to yield technologies that will help in determining the utility of manned military space missions," Mr. Hansen said.

He added that on the basis of preliminary studies, "a spaceborne command post cannot be justified because of the cost factors involved. It simply is not competitive in economic terms with an advanced airborne command post in a 747-type aircraft. In addition, the airborne command post operates in the sovereign airspace of the United States, which is an advantage" compared with a space vehicle that functions in the extraterritorial medium of space.

"But to say this does not mean that we should close the door on such a development for all time. I, for one, am convinced that in the years ahead we will be performing military missions in space that we don't even dream about at the moment." ■

FLAGGING DOWN A FOUR-STAR

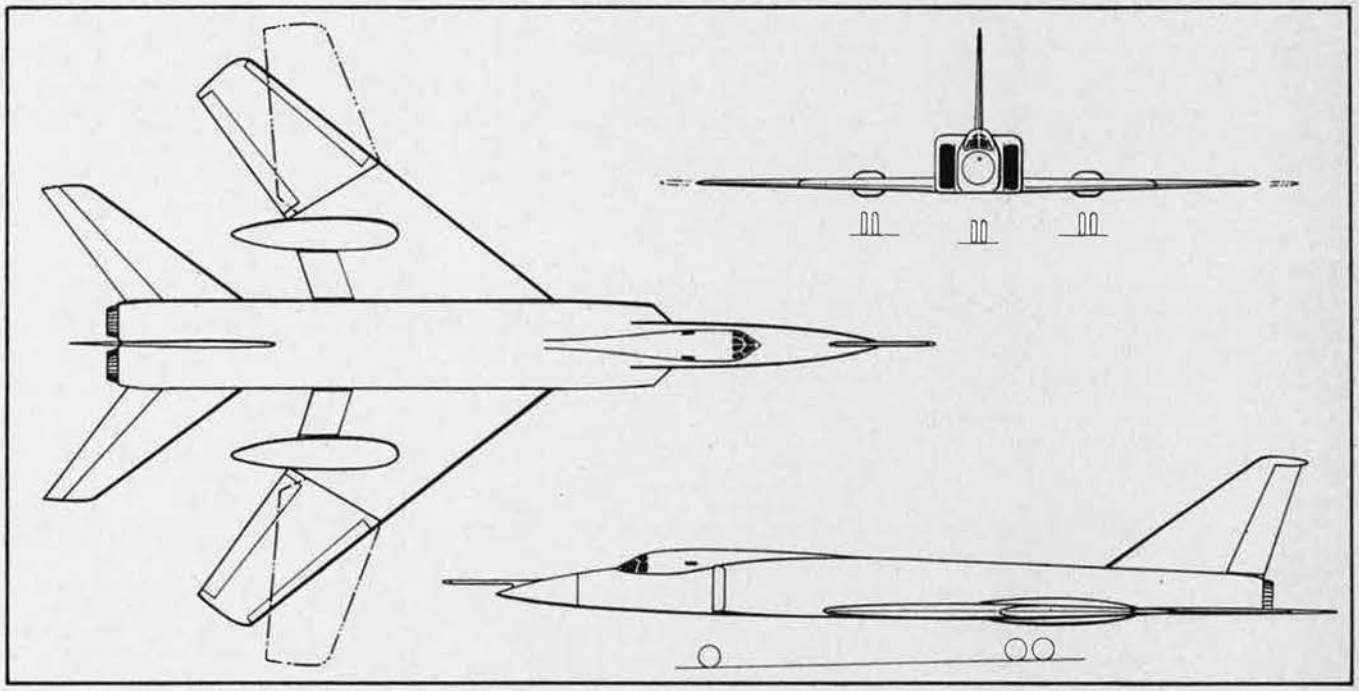
Gen. Henry H. "Hap" Arnold had not yet received his fifth star when he visited the glider pilot training center at Laurinburg-Maxton Air Base, N. C., early in 1944. As his party drove up to the headquarters building, there was a corporal lounging against a nearby fire hydrant. The young man remained all too casual about the brass emerging from the staff car that stopped in front of him. General Arnold wore that famous smile that Air Staff officers who did not know him mistook for pleasure, sometimes at their grave peril. The General pointed to the flag riding the fender of his car. He asked in a controlled voice: "Son, what do those four stars mean to you?" The corporal, by now sprung to rigid attention, looked at the General's face, puzzled over the question for just an instant, then broke out into his own big smile: "It means you've got four boys in the Army."

—CONTRIBUTED BY DR. MURRAY GREEN, OFFICE OF AIR FORCE HISTORY

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

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT



Three-view drawing (provisional) of the new Tupolev variable-geometry bomber known to NATO as "Backfire" (Roy J Grainge)

TUPOLEV
ANDREI NIKOLAEVICH TUPOLEV; USSR

TUPOLEV V-G BOMBER
NATO Code Name: "Backfire"

Official US sources first acknowledged the existence of a Soviet variable-geometry ("swing-wing") medium bomber in the Autumn of 1969. Such an aircraft was not unexpected, as the Tu-22 (NATO "Blinder") is clearly incapable of fulfilling a long-range strategic bombing role in the 'seventies.

A prototype of the new bomber is said to have been observed in July 1970, on the ground near the Tupolev works at Kazan in Central Asia. Subsequent official statements confirmed the aircraft as a twin-engined design by the Tupolev bureau. At least two prototypes were built initially, and it is logical to expect that a small pre-production series will have followed for development testing, weapons trials, and evaluation.

The accompanying general arrangement drawing is based on the limited information so far released officially, bearing in mind the traditional Soviet design policy of evolving new projects logically and cautiously from existing, well-proven designs whenever possible. The NATO code name allocated to the aircraft is "Backfire".

When drawing up the basic parameters for the bomber, the Tupolev bureau is believed to have aimed at a design over-target speed in the range of Mach 2.25 to Mach 2.5, with a maximum unrefuelled range of up to 4,000 nm (4,600 miles; 7,400 km) and a low-level penetration capability at supersonic speed.

By retaining as much as possible of the basic envelope, structure, and systems of the Tu-22, the designers were able to concentrate on the variable-geometry aspects of the project and the optimum method of providing the high power required to ensure the performance minima.

Departure from the familiar Tupolev practice of retracting the main landing gear bogies into fairings on the wing trailing-edges would have involved considerable work. This feature is, therefore, retained on "Backfire", so limiting the variable geometry to the outer wings, as on the "Fitter-B" version of the Sukhoi Su-7 fighter. It can be assumed that each pivot point will be as close as possible to the landing gear nacelle, although this must necessitate a cut-out in the wing trailing-edge to clear the nacelle structure in the fully-swept position.

Tupolev Tu-22 ("Blinder") supersonic bomber, the aircraft which the variable-geometry "Backfire" is designed to replace (Tass)

The leading-edge of each outer wing may be fitted with a slat, as on the Sukhoi design.

Transfer of the two engines to the sides of the fuselage, by comparison with the fin-side installation on the Tu-22, gives a power plant layout reminiscent of that of the Tupolev Tu-28P ("Fiddler") all-weather interceptor. There is no reason to expect external area-rule "waisting" of the long air-intake ducts.

"Backfire" is illustrated with tail surfaces, landing gear, and nose little changed from those of the Tu-22. It would be logical to expect a crew of three, and a flight refuelling nose probe is fitted. The tail-gun of "Blinder" has probably been deleted, to avoid problems now that the exhaust nozzles are at the rear of the fuselage. In any case, such an installation is hardly needed on an aircraft designed to fly at high supersonic speed.

It is not yet possible to identify positively the type of engine fitted to "Backfire", but US sources have suggested the use of two Kuznetsov turbofans similar to those used in Tupolev's Tu-144 supersonic transport. This would be logical, as each engine is rated at 38,580 lb (17,500 kg) st with reheat in the Tu-144. Uprated for military use, such engines would give an increase of more than 50% over the installed power in the Tu-22. The air intakes shown in the three-view drawing have, consequently, been given the same cross-sectional area as those for each of the Tu-144's engines.

"Backfire" is unlikely to be smaller than the Tu-22, which spans 90 ft 10½ in (27.70 m) and is 132 ft 11½ in (40.53 m) long. It can be expected to carry the full range of Soviet free-fall weapons and an air-to-surface stand-off missile at least as advanced and formidable as the 36 ft (11 m) long "Kitchen" carried semi-submerged in the belly of the Tu-22. US reports have suggested that the Soviet Union is also developing small nuclear weapons like the American SRAM (short-range attack missile) and decoy missiles to assist penetration of advanced defence systems.

Loaded weight of "Backfire" has been reported as 272,000 lb (123,350 kg). After one observed flight refuelling, a prototype is said to have remained airborne for a further 10 hours.

MCDONNELL DOUGLAS

MCDONNELL AIRCRAFT COMPANY (A Division of McDonnell Douglas Corporation); Head Office: Box 516, St. Louis, Missouri 63166, USA

MCDONNELL DOUGLAS F-15

The USAF first requested development funding for a new air superiority fighter in 1965, and in due course design proposals were sought from three airframe manufacturers: Fairchild Hiller Corporation; McDonnell Douglas Corporation; and North American Rockwell Corporation. On 23 December 1969 it was announced that McDonnell Douglas had been selected as prime airframe contractor, the initial $1,146,385,000 contract calling for the design and manufacture of 20 aircraft for development testing. These will comprise 18 single-seat **F-15As** and two **TF-15** two-seat trainers. Funding from the 1970 Fiscal Year budget amounted to $80.24 million for airframe design and engineering, but total FY 1970 funding for the F-15 programme amounted to $175 million. This latter figure included allocations for engine and avionics development. Additional funding in FY 1971 brought the total allocated to McDonnell Douglas for airframe design and engineering to approximately $260 million.

Production funding for the F-15 is not expected to receive approval until approximately 10 months after the start of the aircraft's flight test programme, and it is anticipated that initial funding, in the 1973 Fiscal Year, will provide for the production of 30 aircraft. A production contract option for a total of 107 aircraft, if exercised, is expected to include 15 of the two-seat trainer version. Initial two-seat TF-15s will be for pilot training, but the USAF is studying a two-seat strike version.

The contracts are based on a combination of a cost-plus-incentive fee and a fixed-price incentive with successive targets. This means that the contractor has to attain predetermined stages of development at the proper time and within the estimated cost before being allowed to proceed to the next stage. The USAF determines these stages, relates them to release of finance, and decides whether or not the contractor is maintaining a satisfactory rate of progress. If a particular stage of progress has not been achieved to schedule, the programme may be extended or re-oriented; in an extreme case it could be shelved. If performance should fall below that called for in the specification, the additional cost of achieving this would be balanced against the necessity of matching exactly the original specification figures. To hold down costs and discourage any temptation to introduce design changes, the contractor cannot obtain additional funding without giving the USAF 17 months' notice. Any additional cost incurred must be company funded.

The first of the predetermined stages of development was passed late in 1970, when F-15 airframe design was approved during the course of the USAF's preliminary design review. The second major stage of the F-15 programme was a critical design review. Changes in airframe design from the original concept include increased height and area of the fins; deletion of the ventral fins; horizontal tail surface and wings moved aft 5 in (12.70 cm); redesign of the engine air intakes and the addition of cowl fences to enhance directional stability; and a more symmetrical nose radome to improve radar performance.

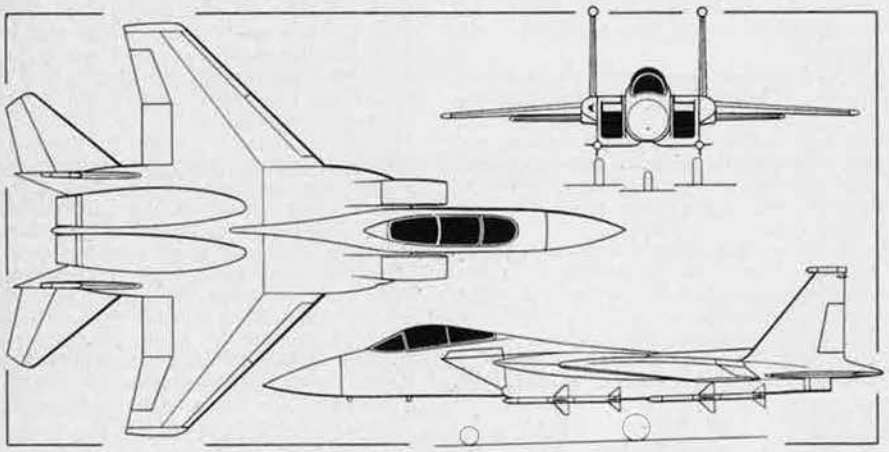
Subsequent development stages were to comprise structural and fatigue tests, avionic equipment review, major structural subassembly review, engine compatibility trials, engine-inlet compatibility tests, first flight in July 1972, and initial aircraft performance trials.

Initial production, by McDonnell Douglas, is scheduled at a rate of one aircraft bi-monthly, increasing to one aircraft per month when the production staff have acquired the necessary experience and skills to step-up to this doubled production rate without any increase in productive hours. As experience is gained, it is intended to progress steadily to a planned maximum production of 12 aircraft per month, by which time McDonnell Douglas will be subcontracting airframe construction.

The F-15A is a single-seat fixed-wing twin-turbofan fighter in the 40,000 lb (18,145 kg) weight class. Its general configuration is shown in the accompanying illustrations. No constructional details are yet available, but it has been stated that the airframe will comprise 35.5% aluminium, 26.7% titanium, and 37.8% composites and other materials.

Although designed for an air superiority rôle, the F-15A will also have an air-to-surface attack capability. It will be able to deploy a variety of air-to-air weapons over

McDonnell Douglas F-15A single-seat twin-turbofan air superiority fighter (Pilot Press)



short and medium ranges, and have an internal rapid-firing gun, the ability to seek and destroy enemy aircraft in all weathers, and a maximum speed in excess of Mach 2.

Following initial engine development contracts awarded to General Electric and Pratt & Whitney in August 1968, for the development of two engines based on a common core but with differing characteristics, to power the F-15 and the USN's F-14B fleet defence fighter, it was announced on 27 February 1970 that the latter company had been selected as prime contractor. Pratt & Whitney's F100-PW-101 advanced technology turbofan engine for the F-15 is expected to have a thrust rating in the 29,000 lb (13,155 kg) class; if this output is achieved the thrust-to-weight ratio will be better than 1:1.

Although the manufacturer is not yet permitted to release details of the capabilities of the F-15, information based on sub-contracts awarded at the time of writing gives some indication of the potential of this new fighter.

TYPE: Single-seat twin-turbofan air superiority fighter.

WINGS: Cantilever shoulder-wing monoplane. Leading-edges swept back at approximately 45°. Outboard aileron actuators by Ozone Metal Products.

FUSELAGE: All-metal semi-monocoque structure.

TAIL UNIT: All-metal structure with twin fins and rudders. All-moving horizontal tail surfaces outboard of fins. Rudder servo actuators by Ronson Hydraulic Units Corporation. Actuators for horizontal surfaces by National Water Lift Company. Boost pitch compensator for control stick by Moog Inc, Controls Division.

LANDING GEAR: Hydraulically-retractable tricycle type, with single wheel on each unit. Nose and main landing gear by Cleveland Pneumatic Tool Company. Wheels and brake assemblies by Goodyear Tire and Rubber Company. Main and nosewheel tyres by B. F. Goodrich Company. Wheel braking skid control system by Hydro-Aire Division of Crane Company.

POWER PLANT: Two Pratt & Whitney F100-PW-101 turbofan engines of approximately 29,000 lb (13,155 kg) st. Fuel tanks by Goodyear Tire and Rubber Company. Refuelling control valve by Ronson Hydraulic Units Corporation. Fuel tank valves and check valves by Schulz Tool and Manufacturing Company. Fuel gauge system by Simmonds Precision Products Inc. Fuel tank pressure regulators by Vap-Air Division of Vapor Corporation.

ENGINE INTAKES: Straight two-dimensional external compression inlets, on each side of the fuselage. Air inlet controllers by Hamilton Standard Division of United Aircraft Corporation. Air inlet actuators by National Water Lift Company.

ACCOMMODATION: Single seat for pilot under transparent canopy. Polycarbonate canopy and acrylic-clad polycarbonate windshield by Sierracin Corporation. Windshield anti-icing valve by Dynasciences Corporation.

SYSTEMS: Electric power generating system by Lear Siegler Power Equipment Division; transformer-rectifier by Electro Development Corporation; and generator constant-speed drive units by Sundstrand Corporation, Aviation Division. Hydraulic system powered by engine-driven pumps supplied by Abex Corporation; modular hydraulic packages by Hydraulic Research and Manufacturing Company. Oxygen system will have a liquid oxygen indicator by Simmonds Precision Products Inc. Air-conditioning system by AiResearch Manufacturing Company. Automatic flight control system by General Electric, Aircraft Equipment Division. Auxiliary power unit for engine starting, and for provision of electric or hydraulic power on the ground independently of the main engines, is being developed by AiResearch Manufacturing Company.

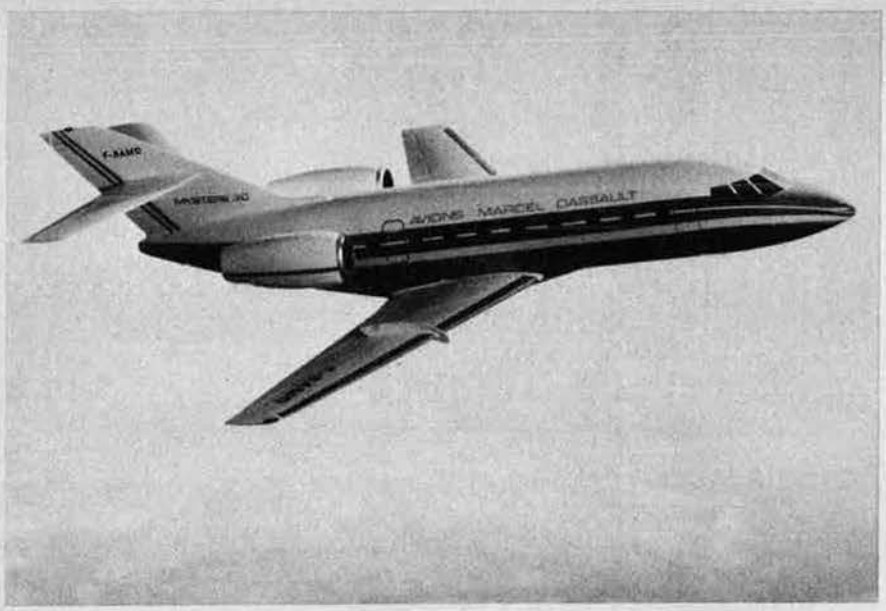
EQUIPMENT: Tachometer, fuel and oil indicators by Bendix Corporation, Flight and Engine Instrument Division. Feel trim actuators by Plessey Airborne Corporation.

ELECTRONICS: A lightweight, high-reliability radar system is being developed by Hughes Aircraft Company. This is required to provide long-range detection and tracking of small high-speed targets operating at all altitudes down to treetop level, and to feed accurate tracking information to the airborne central computer to ensure effective launch of the aircraft's missiles or firing of its internal gun. For close-in dogfights, the radar will automatically acquire the target on a head-up display. International Business Machines, Federal Systems Division, is sub-contractor for the central computer and Conductron Corporation for the head-up display. This latter unit will project all essential flight information in the form of symbols on to a combining glass positioned above the instrument panel at pilot's eye level. The display will give the pilot all the information required to intercept and destroy an enemy aircraft without need for him to remove his eyes from the target. The display will also provide navigation and other steering control information under all flight conditions, as well as built-in test information to pinpoint faults in the aircraft's systems. A transponder for the IFF system, being developed by Teledyne Electronics Company, will inform the pilot if an aircraft seen visually or on radar is friendly. It will also supply data on the F-15's range, azimuth, altitude, and identification to Air Traffic Controllers. A reply evaluator for the IFF system is being developed by Litton Industries Inc, Data Systems. A vertical situation display set, that will use a cathode-ray tube to present radar, electro-optical identification and attitude director formats to the pilot, is being developed by Sperry Rand Corporation, Sperry Flight Systems Division. This will permit inputs received from the aircraft's sensors and the central computer to be visible to the pilot under any light conditions. This company is also developing an air data computer for the F-15, as well as an attitude and heading reference set to provide information on the aircraft's pitch, roll, and magnetic heading via cockpit displays. This latter unit can also serve as a back-up to the inertial navigation set that is being developed by Litton Industries Inc. This is to provide the basic navigation data and will be the aircraft's primary attitude reference, enabling the F-15 to navigate anywhere in the world.

In addition to giving the aircraft's position at all times, the inertial navigation system will also provide pitch, roll, heading, acceleration, and velocity information. Other specialised equipment for flight control, navigation, and communications includes a micro-miniaturised TACAN system by Hoffman Electronics Corporation; a horizontal situation indicator to present aircraft navigation information on a symbolic pictorial display, by Collins Radio Company, which is also responsible for the ADF and ILS receivers, UHF transceiver, and UHF auxiliary-fix receiver. The communications sets will have cryptographic capability. Dorne and Margolin Aviation Products are responsible for the glide-slope localiser antenna, and Teledyne Avionics Company for angle of attack sensors. A special nose radome is to be developed by Brunswick Corporation, Technical Products Division. This will be fabricated from syntactic foam material sandwiched between outer skins, and will offer a weight saving of 35% by comparison with conventional radome structures, as well as providing heat resistance up to 500°F (260°C), undistorted passage for signals from the nose radar and the strength of a primary structure.

ARMAMENT: Provision for carriage and

Artist's impression of the McDonnell Douglas F-15A (two Pratt & Whitney F100-PW-101 turbofan engines)



Model of the Dassault Mystère 30/Falcon 30 commuter transport (two Lycoming ALF 502D turbofan engines)

launch of a variety of air-to-air weapons over short and medium ranges. A competition for development of a new 25 mm high-rate-of-fire gun using caseless ammunition was initiated between General Electric and Philco-Ford Corporation, and was won by the latter company. Pending availability of this new weapon the F-15 will be armed with a 20 mm M-61A1 six-barrel gun. General Electric Armament Department is to develop the gun's accessory system, consisting primarily of a storage drum for ammunition and feed chutes that carry the ammunition to and spent cases from the gun. A lead computing gunsight is being developed by Bendix Corporation, Navigation and Control Division. To keep the pilot informed of the status of his weapons and provide for their management, an integrated stores monitoring and management system is being developed by Dynamic Controls Corporation.

DIMENSIONS, EXTERNAL:

Wing span	42 ft 9¾ in (13.05 m)
Length overall	63 ft 9¾ in (19.45 m)
Height overall	18 ft 7¼ in (5.67 m)
Tailplane span	28 ft 3¾ in (8.63 m)

DASSAULT

AVIONS MARCEL DASSAULT–BREGUET AVIATION; Head Office: 46 Avenue Kléber, 75-Paris 16e, France

DASSAULT MYSTÈRE 30/FALCON 30

The Mystère 30/Falcon 30 is a twin-turbofan aircraft capable of carrying up to 32 passengers on 600 nm (690 mile; 1,112 km) stage lengths at high speed and in a high degree of comfort. It is a direct derivative of the Mystère 20/Falcon 20, intended for commuter operations, and supersedes the Falcon 20 T project described in the 1971–72 *Jane's*.

This aircraft takes advantage of the improvements embodied on the Falcon 20 Series F, including the new high-lift devices, and from the experience of nearly 400,000 flying hours logged by Falcons by early 1972. The prototype is scheduled to fly for the first time in September 1972.

TYPE: Twin-turbofan commuter transport.

WINGS: Cantilever low-wing monoplane. All-metal fail-safe torsion-box structure, with machined stressed skin. Ailerons operated by Dassault twin-body actuators supplied by two hydraulic systems, with artificial feel units. No tabs. Hydraulically-actuated two-section single-slotted flaps. Non-slotted slats inboard of the fence on each wing, and slotted slats outboard of fence. Hydraulically-actuated air-brakes forward of flaps. Leading-edges anti-iced by engine-bleed air.

FUSELAGE: All-metal semi-monocoque structure of circular cross-section, designed to fail-safe principles.

TAIL UNIT: Cantilever all-metal fail-safe structure. Electrically-controlled variable-incidence tailplane. Elevators and rudder each actuated by twin body hydraulic servo controls. No tabs.

LANDING GEAR: Retractable tricycle type of Messier design, with twin wheels on all three units. Hydraulic retraction, main units inward, nosewheels forward. Oleo-pneumatic shock-absorbers: Normal tyre pressure 145 lb/sq in (10.2 kg/cm²) on main gear, 102 lb/sq in (7.1 kg/cm²) on nose gear. Steerable and self-centering nose unit. Goodyear three-disc brakes and anti-skid units. Brake-chute standard.

POWER PLANT: Two Lycoming ALF 502D turbofan engines, each rated at 5,500 lb (2,500 kg) st under ISA + 15°C conditions, mounted in pods on each side of rear fuselage. Two integral wing fuel tanks, total capacity 1,035 Imp gallons (1,240 US gallons; 4,700 litres). Separate fuel system for each engine, with provision for cross-feeding. Single-point pressure refuelling. Emergency refuelling by gravity.

ACCOMMODATION: Crew of two in flight compartment, with fully-duplicated controls and airline-type instrumentation. Normal seating for 29-32 passengers, plus cabin crew. Toilet compartment at rear. Cargo/baggage compartment at rear, with service door. Alternative executive layout for 8–15 passengers, with galley, toilet, wardrobe compartment, and larger baggage compartment. Downward-opening door at front on port side, with built-in stairs.

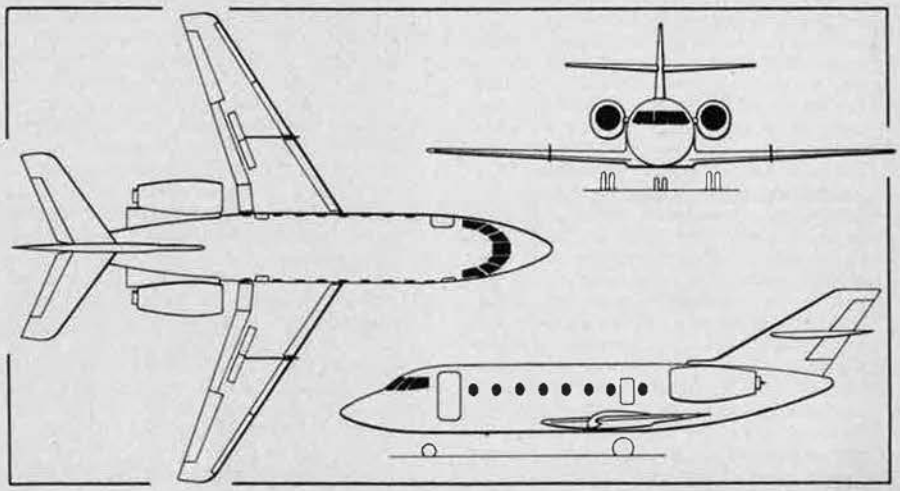
SYSTEMS: Duplicated air-conditioning and pressurisation systems, supplied with air bled from both engines. Pressure differential 8.5 lb/sq in (0.593 kg/cm²). Two independent hydraulic systems, each with operating pressure of 3,000 lb/sq in (210 kg/cm²), supplied by two engine-driven pumps and one electric emergency pump to actuate primary flying controls, flaps, landing gear, wheel brakes, air-brakes, and nose gear steering. 28V DC electrical system, with a 9kW DC starter-generator on each engine, one 1,500VA and two 750VA inverters, and two 40Ah batteries. Automatic emergency oxygen system.

ELECTRONICS AND EQUIPMENT: Standard equipment includes duplicated VOR/ILS, VHF, DME and ADF, marker beacon receiver, ATC transponder, autopilot, and duplicated flight director. Optional equipment includes radio altimeter and weather radar.

DIMENSIONS, EXTERNAL:

Wing span	54 ft 3 in (16.55 m)
Length overall	62 ft 7 in (19.08 m)
Length of fuselage	57 ft 0 in (17.40 m)
Diameter of fuselage	7 ft 9 in (2.36 m)
Height overall	19 ft 3 in (5.88 m)
Tailplane span	22 ft 2 in (6.75 m)
Wheel track	12 ft 3 in (3.73 m)
Wheelbase	19 ft 11 in (6.075 m)
Passenger door:	
Height	5 ft 6 in (1.68 m)
Width	2 ft 10 in (0.85 m)
Height to sill	4 ft 2 in (1.27 m)
Emergency exits (each side, overwing):	
Height	3 ft 0 in (0.914 m)
Width	1 ft 8 in (0.508 m)
Emergency exit (starboard, front):	
Height	3 ft 8 in (1.12 m)
Width	1 ft 8 in (0.508 m)
Cargo hold door:	
Height	2 ft 5 in (0.75 m)
Width	2 ft 7 in (0.80 m)
Height to sill	4 ft 5 in (1.36 m)

Dassault Mystère 30/Falcon 30 twin-turbofan commuter transport (Roy J Grainge)



DIMENSIONS, INTERNAL:
Cabin, excluding flight deck:
Length 35 ft 4 in (10.75 m)
Max width 7 ft 0½ in (2.15 m)
Max height 5 ft 11 in (1.80 m)
Cargo hold volume:
Standard 115 cu ft (3.25 m³)
Executive 159 cu ft (4.50 m³)
AREAS:
Wings, gross 454 sq ft (42.0 m²)
Horizontal tail surfaces, total 121.6 sq ft (11.3 m²)
Vertical tail surfaces, total 91.4 sq ft (8.5 m²)
WEIGHTS:
Weight empty, equipped 18,820 lb (8,535 kg)
Max payload 7,080 lb (3,205 kg)
Max T-O weight 30,865 lb (14,000 kg)
Max zero-fuel weight 26,455 lb (12,000 kg)
Max landing weight 29,980 lb (13,600 kg)
PERFORMANCE (estimated):
Max permissible speed at S/L 350 knots (403 mph; 648 km/h)
Max cruising speed at 25,000 ft (7,620 m) 448 knots (515 mph; 830 km/h)
Commuter range, 29 passengers, with commuter reserves 734 nm (845 miles; 1,360 km)
Typical 150 nm (175 miles; 280 km) commuter stage, with 32 passengers and 1,800 lb (815 kg) fuel reserves:
FAR 25 T-O distance 4,320 ft (1,320 m)
Flight time 22.5 minutes
FAR 121 landing distance 4,120 ft (1,255 m)

AGUSTA

COSTRUZIONI AERONAUTICHE GIOVANNI AGUSTA SpA; Address: CP 193, Cascina Costa, Gallarate, Italy

AGUSTA-BELL 212AS

With the object of evolving a medium-size naval helicopter offering more advanced features than the Agusta-Bell 204AS, Agusta began in late 1971 the design and development of a much-modified version of the Bell Model 212 intended specifically for anti-submarine and anti-surface-vessel operations. By combining improved and more advanced systems with an airframe virtually the same size as the AB 204, the new version, which is designated Agusta-Bell 212AS, will be able to operate from small ship decks.

Apart from some local strengthening and the provision of deck-mooring equipment, the airframe structure remains essentially similar to that of the commercial Model 212 and military UH-1N described under the Bell entry in the current edition of *Jane's*. Details of the modifications proposed for the AB 212AS are given below.

TYPE: Twin-engined anti-submarine and anti-surface-vessel helicopter.

POWER PLANT: As AB 212, but with protection against salt water corrosion.

ACCOMMODATION: Crew of three or four.

SYSTEMS: Standard duplicated hydraulic systems for flight controls, as in AB 212. Third, self-contained system for operation of sonar, rescue hoist and other utilities. Electrical system capacity increased to cater for higher power demand, and the two standard generators integrated with a 20kVA alternator.

ELECTRONICS AND EQUIPMENT: Complete instrumentation for day and night sea operation in all weathers, including radar altimeter, Doppler radar, drift indicator and navigation computer. ASE (automatic stabilisation equipment) and AATH (automatic approach to hovering) equipment is derived from that fitted in AB 204AS. A higher-than-standard capacity rotor brake is fitted.

ARMAMENT AND OPERATIONAL EQUIPMENT: Search radar, with broad-dimension antenna, for navigation, rescue and search. Modern sonar equipment, with miniaturised components. Weapon system may consist of two Mk 44 homing torpedoes, two AS.12 air-to-surface missiles, or a combination of both. Provision for auxiliary installations such as rescue hoist, cargo sling, inflatable emergency pontoons, internal and external auxiliary fuel tanks, according to mission.

PERFORMANCE (typical attack mission, estimated, at 11,000 lb; 4,990 kg T-O weight):
Cruising speed 103 knots (119 mph; 191 km/h)
Endurance for sonar search and attack with torpedoes (50% hovering and 50% cruise), 10% reserves 2 hr 45 min
Endurance for attack with missiles at 90 knots (104 mph; 167 km/h), 10% reserves 3 hr 30 min
Ferry range with auxiliary tanks and 10% reserves 388 nm (447 miles; 720 km)

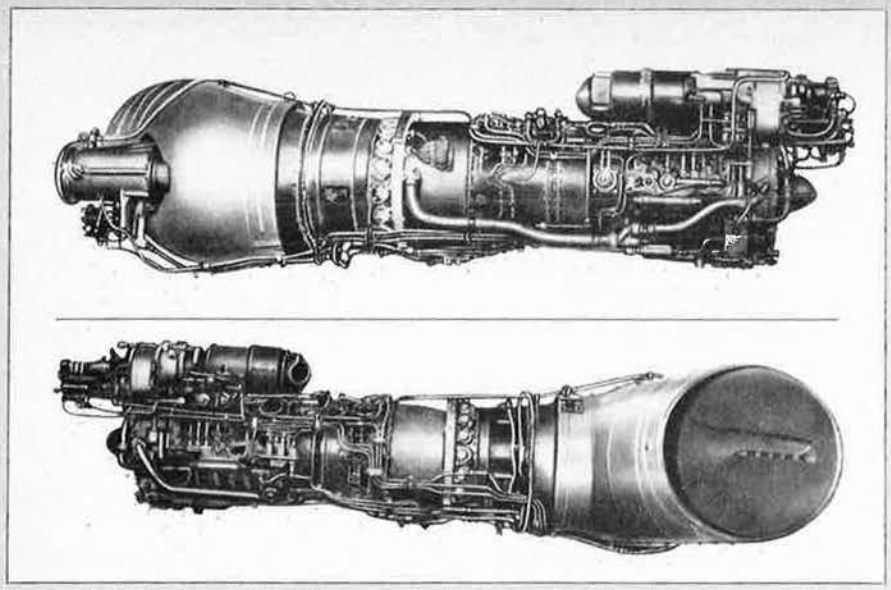
ISOTOV

S. P. ISOTOV, USSR

This engine design bureau specialises in shaft-turbine power plants of moderate size. Its two main products known to the West are the GTD-350, the free-turbine turboshaft fitted to the Mil Mi-2 twin-engined utility helicopter and the much larger TV2 turboshaft engine fitted to the Mil Mi-8 transport helicopter.

The Mi-8, in some ways reminiscent of a scaled-down Mi-6, is approximately in the class of the American Sikorsky S-61, having roughly the same payload and performance but being larger and heavier. It has so far been seen only in the basic transport form, with nosewheel-type landing gear, whereas the US helicopter is used for many civil and military rôles in land and amphibious versions. The power plant of the Mi-8 comprises two TV2-117A engines coupled through a VR-8A gearbox. As is common with modern Soviet helicopters, the engines and gearbox are delivered and thereafter treated as a single unit. The complete package incorporates a control system (separate from the control system of each gas generator) which maintains desired rotor speed, synchronises the power of both engines, and increases the power of the remaining engine if the other should fail.

Agusta-Bell 204AS, the licence-built ASW helicopter which the AB 212AS is intended to replace



Isotov TV2-117A free-turbine helicopter turboshaft engine (right-hand view on top, left-hand view below)

Practically nothing has been known until recently about the TV2 engine. It is of typically conservative design in many respects, being biased in favour of long and trouble-free life rather than attempting to rival the small size and weight of US engines in the same power class, such as the GE12, T700-GE-700, Pratt & Whitney ST9, and Lycoming PLT-27.

ISOTOV TV2-117A

TYPE: Free-turbine helicopter turboshaft engine.

AIR INTAKE: Direct pitot, with main front casing providing vertical upper and lower drive-shafts to accessory packages. Main accessory group above the engine projects well ahead of intake face. Casing incorporates variable incidence inlet guide vanes.

COMPRESSOR: Ten-stage axial type. Construction principally in titanium to reduce weight in comparison with the steel that would otherwise be used. Inlet guide vanes and stators of stages 1, 2, and 3 are of variable incidence to facilitate starting and increase compressor efficiency over a wide speed range; for the same reasons the casing incorporates automatic blow-off valves. Pressure ratio 6.6 at 21,200 rpm.

COMBUSTION CHAMBER: Annular, with eight burner cones. Fabricated from inner and outer diffuser casings, flame tube, casing, burners, and anti-icing bleed-air pipe.

FUEL GRADE: T-1 or TS-1 to GOST 10227-62 specification (Western equivalents, DERD.2494, MIL-F-5616).

TURBINE: Two-stage axial compressor turbine bolted to rear of splined compressor shaft, through which passes power to drive the accessories on the forward extension shaft. Compressor turbine has solid rotor blades, held by fir-tree roots in discs cooled by bleed-air (first disc from 10th-stage air, all other discs from 8th-stage air). First- and second-stage stators have 51 and 47 inserted blades, respectively. Free power turbine is of similar two-stage design; its rotors have 43 and 37 blades respectively.

EXHAUST UNIT: Large fixed-area duct which deflects the gas out sideways at 60°. It comprises a pipe, pipe shroud and tie-band, shroud connector links, and exhaust-pipe attachments. The exhaust pipe and shroud together form a double-wall assembly which minimises heat transfer into the power plant nacelle, the pipe being cooled by air circulating in the double wall.

OUTPUT SHAFT: The main drive-shaft is an extension of the power-turbine rotor shaft. It conveys torque from the free turbine to the over-running clutch of the helicopter main gearbox (VR-8A) and is also coupled to the speed governor of the engine free-turbine rotor. Max output speed 12,000 rpm; main-rotor speed 192 rpm.

ACCESSORIES: All accessories requiring rotary power input are mounted on the main drive box above the intake casing, in which a train of bevel and spur gears provides drives for airframe and engine accessories. The engine automatic control system includes a fuel system, hydraulic system, anti-icing system, gas temperature restriction system, engine electric supply and starting system, and monitoring instruments. The hydraulic system positions the variable stators according to a preset programme, depending on compressor speed and air temperature at the inlet; it also sends electrical signals to control the starter/generator system, close the starting bleed-air valves and restrict peak gas temperature to 600°C. Air up to 1.8 per cent of the total mass flow can be used to heat the intake and other parts liable to icing. Fire extinguishant can be released manually by the pilot, upon receipt of a fire warning, through a series of spray rings and pipes.

LUBRICATION: Pressure circulation type. Oil is supplied by the upper pump and scavenged from the five main bearings by the lower pump, returned through the helicopter-mounted air/oil heat exchanger and thence to the helicopter tank. The oil seals and air/oil labyrinth seals are connected to a centrifugal breathing system.

OIL GRADE: The TV2-117A is one of the first Soviet engines to use a synthetic oil, permitting operation at oil temperatures above 200°C, combined with easy starting at minus 40°C without heating the oil. The grade is B-3V to MRTU 38-1-157-65 (nearest foreign substitute Castrol 98 to DERD.2487). Oil consumption, not over 0.88 Imp pints (0.5 litres) per hour per engine.

STARTING: Electrical, fuel, and ignition systems are integrated. The SP3-15 system comprises DC starter/generator, six storage batteries, control panel, ground supply receptacle, and control switches and relays; of these all are airframe-mounted except for the GS-18TP starter/generator which spins the compressor during the starting cycle. The ignition unit comprises a control box, two semiconductor plugs, a solenoid valve, and switch. The starting fuel system comprises an automatic starting unit on the NR-40V fuel regulating pump, a constant-pressure valve, and two igniters.

DIMENSIONS:

Length, with accessories and exhaust pipe	111.5 in (2,835 mm)
Length, intake face to rotor gearbox connection	94.25 in (2,391 mm)
Width	21.5 in (547 mm)
Height	29.25 in (745 mm)

WEIGHT, DRY:

Engine, without generator, transducers, etc.	727 lb (330 kg)
Type VR-8A gearbox, less entrapped oil	1,642 lb (745 kg)

PERFORMANCE RATINGS:

T-O (S/L, static)	1,500 shp (1,520 ch e)
Cruise (122 knots; 140 mph; 225 km/h at 1,640 ft; 500 m)	1,000 shp (1,015 ch e)

SPECIFIC FUEL CONSUMPTIONS:

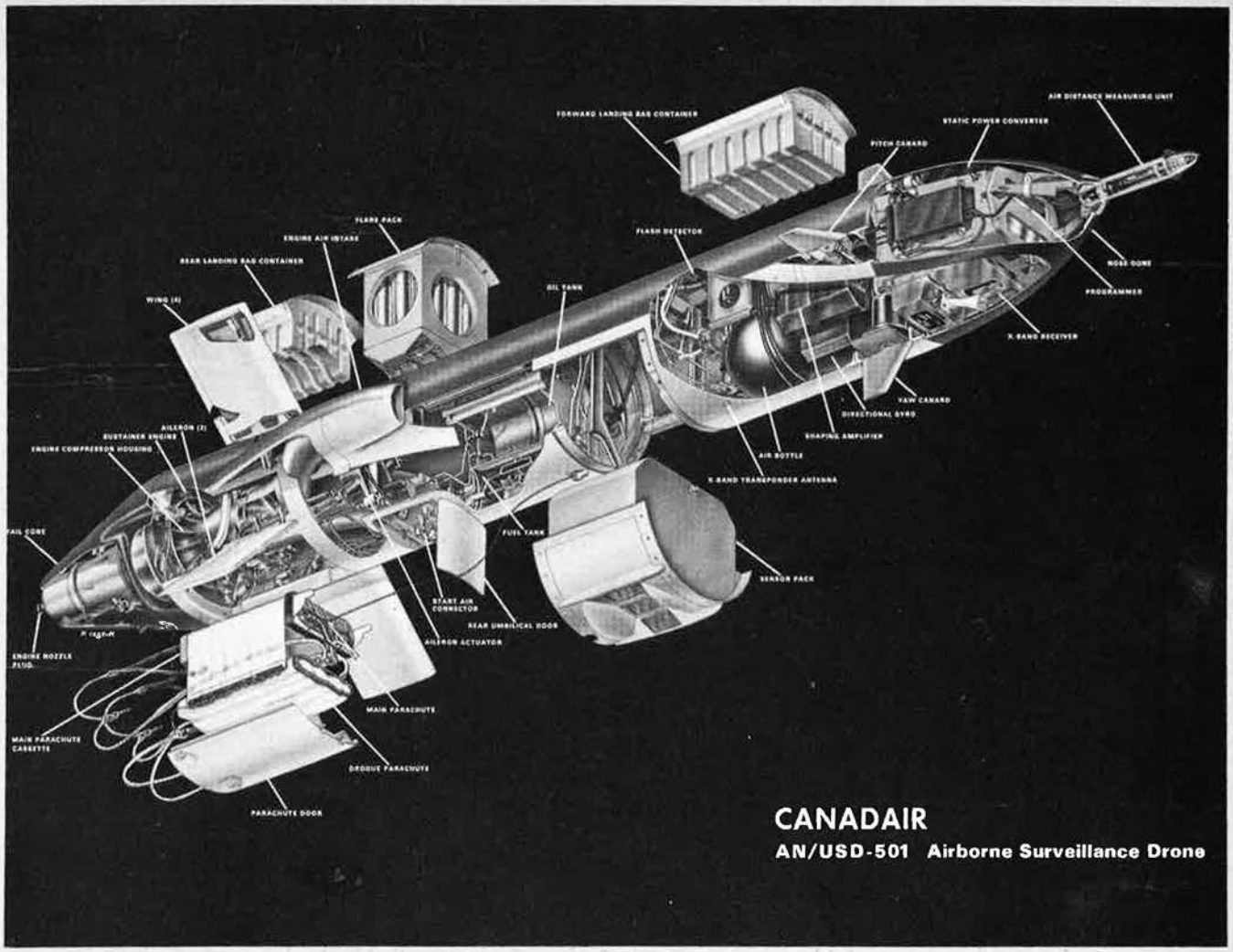
T-O, as above	0.606 lb (0.275 kg)/shp/hr
Cruise, as above	0.683 lb (0.310 kg)/shp/hr

CANADAIR

CANADAIR LTD (Subsidiary of General Dynamics Corporation); Head Office and Works: PO Box 6087, Montreal 101, PQ, Canada

In addition to its work on piloted aircraft, Canadair has developed and is producing a reconnaissance drone system, of which all available details follow.

Mil Mi-8 transport helicopter, powered by two Isotov TV2-117A turboshaft engines (Air Portraits)



Cutaway drawing of the Canadair AN/USD-501 surveillance drone

CANADAIR AN/USD-501
Manufacturer's designation: CL-89

The Canadair CL-89 (AN/USD-501) airborne surveillance drone system has been evaluated and accepted by four countries: Canada, the UK, the German Federal Republic, and Italy.

Development of the drone system was started in 1961 by Canadair Ltd on a shared-cost basis with the Canadian Department of Industry, Trade and Commerce to provide the forward area field commander with fast, up-to-date visual information on territory within a 38 nm (43.5 mile; 70 km) radius. With a high probability of survival against all known air defence systems, the AN/USD-501 can acquire timely and accurate battlefield intelligence, using its photographic and infra-red line-scanning equipment.

The system evolved from a need of the western Allied armed forces for an intelligence-gathering device for battlefield commanders. Canadair, in co-operation with the Canadian government and Canadian Armed Forces, conducted a study to identify the optimum unmanned airborne surveillance system. It was agreed that the system should be simple to operate and maintain; have a high survivability in a sophisticated enemy air defence environment; be capable of detecting and recording enemy formations and weapons of tactical significance in all weathers, by day or night; and provide accurate information in time for the recipient to react.

The system, consisting of the air vehicles plus the related ground support and operational maintenance equipment, is totally integrated, mobile, and independent of such external services as electrical power supplies.

In its early stages of development the CL-89 project was funded on a month-to-month basis by Canada and the UK. In 1963, long-range funding was provided by these two governments, and in 1965 the German Federal Republic joined in development of the system.

The first test flights were conducted by Canadair engineering personnel at the US Army's Electronic Proving Ground Drone Test Facility at Yuma, Arizona. Flying initially from an interim launcher, 41 flights were completed between 1964 and 1966. Canadian, British, and Federal German Army observers were present to witness the last 12 flights of this series. Systems engineering trials, consisting of 51 flights, were carried out using a combined Canadian/British/German military trials team. This series of flights ended in early 1967. Later in 1967 system performance trials, consisting of 20 flights, were conducted at the Canadian Forces Base at Shilo, Manitoba, under the harsh early Winter environment of western Canada. During most of these flights, ancillary equipment necessary to the operation of the system was also operated and evaluated.

Operation of the system under simulated tactical conditions was carried out during a "Demonstration of Conformance" trial at CFB Shilo in the Autumn of 1969. The aim of this demonstration, conducted by the tripartite military unit, was to demonstrate that the production equipment met the requirements of the three user countries.

The three participating nations shared in the initial production order for 282 AN/USD-501 drones and associated ground support equipment. Additional quantities have since been ordered by the UK and the German Federal Republic, bringing the total number ordered by early 1972 to more than 400.

The British Army has completed a series of range-proving flights at the Hebrides missile range, Scotland, as well as a series of operational training flights. The Federal German Army has conducted a series of flights at the NATO ranges at Bergen Hohne in western Germany.

In June 1971, a series of evaluation flights for the Italian Ministry of Defence was carried out at the Sardinian missile range at Salto di Quirra. Their purpose was to prove that the system would meet the requirements of the Italian Army, as certain performance characteristics unique to such an environment had not previously been demonstrated. The trials confirmed that the system in all cases surpassed the Italian Army's requirements, and in early 1972 negotiations were proceeding between the Canadian and Italian governments for the sale of a number of AN/USD-501 drone systems.

The CL-89 system has now been operated successfully in a world-wide range of temperatures and environments, and more than 200 flights had been made by early 1972,

Preparing a Canadair AN/USD-501 surveillance drone for launch

indicating a high level of system reliability, re-usability and cost-effectiveness.

TYPE: Recoverable airborne surveillance drone system.

WINGS: Four rectangular single-spar stub-wings at rear of drone fuselage, in a cruciform arrangement at 45° to the horizontal and vertical centre-lines. Upper pair fold out of the way when the landing air-bags are inflated. Ailerons on port upper and starboard lower wings.

FOREPLANES: Two pairs of canard foreplane surfaces, of cropped-delta planform, aft of nose-cone on horizontal and vertical centre-lines, for pitch and yaw trim respectively.

FUSELAGE: Cylindrical metal structure, with curved nose-cone and tapering tailcone. Three detachable dorsal packs for forward and rear landing bags and flare container, and two detachable ventral packs for sensor equipment and parachute recovery system.

POWER PLANT: One 125 lb (56.7 kg) st Williams Research WR2-6 single-stage turbojet engine, with variable exhaust nozzle, installed in tailcone aft of wings. Air intake fairing on each side of fuselage, forward of wings. Fuel and oil tanks in central fuselage compartment, forward of air intakes.

BOOST: One Bristol Aerojet Wagtail rocket motor (average thrust 4,550 lb; 2,065 kg st), with electrical ignition, installed in a helically-welded steel case which has four rectangular cruciform tail fins and is attached to the body of the drone by three Vee-shaped thruster arms and a cable. After 2.5 seconds of flight the cable is cut automatically, freeing the thruster arms and allowing the booster assembly to fall away.

SYSTEMS: Engine-driven alternator for electrical power during flight.

GUIDANCE: The flight path, altitude, and sensor on/off commands are controlled by a preset programmer which receives information from an Air Distance Measuring Unit (ADMU) and combines this with the preset programme to control the flight path. A ground homing beacon positions the drone in its final stages of flight to ensure the accuracy of the landing.

RECOVERY: After final positioning by the ground homing beacon the drone is inverted, and the drogue parachute deploys to slow it down until the main parachute is deployed. The forward and rear landing bags are then automatically inflated and deployed to absorb the landing shock.

EQUIPMENT: Air Distance Measuring Unit (ADMU) in nose probe. Nose-cone houses programmer, static power converter and X-band receiver. Compartment aft of nose-cone houses shaping amplifier, flash detector, directional and vertical gyros, X-band transponder antenna, forward landing bag container, and air bottle to inflate both landing bags. Ventral sensor pack is immediately aft of this compartment. Two sensor systems are currently in use: the Carl Zeiss KRb 8/24 camera system and the Hawker Siddeley Dynamics Type 201 infra-red linescan system. Linescan is a reconnaissance technique in which the terrain overflown is scanned at high speed in narrow strips at right-angles to the flight path. Forward motion builds up a continuous picture of radiation from the ground below. In an infra-red linescan, the radiation is collected by an optical scanner and focussed on to an infra-red detector. Variations in the radiation received cause corresponding fluctuations of the signal output from the detector. The detector output is processed electronically and is used to modulate the intensity of a light source which exposes a photographic film. This equipment greatly enhances the night performance of the AN/USD-501, since the infra-red linescan can produce continuous imagery on the darkest night without the use of illuminating flares. It is also possible to detect "hot" targets, such as military vehicles which are under camouflage, by virtue of the difference in temperature from their surroundings. Aft of the sensor pack is the compartment for the fuel and oil tanks. This compartment also has a ventral umbilical door providing access to the engine start air connector, and a dorsal pack containing 12 photo-flares just forward of the rear landing bag container. The final cylindrical compartment houses the rear landing bag container itself and the parachute recovery pack, between the dorsal and ventral pairs of wings respectively. The sustainer engine is mounted in the tailcone.

DIMENSIONS, EXTERNAL:

Length overall, excl nose probe:	
with booster	12 ft 2 in (3.71 m)
without booster	8 ft 6½ in (2.60 m)
Body diameter	1 ft 1 in (0.33 m)
Span of wings	3 ft 1 in (0.94 m)
Span of foreplanes	1 ft 7 in (0.48 m)

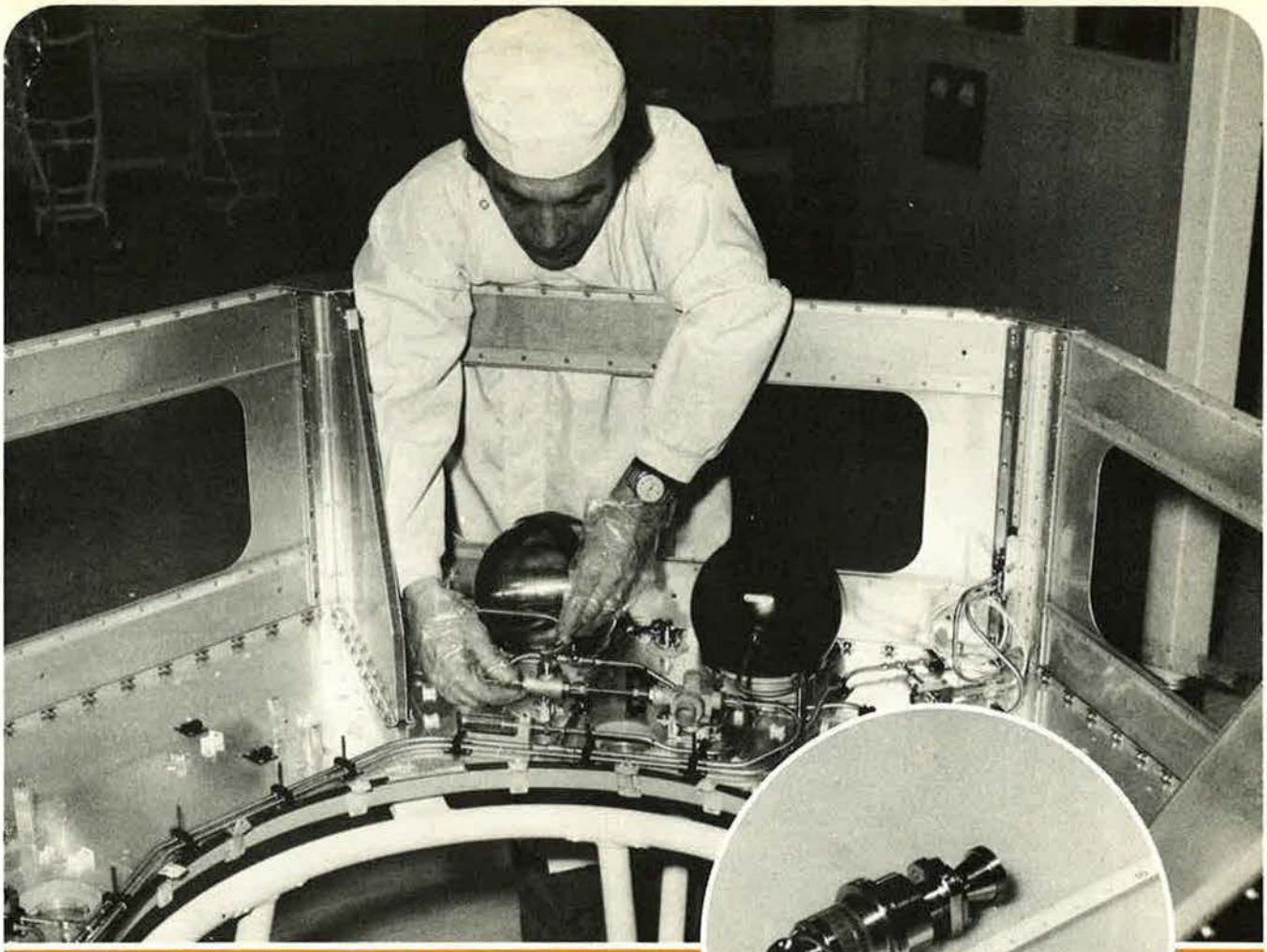
WEIGHTS:

Weight of booster	70 lb (32 kg)
Max launching weight:	
with booster assembly	343 lb (156 kg)
without booster assembly	238 lb (108 kg)

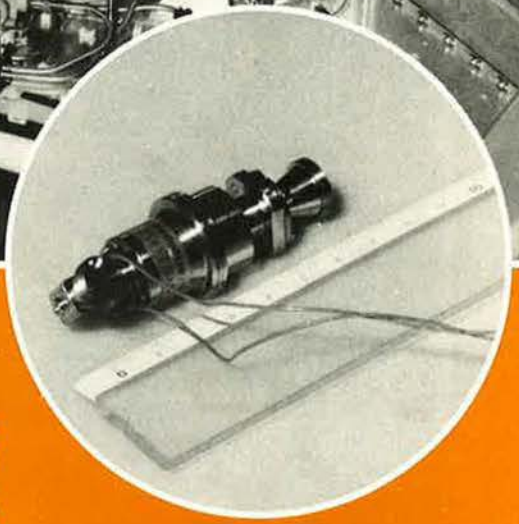
PERFORMANCE:

Max speed	approaching Mach 1

Launch of a Canadair AN/USD-501 surveillance drone



Integration of the cold gas attitude control system on the qualification model of SYMPHONIE



Symphonie type thrust valve (2.75 inches)

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Power	4 W
Thrust	1 N
Delay	5 ms
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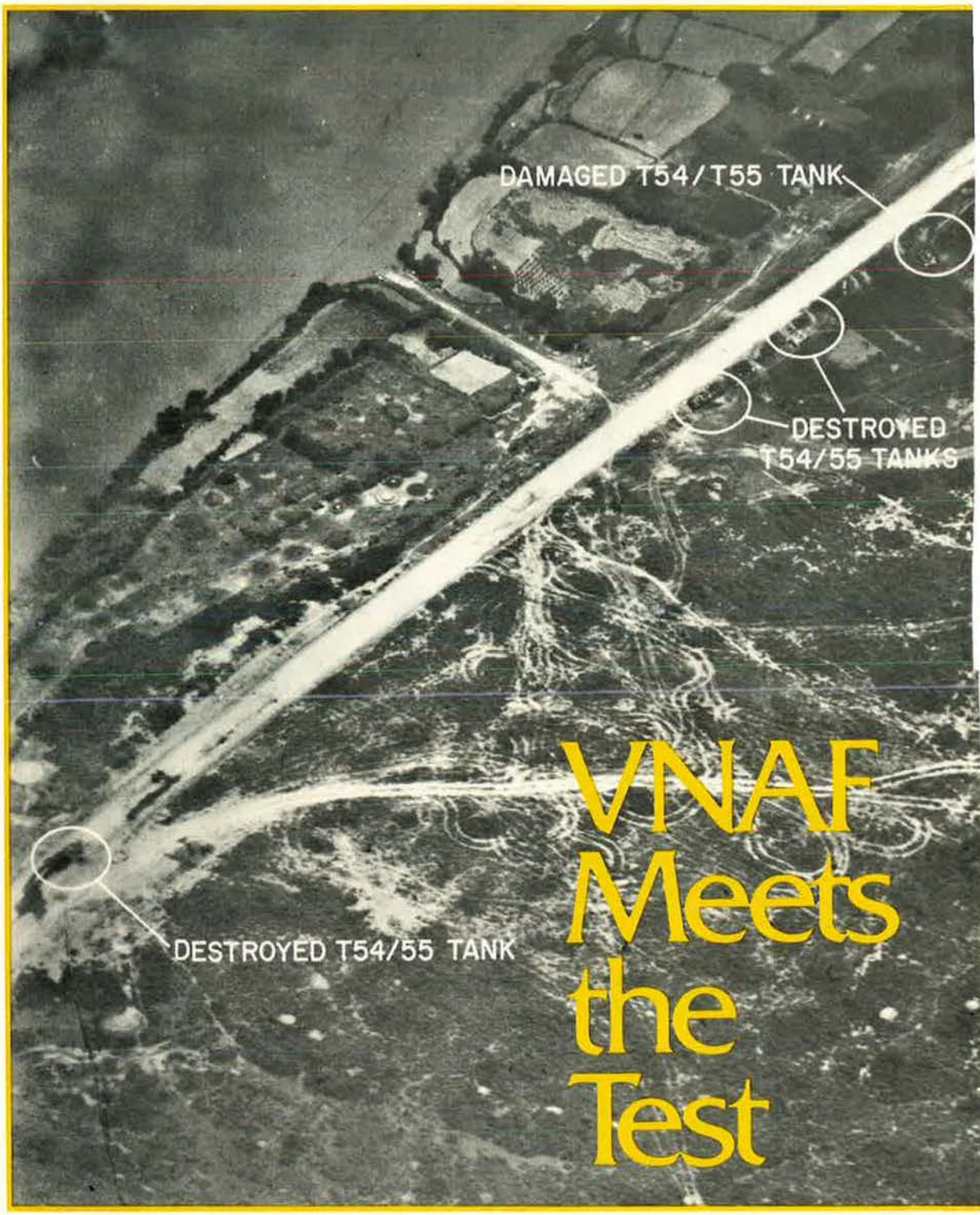
How successful has Vietnamization been in the case of the South Vietnamese Air Force (VNAF)? Its combat record during April and early May has been excellent though largely overlooked in accounts of the current North Vietnamese invasion. Here is a report on VNAF combat operations, and some underlying reasons that help explain why . . .



VNAF Meets the Test

T-54 tanks knocked out by VNAF A-1 pilots, who destroyed 150 enemy tanks in first month of the invasion.

By John L. Frisbee, EXECUTIVE EDITOR, AIR FORCE MAGAZINE

Air War in Vietnam

IN ALL the millions of words that have been spent on North Vietnam's invasion of South Vietnam, little has been said about the performance of the South Vietnamese Air Force (VNAF). Perhaps it's because the VNAF has been so overshadowed by interest in US Air Force and Navy air operations. Perhaps because South Vietnam's airmen have provided little copy for those who prefer to dwell on the horror stories and misfortunes of the war.

AIR FORCE Magazine has reported several times on the progress of VNAF Vietnamization—the Improvement and Modernization Program. That story is worth an up-date in the context of the invasion that began on March 30, when North Vietnam struck across the DMZ. But first, an overall look at the situation as it stands early in May, compared to the Communist Tet offensive of 1968, which established a takeoff point for the Vietnamization program.

Vietnamization: Success or Disaster?

What happens in Vietnam during the next sixty days may determine the future of the Republic of South Vietnam. It will also influence the US elections in November, and the character of American foreign and defense policy in the years ahead. A great deal is at stake, not just for South Vietnam, but indirectly for much of the non-Communist world.

Now, in early May, no one can predict with certainty the outcome of the battles and skirmishes that rage in Vietnam. Despite bleak news of North Vietnam advances in the early days of May, South Vietnam appears to have at least an even chance of holding enough territory to survive as an independent, non-Communist nation.

The long-term as well as the immediate future of South Vietnam hinges on success of the Vietnamization Program that started shortly after the Tet offensive and is not yet completed. Because South Vietnamese troops have given ground, in several instances approaching a rout, Vietnamization—more specifically Vietnamization as applied to the South Vietnam Army (ARVN)—has been labeled by some prestigious commentators as a failure, a disaster, a program in shambles. So far, the facts do not bear out those judgments.

Compare the situation in February 1968—the Tet offensive—with that of April 1972. In 1968, the US had nearly 493,000 military personnel in South Vietnam. Of them, 325,500 were Army; 56,400 USAF; 78,200 Navy; and 32,300 Marines. There were twenty-six USAF tactical fighter and attack squadrons in South Vietnam and thirteen more in Thailand, with additional carrier airpower offshore. It is unthinkable that South Vietnam could have survived Tet without the massive ground and air support provided by these US forces.

At the end of April 1972, there was a total of 68,100 US military personnel in South Vietnam, of whom only 18,400 were Air Force. At the start of the 1972 offensive, USAF had one A-37 and three F-4 squadrons in Vietnam; one F-105 and eight F-4 squadrons in Thailand. In April, they were augmented by an F-4 squadron in South Vietnam, and in Thailand by one F-105 and five F-4 squadrons, for a total of seventeen USAF tactical fighter units in the entire Southeast Asia theater.

With no direct combat support from US ground forces and twenty-two fewer US tactical fighter squadrons on hand than in 1968, the South Vietnamese have weathered more than four weeks of bitter fighting. It took North Vietnam divisions a month to capture their immediate objectives within miles of the DMZ. And this time, South Vietnam has faced a carefully prepared, well-coordinated invasion by North Vietnamese regular divisions, supported by an abundance of heavy artillery, armor, antiaircraft weapons, and combat engineers.

North Vietnam's Foreign Minister, Nguyen Duy Trinh, said the objective of the offensive is to "destroy the Vietnamization of the war and the Nixon Doctrine." Just about everything that would roll was thrown into the invasion.

Under these circumstances, so different from 1968, only extreme pessimists, knee-jerk antiwar critics, and military neophytes would deny credit to South Vietnam. Clearly, something has happened to the South Vietnamese armed forces in the past four years, and that something has been steady progress of the Vietnamization Program.

The question is not whether Vietnamization has worked. It has, but clearly its goal hasn't yet been reached. The question is whether, in the midst of a war, it is reasonable to expect the intangible elements of military professionalism to be advanced in three years to a point where South Vietnam would be militarily self-sufficient.

What Vietnamization Must Prove

If Vietnamization is to be the salvation of the Republic of South Vietnam, events must prove that the program has developed or can develop the professional qualities that tilt the balance between relatively evenly matched forces. Let's look at the balance in terms of tangible assets and clearly definable advantages.

The South and North Vietnamese armed forces are roughly comparable in size, with advantages on one side more or less offsetting different advantages on the other. Both have approximately 500,000 men in regular units with about the same number in paramilitary

formations. It is not known how much ground equipment was funneled into North Vietnam in preparation for the invasion. Six months ago, South Vietnam had forty percent more artillery; North Vietnam nearly twice as many tanks, including heavy tanks which the South lacks. Each side has approximately 200 combat aircraft. The North holds a clear qualitative aircraft superiority, with MIG-17s, -19s, and -21s compared to South Vietnam's A-1s, A-37s, and a few F-5s. But Hanoi has not been able to use its air force to support its ground forces because of US/VNAF air superiority. The effectiveness of Allied airpower has been reduced by North Vietnam's huge preponderance in antiaircraft missiles and guns.

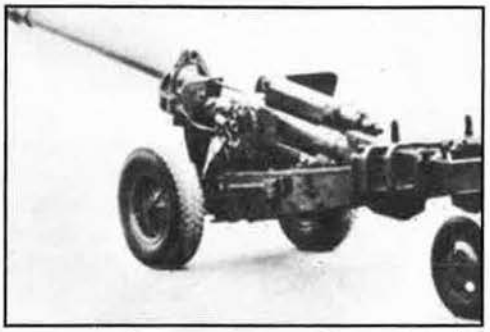
The South has the advantage of shorter supply lines and some enhanced mobility provided by its own small airlift; the North—now and probably in the future—the great advantage of the initiative. Finally, Hanoi controls a weakened but still present Viet Cong infrastructure in South Vietnam. So far in the current offensive, the Viet Cong has not been an important factor, but it has to be reckoned with.

When a balance between the two sides is struck, it appears that the outcome of the present struggle will be determined by two factors: airpower and leadership. The VNAF, buttressed by USAF and US Navy airpower, will continue to control the air over the battlefields and to interdict the heavy flow of supplies needed by the North to sustain its invasion. There is hope that the enemy will not be able to continue supporting a mechanized invasion that eats up supplies in huge quantities—or that he can for long accept the severe casualties (said to be about 20,000 in the first four weeks, compared to 4,000 South Vietnamese casualties) that any army fighting without airpower inevitably suffers.

Who holds the edge in leadership, the decisive intangible, the slender thread by which South Vietnam's future hangs?

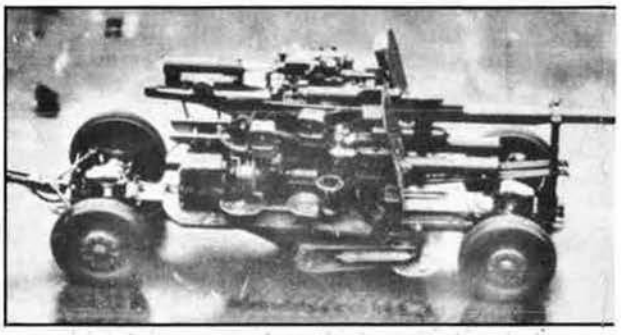
The word "Vietnamization" implies a return of control, direction, leadership—largely and necessarily taken over by the US in 1965—to South Vietnam. On the other hand, North Vietnam has provided its own leadership continuously for all the years that this dreary war has been going on at low or high intensity. Has the Vietnamization Program provided a broad enough base of professional leadership—in the field and on staffs; among NCOs, junior officers, middle management, and at the top—to ensure that South Vietnam can meet the present challenge in the absence of massive US Army combat assistance? Can it foster a degree of professionalism and esprit that will enable the South to deter future aggression from the North, for, almost certainly, Hanoi will not give up its goal of absorbing South Vietnam when Allied forces have gone.

People who have worked closely with the Vietnamization Program still think the answer is "yes," despite a number of well advertised failures of South Vietnamese commanders. If ARVN and VNAF leadership does not measure up, the United States must bear some of the blame because of our tardiness in launching a serious, large-scale program to train and equip South Vietnam's military forces.



130-mm field gun used extensively by the North in the invasion.

Russian T-54 tanks, deployed by the North in large numbers.



Four regiments of Soviet 100-mm AA guns were deployed in the South to support the invasion.

VNAF Performance

How about the VNAF, of whom we have heard so little since the invasion started? The Vietnamese Air Force is now more than two years into its Improvement and Modernization Program, with final goals about eighty-five percent achieved. Its performance during April 1972 has been rated by USAF observers from "better than we had any right to expect" to "magnificent." Here are a few examples.

During the first four weeks of the offensive, more than 150 enemy tanks were destroyed by air action. About seventy-five percent were killed by VNAF pilots flying A-1s and A-37s armed with rockets and 500-pound bombs.

In the six months prior to the offensive, VNAF pilots were flying about 100 tactical sorties a day. During the latter part of April, with 150 A-1s and A-37s and eighteen F-5s, they averaged close to 200 sorties daily. How long can they keep this up? Indefinitely, the experts say, and we'll look at that judgment in a moment.

Since the offensive got under way, VNAF

casualties have increased considerably. Why? Because they have been hitting the really tough targets—gun emplacements and tanks. One officer who has worked with the VNAF for several years commented: "It seems callous to say this, but if their casualties hadn't gone up, we would be concerned. That would mean they were avoiding the tough targets." Have increased casualties affected VNAF morale? "No. If anything, the VNAF is gaining confidence."

This is the payoff end of the line—combat capability. Behind it lies a *system* that has been painstakingly built, largely in the last two years.

The VNAF's Vietnamization started with a nucleus of the most experienced combat pilots in the world—at least the most experienced in close-support operations. The old heads in VNAF have flown literally thousands of combat sorties. There is no one-year tour for them. But the VNAF was not an air force. It was more a collection of pilots, planes, and support people, largely parceled out to ARVN corps commanders, with little experience or voice in planning joint operations, and lacking the substructure of support on which a modern air force depends.

USAF officials say that the greatest achievement of the Vietnamization Program has been creation of VNAF's Air Training Command. It now trains, in-country, all VNAF technicians needed to keep an air force flying—maintenance, supply, administration, and housekeeping. As a result, the VNAF is doing all its own maintenance including IRAN, jet and reciprocating engine overhaul, battle-damage repair, and component maintenance. A maintenance computer is being installed and the VNAF logistics system has been computerized for more than a year.

With these advances, the VNAF is able to meet the same operational readiness and utilization rates as USAF units flying comparable equipment. This is in direct contrast to some earlier US military assistance programs, which provided aircraft to countries that had not yet developed the support skills needed to operate them. That course, as the USSR also found out in Indonesia, leads to disaster.

VNAF personnel now operate all radars in the country and the Tactical Air Control System (TACS) in Military Regions 2 and 4. They are capable of taking over TACS countrywide, and are scheduled to do so in the near future. Both ground controllers and pilots have been training for the air defense role they will assume with delivery of three programmed F-5E squadrons, estimated to begin late in 1973.

The fixed-wing pilot training program, now conducted in the US, will be transferred to Vietnam next year. Helicopter pilot training, also based in the US but administered by the US Army, will move to Vietnam two years hence.

As deficiencies in night and instrument flying have been remedied, working relations between VNAF and ARVN have improved. The ARVN used to prefer USAF close support. Now, if they have any preference, it is for the VNAF, which has its own FACs and ground controllers. Vietnamese air and army people work together regularly in planning joint operations.

One of the most encouraging signs of VNAF maturity is its increasing participation in the work of the Vietnamese Joint General Staff. The VNAF now has a major voice in planning interdiction campaigns, and by virtue of its centralized control and growing sophistication has ceased to be regarded by the Army as organic firepower.

Post-Invasion Alternatives

The current combat record of the VNAF and the carefully constructed training programs and support systems that underlie it are impressive evidence that the VNAF Improvement and Modernization Program has worked.

The VNAF now has about 47,000 officers and airmen. In addition to the 168 attack and fighter aircraft mentioned earlier, it has thirty-six gunships, some 500 helicopters, and transports and liaison aircraft, bringing its total aircraft inventory to about 1,000 of all types. Obviously, this is not a force adequate in either size or equipment to meet the airpower demands of the present invasion. It was designed for the kind of low-level warfare to which the Viet Cong and North Vietnam turned after Tet.

If the fighting reverts to small unit operations after the invasion has run its course, the VNAF should be adequate to support ARVN forces. It could not, even when the Improvement and Modernization Program is completed, do the job alone if North Vietnam again invaded in force as it has this year.

For the long term, the US must consider the possibility of again deploying USAF and Navy airpower to Southeast Asia—perhaps repeatedly—under the Nixon Doctrine or, alternately, of supporting a larger and better equipped VNAF. This is assuming that there will be no drastic change in US foreign policy.

The immediate problem is to overcome deficiencies in the total South Vietnamese defense structure with judicious use of Allied airpower. There is no viable alternative.

In the first five weeks of the invasion, the VNAF has contributed its fair share in countering the invasion. It has done so with skill and with some distinction. ■

If there is one military technology program that really stands out, it is the high-energy gas laser program. While the Department of Defense has not yet made a commitment to the deployment of laser weapons, studies of their potential uses are believed to range from bomber defense weapons to anti-ballistic missile systems. A former development engineer in the Air Force Weapons Laboratory's Laser Division traces the history of USAF's interest and involvement in Light Amplification by Stimulated Emission of Radiation . . .

The Evolution of Revolutionary LASER WEAPONS

By Forrest M. Mims, III

THE high-energy gas laser may prove to be the most intriguing weapon system since the advent of nuclear weaponry. At the moment, laser weaponry can be compared to the status of atomic-bomb development in the very early days of the Manhattan Project. The physics works, but enormous engineering problems remain to be solved before a practical system can be deployed. But the research effort is so intensive that a practical laser weapon system is generally regarded as eventually attainable.

A few years ago, the entire laser weaponry program was cloaked in tight secrecy. But since 1970 the Department of Defense has allowed literally dozens of highly technical research papers and reports describing important scientific and engineering developments in the field of high-energy gas lasers to be openly published. Security requirements still restrict news about the highest powers achieved, development schedules, and some other military aspects of the laser program, but enough information has been released to provide a fairly comprehensive picture of the scope and extent of the weaponry effort.

Air Force a Pioneer

The Air Force plays a prime role in the program to develop practical laser weapons. Under the leadership of Col. David R. Jones, former Commander of the Air Force Weapons Laboratory and now retired, USAF scientists began working with lasers almost as soon as a Hughes Aircraft Co. researcher operated the first crude laser in 1960. Dr. Petras V. Avizonis, then a young lieutenant with a Ph.D. in physical chemistry and now Technical Director of the Weapons Laboratory's Laser Division, recalls meeting with Colonel Jones in March 1962. The Colonel asked him what he knew about lasers, and Avizonis replied that he had read about ruby lasers and seen a television program on the subject. The senior officer countered, "That's more than we know!" and Avizonis found himself assigned to what was destined to become one of the largest laser research laboratories in the world.

Initially, the Weapons Lab used solid-state lasers to simulate high-energy nuclear effects. The project was successful, and DoD's Advanced Research Projects Agency (ARPA) asked the Lab to check the possibility of using lasers in actual weaponry applications. Colonel Jones recalls those early days: "By September 1963, the work was well under way, and we had seven or eight people on the project. The question was, 'Can lasers function like weapons?' The answer was, 'Sure, but we would need the energy of Niagara Falls just to power them.' "

The conclusion wasn't exaggerated. The high-energy gas laser had not yet been invented, and the lasers then in use could achieve very high power levels for only a few millionths of a second. Nevertheless, ARPA kept the small laser effort at the Weapons Lab funded for the next several years in order to keep abreast of developments.

In 1965, interest in laser weaponry was renewed with the development of the continuous carbon dioxide (CO_2) gas laser. With the highest power output of any gas laser yet

developed, the CO_2 laser showed good promise as a candidate for a new laser weapon program, and the Weapons Lab built several of the devices. One forty-four-foot-long CO_2 laser at the Lab could burn through a firebrick in about five seconds with its 500-watt infrared beam.

Varied Approaches

But the interest suddenly shifted back to solid-state lasers as a result of several important technological breakthroughs in very high power devices. Colonel Jones recalls that "solid-state developments were blossoming out like a flower."

The Weapons Lab began an intensive program to investigate the effects of solid-state lasers on a variety of metals and other materials. A classic photograph of the era showed the brilliant red beam of a ruby laser vaporizing a hole through a mock missile nose cone. Other solid-state efforts centered around the development of covert infrared illumination and detection systems, and a small project to study biological effects was begun.

By 1968, the Weapons Laboratory's laser effort was divided into two parallel efforts, one concerned with gas lasers and the other with solid-state developments. Then, a dramatic development in the CO_2 laser field shifted the weaponry emphasis back to gas. The previous year, classified programs at several universities and private companies had suggested important new techniques for achieving much higher powers from CO_2 lasers. Since the power levels of CO_2 lasers were directly related to the length of the laser itself, it took a tube many feet long to achieve very high power levels. But the new theoretical work indicated that a radically new lasing process might significantly enhance the performance of gas lasers and result in systems much more compact and with considerably higher power outputs.

The Weapons Laboratory latched onto this new work—as did other military agencies—and correctly identified the emerging technology as the one with the most promise for practical laser weaponry. At this point the Eighth Card project was established to secretly investigate the problems that needed to be solved before any of the new high-energy gas lasers could be considered for a weaponry role. The high-priority project was headquartered at the Weapons Laboratory's Laser Division, and the Lab became DoD's lead laboratory in the field of high-energy laser weaponry research.

Needless to say, prospective military applications for such potent laser systems as those being considered stimulated the imagination of even the most skeptical scientists and generals. Visions of a Buck Rogers heat-ray weapon were rampant, and teams of military briefers made much of spectacular color films showing the devastating pyrotechnical effects of high-energy lasers on a variety of target materials, and elaborate view graphs showing futuristic laser weapons attached to Air Force aircraft. The old photo of the ruby laser penetrating a fake nose cone was supplanted by pictures of a gas laser disintegrating the real ceramic nose cone of a small tactical missile.

Engineering Problems

The initial excitement was calmed somewhat as the magnitude of engineering difficulties was better comprehended. While the physics of the new lasers was relatively well understood by both military and civilian scientists, the immensity of the engineering problems was unanticipated. Contractors found, for example, that the enormous powers of some high-energy lasers destroyed the mirrors required to give the feedback necessary to laser action, unless the mirrors were cooled by flowing water. In some cases, it was impossible to accurately measure the power output of the huge lasers, since conventional power-monitoring devices were literally consumed by the powerful infrared beams.

The present status of the high-energy laser weaponry program is multifaceted. While the Air Force Weapons Laboratory is the lead lab in the triservice program to develop a laser weapon, all the services, several government agencies, and a host of contractors are actively conducting programs of their own.

Most of this research centers around three different types of high-energy gas lasers, each of which uses strange techniques to achieve high-power infrared radiation. The operation of most lasers is passive in the sense that the lasing medium is motionless, but the high-energy lasers use supersonic jets of excited gas mixtures to rush huge volumes of activated material between the mirrors required for laser action.

The Gasdynamic Laser

One of the first, and still the most powerful, high-energy device yet reported is the gasdynamic laser (GDL). The highest reported power output from a GDL is 60,000 watts, but much larger GDLs, including one at the Weapons Lab, have since been built. The operation of this device involves the combustion of carbon monoxide, air, and water in a chamber. Nitrogen is injected into the heated combustion product, which contains up to ten percent CO_2, and the mixture is passed through supersonic nozzles and out an exhaust port. In a process fundamental to CO_2 lasers, nitrogen molecules excited by the 2,000 degrees Fahren-

The author, Forrest M. Mims, III, is a former Air Force officer who served as a photo-interpreter in Vietnam and a development engineer in the Air Force Weapons Laboratory's Laser Division. Though he has a degree in government from Texas A&M University, Mr. Mims has an active interest in science. He has developed an eyeglass infrared travel aid for the blind and a new type of rocket control system. Now a full-time free-lance science writer, Mims has written two books (one on lasers and the other on transistors), several technical papers, and more than thirty-five magazine articles.

heit temperature of the hot gases transfer their energy to the CO_2 molecules. Mirrors on both sides of the nozzle exits provide the optical resonance necessary for laser action, and the excited CO_2 molecules give off their energy as infrared with a wavelength of 10.6 microns.

A major difficulty with this type of GDL is the requirement to keep the gas mixture from losing its excited state during the passage through the supersonic nozzles. Nitrogen acts as the storage gas for the excitation, but the key to lasing is the CO_2 molecule, since nitrogen itself does not give off infrared.

Problems occur when the gases are mixed. While relatively slow flow rates do not necessarily affect the mixture, the high pressures and large nozzles necessary for very high power outputs "thermalize" the gases and inhibit laser action.

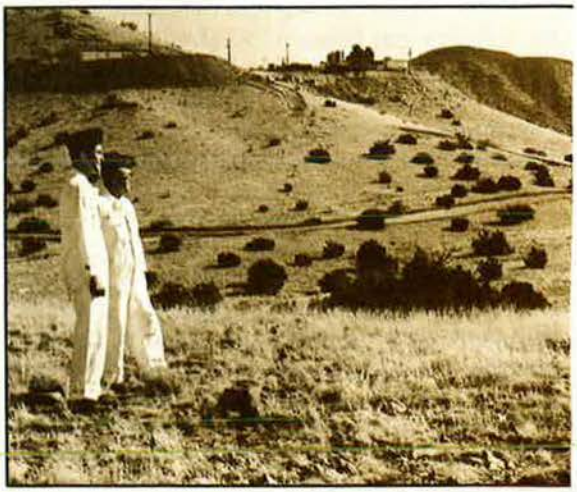
To eliminate this drawback, GDLs are being designed to operate in a variety of methods, not all of them involving combustion of the gases serving as fuel. One exceedingly simple GDL has been recently developed by Israeli scientists. In operation, the mixture of fuel gases is injected into a closed chamber and ignited by an ordinary auto spark plug. The resultant high-pressure gases undergo chemical changes, force open a valve assembly, and pass between two mirrors.

The Shock Tube GDL

In a noncombustion gasdynamic technique, a shock tube is used to achieve the conditions necessary for laser action. In this manner, brief pulses of high-energy laser radiation can be conveniently generated without the attendant problems of a combustion device.

The Air Force Weapons Laboratory is investigating the shock-tube GDL concept through contracts at the University of Washington, and in-house work. A large part of the newly completed addition to the Weapons Lab's laser building houses a complex system of gas storage facilities, heat exchangers, vacuum pumps, and pipe lines that can be used for testing shock-tube GDL concepts in controlled experiments. The most visible part of the system is a twenty-eight-foot diameter vacuum sphere used to suck the lasing gases through a thirty-inch test section that can be equipped with various nozzle configurations. Probe beams from small CO_2 lasers can be passed through the high-speed gas flow to check efficiency, gain, and other parameters of various gas mixtures excited to the lasing state by shock techniques.

A laser weapon testing site at a remote range in New Mexico. Photo does not show the extensive equipment that was provided later. Note the many gas trailers required to fuel the laser.



Capts. Ronald Selleck and Albert Takenhorst of the Air Force Weapons Laboratory's Laser Division inspect the range. A gasdynamic laser weapon prototype occupies the hillside facility.

In order to obtain reliable, high-energy Gasdynamic Lasers, many technical problems remain to be solved. The problems are far from trivial, as shown by delays in the testing program at the Weapons Lab and elsewhere, and other types of high-energy lasers are being given a hard look.

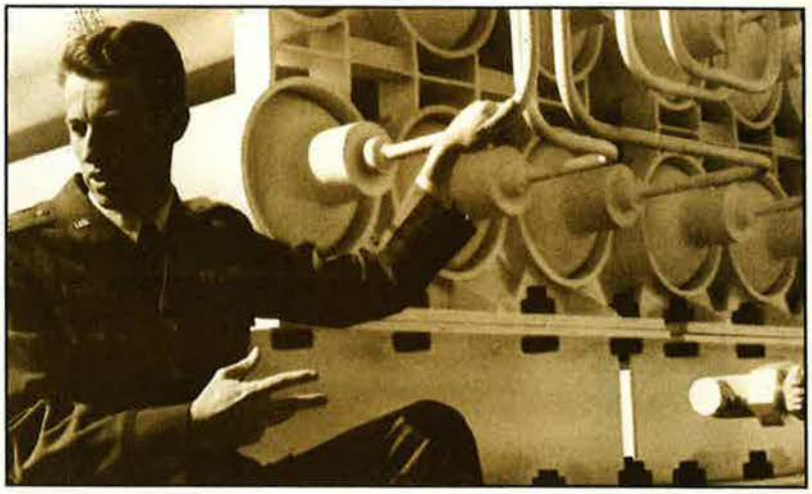
The Electro Aerodynamic Gas Laser

One strong possibility is the electro aerodynamic gas laser (EAL) invented by Alan Hill, a civilian scientist at the Weapons Lab. In a joint development effort with the Air Force Aero Propulsion Laboratory at Wright-Patter-

son AFB, Ohio, Mr. Hill and a team of Air Force scientists and engineers have developed the most powerful continuous electrical discharge CO_2 laser yet reported. The test laser has produced 19,000 watts continuously with an efficiency of 22.6 percent. Unlike the GDL, the EAL uses the same gases over and over in a closed-cycle system. Since the laser's "fuel" is recyclable, there is no need for heavy, bulky gas storage tanks.

According to an Air Force report on the laser, "Successful operation of the entire EAL system has established a technology base from which advanced, relatively compact gas lasers can be developed for military application."

Dr. Petras V. Avizonis, Technical Director of USAF Weapons Lab's Laser Division, has been involved in the weaponry effort from the start.



The Laser Division's Capt. Charles LaSalle describes a complex gas storage and mixing facility he designed to help study lasing effects in various gas mixtures.

Chemical Lasers

Another viable alternative is the chemical laser. An esoteric device that achieves laser action merely by mixing a variety of active gases, the chemical laser is potentially a very efficient, compact device. In a typical laser, nitrogen is heated by an electric arc and mixed with sulfur hexafluoride. The heated mixture is then forced through a set of nozzles much like those used in the GDL, and hydrogen is injected into the exhaust. Lasing takes place when the highly poisonous exhaust passes between two mirrors.

Chemical lasers built by Aerospace Corp. under Air Force contracts have produced more than 1,000 watts of infrared radiation at efficiencies of up to sixteen percent. Though well below the power levels of the GDL, the chemical laser produces such a large amount of energy in relation to its size that it is very much in the running as a potential laser weapon.

Though these three major laser systems are the chief contenders in the race to develop a laser weapon, the technology is advancing at such a dizzying rate that a number of other exotic systems may also become contenders. As the Weapons Lab's Dr. Avizonis puts it, "Pick your wavelength, pick your material, and you can make your laser."

An Antiaircraft Weapon?

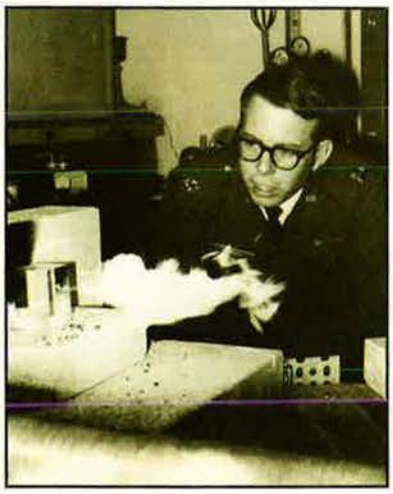
When a practical laser weapon is developed, all three military services will be in line with lists of applications. But Air Force applications may be more imminent since that service is in the enviable position of having the lead laboratory. Since current research and development efforts are heavily mission-oriented, it seems likely that a primary Air Force application will be an antiaircraft role. A large pile of aircraft wing sections at the primary target site of the Weapons Lab laser test range south of Albuquerque, N. M., lends support to this viewpoint. Additionally, it has been learned that this spring the Lab is scheduled to begin testing the tracking system of a prototype laser weapon against small radio-controlled drones.

A rotating target to which is mounted an infrared source suggests infrared tracking techniques might be used to point the prototype laser. Such optical tracking is inherently less complex than radar, and the infrared detection system could be coupled directly to the laser's pointing mirror. Whatever technique is em-

ployed, a hole neatly burned through a masonite card mounted adjacent to the target's infrared source suggests good accuracy.

The implications of laser weaponry for aircraft of the future are foreboding indeed. Some of the damage phenomena were vividly demonstrated in Weapons Lab experiments with relatively small CO_2 lasers. A 3,000-watt infrared laser beam drilled through solid plexiglass blocks at a rate of several inches a second, thus providing doubt about the future of conventional aircraft canopies. In another startling demonstration, a 100-watt CO_2 laser took more than a second to heat a sample of aluminum only about twelve degrees Fahrenheit above room temperature—but a hole was almost instantly vaporized through a sample painted with a thin layer of black paint. Since aluminum has a melting point of 1,220 degrees, the painted sample was heated to at least that point.

The effect of a laser beam on painted and unpainted aluminum is demonstrated by 2d Lt. Steve Cunningham of the Weapons Lab.



Capt. Dennis Mansell observes as the beam from a small high-energy gas laser pierces a block of plexiglass in seconds.

Effect on Aircraft Design

These simple experiments suggest that planes of the future may be forced to employ periscopes or other observation methods in lieu of highly vulnerable plastic canopies. The implication of the painted aluminum sample is that future aircraft may be unpainted.

Almost all paints have very high absorption in the infrared wavelengths emitted by high-energy lasers. To eliminate soft spots, therefore, aircraft fuselages and wings will even have to be devoid of insignia and other markings. The abundant use of camouflage paints on aircraft in Southeast Asia provides an indication of the magnitude of the problem.

Even if highly vulnerable materials are removed from aircraft, superpower laser beams might penetrate the unpainted skin of the plane. Already, industrial gas lasers are being used to cut materials such as three-eighth-inch titanium at linear rates of ninety inches per minute. And titanium has a melting point more than twice that of aluminum.

A frequent suggestion is to polish all metal surfaces so that the beam from a laser weapon would be harmlessly reflected, but the practical aspects of such a scheme are imposing. Discounting the highly absorbing deposits of carbon that tend to accumulate around jet engine exhausts, even highly reflecting, vacuum deposited aluminum films absorb two or three percent of the infrared that strikes them.

Other suggestions include flowing coolants under the aircraft skin, application of an ablative coating to all exposed surfaces, establishing a plasma around the aircraft, and ejecting infrared absorbing material or vapor from forward ports. One interesting possibility might be to employ polished-metal corner reflectors along the aircraft's fuselage. As with ordinary auto or highway reflectors, most of the beam of infrared striking the reflector would be reflected directly back to its source. If successful, the target might become the marksman, thus making things difficult for the aircraft carrying the laser weapon.

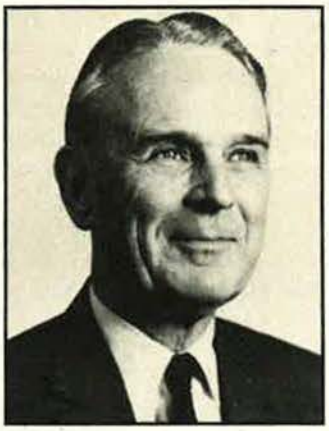
More conventional means of evading a laser weapon concentrate on the system's pointing and tracking gear. If infrared tracking is employed, for example, infrared flares and rockets might be employed as decoys. In deference to the uncanny accuracy of heat-seeking, air-to-air missiles, these items are stocked in many military aircraft already.

No US Monopoly

Right now, a working laser weapon capable of the military applications suggested here is still a gleam in the eyes of laser researchers at the Air Force Weapons Laboratory. Unfortunately, this country is not alone in the high-energy laser business; it is known that the Soviet Union has an extensive, well-financed laser program. Russian scientists were among the first to propose the principles of certain high-energy lasers, and Dr. John S. Foster, Jr., Director of Defense Research and Engineering, recently noted that "laser weapon systems are within the grasp of any technologically advanced nation." A strong research effort in this weapon system of the future can help guarantee the degree of readiness required to meet the potential threat of enemy laser weapon systems being employed against US aircraft. ■

Gen. Maxwell D. Taylor's latest book—an unflinching account of his personal involvement in the great events of the past two decades—is dissected by a participant in, and close observer of, some of those events. In *Swords and Plowshares*, General Taylor reflects a "point of view uniquely from the center of action" as he sounds . . .

A MORE CERTAIN TRUMPET



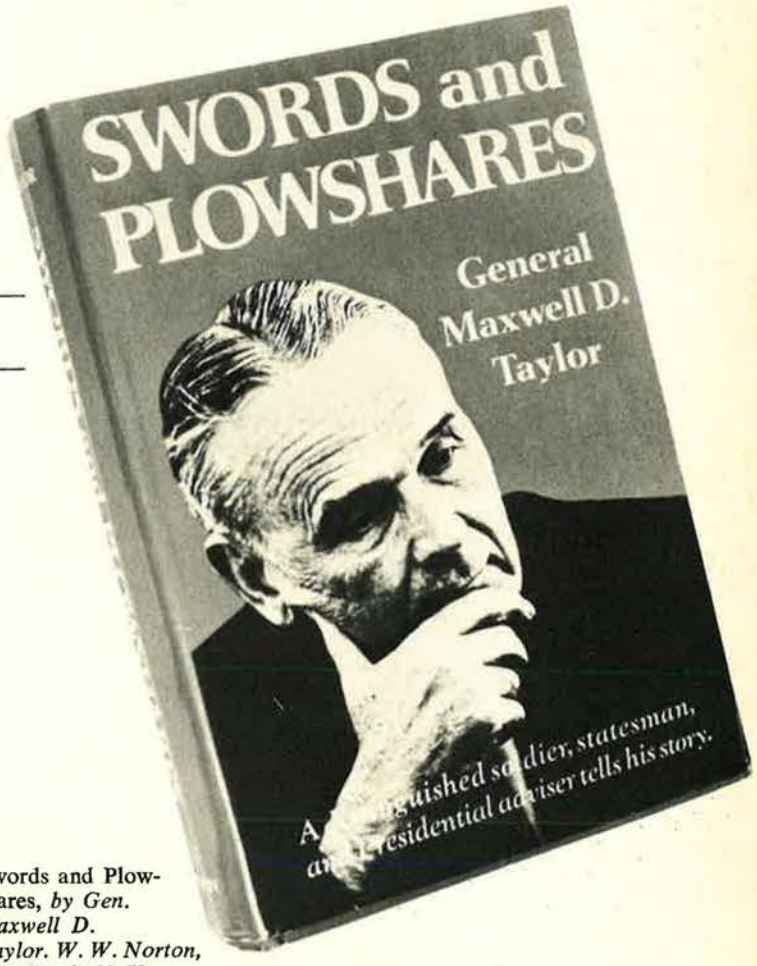
Gen. Maxwell D. Taylor, USMA 1922; Cmdr., 8th Army, Korea; Chief of Staff, US Army, 1955–59; Military Adviser to the President, 1961–62; Chairman, JCS, 1962–64; Ambassador to Vietnam, 1964–65; Special Consultant to the President.

By Brig. Gen. Noel F. Parrish, USAF (Ret.)

AT LAST we have a book on recent military problems that is based on both experience and research. For his title, General Taylor turns again to the Old Testament. In the preface, he reminds us that the familiar exhortation about sword-beating and spear-bending is countered by an exact opposite: "Beat your ploughshares into swords and your pruning hooks into spears: let the weak say, I am strong" (Joel 3:10).

A scholar in many fields, General Taylor explains, disarmingly, that the injunction to arm came first, for the prophets predicted the forces of evil must be found and conquered before peace can reign. Truly, the military-industrial reciprocity has always been more complex than its critics have recognized. General Taylor helps to explain some of these critics by another quotation: "War hath no fury like a noncombatant."

Surprisingly, Taylor's intent is not to silence



Swords and Plowshares, *by Gen. Maxwell D. Taylor. W. W. Norton, New York, N. Y., 1972. 434 pages. $10.00.*

critics or even to rebut them. It is a straightforward account of events and judgments of events as Taylor saw them or, in most cases, as he participated in them. In this, his third book, he is really a participant, not the victim of circumstances he was in his first book, nor the detached and "academolympic" spectator of global phenomena he appeared in his second. Indeed, there is revealed a considerable change in Taylor's own views and attitudes in these publications, evenly spaced across a dozen years.

In *Swords and Plowshares* Taylor refers not at all to his second book, *Responsibility and Response,* and only briefly to *The Uncertain Trumpet,* which brought him some fame if not fortune, and disfavor in the eyes of some military colleagues, including President Eisenhower, who felt he had violated their confidences. More important, as it turned out, the book brought the favor of an aspiring Senator named John Kennedy, who was looking for issues such as "the alleged missile gap," which, as Taylor puts it, he could use "as a stick to beat the Republicans."

After the Bay of Pigs, Kennedy called Taylor to the White House as "Military Representative."

Taylor favored Senator Lyndon Johnson during the 1960 primaries, because of LBJ's interest in Taylor's testimony during his many appearances before the Armed Services Committee where Kennedy, though a member, never showed up. Evidently, however, Kennedy sometimes stayed home with a good book, for after his nomination, he wrote Taylor "a friendly note regarding the strategic views presented in *The Uncertain Trumpet,* which he described as 'most persuasive' and 'helped to shape my own thinking.' "

The Levels of Loyalty

Eventually, President Kennedy, in deep trouble over the Bay of Pigs blunder, persuaded Taylor to occupy an office overlooking the White House as "Military Representative" and sent him to Gettysburg along with Allen Dulles to see General Eisenhower. Taylor asked Dulles "to toss my hat into Ike's office to see how he treated it," but "the General was his usual, cordial self." This is a gracious and deserved tribute to Eisenhower. In marked contrast to the "Irish Mafia" around Kennedy, including McNamara, Eisenhower was never vindictive toward those who disagreed with him.

Eisenhower, though offended by The Uncertain Trumpet, *received Taylor graciously at Gettysburg.*

What constituted proper loyalty in Taylor's view may seem a bit strange to anyone not familiar with the personal and emotional pressures of an early Academy background and a single service career. As Taylor saw it, disgruntled Army leaders and the Chief of Staff they pressured so heavily were not personally disloyal to the President; it was the President who was personally disloyal to the particular color of his old uniform.

Taylor says frankly that he arrived to take the oath as Army Chief of Staff in 1955 with plans which "primarily concerned ways and means to improve the combat readiness of the Army in support of a strategy of Flexible Response and to improve its morale depressed as it was by the precedence given to the needs of the Navy and Air Force by the ex-Army man in the White House. . . . I hoped also to remove the chill which affected the attitude of the President to his old service and work out some way of seeing him regularly."

The "chill" had, of course, resulted from the travail of Taylor's predecessor, General Ridgway, who had retracted his official "support" of the reduced Army budget. The President said his budgetary disagreement with Ridgway was caused by the General's "parochial" point of view. In any case, an appeal to any high official's loyalty as an "old soldier" could scarcely be expected to work, not even on General MacArthur.

In the American tradition, men who rise in responsibility are expected also to rise above local and "parochial" loyalties, and many military leaders, with the notable exception of General Bradley, have shown that it can be done. Among them are Admiral Radford, once the Navy's hero as its outstanding rebel and later the Navy's outcast as a force-reducing Chairman of the Joint Chiefs of Staff, and, most notably, General Taylor himself.

Gradualism, Airpower, and Armies

There is not much in the latter half of *Swords and Plowshares* that could be cited as special pleading on behalf of the Army. Taylor did not want a ground invasion of Cuba, though he supported the Chiefs' desire for a completely effective air attack and a complete blockade. He supported the Chiefs' demand for safeguards in return for their support of the nuclear test ban treaty, and he is now disturbed by Russian "expansionism under the protection of its increased nuclear armament" as well as the fact that "we are increasingly reluctant to spend the vast sums necessary for the maintenance of modernized strategic forces, even though the deterrent effect of those we have has been impaired by our disunity here at home."

In Vietnam, Taylor repeatedly resisted pressures from "Washington" to introduce more ground forces, and he often asked, vainly, for air strikes instead. This sort of thing happened even before our ground combat forces were introduced.

Writes Taylor: "I was greatly surprised that the offer of ground troops was made so casu-

ally, as it seemed to me a much more difficult decision than the use of our air forces." Concerning the first introduction of our ground combat forces, Taylor complains, "It was curious how hard it had been to get authority for the initiation of the air campaign against the North and how relatively easy to get the Marines ashore. Yet I thought the latter a much more difficult decision, and I concurred in it reluctantly." Taylor is understandably puzzled as to why ground warfare was restricted in Korea and unrestricted in South Vietnam while sorties over North Vietnam were "controlled rigidly from Washington in a way unknown over North Korea."

A further comment provides a partial explanation to the puzzle. Employing a metaphor first used by General Vandenberg with regard to US air pressure on North Korea, Taylor says: "Our most valuable blue chip, the bombing of North Vietnam, was obviously causing great pain to the enemy. His discomfort was evidenced by the violent propaganda campaign promoted by Hanoi and abetted by doves at home to make us stop the bombing." Obviously, one explanation for the sudden rise in aerophobia between the two wars is that strange new ornithological phenomenon—the fear of the cooing American hawk for the shrieking American dove.

Another explanation is suggested by Taylor's citation of "a misguided attempt to translate the principle of gradualism and limited violence from the strategic to the tactical realm." He charges, "Our pilots were required to return through increasingly heavy air defenses" to repeat attacks on targets that could have been destroyed in the first attack if a sufficiently strong first attack had been permitted.

What Taylor does not say, but former members of the Joint Staff know, is that the man whose strange compulsion it was to emasculate air attacks at the last minute was Robert McNamara. Why? Speculative explanations have been advanced, one going back to discontented factions in the old RAND Corporation, which furnished McNamara some early advisers. Another leans toward a newer thought-provoking group in the Brookings Institution.

The Demise of Diem

Such questions are beyond the scope of Taylor's book and are just a few among many that are raised by his candid accounts. Generally, he does not point a finger at anyone; he just raises his hand as a witness to events as he saw them happen. Yet on two occasions, he does fix primary responsibility for actions that already appear unheroic at best. One concerns the State Department; the other, Defense.

On the subject of the destruction of President Diem, Taylor's usually calm narrative becomes intense, and understandably so. He blames himself in some degree for eventually being drawn into a plot hatched by a small group in the Department of State and carried out with the help of a large portion of the press corps in Vietnam. It is an almost incredible story of the harm a couple of inordinately ambitious and uninhibited youngsters can achieve when assisted by a trio of bumbling oldsters and abetted by an always frustrated press corps anxious to get in on a piece of the action.

In this case, the principal instigator was Roger Hilsman, then Assistant Secretary of State. The plot was first exposed when "the group, later identified as Under Secretary of State Harriman, Assistant Secretary of State Hilsman, and White House Staff Member Michael Forrestal, drew up a cable, cleared it with Under Secretary of State George Ball on the golf course, and obtained clearance from President Kennedy in Hyannisport. It was then dispatched without the concurrence of the Secretary of Defense, the Deputy Secretary of Defense, or the Joint Chiefs of Staff, all of whom had a vital interest in its contents."

It seems the plotters had waited until a weekend when all who might question their trickery were away from Washington for a weekend, and also until conscientious Ambassador Nolting had been replaced by Nixon's 1960 campaign millstone, Henry Cabot Lodge. The strange cable authorized telling any Vietnamese generals willing to overthrow their President that they would receive our "direct support."

Lodge pretended in Washington that he would hold up action on the cable, but, once back in Vietnam, he informed various Vietnamese generals concerning its contents. Embassy personnel began leaking anti-Diem materials to the hungry press corps, who moved to arouse the American public. Diem was all but doomed by the spreading conspiracy.

Taylor and McNamara were at pains to try to guide the inevitable course of events, but to no avail. So many CIA, embassy, and other personnel were involved that the coup, when it happened, took even Taylor by surprise. He reveals that at the news of the death of Diem and Nhu, "Kennedy leaped to his feet and rushed from the room with a look of shock and dismay on his face I had never seen before." He had somehow been persuaded to believe the plot could be executed without bloodshed.

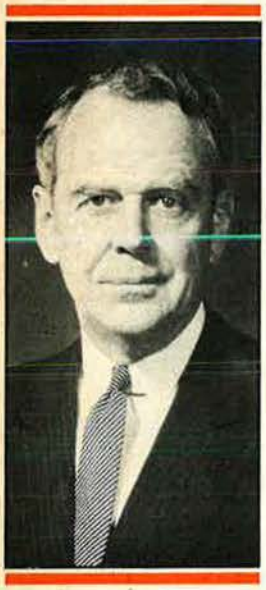
Diem's police and administrative system went down with him, infiltration on a large scale began, and no one appeared who could long remain in charge of the shaken country. President Johnson then sent McNamara and Taylor to Vietnam with orders to support

Under McNamara, there were misguided attempts to translate gradualism "from the strategic to the tactical realm."

the current incumbent—General Khanh—and "make the front pages of the world press holding up his arms." This they literally did, all over Vietnam, "in a posture befitting the victorious finale of a prize fight or of a political convention. . . . There was no doubt that he [Khanh] was the 'American Boy,' at least for the time being."

The ghost of Diem had become as the ghost of Banquo in a land without a feast. "President Kennedy and all of us who advised him bore a heavy responsibility . . . beyond the death of Diem . . . to the prolongation of the war." There was no evidence of American participation in carrying out the coup or the assassination, and the voice of the Kremlin, *Izvestia,* approved it all.

In the period of disorder after Diem, even Taylor, a true believer in our being there, might have been tempted to think of pulling out; yet "there was the memory of Diem to haunt those of us who were aware of the circumstances of his downfall. By our complicity, we Americans were responsible in some degree for the plight in which the South Vietnamese found themselves. That thought gave pause to any consideration of abandoning them."



Secretary of Defense Clark Clifford and his advisers thought Tet a Communist victory.

Tet and Its Aftermath

On a much later occasion, after the terrible Tet offensive and the replacement of McNamara by Clark Clifford, there was a conference on the future of Vietnam when "some of the civilians of the Department of Defense were taking a new tack which caught me by surprise." The civilians present were "Clifford, Nitze, Warnke, and Goulding." They interpreted the Tet offensive as a military victory for the Communists and as proof that military efforts were futile. They now argued we should "try to stalemate the situation with the resources presently committed and hope for a break."

There was also a surprising "misunderstanding" by the Defense civilians about some 200,000 troops that might be needed because of new developments such as the seizure of the *Pueblo*. "In the course of our discussions, their gist was leaked to the press in a distorted form, and the 206,000 figure was publicized as a firm request for reinforcements," which it was not. Obviously, these "civilians from Defense" were trimming sail for a new tack, and they exploited a chance to place the blame on uniformed members of their Department, as had become the custom.

When it became obvious which way the Presidential face was newly set, the entourage began to help him too far and too fast. The once impatient demand to advance had suddenly turned into an equally impatient "search for peace." Even Acheson, Vance, and Bundy became pessimists, and the indefatigable Harriman was sent with Vance to achieve an "understanding."

In return for relief from our bombing, the Communists agreed to stop outright their invasion of the South. Of course, they never intended to admit or to honor such an understanding. Their violations of it went unpunished from the start. Thus, the cessation of the bombing as an inducement was lost, for no gain. The understandings "were a hoax, largely self-perpetrated."

Taylor watched the peace negotiations on Vietnam become more hopeless than those of Korea when our "overreadiness" to make unrequited concessions and our "failure to insist on reciprocity . . . largely nullified the successes won by our fighting men." Of those fighting men, Taylor says proudly that, despite their rapid deployment into a new and strange environment, "in hundreds of combats with a war-hardened enemy" they "never suffered a reverse worthy of the name."

Influence of the Media

Why have we failed these men? Why did "Washington" sometimes display a volatility even more unpredictable than the vagaries of public opinion in the nation starving for consistent leadership? Taylor blames "the effect of media reporting of the Tet offensive." Most of the President's readily reversible advisers "lived in news enclaves dominated by the New York *Times* and Washington *Post*.

"It is all very well to say that intelligent sophisticates of the Eastern Establishment would be immune of the effects of media bias," Taylor explains, but his own experience as a resident of foreign nations where "selective reporting" consistently pursued a single theme caused him to admit its effect even on himself. No one in the Administration seemed to want to be caught trying very hard to correct the public misconceptions caused by writers who became obsessed with a desire to shape events, rather than simply to report them.

Taylor could not help much with this problem: "My experience certainly did not include public relations." He demonstrated this by his failure to forestall what the President's panicking followers, shaken by the fall of "Mighty Mac," would do with General Westmoreland's "contingency" figures involving 200,000 men. He should have known the effect his proposal to call the Reserves would have on officials who remembered the political damage caused by that policy during the Korean stalemate.

Nor did he seem to grasp in time a most important cause of the difference in public acceptance of our involvement in Korea as against

that in Vietnam. Sage indeed was "a prescient warning" by the Joint Chiefs in the early years "that the American people would probably respond better to a firm initial position than to courses of action which would lead the country in gradually." Obviously they would, and did, object to being "led in," and the more gradually it happened, the more they believed themselves tricked and deceived.

Misreading the Communists

Finally, Taylor, along with the others who were in and out of Washington, must be faulted for repeated failure to understand that the Communists are even more preoccupied with "public opinion" than we. While our leaders react to opinion, or to whatever they are afraid it is, Communist leaders act to create it. Many of their thought-dominating actions require the ready sacrifice of their most expendable resource—the lives of their people.

As early as Korea, Taylor found it "a sobering experience to observe the willingness of the Chinese to expend their lives in great numbers right up to the last day." This was obviously for "propaganda" reasons, certainly not for military ones. Yet of the Communist decision in 1968 to abandon protracted war and launch the costly Tet offensive, Taylor says: "I have never understood why that decision was taken."

Also, he failed to see a reason for the Communist attack in the Tonkin Gulf, and in the last chapter of his book, he unfortunately states "while the final outcome is still uncertain in mid-1971, the decline in intensity of enemy military operations and the steady reduction of American forces afford strong reason to believe that we are in the final phase of at least the military hostilities." Since those cheerful words, the Tet offensive has already been surpassed by a far more serious challenge, and a blatantly obvious rerun of the Tonkin Gulf affair has been successfully staged.

Taylor admits at one point that maybe Ho understood us better than we understand ourselves. Who among those who have fought most valiantly really knows the nature of the foe? Were we too busy preparing flexible responses to see clearly the enemy's inflexible will?

More What Than Why

General Taylor satisfactorily explains his change of view about the functioning of the Joint Chiefs of Staff during his experience as Chairman, and he shows that his rare view from the top both here and in Vietnam has expanded his once "parochial" opinions as to what should be the flexibility of our response; yet he is reluctant to examine or explain the cause and nature of that change.

He would do us a great service to produce another narrative of his encounters offstage, which have contributed toward a more extensive understanding. As for now, it is important to recognize the value of what General Taylor has accomplished in *Swords and Plowshares.* Because he is still searching for better answers and deeper meanings, most of the book is straightforward and, therefore, excellent history. It is primarily an account of what happened rather than a too strenuous effort to explain why.

At this time, when many American historians are overloaded with what they declare to be "self-evident moral principles" and are following faddish ideologies, this kind of new history is a pleasure. All but the final two chapters display the excellent organization and polished prose expected of a serious work. But the book remains spontaneous and interesting from the frankly personal flavor of the narrative. No future evaluations of our recurrent sword-making and sword-breaking since the Korean War's beginning can ignore it. Whether or not there is always agreement with its point of view, that point of view is uniquely from the center of the action. ■

During the fifteen years prior to his retirement in 1964, Brig. Gen. Noel F. Parrish, the author of this article, served as Deputy Secretary of the Air Staff; Special Assistant to the Vice Chief of Staff, USAF; Air Deputy of the NATO Defense College; Assistant for Coordination, DCS/Plans and Programs, Hq., USAF; and Director of the Air University's Aerospace Studies Institute. After completion of a Ph.D. in history at Rice University, General Parrish joined the faculty of Trinity University, San Antonio, Tex.

CHECK FLIGHT

Several years ago, while still on active duty, I was en route to Europe on a MAC C-135 when the flight attendant conveyed the aircraft commander's invitation to come up front. The AC, a captain, introduced himself. Was I familiar with the C-135? As a CRT veteran of the B-25, Gooney Bird, and T-29, I wasn't. He patiently explained the then-exotic equipment, observing that it was a little different from the bird we last flew in together.

"Sorry," I said, "but I don't seem to remember you."

"Colonel," he replied, "I'll *never* forget you. You failed me on my first sixty-hour check in Primary."

—CONTRIBUTED BY JOHN L. FRISBEE, EXECUTIVE EDITOR, AIR FORCE MAGAZINE.

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

There is a prospect that, in the near future, antimilitarism will be defuzed, and the US will encounter a social phenomenon already noticeable in other Western nations . . .

The Descending Spiral of A ilitarism

By Col. Richard F. Rosser, USAF

BY THE next decade, a major factor affecting civil-military relations in the United States will be the attitude of contemporary youth toward the military in general, the military as a profession, the concept of military service, the use of force in international relations—in effect toward those concepts summarized in the West Point code of behavior: "Duty, honor, country." I suggest that the predominant attitude of American youth toward the military by 1980 will be one of "amilitarism," an apathy toward the military and all things connected with it.

Amilitarism is not the normal description of the attitude of many American youths toward the military just a few months ago. The young men who made the headlines by burning draft cards, storming the Pentagon, and distributing underground newspapers on Army posts were not indifferent to the military. We generally saw the phrase "antimilitarism." And no doubt that attitude existed, and still exists for some.

Because antimilitarism has occurred in this century before, the older generation in America tended to brush it off as transitory. Their evaluation is largely correct. Antimilitarism is never static. It seems to be greater in a given Western society: (1) the higher the rate of technological advance and sociological upheaval; (2) the more unpopular the functions armed forces perform, externally and internally; and (3) the larger, more obvious, and more expensive the military establishment. Starting from these assumptions, the United States qualifies as the society experiencing the greatest degree of antimilitarism today.

However, the vital question is what replaces antimilitarism when the above variables change, when antimilitarism is defuzed as it probably will be in the United States after Vietnam. Here we must draw on the experiences of the other advanced Western nations. They appear to be over the hump as far as violent antimilitarism is concerned. They largely avoided or defuzed it earlier by reducing their armed forces, by opting for a volunteer army in Britain and Canada, and by eliminating unpopular foreign commitments. Increasing use of armies for internal security may counteract this earlier achievement. Moreover, these societies have not yet caught up with the United States in regard to the state of social and technological change. But the antimilitarism that did exist seems to have been replaced by amilitarism among their young people.

There still is too little known about the attitudes toward the military of our own social, educational, and racial groupings to determine whether antimilitarism is even now being displaced by amilitarism. We are dealing with a complex phenomenon in a complex society. Strains of antimilitarism, amilitarism, and *pro-*

militarism exist side by side among white and black youth, college-educated men and high-school dropouts, sons of middle-class parents and of "hard hats." Yet I predict that amilitarism, just as in other Western nations, will become dominant in the United States by the next decade. There are several reasons for this expectation.

Long-Range Trend

In the West as a whole, the most fundamental long-range trend affecting the attitudes of contemporary youth toward the military is the extraordinary rate of change in the twentieth century. Any major crisis in a society—war, revolution, economic depression—places a great strain on traditional customs and mores. And no century has witnessed such upheavals as our own. These social changes have been compounded by unprecedented developments in technology and their impact on the economic system, the political structure, and all aspects of society.

The cumulative effect of the above changes is clearly profound. The very nature of the "Establishment's" authority is in question. The leaders of political, religious, educational, and economic institutions are under pressure not just to make reforms, but to explain why their power should be considered legitimate. The armed forces—that most Establishment of all organizations in the advanced West—inevitably is called into question. How could it have been otherwise? The American armed forces are now labeled unnecessary, brutal, inhuman, irresponsible, wasteful, and, at the very least, inefficient.

The leaders of the fight for social change in the United States come from all strata and age groups, but most of all from the college youth. Their generation is the first to suffer the full impact of the accumulated changes in society; they are affluent students, supported by affluent parents or state scholarships, with time to think—and demonstrate. They have learned how to dramatize their cause. Columbia University's then-President-elect William J. McGill testified before the President's Commission on Campus Unrest in August 1970 that as many as fifty percent of all collegians now belong to an "alienated culture, hostile to science and technology, which is growing at a very rapid pace." The majority of the "alienated" students, incidentally, appear to be studying liberal arts.

America's college population does not represent all American youth. But a higher percentage of young people go to college in the United States than in any other country. Perhaps forty percent who are of college age—some 7,000,000—enter institutions of higher learning. Almost all future political and business leaders will have gone to a university, and, by requirement of the armed forces, most officers. (The military academies, four-year degree-granting institutions, must be counted as universities.)

Pressing for Change

It has been suggested that the students who press for change are largely children of left or liberal parents. Yet a significant development is the number of young people from WASP Establishment families who now are questioning the system, in particular the Vietnam War. After talking with his children, Secretary of the Interior Walter J. Hickel wrote his famous letter to President Nixon, pleading for more understanding of the antiwar attitudes of the young. Ohio Republican Sen. William B. Saxbe viewed most antiwar dissenters as "crazies" until he received a jolting letter in June 1970 from his "most conservative" son—a Marine lieutenant—asking his father to help end "a war that is contrary to everything I've been taught to believe about America."

The actual number of true radicals in the college population who espouse violent change is very small—perhaps no more than one or two percent. The striking thing, however, is the large number of students opting for a withdrawal from Vietnam, a reordering of national priorities, and a change in life style.

Much has been made recently of the relative quiet on college campuses. This calm should not be misinterpreted. There is a massive reaction against the use of violence to effect change. But recent opinion polls suggest that students are even more uneasy and worried about society in 1972 than in 1970. More of them believe that we have a sick America on our hands; only a handful believe our national policies will lead to peace or economic well-being.

Of special interest, students are even more concerned about Vietnam—still the number-one indication in their minds that the American political system is not working properly. As a result, students are increasingly pacifist in outlook; there is a marked trend toward rejecting force as an instrument of policy for almost any reason. Understandably, patriotism as a personal value is decreasing.

We have yet to discuss the students, mainly in the engineering sciences, medicine, agriculture, and other technical fields, who are not "turned off" by the Establishment. Combined with the blue-collar children who go straight from high school to work or to war, they form some eighty percent of their generation. This majority tends to follow parental politics. Yet it is hardly quiescent, joining the disaffected

college group in diverging from parental guidelines on hair, dress, and drugs.

The Effect on Recruiting

Here we turn to the central problem of this article: How will the attitude of youth toward the military impact on armed forces recruiting by the 1980s? I will examine this question with the assumption that the draft will be phased out sometime in the 1970s. The armed forces then will rely completely on volunteers.

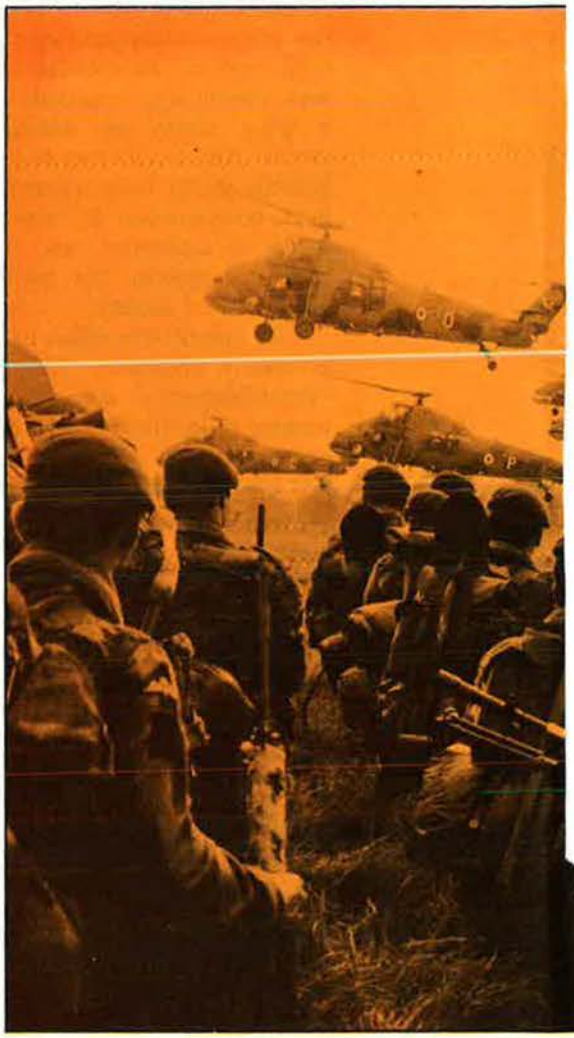
Establishment college youth may provide a sufficient reservoir of officer manpower. Military recruiters seem to think so, balancing the loss of Reserve Officer Training Corps units at prestigious Ivy League universities against other schools on the waiting list for units, and drawing hope from the recent increase in

With the end of the military draft, the armed forces will be hard pressed to recruit the number and kind of people they need.

ROTC scholarships. The critical imponderable is what happens to this major source of officer recruitment if a volunteer army becomes a reality.

Young men appear to join ROTC primarily so that they may avoid the draft, finish college, and later serve as officers rather than as enlisted men. This motivation is graphically demonstrated by the small percentage of ROTC graduates who continue in the service after their initial obligation. A somewhat higher percentage of officers from the various Officers' Candidate Schools, the second largest commissioning source, remain in the service. A majority of Academy graduates remain, but even that percentage may be declining. Moreover, the Academies still provide only a small fraction of the new officers entering the service in a given year.

There is a further question, rarely asked, about officer recruiting in the absence of the draft: What kind of young men will volunteer for the officer ranks? There would not be the broad spectrum now in the service. We just have noted the loss of ROTC units at Ivy League schools and the disaffection of the liberal-arts students from the Establishment. In short, there is the prospect of an officer corps increasingly unrepresentative of society as a whole. I am not concerned, however, with



The British Army, faced with recruiting and retention problems,

the supposed danger of an isolated "military caste" backed by an "out-of-control military-industrial complex." The problem is that a modern armed force needs highly intelligent officers with training in all the disciplines. Moreover, the military would seem to have much more sympathetic support for its needs if it is broadly representative of society.

The recruiting situation where enlisted men are concerned is even less encouraging. Draftees comprise only twenty to twenty-five percent of the Army's strength, but Pentagon studies show that thirty-eight percent of the enlistees in all the services would not have volunteered without the pressure of the draft. The Air Force, for example, admits that, until recently, it had young men with high IQs waiting in line to volunteer in order to avoid the Army.

has reduced its size and cut back foreign deployment.

How then do we man the armed forces, and procure the right kind of personnel? The President's Commission on an All-Volunteer Armed Force, the "Gates Commission," believes the primary answer to be better pay, especially for first-term officers and enlisted men. However, there is considerable doubt as to whether a mere pay raise is sufficient inducement to procure the required numbers of men, with the proper skills, and to keep them in the service after their initial commitment. In the coming decade the United States will see the further development of trends that will make even the young man who is essentially pro-military think twice before joining the armed forces, regardless of pay.

One of these trends is the declining world role of the American military, implicit in such policies as the Nixon Doctrine. The American armed forces have yet to enter the era of a drastically altered mission. Yet, by noting the British experience, we can gain some idea of the impact that may result from a change in the nature and scope of an armed forces' mission or recruiting.

The British Experience

Young British gentlemen used to join the army or its colonial offshoots for travel, excitement, leisure, sport, congenial companionship. Many, coming from families where military service was hereditary, thought that this was the only way of life. The lure of adventure in distant lands—not service in Britain—was a powerful motivation for enlistment. Even the enlisted ranks, largely composed of Irish peasants and urban poor, must have been attempting to escape a confining environment at home.

Life for a British soldier today is quite different. He probably will spend most of his career in Europe, primarily in his home country. Unfortunately, the densely populated areas of Europe are not conducive to active soldiering. Moreover, the standard of living in Britain —particularly for the officer corps—is considerably below that which had been typical of Imperial postings.

Today, the British soldier is part of a deterrent force which we all hope will never be used. But what happens to armies when they never fight? The populace begins to question whether they are really necessary, and a young man inevitably asks whether service in the armed forces is worthwhile. He may see "combat" but only in performing internal security duty. And there is no more distasteful and frustrating assignment for a military man in Western society. This is not the enemy he expected.

The changing role of the armed forces in major Western industrial societies such as Britain undoubtedly is having an effect on recruiting. Boys who once joined the British Army to see the Middle East, says one British schoolmaster, now go into middle management. They believe that they can see more of the world with an oil company than in uniform.

Others suspect that the recruiting problem has deeper roots. A public school teacher who

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has been closely associated with the British military academy at Sandhurst and with officer recruiting comments: "There is a general failing among boys to appreciate why we need an army, a feeling that 'the army is not for me.' They are searching for something which they feel is more purposeful, rather than what seems to many to be a negative, unproductive policing job at the present time."

Increasing Contrast

There is a second trend that will make the services less attractive. I refer to the increasing contrast between life in the military and life as a civilian in the mature industrial state. A man can be patriotic, satisfied with the pay, and still not enlist or extend because of the relative hardship of life in the military compared with a similar job in the civilian economy.

Polaris nuclear submarine officers are a case in point. They are handpicked, highly trained, and motivated seamen. Yet such men are leaving the service in increasing numbers. In the US Navy, they spend sixty days under water, then ninety days in port with sixty of these days ashore devoted to intensive training. Many officers have been assigned to submarine sea duty for up to seventeen years. If they leave the Navy and join private industry, they earn more money, spend every night with their families, and still do a task which is considered a service to the community. The seriousness of the retention problem is demonstrated by the unprecedented bonus of $15,000, which the Navy gives promising Polaris officers with eight years of service who volunteer to remain on duty for an additional four-year period.

The contrast between other jobs in the civilian and military communities may not be as great, but it is there. Relatively few jobs are left in a modern military organization that are completely unskilled or lack a civilian equivalent. The services need computer programmers, missile repairmen, electronic technicians, jet engine mechanics, pilots—the list of skilled occupations is almost endless. Advanced societies have an equal need for such valuable skills, and soon will probably offer thirty-five-hour working weeks with considerably higher pay for almost exactly the same kind of work.

Shifting Values

A third trend militating against recruiting for the enlisted ranks is hard to quantify, but definitely exists. Societal values are shifting in the United States toward increased individualism, equality, and cultural and educational uniformity. The average young recruit entering the service today is likely to be at least a high school graduate, expecting to earn $600 to $800 a month and have his own car in civilian life. A decade ago he rarely would have graduated from high school and his earning expectations were much more modest. Yet this young man still goes through the traditional derogatory and harsh recruit-indoctrination procedures. (It should be noted that the US Army is now carefully reviewing its basic training program in respect to such criticisms.)

The significance of the egalitarian ethic for the enlisted man does not necessarily diminish after basic training. Indeed, it may grow as he comes into closer contact with the officer ranks. Based on personal experience, I can testify that a considerable number of enlisted men no longer accept the armed forces' definition of an officer. They do not believe a college education is a sufficient distinction, since many enlisted men have, or gain, a college education while in service. (Enlisted men who enter the service with college degrees are primarily draftees.)

Air Force enlisted men, moreover, do not believe that a pilot is automatically qualified to be an officer. It may be that in many service specialties the traditional distinction between officer and enlisted man is no longer relevant, and indeed is a needless irritant. Discipline and rank certainly must be maintained, but there could be equal opportunity for all to advance through the ranks. Police forces have operated on this principle for decades.

The officer structure itself is no longer free from the egalitarian trend in American society. The "Concerned Officers' Movement" has made national headlines by speaking out against the war in Vietnam. But even more extraordinary is the fact that the leaders of this movement initially were considered to be excellent

young Naval officers with impeccable academic and military records in ROTC or Officers' Candidate School. One of these men commented, "The Navy has no questioning, and I'd just spent four years questioning things." Establishment youth cannot totally escape wondering about the "system" while at a university. What is more natural than to question the first organization they join—the military?

Nature of the Commitment

A fourth trend in the advanced societies also affects both the officer and enlisted ranks: the nature of the commitment to the organization. In mature Western societies, an individual with a skill is highly mobile. He does not feel the same degree of loyalty as did his father to a given company, industrial concern, or educational institution. The professional man supposedly is loyal to at least his profession. But even this may be breaking down. Physicians, for example, are charged with having forgotten their Hippocratic oath; professors, their students.

Even if he is patriotic and satisfied with the pay, an individual may reject a military career because of the hardships and sacrifices.

This trend finds its inevitable reflection in the service. Older officers cannot understand why younger officers are not philosophically and psychologically committed to a thirty-year career when they receive their commission. In part, military professionalism, like professionalism in other areas, is weakening. Why should an officer make sacrifices for an ideal, a young captain asks, when few others in society are prepared to forego the good life?

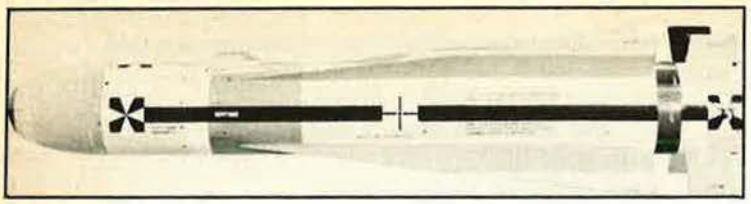
Perhaps the biggest challenge to the concept of military professionalism is the need for specialization in all ranks. Young men in the service increasingly think of themselves as meteorologists, pilots, economists, electrical engineers, political scientists, nuclear physicists. If they have a commitment, it is primarily to their particular profession or discipline, and secondarily to the military profession.

Today the officer with a professional skill may be most concerned about his opportunities to practice his particular specialty and to advance in that specialty. He will stay in the service if he considers that his opportunities in this regard are equal to or better than in the civilian community. To put it bluntly, his basic question is what can the organization offer him —not what can he offer the organization. (The more idealistic leave for additional reasons. They are frustrated because the organization is not immediately ready to act on their prescriptions for change.)

The American soldier is much better off today with regard to pay, training, and living conditions than his predecessor. But the attractiveness of his job always is relative. And the armed forces demand a degree of commitment, of professionalism, of sacrifice, of hardship which increasingly diverges from that demanded by other sectors of an advanced, democratic society. Above all, he will be asked in the coming decades to accomplish tasks which probably will be both more difficult and less popular.

Thus is born the major security dilemma of the next generation—*not* how to live with the "delicate" balance of terror, but how to maintain an effective armed force in a democratic society where the mood among the young is amilitarism. Once a society begins to downgrade its armed forces, a descending spiral seems to take hold. The less valued the military function by the public, the fewer good men join the military. The fewer good men in the military, the more derogatory the opinion of the public about the armed forces—and the less money appropriated. At some point, the spiral will stop.

Few in the West are ready for unilateral disarmament. The unanswerable question is whether the resulting armed force will be sufficient to support a society's foreign and defense policy. For it is doubtful whether any general war in the future will permit leisurely mobilization. Even minor crises between major powers require forces in being. And an armed force once torn asunder is not easily or quickly rebuilt, particularly in the last decades of the twentieth century. ■



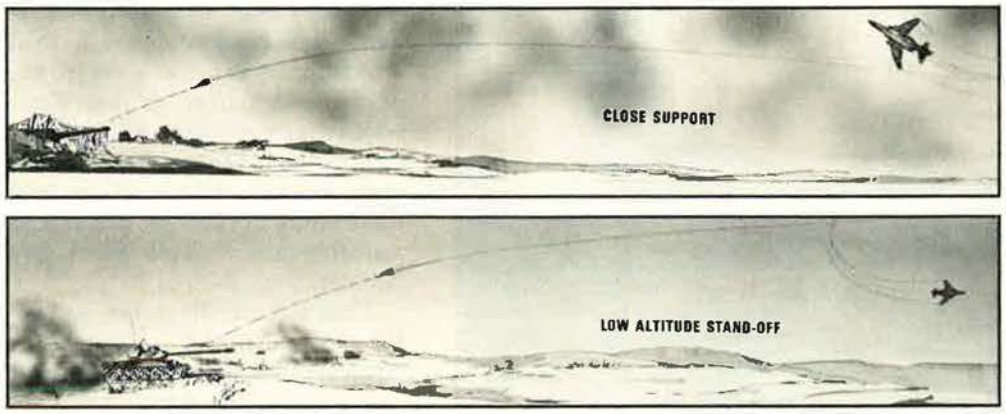
AGM-65A, USAF's new tactical missile, is a TV-guided standoff weapon.

THE Air Force's ground-support capability will increase dramatically when its new rocket-powered, TV-guided tactical missile, the AGM-65A Maverick, attains operational status early in 1973. Col. James A. Abrahamson, Maverick Program Director, told AIR FORCE Magazine that the versatile, standoff, air-to-ground missiles will be available to the Tactical Air Command for deployment on F-4 and A-7 aircraft next year. Eventually, a substantial number of the 500-pound, eight-foot-long missiles, built by Hughes Aircraft Co., might be obtained by the Air Force.

The Air Force's tactical punch will receive a marked boost next year when a sophisticated, conventionally armed missile will enter the inventory in quantity. Already established as a highly reliable and ex-

MAVERICK—TAC'

By Edgar Ulsamer
SENIOR EDITOR, AIR FORCE MAGAZINE



Maverick is shown here in two of its four basic deployment modes. For the time being, USAF's new tactical missile is used only as a visual weapon, but DoD has authorized development of a laser-guided version.

Guided by a miniature TV camera in its nose, Maverick uses a centroid tracking system that "locks" the missile automatically to the center of small field targets like hardened fortifications, radar sites, buildings, tanks, or armored vehicles. While the exact manner in which this is accomplished can't be discussed, the TV guidance unit is very accurate.

Mounted on the carrier aircraft's wing pylons, Maverick, through its nose camera, presents a view of what it sees to the pilot on a master TV screen in the cockpit. Once the pilot has located a target in a standard visual manner, he shifts his view to the TV screen, and, using a hand control unit, centers the camera's cross-hair sight on the target. The pilot then activates a lock-on and launches the missile.

Once launched, however, Maverick operates on its own; it is guided automatically, and independent of the launching aircraft, to the point to which its TV seeker has locked on. Because of this feature, it matters little whether the target moves or not. This capability also permits the pilot to attack other targets or leave the area, once the missile is launched.

Maverick can be used against any target "the pilot can see," according to Colonel Abrahamson. Its exact range is classified, "but it can be used in close to a target, or at fairly long distance." Maverick, one of the so-called "smart missiles," is a far cry from the older, more conventional air-to-ground missiles, which operate either in a purely ballistic mode or must be guided all the way to the target by the pilot.

In the case of Maverick, Colonel Abrahamson explained, "the pilot need only slew the seeker over the target; he doesn't have to put the pipper exactly on the target as he would with a gun or earlier TV-guided weapons. With the seeker on the target, the pilot achieves a lock-on and then he is free to launch the missile and leave the target area. The missile 'remembers' the target and guides itself to a hit."

Recent tests in Europe under adverse weather conditions proved that, if sufficient visibility exists for the pilot to see a target, Maverick can be employed. Although the missile is a visual weapon, tests have proved that Maverick can be operated under some very low ceilings and in weather bad enough that the weapon's use would surprise an enemy.

Except for its guidance unit, the entire weapon system is designed for simplicity. One of the design ground rules was to keep modifications to the carrier aircraft to a minimum. The system requires TV cables in the aircraft wing, a few relay switches, a TV display unit, several more switches, and a hand-controller in the cockpit.

The highly successful flight-test program of the Maverick system enabled the Air Force early this year to end the demonstration phase ahead of schedule and with twenty-seven rather than the initially scheduled forty test launches. In keeping with the renewed DoD emphasis on operational testing, some of the extra missiles will be used in a joint operational test in concert with the US Army. These tests will be con-

ducted at Fort Riley, Kan., and will allow the Tactical Air Command an early opportunity to exercise Maverick employment concepts in a "two-sided," tactical environment.

Maverick's unit flyaway cost is between $20,000 and $30,000, calculated on the basis of the present "buy" of 2,000 missiles. The system is being developed and procured on the basis of a Total Package Procurement contract, the only major Air Force contract of its kind still in effect. The current production phase is based on a contract entered into by the Air Force and Hughes Aircraft Co. in July 1971 and valued at more than $70 million. The fixed-price development portion of the contract totals a bit more than $100 million.

While Colonel Abrahamson expressed doubt about whether the government would "use this procurement method if we had to do the job over again, Maverick can be seen as a successful application of this concept. Of course, we had a chance to learn from the problems of some of the earlier TPP contracts." He said a key advantage which the program derived from the total package procurement structure "was that it presented a strong deterrent to 'gold-plating.' Its principal drawback, on the other hand, was the fact that TPP is rather inflexible."

Although the program has experienced cost growth, the *bête noire* of all other TPP programs, it has been kept below the contract's ceiling, according to Colonel Abrahamson.

One of Maverick system's fundamental design features, and its key to system's growth, is its modular structure. The Air Force is already exploring the potential for different guidance modules which could add unique capabilities to the weapon system. Laser guidance looks attractive, Colonel Abrahamson said, primarily in the close air support role, because the laser becomes a communications link with friendly troops or an air controller as well as a guidance technique.

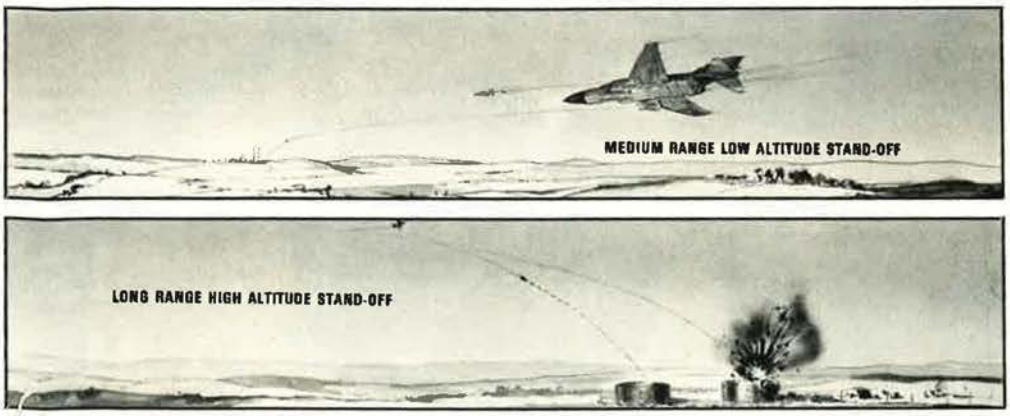
Be that as it may, the TV Maverick is already an excellent support weapon as well as an interdiction system. With laser designators available to the man-on-the-ground, the foot soldier could mark and guide the missile to targets the pilot cannot see. The advantage that TV offers is that target designation is not required, and the pilot has available to him a highly accurate and self-sufficient launch-and-leave system. An infrared guidance system, while much more expensive than the present TV system, could provide a night capability equivalent to the Maverick's exceptional daytime performance.

Colonel Abrahamson believes that Maverick's test results to date have been truly outstanding and that they have provided a firm basis for the Air Force decision to begin full-scale production.

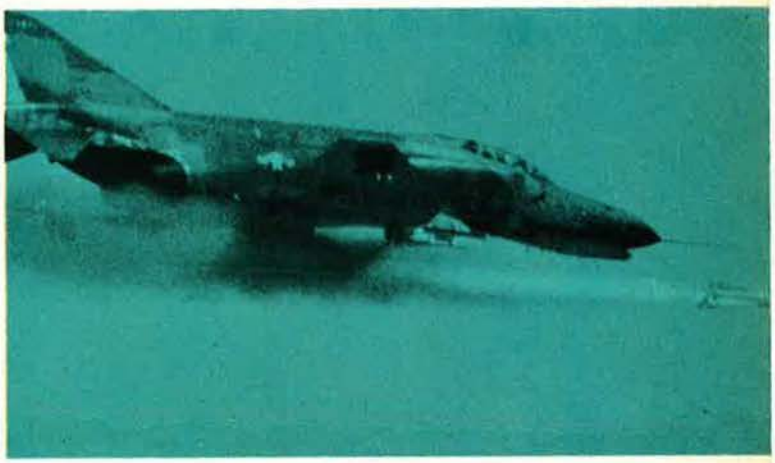
The outcome of the pending joint field tests will determine whether the Air Force will exercise its option for an additional quantity of Maverick missiles before October 1972, according to Air Force Secretary Robert C. Seamans, Jr. ■

tremely lethal standoff weapon capable of destroying hardened targets from afar, the new missile is . . .

Unique, New 'Smart Missile'



Maverick has been successfully tested under very low ceilings and in weather bad enough to surprise an enemy. Once it locks onto a target, Maverick remembers the target and guides itself to it.



A Maverick missile is shown following launch by an F-4. Mounted on the carrier's wing pylons, Maverick's nose camera presents a view of what it sees on the pilot's master TV screen.

Air Force Magazine
September 1972

UNITED STATES AIR FORCE
SILVER ANNIVERSARY
ISSUE

Advertising Reservations Close
August 4th, Copy Required
By August 16th

Airman's Bookshelf

Perceptive Sinology

China Returns, by Klaus Mehnert. E. P. Dutton, New York, N. Y., 1972. 322 pages. $10.00.

China's Cultural Revolution was more than just a power struggle. Millions of Chinese were swept up in its demonstrations, political-action meetings, and public readings from the "Little Red Book." The attitudes and ideas that were spread during those chaotic days have become part of contemporary China. Mao buttons and the Little Red Book are still everywhere; so, too, are some more important traits—a widespread feeling of confidence, self-reliance, and a hard-driving determination to increase production "for Chairman Mao and the state." Today, China is a work-oriented society struggling to industrialize itself in a hurry, and doing so with the willing cooperation of its people. How that cooperation is obtained and what it means to those people are the themes of this book.

The cult of Mao is the key, the author suggests. Mao is everywhere; his picture or statue is seldom out of sight, his thought monopolizes the radio, and his quotations pepper the speech of scientists and peasants alike. It is a massive tribute to Mao—but it serves his purposes as much as his ego. While his image focuses Chinese loyalties, Mao's words urge his countrymen to work hard, increase production, and strengthen and modernize China. This technique makes devotion and involvement, not personal gain, the motive for work. It depends more on social pressure and personal commitment than on overt coercion, and it is apparently very effective. The cult of Mao has reduced art and culture to the level of strident propaganda, but it has captured the imagination of the Chinese people, and put them to work with a will.

The Chinese seem happy enough under this regime, although the author quickly admits a foreign reporter would be the last to be told otherwise. Still, Mehnert is an experienced journalist who first saw China over forty years ago, and when writing this book last year he traveled widely throughout China. He was looking for signs of discontent, or hints that the cult of Mao was just a facade. He found neither.

About half the book deals with Mehnert's observations in China, and is written in a straight reporting style. The author's comments and questions are gathered into a separate section, perhaps the best part of the book. Several documents and excerpts from Chinese newspapers and magazines are also included. They do more than give some of the flavor of modern China; they convince that Mehnert has indeed provided a true insight into life in Mao's China.

—Reviewed by Capt. James E. Weland, Department of History, US Air Force Academy.

The Hindenburg Disaster

The Hindenburg, by Michael M. Mooney. Dodd, Mead, New York, N. Y., 1972. 278 pages with photographs. $8.95.

Most all of us have seen that horrifying segment of film, in which the Zeppelin Corp.'s huge dirigible *Hindenburg* floats majestically in for a landing, only to be consumed in a holocaust of flame in just seconds.

And we remember the recording of Herb Morrison's broadcast—one of the most dramatic in radio history—from Lakehurst, N. J., on that day in 1937:

"It's burst into flames. . . . Get out of the way please, oh my, this is terrible, oh my, get out of the way please! It is burning, bursting into flames and falling. . . . Oh! This is one of the worst. . . . Oh! It's a terrific sight. . . . Oh! . . . and all the humanity! . . ."

In this book the author recreates the mammoth lighter-than-air ship's last flight. Based on the testimony of survivors and witnesses, and on interviews with people even remotely connected with the *Hindenburg* fire, Mr. Mooney's contention is that the airship was the victim of sabotage perpetrated by an anti-Nazi crewman.

The book also deals with the history of dirigibles in general, and goes into minute detail concerning their construction and handling.

In following the last flight of the *Hindenburg,* the book is written in the you-are-there format that is currently fashionable with authors delving into historical events. Mr. Mooney's sabotage theory is plausible, considering the rather shadowy findings of the official inquiry into the disaster. All and all, a more than moderately interesting book.

—Reviewed by William P. Schlitz, Assistant Managing Editor, AIR FORCE *Magazine.*

New Books in Brief

Communism in Japan, by Paul F. Langer. The Japanese Communist Party has grown into the largest Communist organization in non-Communist Asia. Different from many party organizations, it is beginning to reap election victories and probably will gather strength despite Japan's economic and political revival. The author, a social scientist at the RAND Corp., has provided an annotated bibliography and a chronology. Hoover Institution Press, Stanford, Calif., 1972. 112 pages with index. $5.95.

Fighters in Service, by Kenneth Munson. A concise, useful handbook on fighter, attack, and training aircraft in operation throughout the world since 1960. Each of the seventy-five aircraft covered is discussed in enough historical and technical detail for any but the professional aerospace technician. There are eighty color plates showing profile and plan views of each aircraft. Included are such late models as the Mirage F-1, MIG-23, F-14, and F-15. Macmillan, New York, N. Y., 1972. 167 pages, hardcover in pocket size. $3.95.

Into the New Realm: A Documentary History of America's Venture Into Space. This publication of the National Archives traces the nation's role in flight from eighteenth-century ballooning to the moon shots. Includes facsimiles of important documents and photographs, as well as commentary. May be ordered from The Cashier, National Archives (GSA), Washington, D. C. 20408. 40 pages, softcover. $.75 single copy; $.50 per copy in orders of eleven or more.

Soviet Air Forces, by Colin Munro. The first part of this book by a British author is a short, fifty-three-page

Airman's Bookshelf

history of the Soviet Air Force. Includes some unusual pictures of early Russian planes, and should remove any remaining doubt about planning and technical competence of Soviet aeronautical engineers. The latter part contains photos, specifications, performance data, and descriptions of twenty-eight modern Soviet military and commercial aircraft. Crown Publishers, New York, N. Y., 1972. 121 pages, paperback. $2.95.

United States Military Aircraft Since 1908, by Gordon Swanborough and Peter M. Bowers. A second edition of the complete, detailed, and authoritative British publication on US military aircraft. In addition to the hundreds of aircraft that are described and pictured in detail, the book includes a short history of the US Air Force; chapters on procurement, designation systems, and markings; and appendices on foreign-built aircraft and balloons and airships. Putnam & Co. Ltd., 9 Bow St., London WC2E 7AL, 1971. 675 pages with appendices and index. £6.50.

United States Military Medals and Ribbons, by Philip K. Robles. Beautifully illustrated with color plates, this history of US military decorations covers almost two centuries. It includes a history and description of each award and decoration; and sections on rules for wearing medals, precedence of awards, and on applying for earned medals. The author, an Air Force technical sergeant, began collecting the data that fills the book while serving as a personal affairs technician. Charles E. Tuttle Co., Rutland, Vt., 1971. 187 pages with bibliography and index. $13.75.

The Uses of Terror, by Boris Levytsky. This history of the evolution of the Soviet secret police is a detailed analysis of the impact of calculated terror on Soviet life. Much of the information presented by the author was obtained from the *samizdat,* the Russian underground press. He makes a forceful case that terror was not exclusively the instrument of Stalin, but that it remains, today, an institutionalized part of Soviet life. Coward, McCann & Geoghegan, New York, N. Y., 1972. 349 pages with notes, bibliography, and index. $7.95.

Tank Warfare, by Kenneth Macksey. A British Armoured Corps officer and military historian traces the history of tanks in combat from World War I to Vietnam, with some observations on the future. Photographs, maps, and organizational charts are helpful to the discussion. Stein and Day, New York, N. Y., 1972. 284 pages with index. $7.95.

Alamogordo Plus Twenty-Five Years, edited by Richard S. Lewis and Jane Wilson. The articles in this book are from a special twenty-fifth anniversary issue of the *Bulletin of the Atomic Scientists.* The essays are under four headings: Projection and Recollection, The International Atom, Application and Research, and The Military Atom. They provide useful perspective in thinking about issues of arms control, disarmament, and military applications. The Viking Press, New York, N. Y., 1971. 281 pages with index. $6.95.

Two bibliographies that will be invaluable to researchers in the areas of weapons acquisition and cost estimating have been produced recently at the Air Force Academy. They are: *A Bibliography of Selected Studies in the Weapons Acquisition Area,* by Lt. Col. James D. Suver and Maj. F. Theodore Helmer; and *Bibliography On Pricing Methodology and Cost Estimating,* by Major Helmer and others. So long as the supply lasts, members of the DoD community may obtain copies by writing: Department of Economics and Management, USAF Academy, Colo. 80840.

Three additions to Arco's Aircraft Album series are volumes on *Messerschmitt, Junkers,* and *Boeing.* Each album includes a short history of the company concerned and a catalog of aircraft produced, with numerous pictures, operational history, and technical data. All are done by competent aviation historians. Arco Publishing Co., 219 Park Ave. South, New York, N. Y. 128 to 144 pages, paperback. *Messerschmitt* and *Junkers* $3.95 each; *Boeing* $4.95.

Recent additions to Ballantine's Illustrated History of the Violent Century Series are: *Salerno: Foothold in Europe,* by David Mason; *D-Day,* by R. W. Thompson; *U-Boat: The Secret Menace,* by David Mason; *Göring,* by Roger Manvell; *De Gaulle,* by Phillipe Masson; *Eisenhower,* by Martin Blumenson; *Warsaw Rising,* by Gunther Deschner; and *Pacific Onslaught: 7th Dec. 1941/7th Feb. 1943,* by Paul Kennedy. All are fully illustrated. Ballantine Books, New York, N. Y. Each volume 160 pages. $1.00 paperback. ■

Councils Meet

AFA's Civilian Personnel, Air Force Reserve, Air National Guard, and Medical Advisory Councils met recently in Washington, were briefed on a variety of topics, and made recommendations to AFA President Martin M. Ostrow.

The Civilian Personnel Council identified four issues for attention and emphasis by its members and AFA: current legislation on the Federal Executive Service; expansion of USAF information programs for civilian employees; federal funding and grade level authorizations; and the matter of key civilian-employee positions as they relate to active participation in the Reserve Forces. This council heard briefings by Robert Hampton, Chairman of the Civil Service Commission, and William J. Abernethy, USAF Director of Civilian Personnel, and his staff.

The Reserve, Guard, and Medical Councils were briefed by Maj. Gen. Homer I. Lewis, Chief of Air Force Reserve; Maj. Gen. I. G. Brown, Air National Guard Director; Maj. Gen. Leo E. Benade, Deputy Assistant Secretary of Defense (Military Personnel Policy); Dr. Theodore C. Marrs, Deputy Assistant Secretary of Defense (Reserve Affairs); Maj. Gen. John S. Patton, Military Adviser to the DoD Reserve Forces Policy Board; Col. Milton E. Mitler, Office of the Chief, Air Force Reserve; and Richard Wilbur, Assistant Secretary of Defense (Health and Environment).

Both councils called for more publicity on the total force concept, and cited a need for increased construction of Reserve Forces facilities.

The Reserve Council also felt that Reserve intelligence officers could be used in declassifying Air Force materials; that educational assistance in the form of scholarships should be available to Reserve Forces members; and that AFA should continue its support for a separate budget for the Air Force Reserve, pursue greater industry support for the Reserve Forces, and solicit views of Reserve commanders on how AFA can best support their activities.

The Guard Council urged that AFA support pending legislation to eliminate ceilings on the number of technicians the Air Guard can have. This council also endorsed more benefits, including commissary and exchange privileges, for the Reserve Forces; enlistment and reenlistment bonuses for Reserve Forces airmen; and recommended continued support for legislation to provide more medical care for the Reserve Forces.

The Medical Council said medical scholarships are needed to support Reserve recruiting. They also suggested that personnel policies for Reserve doctors and dentists—such as the grades in which they are commissioned, and promotion—be brought into alignment with policies for active-duty medical officers. AFA, they said, should promote support among civilian hospitals for the Reserve medical program. They expressed continued support for improved medical service for the armed forces.

Recomp Proposal

A DoD legislative proposal for partial recomputation of retired pay was sent to Congress in April. It provides for recomputing retired pay on the basis of January 1, 1971, pay scales, the increase to be effective at age sixty for retirees who served less than twenty-five years, and at age fifty-five for those with twenty-five or more years' service. Retirees with a disability of thirty percent or more could recompute their pay immediately.

The present system of adjusting retirement annuities on the basis of the Consumer Price Index would continue.

Maj. Gen. Nils O. Ohman, recently retired HEDCOM Commander, has received an AFA Citation of Honor for "outstanding community relations and projecting USAF's civic leadership role."

Maj. Gen. John A. Lang, Jr., USAFR, receives his appointment as new Secretary of Military and Veterans Affairs for North Carolina from Gov. Robert W. Scott. General Lang was formerly Administrative Assistant to Secretary of the Air Force Robert C. Seamans, Jr. A long-time AFA member, General Lang has held many posts in the AFRES and is presently a member of AFA's Civilian Personnel Council.

The Bulletin Board

This proposal is an outgrowth of the report on the President's Interagency Committee to study military retirement. (*See "The Bulletin Board," April '72 issue.*)

The proposal has been introduced as HR 14524 by Rep. Charles S. Gubser (R-Calif.).

Palace Chase

Certain pilots, navigators, and airmen with at least a year of active duty can trade their remaining commitment for service in the Air Force Reserve or the Air National Guard.

The program is called Palace Chase. Volunteers must agree to a two-for-one trade—they'll serve two years in the Air Reserve Forces for each year of active duty waived.

Eligibility is linked to specific requirements in the Guard and Reserve, where extensive modernization is under way, and transfer of weapon systems from the active inventory has resulted in personnel shortages.

Airmen Council

Pentagon evaluation of suggestions by AFA's Airmen Advisory Council indicates that, in several instances, the council's thinking parallels that of the Air Staff.

Officials said that two of the council's suggestions—opening US Armed Forces Institute (USAFI) courses to the Air Reserve Forces, and improved study materials for the Weighted Airman Promotion System—are already in development.

The council felt that women members of the Air Force who are married to civilians should receive the same basic allowance for quarters as do Air Force men whose wives are civilians. USAF agrees, and said that DoD, like the council, supports pending legislation to change the statutory definition of a military dependent. The legislation would entitle the spouses of Air Force women to the same benefits that the wives of Air Force men now have.

The council urged that NCOs, E-4 and above, be authorized to live off base if they wish to, regardless of the availability of quarters on base. USAF replied that while it supports the idea of optional residency, it has neither the authority nor the funds to implement such a program. DoD has the authority, and is presently considering the matter.

Another council recommendation was assignment options for airmen in career fields that may be subject to exceptionally frequent remote-area

During a visit to Udorn Royal Thai AFB, Thailand, Gen. John C. Meyer talks tactics with MIG-killers of the 432d Tactical Fighter/Recon Wing. General Meyer, recently named SAC Commander, himself downed two MIG-15s during the Korean War, as did the 432d's Commander, Col. Charles A. Gabriel (far right). 1st Lt. Roger C. Locher (left kneeling) and Maj. Robert A. Lodge (right kneeling) destroyed their first MIG-21 in February. 1st Lt. Leigh Hodgdon (standing left) and Lt. Col. Joseph W. Kittinger (standing second from left) shot down their first Soviet-built MIG-21 a few days later, on March 1.

Cadet 1st Class Robert B. Ross, Captain of the USAF Academy hockey team, holds the trophy awarded for victory over the Royal Military College of Canada in the Annual Hockey Series. Flanking him are (left) AFA National Director G. M. Douglas and W. A. Gryba, National Vice President of the Royal Canadian Air Force Association. Award of the new trophy is to be sponsored annually by AFA and RCAFA.

John J. McLaughlin, fifty-three, who served six Secretaries of the USAF as Administrative Assistant, died in Washington in April following injuries incurred in an auto mishap.

uty. Allow these men a choice—he standard PCS tour of a year re-note, or two six-month TDYs, sepa-ated by a one-month leave—the coun-il said. USAF recognized that such a procedure would benefit the airman iving in government quarters, since ie would not then be required to move his family off base when he leaves for overseas.

Those airmen already living off base currently have the choice of leaving their families where they are, or moving them to a location of their choice at government expense. The proposal would result in fewer base quarters for incoming airmen, though.

The program would be costly, and the individual's month-long absence from his overseas unit could impair effectiveness. USAF said, however, that it is quite concerned about the problem of frequent remote duty for some airmen, and recently began a major study to find ways to improve the situation.

The Air Force disagreed with a proposal for a star device to be worn on the NCO Academy Ribbon to denote distinguished graduates. USAF is still considering a council recommendation that all optional-wear uniform items be available in base clothing sales stores.

CAP Committee

The Civil Air Patrol Committee, one of AFA's newest, recently met in conjunction with the National Congress on Aerospace Education at Middle Tennessee State University, Murfreesboro, Tenn.

The committee was briefed on all phases of CAP activity by John V. Sorenson, CAP Deputy Chief of Staff for Aerospace Education and Cadet Programming. Committee members received personal letters from Brig. Gen. Richard N. Ellis, national CAP Commander, who advised them that he has appointed an AFA Advisory Committee to his headquarters.

While a formal Committee report is soon to be made to the Association's President, among the committee recommendations are: greater AFA liaison with all elements of CAP; increased participation in CAP events by AFA state and chapter organizations; increased recognition of CAP programs by AFA at the national level; and that AFA encourage a working relationship between AFJROTC and CAP units in the area of aerospace education. ■

Senior Staff Changes

Col. (B/G selectee) Kenneth E. Allery, from Asst. DCS/Plans, Hq. ADC, to Asst. DCS/Plans, J-5, NORAD/CONAD, Ent AFB, Colo., replacing B/G (M/G selectee) James V. Hartinger . . . **B/G Leslie J. Campbell, Jr.,** from Executive to DCS/P, Hq. USAF, to Dir., J-5, USAFSO, Quarry Heights, Canal Zone, replacing B/G Edwin J. White, Jr. . . . **L/G (General selectee) Russell E. Dougherty,** from Cmdr., 2d AF, SAC, Barksdale AFB, La., to C/S, SHAPE, Belgium, replacing Gen. Horace M. Wade . . . **M/G Abraham J. Dreiseszun,** from DCS/Procurement & Production, Hq. AFLC, Wright-Patterson AFB, Ohio, to Cmdr., Defense Personnel Support Center, DSA, Philadelphia, Pa., replacing M/G Robert E. Hails . . . **L/G Richard H. Ellis,** from Cmdr., 6th ATAF, Izmir, Turkey, to Cmdr., Allied Air Forces Southern Europe, Naples, Italy, replacing L/G Fred M. Dean, who recently retired.

M/G Robert N. Ginsburgh, from Chief, Office of AF History, to Dir., Office of Information, SAFOI, Hq. USAF, replacing M/G H. L. Hogan, III . . . **M/G Robert E. Hails,** from Cmdr., Defense Personnel Support Center, DSA, Philadelphia, Pa., to Cmdr., Warner Robins AMA, AFLC, Robins AFB, Ga. . . . **Col. (B/G selectee) Guy E. Hairston, Jr.,** from Cmdr., 3646th Plt. Tng. Wg., ATC, Laughlin AFB, Tex., to Cmdr., OTS, USAF, ATC, Lackland AFB, Tex. . . . **B/G Colin C. Hamilton, Jr.,** from Dep. Dir., J-3 (NMCC), Jt. Staff, OJCS, to Dep. Dir., Command and Control, J-3, US European Cmd., Stuttgart, Germany . . . **Col. (B/G selectee) James R. Hildreth,** from Cmdr., 4th TFW, TAC, Seymour-Johnson AFB, N. C., to Dep. Dir., J-3 (NMCC), Jt. Staff, OJCS, replacing B/G Colin C. Hamilton, Jr.

Mr. Irving Katz, from Chief, Ops Analysis, to Asst., DCS/P&O, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **Col. (B/G selectee) Lyle E. Mann,** from Special Asst., ACS/Intelligence, Hq. USAF, to Asst. DCS/Intelligence, Hq. PACAF, Hickam AFB, Hawaii . . . **Mr. William J. McGraw,** from Dir., Directorate of Range Engineering, AFWTR, to Dir., Engineering, Space, and Missile Test Center, AFSC, Vandenberg AFB, Calif. . . . **M/G George W. McLaughlin,** from DCS/Logistics, Hq. TAC, Langley AFB, Va., to Cmdr., Sacramento AMA, AFLC, McClellan AFB, Calif. . . . **M/G John M. McNabb,** from C/S, Hq. PACAF, Hickam AFB, to DCS/P&O, PACOM, Camp David Smith, Hawaii . . . **B/G Slade Nash,** from Vice Dir., Defense Special Projects Group, Washington, D. C., to Dep. Dir., Office of Information, SAFOI, Hq. USAF, replacing B/G Thomas P. Coleman . . . **M/G Edmund F. O'Connor,** from DCS/Procurement & Production, Hq. AFSC, Andrews AFB, Md., to Cmdr., San Antonio AMA, AFLC, Kelly AFB, Tex.

B/G Russell G. Ogan, from Dep. Dir., Personnel Programs, DCS/P, Hq. USAF, to Dir., POW/MIA Affairs, OSD, Washington, D. C. . . . **Col. (B/G selectee) Benton K. Partin,** from Cmdr., AF Armament Lab, AFSC, Eglin AFB, Fla., to Dep. Dir., Development and Acquisition, DCS/R&D, Hq. USAF . . . **M/G (L/G selectee) William F. Pitts,** from Cmdr., 3d AF, USAFE, South Ruislip AS, England, to Cmdr., 6th ATAF, Izmir, Turkey, replacing L/G Richard H. Ellis . . . **Mr. Aristides Sarris,** from Asst., Data Automation, DCS/Comptroller, to Chief, Office of AFLC Planning Board, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **Col. (B/G selectee) Winfield W. Scott, Jr.,** from Cmdr., 3640th Plt. Tng. Wg., ATC, Laredo AFB, Tex., to Asst. DCS/Ops, Hq. ATC, Randolph AFB, Tex. . . . **Col. (B/G selectee) John C. Toomay,** from Cmdr., Rome Air Development Center, AFSC, Griffiss AFB, N. Y., to Dep. Dir. (Strategic & Space Systems), Research and Engineering, DoD, Washington, D. C. . . . **Col. (B/G selectee) James A. Young,** from Cmdr., 8th TFW, PACAF, Ubon AB, Thailand, to Dep. Dir., Plans, Hq. PACAF, Hickam AFB, Hawaii.

PROMOTIONS: To be **General:** Russell E. **Dougherty.** To be **Lieutenant General:** William F. **Pitts.**

RETIREMENTS: M/G Timothy J. **Dacey,** Jr.; L/G Fred M. **Dean.** ■

J. Gilbert Nettleton, Jr., Iron Gate Chapter President, accepts a Special Air Force Citation for the Chapter from Air Force Secretary Robert C. Seamans, Jr.

AFA'S IRON GATE CHAPTER'S

ANNUAL AIR FORCE SALUTE

Mrs. Anna Chennault, Chairman of the Salute's Women's Committee, with Columnist Bob Considine, Salute Vice Chairman.

AS THE official "kickoff event" for the USAF Silver Anniversary, the Iron Gate Chapter's ninth National Air Force Salute was a huge success. Held at New York City's Hilton Hotel on Friday, March 24, the star-studded gala grossed more than $110,000, bringing the AFA Chapter's total raised for Air Force charities over the past nine years to almost three quarters of a million dollars.

Admiral of the Fleet, the Right Hon. The Earl Mountbatten of Burma was the Honorary Chairman. For the second successive year, J. Raymond Bell, former President of the Iron Gate Chapter, was General Chairman. Mrs. Anna Chennault was the Chairman of the Women's Committee. Astronaut Frank Borman, a Vice Chairman of the Salute, gave a special tribute to the Air Force. Air Force Secretary Robert C. Seamans, Jr., and Chief of Staff Gen. John D. Ryan received the Chapter's Bronze Eagle Award on behalf of the Air Force.

Among other distinguished guests were Dr. John S. Foster, Jr., Director of Defense Research and Engineering; Adm. John S. McCain, Jr., Commander in Chief, Pacific Command; Senators Barry Goldwater and Robert Stafford; Representatives Melvin Price, William Minshall, and Lester Wolff; U.N. Ambassador George Bush; Assistant Secretary of Defense for Public Affairs Daniel Z. Henkin; Assistant Secretaries of the Air Force Richard J. Borda and Grant L. Hansen; former Air Force Chief of Staff J. P. McConnell; Gen. David A. Burchinal, Deputy Commander in Chief, US European Command; Gen. George S. Brown, Commander, AFSC; Gen. Jack J. Catton, Commander, MAC; and Gen. Seth J. McKee, Commander in Chief of NORAD.

Also present were motion picture executive Jack Warner; Civil Service Commission Chairman Robert E. Hampton; Federal Communications Commission Chairman Dean Burch; and Astronauts Edwin E. "Buzz" Aldrin and Ronald E. Evans, who will be Apollo-17 Command Module Pilot.

Entertainment was provided by the United States Air Force Academy Cadet Chorale with music by the Air Force's Airmen of Note and Lester Lanin's society orchestra.

The tenth National Air Force Salute will be held at the Americana Hotel in New York City on Friday, March 23, 1973. ■

A Message From the White House

THE WHITE HOUSE
WASHINGTON

March 1, 1972

Dear Ray:

It gives me great pleasure to join with you and the Iron Gate Chapter of the Air Force Association in paying tribute to the United States Air Force on the occasion of its silver anniversary.

Their fellow Americans owe the brave men and women you honor a great debt of gratitude for their unfailing dedication to our cherished heritage of freedom for two and one-half proud decades.

I join you in congratulating the Iron Gate Chapter which, both individually and collectively, has earned the coveted Bronze Eagle Award, and I know that fellow citizens everywhere will be with you in spirit on this occasion.

Sincerely,

Richard Nixon

Mr. J. Raymond Bell
General Chairman
Ninth National Air Force Salute
711 Fifth Avenue
New York, New York 10022

J. Raymond Bell, center, who received the Air Force's Exceptional Service Award, and Salute Vice Chairman Frank Borman present Iron Gate medal to Lord Mountbatten, left.

J. Raymond Bell, Salute Chairman, presents Bronze Eagle Award to Air Force Secretary Robert C. Seamans, Jr., and Chief of Staff Gen. John D. Ryan as Salute Honorary Chairman Lord Mountbatten assists.

THE LANGLEY CHAPTER, VA. . . .

cited for consistent and effective programming in support of the mission of AFA, most recently exemplified in its annual military-civic dinner dance, and its support of the TAC NCO Academy.

By Don Steele
AFA AFFAIRS EDITOR

Sen. Barry M. Goldwater (R-Ariz.), and **Gen. William W. Momyer,** Commander, Tactical Air Command, were guests of honor at the **Langley Chapter's** annual military-civic dinner dance, which this year observed the Silver Anniversary of the United States Air Force.

In their after-dinner remarks, both General Momyer and Senator Goldwater commented on the significance of the Air Force's Silver Anniversary, and stressed the need for continued strong airpower.

Chapter President **Lester J. Rose** was master of ceremonies, and **George D. Hardy,** Chairman of AFA's Board of Directors, introduced Senator Goldwater. The gathering of more than 500 included leaders of the community, the Air Force, and aerospace industry from throughout the country. Also participating were the following AFA leaders: **John R. Alison,** a past National President of AFA; **A. A. "Bud" West,** Vice President for AFA's Central East Region; **Richard C. Emrich,** President of the Virginia AFA; and **Clifford A. Dougherty,** Judge Advocate of the Virginia AFA.

Another highly commendable project of the Langley Chapter is a trophy established by the Chapter to provide incentive, motivation, and recognition to the Tactical Air Command's **noncommissioned officer leadership.** It is a perpetual award given to the honor graduate of each TAC NCO Academy graduating class, and has been designated the "Commander's Trophy." The trophy is retained at the academy, and an identical miniature is given to the graduate for his permanent retention.

In graduation ceremonies recently held at Langley AFB, AFA's Board Chairman, George D. Hardy, on behalf of the Chapter, turned the trophy over to TAC's Commander, General Momyer. The General then presented the trophy to the honor graduate of TAC's NCO Academy Class 72-2, **TSgt. Vernon C. Totsch,** a Flight Simulator Technician from the 16th Tactical Airlift Training Squadron at Little Rock AFB, Ark.

In accepting the first Commander's Trophy, Sergeant Totsch thanked General Momyer and the Air Force Association for supporting the professional training of the noncommissioned officer in TAC.

Mr. Hardy informed the graduates that they were not only the first class to receive the Commander's Trophy, but the first NCO Academy Graduating Class in the entire Air Force to be offered a complimentary one-year membership in the AFA. He explained that during the Silver Anniversary Year, each graduate of an Air Force NCO Academy, as well as graduates of the Air Force Academy, AFROTC, and the Air Force Officers Training School will receive the complimentary membership offer.

Gen. William W. Momyer, Commander of the Tactical Air Command, presents the first Commander's Trophy to TSgt. Vernon C. Totsch, who received the award as the honor graduate of TAC's NCO Academy Class 72-2. Looking on, from the left, are AFA's Langley Chapter President Lester Rose and AFA Board Chairman George D. Hardy. (See accompanying story for details.)

Gil Friederichs, right, Ute Chapter President, presents an AFA watch to O. C. Boileau, Group Vice President/Aerospace, Boeing Co., guest speaker at the Chapter's "Industry Night" dinner at Hill AFB Officers' Open Mess. AFA National Secretary Nathan Mazer was toastmaster at the affair.

In recognition of the Chapter's outstanding programming in support of AFA's mission and objectives, exemplified by these two programs, we are proud to name the Langley Chapter as the **"Unit of the Month"** for June.

Speaking to an audience of more than 175—including members of the Air Force, aerospace industry, and AFA—**O. C. Boileau,** Group Vice President/Aerospace, Boeing Co., delivered a provocative challenge to the nation to "Put Your Money Where Your Mouth Is."

The occasion was the **Ute Chapter's "Industry Night"** at the Hill AFB Officers' Open Mess.

AFA's ANNUAL CONVENTION and AEROSPACE BRIEFINGS and DISPLAYS

SEPTEMBER 17-18-19-20-21

WASHINGTON, D.C.

Proudly Saluting the 25th ANNIVERSARY of the United States Air Force

TENTATIVE SCHEDULE OF EVENTS

SATURDAY, SEPTEMBER 16

All Day	USAF 25th Anniversary—National Capital Area Open House & Air Show, Andrews AFB, Md.

SUNDAY, SEPTEMBER 17

All Day	USAF 25th Anniversary—National Capital Area Open House & Air Show, Andrews AFB, Md.
12:00 NN	Registration Desk Open
8:00 PM	USAF 25th Anniversary Concert, Constitution Hall

MONDAY, SEPTEMBER 18

8:00 AM	Registration Desk Open
10:00 AM	Opening Ceremony & Awards
1:00 PM	1st AFA Business Session
7:00 PM	AFA President's Reception

TUESDAY, SEPTEMBER 19

8:00 AM	Registration Desk Open
8:30 AM	2d AFA Business Session
9:00 AM	Briefings & Displays
11:45 AM	Briefing Participants' Buffet Luncheon
11:45 AM	USAF Chief of Staff Reception
12:30 PM	USAF Chief of Staff Luncheon
2:30 PM	Air Force Symposium
6:00 PM	AFA Anniversary Reception

WEDNESDAY, SEPTEMBER 20

8:00 AM	Registration Desk Open
8:30 AM	3d AFA Business Session (if required)
9:00 AM	Briefings & Displays Open
11:45 AM	Briefing Participants' Buffet Luncheon
11:45 AM	USAF Secretary's Reception
12:30 PM	USAF Secretary's Luncheon
2:30 PM	USAF Reserve and Air National Guard Seminar
4:00 PM	Briefing Participants' Reception
7:00 PM	USAF Silver Anniversary Reception
8:00 PM	USAF Silver Anniversary Dinner Dance

THURSDAY, SEPTEMBER 21

9:00 AM	Briefing & Displays Open
11:45 AM	Briefing Participants' Buffet Luncheon
4:00 PM	Briefing Participants' Reception

ADVANCE REGISTRATION FORM

26th ANNUAL AIR FORCE ASSOCIATION CONVENTION & AEROSPACE BRIEFINGS & DISPLAYS

SEPTEMBER 17-21, 1972 • SHERATON-PARK HOTEL • WASHINGTON, D.C.

1947 USAF SILVER ANNIVERSARY 1972

Type or print

NAME_____

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AFFILIATION_____

ADDRESS_____

CITY, STATE_____

Reserve the following for me:

☐ Advance Registrations @ $50.00 per person ..... $_____

☐ AF Anniversary Reception & Dinner Dance Tickets @ $30.00 per person ..... $_____

☐ Amount Enclosed ..... $_____

Mail to: Convention Registration Office, Air Force Association, 1750 Pennsylvania Ave., N.W., Washington, D.C. 20006

AFA's 1972 EXPOSITION OVER 85% SOLD OUT

HURRY!

ONLY 3 BRIEFING LOCATIONS REMAIN

FA's 1972 National Convention and Aerospace Devel-
›ment Briefings & Displays will be held at the Shera-
n-Park Hotel, September 17-21 (see schedule on
›posite page). This year marks the Silver Anniversary
the United States Air Force, which will be highlighted
/ an Air Force Open House and Air Show at Andrews
FB on Saturday and Sunday, September 16 and 17.
nother AF Anniversary highlight will be a special Air
›rce Concert Program at Constitution Hall, Sunday
vening, September 17. Charter buses will be utilized to
ansport AFA Convention Registrants to the AF Open
›use and Air Show at Andrews AFB and the AF Con-
ert Program at Constitution Hall on Sunday, September
. The National Convention will also feature AFA's
›ening Ceremonies, luncheons for the Secretary of
e Air Force and Chief of Staff, the Annual Reception
the Exhibit Hall and the AF Silver Anniversary Recep-
›n and Dinner Dance. Other activities will include AF
eminars and Symposiums, AFA Business Sessions and
veral other events, including the Chief Executives'
ception and Buffet Dinner (an invitation-only event).
ne Advance Registration Fee for AFA's National Con-
ntion is $50.00. The Registration Fee after September
and at the Convention Registration Desk, will be
0.00. Advance Registration Forms are enclosed. To
lp us with our advance planning for the Convention,
e would appreciate receiving your Advance Registra-
›ns as early as possible. AFA's National Convention
nd Aerospace Briefings and Displays will be one of
ne largest and most impressive in AFA history. We look
›rward to having you with us. Plan NOW for your
articipation!

AEROSPACE/DEFENSE COMPANIES TO PRESENT THEIR "HARDWARE OF THE SEVENTIES"

Some 50 companies will present their latest advances in aerospace/defense hardware at the 1972 Aerospace Development Briefings and Displays, to be held in conjunction with AFA's 26th Annual National Convention at the Sheraton-Park Hôtel in Washington, September 17-21.

The Briefings and Displays offer a unique combination; the physical presentation of aerospace/defense equipment . . . and . . . informative company briefings, in the booth, to key military, government, and industry personnel. Morning attendees are assembled into parties of 20 persons each and are escorted from briefing to briefing on schedule. Afternoon attendees may select any presentation offered in any order of preference.

Last year, 5,483 persons participated in the Briefings and Displays, including 189 General Officers and Admirals and 549 Colonels and Navy Captains. The Secretary and the Chief of Staff of the Air Force were honored at a reception in the Exhibit Hall, attended by some 2,000 guests.

This year's Convention salutes the 25th Anniversary of the United States Air Force, established in 1947; thus attendance at the 1972 Briefings and Displays is expected to be the largest yet. The Briefing concept was developed by AFA in 1964 and has been widely acclaimed for its ability to guarantee exhibitors an audience in their booth on schedule.

Over 26,000 square feet of display space have already been assigned for 1972. Companies wishing to participate in the Briefing and Display Program should contact AFA as soon as possible. A minimum of 300 square feet is required to conduct briefings; no minimum is required to display only.

To Reserve Briefing/Display Space, Write or Call:

AFA Exposition Headquarters

Attn: Bob Whitener
1000 Connecticut Ave., NW, Suite 1107, Washington, D.C. 20036
Telephone: (202) 833-9440

Mr. Boileau declared that the time has come to get the nation out of a "problem identification mood" and shift into high gear in a "problem-solving mood."

For a solution to our pollution and other problems, he recommended that Congress take advantage of the accumulated experience of the aerospace industry in systems management.

"New national goals are needed," he said. "We need appropriations to match the rhetoric. We must put our money where our mouth is."

Chapter President **G. F. Friederichs** gave the welcoming remarks, and **Nathan H. Mazer,** AFA's National Secretary, was toastmaster.

Among the many distinguished guests were: **Milton Weilenmann,** who represented Utah Governor Calvin Rampton; **Maj. Gen. Richard M. Hoban,** Commander, Ogden Air Materiel Area; **Brig. Gen. Charles F. Minter, Sr.,** Vice Commander, Ogden Air Materiel Area; **Jack C. Price,** Vice President for AFA's Rocky Mountain Region; and **Glen Jensen,** Utah AFA President.

We commend the Ute Chapter for its very effective programming in support of AFA's mission and objectives, and especially for the favorable newspaper editorial coverage the program attracted.

CROSS COUNTRY:

• A heavy snowstorm failed to dampen the spirits of more than 300 leaders of the Air Force, aerospace industry, and AFA who attended the **Nation's Capital Chapter's** recent dinner-dance honoring **Gen. John D. Ryan,** USAF Chief of Staff.

The highlight of the program, held at the Bolling AFB Officers' Open Mess, was remarks of Air Force Secretary **Dr. Robert C. Seamans, Jr.** Chapter President **Thomas Turner** was master of ceremonies, and **Maj. Gen. Roy M. Terry,** Chief of Chaplains, gave the invocation. The Air Force's Singing Sergeants provided entertainment, and dancing followed the dinner program.

Among the many distinguished guests were: **Sen. Howard W. Cannon** (D-Nev.); **Gen. George S. Brown,** Commander, Air Force Systems Command; **Lt. Gen. O. J. Glasser,** DCS/Research and Development; **Lt. Gen. George J. Eade,** DCS/Plans and Operations; **Lt. Gen. Robert J. Dixon,** DCS/Personnel; **Lt. Gen. Eugene B. LeBailly,** Chairman, Inter-American Defense Board; **Lt. Gen. Duward Crow,** Comptroller of the Air Force; AFA National Directors **A. Paul Fonda** and **Winston P. Wilson;** and **A. A. West,** Vice President for AFA's Central East Region.

Lt. Gen. Glen W. Martin, left, Vice Commander in Chief, SAC, the guest speaker at a joint AFA and Reserve Officers' Association observance of the Twenty-fifth Anniversary of the Air Force, visits with the Presidents of the sponsoring organizations, Paul H. Johnston, center, of the AFA Tennessee Valley Chapter; and Lt. Cmdr. William R. Mixon, Jr., USNR, ROA's Huntsville Chapter.

• AFA's **Illini Chapter** recently hosted a banquet at the Chanute AFB Officers' Club as the kickoff event for a series of observances at the base of USAF's Silver Anniversary.

More than 200 members, their wives, and guests attended the function. The guest of honor, **MSgt. Frank S. Elkins,** Chanute AFB's Instructor of the Year, was presented an all expense vacation for two to Florida's Disney World by the Rantoul, Ill., Chamber of Commerce.

The guest speaker was **Brig. Gen. Geoffrey Wiedeman,** Command Surgeon, Air Training Command, Randolph AFB, Tex. Chapter President **Lewis Tanner** was master of ceremonies.

Special guests included **Col. Robert Casey,** Vice Commander, Chanute Technical Training Center; and **Daniel Molloy,** President, Rantoul Chamber of Commerce.

• Celebration of the Thirtieth Anniversary of Laughlin AFB, Tex., and the Twenty-fifth Anniversary of the Air Force was launched by AFA's **Del Rio Chapter** at a gala dinner-dance honoring the base's past wing commanders.

Four of the commanders attended the function: **Maj. Gen. Frank M. Madsen, Jr.,** Commander, Keesler Technical Training Center (ATC), Keesler AFB, Miss.; **Brig. Gen. August**

Participants in the charter night program of the Scott Chapter, which was recently organized at Scott AFB, Ill., included, from the left, Brig. Gen. Howard T. Markey, US Air Force Reserve, guest speaker for the occasion; Chapter President William A. Johnston; Illinois AFA President Lee Cordell; Bernard D. Osborne, Vice President for the Air Force Association's Great Lakes Region; and Maj. Gen. John P. Henebry, also of the Air Reserves. Generals Henebry and Markey are both former National Presidents of the AFA.

Maj. Gen. Gilbert Curtis, left, Chief of Staff, Military Airlift Command, chats with Sgt. James Shaw during the recent organizational meeting of a new AFA Chapter at Scott AFB, Ill. Shaw was the first new member during the current AFA membership drive at the base. Bernard D. Osborne, Vice President for AFA's Great Lakes Region, was the speaker at the meeting.

F. Taute, DCS/Personnel, Air Training Command, Randolph AFB, Tex.; **Brig. Gen. William R. Goade,** Commander, 1035th USAF Field Activities Group, USAF Headquarters; and retired **Col. R. O. Mosher,** who now resides in Del Rio.

The base's present Commander, **Col. (Brig. Gen. selectee) Guy Hairston,** spoke of the warm and unique relationship between Laughlin AFB and the cities of Del Rio and Ciudad Acuna, Mexico.

In his remarks, **Rep. O. C. Fisher** (D-Tex.), a ranking member of the House Armed Services Committee, said he shares with all Del Rioans a pride in the base's outstanding record. He drew heavy applause when he castigated those who propose amnesty for Americans "who turned their back when called to serve their country."

General Madsen said a revival of patriotism among America's young people is very evident among the 10,000 young airmen under his command.

Mayor **Alfredo Gutti Gutierrez** of Del Rio and the former mayor of Ciudad Acuna, **Jesus Maria Ramon,** expressed the best wishes of their communities for the base and its personnel—past and present.

Del Rio Chapter President **H. W. "Pete" Monzingo** was master of ceremonies for the occasion.

• The **San Francisco Chapter's** recent dinner-dance honored the Chapter's past presidents, and observed the Twenty-fifth Anniversary of USAF.

The speaker for the occasion, **Sam Ponton** of the North American Rockwell Corp., gave a presentation on the B-1 program.

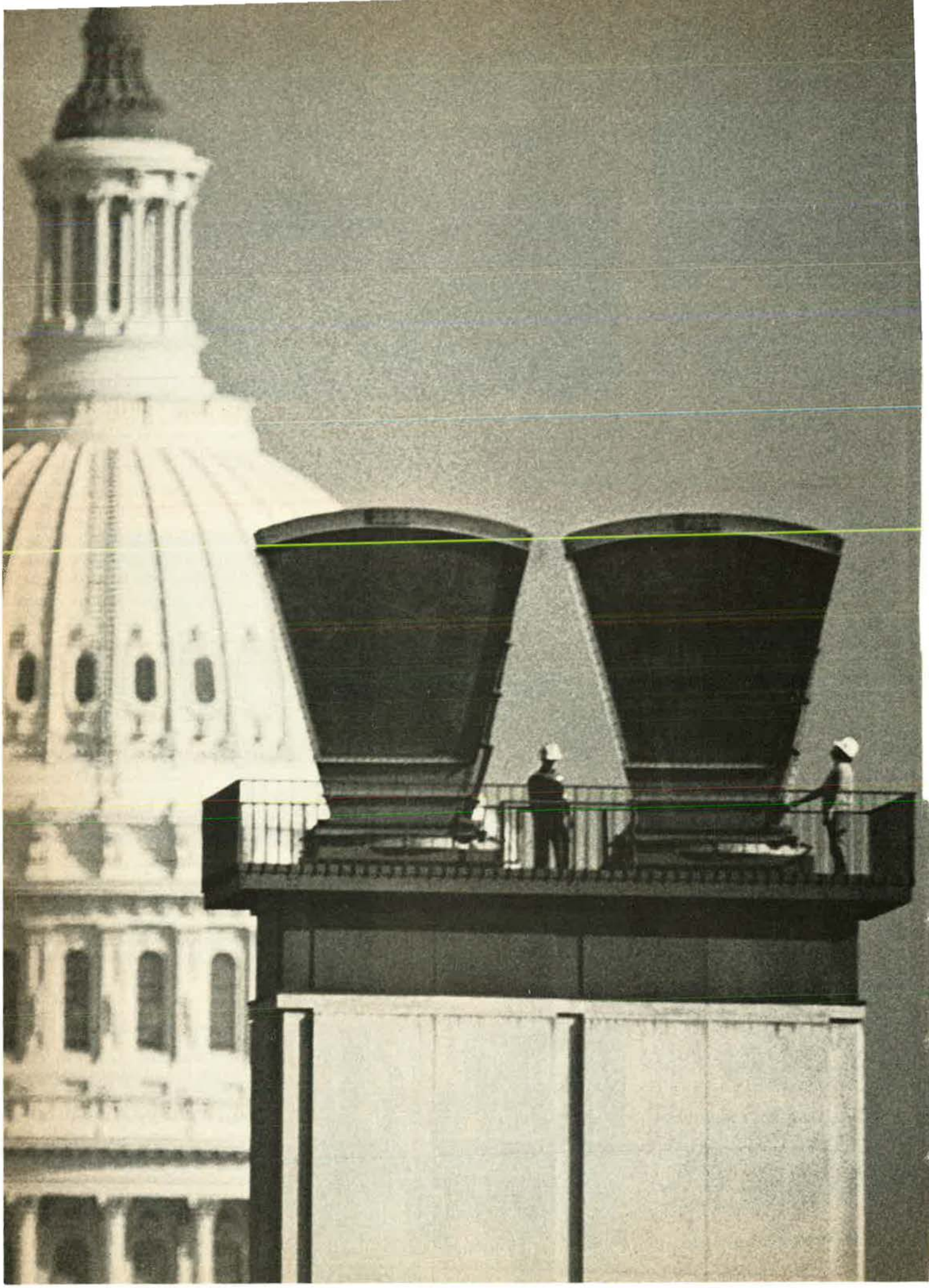
AFA's AFROTC Silver Medal was presented to **Cadet Lt. Col. Dennis Doroff** of the University of California/Berkeley AFROTC detachment.

During the program, the following newly elected officers were installed:

AFAers in Middle Georgia will go to almost any lengths to publicize their motto. Here, Dr. Dan Callahan, left, Georgia AFA Vice President, shows off his state "prestige" license plate to Foy Evans, Editor of Warner Robins' The Daily Sun. *The letters on the Peach State automobile tag stand for "Every Day [Is] Air Force Appreciation Day."*

Utah Gov. Calvin L. Rampton, an enthusiastic supporter of his state's AFA organization for many years, receives an honorary membership in AFA's Salt Lake City Chapter during recent ceremonies in his office. Participants included, seated from the left, Chapter President Gloria Denner; Governor Rampton; and Utah AFA President Glen Jensen. Standing, from left, are Nolan Manfull, a former AFA Vice President; AFA National Secretary Nathan Mazer; Utah AFA Vice President Lynn Summers; and AFA National Director George Douglas, a member of AFA's National Membership Committee from Denver, Colo.

At recent ceremonies conducted by AFA's Ak-Sar-Ben Chapter, retiring SAC Commander Gen. Bruce K. Holloway, left, was awarded a special AFA plaque. AFA Board Chairman George D. Hardy did the honors. (For General Holloway's retirement plans, see "News Notes," p. 18.)



Here's new help for the data explosion. Data Under Voice, from the Bell System.

Computers are spending more and more time on the phone, exchanging information with other computers. In fact, data transmission is now the fastest growing segment of our business.

To help us serve our customers in this expanding data market, Bell Laboratories is developing new ways to transmit data in digital form, over our existing facilities. A Digital Data System using these techniques will be available in 1974.

An important part of this new system is the "Data Under Voice" or DUV terminal, currently undergoing field trials. DUV allows a digital signal carrying many data channels to "hitchhike" on our microwave radio systems, in the lower portion of the baseband frequency spectrum. DUV accomplishes this through a relatively small addition to the terminals we use now.

Data Under Voice will enable our Digital Data System to reach all the cities, large and small, now served by our microwave links. So we can offer our data customers in those cities the accuracy and economy of digital transmission.

The Bell System is committed to meet all the nation's needs for digital data transmission. Development of Data Under Voice demonstrates once again that commitment.

AT&T and your local Bell Company.

This Is AFA

The Air Force Association is an independent, nonprofit airpower organization with no personal, political, or commercia axes to grind; established January 26, 1946; incorporated February 4, 1946.

Membership

Active Members: US citizens who support the aims and objectives of the Air Force Association, and who are not on active duty with any branch of the United States armed forces—$10 per year.

Service Members (nonvoting, nonofficeholding): US citizens on extended active duty with any branch of the United States armed forces—$10 per year.

Cadet Members (nonvoting, nonofficeholding): US citizens enrolled as Air Force ROTC Cadets, Civil Air Patrol Cadets, Cadets of the United States Air Force Academy, or a USAF Officer Trainee—$5.00 per year.

Associate Members (nonvoting, nonofficeholding): Non-US citizens who support the aims and objectives of the Air Force Association whose application for membershi meets AFA constitutional requirements—$10 per year.

Objectives

• The Association provides an organization through which free men may unite t fulfill the responsibilities imposed by the impact of aerospace technology on mod ern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based or respect for the principle of freedom and equal rights to all mankind.

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Edward T. Nedder
Hyde Park, Mass.
Dick Palen
Edina, Minn.

Julian B. Rosenthal
New York, N. Y.
Peter J. Schenk
Arlington, Va.
Joe L. Shosid
Fort Worth, Tex.
Robert W. Smart
Washington, D. C.
C. R. Smith
Washington, D. C.
Carl A. Spaatz
Chevy Chase, Md.
William W. Spruance
Wilmington, Del.
Thos. F. Stack
San Francisco, Calif.
Hugh W. Stewart
Tucson, Ariz.
Arthur C. Storz
Omaha, Neb.

Harold C. Stuart
Tulsa, Okla.
James M. Trail
Boise, Idaho
Nathan F. Twining
Hilton Head Island, S. C.
Winston P. Wilson
Alexandria, Va.
Jack Withers
Dayton, Ohio
James W. Wright
Williamsville, N. Y.
Rev. Robert D. Coward
(ex-officio)
National Chaplain, AFA
Orlando, Fla.
Norman R. Flemens
(ex-officio)
National Commander,
Arnold Air Society
Austin, Tex.

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Walter W. Berg, President; **R. W. Halbert** and **Jeannine R. Stallings,** Vice Presidents; **Robert Peltz,** Treasurer; and **Joseph Tretinik,** Secretary.

• More than 225 civilian and military members attended the first meeting of the newly reorganized **Las Vegas Chapter** in the Officers' Open Mess at Nellis AFB, Nev. **Gen. Jack J. Catton,** Commander of the Air Force Military Airlift Command, was the guest speaker.

In his address, General Catton spoke of achieving the national objectives of "a generation of peace without inflation," as expressed by President Nixon in recent policy addresses. The General indicated that the objectives can be met with national strengths in the economy, military security, and moral courage. He urged AFA members to continue to inform the general public of the importance of a strong national defense posture.

The program also included ceremonies honoring the retiring chief of the Las Vegas office of the Federal Bureau of Investigation, **Harold Campbell.** Mr. Campbell spoke briefly on the cooperative relationship between the FBI and Nellis AFB.

Chapter President **James K. Johnson** introduced the special guests, including **Maj. Gen. William Chairsell,** Commander, USAF Tactical Fighter Weapons Center, Nellis AFB; Las Vegas Mayor **Oran Gragson;** Boulder City Mayor **Morgan Sweeney;** State Assemblyman **Zell Lowman;** and Nellis AFB wing commanders **Col. Freddie Poston** and **Col. Kenneth Miles.**

• The **Northern Virginia Chapter's** recent quarterly dinner meeting featured a presentation by **Steven C. Paton,** Director of Public Relations, Fairchild Industries, Inc., and his assistant, **Kathryn Beck.**

The presentation entitled "It's Your Turn!" was developed by Fairchild Industries in an effort to reverse the antitechnology attitude of today's young people.

Chapter President **Buck Burlando** was master of ceremonies. Virginia AFA President **Dick Emrich** was a special guest.

• Some seventy members and guests attended the recent charter night dinner of the newly organized **Florida Gulf Coast Chapter** in Sarasota.

During the program, **William H. Kelly,** Vice President for AFA's Southeast Region, presented the AFA charter to Chapter President **Edwin Shapiro.** Florida AFA President **Dan Callahan,** Maj. Gen. USAF (Ret.), Deputy Director of Administration for NASA; and AFA National Director **Martin H. Harris** shared the podium. General Callahan spoke on the Apollo-16 mission, and Mr. Harris's subject was the "Aims and Objectives of AFA."

Other officers of the Chapter: **Paul Sommey,** Vice President; **Miss Judith Mitchell,** Secretary; **Glen Berry,** Treasurer; and **C. C. Andrews, Frank DeLong, Jr.,** and **Henry Dick,** Councilmen.

Special guests included **Charles E. Miller,** a member of AFA's CAP Committee; and **Miss Marion Chadwick** and **Mrs. Agnes Gard,** President and Treasurer, respectively, of the **Florida Sun Coast Chapter.** Miss Chadwick and Mrs. Gard worked with Florida AFA Organization Director **Herbert West** in organizing the new chapter.

• The **Cheyenne, Wyo., Chapter** recently sponsored a dinner meeting at the F. E. Warren AFB NCO Club to observe the Silver Anniversary of the Air Force.

Featured was a presentation on the B-1 strategic bomber. The presentation was made by **Mel Whittacker,** District Manager, North American Rockwell Corp.

Jack C. Price, Vice President for AFA's Rocky Mountain Region, presented a plaque to **Lt. Harry Disbrow, Jr.,** the Outstanding Junior Officer at the base. The award is presented quarterly by the Chapter. Following the presentation, Mr. Price spoke on the objectives and mission of the Air Force Association.

Chapter President **Fred Milam** was master of ceremonies.

• **Col. Robert L. Stephens,** better known as the "Silver Fox" and the "fastest man on earth," was guest speaker at the **Portland, Ore., Chapter's** recent meeting at the Portland Air Base.

Colonel Stephens, an Air Force test pilot since 1947 and a former technical adviser to the SST program at Boeing Co.'s Seattle plant, gave a presentation on the SR-71 and told of his many exciting experiences during his long and distinguished Air Force career. At present, he is commander of a service squadron at McChord AFB, Wash.

Included among the more than 100 AFA members and guests at the meeting were **Maj. Gen. Chester L. McCarty,** USAF (Ret.); **Brig. Gen. Gordon Doolittle,** Oregon Air National Guard; Oregon AFA President **John R. Nall;** and Chapter President **John G. Nelson.**

COMING EVENTS . . . Idaho AFA Convention, AFA President Martin M. Ostrow will be featured speaker, Boise, June 9 . . . **Illinois AFA Convention,** O'Hare Field, Chicago, June 10 . . . **Texas AFA Convention,** Abilene, June 16–17 . . . **Virginia AFA Convention,** Executive Motor Hotel, Richmond, June 17 . . . **Pennsylvania AFA Convention,** Holiday Inn, Sewickley, June 23–24 . . . **New York AFA Convention,** Holiday Inn, Plattsburgh, June 24 . . . **Michigan AFA Convention,** Ramada Inn, Detroit, September 9 . . . AFA's Twenty-sixth **National Convention and Aerospace Development Briefings,** Sheraton-Park Hotel, Washington, D. C., September 17–21.

During a recent visit to Eglin AFB, Fla., two members of AFA's National Staff met with officials of the Eglin Chapter to discuss the Chapter's projects and activities for the coming year. At the meeting were, from the left, retired Air Force Maj. Gen. Walter B. Putnam; AFA's Executive Director James H. Straubel; Maj. Gen. J. C. Maxwell, Commander of Eglin's Armament Development and Test Center; Chapter President Franklin Fisher; Col. William Bethea, an Eglin Chapter member; and Edgar Ulsamer, an award-winning Senior Editor of AIR FORCE *Magazine.*

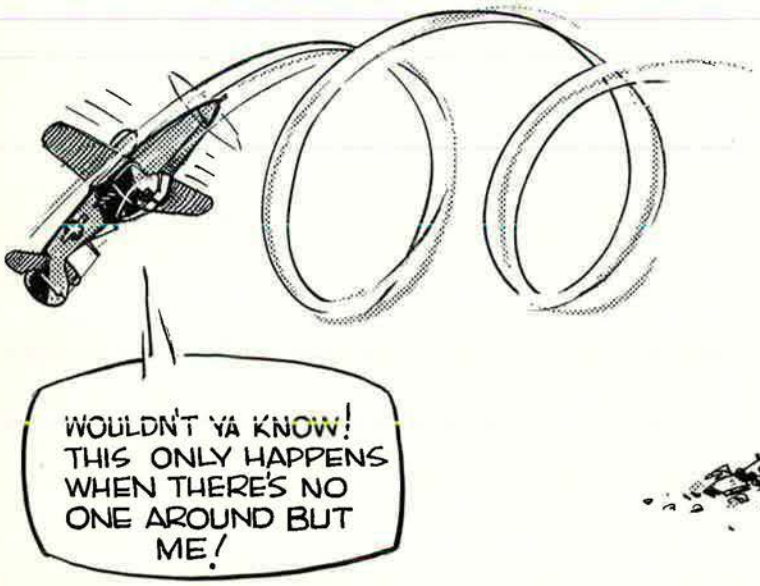
Bob Stevens'

"There I was..."

**Gather round, you Big War jocks,
You guys who flew the Straight,
Or sweated out a Cobra, or left a '38.
Take pen in hand and write us:
Are all these stories true
About the vintage recips
You throttle-benders flew?**

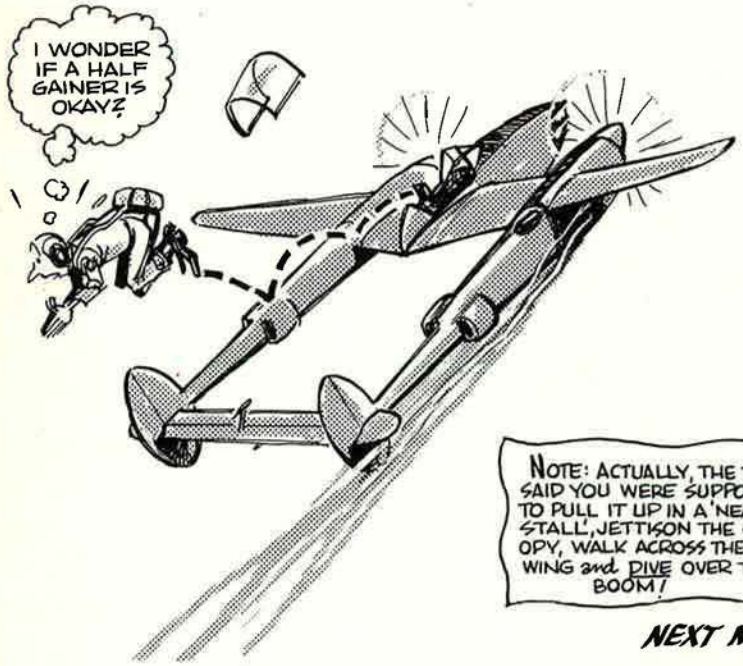
HERE ARE A FEW "OLD PILOTS' TALES" THAT'LL STILL START A RHUBARB—

"A P-39 WOULD TUMBLE"



"THE B-26 (MARAUDER) WOULDN'T FLY ON ONE ENGINE"

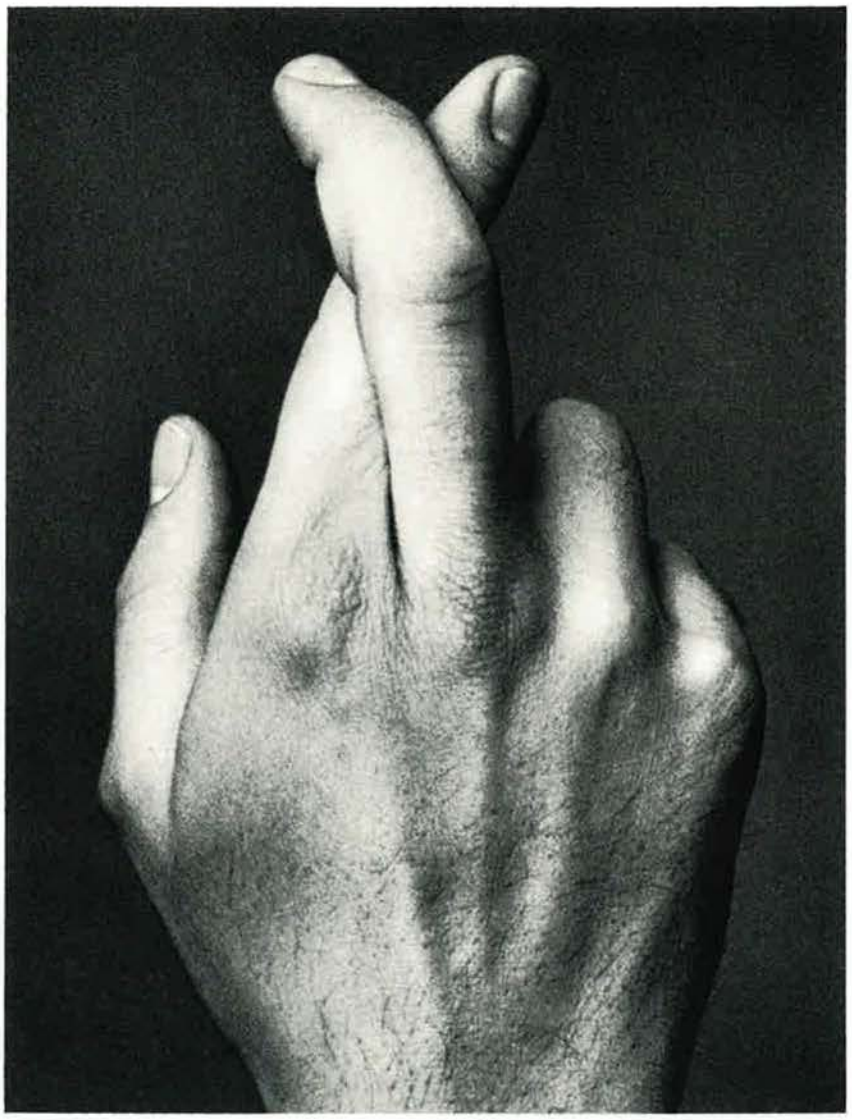
"YOU COULDN'T SAFELY BAIL OUT OF A P-38"



"IF THE P-47 HIT 'COMPRESSIBILITY' IN A DIVE THE STICK 'FROZE'"

P.S. THEY ALSO SAID THIS ABOUT THE '38

NEXT MONTH ~ THE P-39! Bob Stevens



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