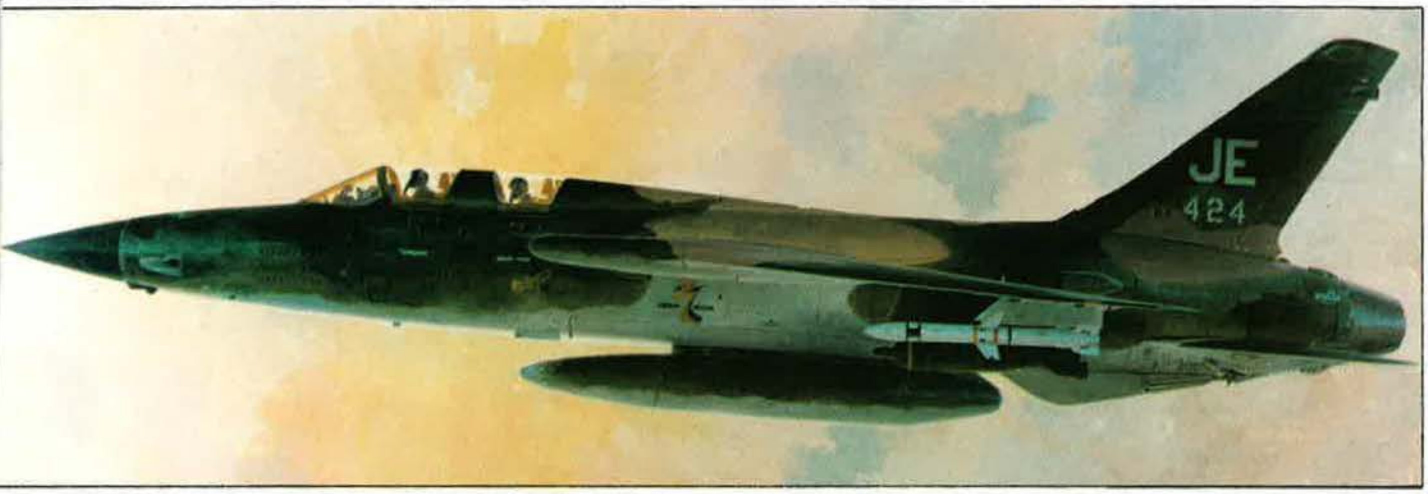
APRIL 1974 / $1

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

FLYING THE THUD



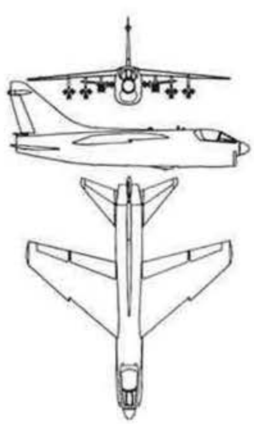
"Big Brass Ones," by Keith Ferris, from the Air Force Art Collection

How USAF "Wild Weasel" F-105s Suppressed the Enemy's SAM Defenses in the Vietnam War

"The A-7 is the most

accurate and effective tactical air weapon system in the air today. And this is the humble opinion of the Forward Air Controllers who've seen 'em all."

...QUOTE FROM OPERATIONAL REPORT



Today's A-7 has earned its reputation under fire. From the pilots who fly it. And the Forward Air Controllers who call in strikes and assess hits.

It's equipped with the most advanced navigation and weapon delivery systems in service. These systems are integrated and programmed to insure that the A-7 delivers a devastating load of ordnance right on target. With better than 10-mil accuracy.

In the tactical role of close support, the A-7 is singled out for the toughest sorties.

The A-7. A classic aircraft in its own time.

VOUGHT SYSTEMS DIVISION
LTV AEROSPACE CORPORATION

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

VOLUME 57, NUMBER 4

APRIL 1974

THIS MONTH

THIS MONTH'S COVER . . .

The cover artist is Keith Ferris, here with the original of Big Brass Ones. A mainstay of USAF's art program, he's flown in many of the subjects he's painted, including the B-17, B-52, F-4, F-100, F-105, F-106, F-111, KC-135, and T-38.

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AN EDITORIAL

HARD FACTS AND GOSSAMER HOPES

BY JOHN L. FRISBEE

EXECUTIVE EDITOR, AIR FORCE MAGAZINE

SECRETARY of Defense James R. Schlesinger's "Report to the Congress on the FY 1975 Defense Budget and FY 1975–79 Defense Program" is, in our opinion, the most persuasive, best articulated presentation of its kind in the annals of the Defense Department. Elsewhere in this issue, Senior Editor Claude Witze discusses some of the major issues covered in the report. We want to add some comments of our own.

If Dr. Schlesinger's discussions of strategic targeting haven't convinced critics that the Secretary is not advocating a first-strike counterforce posture, a comparison of the FY '64 and FY '75 budgets should do it. In the earlier year, when we were building nuclear missile superiority over a then technically and numerically inferior USSR, seventeen percent of the budget went for strategic forces and thirty-two percent for general-purpose forces. The FY '75 budget request allocates only eight percent for the strategic forces in an era of US numerical inferiority, while general-purpose forces will absorb the same share of the budget as they did in FY '64.

Put another way, if the two budgets are compared in terms of 1974 dollars, the US budgeted $14.7 billion for strategic forces in FY '64, and $7.6 billion in FY '75. Figures for general-purpose forces in the two budgets are $28.4 billion and $29.2 billion, respectively.

The goal of the Administration obviously is not to create a first-strike capability or to seek strategic superiority through technical improvements in our missile force. It is merely to maintain—or perhaps more properly, regain—parity by providing the President with the same range of strategic options that the USSR, since SALT I, has achieved by what Dr. Schlesinger describes as " . . . a truly massive effort—four new missiles, new bus-type dispenser systems, new MIRVed payloads, new guidance, new-type silos, new launch techniques, and probably new warheads."

Assuming that long-term strategic parity can be assured by successful SALT II negotiations and the rather modest technical improvements in our forces that the new budget provides, the most likely area of military confrontation then will be confined largely to general-purpose forces. We will have available to man them the smallest active-duty force since 1950.

The USSR has shown no comparable inclination to reduce its general-purpose troop strength. As pointed out by William Scott in his article on Soviet military manpower, beginning on p. 26, " . . . in a protracted conventional conflict . . . manpower could well be the decisive element when a rough parity in weapons exists."

Numerical parity in conventional weapons—tanks, SAMs, AAA, tactical fighters, ships—does *not* exist. In all these categories and many others, we are substantially outnumbered by the USSR and will be for the foreseeable future. Those who argue that the quality of our conventional systems will counterbalance Soviet quantity tread increasingly shaky ground. "The evidence [that the Soviets rely on rugged, inexpensive equipment] is often otherwise," Dr. Malcolm R. Currie, Director of Defense Research and Engineering, observed in his March 4 appearance before the Senate Armed Services Committee.

In presenting the FY '75 budget to the Congress, Secretary Schlesinger said: "This request is a substantial one, but I offer no apologies for its size. [It] bears directly on the question of whether or not the United States will continue to fulfill the responsibilities it has around the world." Considering the fragility of détente and the mounting evidence of Soviet desire to reach out into areas that traditionally have lain outside its sphere of influence, we believe the program is at best a risky minimum. In the Secretary's own words, "We maintain a much more modest defense establishment in 1974 than was considered necessary in peacetime only a decade ago."

Already the Defense budget is running into determined opposition in Congress. Undoubtedly, it will not go through unscathed. The real danger, however, lies in the years immediately ahead. Defense budgets for a number of years will have to be at least as high as this year's and probably higher. Manpower costs, now taking fifty-five percent of the budget, can be reduced only by further cuts in an already minimal baseline force. Modernization, long postponed by the Vietnam War, must go forward. War-readiness stocks must be rebuilt, for the Middle East war provided a startling preview of the magnitude of battlefield losses that must be anticipated in any future conventional war.

The public, where the ultimate decision on defense matters lies, is preoccupied with inflation, a recession, unemployment, the energy crisis, and political scandals. There is less public concern over burgeoning Soviet military strength than there was over Hitler's rise to military power in the 1930s, when we were not "on the front line," as we are today. Helping to lay the facts of the military balance before the public is the greatest single contribution to national security that the members of this Association can make.

As Secretary Schlesinger told the Congress, ". . . we must continue to build our peace structure on the hard facts of the international environment rather than on gossamer hopes for the imminent perfectibility of mankind." ■

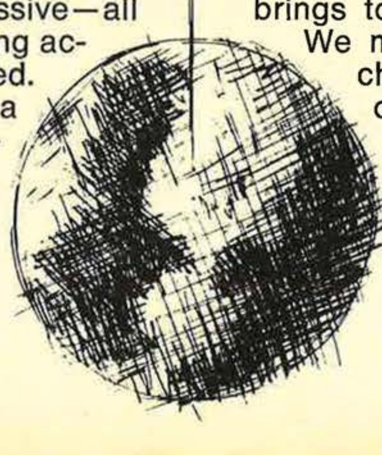
satellite?

It may not look like one, but the receiving equipment we developed and tested during Project 621B couldn't tell the difference. And that was the whole point in hanging a transmitter from a balloon. It was the fourth "satellite" in an inverted "constellation" configuration. The other three "satellites" were positioned on the ground. Flying a receiver between the ground "satellites" and the balloon demonstrated the practicality of a satellite navigation system. In cooperation with the Air Force Systems Command, Space and Missile Systems Organization (SAMSO), Grumman ran this field test program at Holloman AFB during 1971-1972.

Field test results were impressive—all goals for three-dimensional fixing accuracies were met or exceeded. The conceptual approach to a satellite global positioning system was confirmed.

Grumman knows how to build systems for space. Our Orbiting Astronomical Observatory, the most advanced three-axis stabilized scientific satellite for its time, was finally turned off after 4½ years, 3½ years beyond its design life. Our Lunar Modules operated with dramatic success during Project Apollo. On each of these programs we did the systems engineering and developed the hardware to our specifications. And now we're applying that same engineering integrity to building the Earth Limbs Measurement Satellite (ELMS) for SAMSO.

This is the background Grumman brings to building new space systems. We may have needed a balloon to check a concept; we won't need one to get working hardware off the ground.



GRUMMAN AEROSPACE CORPORATION

The Lockheed C-5A proved

The C-5A was designed and built to be the world's greatest airlifter. This capability has now been proven in actual operations in distant parts of the world.

In the Middle East and Asia, it has airlifted cargo which no other plane in the world could handle, cargo which once would have taken precious days and weeks to transport on ocean-going ships.

Because it was designed for massive airlift, the C-5A is the only plane able to carry enormous bridge launchers, 50 ton M-60 tanks and Super Jolly Green Giant helicopters. Plus the crews to man them.

It can load them quickly and easily through huge front and rear-end cargo openings close enough to the ground to let vehicles drive on without any ground-handling equipment.

Fly them halfway around the world in hours, refueling in midair if friendly bases are not available.

Find its way to destinations without ground aids and land in weather that would turn back all other planes.

Airmail

Strategic Shift

Gentlemen: The February issue of AIR FORCE Magazine arrived this morning, and it is the best issue I have seen. Things are certainly looking up. The editorial on "Counterforce Revisited" is precisely the kind of analysis that needs to be read widely now.

Myself and a number of my American friends are trying to explain the "Schlesinger shift" to people who just do not comprehend the utility of strategic flexibility. (My letter, which was cut, in *Foreign Affairs* of January 1974 was a very small step toward taking the conceptual battle to the "enemy.")

Many commentators seem determined to ignore the fact that assured destruction is not a strategy at all. It is a tool for force planning. Despite the very sensible strategic shift discernible in the FY '75 budget request and in Secretary Schlesinger's pronouncements, it must not be forgotten that a lot of time has been lost and needs to be made up. Unfortunately, most of the pro-counterforce analysts are within government to some degree and are thereby somewhat constrained from public utterance. So, my congratulations on a most timely and effective piece.

Colin S. Gray
Department of War Studies
King's College
University of London
London, England

Urban Defense

Gentlemen: I have just finished reading the February issue—cover to cover. Better and better! Congratulations on a very fine product.

I enjoyed the interview with Gen. George S. Brown. I think he's the cream of the crop.

I was taken with an omission [from the articles dealing directly with national security] that I think is significant: No discussion of or concern about urban antimissile defense. Without it, I do not see any of our military forces being permitted to operate boldly and effectively. Unwillingness to take risks has traditionally led to military ineffectiveness. I just hope that fundamental research is going on quietly in search of a new approach —possibly airborne chemical lasers of tremendous power.

All the best and my very earnest support for your fine achievements.

Maj. Gen. Haywood S. Hansell, Jr., USAF (Ret.)
Hilton Head, S. C.

Also On the Team

Gentlemen: I'm an Instructor Boom Operator with the 93d Air Refueling Squadron at Castle AFB, Calif. I agree with the letter, "Need to Know," in your February issue and would like to add that it would be nice to see more on enlisted flying personnel and enlisted people in general.

I've read article after article on officer flight pay, and haven't read anything on enlisted flight pay. We're up there with the officers and flight pay is just as important to us. I know very few enlisted crew members who would fly without flight pay.

Let's hear more about boomers, gunners, engineers, loadmasters, and other *enlisted* crew members who are doing their part on the "Aerospace Team."

TSgt. Al D. Burger
Atwater, Calif.

Belated Recognition

Gentlemen: How very much I appreciated the article, "Reflections of an Early Refueler." I have looked through many Air Force history books that mention the *Question Mark* and have always felt that a huge piece of the puzzle was missing. The refuelers have been virtually ignored, and they were as outstanding as the pilots on the mission.

The fact that I am the daughter of one of those early refuelers, the then Lt. Auby Strickland, I am sure contributes to my interest. I feel, however, that contributors to aviation history must be given credit, and to my knowledge this has not been done properly before.

The members of the *Question Mark* crew and their two refueling crews have indeed left a legacy for the pilots of today, and I am happy to see it all written out. If my father were here today, I know he would thank you.

I have written a letter to General Hoyt thanking him, and I feel it only proper that I share my appreciation with you.

Mary Lee Strickland O'Neal
Mather AFB, Calif.

Refuelers

Gentlemen: I read with interest "Reflections of an Early Refueler," by Brig. Gen. Ross Hoyt, in the January issue.

Having commanded two fighter wings and two air divisions with refueling capability, I have long felt that the refuelers, like the linemen in the "pit" during a football game, were largely responsible for making the play successful. Unfortunately, their efforts were missed by most spectators who had eyes only for the backfield.

Now that TV and instant replays are giving linemen their fair share of credit, it is timely that your magazine has shown some close-ups of the action that made history and proved aerial refueling feasible.

I believe that follow-on articles would be of interest to many of your readers.

Maj. Gen. Ivan W. McElroy, USAF (Ret.)
Spicewood, Tex.

MIA Hell Hawks

Gentlemen: I have completed a unit history of the 365th Fighter-Bomber Group (Hell Hawks) of the Ninth Air Force during World War II. The book consists of 500,000 words and approximately 400 photographs and will be off the press in mid-May. During the research of material for the book, several questions arose that have never been satisfactorily answered.

Many Hell Hawk pilots were shot down and to this day remain in the records as MIA. It is hoped that some readers can enlighten me as to the fate of some of these men. In particular, I refer to the following who were shot down on the dates listed: 2d Lt. Robert O. **Baker,** October 7, 1944; Capt. Norman V. **Beaman,** July 18, 1944; 2d Lts. Al-

Airmail

fred R. **Bouley** and James W. **Burnett,** Jr., January 16, 1945; 2d Lt. James L. **Dyar,** July 18, 1944; 1st Lt. Joseph W. **Faurot,** February 22, 1945; 1st Lt. Thomas G. **Hasemeier,** Jr., August 19, 1944; 2d Lt. Richard F. **Hunter,** October 7, 1944; 1st Lt. Walter W. **Irwin,** April 20, 1945; 2d Lt. Carl O. **Keagy,** November 28, 1944; 1st Lt. Horace C. **Lyons,** July 10, 1944; 2d Lt. Joseph R. **Miller,** August 14, 1944; and, finally, 1st Lt. William **Thistlewaite,** of the 353d Fighter-Bomber Group, who ditched in the Channel on May 12, 1944, while on a mission with the Hell Hawks.

There is yet time to get information in the book, so I would appreciate hearing from anyone who can shed any light on the fates of these men.

Charles R. Johnson
Hell Hawk Historian
6 Helena Dr.
Cromwell, Conn. 06416

Missed the Point

Gentlemen: The February review [of "The Passing of the Night: My Seven Years as a Prisoner of the North Vietnamese," by Col. Robinson Risner] misses by a wide margin the real meaning of the book. . . .

Risner intended to show that moral fiber, soundly based in family, with a firm belief in God, could survive the worst physical and mental torture conceivable. Further, that a system could be devised to encourage all those who were willing to risk this fate for their country and finally had to endure it to survive it.

There can be no doubt that the character of the men and their leaders were equal to this task! . . .

John Fagan
Northridge, Calif.

F-15 Information

Gentlemen: In the February issue's F-15 Equipment Tabulation on page 28 ["Flying the F-15," by Capt. Don Carson], one essential element of the F-15's IFF equipment complement was omitted from the list of "Suppliers of Government-Furnished Equipment." It is the RT-868A/APX-76, which provides the basic IFF data for the listed IFF Reply Evaluator.

The IFF Interrogator System AN/APX-76A is built by Hazeltine and has been providing the air-to-air identification capability for our pilots of Air Force and Navy aircraft since 1968.

We appreciate the equipment and aircraft performance reports and other items of interest in your magazine.

J. R. Colarusso, Vice Pres.
Communication, Detection & Identification
Hazeltine Corp.
Greenlawn, N. Y.

Gentlemen: I find your magazine excellent reading, as it contains many very informative and interesting articles. However, recent reviewing of one article revealed two errors.

Reference your February issue, page 24, "F-15 Eagle—Facts and Figures," under armament, which lists the 4 AIM-7 missiles as "Sidewinders" and the 4 AIM-9 missiles as "Sparrows." This information is incorrect. It should be vice versa, *i.e.,* the AIM-7 is the Sparrow and the AIM-9 is the Sidewinder. I'm sure the many munitions, weapons, and missile personnel in the Air Force would like to see the record set straight.

MSgt. William M. Poe
Shaw AFB, S. C.

• *You are correct, of course. Thanks for bringing the transposition to our attention.*—THE EDITORS

P-61 Replies

Gentlemen: I have been meaning to write to thank you for the tremendous favor you did for me in the September '73 issue. In the fifteen years that I have been collecting P-61 material, it is the biggest break I ever had. I got about twenty-five replies to the "Airmail" mention *[p. 10].* I have corresponded with several of them more than once and have made some close friends. I was able to obtain several excellent photographs.

. . . Over the past few years, I have been building a current address book, by squadrons, of the Night Fighter veterans. If anyone who served in a Night Fighter squadron during WW II would send me his current address with name and the squadron he was in, I could help many of them get together again, or supply addresses for proposed reunions.

Warren Thompson
7201 Stamford Cove
Germantown, Tenn. 3813[illegible]

UNIT REUNIONS

Spookfest

There is going to be a "Spookfest" reunion on April 20 of personnel assigned or attached to AC 47 units, at Andrews AFB, Md. Send self-addressed, stamped envelope for full details.

Col. D. O. Sandfort, USAF
Inter-American Defense College
Fort Lesley J. McNair
Washington, D. C. 20315

World War I Overseas Flyers

The World War I Overseas Flyers will be holding their fourth reunion in London and Amsterdam, May 12–22. Final arrangements are not yet complete, but tentative schedule calls for activities with aviation groups and officials in London, trips to Stratford-on-Avon, Bristol, Bath, and Stonehenge, visiting WW I air bases along the way, and then on to Amsterdam and The Hague, Holland. Further details from

Ira Milton Jones, Pres.
P. O. Box 2016
Milwaukee, Wis. 53201

June '29 Pilot Class

Members of the Kelly Field Flying School Class of June 1929 will celebrate the forty-fifth anniversary of their graduation at the Broadmoor Hotel, Colorado Springs, Colo., May 24–27. For information and program details contact

Lt. Gen. R. C. Lindsay, USAF (Ret.)
1001 E. California Ave., #12A
Glendale, Calif. 91206

62d Troop Carrier Sqdn.

WW II members and friends of the 62d Troop Carrier Sqdn., 314th TC Group, have scheduled their second reunion at the Cosmopolitan Hotel, Denver, Colo., June 6–9. Contact

David E. Mondt
P. O. Box 155
Boone, Iowa 50036

365th Fighter-Bomber Group

The 365th Fighter-Bomber Group (Hell Hawks) of WW II will be holding a reunion in Denver, Colo., July 26–28. For further information contact

Charles R. Johnson
Hell Hawk Historian
6 Helena Dr.
Cromwell, Conn. 06416
Phone: (203) 347-4344
or
Tillson L. Gorsuch
948 Spencer St.
Longmont, Colo. 80501
Phone: (303) 776-4516

Airpower in the News

By Claude Witze
SENIOR EDITOR, AIR FORCE MAGAZINE

The Pentagon Looks Good

Washington, D. C., March 4

Secretary of Defense James R. Schlesinger sent his annual report, commonly called the Posture Statement, up to Capitol Hill this morning. It is, of course, a defense of the defense budget, and usually is big news, as it should be. This year, it was not received as big news.

The reason is that all official Washington, not just the White House, seems to be moving from day to day in a grim atmosphere of "make-do." There is small doubt that the Executive Branch of the government, while it waits for Judge John Sirica to drop the other shoe, is in limbo, to one degree or another. The Federal Energy Office, at this writing, appears to have turned a gasoline shortage into a debacle, although the fault may lie more in the law than in the competence of its administrators.

The politically greedy are capitalizing on the situation, even at the peril, in some cases, of resorting to demagoguery. The Justice Department shares the onus of Watergate; its former chief has been indicted by two grand juries, and there is little evidence that the Department can restore its former luster. Mr. Butz, the Secretary of Agriculture, is unconvincing in his effort to explain rising food costs and the kind of hanky-panky the public detects in the wheat market. The welfare agencies are in equal trouble; their effort to provide housing for the needy results in homes that have a shorter useful life than that achieved by the aerospace industry when it builds hardware.

There is no need to labor the point. So far as management is concerned, the Department of Defense can hold its head high. With some allowance for the magnitude and complexity of its problems, DoD may be the best managed agency of the federal government. Without comparing it to the Post Office, or looking for anything worse, the Pentagon today is setting standards of efficiency, economy, and effectiveness that are not matched by anything we can see in this city.

At the time of the Yom Kippur war, last October, the goods were delivered. That was the mission, and it was carried out by professionals, who knew where the ammunition was, how to load it, and how to get it there. One of their rewards is that the military, pressured by an Illinois senator, is now changing its specifications for coffee. The specifications were too high, it was decided with support from the General Accounting Office, and the quality of GI coffee is being rolled back to a poorer commercial grade. This may save $900,000 a year, funds that could become available to increase the public subsidy to the Senate dining room, or expand free parking facilities provided for Congress on Capitol Hill.

"The men and women of the Department of Defense," Mr. Schlesinger says in his report, "are without peers as servants of the nation. It does not follow, however, that patriotism can proceed without respect. We must give them the respect, dignity, and support that are their due."

The Secretary did not choose to make an issue out of the coffee, but he does insist that the safety of this country depends on a military establishment that can continue to do its job. "We who represent this department," he declared, "must not be reticent in stating the needs we have or the pride we feel" in the performance of the mission.

At the outset, Mr. Schlesinger's evaluation is based on how he views the threat. The Soviet Union, he says, sees no inconsistency between détente and a program designed to increase military capability. For us to do the same thing, he recognizes, appears incongruous to many Americans. We have a tradition of arming fast when war starts and disarming even faster when it is over.

The Russian budgets, forces, and forward deployments keep increasing. "We would serve ourselves and our allies poorly indeed if we relied solely on fond hopes or soft words while failing to take practical accounts of improving Soviet capabilities," the Secretary cautioned.

He discusses, at some length, the shift in strategic target planning announced earlier this year. There is a need for additional US options in case of a crunch, but they "do not include the option of a disarming first strike." The improvements in Soviet missile technology will force the US to remain competitive and "be certain that the USSR has no misunderstanding on this point." Then:

"In the past, most of these options—whether the principal targets were cities, industrial facilities, or military installations—have involved relatively massive responses. Rather than massive options, we now want to provide the President with a wider set of much more selective targeting options. Through possession of such a visible capability, we hope to reinforce deterrence by removing the temptation for an adversary to consider any kind of nuclear attack. Therefore, the changes we are making in our strategic planning this year are specifically intended to shore up deterrence across the entire spectrum of risk. We believe that by improving deterrence across the broad spectrum, we will reduce to an even lower point the probability of nuclear clash between ourselves and other major powers."

If deterrence fails, the Secretary contends, we must be able to limit the chances of escalation and hit important targets so accurately they, and they alone, will be demolished.

He discloses that, in the past year, the Russians have tested four new ICBMs. Three of the four have been flown with MIRVs, and all have increased accuracy. On top of this, Mr. Schlesinger says the range and primary mission of the new Russian Backfire bomber is not "fully resolved." The latest model will have improved range and could be used on intercontinental missions because it can be air refueled.

At the same time, the Pentagon chief says, there is little to be gained by setting up a defense against bombers while we cannot defend our cities against missile attack. This capability has been limited by agreement. Here is his reasoning on the futility of the air defense effort:

"Even if the USSR uses all of its ballistic missiles against our strategic offensive forces and reserves its bombers for use against our cities, repeated analyses have convincingly demonstrated that under all foreseeable circumstances, we would have sufficient surviving forces to retaliate decisively against Soviet cities. . . . Even after absorbing the full weight of a Soviet nuclear attack, that [capability] offers the best hope of deterring attack and thus protecting our cities, not our ability to defend them against bomber attack."

It had been argued earlier, by former Defense Secretary McNamara, that an air defense system might prevent a bomber attack on our missile forces. Now, Mr. Schlesinger says, Russia's new MIRVed ICBMs, up to the limits allowed by the interim agreement, make this concept obsolete. He concludes: "To protect our withheld ICBMs, SLBMs in port, and bomber bases, we would need a balanced defense against both missiles and bombers. Such a defense is foreclosed by the ABM treaty."

He does favor continued research and development efforts in the air defense area, but no development of specific new weapon systems.

Of special interest to the Air Force, and a further illustration of the magnitude of the Pentagon's management effort, is Mr. Schlesinger's report on the B-1 bomber. The requirement for the system remains clear; the Strategic Air Command will need an airplane that can get out of its nest quickly, resist nuclear detonations, and penetrate at low altitude. There have been "adjustments in the program," and the decision on production has been put off until May 1976. The B-1 program review, headed by Dr. Raymond Bisplinghoff, found no major technical problems, but did project changes in cost and schedule.

A basic problem, and one that good management can solve, was the gap of two years between first flight and the production decision. The contractor, Rockwell International, would not be able to maintain its team and the critical skills over so long a period. At least one, and possibly two, more test aircraft are proposed to speed the flight program and at the same time ease the transition into full production. This will preserve the fly-before-you-buy principle, and there would be no additional cost, assuming production is ordered. *(See also the box, p. 38.)*

The Posture Statement also defends the request for $37 million to explore the development of a new ICBM. There are two concepts: a large payload weapon that could be launched from Minuteman silos, and a new mobile missile, ground or air launched. The Pentagon is going to be deliberate about this, with one eye on current SALT negotiations, the other on Soviet missile developments. The United States has said mobile ICBMs are not consistent with the objectives of existing agreements. Russia has not responded, but the US, Mr. Schlesinger says, cannot preclude the possibility that a mobile weapon will be deployed by their forces.

An interesting feature of the Secretary's report on management aspects is the disclosure that he has under way a review of the reporting system set up to keep Congress informed on the status of weapon projects. A committee, he said, is considering twenty-two separate issues for improvement and refinement of the Selected Acquisition Reports (SAR) system. The project was started in December.

In addition, he is giving new attention to the problem of aging and obsolescence, one that becomes more complex as unit costs go up and modernization is delayed, particularly as it was by the war in Vietnam. The service life of tactical aircraft, for example, is increasing at nearly half a year per year, indicating that by 1985 the average force age will be more than ten years. Currently, it is less than six years. The average age of USAF fighter and attack airplanes, a table shows, will be seven years in 1980, nine years in 1985, and eleven years in 1989. The conclusion: More new aircraft will have to be procured in order to keep the force at an acceptable age. Mr. Schlesinger's figures on the life of fighters and attack aircraft, in years:

Experience		*Projection*	
F-8	10.0	F-4B	17.5
F-100	18.0	F-14	19.6
F-105	16.0	A-7	20.2
F-104	10.0	A-6	18.4
A-1	20.0		

He estimates that in the 1980 to 1985 period, major procurement funding will have to be increased by $1 billion to $2 billion a year to cope with the aging process.

The struggle to reduce weapon costs continues. Three experimental Mission Concept Papers (MCPs) are in preparation. They will cover strategic offense, continental air defense, and theater air defense. They will assess the threat, the resources available, the requirement, and the deficiencies. Out of this, the Pentagon's managers will try to identify where new technology is needed, evaluate the possible costs, lay plans for the utilization of industry capability and resources, and schedule development.

The military base structure faces further cuts and realignment. In the past ten years, there have been almost 3,400 actions to close, reduce, or realign US military installations all over the world. The changes have resulted in a cut of about 700,000 military and civilian personnel. Mr. Schlesinger says, without any hint of specifics, that the program will continue until the base structure is "consistent with current force structure."

When the debate rages this year as the defense budget comes under attack, there will be a great deal of loose talk about Pentagon management. Yet, there is no department in the government with a longer history of continued effort and proved results in improving management. It started with James Forrestal, the first Secretary. We have watched the efforts and philosophies of men as varied as Charles E. Wilson, who came from the automobile world and reflected that fact, to Neil H. McElroy, out of the consumer-minded arena of soap, and back to autos with Robert S. McNamara, godfather to the Whiz Kids and Total Package Procurement.

These men, and all the others, made mistakes and pursued elusive goals, some of them impossible, some of them silly. But the overall result, including the monstrous weaknesses, is not as portrayed by the Proxmires and Aspins of Capitol Hill. It may be that we had to hit this period of malaise, now gripping the nation's capital, to put the Defense Department in honest perspective.

It's not as good as it might be, but, in comparison, it stands tall. ■

he Wayward Press

"The Wayward Press," this month, elcomes a guest columnist. He is obert D. Heinl, Jr., a retired Marine orps colonel, now military analyst r the Detroit News, *where this ticle appeared on December 6, 973.*

On December 19, Rep. Mendel avis of South Carolina inserted einl's article in the Congressional ecord, *charging that $100,000 had een "wantonly squandered" with- ut any protests from the press. The eason, Mr. Davis suggested, was iat the press itself was to blame or the waste. The congressman fur- ier accused the Washington* Post *f ignoring the fact that it has sen- ationalized untruths. False infor- nation was printed, Mr. Davis said, ind the true story "muzzled."*

It should be pointed out that the JSAF investigation at Charleston AFB, S. C., had been initiated be- ore the Post *printed its story, here inalyzed by Heinl. The newspaper's sources at Charleston already iad circulated their unsubstantiated charges. The* Post's *contribution vas to give them national circula- ion, without exercising journalistic esponsibility for their accuracy.*

The kind of bum rap the armed orces often get from the media has been painfully exemplified in a recent case of journalistic malpractice on the part of the Washington *Post* against he US Air Force.

Last August 15, in a page-one story, the *Post* alleged that in order to fool a team of visiting inspectors, authorities at Charleston AFB, S. C., had secretly buried "thousands of dollars worth" of costly gear in the base dump and a nearby pond.

Crediting an official of the base employes' union, *Post* reporter William Claiborne listed "electronic equipment, aircraft parts, and other new and usable equipment . . . 27 rolls of stainless steel cable, new and used engine parts, printed electrical circuits, scores of cans of paint, desks, chairs, and file cabinets, new shower stalls, transistors, and new GI cans."

All these and more, the *Post* reported, had, for reasons never altogether clear, been buried or dumped in the pond.

Claiborne's source had originally promised photographs of the dumping operation but reneged—a highly suspicious fact duly reported by the local Charleston *News and Courier* but not mentioned by the *Post*.

Claiborne's 41 column-inches were damningly headed: "Cleanup or Cover-up? Supplies Buried in Dump Prior to Inspection." The piece was syndicated by Los Angeles Times-Washington Post News Service and, as might be expected, generated fallout from indignant readers.

Picking up the cry, the Los Angeles *Times* editorialized: "Punishment is in order. . . . The best way to stop this needless waste would be to start punishing the officers who gave the orders."

That reaction of the Los Angeles *Times* to what—from Claiborne's story —seemed to be incredible brass-hat stupidity, spoke typically for news and electronic media across the country.

At Charleston, however, the reaction that mattered most was a storm front of investigators and inspectors that swept down on the base and its commander, Brig. Gen. R. L. Moeller.

The day the *Post's* story ran, the deputy inspector-general of the Air Force, a major general, jetted down from Washington to direct a probe already launched by the inspector-general, Military Airlift Command (who had flown in from Illinois).

Backing the inspectors was a task force from the Air Force Office of Special Investigations.

For four days, sleuths and inspectors took sworn testimony from every known source of Claiborne's article. Marshaling an array of earth-moving equipment, they dug and sifted the entire dump and even drained the pond.

Examined on oath in the presence of union representatives, employes named by the *Post* denied words put in their mouths by reporter Claiborne, or, in one particular employe's testimony regarding electrical equipment, said he had been misunderstood.

Dump and pond proved barren. Although in the words of CBS-News reporter David Henderson, who filmed the dig, "they dug up the entire dump," recovery amounted to one scraper-blade, a few runway sweeper brushes, nine old GI cans, several moldy mattresses, and thirty sacks of damaged fertilizer.

The four days' probing, trenching, and pumping that produced this meager return was carried out under the eyes of CBS (which gave up on the story), local reporters, and wire-service men who stayed to the end.

The only reporter who didn't stay for the dig was from the Washington *Post*. On August 14, soon after General Moeller had already started excavation, Claiborne, as he admitted, announced he "had a plane reservation to make" and departed for Washington, where his article started so much trouble the next morning.

Asked why he had not stayed to watch the diggings, which would prove or disprove his story, Claiborne replied, "They didn't decide to dig until they knew I had plane reservations and had to leave."

Moeller tells it differently. "I immediately told Claiborne," he stated, 'We're digging this whole thing up, and I can get you a comfortable chair so you can sit in the shade of a tree and you can watch this entire dump being dug up.' "

One who did stay was Henderson from CBS-News. "We simply couldn't back up the *Post* story," Henderson said afterward, a fact, he added, that gave him problems with New York, which insisted to the end that if it was page-one Washington *Post*, it had to be so.

When nothing more was left to dig, drain, or investigate, wire services duly reported negative results, as well as official exoneration of General Moeller and the fact that Air Force headquarters allowed the base to retain its original rating as the best command in the Air Force.

Neither the *Post* nor Los Angeles *Times* can find that they ran any wire-service stories that would have balanced the original unfair report. Having launched a sensational story with highly adverse reverberations for the Air Force, the *Post* undertook no follow-up and dropped the story, as did the Los Angeles *Times*.

(On November 30, over three months late, the *Post*, belatedly aware of inadequacies in Claiborne's story, ran a grudging, deeply buried report that Air Force inspectors-general had cleared the base, but gave no hint of this non-story's original insubstantiality.)

Of all radio-TV stations that ran the dump story nationwide, only KMOX-TV (St. Louis, Mo.), a CBS affiliate, is known to have given the Air Force time to refute after the original charges had been demolished.

Claiborne nevertheless still stands by his story. "I think the Air Force got a fair shake," he insists.

One party who emphatically did not get a fair shake on the *Post's* "exposé" was the taxpayer. Costing out the thousands of gallons of now-scarce jet fuel wasted in flying investigators from Washington and Illinois, travel expenses and per diem for them and aircrews, aircraft operating costs, thousands of man-hours' labor and investigation, heavy equipment tied up and all other charges associated with the probe, General Moeller glumly put the total close to $100,000.

What this irresponsible reportorial caper may have cost the armed forces other than in dollars is intangible and therefore incalculable.

On the part of the US Air Force, a proud and competent service victimized by the *Post's* cheap shot, the damage is worse than incalculable: It is unforgivable.

Aerospace World

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C., MARCH 6

During the third week of February, the Soviet Union test-fired two SS-X-18 ICBMs from its launch facility at Tyuratam in central Russia into the Pacific Ocean near Midway Island, a distance of about 5,000 miles.

These shots followed the test flight of a MIRVed SS-19 ICBM late in January 1973 *(see March '74 issue, p. 23).*

Aboard the first SS-X-18 were "several MIRV-type reentry vehicles," according to a Pentagon spokesman, while the second missile carried "a single reentry object."

The test-firing of a missile with just one warhead provoked considerable speculation. Observers pointed out that the SS-X-18—one of four new Soviet ICBMs currently being developed—probably has a throw weight (payload-carrying capability) thirty percent greater than the SS-9—a missile US experts believe the SS-X-18 is intended to replace. It is known that the SS-9 can deliver a twenty-five-megaton payload.

But since twenty-five megatons is more than enough to knock out even the hardest of targets, questions about the single-warhead test persisted. (The Defense Department reserved comment until its analysis of the test series is completed.)

It was noted, however, that during 1973 the Soviet Union launched 371 large rockets, or roughly one shot a day. "It simply gives you a handle on the fact that they have a very sizable program," a Pentagon spokesman commented.

This surge in missile-test activity certainly has a major political aspect, in that the Soviet Union now has a much stronger hand to play in Geneva during the second round of Strategic Arms Limitation talks.

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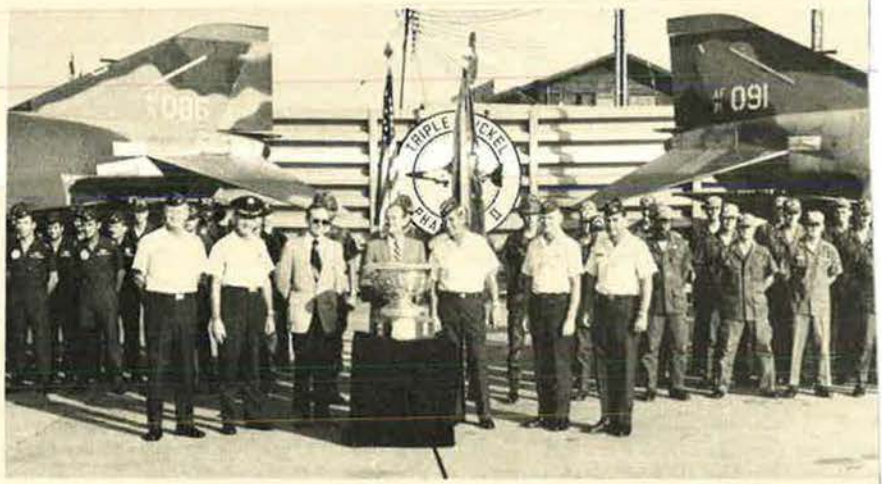
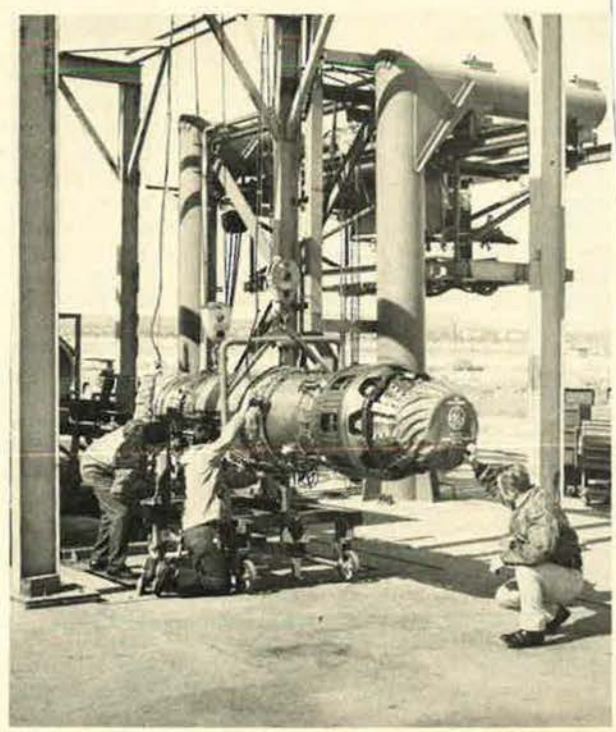
In a more cooperative venture, US and Soviet officials have agreed to exchange information in the field of transportation.



The 555th Tactical Fighter Squadron earlier this year was presented the Hughes Trophy at Udorn RTAFB, Thailand, for "outstanding performance of air defense." Present, from left, were Col. Robert W. Clement, 432d Tactical Reconnaissance Wing Commander; Maj. Gen. LeRoy J. Manor, 13th Air Force Commander; Don Chase, Hughes Aircraft Co. Assistant for Customer Relations; Bob DeHaven, Hughes Vice President; Gen. Timothy F. O'Keefe, Commander, US Support Activities Group/Seventh Air Force; Brig. Gen. James R. Hildreth, 13th AF Advanced Echelon Commander; and Lt. Col. Edward R. Shields, II, Commander of the famous "Triple Nickel" squadron, a unit that has, among other things, produced two of USAF's three Vietnam aces.



GE's YJ101 engine will power Northrop Corp.'s YF-17 prototype lightweight fighter, scheduled for roll-out on April 4. The YF-17, to be equipped with two of the 15,000-pound-thrust engines, is expected to fly at supersonic speeds with afterburner. The engine has been recommended for flight release by a senior USAF propulsion review board.

The following joint US-USSR news release was issued on February 15, 1974. For related subjects, see the interview with Dr. Malcolm Currie, DDR&E, beginning on p. 36.

US-USSR COMMITTEE AGREES TO IMPLEMENT AGREEMENT ON PEACEFUL USES OF ATOMIC ENERGY

The US-USSR Joint Committee on Cooperation in Atomic Energy met in Washington, D. C., February 4–6, 1974, and reached accord on implementation of the Agreement on Scientific and Technical Cooperation for the Peaceful Uses of Atomic Energy, signed June 21, 1973, by President Nixon and General Secretary Brezhnev.

Professor Petrosyants, Chairman of the USSR State Committee on the Utilization of Atomic Energy and leader of the twelve-man Soviet delegation, met with Dr. Dixy Lee Ray, Chairman, US Atomic Energy Commission; Dr. Guyford Stever, Director, National Science Foundation; and Kenneth Rush, Deputy Secretary of State.

A Protocol on Cooperation in *Controlled Thermonuclear Fusion and Plasma Physics Research* was signed in furtherance of the agreement at the meeting by AEC Commissioner Clarence E. Larson and State Committee Chairman Andronik M. Petrosyants, cochairmen of the Joint Committee. Joint coordinating committees were established to implement fusion and fast breeder reactor cooperation, and a program of cooperation in research on fundamental properties of matter was agreed upon.

Following the Washington meeting, the USSR nuclear delegation visited a number of US scientific centers and nuclear power stations.

Early this year, a joint committee lrew up an agenda of topics waranting consideration:

- **Marine transport.** Requirements of both countries for safety at sea; data exchange about "ice-transiting" vessels; shared technology about ocean commerce and cargo handling in ports; knowledge about commercial ship equipment, crew training, and "human factors"; studies of ocean-wave spectra and ship loading.
- **Civil aviation.** Airworthiness standards and certification procedures; air traffic control techniques; nonvisual approach landing systems; accident investigation and analysis; specialist training; aviation use in agriculture, construction, and commerce; security for passengers, aircraft, and cargoes.
- **Rail transport.** Modern equipment design, including tracks and their mechanized maintenance; perishable foodstuff transport; use of electrified railroads. (Later studies will probe high-speed passenger transport and automation.)
- **Automotive.** Highway safety; improved roadways and driver education.
- **Transportation construction.** Bridge and tunnel design and technology.

Items for future study: urban transport systems and advanced guided surface systems.

(In regard to this joint project, it may be pointed out that the Soviet Union has one of the most extensive and efficient rail networks in the world, and her commercial and fishing fleets are second to none. In this instance, at least, the US may get as good information as it gives.)

☆

With the pullback of Israeli forces across the Suez Canal under terms of the Mideast cease-fire, Egypt has begun clearing the man-made waterway preparatory to reopening it to ship traffic—a task that may take six months or more.

With that accomplished, the canal will be capable of accommodating ships up to 60,000 tons. (A study is currently under way to determine the feasibility of enlarging the waterway to permit passage of ships among the world's biggest—huge commercial tankers of 250,000-ton displacement. Such renovation would require a minimum of five years and cost $6 billion-plus, Egyptian officials estimate. Financing is not expected to be a problem, if the go-ahead for the major reconstruction project is given.)

As far as Israel is concerned, its cargoes would be allowed transit through the present canal, once the clearing operation is complete, while Israeli ships would not.

In the bigger strategic picture, US officials are aware that the reopened canal would give Soviet fleet elements easy access to the Indian Ocean and, perhaps more important, to the crucial Persian Gulf, a major source of the lifeblood of the industrial world—crude oil. It is currently estimated that outbound tankers leave the Gulf area on an average daily rate of one *every eleven minutes.*

Thus, the Suez Canal and adjacent oil-rich lands are irrevocably intertwined in terms of the world's military and economic security, a fact not likely to be overlooked by US military and diplomatic strategists.

☆

Between now and June 1975, Aerospace Defense Command plans a fairly hefty cutback in aircraft and manpower. In all, ADC will lose 144 planes—F-102 Delta Daggers from eight Air Guard squadrons. (For an AFA Resolution on best utilization of the experienced personnel to be at liberty due to the realignment, see p. 74.)

The twenty-seven fighter-interceptor squadrons composed of seven active and twenty Air Guard units currently available to the Command will be whittled down to twenty interceptor units—six active and fourteen ANG.

The resulting ADC force, totaling some 335 aircraft, will be made up of six active-duty F-106 Delta Dart squadrons and six F-106, six F-101 Voodoo, and two F-102 Delta Dagger ANG squadrons.

In the realignment, ADC will lose the active-duty 460th FIS, Grand Forks AFB, N. D., this summer. Its F-106s will go to other units *(see below).*

Also to be inactivated are four ANG units, all flying F-102s: 106th Fighter-Interceptor Group, Suffolk County Airport, N. Y.; 112th FIG, Greater Pittsburgh International Airport, Pa.; 115th FIG, Truax Field, Wis.; and 163d FIG, Ontario International Airport, Calif.

Four ANG squadrons will convert from F-102s to F-106 and A-7 fighters and EB-57 electronic warfare aircraft: 158th FIG, Burlington, Vt., to EB-57s; 125th FIG, Jacksonville IAP, Fla., to F-106s; 144th FIG, Fresno Air Terminal, Calif., to F-106s; and 169th FIG, McEntire ANG Base, S. C., to A-7s (TAC will

Aerospace World

gain this redesignated tactical fighter squadron.)

The 147th FIG, Ellington AFB, Tex., is to become an all-F-101 unit and active air-defense interceptor squadron. (Previously, the 147th conducted ANG combat crew training for F-101s and F-102s.)

Five ADC dispersed operating bases will be discontinued this spring: Bangor IAP, Me. (ANG F-101 unit; the 101st FIG will remain stationed there); Duluth IAP, Minn. (ANG F-101 unit; 148th FIG will remain); Logan Field, Mont.; Volk Field, Wis.; Walla Walla Airfield, Wash.

Four new ADC active-force F-106 fighter-interceptor alert detachments will be established this summer: Detachment No. 1, 5th FIS, Davis-Monthan AFB, Ariz.; Detachment No. 1, 87th FIS, New Orleans Naval Air Station, La.; Detachment No. 1, 49th FIS, New Hanover County Airport, N. C.; Detachment No. 1, 84th FIS, Ontario IAP, Calif. (when ANG's 163d FIG is deactivated).

This summer, ADC's dispersed operating base at Kingsley Field, Ore., will become an F-106 alert detachment facility: Detachment No. 1, 318th FIS.

In all, ADC stands to lose 559 military and thirty-four civilian spaces. In addition, ANG air-defense force reductions will come to 4,170 military spaces, of which 980 will be full-time air technicians. (The latter are full-time ANG employees occupying military slots during weekend training.) Several hundred other ANG slots are due to be lost by realignment of non-ADC units.

ANG will make every effort to relocate the 980 full-time air technicians displaced by the realignment. Air Guardsmen retaining a military commitment will be reassigned to other ANG or Air Reserve units within commuting distance, while those who have fulfilled their ANG service obligation will be allowed to separate or seek spots in other ANG or Air Reserve units.

☆

Late in February, US Navy received the first of a new type of carrier-based jet aircraft designed primarily to "revolutionize" Navy's antisubmarine warfare capability.

The Lockheed-built S-3A Viking is to replace the Grumman S-2 Tracker, a prop-driven aircraft that has been the mainstay of Navy's ASW operations for the last twenty years.

According to Lockheed, the Viking "incorporates the most extensive and sophisticated application of advanced electronics, sensors, and software technology ever developed for a tactical aircraft." Its electronic gear should make Viking ten times as effective as the Tracker, Navy said.

With the capability of searching 9,000 square miles of ocean on a single mission, the sweptwing, four-man-crew S-3A has maximum speed of 500 mph, provided by twin high-bypass GE TF-M34 turbofan engines with 9,000 pounds' thrust each.

Supplementing Viking's Mark 45 homing torpedo and giving the aircraft a traditional attack mission will be the long-range Harpoon antiship missile, currently under development. The S-3A also is equipped with an underwing arsenal of rockets, mines, bombs, and special weapons.

The Navy sees a lifespan of twenty years for the $10 million Viking and has ordered 187 of the aircraft to be delivered through 1975.

☆

Congratulations to our northern neighbors on the fiftieth anniversary of the founding of the Royal Canadian Air Force on April 1, 1924.

From a tiny force of 300 officers and men, RCAF was to grow by World War II to eighty-eight squadrons numbering 250,000 men an[d] women.

Hyman L. Shulman, left, senior engineer at Rand Corp., receives Rand President Dr. Donald Rice's congratulations on receiving USAF's Exceptional Service Award, top civil honor, for missile-guidance work.

Canadian fighter units were o[n] hand during the Battle of Britain and sixteen squadrons formed a[n] entire bomber group of RAF Bomber Command.

Canadians also flew as part o[f] RAF Transport and Coastal Commands and, at home, trained 131,53[?] British Commonwealth aircrews, not to mention participating in the Battle of the Atlantic.

Although the Canadian armed forces were unified in 1968, the air element has maintained a big slice of its history intact. Among five of seven chiefs of RCAF Air Staff still living is Air Marshal C. Royal Slemon, who served from RCAF's inception in 1924 until retirement in 1964. Other senior airmen still serving are Vice Chief of Defence Staff Lt. Gen. A. Chester Hull, Deputy NORAD CinC Lt. Gen. Reginald J. Lane, and Maj. Gen. Richard C. Stovel, Commander of the Canadian Defence Liaison Staff, Washington, D. C., who rose from aircraftsman, second class, to his present rank.

A big birthday bash is planned for the Ottawa area April 6, at which 3,000 active and retired airmen are expected.

Through the years, the hospitality of Canadian airmen to their visiting American counterparts has become legend in the USAF.

☆

In the vital area of advanced weaponry, the Air Force Systems Command announced changes in key posts.

On April 1, Maj. Gen. Herbert A. Lyon assumes command of the Space and Missile Test Center (SAMTEC), Vandenberg AFB, Calif. Replacing retiring Maj. Gen. Jessup D. Lowe, General Lyon previously was Vice Commander, Space and Missile Systems Organization (SAMSO), Los Angeles, Calif.

On March 1, Brig. Gen. Gerald K. Hendricks became Director of Science and Technology. Previously, he was Commander of the Air Force Armament Laboratory (AFATL), Eglin AFB, Fla. General Hendricks replaced Dr. Alan M. Lovelace, now Principal Deputy, Assistant Secretary of the Air Force (R&D).

Also on March 1, Col. (Brig. Gen. selectee) James A. Abrahamson assumed duties as Inspector General. He was formerly Commander, 4950th Test Wing, Aeronautical Systems

Division (ASD), Wright-Patterson AFB, Ohio. Colonel Abrahamson replaced Brig. Gen. Robert A. Rushworth, who became Commander of the Air Force Flight Test Center (AFFTC), Edwards AFB, Ohio.

On April 1, Maj. Gen. Benjamin N. Bellis became Commander, Electronic Systems Division (ESD), L. G. Hanscom Field, Mass., replacing retiring Maj. Gen. Albert R. Shiely, Jr. Filling the former Bellis post as F-15 System Program Director is Brig. Gen. Robert C. Mathis, previously Deputy for Reconnaissance/Strike/Electronic Warfare at ASD, Wright-Patterson. His former Assistant Deputy, Col. (Brig. Gen. selectee) Robert A. Foster, will become Deputy.

And, on March 4, AFFTC's former Commander, Brig. Gen. Howard H. Lane, became Commander, USAF Tactical Air Warfare Center (TAC), Eglin AFB, Fla.

☆

SSgt. Jim Jackson took this shot of a KC-135 tanker bathed in frosty sunlight at "high-noon" at Eielson AFB, Alaska, on December 21. Now with spring in the air, Training Command's Arctic Survival School at Eielson is closing out another season of instruction in cold-weather survival (see below).

With spring in the air, it means the closing out of another active winter season for men of Detachment 1, 3636th Combat Crew Training Wing, Eielson AFB, Alaska.

This unit is responsible for running ATC's Arctic Survival Training School, which graduates about 800 students in a total of eighty classes through the winter months.

The survival course is just one gauge of how civilian and military communities in the northern clime cooperate with each other more fully than in most other places. Trainees in Arctic survival at Eielson are not only from all branches of the military but consist of airline personnel, state park rangers, state police, and media people, among others, including a substantial number of women.

Following a stint of classroom instruction, student "survivors" move out into the field for a session of emergency shelter building and other tasks of staying alive in conditions many an unfortunate downed aircrew has experienced. The climax of the course is learning techniques to vector in search aircraft. The fervent hope of many graduates: Never having to use their newfound knowledge.

☆

In 1973, USAF's Aerospace Rescue and Recovery Service marked another banner year in its continuing worldwide mission of saving lives.

For the first time in a decade, the great majority of ARRS saves took place in other than combat conditions in Southeast Asia. (Of 519 saves credited in the year, only fourteen were of US airmen downed in SEA.)

ARRS fixed-wing aircraft and helicopters teamed up around the globe to perform such diverse missions as evacuating hospital patients from Iceland's volcano-devastated Heimaeyn Island to plucking an injured Turkish seaman from the deck of a ship 300 miles off the coast of Okinawa.

And while ARRS's smooth pro-

AIR FORCE ACADEMY ANNIVERSARY

On April 1, 1954, President Eisenhower signed Public Law 325 of the 83d Congress, establishing the United States Air Force Academy. It was the culmination of three decades of frequently interrupted planning by airmen and their supporters.

Two months later, Secretary of the Air Force Harold E. Talbott selected the present Academy site near Colorado Springs, from among three potential sites that had been chosen for final consideration by a Site Selection Committee. Lt. Gen. Hubert R. Harmon was named the Academy's first Superintendent. Interim facilities were constructed at Lowry AFB, Denver, Colo., where the Academy was housed until the permanent plant could be completed. The first class of cadets arrived in July 1955, and the Academy was officially dedicated on July 11 of that year.

In the two decades since its establishment, the Air Force Academy has achieved recognition as one of the nation's outstanding educational institutions. Its first fourteen classes have produced a higher proportion of Rhodes Scholars than any other US college with the exception of Harvard, Yale, Princeton, and the US Military Academy, with which USAFA is tied for fourth place.

The Academy's contributions to national security are equally impressive. Seventy-five percent of its graduates served in Southeast Asia during the Vietnam War. Eighty-one were killed in action, thirty became prisoners of war, and forty-three remain missing in action. Two of the three USAF aces of that war are Academy graduates. USAFA men were awarded twelve Air Force Crosses and 141 Silver Stars. More than 1,500 graduates earned one or more DFCs, and 2,350 one or more Air Medals.

Of the Academy's 7,789 graduates, 6,156 are still on active duty with the Air Force and thirty in the other services. Seven graduates of early classes have been promoted to the rank of colonel.

No other US educational institution, either civilian or military, has achieved in its first twenty years a comparable degree of excellence over as wide a range of activities—intellectual, public service, architectural, athletic—as the United States Air Force Academy. It is a national institution in which we may all take pride.

—JLF

fessionalism is reflected in the statistics of lives saved and missions flown, no mission can be regarded as routine. (In SEA alone since 1964, ARRS personnel have been awarded more than 33,000 individual citations, many posthumously.)

☆

Feel inventive? Well, a British industrialist is offering a $120,000 cash prize to anyone who can fly a man-powered plane around two pylons a half mile apart. The craft must maintain an altitude of not less than ten feet, after a takeoff by manpower alone.

The international competition is being sponsored by Henry Kremel, who first offered a $12,000 prize for such a craft fourteen years ago. With no takers, he doubled the prize in 1967, with a similar result.

With prospective winnings now ten times the original amount, interest has perked up. Even MIT computers have been pressed into service in a student project to help solve the major stumbling block: a design that will allow tight turns around the pylons without excessive loss in altitude.

☆

NEWS NOTES—USAF **Brig. Gen. John P. Flynn,** a former ranking POW, has been nominated for promotion to **major general.** He currently is Vice Commander of the Air War College, Maxwell AFB, Ala.

Earlier this year, the **53d Tactical Fighter Squadron,** Bitburg AB, Germany, marked its **50,000th accident-free flying hour,** the only unit in USAFE to hold that mark.

Awarded wings at the Corpus Christi, Tex., Naval Air Station on February 22 was **Lt. (jg) Barbara Allen,** the **first woman** to become a US military pilot. She'll fly transports.

Dale D. Myers, head of all manned spaceflight programs since January 1970, has resigned from NASA to rejoin **Rockwell International Corp.** as president of a newly formed aircraft group.

Sgt. Paul J. Gillette, SAC historian for the 307th Strategic Wing, U-Tapao Royal Thai Navy Airfield, Thailand, has been named **Air Force Historian of the Year for 1973.** His writing about Linebacker II won plaudits for "objectivity, honesty, and fairness" in reporting on his unit.

John P. Flynn will be the first returned Vietnam POW in USAF to attain two-star rank. He's currently Air War College Vice Commander.

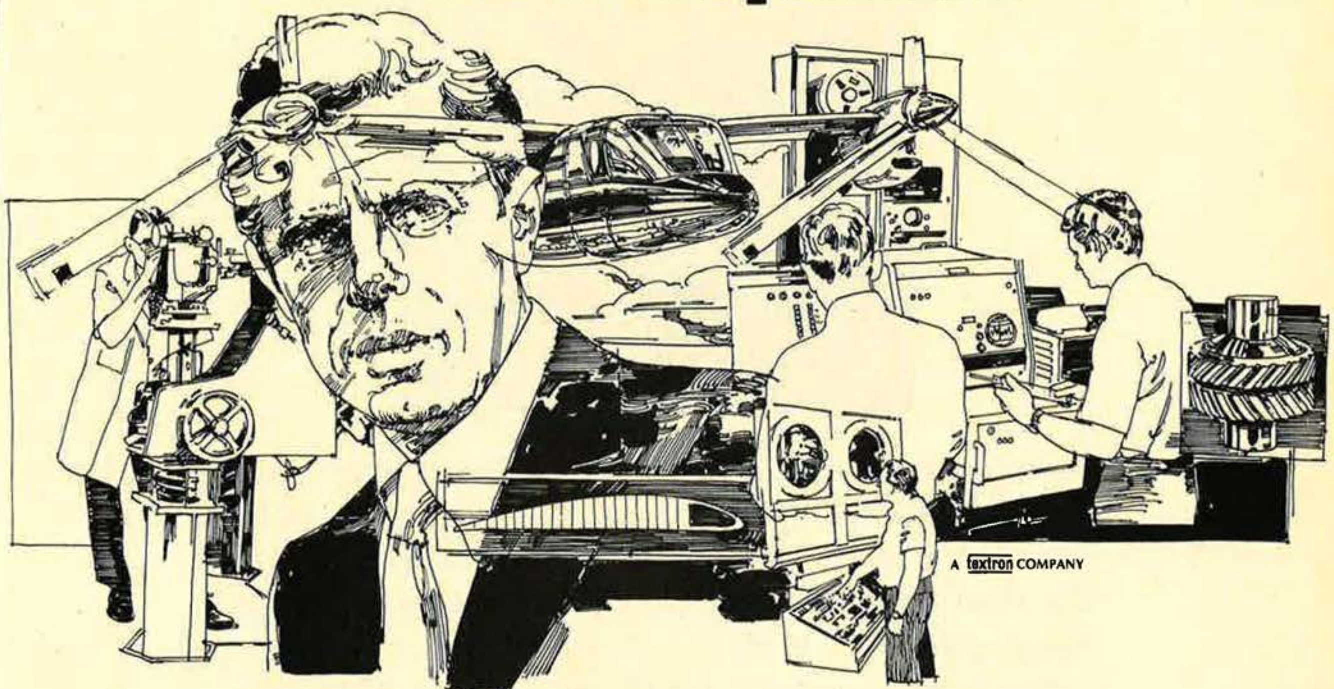
Greece's NATO Air Defense Ground Environment (NADGE) system will be beefed up to the tune of **four additional radar sites** and the modification of three.

Died: Michael Amrine, scientific writer and biographer and sometime contributor to AIR FORCE Magazine, of lymphoma in Washington, D. C., in February. He was fifty-five years old.

Died: Avery McBee, a former Washington, D. C., **public relations official** well known in aviation and aerospace circles, in Delray Beach, Fla., in February. He was seventy-five. ■

Index to Advertisers

When all you make are helicopters, one of the things you emphasize is Research and Development.



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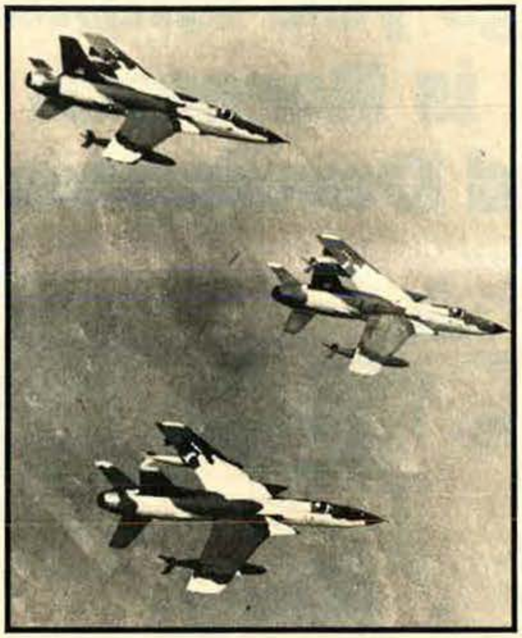
A trio of Thuds heads North. The F-105 Thunderchief earned its place in history as one of the all-time great fighters.



When the F-105 Thunderchief entered the tactical inventory in 1960, pilots frequently accused Republic of building it out of lead. The F-105 was nicknamed the Nickel, the Thud, and sometimes the squash bomber (if all else failed, you could land on a target and squash it). The names were in jest. No aircraft ever earned more complete devotion from its pilots than did the F-105. Here is what it was like to fly the F-105 on a mission up North during the Vietnam War and a look at how the aircraft is being used today as we go . . .

FLYING THE THUD

BY CAPT. DON CARSON
CONTRIBUTING EDITOR
AIR FORCE MAGAZINE

IT WAS a typical Southeast Asian night. The early evening rains left every object dripping with moisture. I sat on an empty 650-gallon fuel tank stored in the revetment and talked with my Electronic Warfare Officer (EWO), Don Brian, and a couple of crew chiefs who waited to send off their planes.

0230 . . . time to strap into my F-105 and get going for that 0300 takeoff. Tonight we were flying a Wild Weasel mission supporting four F-105 "Ryan's Raider" aircraft on a night bombing mission over North Vietnam. Ryan's Raider missions were flown in specially modified two-place F-105Fs having expanded radarscopes and an improved radar bombing system. (Ryan's Raiders were named for Gen. John D. Ryan, who spearheaded this program.)

Both the Wild Weasel and Raider aircraft belonged to the 44th TFS at orat, Thailand. The official USAF ames for these missions were Comnando Nail and Iron Hand, but aider and Weasel were terms used nore often by those of us who flew nem.

In 1968, the F-105 Raider birds vere the USAF's primary operaional night and all-weather fighterombers. A few F-111s, with their ophisticated radar bombing sysems, were in their initial combat est, but would not enter the air var in squadron strength until four ears later. It was these few hybrid -105s that helped to ensure that Jncle Ho's boys did not use the lanket of darkness or foul weather o move their supplies and troops outh with impunity.

We had briefed several hours earlier and had worked closely with he Raider crews to plot their initial points (IPs), run-in headings, altiudes, and times. It was vital that our Weasels fly close to the Raider aircraft to give them protection from the SAMs guarding their target area.

Tonight there would be four Raider and two Weasel birds on this mission. We would take off separately in the Weasel birds and cover each of the Raiders during their target runs. The planned spacing enabled us to cover the first aircraft to its target and return to the IP to pick up the next crew for its run-in. Timing and coordination were critical if we were to be of any use to the Raiders. We had to take off, hit the tanker, and get to our rendezvous point as briefed. My EWO had this worked out to a precise schedule.

I depressed the starter button, firing the huge shotgun-like starting cartridge. The engine turned over with a roar and engulfed the entire revetment in acrid smoke that hung in the still night air. I brought the throttle up to idle as the RPM reached eight percent. Oil pressure, hydraulics, fuel flow, all looked good. The exhaust gas temperature (EGT) began to rise as the fire in the Pratt & Whitney J75 engine caught. With an increasing rumble and whine, the F-105 sprang to life.

Going through the many checks, we readied the F-105 for takeoff. I checked out the flight controls, air-refueling system, and other flight systems while Don ran through the Doppler navigation system and electric warning and homing equipment. The extra black boxes mounted in the back seat of the Weasel aircraft gave us the ability to seek out and destroy surface-to-air missiles and radar-guided antiaircraft guns.

The equipment was too much for one man to operate while flying the aircraft, so the two-place Fairchild/Republic F-105F was used. Electronic warfare officers had their hands full keeping track of enemy radars and giving their pilots threat warnings. This extra equipment and two-man crew enabled Weasels to fly routinely in areas that other aircraft avoided.

Checks complete, we taxied out of the revetment and headed down to the end of the runway. Stopping in the last-chance inspection area, the armament specialists armed the AGM-45 Shrike antiradiation missiles on the outboard pylons and

F-105 THUNDERCHIEF—FACTS AND FIGURES

Manufacturer	Fairchild Republic Div. of Fairchild Industries.
Type	Supersonic fighter-bomber.
Powerplant	Pratt & Whitney J75-P-19W turbojet; with afterburning, 24,500 pounds thrust; with water injection and afterburning, 26,500 pounds thrust.
Length	F-105D—64 feet, 3 inches; F-105F—69 feet, 1 inch.
Height	(D) 19 feet, 8 inches; (F) 20 feet, 1 inch.
Wingspan	34 feet, 11 inches.
Maximum takeoff weight	(D) 52,500 pounds; (F) 54,000 pounds.
Maximum unrefueled range	2,000 miles.
Maximum wing loading	140 pounds per square foot.
Speed	Mach 1.11 at sea level; Mach 2.1 above 36,000 feet.
Crew	Models A through D—one pilot. Models F and G—two pilots or one pilot and one electronic warfare officer (in tandem).
Armament	Full range of conventional and nuclear tactical armament and General Electric M-61 20-mm Vulcan automatic multibarrel gun, with 1,029 rounds.
First flight	YF-105A prototype first flew October 22, 1955.
Production	Total of 833 F-105s manufactured, until 1965.
Models	YF-105A—2 built; F-105B—75 built; RF (later JF)-105B—3 built; F-105D—610 built; F-105F—143 built, of which 48 were modified to become F-105Gs.
Wild Weasel version	The F-105G, a modified Wild Weasel version of the F-105F, has built-in ECM pods along lower sides of the fuselage. All other data for F-105F is valid for the F-105G.

F-105s were able to take a lot of punishment and still fly home.

pulled the pins on the 450-gallon fuel tanks and the centerline 650-gallon tank. We were carrying a maximum fuel load. This would allow us to remain in the target area long enough to cover all the Raider aircraft.

The armament troops finished, and we lowered our canopies and called for takeoff. The tower controller answered, "Vampire, cleared for takeoff . . . winds calm." Pushing up the power, the heavily laden F-105 began to move slowly toward the runway. Three fuel tanks and two Shrikes gave us a takeoff weight of more than 52,000 pounds. However, the temperature was relatively cool after the rains, and our takeoff roll would be only 6,800 feet. A hot afternoon takeoff with a full bomb and fuel load would use up more than 8,000 feet of runway.

Holding the brakes, I ran the engine up to military power and checked the gauges and flight controls. The oil pressure was fluctuat ing slightly—normal for the J7 We joked that when the oil pres sure did not fluctuate it was tim to worry. The J75 engine had it peculiar rumbles and groans tha we all recognized. Everything looke good.

I wiped the condensation fror inside the front windscreen, release the brakes, selected afterburner, an waited. It took five seconds for th F-105 afterburner to light, and w barely rolled without it. The burne light on the F-105 is especially harc When it lights, the entire aircrai feels as if it had been hit fror behind by a big truck. I turne on the water injection and we be gan to gain speed.

With water on, the J75 engin puts out 26,500 pounds of thrust— a big engine and extraordinarily re liable. It was rumored that yo could throw rocks in the intake and watch sand come out the tailpipe That may be mildly hyperbolic, but the J75 is a fantastic engine. If I ever have to fly combat again, I hope it is with an engine as tough as the Pratt & Whitney J75.

The airspeed tape read 185 knots, and I eased back on the stick to raise the nosewheel off the runway. We broke ground at 195 knots, just as the 7,000-foot marker flashed by. Once the F-105 was airborne, it was in its element. Whatever it lacked in takeoff ability, it made up for many times over in flying ability.

I felt a slight loss of power and saw the EGT drop as the water-injection system emptied, and there was a 2,000-pound decrease in thrust. At 350 knots, I pulled the throttle out of afterburner and climbed to 15,000 feet. Don gave me a heading of 060 degrees to the tanker. We had about thirty minutes until rendezvous. Time to get some last-minute checks completed and think about tonight's mission.

When flying daylight missions, the heat and humidity of Southeast Asia made the F-105 cockpit feel much like a greenhouse on a hot summer day. It didn't take long to feel as if you had been through a steam bath fully clothed. Flying at night had its advantages, among

F-105F and F-105D of the 388th TFW, Korat RTAFB, Thailand, on the way North with a load of bombs. F-105s did much of the bombing of North Vietnam.

ıem the relative coolness and lack f burning rays of the sun.

lunting the SAMs

"Invert," the GCI site, came in ver the radio with a vector to the anker, now thirty miles ahead. Following Invert's vectors, we picked p the tanker's lights ahead and hanged to the refueling frequency.

"Peach 41, this is Vampire," I alled to the tanker. Peach 41 nswered, "Roger, Vampire, you re loud and clear. We have a allyho, and you are cleared in."

I opened the air-refueling door nd checked for the ready light. Reaching down, I turned off the cabin pressurization to prevent any JP-4 fumes from entering the cockpit. JP-4 could get into the air-conditioning system during refueling, and the fumes burned your eyes like getting soap in them. Only once did I forget to turn off the pressurization. You don't make that mistake twice.

By now I had moved about ten feet behind the tanker's dimly lit boom. Stabilizing, I pushed the throttle forward and moved to the contact position. The boomer reached out with the boom and made a quick stab at the refueling receptacle in the nose of the F-105. I called, "Contact . . . good hookup, Boomer." You could always tell the experienced boomers. They would reach out and stick your aircraft as soon as you were anywhere near contact position. They didn't waste a minute in giving you fuel.

I watched the fuel gauge by my right knee slowly move up, indicating we were taking fuel. It was getting turbulent as we whisked in and out of clouds. The weather was good tonight, but on nights when we had to thread our way through thunderstorms to find our tanker, it was really exciting.

In a couple of minutes, the boomer called, "Vampire, you have your fuel." I made the disconnect and backed away from the tanker, thanking them for the fuel. Closing the refueling door and repressurizing the cockpit, we headed northeast.

As I changed back to Invert's radio frequency, I heard John Revak and Stan Goldstein in Packard, the first Raider, being vectored toward their tanker for fuel. We had thirty minutes until we had to pick them up at the IP. I turned off all external lights, and Don checked the vector gear once more to be sure we had all our warning systems working. As we crossed into North Vietnam, I commented on the excellent visibility and brightness of the full moon. I could see the reflections from the rivers and small lakes as we headed toward Packard's target run-in.

We trolled back and forth along his target area, listening and looking for any enemy SAM or AAA activity. This was not unlike trolling for fish, except this time we were the bait. A couple of strobes from a radar-guided gun and a low pulse rate frequency (PRF) SAM radar light indicated that someone knew we were there. They probably also knew that since we were alone and carried no jamming pods, we were a Weasel bird.

SAM operators normally did not bother a Weasel unless they could be assured of a good shot at him. If they fired and missed, they gave away their position and risked destruction. Even if they did not launch a SAM, we could fire a Shrike to ride down their radar beam if they stayed on the air too long. They knew this and only turned their radars on for a few moments at a time . . . just long enough to keep track of our location. It was a game of cat and mouse . . . much like the way a real weasel hunts its prey.

We purposely turned our tail toward the SAM site that had been giving us the once over, hoping to get him to turn on his radar long enough for us to turn into him and launch a Shrike. No luck. He was too smart. He probably knew that the second Weasel bird, Muskrat, was also in the area just south of our position. We had coordinated with Muskrat that we would stay north of the final run-in from the IP and they would stay south.

The Raider birds were to hit storage and truck staging areas just northwest of Dong Hoi, in the southern panhandle of North Vietnam. We really did not expect too much SAM activity since it had been quiet for the past few nights. I checked the clock, and we had ten minutes until we were to be at the IP. Heading west, we descended to our briefed altitude and waited for Packard to check in.

"Vampire, this is Packard . . . on time," they called. I answered, "Roger, Packard, we will be at the IP in five." I pushed the throttle up to get 550 knots as we turned to make the run-in. I briefed Packard on the SAM and AAA activity so they would have an idea of where to look for trouble.

Three Ringer

Once again we flew the route to the target area, this time with Packard about two miles off our right wing and 2,000 feet low. The vector gear now began to show some increased activity. The North Vietnamese gunners and SAM operators would love to get off a shot at Packard, but they were wary of our Shrikes.

Several 37-mm guns began to open up on us, but they were well off to our left. The shells arc skyward and explode with a bright flash that is gone in a moment, leaving small puffs of smoke that are visible in the moonlight. They look almost beautiful, like roman candles, when they are far away from you. Don comments on their bad aim tonight. I answer, "I hope it stays that way."

"SAM . . . low PRF . . . two o'clock," Don calls. I can tell by his voice that it is not yet much of a threat. When the danger is more immediate, the pitch of his voice lets me know. When you fly with someone every night, you learn to grasp the meaning of every inflection and sound.

COVER PAINTING COINCIDENCE

The cover painting, "Big Brass Ones," by Keith Ferris, shows Majs. John Revak and Stan Goldstein flying an F-105F, "Crown Seven," on a Wild Weasel mission over North Vietnam. They were assigned to the 44th TFS at Korat RTAFB, and Keith Ferris was there when they completed their hundredth mission, in November 1968. The painting now is part of the USAF Art Collection.

The painting became available to AIR FORCE Magazine after Capt. Don Carson had written the accompanying story. By a strange coincidence, Majors Revak (above, right) and Goldstein (left) were flying one of the F-105 Raider aircraft that Captain Carson escorted in the mission described here. Captain Carson also flew "Crown Seven" on many of his own Wild Weasel missions up North.

Artist Ferris dedicated the painting "To All Weasels, Everywhere," for their courage in flying what he accurately described as "this most dangerous mission."

About two minutes out from the target, we begin to really get some activity from the AAA gunners. They seem to know our exact location and altitude. They surrounded our aircraft with 37- and 57-mm rounds. Packard, off to our right, was getting it even worse. This was barrage AAA and not radar-guided, as we did not get any significant radar strobes.

Just to make things more interesting, we picked up a strong new SAM signal at ten o'clock. Don called out, "Three ringer at ten," indicating that he was getting a strong signal off to the left. The red warning lights in the cockpit and the rattlesnake growl in my earphones confirmed the higher pitch in Don's voice. Several times before I had thought we had a SAM launched at us when we didn't. Lightning and static electricity in weather could trigger the warning gear and give a momentary false indication of a launch. However, when it is for real, there is no doubt.

This SAM operator was serious, and he wanted Packard. The signal continued as I maneuvered into position to launch a Shrike. We turned directly toward the site, telling Packard that we had a SAM locked on at his ten o'clock. The guns continued to hammer away at us. Pulling up into the SAM site, I launched a Shrike.

I had heard a hundred times that you should close your eyes when launching a missile at night to protect your night vision. That was like telling a boy at a county fair peep show that he will go blind if he looks at the dancing girls. I decided to risk one eye!

The Shrike lit off with a roar and left the F-105 with a burst of speed and a trail of brilliant fire. It was beautiful, but I did not have time to watch it for long. Now every gun in that part of the world had opened up on us.

I waited for Don to call the SAM launch, hoping the Shrike would get there first. The Shrike guided, and as we saw it impact, the SAM signal suddenly ceased.

"I think we got him," I called to John and Stan in Packard, wh[o] were approaching their bomb releas[e] point. John had to hold a precis[e] heading and speed in order fo[r] Stan to get a good run-in for hi[s] radar bombing. The SAM launc[h] would have prevented their makin[g] a run and might well have ende[d] their night. I don't know why th[e] SAM site waited to launch, but [I] am glad it did!

"Packard's off left." We starte[d] a turn back to the west. They ha[d] carried a load of 750-pound bomb[s] that were now on their way to th[e] fuel and ammunition storage area.

The bombs exploded second[s] later with a brilliant flash, followe[d] by secondary explosions of brigh[t] orange. The fireballs shown brightl[y] in the darkness.

We turned to escort Packard ou[t] of the area and pick up our nex[t] Raider. The guns were still hammering away, but we were climbing above them as we headed back to the IP.

The second run-in with Buick

This Ryan's Raider bird is loaded with a rack of 750-pound bombs for a mission over North Vietnam (1968).

vas not quite as interesting as the irst. Evidently, we had knocked out he SAM radar, or at least scared hem into shutting down for a vhile. We heard not one bleep rom their radar the rest of that ight. The AAA gunners still had good supply of 37- and 57-mm ounds, but were not up to their isual level of accuracy.

Many pilots didn't like flying ight combat missions. Actually, I hink they were safer than day misions. You could see much earlier vhen someone was shooting at you, ind you had a great deal of time in vhich to react. This far outweighed he disadvantages of flying at night. Often on a day mission, the first time you knew you were being shot at was when AAA surrounded your aircraft or you were actually taking hits.

We stayed in the target area for another hour escorting the remainder of the Ryan's Raider aircraft in and out of the target area. They had gotten some good secondary explosions this night. There was a lot of fuel and ammunition that would never reach the Viet Cong in the South, thanks to their efforts.

Heading out of North Vietnam, we turned on the external lights and called Invert for a tanker. They again vectored us toward Peach 41, who gave us 4,000 pounds to see us safely back to Korat.

Low and Fast

The sun was just coming up as we dropped off the tanker and headed home. It was going to be a beautiful morning. I tried to resist the urge, but it was too nice a day to drive home at 20,000 feet. I rolled over and dived at the ground. The airspeed rapidly climbed to 650 knots as the F-105 came to life. It is like a thoroughbred racehorse . . . it likes to do one thing . . . go fast! It can do that better and smoother than anything flying. The lower and faster you take it, the better it handles.

I leveled off above the jungle and left the throttle at military power. We were holding well over 550 knots even with the extra drag of three external fuel tanks. I now relaxed and enjoyed the scenery flashing by.

When the Doppler indicated we were twenty miles out, I leveled at traffic-pattern altitude and called Korat tower for landing. Slowing to 350 knots, I turned initial. Into the break, gear and flaps down, turn final. The F-105 flies a fast final approach—with our fuel load, 195 knots. Touching down, I felt the drag chute take hold and help us slow down.

As we taxied back to the revetment, the first F-105 strike flight of the day was taxiing out for a mission over the North. Sixteen F-105s taxiing to the end of the runway, fully loaded, were an impressive sight.

The men flying the F-105 loved their aircraft as much as any machine in history. There are said to be two types of fighter pilots: those who flew the F-105 and those who wish they had. The ruggedness, honesty, and extreme reliability of this aircraft earned the respect of all who worked with it. To those of us who flew it, it has no equal.

During the early phases of the war, F-105s carried most of the bombs dropped in the North. The records and accomplishments of the F-105 are legendary—but it paid heavily for the glory gained in war. There were many lost to enemy SAMs and AAA.

The F-105 was not perfect. It also had its faults and weak points. Its takeoff roll was excessive. It did not turn as well as most fighters. The flight-control hydraulic lines were located too close together. One hit in a critical area and the chances were great of losing all flight controls.

In spite of its faults, I have never met an F-105 pilot who did not love the aircraft. The F-105 could go faster and further with more bombs than any fighter in the skies. It was an extremely accurate platform for weapons deliveries, and it would get you home again. The men who loved it most are those who took hits over Hanoi or Haiphong and flew home with part of a wing missing, a slab shot away, or a fire in the bomb bay. Battle-damaged F-105s have flown for hundreds of miles with zero oil pressure.

MiGs also took a heavy toll on F-105s. They were often attacked while fully loaded with bombs on their way to a target. Rather than jettisoning their bombs, Thud pilots would use their great speed to keep the MiGs at bay until they hit their targets. Once the bombs were cleaned off, an F-105 on the deck could easily walk away from any MiG.

In spite of the heavy wing loading and inability to turn well, the F-105 did a creditable job of downing MiGs in air-to-air battles. A total of twenty-nine MiGs was downed by F-105s during the war . . . not bad for an aircraft whose mission was to deliver bombs. ■

THERE'S STILL A LOT OF THUNDER LEFT

F-105s Join USAF Reserve Forces

BY CAPT. DON CARSON, USAF
CONTRIBUTING EDITOR, AIR FORCE MAGAZINE

—Staff photo by Capt. Don Carso

The majority of F-105s flying today are in the ANG and USAF Reserve. Those who work with the F-105 think it still has a lot of flight left.

The F-105 Thunderchief has almost vanished from the active USAF inventory. Today, the sole remaining F-105 squadron in the USAF is located at George AFB, Calif. It is a Wild Weasel squadron equipped with F-105F and G models. The remainder of the fleet has been assigned to the Air National Guard and Air Force Reserve.

I recently spent several days flying with the 192d Tactical Fighter Group of the Virginia Air National Guard. It had been almost five years to the day since I had flown my last mission at Korat. I had many fond memories of the F-105 and wondered how much of my love for it was fact and how much was colored by the passing of the years. As I sat in the briefing room and listened to my flight leader discussing the morning's mission, I wondered if I would feel the same way after flying the F-105 again.

The aircraft are older now, many with more than 5,000 hours on them. During the war in Southeast Asia, many were patched up with temporary fixes to get them through the immediate necessities of war. They had seen some hard years of very demanding flying.

This morning's mission was to be an Air Combat Maneuvering (ACM) mission. Because of a cutback in fuel and flying time, we were not flying with external fuel tanks. Missions were limited to just over one hour, so ACM was about all we could do. A mission to the air-to-ground gunnery range would take too much fuel and time. ACM is not the 192d's primary mission, but it does help keep the pilots proficient in tactics.

I would be flying with Lt. Col. Al Mattox, an American Airline pilot who flies with the Guard. Pilots from the 192d work in all types of civilian jobs. With the exception of six full-time pilot technicians, the 192d's pilots fly as a second job.

Their training requirements are the same as those of active-duty TAC fighter squadrons. From the looks of their gunnery scores, they seem to handle the F-105 as well as pilots of any squadron in which I served.

After the briefing, Al and I talked about flying. "The F-105 is extremely stable and accurate on the gunnery range," he said. "Our pilots really like the airplane. It is the most honest fighter I have flown."

Commander of the F-105 squadron, Col. Stuart E. Tompkins, Jr., explained, "My pilots come from all over. I have men who flew the F-105, F-100, and F-4 in Southeast Asia. I also have young lieutenants fresh out of gunnery school. They all like the F-105. Our squadron is not unlike a squadron in the active Air Force. We follow TAC training directives just like any fighter squadron. Our biggest advantage over an active-duty squadron is in the stability of our people. Many of our pilots have been flying in this squadron for years. They always fly with the same men and get to know them. Our maintenance is the other big plus. The maintenance troops have a lot of experience on fighters. Our maintenance is as good as you can find in any squadron."

The 192d's aircraft look and fly even better than when I last flew the F-105. However, the F-105 is beginning to show signs of age. Many of them are getting cracks in the wings and slab, which have necessitated a speed restriction until the aging warriors can be repaired. Even the indestructable F-105 is getting old. The weapon systems are maintained on only a limited scale. The Guard has no nuclear mission, so the toss-bomb computer is not maintained. All other systems of the F-105 seem to be holding up well. I asked an old friend, Fairchild/Republic's technical representative to the Virginia ANG, Don John, how he thought the F-105 was holding up. "The birds are flying very well now that we have had time to repair the damage they received in the war," he said. "I think they are programmed to fly forever."

I flew two missions with the 192d and found the F-105 as good as ever. The stick feel is still second to none. The aircraft is so stable you can trim it up in close formation and fly it hands off. We flew two ACM missions, and, after five minutes in the bird, I felt as if I had flown it five days ago rather than five years. For all its gigantic size and varied systems, the F-105 is a simple aircraft to fly. It is very honest and forgiving.

Originally designed as a low-level, high-speed nuclear fighter-bomber, the Fairchild/Republic F-105 Thunderchief served TAC best as a strike fighter-bomber. It is this mission for which the F-105 gained its fame in Southeast Asia, and it is this mission it is performing in the Guard and Reserve today.

Unstrapping from my last mission with the 192d, I thought about what I had learned during my visit. I had seen that Guard pilots are really professional fighter pilots who can fly an F-105 as well as active-duty pilots. I had observed their maintenance program that would put a smile on the face of any squadron commander. I had flown the F-105 again and rekindled an old flame. My opinion of this grand aircraft had not diminished with time. The F-105 is a little older, and it cannot do everything it could once do, but neither can a lot of us who flew it when we were all younger.

As I walked away from the flight line, I realized how lucky I had been to have spent more than four years during my career flying the F-105. It is not out to pasture yet. Guard pilots say their 105s have a lot of good flying hours left in them, and I believe it! ■

The author, Capt. Don Carson, is assigned to AIR FORCE Magazine for a year's training under the AFIT Education With Industry (EWI) program. A fighter pilot with 131 SEA missions in the F-105 to his credit, he is the author of the F-15 pilot report article in our February issue and last month's report on the TAC T-38 Aggressor Squadron.

An authority on Soviet military affairs presents an analysis of Soviet military manpower that is at considerable variance with generally accepted estimates. At a time when the USSR has numerical—and in some cases, qualitative—superiority in several major weapons categories, "we can ill afford to delude ourselves about the true size and quality of the USSR's pool of trained military people." Here are some disturbing answers to a question of vital importance . . .

ARE WE UNDERRATING SOVIET MIL

BY COL. WILLIAM F. SCOTT, USAF (RET.)

Soviet paratroopers board An-12 transports preparatory to a practice jump. The author believes that the USSR may have a million more active-duty troops than acknowledged.

RY MANPOWER?

DURING the past six months, the media have given much time and space to the rapidly increasing quality and quantity of Soviet weapons. There has been abundant comment on Secretary of Defense James R. Schlesinger's August 1973 revelation of four new Soviet ICBMs. Millions of words have been spent on the October Middle East war, which demonstrated both the sophistication of several Soviet conventional weapons that had not been used previously in combat, and the USSR's ability to provide enormous quantities of weapons to its client states.

Hardware is one part—a very important one—of a nation's military strength. Another essential is manpower. Beyond gross manpower figures announced by the USSR, little has been published in this country about the size, recruitment, training, and service commitments of Soviet military manpower. Much of what has appeared is inaccurate, incomplete, or both.

In a protracted conventional conflict—or in a general nuclear war as envisioned by Soviet military writers—manpower could well be the decisive element when a rough parity in weapons exists. Today, in many important categories of nuclear and conventional weapons, the US is in a position of numerical—and in some cases also of qualitative—inferiority to the USSR. We can ill afford to delude ourselves about the true size and quality of the USSR's pool of trained military people. This is especially true today, as pressure for further reduction of US troop strength continues, as uncertainty over our ability to recruit and retain capable young people in an all-volunteer force mounts, and as negotiations for force reductions in Europe proceed.

Organization of Soviet Armed Forces

In order to assess the active-duty strength of the Soviet Union's entire military establishment, it is first necessary to examine how Soviet forces are organized.

Under the Ministry of Defense, roughly comparable to our Department of Defense, are five separate services: Strategic Rocket Forces, Ground Forces, Troops of National PVO (aerospace defense), Air Forces, and Navy. The strength of these forces is given by a number of analysts as 3,425,000. There is an undisclosed number of other troops, such as those in civil defense and in military construction which are separate entities under the Ministry of Defense.

In addition to Ministry of Defense organizations are additional forces that are usually referred to by Western writers as "paramilitary." They are units of the Committee of State Security (KGB) and of the Ministry of Internal Affairs (MVD). The former include the Border Guards and other specialized units, reported to number about 125,000. MVD troops are a backup for the regular police force that maintains order throughout the USSR and are said to have a strength of 175,000. By Soviet law, both are part of the armed forces of the USSR.

Only by the most general interpretation of the term can KGB and MVD troops be considered "paramilitary." They are equipped with tanks, armored vehicles, and in some cases aircraft and helicopters. The KGB has its own Navy. The 1969 battle between Soviet and Chinese forces on Damanskiy Island was fought by KGB troops—not by those of the Ministry of Defense.

The period of obligatory service is two years for those serving in the Strategic Rocket Troops, Ground Forces, Troops of National PVO, Air Forces, the air arm of the Navy, the MVD, and ground units of the Border Guard. Service in the Navy, excepting its air arm, and the naval units of the Border Guard is three years. Service in the specialized troops of the Ministry of Defense probably is two years. Only one year of service is required of certain categories of males with higher education.

These periods of obligatory service, which seem unreasonably short in an age of sophisticated weapons, are compensated for by an elaborate program of premilitary training that will be discussed later.

Some Insights on Actual Strength

Under Soviet law, "Information on the organization of the armed forces, their number, location, combat capability, armaments, equipment, combat training, the moral/political status of troops, their material and financial support is a military secret." According to the

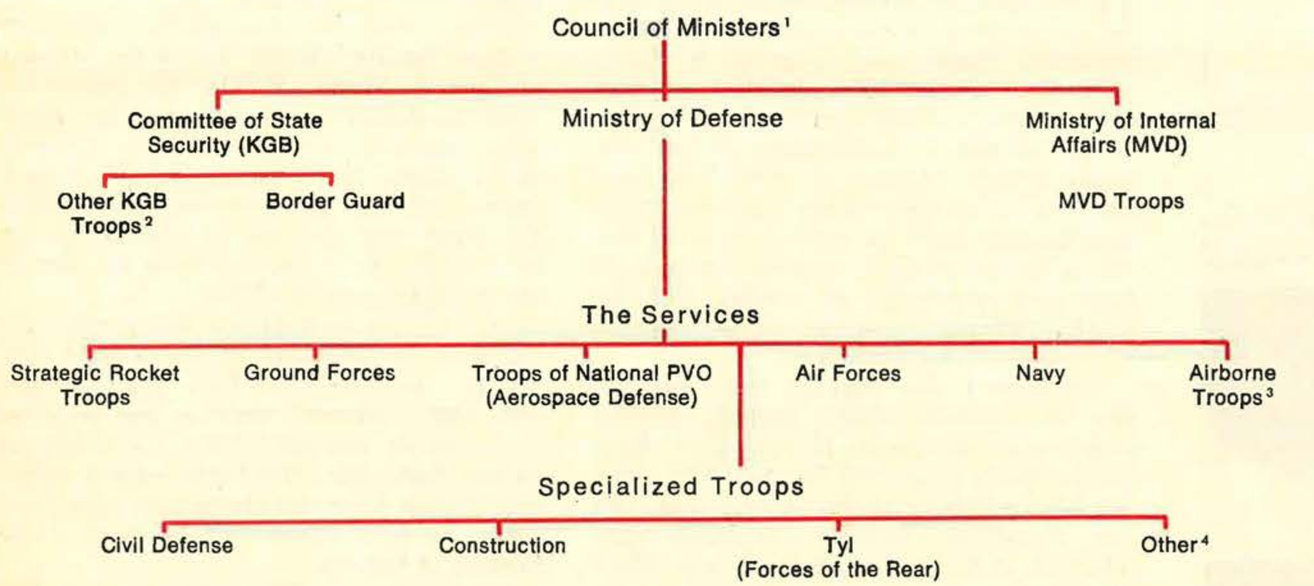
US press, all data on the Soviet armed forces used during the SALT I negotiations was provided by the United States. Hence, the number of Soviet youths called up each year under universal military service (which began in 1939 and was not terminated after World War II), as well as the total strength of the Soviet armed forces, has never been revealed.

The number of males reaching military age in the Soviet Union has varied widely during the past fifteen years. This variation may have

manpower. The decline in youths of militar age, which had started in 1957, was not re couped until 1973, at which time the numbe was estimated at 2,383,000.

It is not known what percentage of Sovie males are excused from military service fo physical and other reasons. Age of parent number of younger brothers and sisters, an other reasons may defer military service unti age twenty-seven, after which the individua is excused. A number of people who hav spent considerable time in the Soviet environ ment suggest that fewer than thirty percent o Soviet youths are exempt from military train

ORGANIZATION OF THE SOVIET ARMED FORCES



[1] The real decision-making body in the Soviet Union is the Politburo, rather than the Council of Ministers. Brezhnev, as the General Secretary of the Communist Party, signed with President Nixon the SALT I agreement. Kosygin is head of the Council of Ministers.

[2] Other KGB troops perform specialized tasks, such as maintaining a high-level communications system and guarding certain nuclear weapon stockpiles.

[3] Airborne troops are not a service, but are a branch directly under the Ministry of Defense. (See: Chart #21 in a series of charts, "Army of the Soviets," number G280170, Moscow: Publishing House of the Central Home of the Soviet Army, December 30, 1970.)

[4] There are many other specialized troops whose exact subordination is not known.

impacted upon the size of the Soviet forces, and the length of service demanded of the recruits. It is estimated that in 1957 the number of eighteen-year-old males was 2,380,000. For a five-year period, this number showed a steady decline, reaching a low of 917,000 in 1962—the year of the Cuban missile crisis. With 20,000,000 deaths attributed to World War II, and with millions of men at the front, few babies were conceived in 1944 and 1945. Khrushchev's emphasis on nuclear weaponry in the early 1960s may have been in part an effort to compensate for his lack of military

ing. If this is approximately correct—and it may be conservative—then as many as 3,300,000 conscripts may be in the Soviet armed forces at any one time. When this figure is combined with the officers, warrant officers, noncommissioned officers, and the recruits who have volunteered for additional service, the size of the Soviet armed forces may well be more than 4,500,000.

It seems almost certain that the KGB and MVD forces also are larger than usually reported. Some sources place the strength of the KGB at about 500,000. When the size of the Border Guards districts is taken into consideration, together with the tension along the Chinese border, a strength of 175,000 troops appears wide of the mark. It also seems likely that MVD troop strength is closer to 275,000 than to the 125,000 with which they generally are credited. A force larger than that would be needed just to guard and supervise the estimated 2,000,000 Soviet citizens who are in labor camps.

Leadership in the Soviet Armed Forces

Critics of the military in the United States often point to the number of officers in our own armed forces, especially in the senior ranks. In the Soviet armed forces, the officer strength may be more than double that found in the United States.

An indication of the Soviet officer strength is reflected in their military school system. There are seventeen Soviet military academies that correspond roughly to our own war colleges and staff colleges. These academies generally are headed by marshals or four-star generals. By regulation, an academy head is at the same rank level as the commander of a military district or fleet. Also, by regulation, heads of departments within the academies are general officers. Buildings and grounds of these academies are impressive. Course length at most academies is three years—considerably different from the much shorter courses at war colleges in this country.

There are 104 known "higher military schools" in the Soviet Union that are roughly the equivalent of the military academies in the United States. Insofar as is known, all of the schools are commanded by general or flag officers. Age of entry is between seventeen and twenty-one. After a four-year course (except for five years at certain naval schools), graduates receive engineering or equivalent degrees and are commissioned as lieutenants. Judging from the outside appearance of these schools, their student body would appear to be between 500 and 1,000.

In addition, there are twenty-two other "military schools," with student entry also between ages seventeen and twenty-one, and which provide three-year courses. Graduates are commissioned as lieutenants and receive technical degrees.

Assuming an average student enrollment of 700 at the higher military schools and military schools, this total student body would be in ·xcess of 88,000.

The Soviet officer educational program in- ·des a study area that is seldom found in the ed States—that of military science. Hun- of officers hold this degree at the candidate level, a degree corresponding approximately to our Ph.D. A considerable number of officers are doctors of military science. The doctorate in the Soviet Union is awarded only after an individual is a recognized authority in his field and has defended a dissertation. Among the senior officers holding this degree are Chief Marshal of Tank Troops P. A. Rotmistrov and Marshal of Aviation G. V. Zimin.

Training and morale among the Soviet armed forces appear excellent. In particular, those troops assigned to the Soviet "Groups of Forces" in Germany and other Eastern European nations present a combat-ready appearance, as do the troops in Khabarovsk, the headquarters of the Far Eastern Military District. In contrast, many of the construction troops appear as laborers in military uniform.

Soviet Reservists

The Soviet armed forces are backed up by a reserve system that has no counterpart in the United States. When an individual finishes his universal military service he is "discharged into the reserves." He remains in the first category of reserves until age thirty-five, the second category until age forty-five, and the third until age fifty. In the Soviet Union there are at least 11,000,000 male reservists under thirty who have had military training, and additional millions in the second and third age categories. This is a far cry from the figure of 3,000,000 reserves that is often reported.

One purpose of the massive Soviet officer strength discussed earlier is to man the cadres from which new units could be formed by mobilization of the reserves. Soviet military spokesmen emphasize that their entire military structure is designed around the cadre system. Throughout the entire Soviet Union there are military commissariat offices, which keep detailed records for each area of all personnel and equipment that have a mobilization potential. Even bicycles are included. As a result of this organizational structure, combined with a highly disciplined and controlled society, the size of the Soviet armed forces probably could be doubled in less than two weeks.

There is a great difference in the training and use of Soviet and US reserve forces. For example, prior to the Soviet invasion of Czechoslovakia in 1968, a number of Sovietologists thought that the shortage of military transport organic to each division would limit the offensive capability of the Soviet forces. What was not realized at the time was that trucks and other vehicles used in the Soviet civilian economy have specific mobilization assignments. Also, selected drivers in the military reserve are assigned to specific trucks.

Certain categories of reserves were called up

Soviet military forces have a huge training establishment, capable of handling perhaps a million and a half conscripts at a time. The USSR has more than 100 "higher military schools" that are roughly equivalent to our military academies. Here a major (center) and a junior lieutenant (left) discuss a training problem with two sergeants.

for maneuvers in the summer of 1968, along with vehicles. As they were withdrawing from their maneuver area in Poland, a change in the order of march was given, which took them into Czechoslovakia, completely surprising the West. A considerable part of the force was moved by trucks that, a few weeks earlier, might have been hauling bricks for the construction of a new Intourist hotel in Kiev.

Premilitary Training

As suggested earlier, two years is an insufficient time in which to take a recruit from basic training to the mastery of sophisticated weapon systems. Accordingly, the Soviet leadership has provided a comprehensive premilitary training program, designed to assist the recruit in becoming effective as a soldier in a minimum period of time.

"Bringing up a future soldier begins, if you please, with childhood," according to a recent Soviet military journal. Children's books, glorifying war and military life, and attractively illustrated are sold at extremely low prices. Another Soviet spokesman wrote that "the formation of a soldier . . . begins at the first signs of maturity, during the time of adolescent dreams."

Twenty-five million Soviet boys and girls between the ages of eight and fifteen are members of the Pioneers, a Communist young peoples' organization. Their official handbook has thirty-five pages devoted to "war of the future." This book explains one of the military-sport games, Zarnitsa, first started in 1969, in which 15,000,000 Pioneers have participated in unit exercises at one time. The basic unit for the game is the battalion, consisting of a commander, his deputy for political matters, and detachments of soldiers. In each detachment there must be a commander, political officers, scouts, riflemen, medical corpsmen, cooks, and an editor for the battalion combat journal. These games are widely publicized in the Soviet press and on television.

Another phase of premilitary training is conducted by DOSAAF—the Volunteer Society for Cooperation with the Army, Aviation, and the Fleet. This organization may be joined by boys and girls fourteen years of age and above. DOSAAF has 308,000 separate groups and 2,700 major units. Its active membership officially is reported at 9,000,000, with another 5,000,000 taking part in its sports activities. Some sources believe that 40,000, 000 people use DOSAAF's facilities. Currentl DOSAAF is headed by an active-duty marsh of aviation, with numerous other officers signed, including political officers.

The 1967 modification to the military-service law, which reduced the average length of service from three to two years, places overall supervision of premilitary training in the Ministry of Defense, with specific help to be given by DOSAAF and the various ministries concerned with education. If not truly a nation-in-arms, the USSR is, at the least, a country in which most adults have had some military training and in which every effort is made to create interest in military affairs and to enhance the prestige of the military profession.

Universal Military Service and the Communist Party

Many analysts in the West attempt to study conditions in the Soviet Union through a "mirror-image" of like conditions they believe exist in the United States and in other NATO nations. Some of these analysts feel that Soviet military leaders are in conflict with party leadership in seeking to maintain the size of the armed forces at a high level. In actual practice, this "mirror-imaging" seldom is applicable with respect to the Soviet Union. Party theoreticians appear to give full support to universal military service. The Soviet armed forces are the arm of the Communist Party, with the task of "protecting the gains of socialism" and of ensuring the "historic inevitability of the downfall of capitalism."

According to General Secretary Leonid Brezhnev, "In our country military service is not only a school of combat skill. It is also a good school of ideological and physical steeling, of discipline and organization." Universal military service provides the Party with the opportunity to have Soviet youths for a final period of intensive political indoctrination, under completely controlled conditions. All members of the Soviet armed forces, from officers to conscripts, are required to attend periods of political indoctrination each week. Political officers are told exactly what and how to teach. They are attempting to mold the "new Soviet man," one of the goals of Marxism-Leninism.

The Soviet Economy and the Military Conscript

In the United States, military manpower costs absorb slightly more than forty percent of the total military budget. (Total manpower costs—military and civilian—account for more than half of the US defense budget.) Soviet conscripts receive only token pay. The cost of their food is reduced by the maintenance of military farms, on which they themselves provide the labor. Soviet barracks for enlisted personnel are simple and spartan to an extreme. Men sleep on cots in huge, open bays. Their personal possessions are few. Food, clothing, and shelter are only a fraction of similar costs in the armed forces of the United States.

But that is not all. The Soviet conscript performs a valuable service to the Soviet economy by providing inexpensive and disciplined manpower. Military troops work on projects such as the buildings on Moscow's Kalinin Street or Moscow State University, and the ministry for which the work is performed pays some reimbursement to the Ministry of Defense. Payment is only a transfer of funds from one ministry to another. The labor itself is practically donated.

In addition to performing construction work for the civilian economy and maintaining the military farms, conscripts frequently can be seen in fields helping with the sowing and harvesting and doing a wide variety of other manual tasks. In pouring rain and in bitter cold they lay pipe, dig ditches, build railroads and roads in areas seemingly far removed from military installations.

Thus, the Soviet military conscript is not completely out of the Soviet labor pool during his period of obligatory service. During his military-training period he also may make contributions to the economy.

Implications for the United States

From this brief discussion of Soviet military manpower, several significant facts emerge:

- A basic tenet of Soviet military doctrine is that the entire Soviet people be prepared for the eventuality of war.
- The Communist Party gives full support to universal military service and the maintenance of large forces, for reasons that are both political and military.
- Soviet military manpower costs are dramatically lower than those of the US.
- Active-duty military forces of the USSR probably are about a million larger than usually reported, and roughly twice as large as those of the US.
- Soviet active-duty forces are backed by reserves that may be from two to three times larger than generally recognized, and greater than those of the US by an order of magnitude.

Faulty information about the size and organization of the Soviet armed forces may lead to inadequate force programming on our own part. We might well ponder the desirability of an all-volunteer force—and its implications for the preparedness of this nation—when contrasted to the system of universal military service in the Soviet Union. ■

The author, Col. William F. Scott, USAF (Ret.), graduated from the US Military Academy in 1943. Subsequent to wartime duty as an Eighth Air Force B-17 pilot in Europe, he was an instructor at the RAF College, Cranwell, and at the Air University. He has had exchange duty with the US Department of State and served in War Plans at Air Force Headquarters. Colonel Scott has twice been US Air Attaché in Moscow, a position from which he retired in late 1972. During a visit to the USSR last summer, he and Mrs. Scott (she also is an expert on Soviet affairs) met with several of the USSR's leading military theorists. Colonel Scott's doctoral dissertation at George Washington Univ., Washington, D. C., was on "Survival in the Nuclear Age: An Examination of a Soviet Concept."

RECON PHOTOS

Drone- and manned-aircraft photo reconnaissance, together with other sources of information, has enabled intelligence experts to assess in detail the extent of . . .

THE COMMUNIST BUILDUP IN VIETNAM

BY JOHN L. FRISBEE
EXECUTIVE EDITOR, AIR FORCE MAGAZINE

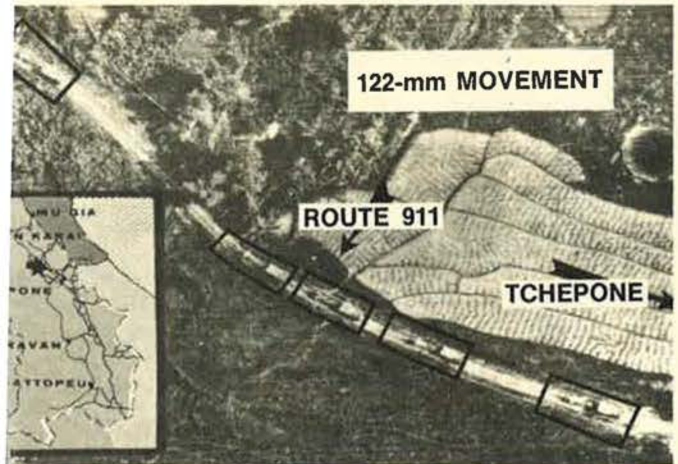
AIR FORCE Magazine's January 1974 editorial commented on the buildup of North Vietnam combat forces, equipment, and supplies in South Vietnam. We noted that few of the thousands of reconnaissance photos that documented the buildup had been made public. "As a result, the American people, including many in Congress, are unaware of the extent of North Vietnam's preparations [for resuming large-scale fighting] and how serious the situation is."

Since the editorial was written, a broad sampling of recce pictures has been released. But the media—preoccupied with the aftermath of the Mideast war, the energy crisis, and Watergate—have paid scant attention.

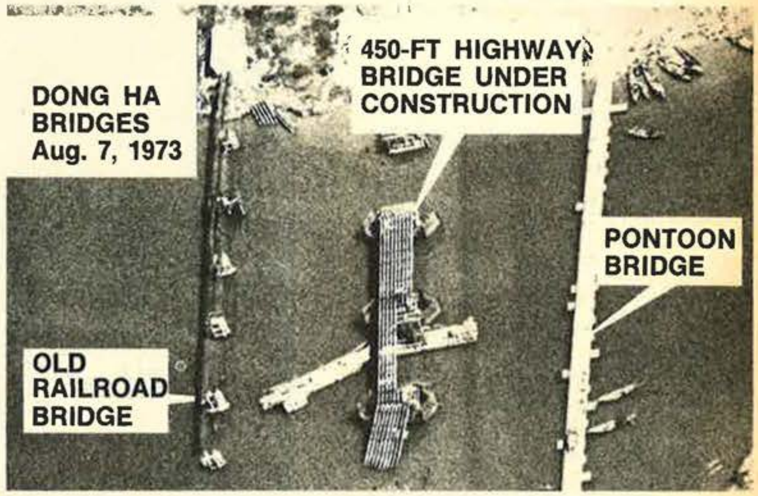
A selection of the photographs is presented here. Those of installations in enemy-held South Vietnam were taken by reconnaissance drones and demonstrate the quality of low-altitude drone photography.

More important, they leave no doubt that intelligence analysts have all the information needed to accurately assess the extent of Hanoi's infiltration of the South. So massive a buildup was not possible during the interdiction campaign conducted by US airpower prior to the cease-fire.

Heavy artillery moves south through Tchepone, Laos, and on into South Vietnam's Quang Tri Province.



Since the cease-fire, Hanoi has more than tripled its armored forces in the South. These Russian-made T-54s are based twenty miles south of the DMZ.



Dong Ha bridges under construction in August (top). By December the highway bridge was nearly completed.

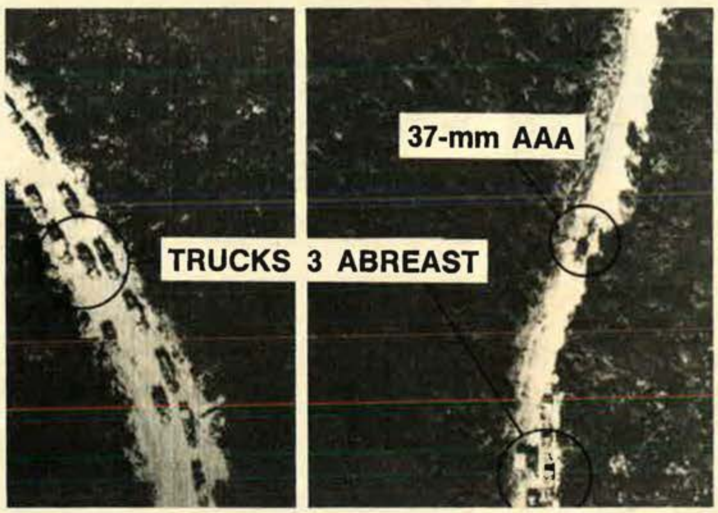
From reconnaissance coverage and other sources, US intelligence experts have concluded that some 100,000 North Vietnamese troops moved into the South between the signing of the cease-fire agreement in January 1973 and the end of that year (the period covered by all estimates that follow). About 43,000 North Vietnamese troops were killed in engagements during 1973: thus, there was a net gain of more than 56,000 North Vietnamese soldiers in the South, although Article 7 of the cease-fire agreement allows only a one-for-one replacement of men and supplies to be brought in at specified entry points. At the close of 1973, North Vietnam had approximately 190,000 troops in the South.

In January 1973, there were between 150 and 190 North Vietnamese tanks south of the Demilitarized Zone (DMZ). At year's end, that force had grown to between 500 and 700—a considerably larger number of tanks than Hanoi had in the South at the start of its spring 1972 invasion.

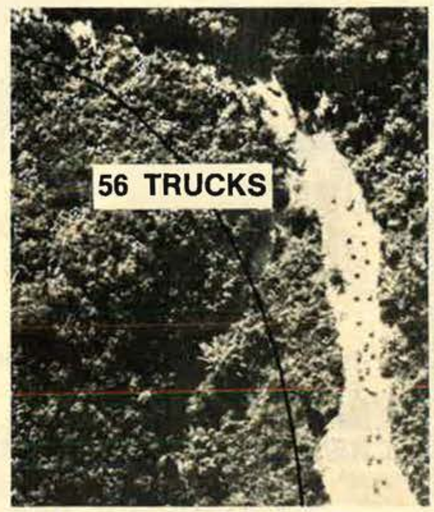
Long-range 100-, 122-, and 130-mm artillery has been increased from between 170 and 220 pieces at the cease-fire to between 570 and 715 pieces in December 1973.

Equally dramatic has been the

At the end of July, Khe Sanh's runway had been repaired and extended to 5,300 feet. A second runway is being built.



Trucks moving south through Laos in November 1973. This volume of traffic was impossible during US air interdiction.



This stretch of road in the panhandle of Laos shows the huge increase in highway capacity since the January 1973 cease-fire.

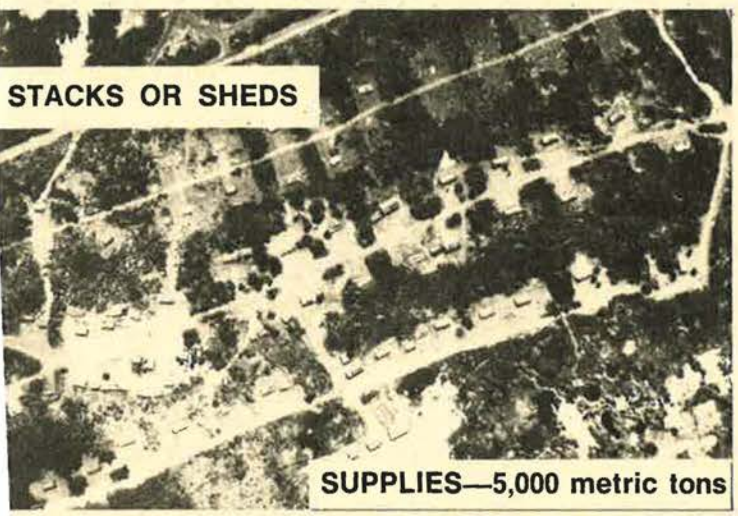
expansion of North Vietnam's logistic base in the South. During 1973, more than 100,000 tons of supplies were brought into northern South Vietnam, much of it directly through the DMZ. About half of the supplies are believed to have been consumed or used to build military facilities, leaving the North with a stockpile increase of about 55,000 tons. The North's logistic support in the South is now adequate to sustain heavy offensive operations for at least a year. More than 3,000 permanent buildings and storage areas have been built to accommodate these supplies.

Most of the supplies were moved into the South by truck. In the first six months of 1973, 16,000 trucks were photographed along the Ho Chi Minh Trail alone. The North is using some 5,000 trucks to distribute supplies in the northern provinces and many others to transship to the central and southern regions of South Vietnam.

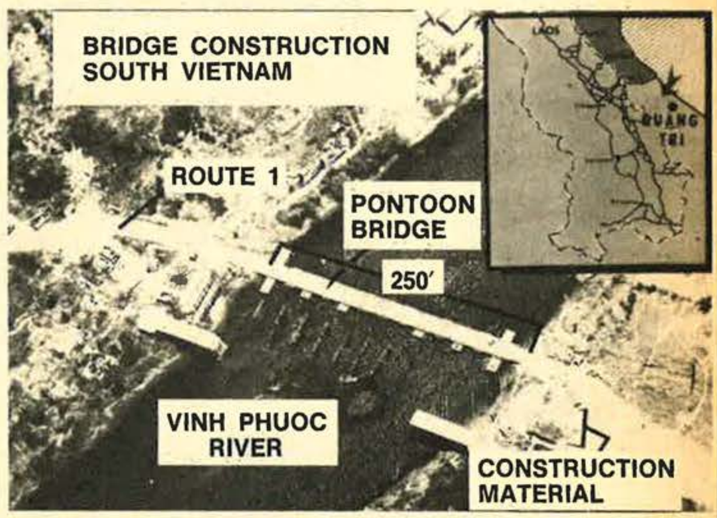
All-weather roads have been built leading into South Vietnam, as well as a major new highway system within the South. This system has cut in half the time needed to travel from Hanoi to the Central Highlands of South Vietnam.

The highway net is augmented by water terminals below the DMZ. One of the largest ports, Dong Ha, *Here, construction on six buildings (shaded areas) had just started. Six weeks later the complex was completed.*

On the day this drone photograph was made, the main communications cable from North Vietnam was located ten miles south of the Demilitarized Zone.



The speed of the logistic buildup is shown by this storage area at Khe Sanh, where, despite many sheds, 5,000 tons of supplies are still stacked in the open.



While this 250-foot steel bridge north of Quang Tri City was under construction, supplies continued to move west over a pontoon bridge.

s estimated to handle more than 200 tons of supplies a day.

To defend their forces in the South against air attack, the North Vietnamese have vastly increased their air defenses. By the end of July 1973, they had built eleven surface-to-air missile sites near Khe Sanh and one near Cam Lo. Antiaircraft regiments, which numbered nine at the time of the cease-fire, were increased to twenty-three, with nearly 1,400 guns, by the end of the year.

The North Vietnamese also have built or improved at least twelve airfields in the South. Khe Sanh is a good example. Its runway has been lengthened to 5,300 feet and can accommodate any aircraft in the North Vietnamese Air Force, including MiG-21s and Il-28 light jet bombers.

The permanence of construction—headquarters, barracks, steel bridges, hardened POL storage, pipelines, hard-surface roads—indicates that the North Vietnamese intend to hold large areas of South Vietnam indefinitely. Their logistic buildup—far beyond anything needed to defend the areas they now hold—is clear evidence that Hanoi plans to seize additional areas of South Vietnam.

One question remains in doubt. When will North Vietnam's all-out offensive begin? ■

INTERVIEW WITH DR. MALCOLM R. CURRIE, DDR&E

Changes in national policy for deterring nuclear war, coupled with the broad and accelerating Soviet strategic arms development programs, have a major impact on US defense R&D as well as the FY '75 Defense budget. In an exclusive AIR FORCE Magazine interview, the Pentagon's research chief spells out . . .

URGENT US R&D REQUIREMENTS

BY EDGAR ULSAMER

SENIOR EDITOR
AIR FORCE MAGAZINE

IN THE view of Dr. Malcolm R. Currie, Director of Defense Research and Engineering, the "United States is in a technology race with the Soviet Union rather than an armament race per se. The Soviets treat science and technology as perhaps the major instrument in implementing their long-range national policy, which transcends purely military concerns."

Although he sees convincing evidence that the Soviet Union's level of effort in defense-oriented research and development exceeds that of the United States and is "significantly greater than ours when measured in dollars," Dr. Currie believes that the most telltale indicator is the Soviet Union's increasing production of scientists and engineers—triple that of the United States. They are graduating about 300,000 per year, compared to 100,000 in the US, he said. "The Soviets are now ahead of us in the number of graduate scientists and engineers assigned to R&D overall, and, in turn, a far greater proportion is assigned to the military and space sphere in the USSR than in this country," according to Dr. Currie.

Dr. Currie acknowledged that there is a sizable number of research efforts under way in the Soviet Union oriented toward high-energy physics, which US scientists are unable to assess; therefore, there is a "danger of technological surprise. There are unknowns in what [Soviet scientists are doing] that we have no explanation for. If one considers the potential of the field of high-energy physics—in a conceptual as well as a technical sense—and also the area of undersea detection and surveillance and similar fields, our concern with technological surprise becomes pronounced."

Dr. Currie emphasized that the "Soviets have classically been very strong in building very big machines. They also have, for a number of years now, built up a vast body of expertise in plasma physics [the ionized state of matter that results from intense heating] and associated technologies. Our concern about Soviet high-energy physics research stems from their propensity for the 'big and powerful,' with the inherent danger of a technological breakthrough.

"Obviously, there is the danger of a technological advance that could tip the scales overnight. This applies especially to the strategic area where we have had no fundamental developmental breakthrough in years and where we have been on a technical plateau [since the advent of the nuclear-armed ballistic missile]. We have had evolutionary improvements since then, but history is replete with examples proving that it is the revolutionary development that tips the scales of the balance of power," he said.

While he draws a pessimistic picture of a possible R&D imbalance between the US and the USSR, Dr. Currie is encouraged by what he views as "a turning of the tide so far as understanding the fundamental and vital role of R&D by the American people is concerned The past year has brought about a fundamental change in how we perceive ourselve and our role, vis-à-vis the rest of the world in terms of national security, economics, an basic posture. First, there was clear-cut evidence of the enormous Soviet thrust in th strategic arena, involving the demonstration new ICBMs, MIRVing, and new strateg submarines. Second, there was the Midea conflict and the immense investment of mat rial and treasure the Soviet Union was maki in that region. And, third, there was the ener crisis—made acute although not caused by t Middle East war—that has jeopardized o position in the world and enfeebled our al ances.

"The confluence of these factors, it seems, is impressing on the American people the need for an active R&D program, not only for the sake of national security but as the pillar of our economy and our standard of living. As a result, we seem to be moving toward a reconciliation with R&D and rerecognition of its pervasive role in a society such as ours. We don't know how the Congress will react to our R&D budget request, but the Department of Defense will present its case in exactly those terms. We need understanding and acceptance of the catalytic role of science and technology by the Congress, not just in terms of individual weapon systems, but broadly and with regard to all government-sponsored R&D," Dr. Currie declared.

Needed: Reversal of R&D Trends

DoD's RDT&E budget request for FY '75, in terms of total obligational authority, is $9.3 billion, or $1.2 billion more than in the current year. This increase reflects what Dr. Currie terms a clear-cut need for R&D budget boosts "sufficient to cover the rate of inflation and to provide for some actual growth. We must reverse the trends of the past ten years—which resulted in a thirty percent drop in R&D investments since 1964 when measured in constant dollars—and at the same time improve our management effectiveness to get the best possible return on our R&D investment."

Stressing that the Pentagon views strategic arms as the most critical R&D area "in the next few years, especially in light of the modified strategic arms policy [announced by Defense Secretary James R. Schlesinger and keyed to a mix of Assured Destruction and Limited Military Targeting Options]," he disclosed that "we, therefore, have developed certain strategic 'initiatives,' the first of which are incorporated into the FY '75 budget. We view these programs as short-term investments in potential strategic-weapon improvement so that we may be able to reduce costs on a long-term basis. We don't want an arms race with the Soviet Union, but we do need these options in order to stabilize the strategic situation in the next few years, hopefully through the mechanism of SALT II."

The FY '75 budget proposal includes a range of provisions to improve ballistic missile performance involving R&D outlays of about $250 million, more than double last year's figure. These include $32 million for Minuteman III accuracy improvement; $32.5 million for the so-called missile performance measurement system, closely related to AIRS (the Advanced Inertial Reference Sphere program); $25 million for RV (reentry vehicle) improvements; $82 million for MARV (the maneuvering RV program); and $19 million for developing a larger number of smaller Minuteman RVs. No final decisions regarding how additional counterforce capabilities might be incorporated into the ICBM force "have been made as yet. We are considering a range of options, from increasing accuracy, throw weight, and number of warheads to enhancing yield per weight," Dr. Currie told AIR FORCE Magazine.

Options for boosting the combat effectiveness of the US ICBM force in case SALT II were to fail pivot on increasing the accuracy of reentry vehicles and the size and number of warheads, as well as the ratio of explosive yield to warhead weight, according to Dr. Currie.

Regarding yield, the Pentagon's third-ranking executive said, "We haven't made use of the available technology at all. There have been various advances in nuclear-weapon design since the most modern of our warheads entered the inventory. This technology has been lying dormant for some time. We have not put it to use, but we are now in a position where we will have to start thinking about applying these techniques unless we get a satisfactory agreement with the Soviets" at the current SALT negotiations, Dr. Currie told AIR FORCE Magazine.

While he declined to describe how the improvements in warhead yield are made possible by recent advances in nuclear weapon technology and packaging, he termed them "significant but not dramatic." (The AEC's proposed budget for FY '75 allocates about $850 million for the development and acquisition of nuclear weapons and related items.)

Increasing the number of MIRVs carried by each missile would primarily enhance the effectiveness of the residual force (the missiles that survive an adversary's strike), but a significant increase in accuracy coupled with improved yield per weight "could well provide us with enhanced capability compared with the present system," according to the Pentagon's research chief.

Other new initiatives proposed in the FY '75 budget in the area of strategic weapons development include $37 million for advanced ICBM technology; $160 million for the site defense system, meant to defend Minuteman silos and command centers against missile attack; $45 million for a sea-launched strategic cruise missile; and $80 million for an air-launched cruise missile.

The Strategic Cruise Missile

The objective of the cruise missile program is to develop an air-launched strategic cruise missile as an adjunct to the strategic bomber force and tactical and strategic variants of a submarine-launched cruise missile that makes maximum use of the standard submarine torpedo tube.

Dr. Malcolm R. Currie assumed the office of Director of Defense Research and Engineering on June 21, 1973. Formerly an industry executive specializing in research and development, Dr. Currie holds a Ph.D. (E.E.) from the University of California, Berkeley.

Scheduled for initial flight testing in 1976, the Strategic Cruise Missile is envisioned as a 1,500-mile-range, subsonic missile with a capability for penetration at very low altitudes and having an extremely small radar cross-section. One version of the Strategic Cruise Missile could be a one-for-one alternative for the SRAM in both rotary racks and wing pylon mounts.

An inertial guidance system with TERCOM (terrain contour matching) update is the leading candidate to obtain a highly accurate guidance system. TERCOM involves a digitized contour map-matching technique that provides fixes for the missile along its flight path. While there have been questions raised about the cost of "digitizing the world," meaning translating the topography of the world into computer language and storing the information, Dr. Currie dismissed these reservations. The area considered is relatively small and the cost appears reasonable.

A future candidate to obtain high accuracy is the NAVSTAR Global Positioning System, scheduled for first operational testing in three years, which is being developed as a joint program with the Air Force as the executive service. NAVSTAR, according to senior Pentagon officials, will be capable of fixing the position of any point on the surface of the earth or in the atmosphere with a three-dimensional accuracy of less than 100 feet—eventually, possibly as little as twenty feet.

The Defense Department requested $35.9 million in R&D funds for this program in FY '75. General Dynamics Corp. and Philco-Ford Corp. are the prime contractors for the definition of the user and ground control station equipment of the NAVSTAR system, which is to serve for strategic as well as tactical missions.

New strategic requirements result from the steadily increasing momentum of Soviet strategic weapon development: four new ICBM systems, two new missile-launching submarines, and an SLBM of greater range than any in the US inventory, all unveiled and flight-tested during the past twelve months. In assessing these developments, Dr. Currie stressed "the pervasive importance of the B-1 to our strategic posture as an indispensable leg of the Triad." (The Air Force has just announced a significant change in the schedule and structure of the B-1 program, which, while stretching out the effort by several months, will facilitate the transition from prototype to production. See box, at right.)

Advanced Tanker/Cargo Carrier

Although recognized as important for some time, the Middle East war of October 1973 emphasized the need for a combination of

Secretary McLucas on B-1 Program Changes

Testifying before the US Senate's Armed Services Committee on February 7, Air Force Secretary John L. McLucas disclosed significant changes in the nature and timing of the B-1 program. The relevant excerpts, quoted verbatim, appear below:

As you know, in order to ensure a prudent pace of development without increases in FY '74 funds or technical risk, last July we extended the B-1 development schedule. In August, we asked Dr. [Raymond L.] Bisplinghoff, [an executive of the National Science Foundation], and a group of experts to review the technical and management aspects of the B-1 program. In November, they reported their findings. After further intensive study by the Air Force, we find we agree with the main conclusions of the Bisplinghoff group—namely, the program should be structured to provide better transition to production, and thereby accomplish additional development tasks before a production decision is made. Accordingly, in FY '75, we plan the first flight of air vehicle No. 1 in the fall and continued manufacture of air vehicles two and three. We also plan to begin working on a fourth aircraft starting in November 1974 and possibly a fifth aircraft in FY '76, funded with research and development funds, which will incorporate the production design.

These aircraft, which will be used initially for testing but will become part of the operational force, will provide better balance to the development program and will be a first step in transitioning to production. A production decision could be made in November 1976, when, in consonance with our fly-before-buy management principle, the B-1 is expected to have undergone about two years of flight testing and will have achieved critical milestones. However, because sufficient test data will have been accumulated, we plan to request in the FY '76 budget long lead funding for the first increment of production aircraft to preserve program continuity without prejudging the decision on B-1 production. Actual fabrication of these first production aircraft will begin in FY '77. To further the B-1 program in accordance with this plan, we are requesting $499 million in FY '75.

I consider development of the B-1 bomber to be crucial to our overall national security interests. We need the B-1 to assure that we can maintain an effective bomber force in the 1980s so that we maintain essential equivalence with Soviet strategic forces.

tanker and transport aircraft to strengthen US strategic airlift capabilities, Dr. Currie told this reporter. The FY '75 budget provides $20 million for such a combination vehicle. "While we have not yet arrived at a specific configuration, we plan to implement such a program within the next six months. The basic challenge is to come up with an aircraft that can refuel both our tactical and strategic forces as well as act as a cargo carrier, including the transport of bulk fuel.

"We are looking at this concept in two areas, in the context of the CRAF system [augmentation of military airlift by commercial carriers], as well as a part of the force owned by DoD." Such a multimission vehicle, Dr. Currie explained, would be usable as a tanker or cargo carrier "in an easily convertible way. While an aircraft of this type could be used to tranport bulk fuel [in modularized tanks], it must be recognized that it is not normally cost-effective to air-deliver POL. In the case of air refueling, on the other hand, an advanced tanker [derived from the new family of superjets] would be very cost-effective and able to do the job of perhaps as many as seven or eight conventional tankers," he added.

Standoff and RPVs

Another principal lesson of the 1973 Arab/Israeli war, reiterating earlier US experience in Southeast Asia, "is the need for greater standoff-missile and other defense-suppression capabilities," according to Dr. Currie. "We plan to exert new and intensified thrust in these areas, mainly in terms of precision delivery of air-to-ground weapons under all weather and night conditions as well as from standoff positions." *(See March '74 issue, "ADTC Adds New Dimensions to Tac Air.")*

In terms of standoff weapons, Dr. Currie said, Modular Guided Glide Bombs (MGGBs) and extended-range vehicles (capable of longer ranges with the help of low-cost propulsion systems) will be emphasized along with Remotely Piloted Vehicles (RPVs). "RPVs are likely to gain in importance from our concern with defense suppression. We are thinking of roles not only in the recce area but in target positioning, mainly through TOA/DME weapon delivery," Dr. Currie told AIR FORCE Magazine.

The latter technique is being viewed as a highly promising approach to all-weather and night guidance. RPVs can be substituted for manned aircraft in the creation of TOA/DME net, thereby reducing the cost and manpower losses of such an operation in contested airspace. Another role for RPVs being emphasized by DDR&E and the Air Force, Dr. Currie said, involves strike missions from a "nominal standoff position."

Nominal standoff, he explained, "makes more sense for RPVs than taking these vehicles directly over the target and exposing them to [the full lethality of] the enemy's air defenses. In the latter case, guided standoff weapons would be more cost-effective." DDR&E is equally concerned with enhancing tac air's defense suppression capabilities by "increasing the scope and nature of our electronic warfare systems, especially so far as ECM [electronic countermeasures] is concerned," he added.

A promising but not yet fully explored concept in air-to-air ordnance that is being followed closely by DDR&E, Dr. Currie said, is CLAW, the Air Force's advanced development program designed to halt the trend toward ever more sophisticated air-superiority missiles. "The objective behind CLAW is to show the feasibility of inexpensive, simple, and short-range air-to-air missiles that can be fired either singly or in salvos. The concept is appealing.

"The real question is not so much technological feasibility but rather the underlying economics." CLAW, if successful, could replace the Agile missile, which was to become the dogfight missile for both Navy's F-14 and USAF's F-15. Agile, under development by the Navy, is a "very ambitious program which we are stretching out because there are problems that have not yet been worked out. We simply are not yet ready to launch a full-scale development program on Agile," he said.

AWACS and New Tac Air Systems

Another weapon system receiving increased Pentagon attention because of the experience of the Mideast war is AWACS. Now assigned to the General Purpose Forces, rather than being parceled out to ADC and TAC, the E-3A Advanced Warning and Control System (AWACS) is funded to the tune of $769.5 million in the FY '75 DoD budget. Its mission has been redefined as "a survivable airborne surveillance command and control communications system . . . to provide battle management in conducting air warfare in tactical theaters or air defense of a continental land mass."

Dr. Currie said AWACS's potential is "immense, transcending the area of tactical air control by demonstrating its ability to control ground forces as well. This was confirmed during NATO test operations in Italy and may well be an indication of things to come," Dr. Currie emphasized.

He added, "We are making a major effort to work this system into the NATO environment where it could be very important, not just in the sense of tactical command and control, but as a unifying force between the NATO members because its proper use will bolster a common communications net as well as the common use of the fixed air defenses that are already there."

The Pentagon's research chief singled out three other Air Force weapon-development programs because of their importance to improved conventional warfare capabilities and force modernization. AMST, the Advanced Medium STOL Transport prototype, is of "integral importance to airmobility," he said. A total of $55.8 million is being requested in FY '75 for the development of the wide-bodied turbofan-powered STOL vehicle that is a future replacement option for the C-130.

Crucial to tac air's ability to perform optimized close air support is the A-10 and its GAU-8 30-mm gun, according to Dr. Currie. "This weapon system represents a major advance in basic effectiveness, survivability, and firepower and would have been very useful in an environment such as the [October 1973] Mideast war," he added. A total of $267.7 million is being requested for the A-10 program in the coming fiscal year.

Finally, Dr. Currie stressed that the Lightweight Fighter prototype program, funded to the tune of $22.7 million, "is bringing along exciting technologies that could be important to the future of the Air Force." Regarding the related Air Combat Fighter program, for which $36 million is being requested, he said, "this program provides an option so that these technologies, or their logical derivatives, can eventually add new cost-effective capabilities to both the air combat and the strike/interdiction arenas."

Caveats for Technology Exports

Sometime this coming summer, a group of defense industry experts, headed by Texas Instruments Inc.'s Executive Vice President, J. Fred Bucy, and operating under the aegis of the Defense Science Board, will make recommendations on how to prevent what the Pentagon views as serious potential drains from the pool of US defense technology.

The Soviets, Dr. Currie explained, have become "critically aware that their great deficiency is not in scientific knowledge, but rather in production technology. They apparently believe they can neither close pivotal gaps in their military capabilities nor gaps in their general economic growth, both domestically and worldwide, until they acquire a manufacturing technology comparable to ours. This applies especially to high-technology areas having both military and civilian application—such as integrated circuits, computer software, aircraft engines, avionics, and specialized instruments, to name a few."

In order to catch up, the Soviets are looking for shortcuts "through a carefully designed approach to acquire production technology in the form of turnkey plant operations [complete plants that are built in the USSR by foreign nations] in these critical areas," he added. In contrast to the US concern with balance-of-payment deficits, the competitive nature of US industry, and the absence of a viable mechanism in Washington "that looks at the big picture in the technology area . . . Soviet negotiators are well organized and briefed to deal with our individual firms—especially those that are behind their competitors—as a monolithic customer offering tantalizing visions of future markets," according to Dr. Currie.

The problem is compounded, he pointed out, by "our sometimes naïve acceptance of the availability of vast new markets," adding that "the market may be significantly less than advertised, the difficulties of doing business extensive, and the ability to pay questionable." To date, Dr. Currie said, "there have only been agreements in principle currently being reviewed by the various government agencies."

Dr. Currie expressed the hope that the White House and the National Security Council, after reviewing and assessing the Pentagon's recommendations regarding the export of production technologies and those of other concerned government agencies, "will issue a policy statement on this issue of great national importance." Dr. Currie stressed that the Pentagon's concerns were focused mainly on the export of "production and design know-how, something that is fundamentally different from the export of individual products or the exchange of scientific information, which we don't object to. Generally, we have no misgivings about the export of such high-technology products as sophisticated military aircraft or aircraft engines because it's a long way from seeing the product to replication of the production technology that made it possible."

(Air Force experts for some time now have been alarmed by the free access Soviet officials are being given to US aerospace facilities, where they attempt to buy up shop manuals and other basic know-how that industry developed laboriously over a period of years.)

R&D Is a Team Effort

Dr. Currie, who assumed the post of Director of Defense Research and Engineering last summer, told AIR FORCE Magazine that the principal thrust of the Pentagon R&D effort under his stewardship will "be on the main management team, the three assistant secretaries [of the three services], and DDR&E. Our principal goal is to achieve increasing credibility and acceptance of our ability to manage the Defense Department's research and development programs."

By reversing the downward budgetary trends of defense technology, Dr. Currie and his team appear to have taken a long step forward toward achieving this goal. ■

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT

Final inspection of the Teledyne Ryan YQM-98A Compass Cope prototypes before the roll-out ceremony

TELEDYNE RYAN
TELEDYNE RYAN AERONAUTICAL; Head Office: 2701 Harbor Drive, San Diego, California 92112, USA

TELEDYNE RYAN MODEL 235
COMPASS COPE R
USAF designation: YQM-98A

This high-altitude aircraft was ordered by the USAF in 1972 for evaluation in its Compass Cope programme for a signal intelligence collection RPV. Brief details of this programme were given in the description of the Boeing Compass Cope B (YQM-94A) vehicle which appeared in the *Jane's Supplement* in the June 1973 AIR FORCE Magazine.

Representing a third-generation vehicle to follow the Model 147H/AQM-34N and Model 154/AQM-91A, the Teledyne Ryan Model 235 has extremely high aspect ratio wings and an over-fuselage pod mounting for its power plant. Design features of the Garrett ATF 3 engine configuration are such as to produce a low infra-red signature, low radar reflectivity, very low smoke and noise emissions, and a capability for very high altitude operation. A decision whether to adopt a single- or twin-engined configuration for any selected Compass Cope production aircraft will not, however, be taken until after analysis of flight test results, and will not necessarily select the ATF 3 as power plant. The YQM-98A, like the Boeing Compass Cope vehicle, has a tricycle landing gear for normal runway take-offs and landings. Detachable forward and aft fuselage sections and outer wing panels permit the aircraft to be dismantled for air transportation.

Two YQM-98A prototypes were ordered, under a $10.1 million cost-plus-fixed-fee contract awarded by the USAF's Aeronautical Systems Division on 13 June 1972. First materials were ordered in December 1972, and prototype construction began in February 1973. Completion was achieved on 21 December 1973, and both prototypes (72-01871 and '872) were rolled out on 4 January 1974, the first time that Teledyne Ryan had delivered two prototypes of a major new aircraft simultaneously. At that time it was stated that, although the aircraft were ready to begin flight testing by the end of January 1974, the first flight would probably be delayed until late in the year, due to a reduction in the USAF's current budget allocation for RPV development.

TYPE: Prototype high-altitude long-endurance strategic RPV.

WINGS: Cantilever low-wing monoplane, of very high aspect ratio. Slight sweepback on leading-edges. Two-section aileron on each trailing-edge. Spoiler on each upper surface. Triangular fillet on each trailing-edge at root. Conventional semi-monocoque structure, with selected use of composite materials. Detachable 14 ft (4.27 m) outer panels have an aluminium core and graphite composite skin; trailing-edges make extensive use of DuPont PRD 49 glassfibre.

FUSELAGE: Semi-monocoque structure, of basically rectangular cross-section with rounded edges, tapering towards front and rear. Undersurface flared and flattened to reduce radar reflectivity. Nose, tailcone, and parts of fuselage are components from AQM-91A. Nosecone, forward fuselage, and tailcone are detachable for transportation.

TAIL UNIT: Cantilever low-set swept tailplane, with twin sweptback fins and overhanging rudders at approx half-span. Full-span elevators. Part of tailplane is component from AQM-91A.

LANDING GEAR: Retractable tricycle type. Single-wheel main units, modified from those of a Cessna A-37, retract inward into wings; nosewheel unit, from a Canadair CF-5, retracts rearward.

POWER PLANT: Prototypes are each powered by one Garrett-AiResearch ATF 3 (XF104-GA-100) turbofan engine, rated (early 1974) at 4,050 lb (1,837 kg) st, mounted in a pod on a shallow pylon on top of the fuselage, in line with the wings. Design thrust of this engine is 5,000 lb (2,268 kg). Fully-automatic electronic fuel control system. Fuel tank in each inboard wing panel, each with refuelling point on wing upper surface, and in fuselage.

SYSTEMS AND EQUIPMENT: Equipment compartments in nose and tail portions of fuselage. Main mission payload compartment in lower forward fuselage, with provision for additional payload to be carried in rear fuselage. Provision for manually-controlled, semi-automatic, or fully-automatic (Singer Kearfott Talar microwave approach) landing system. Details of other systems and equipment are not available officially, but these are expected to include an integrated flight control system.

DIMENSIONS, EXTERNAL:

Wing span	81 ft 2.4 in (24.75 m)
Wing aspect ratio	19
Length of fuselage	37 ft 4 in (11.38 m)
Height overall	7 ft 11 in (2.41 m)
Tailplane span	21 ft 5 in (6.53 m)
Wheel track	approx 7 ft 6 in (2.29 m)
Wheelbase	10 ft 1 in (3.07 m)

AREA:

Wings, gross	347 sq ft (32.24 m²)

WEIGHTS (approx):

Weight empty	approx 5,600 lb (2,540 kg)
Payload for 24 hr mission	700 lb (317.5 kg)
Max T-O weight	14,300 lb (6,486 kg)
Min wing loading	16 lb/sq ft (78 kg/m²)
Max wing loading	41 lb/sq ft (200 kg/m²)

PERFORMANCE (estimated):

Cruising speed at altitudes from 50,000 to 70,000 ft (15,240 to 21,340 m)	Mach 0.5 to 0.6
T-O field length	3,500 ft (1,067 m)
Max endurance	30 hr

BOEING VERTOL

BOEING VERTOL COMPANY: Head Office: Boeing Centre, PO Box 16858, Philadelphia, Pennsylvania 19142, USA

BOEING VERTOL XCH-62 HEAVY LIFT HELICOPTER

In November 1970 the US Department of Defense issued Requests for Proposals for a heavy lift helicopter (HLH) to nine aerospace manufacturers. From the five tenders that had been submitted by 11 February 1971, that from Boeing Vertol was selected, and the company was awarded a $76 million contract on 11 May 1971 for the first phase of the development of an HLH.

The objective of the first phase of the programme was to demonstrate component technology to reduce the development risks applicable to an HLH with a 22.5 ton payload. The Boeing Vertol design uses tandem rotors and a transmission not greatly larger than systems in current use, in order to ensure the smallest possible technical risk, as well as lower costs for development and production.

Boeing Vertol has designed and will build and demonstrate selected advanced-technology components. These include a titanium and glassfibre rotor blade with Boeing-developed aerofoil section, a titanium hub with elastomeric bearing blade retention, a drive system using advanced gear materials and integral transmission lubricating systems, a fly-by-wire control system, and a cargo handling system incorporating dual winches. The Allison T701-AD-700 power plant has been selected for the HLH, and procurement of test engines has started.

On 29 January 1973 the Boeing Vertol Company was awarded a contract to build a single prototype, designated XCH-62, and to conduct the initial flight test programme. This phase of the programme will permit flight demonstration of the advanced-technology components, and will also provide a basis for both technical and cost projections of an operational HLH. A dynamic test rig is being constructed to provide early verification of rotor and transmission design. This will have a single rotor powered by three turboshaft engines driving through a combiner transmission in the layout intended for the aft rotor, the load of the forward rotor being simulated by the interconnecting shaft driving a dynamic water brake.

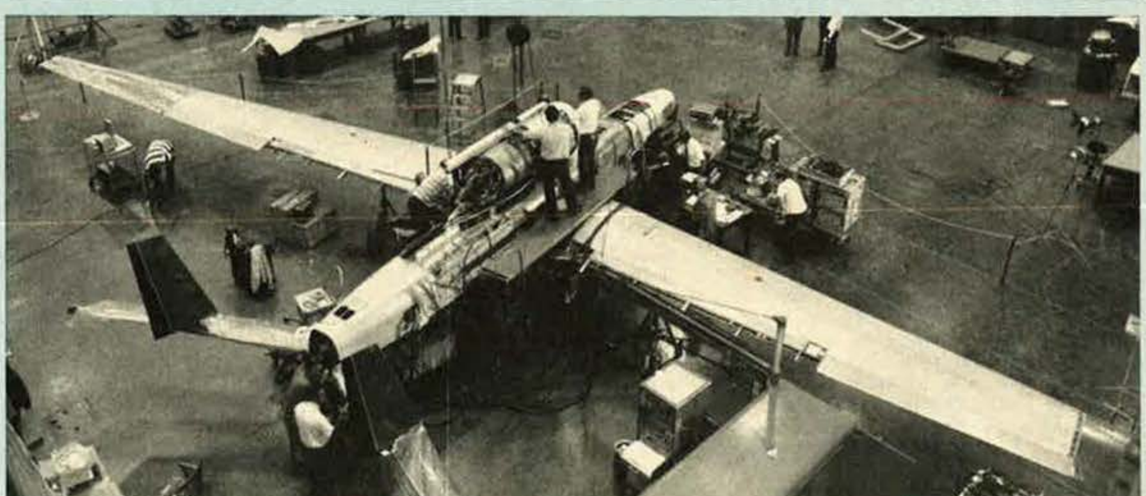
The general appearance of the HLH is shown in the accompanying three-view drawing. Responsibility for developing this aircraft has been assigned to the US Army, with Navy participation in the programme, although the aircraft has to meet the shore-based heavy lift requirements of all the US services.

The first flight is scheduled for August 1975.

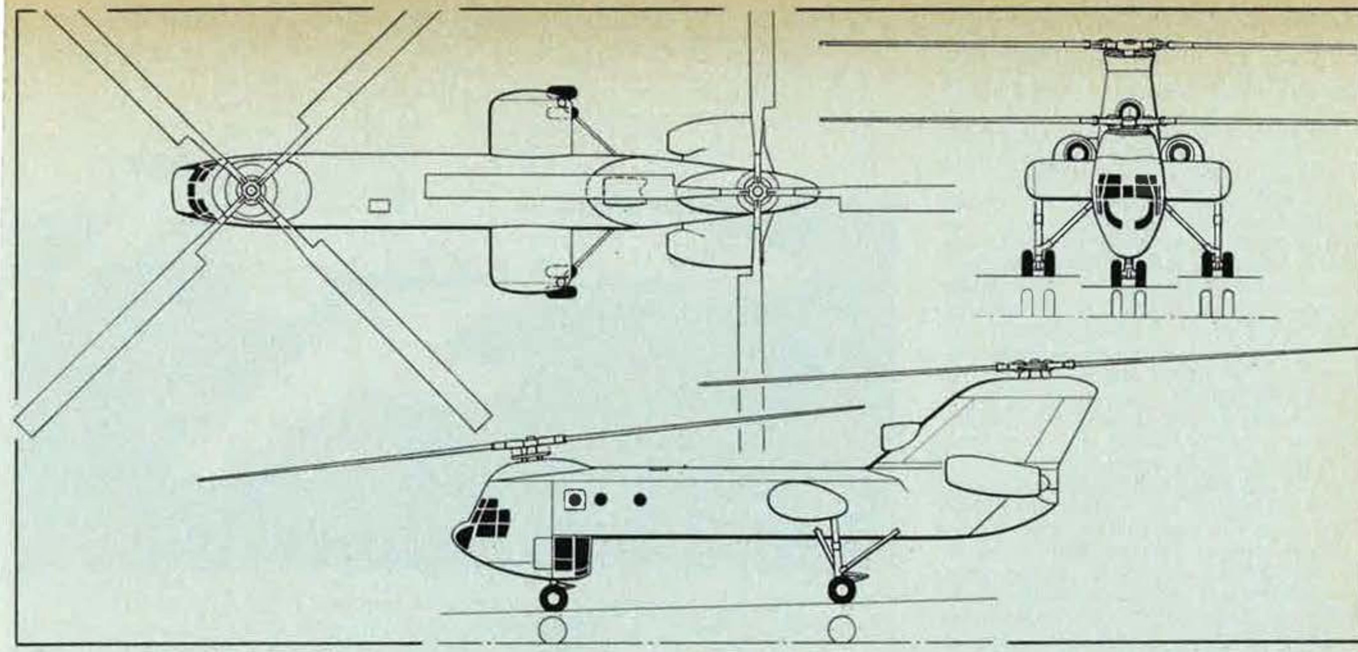
TYPE: Three-engined heavy transport helicopter.

ROTOR SYSTEM: Two four-blade rotors turning in opposite directions and driven through an interconnecting shaft. Each composite-structure blade has a chord of 3 ft 4 in (1.02 m) and is of advanced aerofoil section. The leading-edge of the glassfibre spar is protected by a formed titanium nose cap, while the trailing-edge comprises a sub-assembly of glassfibre/Nomex honeycomb. The blades have redundant load path and incorporate diagnostic warning and pneumatic failure warning systems. The titanium rotor hub has elastomeric bearing blade retention and a replaceable erosion cap. The rotor system has an estimated mean time between replacement of 3,000 hours.

ROTOR DRIVE: Transmission rated at 17,700 hp. Power is transmitted from each turboshaft engine into the combiner transmission, thereby providing a single power output to the interconnecting shaft. The combiner gearbox has integral cooling, dual lubrication, self-sealing sumps and casing, diagnostic and failure warning systems, and is operable with lubricant loss. New design offers reduced noise levels and, as with the rotor system,



Teledyne Ryan YQM-98A Compass Cope R signal intelligence collection RPV under construction



Boeing Vertol XCH-62 heavy lift helicopter (HLH) (Pilot Press)

there is an estimated mean time between replacement of 3,000 hours. Normal maximum rotor rpm is 156, equivalent to a tip speed of 750 ft (229 m)/sec.

FUSELAGE: Basic square-section all-metal semi-monocoque structure.

LANDING GEAR: Non-retractable tricycle type with dual wheels on each unit. Oleo-pneumatic shock-absorbers on each unit. Nose and main units can be extended hydraulically on the ground to provide approximately 14 ft (4.28 m) of headroom between fuselage undersurface and the ground to permit loading of large-size containers.

POWER PLANT: Three Allison T701-AD-700 turboshaft engines, each with a maximum contingency rating of 8,075 shp. They are mounted one on each side of the rear rotor pylon, the third centrally within the pylon structure. Power available at transmission output with one engine inoperative is 8,310 shp. Maximum integral fuel capacity 19,120 lb (8,672 kg).

ACCOMMODATION: Crew of two on flight deck in side-by-side seats.

SYSTEMS: Flight control system relies upon fly-by-wire techniques to enhance combat survivability. Central data computer, automatic flight control system, and full IFR capability. External cargo system provided for single or dual suspension by means of adjustable-span pneumatically-operated suspension arms. Provision for in-flight load levelling capability and discharge of static electricity.

DIMENSIONS, EXTERNAL:
- Diameter of rotors (each) — 92 ft 0 in (28.04 m)
- Length overall, rotors turning — 162 ft 3 in (49.45 m)
- Length of fuselage — 89 ft 3 in (27.20 m)
- Height to top of rear rotor hub:
  - landing gear in normal position — 32 ft 3 in (9.83 m)
  - landing gear in extended position — 38 ft 3 in (11.66 m)
- Wheel track (c/l of shock-struts) — 25 ft 0 in (7.62 m)
- Overall width, over wheels — 29 ft 6 in (9.00 m)
- Wheelbase — 40 ft 11½ in (12.48 m)

AREAS:
- Rotor blades (each) — 153 sq ft (14.2 m²)
- Rotor discs (total) — 13,295 sq ft (1,235 m²)

WEIGHTS AND LOADING (approx):
- Weight empty — 59,580 lb (27,025 kg)
- Design mission fuel weight — 11,080 lb (5,025 kg)
- Design payload — 45,000 lb (20,411 kg)
- Design gross weight — 118,000 lb (53,520 kg)
- Max alternative gross weight — 148,000 lb (67,130 kg)
- Disc loading, at design gross weight — 8.9 lb/sq ft (43.45 kg/m²)

LOCKHEED

LOCKHEED-GEORGIA COMPANY;
Head Office: 86 South Cobb Drive, Marietta, Georgia 30060, USA

LOCKHEED MODEL 1329-25 JETSTAR II

The Lockheed JetStar II, which was first announced in the Summer of 1973, has an airframe generally similar to that of the earlier JetStar, but there are detail changes in configuration and equipment as described below.

Design of the Model 1329-25 began in October 1972, and the major change involved the selection of four AiResearch TFE 731-3 turbofan engines, flat-rated at 3,700 lb (1,678 kg) st to 76°F (24.4°C), to replace the 3,300 lb (1,497 kg) st Pratt & Whitney JT12A-8 turbojet engines of the JetStar. The new power plant offers significant improvement in both range and noise levels, as well as allowing an increase in maximum take-off weight.

Construction of the prototype began in December 1972. Its first flight was scheduled for February 1974, followed by the first flight of a production aircraft in June 1974; with FAA certification programmed for February 1975.

The description of the Model 1329 JetStar as given in the 1973–74 *Jane's* applies also to the JetStar II, except as detailed below:

WINGS: As for JetStar, except single aileron trim tab located near the centre of the trailing-edge of the port aileron. An electrically-powered dual trim actuator is located within the aileron directly forward of the trim tab. Hydraulically-boosted aileron controls are powered by both normal and standby hydraulic systems, either of which is capable of operating the ailerons independently. Manual aileron control is possible in the event of complete hydraulic failure. Aileron booster actuators manufactured by National Waterlift Company.

FUSELAGE: Semi-monocoque fail-safe structure of light alloy. The nose section, crew compartment, and cabin are pressurised. The aft section, where most of the aircraft's system components are mounted, is unpressurised. Hydraulically-operated speed-brake on underside of fuselage aft of pressurised compartment.

TAIL UNIT: Cantilever light alloy structure with tailplane mounted part-way up fin. Variable incidence is achieved by the fin being pivoted, thus allowing an electro-mechanical dual actuator to move the entire tail unit to rotate the tailplane. No trim tabs in elevators. Mechanically-operated elevator control system is hydraulically-boosted, using a National Waterlift Company actuator, sited in the aft fuselage equipment area. The rudder is mechanically controlled, with servo tab assistance. Two pneumatic cylinders, biased by engine bleed air, automatically assist directional control in the event of a power loss from either engine. Details of tail unit de-icing system not yet finalised.

LANDING GEAR: As for JetStar. Main wheels with tubeless tyres size 26 x 6.60, EHP Type VII, 14-ply rating with reinforced tread, pressure 220 lb/sq in (15.5 kg/cm²). Nosewheels with tubeless chine tyres size 18 x 4.40, EHP Type VII, 12-ply rating with reinforced tread, pressure 220 lb/sq in (15.5 kg/cm²). Hytrol fully-modulated anti-skid units.

POWER PLANT: Four AiResearch TFE 731-3 turbofan engines, flat-rated at 3,700 lb (1,678 kg) st to 76°F (24.4°C), mounted in lateral pairs on sides of rear fuselage. Thrust reversers fitted. Air intake anti-icing provided by engine bleed air. Fuel in four integral wing tanks and two non-removable external auxiliary tanks glove-mounted on the wings. Capacity of numbers 1 and 4 internal tanks each 375 US gallons (1,420 litres); numbers

2 and 3 internal tanks each 390 US gallons (1,476 litres), auxiliary tanks each 565 US gallons (2,139 litres). Total fuel capacity 2,660 US gallons (10,070 litres). Gravity refuelling point above each tank, or optional single-point pressure refuelling from starboard wing root. Oil capacity 6.4 US gallons (24.2 litres).

ACCOMMODATION: As quoted for JetStar, except optional jump-seat available for crew compartment. Door at forward end of fuselage, on port side, opens by moving inward and sliding aft. The fourth window aft on each side of the cabin is a CAR Type IV emergency exit, of plug-type and removed inward. Accommodation heated, ventilated, air-conditioned, and pressurised. High-pressure oxygen system for passengers and crew standard. Integral electric heaters for windscreen anti-icing and de-misting.

SYSTEMS: Air-conditioning and pressurisation system not yet finalised. Two independent hydraulic systems with engine-driven pumps, pressure 3,000 lb/sq in (210 kg/cm²), to operate landing gear, wheel brakes, nosewheel steering, flight control booster units, flaps, speed-brake, and thrust reversers. Separate pneumatic systems installed for emergency extension of the landing gear. Air bottles can be manually discharged into the down ports of the landing gear actuators. Two pneumatic cylinders provided to assist directional control if engine power lost. Four 28V 300A engine-driven starter/generators power main DC buses. Two high-discharge 24V 34Ah nickel-cadmium batteries for engine starting and emergency power. Three 3,000VA single-phase 400Hz 115V rotary inverters provide AC power for electronics equipment, flight and engine instruments, and windscreen anti-icing, two being on-load and one on standby. High-pressure oxygen system, 1,800 lb/sq in (126.6 kg/cm²) reduced to 70–90 lb/sq in (4.92 to 6.33 kg/cm²) at the cylinder, provides selective dilution demand or 100 per cent positive pressure demand for crew. A separate 100 per cent demand system with safety pressure and manual control for dilution is installed for passengers. An altitude control valve activates the passenger system when cabin altitude exceeds 14,000 feet, the masks being presented automatically. APU for ground air-conditioning and electrical power is optional.

DIMENSIONS, EXTERNAL: as quoted for JetStar, except:

Servicing door (under fuselage), diameter	2 ft 0 in (0.61 m)
Emergency exits, each:	
Height	1 ft 7¼ in (0.49 m)
Width	2 ft 2½ in (0.66 m)

DIMENSIONS, INTERNAL: as quoted for JetStar, plus:

Baggage hold volume:	
stbd forward	43.1 cu ft (1.25 m³)
port forward	29.8 cu ft (0.84 m³)
centre aft	37.0 cu ft (1.05 m³)

AREAS: as quoted for JetStar, except:

Ailerons (total)	48.8 sq ft (4.53 m²)
Speed-brake	9.2 sq ft (0.85 m²)

WEIGHTS AND LOADINGS:

Basic operating weight	24,178 lb (10,967 kg)
Max payload	2,822 lb (1,280 kg)
Max T-O weight	43,750 lb (19,844 kg)
Max ramp weight	44,000 lb (19,958 kg)
Max zero-fuel weight	27,000 lb (12,247 kg)
Max landing weight	36,000 lb (16,329 kg)
Max wing loading	80.8 lb/sq ft (389.6 kg/m²)
Max power loading	2.96 lb/lb st (2.96 kg/kg st)

Artist's impression of Lockheed JetStar II executive transport (four AiResearch TFE 731-3 turbofan engines)

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

Max level speed at 23,000 ft (7,010 m)	479 knots (551 mph; 887 km/h)
Max diving speed	Mach 0.90
Max cruising speed at 23,000 ft (7,010 m)	479 knots (551 mph; 887 km/h)
Econ cruising speed at 35,000 ft (10,670 m)	441 knots (507 mph; 816 km/h)
Stalling speed, with T-O flaps	123 knots (141 mph; 227 km/h)
Max rate of climb at S/L	4,100 ft (1,250 m)/min
Max rate of climb at S/L, one engine out	2,450 ft (757 m)/min
Service ceiling	38,000 ft (11,580 m)
Service ceiling, one engine out	30,000 ft (9,145 m)
T-O to 50 ft (15 m)	5,250 ft (1,600 m)
Landing from 50 ft (15 m) at max landing weight	3,900 ft (1,190 m)
Landing run, at max landing weight	2,550 ft (777 m)
Range with max fuel, 30 min reserve	2,770 nm (3,190 miles; 5,134 km)
Range with max payload, 30 min reserve	2,600 nm (2,994 miles; 4,818 km)

WESTLAND

WESTLAND HELICOPTERS LTD; Head Office and Works: Yeovil, Somerset, UK

WESTLAND SEA KING and COMMANDO

The Westland Sea King was developed originally to meet a Royal Navy requirement for an advanced anti-submarine helicopter with prolonged endurance. The British version utilises the basic airframe and rotor system of the Sikorsky SH-3D, with extensive changes in power plant and specialised equipment to meet British requirements. The Commando is a land-based general-purpose tactical helicopter, based on the Sea King Mk 50. Full descriptions of both types are given in the 1973–74 *Jane's*.

By the end of 1973, total orders had been received for 146 Sea Kings and Commandos. These comprise: 56 Sea King HAS. Mk 1 for the Royal Navy; 22 Mk 41 for the Federal German Navy; 12 Mk 42 for the Indian Navy; 10 Mk 43 for the Norwegian Air Force; 6 Mk 45 for the Pakistani Navy; 10 Mk 50 for the Royal Australian Navy; and a mixed order for 30, placed by the Saudi Arabian government, which includes some Sea Kings, five Commando Mk 1, and an undisclosed number of Commando Mk 2.

Compared with earlier Sea Kings, the Mk 50 and both versions of the Commando have uprated Rolls-Royce Gnome H.1400-1 turboshaft engines (1,590 shp max contingency rating), a six-blade tail rotor, and a max T-O weight of 21,000 lb (9,525 kg). The Commando Mk 1, which represents a minimally-modified version of the Sea King, can transport up to 25 troops; the first two examples were flown for the first time on 12 and 13 September 1973. The Commando Mk 2, which was due to make its first flight in February 1974, can carry up to 30 troops or a 9,000 lb (4,082 kg) payload.

WESTLAND/AÉROSPATIALE LYNX

The Lynx is one of three types of aircraft (Puma, Gazelle, and Lynx) covered by the Anglo-French helicopter agreement first proposed in February 1967 and confirmed on 2 April 1968. On 1 December 1972 a long-term agreement was signed between Westland Helicopters and Aérospatiale to formalise and strengthen the existing collaboration programme. Westland has design leadership in the Lynx, which is a medium-sized helicopter intended to fulfil general-purpose, naval, and civil transport roles. It is the first British aircraft to be designed entirely on a metric basis.

Five basic aircraft are being used by Westland to prove the fundamental design parameters. Following flight testing of two Scout helicopters fitted with scaled-down versions of the Lynx rotor system, the first Lynx prototype (XW835) flew for the first time on 21 March 1971 and was followed by XW837, the third prototype (second Lynx to fly), on 28 September 1971. Third to fly was the fourth Lynx (XW838, on 9 March 1972), the first to have the monobloc rotor head designed for production aircraft. Then followed, on 24 March 1972, the first flight of the second aircraft (XW836), which had previously been used for ground vibration testing. The fifth Lynx to fly (XX153, on 12 April 1972) is the development aircraft for the British Army AH. Mk 1 version. In addition to these five aircraft, a sixth Lynx (XX907, first flight 20 May 1973) was allocated to Rolls-Royce for engine development. Other airframes have been built for static, fatigue, and electrical testing.

On 20 and 22 June 1972, respectively, piloted by Roy Moxam, XX153 set up Class E1e international speed records of 173.61 knots (199.92 mph; 321.74 km/h) over a 15/25 km straight course and 171.868 knots (197.909 mph; 318.504 km/h) over a 100 km closed circuit. During the flight test programme the Lynx has been rolled at more than 100° per second, dived at 200 knots (230 mph; 370 km/h), and flown backwards at 70 knots (80 mph; 130 km/h).

A further seven aircraft are being used for the main military development programme. First of these to fly was XX469, first prototype for the Royal Navy HAS. Mk 2 version, which made its first flight on 25 May 1972. The second Royal Navy prototype, XX510, flew for the first time on 6 March 1973. The first French Navy prototype (XX904) made its first flight on 6 July 1973, and the second (XX911) on 18 September 1973. The three remaining prototypes, all of which are due to have flown by the Spring of 1974, will comprise one more Royal Navy version, one common naval version, and one basic version.

The following versions of the Lynx have been announced:

Lynx AH. Mk 1. General-purpose and utility version for the British Army, due to enter service in the Autumn of 1976. One development aircraft (XX153). Capable of operation on tactical troop transport, logistic support, armed escort of troop-carrying helicopters, anti-tank strike, search and rescue, casualty evacuation, reconnaissance, and command post duties.

Lynx HAS. Mk 2. Version for Royal Navy, for advanced shipborne anti-submarine and other duties. Due to enter service in early 1976, following first production deliveries in 1975. Ferranti Seaspray search and tracking radar in modified nose. Capable of operation on anti-submarine classification and strike, air to surface vessel search and strike, search and rescue, reconnaissance, troop transport, fire support, communication and fleet liaison, and vertical replenishment duties. Two development aircraft (XX469 and XX510) originally, of which the former carried out deck landing trails at RAE Bedford and, on 4 August 1972, on board the French destroyer *Tourville* in harbour. This aircraft was subsequently lost in an accident and is to be replaced by one of the final three prototypes. Sea trials on board the helicopter support ship RFA *Engadine*, by XX510, began on 29 June 1973, and air launches of dummy Skua weapons have been made.

The Argentine Navy has expressed its intention to order two aircraft of a similar type.

Lynx (French Navy). Naval version, generally similar to British HAS. Mk 2 but with more advanced target detection equipment. Two development aircraft (XX904 and XX911), both of which were handed over to Aérospatiale in the Autumn of 1973 for equipment to Aéronavale standard and continuation of testing in France.

Lynx HT. Mk 3. Training version for Royal Air Force.

Sea Lynx. Name given by Sikorsky Aircraft to a proposed version to meet the US Navy's LAMPS (Light Airborne Multi-Purpose System) requirement for a successor to the Kaman SH-2 Seasprite. Westland and Sikorsky are negotiating an agreement for a marketing programme to present the Sea Lynx as the Sikorsky candidate in this programme. Preliminary tests, using a Lynx mock-up, were initiated by Sikorsky in April 1972.

Civil Lynx. Westland plans to market a civil Lynx, based on the general-purpose version, from about 1976. Layouts being studied include an eight-seat executive transport version. Max accommodation would be for pilot and 13 passengers or 3,000 lb (1,360 kg) of internal or slung cargo.

The first Lynx production order, covering the setting up of production facilities and ordering of materials for more than 100 aircraft, was placed by the Ministry of Defence in May 1973; confirmation of this order was announced in February 1974. On 30 July 1973 Ferranti announced receipt of a contract for 100 Seaspray radars for installation in the British naval version. Lynx production will be shared in the ratio of 70% by Westland to 30% by Aérospatiale.

The following description applies generally to the basic military general-purpose and naval versions, except where a specific version is indicated:

TYPE: Twin-engined multi-purpose helicopter.

ROTOR SYSTEM: Single four-blade semi-rigid main rotor and four-blade tail rotor. The main rotor blades, which are interchangeable, are of cambered aerofoil section and embody mass taper. Each blade consists of a two-piece, two-channel stainless steel D-shaped box-spar, to which is bonded a glassfibre-reinforced plastics rear skin stabilised by a Nomex plastics honeycomb core. Blade tips are of moulded glassfibre-reinforced plastics, with a stainless steel anti-erosion sheath forward of the 50% chord line. Each blade is attached to the main rotor hub by titanium root attachment plates and a flexible arm; the inboard portion of each arm accommodates most of the flapping movement of each blade, while the outer portion provides freedom in the lag plane. The rotor hub and inboard portions of the flexible arms are built as a complete unit, in the form of a titanium monobloc forging. A feathering hinge, comprising double needle bearings, is incorporated between the inboard and outboard flexible arms. The feathering hinge bearings are relieved of centrifugal loading by a flexible torsion bar which joints the inboard and outboard section of each arm. A two-pin jaw for blade attachment and manual blade folding is provided. Each of the tail rotor blades has a light alloy spar, machined integrally with the root attachment, which forms the nose portion of the aerofoil section and has a flush-fitting stainless steel sheath on the leading-edge. The rear section of each blade is of similar construction to that of the main rotor blades. The tail rotor hub has conventional flapping and feathering hinges, and incorporates torsionally flexible tiebars which carry the centrifugal loads inboard to the flapping hinges. Tail rotor blades are replaceable in matched pairs, and each blade is attached to the hub by the outboard tiebar pin and a six-bolt root-end flanged joint. Main rotor blades of both versions can be folded, and tail rotor pylon of naval version can be folded and spread manually, to reduce overall length for stowage.

ROTOR DRIVE: Transmission consists of three interconnected gearboxes, transmitting power to the main and tail rotors. The engines are mounted from extensions of the gearbox casing through gimbal and flexible couplings which permit a degree of angular misalignment. The drives are taken from the front of the engines into the main gearbox, which is mounted above the cabin forward of the engines. This gearbox interconnects the two engines, with the speed reduction being carried out in two stages. The first stage uses an involute-form spiral bevel pinion and gear. The second stage comprises a conformal pinion meshing with a gear fixed directly to the main rotor drive-shaft. In flight,

Westland Sea King. Twenty-two have been sold to the Federal German Navy for operation in the search and rescue role

Westland Commando is a development from the Sea King. Designed for land-based operation, it will be able to carry up to 30 troops in the Mk 2 form

Westland-Aérospatiale Lynx, general-purpose version, in flight over the English countryside. Holder of two international speed records in its class, this aircraft is scheduled to enter service with the British Army

the accessory gears, which are all at the front of the main gearbox, are driven by one of the two through shafts from the first-stage reduction gears. For system checking on the ground without the rotor turning, the accessories can be driven by the port engine via a through shaft, a lockout freewheel unit being selected manually to isolate the main rotor transmission from the port engine input drive. Freewheel units are mounted in each engine gearbox shaft, and also within the accessory drive chain of gears. Rotor head controls are actuated by three identical tandem servojacks, trunnion-mounted from the main rotor gearbox and powered by two independent hydraulic systems. The collective jack is mounted centrally on the forward end of the main gearbox, with the cyclic jacks positioned at 45° on each side. Duplex autostabiliser actuators are integral with each jack. Cyclic and collective inputs from the three control jacks are translated to the lower bearing housing of a four-arm spider which is located within, and rotates with, the main rotor shaft. The spider is mounted universally within a splined section of the main shaft, above its bearing housing, and is linked to the blade pitch-change levers by four adjustable-length track rods. Rod and lever control runs are employed on both the cyclic and collective systems, and are carried within protective ducts below the cockpit floor, up to cabin roof level on both sides of the aircraft, and finally to the rotor head. Yaw control runs are initially by rod and lever, and then to cables which transmit pedal movements along the tailboom to the tail rotor control jack, which in turn effects blade pitch changes. Spring feel units and electric trim motors for the cyclic control channels are installed below the cockpit floor. Yaw control pedals are adjustable separately over a wide speed range. Control system incorporates a simple stability augmentation system, which acts in a single channel to provide improved stability in pitch. Provision is made for in-flight blade tracking. Each engine embodies an independent control system which provides full-authority rotor speed governing, pilot control being limited to selection of the desired rotor speed range. In the event of an engine failure, this system will restore power up to single-engine maximum contingency rating to maintain the power turbine/rotor governed speed within the prescribed limits. A single, centrally-mounted rotor speed select lever, with a limited authority, sets the datum of the power turbine/rotor speed governing system. This system meters fuel to maintain the selected speed throughout the flight condition range. A fine-adjustment trimming control is provided to facilitate accurate matching of each engine. On the naval version, the main rotor can provide negative thrust to increase stability on deck after touchdown. Tail rotor drive is taken from the main ring gear. A hydraulically-operated rotor brake is mounted on the main gearbox at the tail rotor drive-shaft coupling, the shaft continuing aft to the single-stage, bevel reduction type intermediate and tail rotor gearboxes. Pitch variation of the tail rotor blades is controlled by a spider, actuated by hydraulic jack via a pushrod which extends through the centre of the tail rotor gearbox.

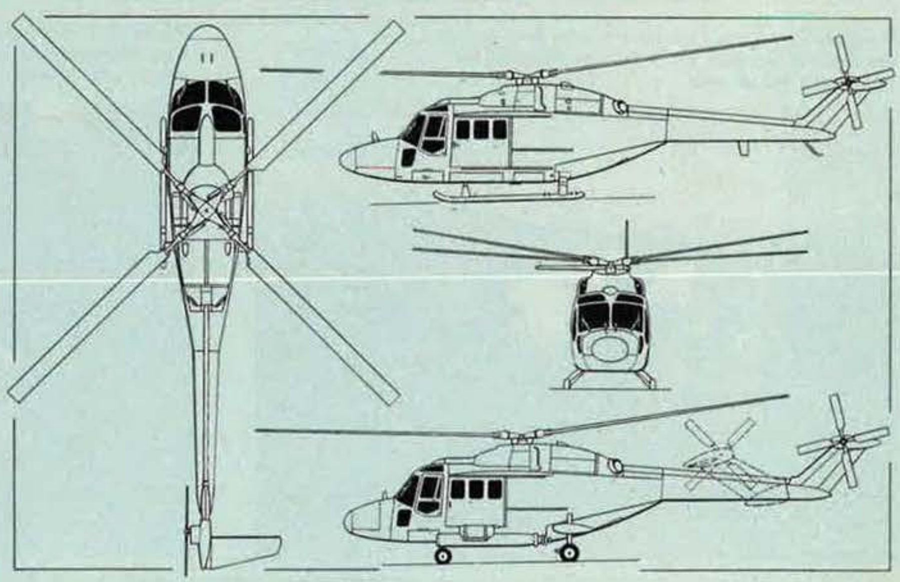
FUSELAGE AND TAIL UNIT: Conventional semi-monocoque pod and boom structure, mainly of light alloy, including a cantilever floor structure with unobstructed surface. Glassfibre components used for access panels, doors, and fairings. The forward fuselage is free from bulkheads, giving an unrestricted field of view. Three large windows in each of the main cabin sliding doors. Provision for internally-mounted defensive armament, and for universal flange mountings on each side of the exterior to carry weapons or other stores. Tailboom is a light alloy monocoque structure bearing the sweptback vertical fin/tail rotor pylon, which has a half-tailplane near the tip on the starboard side. Tailplane leading- and trailing-edges, and bullet fairing of tail rotor gearbox, are of glassfibre.

LANDING GEAR (general-purpose version): Non-retractable tubular skid type. Provision for a pair of adjustable ground handling wheels on rear of each skid. Flotation gear optional.

LANDING GEAR (naval version): Non-retractable oleo-pneumatic tricycle type. Single-wheel main units, mounted on sponsons near rear of main fuselage, are fixed at 27° toe-out for deck landing, and can be manually turned into line and locked fore and aft for movement of aircraft into and out of ship's hangar. Twin-wheel nose unit can be castored hydraulically through 90° by the pilot. Designed for high shock-absorption to facilitate take-off from and landing on small decks under severe sea and weather conditions. Sprag brakes (wheel locks) fitted to each wheel prevent rotation on landing or inadvertent deck roll. These locks are disengaged hydraulically and will automatically re-engage in the event of hydraulic failure. Friction brakes may be fitted for shore use. Flotation gear, and hydraulically-actuated harpoon deck-lock securing system, optional.

POWER PLANT: Two Rolls-Royce BS.360-07-26 Gem turboshaft engines. Each has a max continuous rating of 750 shp, a take-off and inter-contingency rating of 830 shp, and a max contingency rating (2½ min) of 900 shp. Engines are mounted side by side on top of the fuselage upper decking, aft of the main rotor shaft and gearbox, and are separated from the fuselage, transmission area, and each other by firewalls. Engine air

Westland Lynx AH. Mk 1 light general-purpose helicopter, with additional side view (bottom) of Lynx HAS. Mk 2 (Pilot Press)



intakes are de-iced electrically. Fuel in five crashproof bag-type tanks, all within the fuselage structure, comprising two main tanks each of 450 lb (204 kg) capacity, two side-by-side collector tanks each of 204.5 lb (93 kg) capacity, and a 326 lb (148 kg) capacity underfloor tank at the forward end of the cabin. Total fuel capacity 1,635 lb (742 kg). Crossfeed system allows fuel to be supplied from both collector tanks to one engine or from one tank to both engines. If required, ferry range can be increased by installing in the rear of the cabin two metal auxiliary tanks with a combined capacity of 1,600 lb (726 kg). Single-point pressure refuelling (55 lb/sq in; 3.87 kg/cm² max) and defuelling; two points for gravity refuelling. A removable 25 Imp gallon (114 litre)/min pressure refuelling/defuelling pack can be fitted in the cabin which, with the port engine running, can be used to refuel the aircraft from dump stocks on the ground or containers suspended from the hoist. It is also possible to raise fuel about 15 ft (5 m) while the aircraft is hovering. Fuel jettison capability for main and forward tanks. Provision for self-sealing of both collector tanks (except in Royal Navy version) to provide protection against small-arms fire. Engine oil tank capacity 1.5 Imp gallons (6.8 litres). Main rotor gearbox oil capacity 4 Imp gallons (18 litres).

ACCOMMODATION: Pilot and co-pilot or observer on side-by-side seats which can accommodate back-type dinghies and are adjustable fore and aft and for height. Inertia-reel shoulder harness for pilot and co-pilot. Additional crew members (eg, gunner, hoist operator) according to role. Individual forward-hinged cockpit door and large rearward-sliding cabin door on each side; all four doors are jettisonable. Cockpit is accessible from cabin area. Maximum high-density layout (general-purpose version) for one pilot and 10 armed troops or paratroops, on lightweight bench seats in soundproofed cabin. Alternative VIP layouts for four to seven passengers, with additional cabin soundproofing. Seats can be removed quickly to permit the carriage of up to 2,000 lb (907 kg) of freight internally. Tie-down rings are provided at approx 20 in (508 mm) intervals on main cabin floor, which is stressed for loads of up to 200 lb/sq ft (976 kg/m²). Alternatively, loads of up to 3,000 lb (1,360 kg) can be carried externally on a freight hook mounted below the cabin floor and fitted, in naval version, with an electrically-operated emergency release system. For casualty evacuation, with a crew of two, can accommodate three standard stretchers and a medical attendant; electrically-heated casualty bags can be provided. Both versions have secondary capability for search and rescue (up to nine survivors) and other roles (see introductory copy and "Equipment" paragraphs). An 8/13-seat civil transport version is being studied.

SYSTEMS: Two independent hydraulic systems in all versions, pressure 2,050 lb/sq in (144 kg/cm²). Pumps are powered by accessory drive from main rotor gearbox, enabling full power to be drawn from both main systems in the event of an engine failure. If either No. 1 or No. 2 main system fails, the other maintains adequate flying control. No. 1 system, additionally, actuates the tail rotor yaw control and the rotor brake. Tail rotor operation reverts to mechanical control if No. 1 system fails. A third hydraulic system, at the same pressure, is provided in

Westland-Aérospatiale Lynx, naval version, flies alongside RFA Engadine, *helicopter support ship, during recent series of deck landing trials*

naval version when sonar equipment, MAD, or a hydraulic winch system are installed. When this third hydraulic system is installed, the deck-lock harpoon is also operated by this system. No pneumatic system. 28V DC electrical power is supplied by two 6kW engine-driven starter/generators, and an alternator. Engines can also be started from an external 28V DC power source. A 24V 23Ah (optionally 40Ah) nickel-cadmium battery is fitted for essential services and emergency engine starting. 200V three-phase AC power is available at 400Hz from two 15kVA transmission-driven alternators. AC and DC external ground power sockets are fitted on starboard side of fuselage. Graviner Triple FD engine fire detection system: two separate fire suppression systems are fitted, but are interconnected to permit contents of both bottles to be directed to one engine if necessary. All versions are fitted with a centralised standard warning system which provides visual and audio warnings of major emergencies, visual warnings for secondary failure, and visual indications of an advisory nature. Optional cabin heating and ventilation system, using a mixing unit combining engine bleed air with outside air. Optional supplementary cockpit heating system. Electrical anti-icing and demisting of windscreen, and electrically-operated windscreen wipers, are standard; windscreen washing system is optional.

ELECTRONICS AND FLIGHT EQUIPMENT: Main equipment bays are in nose (under upward-hinged door) and at rear of cabin. All versions equipped as standard with navigation, cabin, and cockpit lights; adjustable landing light under nose; anti-collision beacon; first aid kit(s); and hand-type fire extinguishers for cabin. Optional equipment common to all roles (general-purpose and RN versions) includes simplex four-axis cross-country autopilot system; Plessey PTR 377 UHF/VHF transceiver with homing; Ultra D 403M standby UHF; S.G. Brown three-position crew intercom. Optional role equipment or installations for both versions include Marconi-Elliott automatic flight control system (AFCS); AN/ARC-44 VHF(FM); Collins 718 UA HF; VOR/ILS; DME; AN/ARN-52 TACAN (general-purpose version only); X-band transponder (naval version only); Sperry C2J or GM9B Gyrosyn compass system; Sperry E2C standby compass; Plessey PTR 446 IFF transponder; AD 360 radio compass (general-purpose version only); Honeywell AN/APN-198 radar altimeter; dual controls; Decca Doppler Tactical Air Navigation System (TANS); Decca Mk 19 flight log; and vortex-type sand filter for engine air intakes. Additional AFCS units in general-purpose version permit automatic turns and radio height hold; in naval version, when sonar is fitted, these units are extended to provide automatic transition to the hover and automatic Doppler hold in the hover. Other optional equipment (both versions) includes signal pistol and cartridges, Aldis lamp, and stowage.

ARMAMENT AND OPERATIONAL EQUIPMENT: For armed escort, anti-tank, or air-to-surface strike missions, the general-purpose version can be equipped with one 20 mm AME 621 or similar cannon, with 1,500 rds, or a pintle-mounted 7.62 mm GEC Minigun, inside the cabin; or a Minigun beneath the cabin, in an Emerson Minitat installation, with 3,000 rds. An external pylon can be fitted on each side of the cabin for a variety of stores, including two Minigun or other self-contained gun pods; two pods of fourteen and two of seven 2 in rockets; pods of 68 mm SNEB rockets; or up to six BAC Hawkswing or Aérospatiale AS.11, or eight Aérospatiale/MBB Hot or Hughes TOW, or similar air-to-surface missiles. An additional six or eight missiles can be carried in the cabin, for re-arming in forward areas, and an Avimo-Ferranti 530 lightweight stabilised sight is fitted for target detection and missile direction. The Lynx can also transport mobile anti-tank teams consisting of three gunners with missiles and launchers. For the search and rescue role, with a crew of three, both versions can be fitted with a waterproof floor, four 5 in flares (three in naval version), and a 600 lb (272 kg) capacity electrically-operated "clip-on" hoist in the starboard side of the cabin. Alternative option of hydraulically-operated hoist in naval version when third hydraulic system is installed. The hoist, which can lift a load through 250 ft (76 m) at 100 ft (30.5 m)/min, can be swung back into the cabin when not in use, permitting the sliding door to be closed. The general-purpose version can also be equipped for several other duties, including firefighting and crash rescue, reconnaissance, military command post, liaison, customs and border control, and pilot and operational training. Optional equipment, according to role, can include lightweight sighting system with alternative target magnification, vertical and/or oblique cameras, up to six 5 in flares for night operation, low light level TV, infra-red linescan, searchlight, and specialised communications equipment. The naval version can carry out a number of these roles, but has specialised equipment for its primary duties. For the ASW role, this includes two Mk 44 or Mk 46 homing torpedoes, one each on an external pylon on each side of the fuselage, and six marine markers; or two Mk 11 depth charges. Detection of the submarine can either be carried out by the parent ship (in which case the Lynx carries retractable classification and localisation equipment), or the Lynx can itself be equipped for this function, with Alcatel D.U.A.V.4 lightweight dunking sonar, and hydraulically-powered winch and cable hover mode facilities within the AFCS. Ferranti Sea-

The second Westland Lynx naval variant prototype, armed with four Aérospatiale AS 12 air-to-surface missiles

spray lightweight search and tracking radar, for detecting small surface targets in low visibility/high sea conditions. Armament includes BAC CL834 Skua semi-active homing missiles for attacking light surface craft; alternatively, four AS 12 or similar wire-guided missiles can be employed in conjunction with an AF 530 or APX-334 lightweight stabilised optical sighting system.

DIMENSIONS, EXTERNAL (A: general-purpose version; N: naval version):
Diameter of main rotor (A, N)
42 ft 0 in (12.802 m)
Diameter of tail rotor (A, N)
7 ft 3 in (2.21 m)
Main rotor blade chord (A, N, constant, each) 1 ft 3.4 in (0.39 m)
Tail rotor blade chord (A, N, constant, each) 7.1 in (180 mm)
Length overall, both rotors turning (A, N)
49 ft 9 in (15.163 m)
Length overall:
A, main rotor blades folded
43 ft 2.3 in (13.165 m)
N, main rotor blades and tail folded
34 ft 10 in (10.618 m)
Length of fuselage nose to tail rotor centre:
A 39 ft 6.8 in (12.06 m)
N 39 ft 1.3 in (11.92 m)
Width overall, main rotor blades folded:
A, N 9 ft 7.75 in (2.94 m)
N, main wheels fore and aft
10 ft 0 in (3.05 m)
Height overall, both rotors turning:
A, N 12 ft 0 in (3.66 m)
Height overall, both rotors stopped:
A 11 ft 6 in (3.504 m)
N 11 ft 0.5 in (3.365 m)
Height to top of rotor hub:
A 9 ft 8.7 in (2.964 m)
Height overall, main rotor blades and tail folded:
N 10 ft 6 in (3.20 m)
Tail rotor ground clearance:
A 4 ft 7.5 in (1.41 m)
N 4 ft 6.3 in (1.38 m)
Tailplane half-span (from fuselage c/l):
A, N 5 ft 9.9 in (1.776 m)
Skid track (A) 6 ft 8 in (2.032 m)
Wheel track (N) 9 ft 1.4 in (2.778 m)
Wheelbase (N) 9 ft 10.7 in (3.014 m)
Cabin door openings (A, N, each):
Mean width 4 ft 6 in (1.372 m)
Height 3 ft 11 in (1.194 m)

DIMENSIONS, INTERNAL:
Cabin, from back of pilots' seats:
Min length 6 ft 9 in (2.057 m)
Max width 5 ft 10 in (1.778 m)
Width at rear 4 ft 7.5 in (1.409 m)
Max internal floor width
5 ft 7.5 in (1.715 m)
Max height 4 ft 8 in (1.422 m)
Floor area 40.04 sq ft (3.72 m^2)
Volume 184 cu ft (5.21 m^3)

WEIGHTS (A: general-purpose version; N: naval version):
Manufacturer's bare weight:
A 5,225 lb (2,370 kg)
N 5,507 lb (2,498 kg)
Manufacturer's basic weight:
A 5,395 lb (2,447 kg)
N 5,744 lb (2,605 kg)
Operating weight empty, equipped:
A, troop transport (pilot and 10 troops)
5,641 lb (2,558 kg)
A, anti-tank strike (incl weapon pylons, firing equipment, and sight)
6,313 lb (2,863 kg)
A, search and rescue (crew of three)
6,168 lb (2,797 kg)
N, anti-submarine strike
6,481 lb (2,939 kg)
N, reconnaissance (crew of two)
6,409 lb (2,907 kg)
N, anti-submarine classification and strike 6,641 lb (3,012 kg)
N, air to surface vessel search and strike (crew of two and four AS.12s)
6,789 lb (3,079 kg)
N, search and rescue (crew of three)
6,517 lb (2,956 kg)
N, dunking sonar search and strike
7,218 lb (3,274 kg)
Max T-O weight:
A 9,350 lb (4,196 kg)
N 9,500 lb (4,309 kg)

PERFORMANCE (at AUW of 9,100 lb; 4,128 kg at S/L, ISA, except where indicated. A: general-purpose version; N: naval version):
Max never-exceed speed (A, N) at 8,000 lb (3,628 kg) AUW
180 knots (207 mph; 333 km/h)
Max continuous cruising speed:
A 153 knots (176 mph; 284 km/h)
N 150 knots (172 mph; 278 km/h)
A (ISA + 20° C)
144 knots (166 mph; 267 km/h)
N (ISA + 20° C)
141 knots (163 mph; 262 km/h)
Max continuous cruising speed (1 hr), one engine out:
A 142 knots (163.5 mph; 263 km/h)
N 128 knots (148 mph; 238 km/h)
A (ISA + 20° C)
131 knots (151 mph; 243 km/h)
N (ISA + 20° C)
115 knots (132 mph; 213 km/h)
Speed for max endurance:
A, N (ISA and ISA + 20° C)
70 knots (81 mph; 130 km/h)
Min flying speed (max contingency rating), one engine out:
A, N 25 knots (29 mph; 46 km/h)
A, N (ISA + 20° C)
35 knots (41 mph; 65 km/h)
Max forward rate of climb:
A 2,370 ft (722 m)/min
N 2,270 ft (692 m)/min
A (ISA + 20° C)
2,030 ft (618 m)/min
N (ISA + 20° C)
1,980 ft (603 m)/min
Max forward rate of climb (1 hr power), one engine out:
A 910 ft (277 m)/min
N 800 ft (244 m)/min
A (ISA + 20° C) 500 ft (152 m)/min
N (ISA + 20° C) 420 ft (128 m)/min
Max vertical rate of climb:
A, N 1,540 ft (469 m)/min
A, N (ISA + 20° C)
820 ft (250 m)/min
Hovering ceiling out of ground effect:
A, N above 12,000 ft (3,650 m)
Typical range, with reserves:
A, troop transport
304 nm (350 miles; 563 km)
A, search and rescue
164 nm (188 miles; 303 km)
Radius of action, out and back at 150 knots (173 mph; 278 km/h), max hover weight at pick-up of 9,100 lb (4,128 kg), reserves for T-O and landing, 15 min loiter in search area, 2 min hover for each survivor, and 20 min loiter at end of mission:
N, search and rescue (crew of three and two survivors)
148 nm (170 miles; 274 km)
N, search and rescue (crew of three and eight survivors)
135 nm (155 miles; 250 km)
Time on station at 50 nm (58 miles; 93 km) radius, out and back at 150 knots (173 mph; 278 km/h), with two torpedoes and six marine markers, reserves for T-O, landing, and 20 min loiter at end of mission:
N, anti-submarine classification and strike, loiter speed on station
2 hr 20 min
N, anti-submarine strike, loiter speed on station 2 hr 20 min
N, dunking sonar search and strike, 50% loiter speed and 50% hover on station 56 min
Time on station at 50 nm (58 miles; 93 km) radius, out at 135 knots (155 mph; 250 km/h), back at 145 knots (167 mph; 268 km/h), with crew of two and four AS.12s, reserves as above:
N, air to surface vessel strike, en-route radar search and loiter speed on station 2 hr 20 min
Max range:
A 411 nm (473 miles; 761 km)
N 363 nm (418 miles; 673 km)
A (ISA + 20° C)
420 nm (483 miles; 778 km)
N (ISA + 20° C)
374 nm (430 miles; 693 km)
Max endurance:
A, N (ISA and ISA + 20° C)
3 hr 45 min
Max ferry range with auxiliary cabin tanks:
A, N 748 nm (861 miles; 1,386 km)

The US plans to improve the ability of its land-based missiles to destroy hard targets in a counterforce response, should there be an attack on this country. Does this signal abandonment of Assured Destruction in favor of a counterforce strategy or merely a change in targeting emphasis? What useful purpose would be served by US missiles with a greater counterforce capability? Could that capability cause the Soviets to launch a first strike? Could it start an arms race? These and other questions are examined in . . .

COUNTERFORCE: FACTS AND FANTASIES

BY COL. WILLIAM C. MOORE, USAF (RET.)

AN EDITORIAL in the New York *Times* of January 15, 1974, cautioned that before any changes are made in US nuclear strategy the subject "deserves more national debate than it has yet received."

This admonition was aimed at Secretary of Defense James R. Schlesinger, who five days earlier had announced that US nuclear strategy would include the concept of counterforce. In the lexicon of strategists, counterforce describes military action in which the armed forces of warring nations attempt to destroy each other. This is the traditional objective of warfare, advocated by most military experts. It contrasts with assured destruction—the current official US nuclear strategy—which emphasizes the mass killing of Soviet civilians by destroying Soviet cities. In either case, the US objective is to deter both nuclear war and nuclear blackmail.

The debate called for by the New York *Times* is in full swing. So far the critics of counterforce either ask a rhetorical question: "Why change a strategy that has worked so well for over two decades?" Or they assert that Mr. Schlesinger's announcement portends the development of a US first-strike capability certain to make Soviet leaders nervous and perhaps irrational. So irrational that they might launch a preemptive, surprise attack against the United States. Finally, say the critics, there is no sense attacking enemy missile silos, because the ICBMs in them will already be whizzing toward the United States.

Erroneous Premises

Thus far, the debate has exposed several confusing and erroneous premises about counterforce as well as assured destruction and the role of each in US national security strategy, both now and for the past two decades.

Most harmful to sensible debate is the mistaken belief that assured destruction means that most—if not all—US strategic weapons are aimed at Russian cities, and that such Soviet military forces as ICBMs, nuclear-storage sites, and other military forces are largely excluded from attack. Certainly that is not the case. Many American warheads have for years been assigned to Soviet military targets as well as to cities.

Defense officials confirmed this to newsmen. And, although they did not reveal ratios, the only logical conclusion—given the vast number of US weapons and the small number of

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major Soviet cities—is that the majority of US bombs and missiles have been and are still aimed at Soviet military forces, installations, and war-supporting industrial facilities.

—Illustration by Cliff Prine

Another barrier to sensible debate is the tendency to think of strategic nuclear war as a sudden, intense spasm by each side, so devastating, so catastrophic that nothing—except picking up the pieces—happens thereafter. That is not the Soviet concept, as revealed in countless articles by Russian military writers. The spasm scenario eliminates from the debate any discussion beyond first or second strike and makes for convenient logic about overkill and wasting missiles against empty silos.

A scenario in which the US expends all her strategic weapons in a sudden, convulsive reaction to attack by the Soviets is imprudent, perilous, and perhaps fatal to our survival in a nuclear war. Logic and common sense rule out the assumption that neither side would withhold forces in reserve.

Reserve forces are traditional in military thinking, and for good reason. They often have stemmed the tide of defeat or exploited opportunities leading to victory. Reserves correct what went wrong, hit targets that were missed, attack enemy reserve forces, and, most important, hedge the future, ensuring that the balance of forces in the postattack era is not unfavorable.

Reserves, some academic strategists contend, are superfluous in strategic nuclear war. But think a minute. Is this really so? What happens if the US expends all her weapons and the Soviet Union still has some? And also has the command-and-control facilities to use them? How does the postattack scenario then unfold? Not a very reassuring outlook, is it?

So we must look beyond first and second strike. When we do, the validity and legitimate role of the counterforce concept immediately becomes abundantly clear. And given the numerical limits on missiles set by SALT I, it is equally clear that our counterforce weapons must be accurate and effective against hard targets. We no longer can plan to assign several warheads to one target as we did in the days when the US had overwhelming nuclear superiority.

Another faulty premise underlies the query of pundits who ask, "Why change a strategy that has worked for two decades?" They are saying, in effect, that "massive retaliation"—President Eisenhower's strategy of the 1950s—is the same as "assured destruction" of the 1960s.

To equate the two strategies in the context of the current debate is fundamentally wrong. Massive retaliation relied on the traditional concept of military attacking military—counterforce—not city-busting as called for by assured destruction. Obviously, President Eisenhower's first priority was to destroy what was then an immature Soviet nuclear force, but one that could have seriously injured the US. A collateral priority was the need to destroy Soviet military forces that could have overrun Europe. Any city-busting with attendant mass killing of Soviet citizens would have occurred incidental to attacks against military facilities —the side effects or "bonus" in the vernacular of targeteers.

This is not to say that President Eisenhower ruled out deliberate attacks on cities. That option always was available, but it was looked upon as a last-ditch effort to be used only if the preferred option failed, or if an *in extremis* situation developed.

Massive retaliation, therefore, should be remembered as a strategy that blended a great deal of counterforce with a good bit of assured destruction achieved incidental to attacks against military targets located in or near Soviet cities.

Counterforce in the McNamara Era

Secretary of Defense McNamara initially accepted President Eisenhower's nuclear strategy. Soon, however, the counterforce portion of the concept ran headlong into Mr. McNamara's cost-effectiveness mentality. Weapon systems, ammunition, other expendable supplies, concepts, tactics—all had to be precisely defined and "quantified" in the vernacular of Mr. McNamara and his Whiz Kids.

They had little trouble determining the number and size of nuclear weapons required to destroy Soviet cities. But determining what was needed to destroy Soviet military forces and facilities involved a maze of variables, uncertainties, and targeting techniques, few of which neatly fit cost-effectiveness formulas.

Targeteers, given the facts about a target—its size, location, difficulty to hit, hardness, and the effectiveness of enemy weapons defending it—try to determine how best to destroy the target. Lacking accuracy in his own weapons, the targeteer may decide to *smother* the area with his less-accurate weapons. He may decide that, because of enemy defenses, more than one type of weapon should be aimed at the target. He has to expect some mechanical trouble (aircraft or missile aborts), so he increases the number of weapons aimed at the target. Then he increases this number again to account for expected losses to enemy defenses. Finally, the entire equation is subject to deletions or additions depending upon whether the targeteer wants to achieve 100 percent assurance of destruction, eighty percent, or sixty percent.

Targeting, moreover, is not static. Requirements change constantly as enemy military forces become more and more difficult to locate and destroy. Targeteers must either increase the number of weapons aimed at the target—again smother the area of the target—or they must increase the accuracy of weapons so targets can be hit precisely.

Clearly, the precision demanded by cost-effectiveness was incompatible with techniques for determining how many weapons were needed to destroy enemy military forces. Moreover, as Mr. McNamara foresaw, President Eisenhower's counterforce concept required periodic expenditure of hard-to-get funds to ensure that US forces kept pace with Soviet improvements. As one consequence of these factors, Mr. McNamara opted to deemphasize counterforce in favor of assured destruction.

Did this decision mean that those US weapons aimed at Soviet military forces and installations were retargeted to attack cities? Certainly not. Perhaps some minor adjustments were made in aiming points, but undoubtedly the majority of US weapons continued to be targeted against Soviet nuclear military forces and facilities—not cities. It is illogical to conclude otherwise, given the vast number of weapons in the US arsenal.

A logical assumption, therefore, is this: During Mr. McNamara's tenure as Secretary of Defense, US nuclear strategy contained—as it did in the Eisenhower years—both the elements of assured destruction and counterforce (referred to in the McNamara years as a damage-limiting capability), with one significant difference: Mr. McNamara placed emphasis on assured destruction.

Thus shunned officially, US counterforce capabilities began a slow, steady decline in their effectiveness as the number and hardness of Soviet military targets—especially missile silos—increased.

Laird Hints at Options

Melvin Laird chose to continue assured destruction as official policy during his tenure as Secretary of Defense, though he never was comfortable with it. He often complained about relying on one option—the mass killing of civilians. And he occasionally hinted at reemphasizing the traditional military philosophy of counterforce.

The hints never became reality. Instead, they provoked an uproar among some members of Congress—notably Sen. Edward W. Brooke (R-Mass.)—and academic strategists who raised their perennial argument that counterforce would incite the Soviets to execute a surprise first strike against the United States. This argument, barely plausible when the Soviets had few nuclear weapons and needed to make each one count, became progressively less valid during Mr. Laird's tenure. As the Soviet nuclear arsenal grew in size, Russian fears of a US first strike lessened, and, by the time of the first round of SALT, each side realized that neither had any hope of achieving a disarming first strike.

Nevertheless, Mr. Laird did not pursue the issue. Why not is conjecture. Perhaps because improvements in Soviet military forces and facilities had not seriously outpaced US capabilities to attack them. Most assuredly the probability of destruction had slipped below the level desired by targeteers, but the decline during Mr. Laird's tenure was not sufficient to seriously upset the military balance. Nevertheless, congressional fears that the development of counterforce capabilities might be misread by the Soviets as a move toward a first-strike posture caused the Administration to turn down many of USAF's recommended improvements in accuracy and yield for the Minuteman force.

Schlesinger Reemphasizes Counterforce

Mr. Schlesinger is faced with the distinct possibility that the balance is about to shift rapidly, dangerously. Three related factors have combined to bring about this grim outlook:

• Counterforce, lacking status as official policy, has been excluded from the lexicon of strategy when the Pentagon takes its case to the Congress for funds to improve old weapons or to buy new ones. As a consequence, few funds have been appropriated to improve accuracy and warhead yield-to-weight ratios, and US counterforce capabilities have steadily lost the effectiveness they once enjoyed vis-à-vis the hardened Soviet targets they are aimed at.

• The Soviet Union, having dramatically improved its counterforce capabilities prior to the SALT I agreement, was expected to slacken the pace after the agreement. Instead, Soviet leaders have continued with a program that Mr. Schlesinger says "in depth and breadth has been surprising to us." At the same time, they continue by defensive means—hardening mainly—to make their military forces more and more difficult to locate and destroy. Some Soviet targets are becoming so difficult to destroy that US weapons assigned to attack them are becoming inadequate to the task. Previously, a near miss was adequate; now a precise hit is required.

• The SALT I agreement freezing US strategic missiles at 1,710 interrelates with the first two factors and compounds the dilemma facing Pentagon officials. Mr. Schlesinger, denied the option of adding to the US arsenal, must either improve the accuracy of existing weapons or increase the number or power of the nuclear warheads they carry. Otherwise, more and more Soviet military targets will escape destruction in the event of a nuclear war.

What worries Pentagon strategists is this: The obvious loser is mutual deterrence. It could well become one-sided, with the USSR in the driver's seat.

Also obvious is Mr. Schlesinger's determination not to allow this to happen. To prevent it, he intends to reemphasize the concept of counterforce, raising it to the level of official policy, thus ensuring that it gets the attention it deserves.

As history reveals, counterforce has been a vital though sometimes neglected part of US nuclear strategy since the beginning. Mr. Schlesinger's intention is, I believe, simply to strengthen what years of neglect has weakened. This does not mean a wholesale reorientation of the target system, as some journalists are reporting, but rather *a shift in emphasis and priorities within the existing system.*

Military men are already applauding the decision to recognize the legitimate role of counterforce in US nuclear strategy. They have been uncomfortable about the efficacy of city-busting, which to them violates proved axioms of warfare. Instead of protecting the US and her citizens, as the military is supposed to do, assured destruction actually exposes our people and cities to maximum danger and holds them as hostages on a *quid pro quo* basis with Soviet cities and civilians.

Moreover, say military officials, any strategy that relies on city busting and the mass killing of civilians denies the lessons of the history of war. The surest way to success in war, history confirms, is to destroy the armed forces of the enemy; the defeat of one nation's military forces has always signaled the end of the war and victory for the other side.

Nevertheless, some strategists still oppose this military view. Reemphasizing counterforce, they say, will weaken the nuclear deterrent. It will dilute the balance of terror which city busting and the mass killing of civilians guarantees.

If the history of US nuclear strategy is any criterion, the sword of Damocles will not be dulled by counterforce. As in the Eisenhower years, the balance of terror will continue to be stark. Under the numerical constraints of SALT I, it will be a delicate balance, uncomfortable to live with but vastly preferable to a qualitative imbalance in which the Soviets have an extensive counterforce capability and we do not. That is the direction in which the scales have begun to tip, and the more delicate the balance the quicker and more irretrievably it can be upset. That is the disaster that Secretary Schlesinger seems determined to prevent.

In the future, as in the past, the greatest calamity, the most terrifying prospect, the outlook most likely to deter the hand of Soviet aggression is the fear of seeing her armed forces destroyed in a counterforce response. Of being disarmed and helpless. Of having nothing left—or at best only inferior forces—with which to fight or bargain.

A US deterrent strategy incorporating counterforce capabilities is essential to national security in the years ahead. A reemphasis on counterforce is long overdue. It should be welcomed—not opposed. ■

The survivability of Air Force ICBMs, now estimated by USAF's Chief of Staff to be at least eighty-five percent, can be increased significantly by a variety of measures that are currently under close study. At a Washington Symposium, experts from the Air Force, Army, and Navy probed the means for . . .

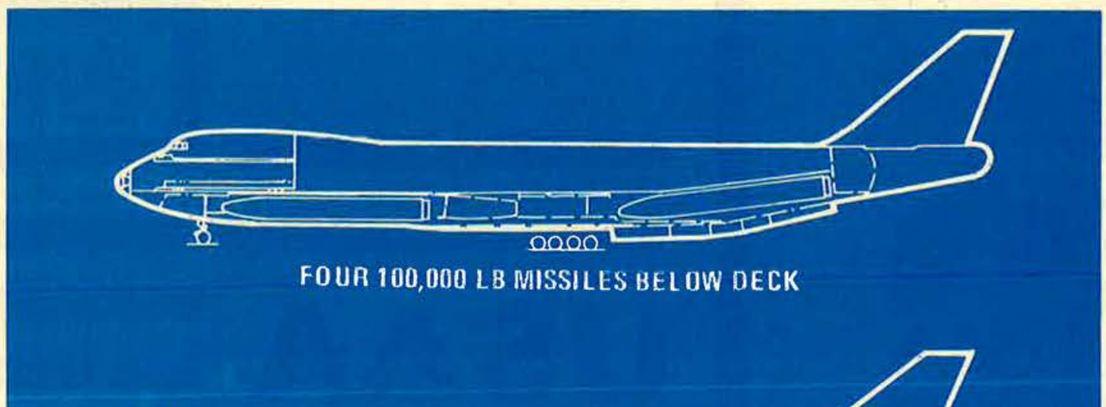
ADJUSTING TRIAD TO MOUNTING SOVIET THREATS

BY EDGAR ULSAMER

SENIOR EDITOR, AIR FORCE MAGAZINE

HUGE amphibian ICBM carriers and ballistic missile ships made to look like conventional merchant steamers were among the potential candidates for future strategic weapon systems highlighted during a symposium of the American Aeronautics and Astronautics Association's recent annual meeting in Washington, D. C. Chaired by Lt. Gen. Kenneth W. Schultz, Commander of SAMSO, the meeting heard from the General Manager of Boeing's Space and Missiles Group, B. T. Plymale, about a variety of carriers for air-launched systems ranging from modified 747s to a six-engine long-endurance airplane with a maximum payload of one million pounds.

Rear Adm. W. J. Crowe, Jr., the US Navy's Deputy Director for Strategic Plans, Policy, and Nuclear Systems, reported that "it is entirely feasible to install missiles of intercontinental range in innocuous-looking merchant types and mingle them with commercial steamers in coastal trade routes or on the high seas. In fact, this turns out to be the least expensive option for expanding our offensive ballistic



Boeing's 747 can be configured to accommodate up to eight ICBMs with payloads similar to Minuteman.

missile capability in a hurry, with reasonable expectation of missile survivability."

Presumably such a system would avoid the command and control problems associated with submarine-launched ballistic missile systems; it would, however, share the current relative lack of accuracy of SLBMs when compared to land-based systems whose launch point is known with greater precision, and, therefore, provide only a marginal counterforce capability. In the past, in 1962 and in 1967, the Joint Chiefs of Staff rejected proposals to place ballistic missiles on surface ships, camouflaged or otherwise, on grounds of high vulnerability.

Admiral Crowe told AIR FORCE Magazine that the new Trident SLBM system was not designed to provide hard-target kill capabilities "at this time." He said, however, that, if necessary, midcourse and terminal guidance could be added to achieve the needed high precision. Senior Department of Defense experts, asked about the potential counterforce capability of Trident, pointed out that the accuracy of the Trident systems is likely to be below that of the present family of sub-launched missiles, if no advanced technology guidance is used. The greater the distance a missile has to travel, the greater the effect of guidance errors. The 6,000-mile range of the ultimate Trident missile (an interim missile with a 4,000-mile range is to be built first) is twice that of present SLBMs.

Airmobile Systems

Examining different airmobile ICBM concepts in terms of standby, ground alert, and full airborne alert, Mr. Plymale concluded from Boeing's initial studies that such systems are operationally and economically attractive and technically feasible. "Airmobile ICBM systems can enhance the survivability and strike capability of our strategic forces. Using a large airplane carrier with air-launched missiles, the systems can be operated at levels of readiness that match the world tension level," Mr. Plymale claimed.

According to Boeing's estimates, the RDT&E costs of such systems range from $730 million for a 747 derivative to $1.55 billion for a 1,800,000-pound long-endurance carrier. While the proposed systems could launch modified Minuteman ICBMs, the Boeing official reported that the basic effectiveness as well as the life-cycle costs of the system would be improved through the development of a smaller, optimized missile whose development would cost about $2.7 billion.

Weighing about 47,000 pounds, or about half the weight of Minuteman, and with a range of up to 6,000 miles, such a missile could deliver the same kind of payload as Minuteman with an accuracy "equal to that specified for silo-based missiles" using currently available technologies. Increased accuracy appears possible through the use of sophisticated post-launch navigation systems, according to the Boeing study.

The MC-747 Missile Carrier

The least-costly launch system proposed by Boeing is a "straightforward derivative" of the 747F freighter now in service with commercial carriers. With a few structural changes and new engines with a thrust output of about 55,000 pounds, takeoff weight of the aircraft could be boosted to 880,000 pounds and maximum in-flight weight following refueling to 1,200,000 pounds. The MC-747 could go for ten hours between refuelings with a 400,000-pound payload. Such an aircraft could accommodate either four advanced technology 100,000-pound ICBMs or eight smaller missiles weighing 47,000 pounds each. Boeing's analyses indicate that launching large missiles poses no special problems for the carrier aircraft, and that, theoretically, missiles weighing up to 200,000 pounds could be launched by an MC-747.

Missile guidance would be aligned in the carrier aircraft before takeoff and updated in flight by the carrier's navigation system, with command and control provided by the National Military Command Center through existing facilities. An on-board two-man team would prevent inadvertent launches. The basic launch control and security procedures of the proposed system parallel those of the silo-based Minuteman. In addition to existing communications systems, the MC-747 could operate during the transattack phase in concert with the E-4 Advanced Airborne National Command Post or a future Survivable Satellite System.

Launched in flight toward its target, an ICBM gains between twenty and thirty percent in range, or in payload, compared to land-based ICBMs, according to Mr. Plymale. Missile launch would be made in straight and level carrier flight. The attitude of the missile is controlled until it has reached a safe distance from the aircraft. An attitude-control system then takes over during the missile's free fall and places it into a thirty- to fifty-degree pitch-up attitude to ensure the proper flight path. A number of free-fall control concepts appear feasible, ranging from parachutes to jettisonable thrusters.

The basic guidance system of Boeing's proposed air-launched missile is AIRS, the Advanced Inertial Reference System developed

SAMSO Commander Lt. Gen. Kenneth W. Schultz, who chaired the AIAA's missile symposium, disclosed that the Soviets launched 371 large rockets during the past year.

but not yet deployed by the Air Force. (AIRS, a key element in enhancing the counterforce capabilities of Minuteman III, can provide marked accuracy improvements over the currently used system.) AIRS would be aligned on the ground before takeoff and updated during the missile carrier's flight. Subsystems for up-dating the missile during its flight include DME (Distance Measuring Equipment, working in conjunction with ground beacons), navigation satellites, area correlation devices, position-fixing radar, and on-board stellar inertial systems. These subsystems, Boeing claims, "could bring the air-launched ICBM accuracy up to levels now being forecast for improved silo-launched systems."

Three Operating Modes

Operation of the system, according to Mr. Plymale, could be in one of three modes: standby, dispersed ground alert, or airborne alert.

In the standby mode, the system would be largely dormant. The missiles, in ready storage at a rapid-load facility, and the unarmed aircraft would be operated only for crew proficiency training and occasional practice launches. Transition from standby to alert would require about two hours per aircraft, according to the Boeing proposal.

Dispersed ground alert involves slightly higher operating costs than standby. It means that each missile-carrying aircraft—Boeing envisions a total alert force of about twenty-five airplanes—would be deployed at a CONUS base with its missile load and crew aboard. The force ideally would be dispersed to at least ten airfields located more than 600 miles inland to increase warning time in case of a surprise attack by enemy sub-launched missiles.

The Boeing study claims that the missile carrier could reach a safe distance from nuclear bursts in less than four minutes after engine start. Special hardening and optimization for scramble takeoff could shave as much as two additional minutes from the required escape time. In Boeing's view, this response capability is sufficient to assure survival of the force, assuming the existence of an SLBM warning system.

In the airborne alert mode, the fleet would operate from a limited number of airfields, possibly one on the east coast and one on the west coast of the United States, with most of the aircraft in the air during periods of tension. The aircraft would operate offshore during periods of low tension; if they came under offshore enemy surveillance, or during periods of high tension, they would move inland and fly over remote areas of the continental United States.

Two advantages accrue from operating in US airspace, according to Mr. Plymale:

• The fact that the US deterrent is operating "overhead," protecting the country, would have a reassuring effect on the public.

• Perhaps more important, an enemy strike against aircraft operating within continental United States airspace would be an unambiguous attack on this country's sovereign territory. It would be an unmistakable provocation, likely to result in retaliation against the aggressor. Operating the missile carriers over US territory, therefore, is a far more reliable deterrent than aircraft or submarines operating offshore where they, at least theoretically, are susceptible to gradual and stealthy attrition.

Normal mission duration could be from twenty-two to seventy-two hours, according to the Boeing plan, and involves refueling every ten hours. Drawing on 747 utilization rates in airline service, Boeing claims that an MC-747 could have a utilization rate (average time in the air per day per aircraft) of up to twenty-one hours, or eighty-eight percent. A total force of thirty-six carrier aircraft and twelve supporting tankers, Mr. Plymale maintains, would permit keeping twenty-five aircraft and 200 missiles airborne and essentially invulnerable to surprise attack.

A "Sea-Sitting" Launcher?

The Boeing proposal includes alternate carrier aircraft designs involving the development of completely new systems. Among them are a four-engine and a six-engine long-endurance carrier. Using large, unswept wings coupled with lightweight construction and up-to-date engine technology, these aircraft could stretch out the refueling intervals to twenty-four hours and accommodate payloads of up to one million pounds. Total development costs would be more than double that of a 747 derivative, according to Boeing's estimates. While the unit cost of the aircraft would be higher than the MC-747, fewer would be required to carry the same number of missiles.

A more radical option, in Boeing's view, might be a new amphibian carrier that could perform continuous alert missions over vast ocean areas. It would, of course, lack the precise deterrence qualities of a system operating within the sovereign territory of the US and be more vulnerable to attack.

The Boeing concept envisions an aircraft with a gross takeoff weight of 1,200,000 pounds when operated from SAC land bases, or 875,000 pounds in case of ocean takeoffs. The aircraft would seek out favorable "sea-sitting" locations up to 4,000 miles from its land base. More than 30,000,000 square miles of ocean area would be available, and the amphibian carrier would look for sites away from sea lanes and shielded by cloud cover to reduce the danger of detection.

These sitting locations would be changed every three or four days, or more frequently in the case of enemy surveillance. If ordered to attack, the amphibian carrier would take off from the ocean and launch its missiles in flight. Boeing estimates that an aircraft of this type could remain on station for more than two weeks and would not require aerial refueling.

Minuteman Survivability

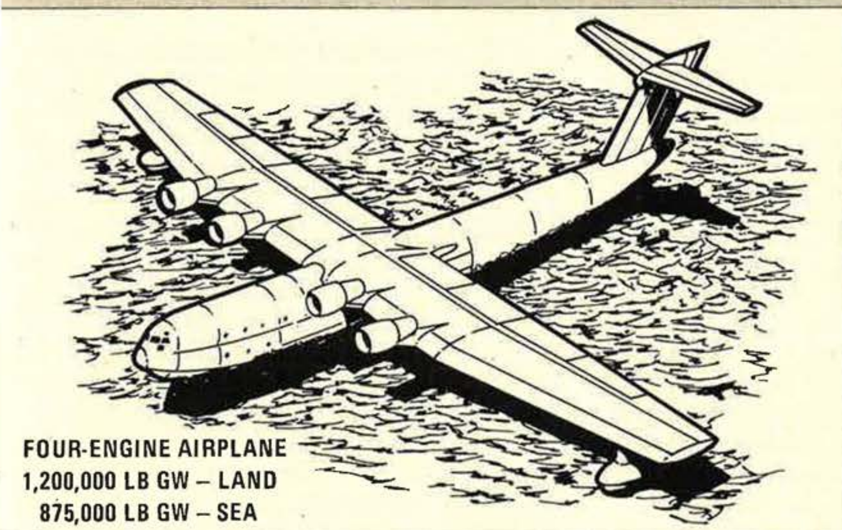
Col. John W. Hepfner, AFSC's recently named Deputy for Minuteman, told the AIAA meeting that "Minuteman is much harder against nuclear effects than was generally supposed." (Gen. George S. Brown, USAF Chief of Staff, told the Senate's Armed Services Committee recently that "Minuteman is today a highly survivable element of the Triad—and I am confident that eighty-five to ninety percent of the Minuteman force would survive a nuclear attack." He added that USAF's ICBM force constitutes "over half of the megatonnage and about two-thirds of the delivery vehicles on alert to support the Single Integrated Operational Plan [SIOP], our general nuclear war plan.")

Minuteman, Colonel Hepfner said, "was originally built with a significant degree of hardness. Our detailed studies and tests of hardened structures over the last several years not only confirmed that large portions of the structures were much harder than the original design goals; they also showed us ways of bringing the balance up to the levels of the hardest part."

Silo-hardening efforts are, of course, not confined to the United States. Adm. Thomas H. Moorer, Chairman of the Joint Chiefs of Staff, testified before the Senate Armed Services Committee that the Soviets are boosting the effectiveness of their new ICBMs through "the parallel construction of hardened silos, capable of surviving appreciably higher overpressures and ground shocks." US defense planners now estimate that some of the superhardened installations in the Soviet Union can withstand overpressures in excess of 3,000 pounds per square inch or roughly triple their original hardening.

While stressing that the survivability of Minuteman III is high, Colonel Hepfner added that, in view of intensive Soviet weapon-development programs and because of unknown aspects of some of their R&D, "we can't afford to assume that the Soviets will never achieve this capability [of successful attack on the US Minuteman force]." For this reason, he said, the Air Force has developed options to boost Minuteman's effectiveness to counter increasing threats. In addition to upgrading the entire force to Minuteman IIIs, "we can carry and deploy more reentry vehicles from the Minuteman III by changing to a propellant of a later design. Since our basic silos were designed to accommodate much larger vehicles, we have a wide range of options to achieve even greater throw weight by increasing the size of the booster and still stay within the Strategic Arms Limitation agreement."

Advances in warhead technology, Colonel Hepfner said, make it possible to "increase the capability of existing reentry vehicles" as well as permitting "rapid deployment of larger warheads if this should prove necessary." New lightweight components are the means for delivering a warhead with greater reentry speed and therefore greater accuracy than is now possible, he said. Minuteman III's effectiveness



Among the options for airborne missile launchers under consideration by industry is an amphibian, known as the "sea-sitter," which would operate from remote ocean areas.

could also be boosted by increasing the number of reentry vehicles that each missile carries.

Another option, according to Colonel Hepfner, is "to significantly improve our accuracy. This would permit the use of smaller reentry vehicles to achieve the same effectiveness as the larger ones with less accuracy; and it would provide the larger ones with a capability to neutralize superhardened structures of the command and control class."

Still another means for increasing the effectiveness of ICBMs is through the so-called "cold-launch" technique, which provides a range of advantages including the use of a larger booster for a given silo size and the capability to reload relatively rapidly. The Soviets have tested cold-launched ICBMs in 1973. (General Schultz told the AIAA meeting that during the past year the Russians launched "371 large rockets" in connection with military and space programs, or more than "one large missile per day all year long, including Saturdays and Sundays.")

Col. John W. Hepfner, SAMSO's Deputy for Minuteman, said Minuteman's effectiveness could be boosted through "cold launch," thereby permitting greater payloads and fast reloading.

Long-term programs to enhance the survivability of the US ICBM force are usually lumped together under the heading of the "M-X Program." Colonel Hepfner said that "we are currently in the process of narrowing down these options to two—one ground-mobility option and one airmobility option—and we expect to have completed this by next spring." The two approaches include many common technologies, he said. "There is a high payoff in mobile systems for propulsion efficiency, and we are looking for improvements in propellants and case materials to fully realize this potential." While the guidance problem associated with mobile systems is more difficult than in the case of silo-based systems, the problem is "not insurmountable. And we are determined to retain or improve upon the capabilities of our silo-based missiles if we are forced into the mobile environment," Colonel Hepfner said.

Regarding ground-mobile systems, he stressed that the Air Force wants "to understand how to optimize a missile transporter—how hard we can make it, how fast we can move it, and what it will cost to build. Similarly, we want to know how hard and inexpensively we can build missile shelters. In the airmobile area, we plan to investigate the dynamics of separation of large missiles from aircraft and the tie-in of the aircraft navigation system with the missile guidance system."

Ballistic-Missile Defenses Support ICBMs

Lt. Gen. W. P. Leber, head of the US Army's SAFEGUARD and Site Defense systems, told the AIAA meeting that there are three parts to the Army's Ballistic Missile Defense (BMD) program: The SAFEGUARD area defense system; the Site Defense system, meant to provide point defense and a "hedge in case Phase II of SALT is not successful and the current interim offensive agreement is not replaced with a treaty"; and an advanced-technology system that is still in a formative state.

Deployment of the SAFEGUARD system at Grand Forks, N. D., limited to 100 interceptors in accord with SALT I, General Leber said, is nearing completion. Site Defense, which he said will "be capable of firing and controlling a missile to intercept from any of several radars," is moving toward prototype demonstration. Terming this system "the most cost-effective solution to ballistic-missile defense," General Leber said development of Site Defense is keyed to expiration of the interim offensive agreement between the US and USSR. The advanced technology system, he said, would incorporate state-of-the-art improvements in the individual components of the Site Defense system for use in the defense of the National Command Authority in Washington, D. C. An improved Sprint intercept missile and advanced radar are being considered for that system.

SANGUINE's Potential

While the presently used command and control system for transmitting emergency action messages to the US Navy's SSBNs provides a "peacetime message delivery reliability of ninety-nine percent," according to Admiral Crowe, these facilities "do not have a high resistance to attack." Recognizing these problems, he said, the Navy has embarked on the development of an entirely new system, known as SANGUINE. It is currently in an R&D phase and "could become operational by FY '79. SANGUINE will be an extremely low frequency (ELF) modular transmitting complex buried underground, which will transmit command and control orders from the National Command Authorities to deeply submerged SSBNs, other deterrent forces, and attack submarines. Not only will SANGUINE provide worldwide coverage, but the transmitter grid, spread over many square miles, will be able to survive a high-intensity nuclear attack. Other attributes of ELF are that its propagation experiences little degradation in a nuclear environment, and ELF signals are virtually unjammable. Since ELF can penetrate seawater twenty times deeper than VLF (very low frequency, used in the current system), submarine survivability is improved by permitting SSBNs to operate at optimum depths and speeds while receiving communications."

Admiral Crowe said the USSR recently flight-tested a new submarine-launched missile with a range of more than 4,000 miles that "enables the Soviets to target the entire United States from the Greenland-Iceland-Faroes-UK gap." ■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In terms of peacetime, nondraft recruiting, the Air Force alone of the services is consistently topping its quotas in attracting bright, high-quality young people to its enlisted ranks. While unprecedented pay and expanded "fringes" are undoubtedly key factors in this success, innovative Air Force personnel policies deserve a large measure of credit. On the other hand, however, are a number of remaining inequities. Here, an expert on Air Force personnel matters takes stock of . . .

THE CAREER OUTLOOK—

MANY PLUSES, SOME MINUSES FOR AIRMEN

BY ED GATES
CONTRIBUTING EDITOR, AIR FORCE MAGAZINE

Student airmen receive instruction in use of aerospace ground equipment at Chanute Technical Training Center, Chanute AFB, Ill.

ENLISTED careers in the United States Air Force have taken on new sparkle over the past few years. The most serious pay and allowance deficiencies have been removed. Airmen now have career patterns that let them know where they can go and when they may expect to get there.

Promotions are awarded on a more equitable basis, and complaints are down.

Most USAF noncoms acknowledge that "things are improved" over a half-dozen years ago, and impressive reenlistment rates of first-term airmen offer supporting evidence.

But thorns persist among the roses. Manpower shortages continue in numerous skills, and inequities remain in practices and statutes that prevent USAF enlisted careers from attaining their full luster. Topping the list of negative factors that irritate, even exasperate, thousands of Air Force enlisteds are discriminatory rules regarding per diem, quarters assignments, and sudden loss of flying pay.

Better Pay Leads the Way

First, however, let's check the good news on the USAF enlisted career front. There's plenty of it, evidenced by the fact that Air Force for the past several months has found itself in something of a "buyer's market" for manpower. Rising unemployment doubtless is a factor, but young men and women of intelligence and responsibility are knocking on the Air Force door in earnest.

Result: Air Force, alone of the services, thus far has exceeded its monthly recruiting quotas. And these people are not just "bodies." Virtually all are high school graduates in the average and high mental categories.

Heartening, too, is USAF's first-term reenlistment rate, which recently hit an unprecedented forty-one percent. For the entire FY '73, USAF signed up more than 26,000 airmen for second hitches against an official "objective" of less than 20,000. The re-up rates on third and subsequent enlistments remain in the ninety percent range.

But with more people seeking membership while Uncle Sam continues to reduce overall manpower, the time has arrived to curb entry into the career force, Air Force Headquarters decided early this year. It forecast the likelihood of denying reenlistment to numerous members whose performance has been satisfactory *(see below)*.

What accounts for USAF's success in attracting qualified enlisted members at the same time the other services consistently fail to meet all-volunteer force goals? It's no single development, but rather a combination of moves, many of them applicable to all of the services. Leadership is a factor; administrative innovations and legislative benefits have proved helpful.

Certainly, as in the other services, better pay is the No. 1 reason the USAF enlisted career has brightened, according to a broad sampling of airmen contacted by AIR FORCE Magazine. The present Chief Master Sergeant of the Air Force, Thomas N. Barnes, agrees. So does former CMSAF Don Harlow. (AFA was credited as being a main driving force behind the adoption, in 1965, of the "breakthrough" pay bill, which finally put the services on the road toward comparability with Civil Service pay scales.)

"Today's pay scales make enlisted service a very good deal for young persons," according to John J. Ford, a House Armed Services Committee staff official closely involved with military compensation and personnel measures.

It was the inauguration of automatic raises for all troops, based on the Consumer Price Index, plus a late 1971 special "all-volunteer force" pay boost, that have combined to make enlisted basic-pay scales so attractive.

The 1971 raise also provided thirty to fifty percent increases in quarters allowances. Meanwhile, the government this past January increased enlisted members' separate rations by thirty-eight percent, sending the daily rate to \$2.28. In effect, the enlisted basic allowance for subsistence (BAS) now comes to \$68.40 per month, far above the officer BAS, which remains at \$47.88.

According to the Defense Department, enlisted members' "salaries" now average from \$5,630 annually for the newest recruit, to \$17,820 for a thirty-year service E-9. These figures include only basic pay, BAS, BAQ, and the resulting "tax advantage," so that other compensations, like reenlistment bonuses and flying pay, would increase these figures.

Inflation, of course, has neutralized many of the recent compensation increases, but the overall thrust has increased enlisted purchasing power.

Additional servicewide benefits recently laid on by the government have enhanced the USAF enlisted career. Most notable is the extension, effective January 2, 1974, of full travel and transportation benefits for E-4s with as little as two years of service.

This change meant that, Defensewide, thousands more service members, at transfer time, are now eligible for government-paid transportation of dependents, shipment of household goods and private cars, dislocation allowance at the "with-dependents" rate, trailer allowance, and overseas station allowance at the dependent rate.

Adding up to a new benefit of significance, "lower E-4 travel" entitlements should reduce financial woes that many lower-ranking married airmen have suffered. Pentagon authorities, meantime, are pressing for (1) similar entitlements for all enlisted members, and (2) financial relief for all uniformed personnel living abroad "on the economy" with unsponsored dependents.

Sergeant Barnes, in citing other recent pluses to improve the Air Force enlisted career, listed increases in professional military opportunities such as NCO academies, creation of the Community College of the Air Force, official heavy emphasis on equal opportunity, reduction in "dormitory irritants," greater commissioning opportunities, improvements in promotion opportunity, and more predictability in assignments.

Speeding Promotion Opportunity

The latter two are innovations developed under TOPCAP, an enlisted management program USAF began phasing in two years ago.

THE AIRMAN CAREER

Recent Major Improvements

- Basic pay, BAS, BAQ, and retired pay up sharply.
- Promotions, career visibility improved under TOPCAP.
- Lower-ranking enlisteds given full travel-transportation benefits.
- Living accommodations upgraded and enlarged.
- Prestige increased, careers more rewarding.
- Commissioning and educational opportunities expanded.

Major Deficiencies Remaining

- Per-diem payment rules discriminatory.
- Many enlisteds "tied" to barracks and mess halls.
- No cost-of-living allowance for high-cost, Stateside-area assignments.
- Unreasonably high auto-insurance premiums, overseas and in the lower ranks in the States.
- Flight pay removed too abruptly.

Throughout the 1960s, numerous airmen served eight, ten, and more years in grade. Promotion delays were causing all kinds of morale problems. Not surprisingly, many of those affected took their complaints to Congress. Partly responsible for the "promotion stagnation" of that period was the Defense-imposed ceiling on the number of members who could serve in the top six grades. That ceiling was insufficient to meet Air Force job requirements.

In addition, wide variations in Air Force manpower grade authorizations within skill levels among jobs existed. Lack of controlled personnel flow, into and out of each pay grade, compounded the difficulty.

At the height of the problem, the average airman waited 8.5 years to make E-5, compared to 2.5 and 4.0 years for the average soldier and sailor, respectively. To make E-6, the typical USAF member waited 14.1 years, whereas the average soldier and sailor both reached that grade in 9.2 years.

During that period, airmen also considered themselves unfairly treated in relation to officers. Officers, they noted, enjoyed equal selection opportunity, regardless of their job specialty.

A House Armed Services subcommittee looked into the matter and nudged the Air Force to come up with improvements. TOPCAP emerged.

As recently as 1971, according to official USAF figures, in twelve representative skills, selections to E-8 and E-9 varied from four to twenty-eight percent. For example, that year only 135 of 3,473 aircraft maintenance members eligible for E-8 were promoted. That's only four percent. At the same time, ninety-nine of 462 air traffic controllers eligible for E-8 were promoted, a twenty-one percent rate.

In 1972, with the introduction of TOPCAP, promotions were no longer made to fill vacancies. Instead, each skill received equal selection opportunity. Here's how it worked out that year for the same two AFSCs competing for E-8:

	Eligible	Selected	%
Aircraft Maintenance	3,681	589	16
Air Traffic Controller	478	73	16

Equally important, TOPCAP lays down a career progression system that is easy to follow.

All this represents solid progress, most airmen agree, though some are unhappy with TOPCAP's "high year of tenure" proviso that can force out of service some people who want to stay.

For example, TOPCAP says that an E-7 not chosen for E-8 by his twenty-sixth year of service must retire. This system of forced attrition is necessary to keep promotions flowing, and the arrangement is similar to the up-or-out and mandatory-retirement features of the officer-promotion system.

Implementation of the high year of tenure rule in FY '72 produced 12,000 more promotions that year than would have been possible without it, according to Col. H. W. Pangle, a personnel planning expert at Air Force Headquarters.

A separate plank of TOPCAP authorizes separation of members who have not reached E-5 by their eighth year of service, and by adopting it the service could fire hundreds of less-productive airmen. Air Force, however, has delayed launching this provision. Authorities say it won't be invoked until Congress approves enlisted severance—or "RIF"—pay, which the Defense Department requested months ago.

The absence of enlisted RIF pay in one sense is a glaring inequity; officers with five or more years of service receive a severance stipend when they are booted out, so why shouldn't EMs? Yet, viewed in another light, some enlisted leaders are reluctant to endorse it. Former CMSAF Harlow and others, for example, fear that approval of enlisted severance pay would be followed throughout the services by numerous involuntary NCO separations.

"They'd clean house," one prominent NCO declared.

Still, it seems likely that enlisted RIF pay may soon become a reality, though the form it might take is uncertain. Under the complex formula in the Defense request, an E-4 fired at the eight-year point would receive about $3,000 in severance pay.

Project "Career"

Air Force, meantime, is going through an enlisted attrition exercise by requiring certain first-termers, whose enlistments end shortly, to depart. The manpower crunch—a heavier demand for USAF affiliation at the same time manpower slots are being reduced—underscores a related new Air Force enlisted career project, appropriately titled "Careers."

It concerns first-term airmen who want to become "careerists," an automatic event in the Air Force for anyone who completes a four-year hitch and reenlists.

Earlier this year, the airmen force had shrunk to 550,000 members. USAF's master plan, based on a total enlisted force of that size, calls for a split—337,000 first-termers and only 213,000 careerists.

Yet, in actuality, the present career force totals about 275,000 members, far above the official target. A main reason Air Force wants to cut that figure is the cost angle; it's much less expensive, for example, to procure, train, and pay seven men for four years of service each (twenty-eight man-years total) than to keep one man for twenty-eight years. The big outlay, of course, is the lifetime retirement outlays.

With military retirement and other personnel costs ever mounting, it is not difficult to project the Pentagon's thrust—toward continued curtailment of the career force and consequently fewer retirements. Some observers believe that, within six years, staying on for twenty years to latch retirement will prove much tougher than it is now.

Under the new Careers project, Air Force is telling first-termers: "If you want to reenlist, tell us by the end of your third year. If we can use you in your present skill, we'll let you know. But if your field is crowding and you can't be reenlisted into it, we'll tell you where, with retraining, you may be used."

Officials in the office of USAF's DCS/Personnel say they will try hard to retrain those wanting to stay into a skill they can be happy with. But persons who want to stay, are surplus now, and can't or won't retrain, stand to become ex-Air Force.

While Careers, slated to get under way this summer, provides a route by which surplus members may "reserve" their spot in the career Air Force, it makes no guarantees about promotions or re-up bonuses.

Air Force authorities cite the plunging AWOL and desertion rates—they are much lower than those of the other services—as additional evidence that the Air Force enlisted career is gaining in public acceptance. Another plus is a recently approved increase in commissioning quotas for airmen, though Air Force refuses to award veteran NCOs-turned-officers a grade compatible with their age and years of service.

Improved living accommodations, including the refurbishing of many dormitory quarters, also have enhanced enlisted careers.

The Thorns That Remain

What about the major drawbacks still remaining as part of the enlisted career?

Career members and close observers of the scene who were queried by AIR FORCE Magazine agree that the rules pertaining to enlisted

AFA'S AIRMEN COUNCIL

Many of the benefits and improvements in the Air Force life-style discussed in the accompanying story can be traced, directly or indirectly, to ideas first surfaced by AFA's Airmen Council *(see p. 83, February '74 issue).*

The Council is currently comprised of twelve persons selected from all ranks from throughout the Air Force. (The Chief Master Sergeant of the Air Force serves as Adviser to this group.)

The Council, which advises AFA's President on matters of special concern to the enlisted men and women of the Air Force, recently held its first meeting of this year in Washington, D. C. *(see* AIR FORCE *Magazine, p. 77, March '74).* Current Chairman is CMSgt. Harry F. Lund, Senior Enlisted Adviser to the Commander, Aerospace Medical Division, Brooks AFB, Tex.

per diem, separate rations, and assignment of quarters are archaic, discriminatory, and crying for repair.

Mr. Ford reports that many enlisted men are firing angry complaints at congressmen about the per-diem problem as it affects crew members, inspection teams, and others on temporary-duty travel.

During an Armed Services subcommittee probe recently, veteran flyer CMSgt. Leon Donnelly of Barksdale AFB, La., told Ford that when enlisteds go TDY to a base, they're required to use the dining hall. "If I don't," Sergeant Donnelly noted, "that part of my per diem is removed. . . . I may be preflighting an airplane, getting ready for a mission—but the mess hall is there. . . . The same thing doesn't happen to an officer; he's paid for his meals in advance, and, of course, nobody asks him whether he eats the meal or not."

Sometimes, the TDYing airman finds there is no transportation to get to the dining hall. A senior NCO told AIR FORCE Magazine how it went when he served with an inspection team:

"The team chief, a colonel, and his officers would take off in the staff car, for lunch at the O-club or in town. Sometimes the enlisted mess was miles away, or we'd worked through the noon hour and it was closed. Naturally, we had to settle for the BX cafeteria—at our expense. . . ."

The colonel's disregard for his NCOs in this instance was unforgiveable, and though such instances are believed to occur infrequently, enlisted careers cannot attain full bloom until such outrages are completely eliminated, top NCOs insist.

Mr. Ford noted that while some commanders approve large-scale reimbursements for enlisted members with TDY expenses, others won't. This does nothing for morale.

On the BAS issue, airmen welcome the recent rate increase, but they note that, unlike officer BAS, the allowance is far from automatic. Here's an example, culled from a recent issue of the prize-winning Sheppard AFB, Tex., newspaper, of how BAS rules hit enlisted members unfairly:

A married master sergeant arrived unaccompanied at the base—his wife would join him in a few months—and he immediately applied for separate rations. Nothing doing, the base declared in an ice-cold rejection, asserting that all enlisteds living in the barracks, "are considered as single members. . . ."

Officers not only don't have to go through the indignity of applying, but they automatically receive BAS, whether married or single. Had the master sergeant been a brand-new second lieutenant instead of a highly respected sixteen-year service NCO, he'd have received BAS without asking.

It's heartless rules of this kind that rankle many enlisteds.

Some of the problems associated with enlisted subsistence pay and mess-hall feedings are drawing critical attention from officialdom. The Defense Department, for instance, reportedly is looking into the bewhiskered subsistence-in-kind system and the possibility of giving all enlisted members a cash allowance in its place.

Many of USAF's bachelor airmen—thirty-nine percent of the force is single—have a special beef—being "tied to the barracks." The rooms exist, so they must be filled, the government holds. Each is assigned accordingly, even though he may prefer to live off base and surrender his BAQ.

"But why only me?" the bachelor airman asks, pointing out that many single officers enjoy the option of living off base and at the same time drawing BAQ. Furthermore, single enlisteds note with disgust, matrimony promptly unchains a man from the barracks. "We're penalized for being enlisted and single," many charge.

Single airmen cite as additional inequities the fact that their barracks are inspected frequently, often without notice, yet inspectors seldom invade bachelor officer quarters and almost never examine married quarters.

"Where's the equal treatment?" critics of the present system ask.

Many airmen, meanwhile, feel Uncle Sam could spruce up the enlisted career in other areas, such as (1) continuing flying pay for three to six months following removal from flight status, to ease a member's adjustment to reduced income; (2) establishing a Stateside cost of living for enlisted people in particularly expensive locations, such as the Washington, D. C., area, where some enlisteds are hurting financially; and (3) making a genuine effort to secure for enlisteds automobile insurance at reasonable rates. As too many service members are well aware, car-insurance premiums can be murderous, especially in the lower ranks and overseas.

Many of the rules and practices airmen cite as damaging to the Air Force enlisted career are, of course, beyond any one service's ability to change. A combined service and Defense Department effort is usually required, buttressed by support from Congress.

These agencies in recent years have been responsive, on a broad front, to many needs of the enlisted force. Certainly the career the Air Force offers most airmen today is more satisfying, rewarding, and productive than it was a decade ago.

But considerably more needs to be accomplished, and gains already achieved must not be frittered away. ■

The author, Edmond N. "Ed" Gates, joined AIR FORCE Magazine as a Contributing Editor in 1973 upon his retirement as Editor of Air Force Times. *Since then, he has delved into many aspects of the Air Force personnel scene.*

AMERICA'S LEADING WORLD WAR I ACE

With only the rudimentary training that US pilots got at flying schools in France, Eddie Rickenbacker flew his first mission on April 14, 1918. In less than five months of combat flying, he scored twenty-six confirmed kills to become the top US ace of the war and, subsequently, a recipient of the Medal of Honor. Here is an account of some memorable missions flown by . . .

RICKENBACKER: 'MOST NATURAL LEADER I EVER SAW'

BY LT. COL. RAYMOND H. FREDETTE, USAF (RET.)

Capt. Edward V. Rickenbacker had a rare ability for leading and inspiring others in combat.

THE qualities that rank Capt. Edward V. Rickenbacker among the great pursuit pilots of World War I were twofold. Beyond the flying skill that enabled him to destroy more German airplanes than any other American pilot in that war, he had a flair for leading and inspiring others in combat. "In Rickenbacker," Billy Mitchell wrote, "we had the rare combination of sound judgment and fighting spirit, quick thinking, and great manual dexterity in handling his craft."

A daring but not foolhardy pilot, Rickenbacker's formula for surviving in the air was a simple one: "I have always made it a point to avoid a fight unless I can maneuver to get the best advantage." Once committed to an attack, he relied primarily on surprise and speed.

A fellow ace, Maj. Reed M. Chambers, recalled that "Rickenbacker's greatest asset was his judgment of distance. He would move right in on them. I and many others, we'd start shooting too far away, and our guns would jam or they'd splatter so wide that we didn't get them. But 'Rick' rarely missed."

His record of twenty-six aerial victories is all the more remarkable because of the relatively brief period he flew in combat. Discounting weeks of hospitalization, convalescence, and leave, his active service as a pursuit pilot totaled less than five months.

One of the most memorable days of that service was September 25, 1918. Maj. Harold E. Hartney, Commander of the 1st Pursuit Group, had notified Rickenbacker the evening before that he was to assume command of the "Hat-in-the-Ring" Squadron. Colonel Mitchell, Chief of Air Service, First Army, wanted commanders who had demonstrated "their ability to lead their men personally in combat and set an example to those around them." He had quickly approved the appointment.

After giving his pilots and mechanics a pep talk that night, Rickenbacker wrote in his diary: "Just been promoted to command of the 94th Squadron. I shall never ask a pilot to go on any mission I won't go on. I must work now harder than I did before."

Early the next morning, Rickenbacker went out alone over the enemy lines. East of Verdun, he saw in the distance two photographic planes escorted by five Fokkers, all heading for the Allied lines. He climbed and circled unnoticed behind the enemy planes, singling out the trailing Fokker for an attack.

The German pilot didn't see the

Spad stealing down behind him until the last moment. As he tried to turn out of Rickenbacker's gunsight, bullets shook his fuselage and most likely killed him in his cockpit. The Fokker spiraled earthward and crashed at Billy, a small village south of Étain.

The four remaining Fokker pilots scattered, apparently believing that there were other Spads in the vicinity. Rickenbacker slipped past them in the confusion to get at one of the reconnaissance machines. He dived and came up to attack from below, but the German pilot spoiled his aim by raising the plane's tail to give his observer a good shot at the Spad. As he kept probing, Rickenbacker came under fire from the gunners of both two-seaters.

"A string of bullets went by my face so close that I could have reached out and caught them," he recalled. Rickenbacker finally maneuvered so that one of the photographic planes was between him and the other two-seater. Then he opened fire at the nearest machine. Rickenbacker saw it "sail right on through my bullets. It burst into flames and tumbled like a great blazing torch to earth. . . ."

Rickenbacker had shot down his ninth and tenth enemy planes, his first double victory for which, twelve years later, he would be awarded the Medal of Honor. But his immediate concern was the effect of the victories on the pilots of the 94th. He wanted to demonstrate "to the men that I meant my pledge of leadership." That pledge was further backed up the next morning when he shot down another Fokker during a predawn balloon-strafing patrol.

Ever since his fifth victory, Rickenbacker had enjoyed the respect of his fellow pilots. But by the time he became Commander of the 94th, one pilot remembered that "the squadron had begun to love him. I don't know how to explain it. At first he was just an uneducated, tough bastard who threw his weight around the wrong way. . . . But he developed into the most natural leader I ever saw."

Up From the Ranks

When Rickenbacker first arrived in France in June 1917, his rise to the command of a pursuit squadron would have seemed highly improbable. Then an enlisted man, he had sailed with the first contingent of the AEF, led by Gen. John J. Pershing and his staff. When asked by an officer of that staff to enlist as a driver, Rickenbacker had rushed to New York from Ohio and joined up just three days before sailing.

Rickenbacker enlisted as a Sergeant First Class because of his reputation as one of the top racing drivers in the country, but he had hopes of doing more than driving while in France. He thought "that, if I could get overseas where the fighting was, I might circumvent the ridiculous regulations that were keeping me from flying."

Rickenbacker had learned about those regulations early in 1917 when he tried to interest the Signal Corps in organizing a flying squadron of racing drivers. He was told that he was too old because the age limit for pilot trainees was twenty-five. Born on October 8, 1890, in Columbus, Ohio, Rickenbacker was then more than twenty-six years old. He also lacked the required college credits. He had left school in the seventh grade after his father died, to help support the family of seven children.

In Paris, Sergeant Rickenbacker was assigned as driver to Maj. Townsend F. Dodd, an aviation officer on Pershing's staff. He also drove Colonel Mitchell, for whom Dodd worked as an assistant. Rickenbacker soon told Mitchell that he wanted to become a pilot, noting that his racing experience and knowledge of engines would help him in his training.

Rickenbacker also applied for a Reserve commission following a chance meeting with Capt. James E. Miller, the officer who had enlisted him in New York. Miller, expecting to command an advanced flying school to be built at Issoudun, sought to recruit Rickenbacker as his engineering officer. Rickenbacker replied that "an engineering officer for a flying school ought to know how to fly himself." Recommended by both Dodd and Miller, he appeared before a board to be evaluated for a commission on August 11, 1917. Twelve days later, Rickenbacker was ordered, at Mitchell's direction, to the aviation school at Tours for primary pilot instruction. He soloed early in September after twelve flights and completed the seventeen-day course with a total of twenty-five hours in the air.

Rickenbacker then reported to Miller at Issoudun before returning to Paris early in October to accept a commission as a first lieutenant. He was officially assigned as engineering officer on October 11, 1917, two days after the aviation training center was finally opened.

Rickenbacker had to practice flying in what time he could spare from his full-time duties, and without the coaching of an instructor. Flying alone and away from the field, he gradually mastered the tailspin and other maneuvers to qualify himself as a combat pilot.

The next step was the French gunnery school at Cazaux in southern France. The first group of Issoudun graduates was alerted to go there, and Rickenbacker asked to be sent with them. Maj. Carl Spaatz, who had replaced Miller as Commander, refused, telling him firmly: "You're too important to me here."

Rickenbacker had not been feeling well. He promptly turned himself in at the camp hospital to prove that he was not indispensable. As it turned out, he was found to be suffering from an acute inflammation of the left ear. A few days after Christmas, he was released after being confined nearly two weeks.

The gunnery school was not ready to receive American pilots for training until later that month. When orders did come through, Rickenbacker was included. He could not resist asking Spaatz why he was finally being allowed to leave Issoudun.

"I'm on to your little game," Spaatz replied, "and if you feel that way about it, I don't want you around here."

Returning to Issoudun after completing gunnery training, Rickenbacker was assigned to the 94th Aero Squadron after a ten-day leave. He moved with the squadron to an airdrome at Villeneuve-les-Vertus, near Épernay, early in March 1918. One of Rickenbacker's most vivid experiences of the war was an unarmed flight he made on March 19 with Maj. Raoul Lufbery, the famed ace of the Lafayette Escadrille, and

Lt. Douglas Campbell. Fortunately, no German planes appeared to challenge them, but Rickenbacker was airsick and his Nieuport was buffeted by exploding enemy shells. On landing, he discovered that a piece of shrapnel had pierced his wings less than a foot from his cockpit.

On the squadron's first official day in combat, April 14, 1918, Rickenbacker flew on an early morning patrol over the lines. He became separated from the other two pilots and barely found his way back to the field in the thick clouds and fog. The first victories were won near the airdrome that same day by Campbell and another lieutenant, Allan F. Winslow, who had stayed behind on standby alert.

Rickenbacker was determined "to score the next victory for our squadron." He realized his wish on April 29, after a spell of rain and cloudy weather. He was on alert duty with Capt. James Norman Hall late that afternoon when a call was received that a German airplane was approaching the lines. After some searching, they found it northeast of St.-Mihiel. As soon as the German pilot realized that two Nieuports were maneuvering to attack him, he went into a dive. Hall and Rickenbacker followed with guns firing. Seeing his tracers hit the enemy plane's tail, Rickenbacker pulled back on his stick slightly to raise the gun mounted on the nose of his Nieuport.

"It was like raising a garden hose," he reported. "I could see the stream of fire climbing up the fuselage and into the pilot's seat. The plane swerved. It was no longer being flown." The crippled craft emitted dense smoke all the way down. Rickenbacker had shot down his first airplane. His claim, filed jointly with Hall, was later confirmed.

Rickenbacker's next combat did not have such a conclusive ending. Again on alert duty on the morning of May 7, he took off with Hall and Lt. M. Edwin Green, following receipt of a French report that a flight of enemy planes had been sighted not far from Pont-à-Mousson. Seeing three Pfalz machines below them, the Americans dived to attack, with Rickenbacker in the lead. He selected the rearmost enemy plane and kept firing until it "turned over and fell into a spin." Green was engaged in a similar combat. Both he and Rickenbacker each claimed to have downed an enemy machine, but neither victory was confirmed at the time.

Hall was missing after the combat. During the dive, the fabric on the upper right wing of his Nieuport had ripped away. Then, as he lost altitude, his engine was struck by an enemy shell. The projectile did not explode, but it caused the disabled plane to crash and he was captured. Shortly after the Armistice, Hall was released. The Germans had told him when he was captured that "one of their pilots had been shot down in flames." The confirmation was filed and forgotten for forty years. It was then reconsidered and Rickenbacker was credited with a victory for this mission, raising his total of confirmed victories from twenty-five to twenty-six.

Teaching Life-Saving Tricks

After Hall was lost, Rickenbacker succeeded him as leader of the squadron's No. 1 Flight, a position in which he virtually became second in command of the 94th. On assuming his new duties, Rickenbacker was intent on "schooling the pilots under my care in some of the life-saving tricks that I had learned." A mounting concern among the pilots was the weakness of the Nieuport's upper wing. Hall's mishap was not unique. On May 17, exactly ten days later, Rickenbacker had the same harrowing experience while on patrol with Lt. Reed M. Chambers.

During a long and fruitless patrol, Rickenbacker had become separated from Chambers. He had just about given up when, far below, he saw three Albatros machines taking off from the German airdrome at Thiaucourt. As they climbed in the direction of the front, Rickenbacker drew steadily nearer to them from behind.

A German gun position, observing the Nieuport from the ground, fired a warning shot ahead of the Albatros pilots to alert them that they were being stalked. Rickenbacker could not delay his attack longer. He dived on the rearmost enemy plane and opened fire. The Albatros fell out of control, and Rickenbacker began to pull out of his long dive.

"A ripping, tearing crash shook the plane," he recalled. "The entire

RICKENBACKER'S CONFIRMED AERIAL VICTORIES

Date	Aircraft Type	Location	Authority
April 29, 1918	Albatros	Vigneulles-les-Hattonchatel	French 8th Army
May 7, 1918	Pfalz	Northwest of Pont-à-Mousson	Secretary AF Memo
May 17, 1918	Albatros	Richecourt	French 8th Army
May 22, 1918	Albatros	Flirey	French 8th Army
May 28, 1918	Albatros	Bois Rate near Flirey	French 8th Army
May 30, 1918	Albatros	Jaulny	French 8th Army
Sept. 14, 1918	Fokker	Villecey-Waville	*GO 8, Sept. 22, 1918
Sept. 15, 1918	Fokker	Bois de Waville	GO 6, Sept. 17, 1918
Sept. 25, 1918	Fokker	Billy	GO 26, Nov. 15, 1918
Sept. 25, 1918	Halberstadt	Foret de Spincourt	GO 10, Sept. 27, 1918
Sept. 26, 1918	Fokker	Damvillers	GO 10, Sept. 27, 1918
Sept. 28, 1918	Balloon	Sivry-sur-Meuse	GO 12, Sept. 30, 1918
Oct. 1, 1918	Balloon	Puxieux	GO 14, Oct. 8, 1918
Oct. 2, 1918	Hannover	Montfaucon	GO 14, Oct. 8, 1918
Oct. 2, 1918	Fokker	Vilosnes	GO 14, Oct. 8, 1918
Oct. 3, 1918	Rumpler	Clery-le-Grand	GO 14, Oct. 8, 1918
Oct. 3, 1918	L.V.G.	Dannevoux	GO 14, Oct. 8, 1918
Oct. 9, 1918	Balloon	Dun-sur-Meuse	GO 21, Oct. 27, 1918
Oct. 10, 1918	Fokker	Clery-le-Petit	GO 20, Oct. 23, 1918
Oct. 10, 1918	Fokker	Clery-le-Petit	GO 21, Oct. 27, 1918
Oct. 22, 1918	Fokker	Clery-le-Petit	GO 21, Oct. 27, 1918
Oct. 23, 1918	Fokker	le Grand-Carre	GO 21, Oct. 27, 1918
Oct. 27, 1918	Fokker	Northwest of Grandpré	GO 22, Nov. 2, 1918
Oct. 27, 1918	Fokker	Bois de Money	GO 22, Nov. 2, 1918
Oct. 30, 1918	Fokker	North of St. Juvin	GO 22, Nov. 2, 1918
Oct. 30, 1918	Balloon	Remonville	GO 22, Nov. 2, 1918

* Hq. Air Service, First Army, AEF

spread of linen over the right upper wing was stripped off by the force of the wind. I manipulated the controls, but it did no good."

The crippled Nieuport went into a spin. It fell thousands of feet before Rickenbacker regained control by opening his throttle. Although the machine was barely flyable and steadily losing altitude, he managed to nurse it through some antiaircraft fire over the front and make a rough landing at Gengoult.

An Albatros that crash-landed at about the same time that morning just inside the French lines with its pilot dead at the controls was evidence enough of Rickenbacker's latest victory. When still another Albatros was credited to him five days later, he and Campbell with three confirmed victories each were the leading contenders for the distinction of being the first American ace who flew entirely with an American unit.

On May 28, the two pilots went out on patrol together. Campbell was now one victory ahead, having downed a Pfalz only the day before. After about an hour in the air, they saw a German formation—four Pfalz pursuit planes escorting two Albatros photographic machines—approaching them from the direction of Mars la Tour.

As soon as the Germans spotted the two Nieuports circling to get behind them, they retreated on their side of the lines. One lone Albatros then headed back out toward the front in an apparent attempt to entice the Nieuports further in over German territory. The Nieuport was a highly maneuverable machine with a rotary engine noted for its quick surge of power. Rickenbacker and Campbell calculated that they could pounce on the Albatros and shoot it down before the Pfalz planes could strike back.

Diving at full speed, they each fired about a hundred rounds at the Albatros, sending it down near the town of Flirey. As the Nieuports quickly regained altitude for another attack, the Pfalz planes gave up the chase and retreated with the surviving Albatros. Since Rickenbacker received sole credit for the two-seater, he and Campbell were now even with four confirmed victories each.

In a large air battle on May 30, Rickenbacker reported downing two more enemy planes. One was confirmed more than a week later as his fifth victory, making him an ace. By then, Campbell had shot down a Rumpler just inside the French lines. Confirmed on the same day, May 31, the victory officially made Campbell the first American-trained pilot to become an ace.

The First Spad

Rickenbacker enjoyed a "first" of another kind early in July by returning from a leave in Paris with a brand-new Spad. Curious about this type of pursuit plane, which was to replace the Nieuport, he had gone to the air depot at Orly, near Paris, where he learned that three of the planes were earmarked for the 94th. One of them had a large numeral "1" painted on its side.

"I wanted that plane," he recalled. Rickenbacker had a mechanic gas up the machine, and he simply flew it back to his airdrome. He was allowed to keep this first Spad as his own.

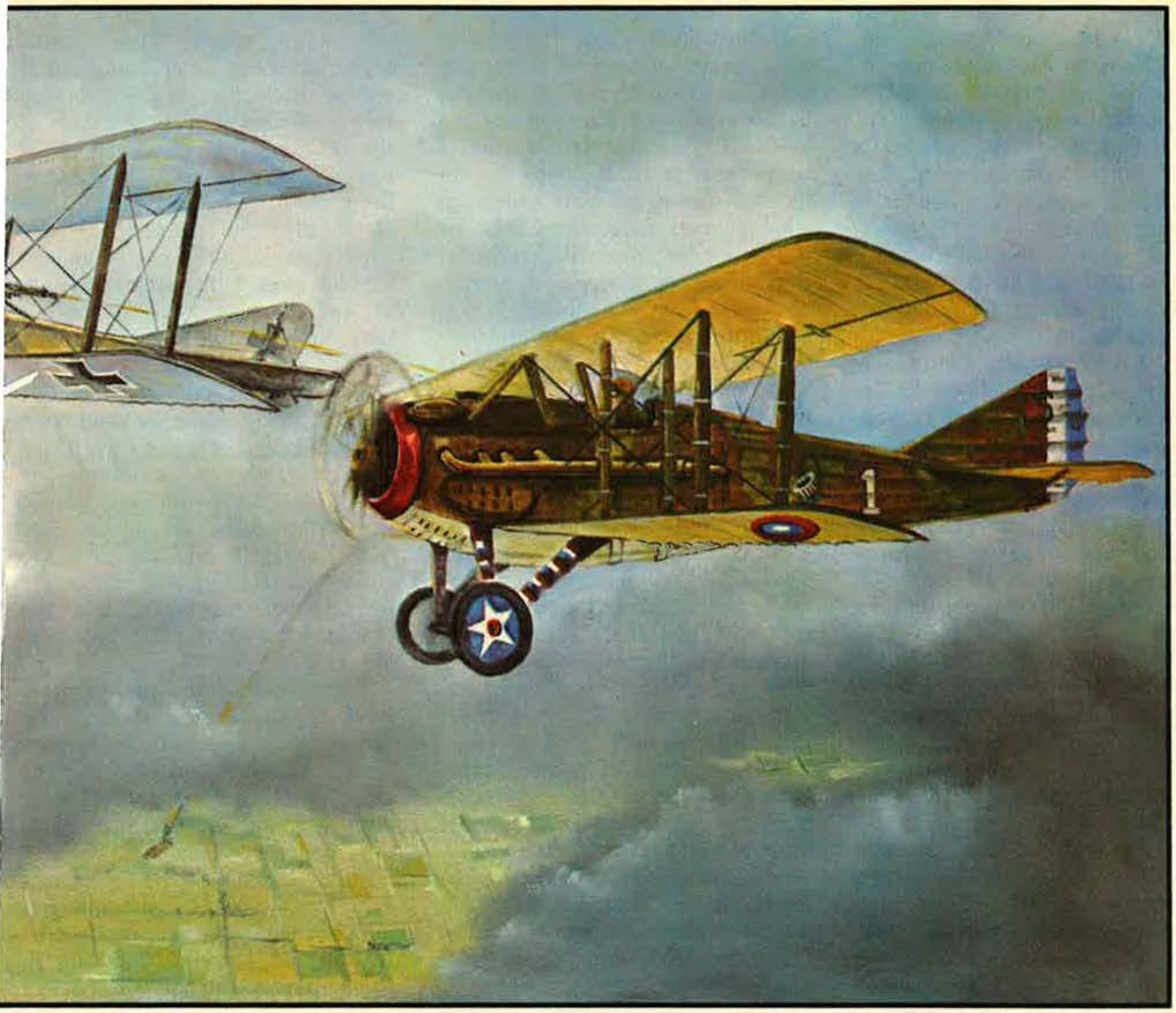
Five days after his return from Paris, Rickenbacker was again hospitalized for recurring ear trouble. Grounded for three weeks, he resumed flying as the squadron was rapidly being reequipped with new Spads. He had time to claim a few Fokkers, which were never confirmed, before returning to the hospital on August 18 for surgery. He was not able to fly again until the eve of the American advance into the St.-Mihiel salient.

On the third day of the drive, September 14, Rickenbacker singlehandedly attacked four Fokkers and shot one down. Reacting swiftly, the other three machines went into a climbing turn and swung about the lone Spad with a skill that amazed Rickenbacker. It was his first encounter with the red-winged Fokkers of the Richthofen Circus. The next day, he attacked a formation of Fokkers in much the same way and sent one down with its fuel tank blazing.

Rickenbacker was now credited with seven victories and leading all other pilots in the squadron. With

—The National Archives

This painting by Donald Trippy, done for AIR FORCE Magazine, illustrates one of Rickenbacker's engagements with German observation planes. Their gunners made the two-seaters dangerous game.



At left, members of the famed "Hat-in-the-Ring" Squadron pose in front of a Spad. From left, Lt. Eastman, Capts. Meissner and Rickenbacker, and Lts. Chambers and Taylor. A former racing driver, Captain Rickenbacker, above, became top US ace of World War I.

his drive and instinct for leadership, his selection in late September to command the "Hat-in-the-Ring" Squadron came as no surprise. All agreed that the 94th "needed a boost." But his combat record after he became squadron commander was truly amazing.

Beginning with his double victory on September 25, his first day as commanding officer, Rickenbacker raised his score to twelve by the end of that month. His twelfth confirmed victory was a balloon that he shot down on the morning of September 28. He destroyed his second balloon a few days later while flying alone at dusk.

During October, he chalked up fourteen confirmed victories—eleven airplanes and three balloons. All but two of the planes were downed in pairs.

"Those were hectic days," he remembered. "I'd put in six or seven hours of flying time each day. I would come down, gulp a couple of cups of coffee while the mechanics refueled the plane and patched the bullet holes, and take off again."

On October 2, he accompanied a low-altitude patrol of six Spads led by Reed Chambers. Flying high above the formation, Rickenbacker observed a Hannover making its way across the lines. He attacked the two-seater and killed the observer, only to have his guns jam before he could finish the job. He was then joined by Chambers, who wounded the German pilot with a few bursts. The Hannover dropped into a long glide and landed on its nose with little damage a few miles behind the American lines near Montfaucon.

Sweet Victories

Rickenbacker cleared his guns and continued his patrol with Chambers. Together, they later engaged a formation of Fokkers as the Germans emerged from a bank of white clouds. The two trailing Fokkers fell under a swift attack and crashed almost simultaneously. The two Spad pilots were each credited with one victory.

On the next day, Rickenbacker led a large formation escorting two Spads sent out to destroy a German balloon near Doulcon. The strafers were successful, and, in a free-for-all with German planes, Rickenbacker downed a Rumpler and an L.V.G. in two separate combats.

On October 10, the 94th was out in strength again with orders to eliminate two more enemy balloons in the same area. Rickenbacker commanded an armada of twenty-nine aircraft on this mission, counting Spads assigned to it from two other squadrons. That such numbers were sent to defend a few strafers is indicative of the German air opposition being encountered in the Verdun area at that time. Large Fokker formations foiled all attempts to burn the balloons, but the 94th claimed four enemy planes. Two of the victims were credited to Rickenbacker. As one of them escaped by parachute, Rickenbacker marveled at the unusual sight of a pilot leaping from his burning machine and "truly wished him all the luck in the world."

After a series of what Rickenbacker described as "eventless flights," another Fokker fell under his guns on October 22. The victory was his twenty-first, and his nineteenth to be confirmed. The next day he experienced what he called the "narrowest escape" of his entire combat service.

Still "fretting over the lack of action," Rickenbacker had gone out alone in the late afternoon hoping to find a German balloon. On his way back after an empty search, he saw instead an Allied balloon suddenly burst into flames up ahead. He then caught sight of a Fokker at a lower altitude flying back toward his own lines. Judging that the attacker would be an "easy victim," Rickenbacker decided to head him off. He was waiting confidently for the Fokker to pass below him when his Spad was suddenly shaken by a stream of bullets ripping through the fuselage and wings.

"I was taken completely by surprise," he wrote. "At least two planes were on my tail. They had me cold. They probably had been watching me for several minutes and planning this whole thing."

Instead of diving, which would have been fatal, Rickenbacker pulled his Spad up into a climbing turn. He saw his assailants pass by beneath him, but two more Fokkers were waiting above. While maneuvering to keep from being sandwiched, Rickenbacker saw a chance for a sudden attack on one of the Fokkers blocking him from below. He turned quickly and dived, firing a burst ahead of the plane. He recalled that the German pilot "flew right into the string of bullets. Several must have passed through his body. An incendiary hit his gas tank, and in seconds a flaming Fokker was earthbound."

Rickenbacker probably had this flight in mind when he said long afterward that the combat pilot's "hardest task is acquiring 'air vision.' . . . To flash a quick glance in all directions, no matter how busily engaged, and to catch the enemy sneaking up and out of the sun to attack from behind, is a trick that must be learned if a flyer is to last long."

Rickenbacker downed two more Fokkers only four days later, on October 27, and both were confirmed. The first "tumbled through space" after a brief combat near Grandpré and crashed just inside the German lines. As he was attacking the second, the enemy plane's engine stalled while attempting a loop, leaving it "upright on its tail." Instead of shooting him down, Rickenbacker forced the helpless German pilot to glide behind the Allied lines where he crashed before he could make a safe landing.

Double victories had become routine for Rickenbacker. He scored his fifth "doubleheader" that month on October 30. He was up observing a patrol of four of his Spads that afternoon when he saw them attacked, unsuccessfully, by two Fokkers. Too far away to join in the combat, Rickenbacker flew a wide circle to intercept the Germans as they retreated. They were flying very low when he pounced on one and shot it down "with less than twenty rounds, all of which poured full into the center of the fuselage."

Another Tandem Kill

The other Fokker escaped, but Rickenbacker would not be denied a tandem victory. On his way back, he unexpectedly flew over a German balloon in its nest only a few miles from the front lines. He ignited it on his first dive without having so much as a single shot fired at his Spad. With night coming on and his gas low, he finally touched down at Rembercourt just as his engine began its "final sputtering."

Captain Rickenbacker—his promotion orders having finally reached him two days before—had won his last aerial victories of the war. Within a few weeks, his twenty-fifth would be confirmed, seven more than the total of his closest rival, Lt. Frank Luke, who was then missing in action. Rickenbacker went to Paris on leave early in November, jauntier than ever in a nonregulation tunic of his own design, pink breeches, and high laced boots. He returned to his squadron in time to be presented with two Oak Leaf Clusters to his Distinguished Service Cross.

According to Mitchell, "Rickenbacker was just about to be given command of a group of 100 airplanes when the Armistice was signed." Maj. Harold E. Hartney, the commander of the 1st Pursuit Group, had already recommended him for promotion to major. When all promotions were "discontinued" as of November 11, 1918, Rickenbacker was advised that he would not receive "the reward you have so well earned."

On November 20, Hartney also recommended Rickenbacker for the Medal of Honor, citing his voluntary patrol of September 25, 1918, in which he had destroyed two of seven German machines, as an act of "extraordinary heroism." In the rush and confusion of demobilization, the decoration was disapproved overseas by Pershing's headquarters.

On his return home early in 1919, Rickenbacker was soon discharged at his request without a commission in the Reserves. Ten years later, he accepted a five-year appointment in the Specialist Reserve and was assigned to the Air Corps as a colonel, a title that he never used. It was as "Captain Eddie" that he was remembered, and the "Hat-in-the-Ring" insignia remained very much a part of his public image as a hard-driving executive in the automobile and aviation industries.

This is the second in a series of articles condensed from the author's book on Air Force Medal of Honor winners, to be published by the Air Force Office of History. Lt. Col. Raymond H. Fredette, who holds an M.A. in international affairs from Tufts University, flew a combat tour with the Eighth Air Force in World War II. Much of his career after recall to active duty in 1951 was in intelligence work. He is the author of a widely acclaimed book on strategic bombing in World War I, The Sky on Fire, *and is writing a military biography of Charles A. Lindbergh, to be published by Harcourt Brace Jovanovich. Colonel Fredette, now retired, lives in Alexandria, Va.*

"I have always felt that the Medal of Honor should have been awarded to Captain Rickenbacker," Hartney wrote in 1927, "because . . . he did have the largest number of officially recognized victories . . . and that at least one living, leading American Flying Officer should have been honored with his country's highest decoration. . . ." After several bills were introduced in Congress to authorize the award, the War Department acted on its own to reconsider his case. It approved the Medal of Honor for Colonel Rickenbacker on June 24, 1930, for the combat action cited in the original recommendation.

The presentation was made at Bolling Field in Washington on November 6, 1930, by President Herbert Hoover. The Chief of the Air Corps, Maj. Gen. James E. Fechet, read the citation. The ceremony ended with an aerial review and mock combat over Anacostia. Among the planes participating were eighteen P-12Cs from the 94th Pursuit Squadron, then stationed at Selfridge Field in Michigan.

Rickenbacker again served the country in World War II as a civilian consultant. Although he was invariably impressed by the fighting spirit of the aircrews, he was often critical of their equipment. His straightforward reports to Secretary of War Henry Stimson and Gen. Hap Arnold always dealt with specifics in a practical way. In considering the need for armor plate in the B-17 bomber, for example, he was reminded that "years before I had placed a stove lid under the seat of my Spad. Here was the same problem all over again."

Battered Invincible

Rickenbacker, a survivor of an airliner crash early in 1941, added to his legend as the "battered invincible" on his trip to the Pacific in the fall of 1942. En route to Australia, the B-17 in which he was flying ditched at sea after missing its refueling stop on tiny Canton Island southwest of Hawaii. Rickenbacker and the crew were rescued on November 13, 1942, after drifting in rubber boats for twenty-four days. All but one of the airmen had miraculously survived the ordeal. Gaunt but still fit, Rickenbacker completed his mission before returning to Washington.

"Once again," he commented, "I had faced the Grim Reaper and had not only bested him myself but had also brought six others through with me." For Rickenbacker, life and inevitable death was always a personal struggle to be fought relentlessly. "I'll fight like a wildcat," he once said with typical irreverence, "until they nail the lid of my pine box down on me."

The "Grim Reaper" finally claimed Rickenbacker at the age of eighty-two. He died in Zurich, Switzerland, of a heart ailment on July 23, 1973, and his remains were returned to Columbus, Ohio, his home town, for burial.

A final Air Force salute was rendered by the 94th Tactical Fighter Squadron, MacDill AFB, Fla., on August 10, 1973. Following a brief memorial service at Greenlawn Cemetery, four F-4E Phantoms emblazoned with the "Hat-in-the-Ring" insignia flew overhead in a missing-man formation in farewell to the "Ace of Aces."

A product of America during the early age of the internal combustion engine, Rickenbacker had survived many dangers to outlive his era. In a sense, reaching old age was the sum of all his victories and his final triumph. ■

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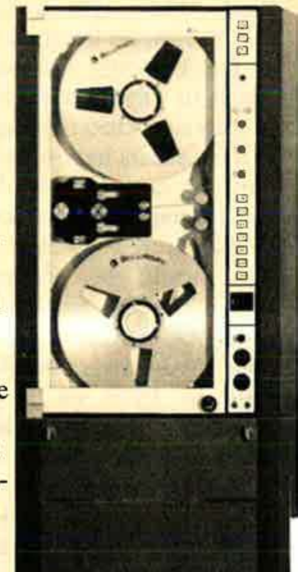
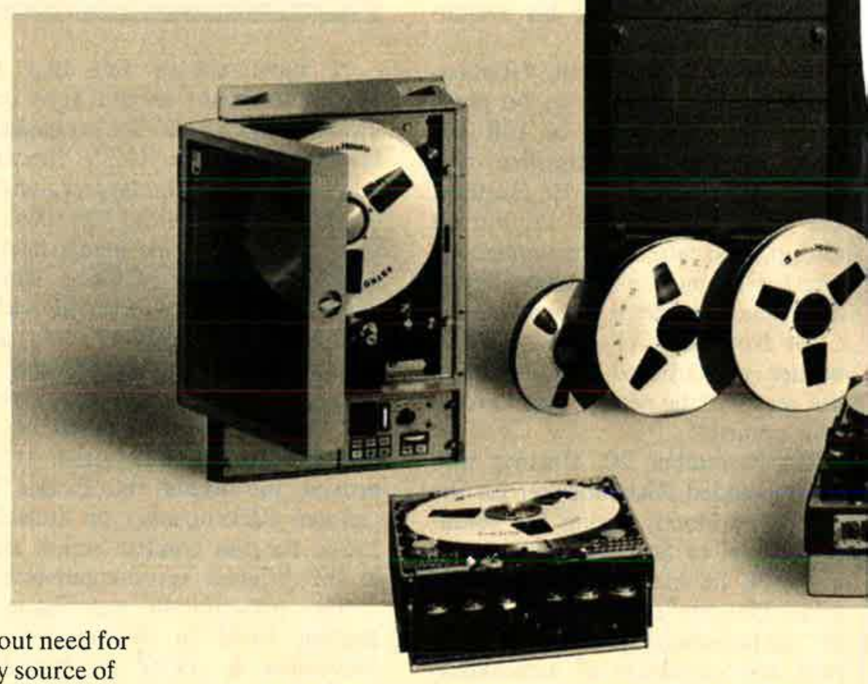
Another bantamweight is the MARS 2000. It's a multiband recorder designed for airborne environments typically encountered in high-performance air-





craft. It features up to 14 channels for recording Direct an FM signals on 10½ inch NAB-type reels, either intermediate band or wideband. Six electrically-switchable speeds from 1⅞ through 60 ips. Absolute tape speed accuracy: only ±0.20% of nominal tape speed at any constant temperature or humidity. *And* a record and reproduce capabil ities for Direct and FM analog signals. Weighing in at just 32 pounds, it's the *smallest* multi-band recorder available.

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Designed to military specifications, the M-14G provides ll front accessibility and modularity to permit complete rvice and maintenance without removing the unit from rack.

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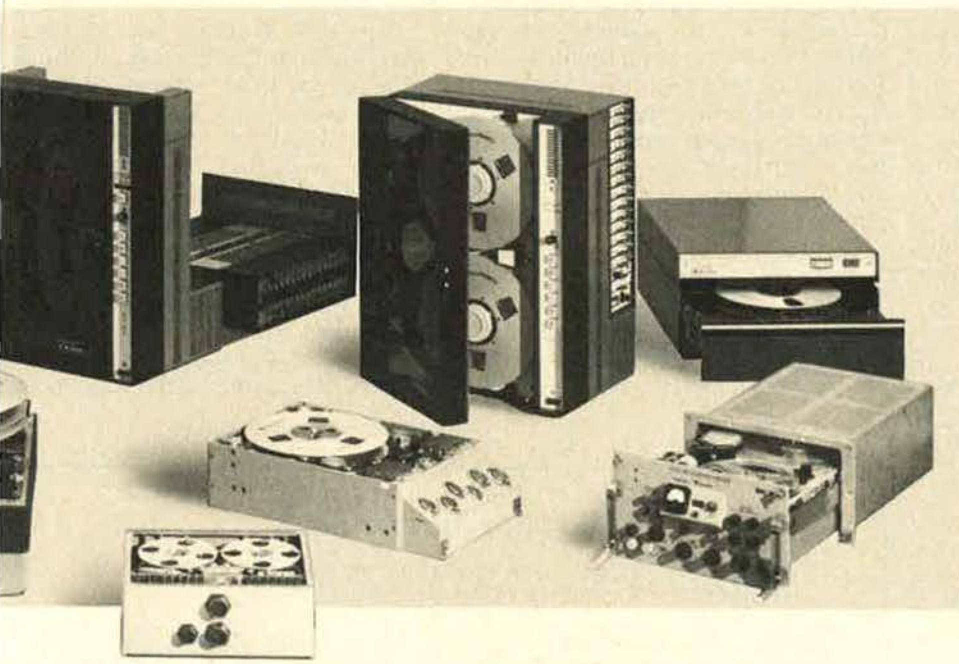
The rough and ready



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The Bulletin Board

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

Flight Pay

The House Armed Services Subcommittee studying flight pay, chaired by Samuel S. Stratton (D-N. Y.), has completed the markup of H.R. 12670. The bill was passed by an overwhelming majority of the House on February 21, and chances of approval by the Senate appeared good at this writing. The bill is a modification of H.R. 8593, the DoD flight pay proposal submitted earlier. Key features of H.R. 12670 are as follows: Rates of flight pay are, as presently, paid up to the sixth year of aviation service. At that point, flight pay is raised to $245 a month and continues at this rate to the eighteenth year of service. Beginning at the eighteenth year, flight pay is reduced twenty dollars every two years until the twenty-fifth year of aviation service, when it stops altogether.

The Subcommittee incorporated a "gate" system into the bill to ensure that aviators spend a substantial portion of their careers in flying duties. To qualify for continuous flight pay, an officer must perform operational flying duties for at least six of his first twelve years and eleven of the first eighteen years. However, if at the eighteen-year gate he has performed operational flying duties for at least nine years, but less than eleven years, he would receive flight pay only until his twenty-second year. Officers with less than nine years of operational flying time at the eighteen-year gate will lose continuous flight pay, but would remain eligible for flight pay anytime thereafter, when actually assigned to flying duty.

The Subcommittee, in the interest of fairness, included a "save-pay" provision. The services are to be allowed a three-year period in which to implement the gate system. Thus, an officer who fails to meet a particular gate within a short time after the bill is passed would not suddenly lose all flight pay. He would receive flight pay at the new rates for up to three years. The save-pay provision also delays the implementation of the twenty-five-year cutoff.

No matter in what year group they fall, flight pay will be limited to a maximum of $160 a month for major generals and above.

Mr. Stratton emphasized that this proposed legislation has two purposes. It will improve aviator retention by increasing flight pay in the earlier years of their careers. It also meets the demands of the House for greater equity in the system by paying the highest flight pay in the years when an aviator does most of his flying.

Thunderbird Jobs

The USAF Aerial Demonstration Squadron, the Thunderbirds, is converting from F-4 to T-38 aircraft. Enlisted personnel having rank of E-4 through E-6 in airframe or avionics maintenance specialties may apply for positions now vacant in this unique squadron. For more information about an assignment to the Thunderbirds, contact your local CBPO or call Captain Reinoso (AUTOVON 682-2277).

Service Couples

The 1973 Frontiero vs. Richardson Supreme Court decision struck down the need for women members of the service to prove dependency of their civilian husbands. As a result, a woman member of the services is now entitled to a Basic Allowance for Quarters (BAQ) and medical benefits for her civilian husband without proof of dependency. The court made the decision retroactive for ten years.

However, the subject of retroactivity for service couples (both

AIR FORCE COMPONENTS

The following resolution was adopted by the Air Force Association's National Board of Directors during the February Meeting:

WHEREAS the Department of Defense has announced realignments in the structure of Aerospace Defense Command, as well as certain adjustments in the structure of Tactical Fighter, Special Operations, Tactical Airlift, and Tactical Air Support forces; and,

WHEREAS such realignments and adjustments will result in the inactivation of a number of units in the Air National Guard and the consolidation of other units in the Air National Guard as well as in the Air Force Reserve; and,

WHEREAS such action involved the elimination of more than 5,000 military authorizations in the Air National Guard, including 1,257 ANG Technicians, and more than 300 in the Air Force Reserve, including twenty-six Air Reserve Technicians; and,

WHEREAS such eliminations would result in the loss of experienced combat-ready personnel possessing critical military skills in which the United States has made a substantial investment, and which represent a well-trained resource currently available at a relatively low cost;

NOW, THEREFORE, BE IT RESOLVED that the Air Force Association call upon the Administration and the Congress to reassess the impact on our military readiness posture, in an all-volunteer force environment, of the loss of these skilled and motivated individuals, and to reexamine the potential of each group of these individuals to assume new missions within their respective Reserve components.

husband and wife members of the service) was not specifically addressed. The Comptroller General recently established that the same retroactive rule would apply for service couples, subject to the ten-year statute of limitations. Instructions will be issued from the Accounting and Finance Center for filing claims.

Physician Extender

The shortage of general practitioners in the USAF promoted the USAF Academy Hospital to institute a Physician Extender Program. Physician extenders are medical technicians who possess a broad background of medical training and experience.

MSgt. Peter R. Brumlik is the Academy's first physician extender. He worked for two years as an in-

Ed Gates . . . Speaking of People

Scratch the Military Retirement Change Package

Scratch that Defense-sponsored package of proposals to overhaul the military retirement system. As of early this year, all signs pointed to continuing congressional refusal to touch the changes that thousands of uniformed members have excoriated officialdom for promoting.

But don't rule out, within the next couple of years, attempts by government agencies to change—adversely from individual service members' viewpoints—certain military retirement policies and/or statutes. Just because the package advanced by the Pentagon has faltered, it doesn't mean that pressures to change rules in order to curb rising retirement outlays have eased.

Certain sections of Defense's plan, called the Retirement Modernization Act, could be extracted and enacted separately, some officials believe. One possibility: base retired pay on the average monthly basic pay a person receives his last year on duty. Or a "high two" or "high three" plan, as is the case with Civil Service retirement.

This would save Uncle Sam dollars, since present policy retires members on the basis of their terminal basic pay.

Another possibility for separate treatment is the Social Security offset provision. Under it, at age sixty-five, military retired pay would be reduced by fifty percent of each person's service-related Social Security benefits. This suggestion, though anathema to most military personnel, would save considerable money. The idea enjoys support in some circles and shouldn't be ruled out.

The nation's lawmakers have been jarred by the avalanche of complaints over the Defense package from their service-community constituents and from service organizations.

There are many sections in the Retirement Modernization Act *(see October '73 issue of* AIR FORCE *Magazine),* but their combined clout calls for too sweeping an overhaul of the retirement system for the legislators to adopt or for the service community to accept.

The major objection, of course, is the section that would reduce the minimum retirement formula from fifty to thirty-five percent of basic pay.

Still, lawmakers and Administration policymakers are concerned over the escalation of retired pay costs. Leaders are aching to find acceptable ways to curb the increases.

Those automatic retired pay raises based on the Consumer Price Index are occurring twice a year now, each adding more than $200 million annually to total outlays. And the retired rolls keep growing; the all-service figure now exceeds 1,000,000 (including some 325,000 USAF members).

Not long ago, House Appropriations Committee members asked Defense: At what point will the number of new retirees be balanced by attrition and the peak retiree load reached?

Not until sometime during the final decade of this century, when it will level off at about 1,500,000 members, Pentagon experts replied. Without changing the present system, annual retired pay costs (now about $5 billion) should hit $22 billion by the end of the century, they added. (Defense had planned, via the Modernization Act, to reduce that figure by $3 billion.)

The Appropriations group looked at many aspects of retired pay. The members were disturbed that for the first time, retired pay this year accounts for more than six percent of the total Defense budget. They indicated concern that recomputation of retired pay remains a live issue.

The same group is keeping ever so close an eye on the services' handling of disability retirement, exerting greater pressure to tighten the rules and in turn save money.

A formal probe by the committee's staff reveals that the tighter disability retirement rules the services adopted early last year are indeed shaving the number of disability retirements. This is especially true in the higher ranks, where disability retirement for colonels and generals is now the exception.

For all ranks, nearly one of every three retiring members as recently as FY '70 received a disability determination (and the accompanying tax and other special benefits). But things have changed. Defense now forecasts about 14,600 disability retirements out of nearly 70,000 total retirements this fiscal year. Pressure to make further cuts remains, however.

One idea suggested by committee staffers, which the group acknowledges would draw "formidable resistance," calls for differentiating between "work-related" disability conditions, such as combat injury, and "nonwork" conditions, such as diabetes or ulcers.

The former would continue to receive a tax-free percentage of disability. The retirement pay of those in the "nonwork" category would be fully taxable (except for "sick-pay" exclusions at "normal" retirement age).

Also questioned was (1) the need for the temporary disability retired list; (2) Army and Air Force practice of awarding higher percentages of disability for officers than the Navy and Marine Corps; and (3) placement of many disabled members "in a limited assignment status" to enable them to complete twenty years of service.

What about supporters of a "contributory" retirement system? That issue hasn't resurfaced recently, but it has supporters. The possibility that the proposition, strongly opposed by the service community, may be dusted off shouldn't be discounted.

Service personnel as a group are generally viewed as lacking in political muscle. But not so with regard to the Retirement Modernization Act, whose apparent demise resulted mainly from the deluge of service members' protests.

Yet the battle to thwart adverse tampering with the services' most prized benefit is far from over. Sharp, separate attacks could flare up at any time. ■

The Bulletin Board

dependent medical technician and has two additional years of experience in air evacuation, including a year flying as a paramedic in Southeast Asia. Sergeant Brumlik treats patients whose illnesses are within his area of knowledge. He also performs examinations and laboratory studies as well as taking X rays.

Physician extenders work directly for a physician who is responsible for all treatment given. Patients requiring specialized treatment are referred by Sergeant Brumlik to physicians. This program will lighten the work load of physicians who spend a great deal of time treating routine and minor cases.

New Officer Career Plan (H.R. 12405)

The Defense Officer Personnel Management System (DOPMS) legislative proposal has been submitted to Congress. This plan proposes some 200 changes to current laws. If enacted into law, this proposed legislation would eliminate the career Reserve policy now in effect.

There would be an all-regular career force of officers beyond the eleventh year. Legislation would also provide for a single selection and promotion program, eliminating the temporary promotion system now in effect. It would provide revised promotion phase points, promotion opportunities, and new grade tables.

H.R. 11113

Other changes involving officers' careers include H.R. 11113, which was initially included in the DOPMS package. This proposed bill would give the services the authority to force retirement of some lieutenant colonels who have at least twice failed selection for the temporary or permanent grade of colonel, and whose names are not on a promotion list. It would also include colonels who have served at least four years in grade and whose names are not on a promotion list at this time.

Under H.R. 11113, up to thirty percent of these colonels and lieutenant colonels could be forced to retire no later than seven months after the Service Secretary approved the selection-board report. Officers not eligible for retirement would be kept on active duty until they were qualified and then be retired. Those forced out would get a lump-sum transition payment of $4,000, unless they were promoted

Senior Staff Changes

RETIREMENTS: B/G Joseph E. **Krysakowski;** M/G Leo C. **Lewis;** M/G Jessup D. **Lowe;** B/G Robert L. **Moeller;** M/G John O. **Moench;** L/G Robert E. **Pursley;** M/G DeWitt R. **Searles;** B/G Robert V. **Spencer.**

CHANGES: Col. (B/G selectee) James A. Abrahamson, from Cmdr., 4950th Test Wg., AFSC, Wright-Patterson AFB, Ohio, to IG, Hq. AFSC, Andrews AFB, Md., replacing B/G Robert A. Rushworth . . . **B/G Thomas A. Aldrich,** from Cmdr., AWS, to DCS/Plans, Hq. MAC, Scott AFB, Ill. . . . **M/G Benjamin N. Bellis,** from Dep. for F-15, ASD SPD, AFSC, Wright-Patterson AFB, Ohio, to Cmdr., ESD, AFSC, L. G. Hanscom Field, Mass. . . . **B/G Charles E. Buckingham,** from DCS/Procurement & Production, to DCS/Acquisition, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **M/G Charles W. Carson, Jr.,** from Cmdr., AAC, Elmendorf AFB, Alaska, to Cmdr., 12th AF, TAC, Bergstrom AFB, Tex., replacing M/G John J. Burns . . . **B/G Charles G. Cleveland,** from C/S, Hq. ATC, to DCS/Tech. Tng., Hq. ATC, Randolph AFB, Tex.

Col. (B/G selectee) William R. Coleman, from Dir. of Maintenance, SMAMA, AFLC, McClellan AFB, Calif., to Asst. DCS/Maintenance, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **M/G Martin G. Colladay,** from Vice Dir., Jt. Staff, OJCS, to C/S, Hq. SAC, Offutt AFB, Neb. . . . **Col. (B/G selectee) John W. Collens, III,** from Cmdr., 9th Weather Recon. Wg., MAC, McClellan AFB, Calif., to Cmdr., AWS, Hq. MAC, Scott AFB, Ill., replacing B/G Thomas A. Aldrich . . . **B/G Thomas P. Conlin,** from Dir., Cmd. Control, DCS/Ops, Hq. SAC, Offutt AFB, Neb., to Cmdr., 19th Air Div., SAC, Carswell AFB, Tex. . . . **Col. (B/G selectee) Sidney L. Davis,** from Cmdr., 1st TFW, TAC, MacDill AFB, Fla., to Asst. DCS/Ops for Ops & Tng., Hq. TAC, Langley AFB, Va., replacing B/G Fred A. Treyz . . . **M/G Peter R. DeLonga,** from Dir. of Maintenance, Engineering & Supply, DCS/S&L, to Deputy IG, Hq. USAF, replacing retiring M/G DeWitt R. Searles.

B/G John P. Flynn, from Vice Cmdt., AWC, to Cmdt., ACSC, AU, Maxwell AFB, Ala., replacing B/G William H. Ginn, Jr. . . . **Col. (B/G selectee) Robert A. Foster,** from Asst. Dep., to Dep. for Recon/Strike/EW, ASD, AFSC, Wright-Patterson AFB, Ohio, replacing B/G (M/G selectee) Robert C. Mathis . . . **Col. (B/G selectee) Martin C. Fulcher,** from Cmdr., 92d Bomb Wg., to Cmdr., 47th Air Div., SAC, Fairchild AFB, Wash. . . . **Col. (B/G selectee) Norman C. Gaddis,** from V/C, to Cmdr., 82d FTW, ATC, Williams AFB, Ariz., replacing Col. (B/G selectee) Warren C. Moore . . . **M/G Jack K. Gamble,** from Cmdr., 25th NORAD/CONAD Rgn., with add'l duty as Cmdr., 25th Air Div., McChord AFB, Wash., to Cmdr., AAC, Elmendorf AFB, Alaska, replacing M/G Charles W. Carson, Jr.

M/G Herbert J. Gavin, from DCS/Logistics, Hq. TAC, Langley AFB, Va., to DCS/Maintenance, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing M/G Charles F. Minter, Sr. . . . **B/G William H. Ginn, Jr.,** from Cmdt., ACSC, AU, Maxwell AFB, Ala., to Asst. DCS/Plans, Hq. TAC, Langley AFB, Va. . . . **Col. (B/G selectee)**

after the date of enactment and voluntarily retired.

Officers falling in the selective-screening categories will have to face selection only once. If selected among the seventy percent to remain on active duty, they would not be screened again during their careers.

Retirement Bill

H.R. 12505, the DoD-proposed Military Non-Disability Retirement Bill, was introduced in the House of Representatives by F. Edward Hébert (D-La.) on February 4. Hearings on this bill have not been scheduled as of this writing.

New Major Generals

PROMOTIONS: To be **Major General:** Ranald T. **Adams,** Jr.; Timothy I. **Ahern;** Louis O. **Alder;** Thomas A. **Aldrich;** Jesse M. **Allen;** Earl J. **Archer,** Jr.; David D. **Bradburn;** Charles E. **Buckingham;** John W. **Burkhart;** Charles G. **Cleveland;** Bennie L. **Davis;** Robert L. **Edge;** Lincoln D. **Faurer;** John P. **Flynn;** Charles A. **Gabriel;** William H. **Ginn,** Jr.; Abbott C. **Greenleaf;** Guy E. **Hairston,** Jr.; Edgar S. **Harris,** Jr.; Richard C. **Henry;** John R. **Hinton,** Jr.; Hilding L. **Jacobson,** Jr.; John R. **Kelly,** Jr.; Larry M. **Killpack.**

Howard M. **Lane;** Richard L. **Lawson;** Lloyd R. **Leavitt,** Jr.; Ralph J. **Maglione,** Jr.; Robert T. **Marsh;** Abner B. **Martin;** Robert C. **Mathis;** Howard E. **McCormick;** Henry J. **Meade;** James S. **Murphy;** Warner E. **Newby;** Paul F. **Patch;** Freddie L. **Poston;** James G. **Randolph;** Edwin W. **Robertson,** II; Ralph S. **Saunders;** George E. **Schafer;** Eugene B. **Sterling;** William A. **Temple;** Henry L. **Warren;** Donald L. **Werbeck;** William B. **Yancey,** Jr.; James A. **Young.** ■

Maj. Gen. (Lt. Gen. selectee) Walter T. Galligan has been named to replace retiring Lt. Gen. Robert E. Pursley as Commander, US Forces, Japan. General Galligan formerly commanded USAF Security Service.

Harold E. Gross, from Dir., Mgt. Analysis, AF Compt., Hq. USAF, to DCS/Compt., Hq. SAC, Offutt AFB, Neb. . . . **B/G Gerald K. Hendricks,** from Cmdr., AFATL, AFSC, Eglin AFB, Fla., to Dir. of Science & Technology, Hq. AFSC, Andrews AFB, Md. . . . **Col. (B/G selectee) Robert T. Herres,** from Cmdr., 449th Bomb Wg., SAC, Kincheloe AFB, Mich., to Dir., Cmd. Control, DCS/Ops, Hq. SAC, Offutt AFB, Neb.

B/G (M/G selectee) Howard M. Lane, from Cmdr., AFFTC, AFSC, Edwards AFB, Calif., to Cmdr., USAFTAWC, TAC, Eglin AFB, Fla. . . . **Col. (B/G selectee) Dewey K. K. Lowe,** from Dir., Materiel Mgt., SAAMA, AFLC, Kelly AFB, Tex., to DCS/Procurement & Production, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing B/G Charles E. Buckingham . . . **M/G Herbert A. Lyon,** from V/C, SAMSO, AFSC, Los Angeles, Calif., to Cmdr., SAMTEC, AFSC, Vandenberg AFB, Calif., replacing retiring M/G Jessup D. Lowe . . . **B/G (M/G selectee) Robert C. Mathis,** from Dep. for Recon/Strike/EW, ASD, to Dep. for F-15, ASD SPD, AFSC, Wright-Patterson AFB, Ohio, replacing M/G Benjamin N. Bellis . . . **M/G Charles F. Minter, Sr.,** from DCS/Maintenance, Hq. AFLC, Wright-Patterson AFB, Ohio, to V/C, 15th AF, SAC, March AFB, Calif., replacing retiring M/G Leo C. Lewis . . . **Col. (B/G selectee) Warren C. Moore,** from Cmdr., 82d FTW, ATC, Williams AFB, Ariz., to Asst. DCS/Ops, Hq. ATC, Randolph AFB, Tex.

Col. (B/G selectee) William R. Nelson, from Asst. DCS/Logistics, to DCS/Logistics, Hq. TAC, Langley AFB, Va., replacing M/G Herbert J. Gavin . . . **Col. (B/G selectee) Jerome F. O'Malley,** from Cmdr., 22d Bomb Wg., SAC, March AFB, Calif., to C/S, 15th AF, SAC, March AFB, Calif. . . . **B/G Earl G. Peck,** from Cmdt., Squadron Officer School, AU, Maxwell AFB, Ala., to Chief, Office of AF History, Washington, D. C. . . . **M/G (effective April 20) John J. Pesch,** from Dep. Dir., to Dir., National Guard Bureau, Washington, D. C., replacing M/G I. G. Brown . . . **Col. (B/G selectee) Robinson Risner,** from Student Aircraft Cmdr., F-4 Tng., MacDill AFB, Fla., to Cmdr., 832d Air Div., TAC, Cannon AFB, N. M., replacing retiring B/G Robert V. Spencer.

B/G Robert A. Rushworth, from IG, Hq. AFSC, Andrews AFB, Md., to Cmdr., AFFTC, AFSC, Edwards AFB, Calif. . . . **Col. (B/G selectee) Len C. Russell,** from Cmdr., 4th TFW, TAC, Seymour Johnson AFB, N. C., to Dir., Ftr. Ops, DCS/Ops, Hq. TAC, Langley AFB, Va. . . . **B/G Thomas M. Sadler,** from Cmdr., 322d TAW, USAFE, Rhein-Main AB, Germany, to Cmdr., 437th MAW, MAC, Charleston AFB, S. C., replacing retiring M/G Robert L. Moeller . . . **Col. (B/G selectee) Stuart H. Sherman, Jr.,** from Cmdr., 321st Strat. Missile Wg., SAC, Grand Forks AFB, N. D., to DCS/Civil Engineering, Hq. SAC, Offutt AFB, Neb. . . . **Col. (B/G selectee) Robert B. Tanguy,** from Cmdr., 29th FTW, ATC, Craig AFB, Ala., to IG, Hq. ATC, Randolph AFB, Tex., replacing B/G Stanley M. Umstead, Jr.

B/G Robert C. Thompson, from DCS/Engineering & Services, USAFE, Ramstein AB, Germany, to Dep. Dir., Civil Engineering, DCS/P&R, Hq. USAF . . . **B/G Fred A. Treyz,** from Asst. DCS/Ops for Ops & Tng., Hq. TAC, Langley AFB, Va., to Dep. Dir., Ops, J-3, PACOM, Honolulu, Hawaii, replacing B/G (M/G selectee) James A. Young . . . **B/G Stanley M. Umstead, Jr.,** from IG, to C/S, Hq. ATC, Randolph AFB, Tex., replacing B/G Charles G. Cleveland . . . **B/G (M/G selectee) James A. Young,** from Dep. Dir., Ops, J-3, PACOM, Honolulu, Hawaii, to Cmdr., 25th NORAD/CONAD Rgn., with add'l duty as Cmdr., 25th Air Div., McChord AFB, Wash., replacing M/G Jack K. Gamble . . . **B/G Felix J. Zaniewski,** from Staff Judge Advocate, Hq. MAC, Scott AFB, Ill., to Staff Judge Advocate, Hq. SAC, Offutt AFB, Neb., replacing retiring B/G Joseph E. Krysakowski.

—Compiled by Catherine L. Bratz

MIA/POW Action Report

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

"Trial" on Capitol Hill

The Senate Committee on Foreign Relations, with an open hearing on January 28, at long last publicly recognized the problem of our men still missing and unaccounted for in Southeast Asia.

In an atmosphere of tense anticipation, the hearing room on Capitol Hill was jammed to capacity, with every seat taken and rear and side aisles crowded with several hundred MIA/POW family members. Those without seats—young and old alike—stood attentively in the glare and heat of the overhead lights throughout the long session. The spectators gave their rapt attention, as if an important trial were being conducted in a court of law.

And, in the opinion of more than a few MIA/POW family members, a trial *was* going on—a trial of the US government.

January 29 was exactly a year and a day since the signing of the Paris accords that were to bring about the release of Americans held captive in Southeast Asia and an accounting of the missing. Since then, in the eyes of family members, very little had been accomplished to determine the fate of the MIAs. In fact, a stalemate existed in Southeast Asia, and, in terms of the US government's attitude toward the MIAs—whether justified or not—many MIA family members now used the word "abandonment."

After the emotional ups and downs of recent years, MIA families' patience has again worn thin; their leaders saw the Committee hearing as an important national forum for putting the issue in the strongest possible light and rekindling national concern.

As Scott Albright, League of Families Executive Director, noted in his opening remarks to the Committee, those who have remained active in MIA/POW affairs in the face of growing public disinterest since the return of the American prisoners "are essentially the hardcore infighters—the wives, parents, and other close relatives who are determined that every effort must be made to see that our missing men are properly accounted for." It was many of these who had assembled in the hearing room, to witness what their elected representatives and other government officials could and would do in their behalf.

Scott Albright's statement to the Committee, a congressional body composed of some of the most powerful men in the Senate and chaired by the redoubtable J. William Fulbright, was a concise but extensive rundown on what has transpired since the signing of the Paris cease-fire.

The statement, a familiar litany to anyone following the recent course of MIA/POW affairs, dwelt on the American POWs set free, those still missing, the perfidy of North Vietnam in not allowing the accounting to go forward, and the lack of progress, despite strong statements of concern in the past from the President and other officials. Albright's report was far from optimistic.

With the problem put in perspective for the Senators, Mrs. Joseph P. Dunn, an MIA wife and Acting League National Coordinator, described her dwindling faith in the determination of elected officials—particularly the Senators—"to serve and defend the country and its citizens," and her belief "that neither I nor most families of men missing in the Vietnam War feel that you are living up to this obligation." As for an accounting, she said, "the only method I know by which this can be accomplished—and please note the affirmative attitude—is for the Congress, our top Cabinet officers, and the President to all begin demanding with one voice, loudly and publicly, that the North Vietnamese live up" to the agreement.

Mrs. Dunn said that in talking to the public, "questions inevitably arise about what our Senators and Congressmen are doing about the situation. For years, I have answered that they are trying. . . . But, of late, I feel I am not answering with strong conviction. . . . You gentlemen, as elected officials of this country, must assume responsibility for these men. . . . We [the family members] have to have this load taken off our shoulders."

In his testimony, MIA father and League board member E. C. Mills suggested some leverage the US government might apply, including denying the Soviet Union favored-nation status in trade matters.

Mr. Mills also urged that the nation's elected leaders act forcefully to publicize a "worldwide awareness campaign" to center attention on the MIA situation (described as one of the few options for positive action left open to League and other family members to spotlight their cause—*see January '74 issue, p. 45*).

Following the family representatives' emotionally charged but reasoned addresses to the Committee came statements by spokesmen for the Departments of Defense and State. (While invited to attend the hearing, Secretary of State Henry Kissinger and Secretary of Defense James R. Schlesinger both offered their regrets, a disappointment to family members.)

The position papers by Dr. Roger Shields of DoD and Frank S. Sieverts of State—both long involved in MIA/POW matters—were dispassionate, workmanlike, and described in exhaustive detail the obstacles confronting the government in arriving at a solution to the complexities of the MIA situation.

Aside from Senate attention and a major plus in the form of publicity for the MIA cause, little real progress appeared to result from the hearing on Capitol Hill. "It was better than nothing," one disgruntled family member commented.

In effect, the stalemate that exists in Southeast Asia over the MIA accounting inexorably became the crux of the matter at the hearing. There was no escaping another rendition of a familiar message: Despite whatever the US government might do short of war, it is the inflexibility of North Vietnam that constitutes the essential stumbling block, and there seems very little that can be done about it. ■

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	25-29	60,000	12,500	10.00	6,000	2,000	2.5
	30-34	50,000	12,500	10.00	6,000	2,000	2.5
	35-39	40,000	12,500	10.00	6,000	2,000	2.5
	40-44	25,000	12,500	10.00	5,250	2,000	2.5
	45-49	15,000	12,500	10.00	4,050	2,000	2.5
	50-59	10,000	12,500	10.00	3,000	2,000	2.5
	60-64	7,500	12,500	10.00	2,250	2,000	2.5
	65-69	4,000	12,500	10.00	1,200	2,000	2.5
	70-75	2,500	12,500	10.00	750	2,000	2.5
The High-Option Plan ($100,000 Maximum)	20-24	$100,000	$12,500	15.00	$6,000	$2,000	$2.5
	25-29	90,000	12,500	15.00	6,000	2,000	2.5
	30-34	75,000	12,500	15.00	6,000	2,000	2.5
	35-39	60,000	12,500	15.00	6,000	2,000	2.5
	40-44	37,500	12,500	15.00	5,250	2,000	2.5
	45-49	22,500	12,500	15.00	4,050	2,000	2.5
	50-59	15,000	12,500	15.00	3,000	2,000	2.5
	60-64	11,250	12,500	15.00	2,250	2,000	2.5
	65-69	6,000	12,500	15.00	1,200	2,000	2.5
	70-75	3,750	12,500	15.00	750	2,000	2.5

* In the event of an accidental death occurring within 13 weeks of the accident, the AFA plan pays a lump sum benefit of $12,500 *in addition to* the benefit, except as noted under AVIATION DEATH BENEFIT, above.

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AVIATION DEATH BENEFIT: A total sum of $22,500 under the High-Option Plan or $15,000 under the Standard Plan is paid for death which is caused by an aviation accident *in which the insured is serving as pilot or crew member of the aircraft involved.* Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage.

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Keep your coverage at the low, group rate to age 75, if you wish.

Full conversion privilege. At age 75 [or at any time, on termination of AFA membership] the amount of insurance shown for your age group at the time of conversion may be converted to a permanent plan of insurance, *regardless of your health at that time.*

Disability waiver of premium, if you become totally disabled for at least nine months, prior to age 60.

Convenient premium payment plans. Pay direct to AFA or by monthly government allotment.

Reduction of cost by dividends. Net cost of insurance to AFA insured persons has been reduced by payment of dividends in eight of the last eleven years. However, dividends cannot, of course, be guaranteed.

Administered by insurance professionals on your Association's staff, for excellent service and low operating cost.

EXCEPTIONS:

Group Life insurance: Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane shall not be effective until your coverage has been in force for 12 months.

The Accidental Death Benefit and Aviation Death Benefit shall not be effective if death results: [1] From injuries intentionally self-inflicted while sane or insane, or [2] From injuries sustained while committing a felony, or [3] Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or [4] During any period a member's coverage is being continued under the waiver of premium provision, or [5] From an aviation accident, military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minneapolis as trustee of the Air Force Association Group Insurance Trust. However, because of certain limitations on group insurance coverage in those states, nonactive-duty members who reside in Ohio, Texas, Florida, and New Jersey are not eligible for AFA group life insurance coverage.

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All certificates are dated and take effect on the last day of the month in which your application for coverage is approved. Coverage runs concurrently with AFA membership. AFA Military Group Life Insurance is written in conformity with the Insurance Regulations of the State of Minnesota.

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Both plans have been specifically designed to fill your particular needs. This is full-time, worldwide protection. There are no war clauses—no hazardous-duty restrictions, or geographical limitations on AFA life insurance protection. At AFA, our policy is to provide the broadest possible protection to our members, including those in combat zones.

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And, as a member of AFA, you are able to secure this outstanding protection at low group rates. What's more, there's no increase in premiums for flying personnel. In fact, in most cases, flying personnel are entitled to full death benefits. Only when death is caused by an aircraft accident in which the insured was serving as pilot or crew member does the special Aviation Death Benefit take effect.

Higher Benefits for Young Families

The higher benefits for younger members make both plans particularly outstanding buys for the young family. The young family breadwinner can make a substantial addition to his life insurance estate at a time when his family is growing up—when his financial obligation to his family is at its greatest!

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ate of birth (Mo. Day Yr.)	Height Weight	Social Security Number	Name and relationship of primary beneficiary

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HIGH OPTION PLAN			STANDARD PLAN	
lembers Only	Members and Dependents	**Mode of Payment**	Members Only	Members and Dependents
☐ $ 15.00	☐ $ 17.50	**Monthly** government allotment. I enclose 2 months' premium to cover the period necessary for my allotment to be established.	☐ $ 10.00	☐ $ 12.50
☐ $ 45.00	☐ $ 52.50	**Quarterly.** I enclose amount checked.	☐ $ 30.00	☐ $ 37.50
☐ $ 90.00	☐ $105.00	**Semiannually.** I enclose amount checked.	☐ $ 60.00	☐ $ 75.00
☐ $180.00	☐ $210.00	**Annually.** I enclose amount checked.	☐ $120.00	☐ $150.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth Mo. Day Yr.	Height	Weight

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanitarium, asylum or similar institution in the past 5 years? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes ☐ No ☐

IF YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid. I understand United reserves the right to request additional evidence of insurability in the form of a medical statement by any attending physician or an examination by a physician selected by United.

Date ______, 19 ____ ______ Member's Signature

4/74
Form 3676GL App

Application must be accompanied by check or money order. Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Avenue, NW, Washington, D.C. 20006

MARK YOUR CALENDAR....

PLAN NOW TO ATTEND....

AFA's 1974 Annual National Convention and Aerospace Briefings and Displays

SEPTEMBER 16, 17, 18, 19
WASHINGTON, D. C.

AFA's 1974 Annual National Convention and Aerospace Briefings and Displays will be held at the Sheraton-Park and Shoreham Hotels, September 16–19. Accommodations are limited at the Shoreham Hotel and will be used primarily by other organizations meeting in conjunction with AFA's 1974 National Convention.

All reservation requests for rooms and suites at the Sheraton-Park Hotel should be sent to: Reservations Office, Sheraton-Park Hotel, 2660 Woodley Road, N. W., Washington, D. C. 20008. Be sure to refer to AFA's Annual National Convention when requesting your reservations. Otherwise, your reservation requests will not be accepted by the Sheraton-Park.

AFA's Annual National Convention activities will include luncheons for the Secretary of the Air Force and the Air Force Chief of Staff and the Air Force Anniversary Reception and Dinner Dance. The National Convention will also include AFA's Business Sessions, Symposium, an Air Force Reserve and Air National Guard Seminar, and several other invitational events, including the President's Reception, the Annual Outstanding Airmen Dinner, and the Chief Executives' Reception and Buffet Dinner.

We urge you to make your reservations at the Sheraton-Park Hotel as soon as possible in order to obtain your reservations. Arrivals after 6:00 p.m. require guaranteed payment for the night of arrival.

By Don Steele
AFA AFFAIRS EDITOR

THE COLORADO STATE ORGANIZATION . . .

cited for consistent and effective programming in support of the mission of AFA, most recently exemplified in its Annual Aerospace Education Symposium.

More than 235 Denver-area high school students and educators attended a one-day Aerospace Education Symposium at Lowry AFB, Colo., on January 11.

The Symposium, which was cosponsored by the Colorado AFA and the Rocky Mountain Region of the Civil Air Patrol with the complete cooperation of Lowry AFB personnel, opened with welcoming remarks by Col. Norris M. Overly, Vice Commander, Lowry Technical Training Center (ATC). Paul Aglietti, President of the Hinkley High School Thunderbirds (an aerospace club), and 1st Lt. Billy Mitchell, AFJROTC, Hinkley High School, were co-masters of ceremonies. Noel Bullock, Director of Aerospace Education for the Colorado AFA, directed the Symposium.

During the opening ceremonies, Mrs. Elliott Todhunter Dewey presented Miss Sue Viehman the Ryland Todhunter Dewey scholarship. The award is presented annually to the outstanding aerospace education student in Colorado in memory of Mrs. Dewey's son, Air Force Capt. Ryland Todhunter Dewey, a veteran of the Korean conflict who was killed in an aircraft accident.

The morning session of the Symposium was divided into two programs, one for students and one for educators.

The students received presentations from the USAF's Air Training Command and US Navy briefing teams, then held group discussions with the two teams.

The educators were briefed on the missions of the two sponsoring organizations, then broke into groups for discussions.

Students and educators joined for luncheon in the Lowry AFB Airmen's Dining Hall, after which they heard presentations on the Triad and the North American Air Defense Command (NORAD). The Symposium concluded with a presentation on the USAF space program.

Attending the Symposium were thirty-three aerospace educators, aerospace-education students from twelve senior high schools, AFJROTC cadets from three AFJROTC units, US Navy Sea Cadets, and Civil Air Patrol cadets.

Aerospace educators and students alike were favorably impressed with the program. In the words of one AFJROTC cadet, Malcolm Rea, from Aurora Hinkley High School, "Fantastic! I learned more today than I thought possible."

Following the opening ceremonies of the Colorado AFA's recent Aerospace Education Symposium, Col. Norris M. Overly, Vice Commander, Lowry Technical Training Center and Symposium keynoter, visits with Mrs. Elliott Todhunter Dewey, left, donor and presenter of the Ryland Todhunter Dewey scholarship, and Miss Sue Viehman, recipient of the scholarship.

AFA President Joe L. Shosid congratulated the Colorado AFA, and, in recognition of its outstanding efforts in the field of aerospace education, most recently exemplified by this Aerospace Education Symposium, named the Colorado AFA as AFA's "Unit of the Month" for April.

COMING EVENTS

Front Range Chapter's "Salute to Women in the Air Force," Buckley ANG Base, Colo., April 27 . . . The California AFA's 1974 Convention will be held during SAC's annual Combat Missile Competition and AFA's "Strategic Weapons Development" Symposium at Vandenberg AFB, Calif., April 30 and May 1–2 . . . Florida AFA Convention, Sheraton Hotel, Fort Lauderdale, May 3–5 . . . Alabama AFA Convention, Jet Port, Huntsville, May 3–5.

North Carolina AFA Convention, Fayetteville, May 4 . . . Massachusetts AFA Convention, Yankee Drummer Inn, Auburn, May 4 . . . Texas AFA Convention, Wichita Falls, May 10–12 . . . Washington AFA Convention, Holiday Inn-West, Spokane, May 10–12 . . . South Carolina AFA Convention, Myrtle Beach AFB, May 10–11 . . . Utah AFA Convention, May 11, Ramada Inn, Ogden . . . Illinois AFA Convention, Augustine's Ramada Inn, Belleville, May 17–19 . . . New Hampshire AFA Convention, Manchester, May 18.

AFA's Annual Dinner honoring the Outstanding Squadron at the Air Force Academy, The Broadmoor, Colorado Springs, Colo., June 1 . . . Louisiana AFA Convention, Le Pavilion Hotel, New Orleans, June 7–8 . . . Virginia AFA Convention, Arlington, June 15 . . . New York AFA Convention, New York City, June 15 . . . Georgia Convention, Savannah, June 15 . . . Wisconsin AFA Convention, Marriott Motor Hotel, Waukesha, June 15–16.

Colorado AFA Convention, Sheraton Inn, Colorado Springs, June 21–22 . . . AFA Charity Golf Tournament, sponsored by Riverside County and San Bernardino Chapters, March and Norton AFBs, June 21–22 . . . Pennsylvania AFA Convention, Sheraton-Valley Forge Hotel, Valley Forge, June 22–23 . . . AFA's Twenty-eighth National Convention, September 15–19. ■

More than 400 members and guests attended the Eglin, Fla., Chapter's "Political Appreciation Night" on January 16, a formal dinner at the Eglin AFB Officers' Club honoring outstanding political leaders. Among the distinguished guests and participants were, from left, Maj. Gen. Henry B. Kucheman, Jr., Commander, Armament Development and Test Center (AFSC), Eglin AFB; Congressman Bob Sikes (D-Fla.), who introduced the speaker; Florida Gov. Reubin Askew, the guest speaker; Honorary Chapter President Cecil Anchors; and Chapter President Maj. Gen. Walter B. Putnam, USAF (Ret.).

Gen. George S. Brown, USAF Chief of Staff, was the guest of honor and speaker at the Portland, Ore., Chapter's recent "Air Force Winter Rendezvous." Program participants included, from left, Oregon AFA President John Nelson; Portland Chapter President Phil Saxton; General Brown; and Dr. Clayton Gross, Vice President for AFA's Northwest Region.

Maj. Gen. Charles W. Carson, Jr., Commander, Alaskan Air Command, was the guest speaker at a recent meeting of AFA's Midnight Sun Chapter at Eielson AFB Officers' Club, Fairbanks, Alaska. During the social hour, General Carson, center, is shown talking to, from left, Maj. Arthur B. Coleman, 5010th Supply Squadron Commander; Mrs. Gilmore; and CMSgt. Edward Gilmore.

During a recent meeting of the Grissom Memorial Chapter, Ind., Chapter President C. Forrest Spencer, left, presents an honorary membership in the Chapter to Mr. Dennis Grissom, father of the late Astronaut Gus Grissom for whom the Chapter is named. Looking on are Col. Robert L. Nicoll, center, Wing Commander at Grissom AFB; and Col. Lyle E. Stockton, Grissom Base Commander.

A dining-out for Class 74-09 of the Air Force's Officer Training School at Lackland AFB, Tex., featured an address by AFA President Joe L. Shosid. Shown in the photo are, from left, Alamo Chapter Vice President Ken Bashore; Brig. Gen. Cecil E. Fox, OTS Commander; Officer Trainee Harvey Lyter, President of the Mess; and Mr. Shosid.

CHAPTER AND STATE PHOTO GALLERY

At a luncheon held in conjunction with the February 9 Board of Directors and Membership Committee meetings, Board Chairman Martin M. Ostrow, at left in the photo above, presented an AFA Presidential Citation to Gen. William W. Momyer, USAF (Ret.). Also, a check for a portion of the receipts from the AFA Charity Golf Tournament was presented to the Enlisted Men's Widows and Dependents Home Foundation. In the photo to the left, above, are, from the left, Tournament Executive Committee Chairman Ed Stearns, Foundation Board Chairman Nick Masone, USAF Chief of Staff Gen. George S. Brown, and AFA President Joe L. Shosid.

Mr. Shosid presents an AFA Presidential Citation to the retiring Commander of USAF's Headquarters Command, Maj. Gen. John L. Locke.

E. F. "Sandy" Faust, the Texas AFA's Vice President for Manpower Support, listens to a report from two San Antonio airmen who attended the recent meeting of AFA's Airmen Council in Washington, D. C. CMSgt. Harry Lund, left, Brooks AFB, and A1C Don B. Francois, right, Lackland AFB, brief Mr. Faust and Lt. Danny J. Basil, Brooks AFB Junior Officer Council Recorder.

Regional, State, and local AFA officials were among the more than 400 members and guests on hand to hear Lt. Gen. William V. McBride, Commander, Air Training Command, address a meeting of the Golden Triangle Chapter on January 26 at Columbus AFB, Miss. Shown, from left, are SSgt. James Yawn, Columbus AFB NCO of the Year; Chapter President F. M. Hutchison; Mississippi AFA President William Browne; General McBride; John Haire, Vice President for AFA's South Central Region; and MSgt. Hugh Crumley, Columbus AFB Senior NCO of the Year.

Frank Kula, right, President of AFA's Thomas B. McGuire, Jr., Chapter, presents a check for $100 to Col. Robert I. Weber, Base Commander at McGuire AFB, N. J. The money will be used by the Air Force Historical Foundation to add a display about Maj. Thomas B. McGuire, Jr., World War II ace and Medal of Honor winner, to its Memorial Program exhibit now at the Air Force Museum at Wright-Patterson AFB, Ohio.

AFA News

During his recent visit to San Antonio, AFA President Joe L. Shosid, left center, visited the Air Force Military Personnel Center (AFMPC) at Randolph AFB, Tex., where he met with Maj. Gen. Travis R. McNeil, left, AFMPC Commander; Brig. Gen. Bennie L. Davis, right center, AFMPC Vice Commander; and E. F. "Sandy" Faust, Texas AFA Vice President for Manpower Support.

A recent dinner meeting cosponsored by AFA's Greater St. Louis and Scott Memorial Chapters featured an address by AFA President Joe L. Shosid. Among the National, Regional, and local AFA officials present were, from left, Earl D. Clark, Jr., Vice President for AFA's Midwest Region; Scott Chapter President Charles Harriss; St. Louis Chapter Secretary Stuart Popp; Mr. Shosid; St. Louis Chapter Councilman William S. Schick; St. Louis Chapter Adviser Col. Donald Hawkins; St. Louis Chapter President Donald Kuhn; and Don Steele, Assistant to AFA's President.

Robert W. Hager, left, Minuteman manager for the Boeing Co., was the guest speaker at a recent dinner meeting of AFA's Ute Chapter at the Hill AFB Officers' Club. The theme of the program was "Minuteman, Its Economic Impact on Utah." In recognition of his outstanding presentation, Chapter President Lee Mohler, right, presents Mr. Hager a plaque of appreciation.

Principals in the recent social function sponsored by the Flatirons Chapter of Boulder, Colo., were, from left, Chapter President Stanley G. Engstrom; AFA National Director George Douglas; Larry Ballweg, a former Project Director at the Holloman AFB Rocket Test Track, who presented a program of slides and movies on the Space Age Railroad; and Roy Haug, Vice President for AFA's Rocky Mountain Region.

AFA State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

ALABAMA (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma, Tuscaloosa): **Cecil Brendle,** 3463 Cloverdale Rd., Montgomery, Ala. 36111 (phone 269-7252).

ALASKA (Anchorage, Fairbanks, Kenai): **Charles W. Lafferty,** 1045 Pedro St., Fairbanks, Alaska 99701 (phone 456-5167).

ARIZONA (Phoenix, Tuscon): **H. J. Bills,** 50 S. 45th Ave., Phoenix, Ariz. 85031 (phone 272-3272).

ARKANSAS (Blytheville, Fort Smith, Little Rock): **Frank A. Bailey,** 605 Ivory Dr., Little Rock, Ark. 72205 (phone 988-3432).

CALIFORNIA (Apple Valley, Burbank, Edwards, Fairfield, Fresno, Harbor City, Hawthorne, Long Beach, Los Angeles, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, Santa Barbara, Santa Clara County, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Ben F. Snell,** 11 Sharon Dr., Salinas, Calif. 93940 (phone 422-7571).

COLORADO (Boulder, Colorado Springs, Denver, Ft. Collins, Pueblo): **James C. Hall,** P. O. Box 30033, Lowry AFB Station, Denver, Colo. 80230 (phone 366-5363, ext. 459).

CONNECTICUT (East Hartford, Torrington): **John McCaffery,** 117 Bridge St., Groton, Conn. 06340 (phone 739-7922).

DELAWARE (Dover, Wilmington): **Franklin R. Welch,** Greater Wilmington Airport, Bldg. 1504, Wilmington, Del. 19720 (phone 566-9520).

DISTRICT OF COLUMBIA (Washington, D. C.): **George G. Troutman,** 1025 Connecticut Ave., N. W., Washington, D. C. 20002 (phone 659-3900).

FLORIDA (Bartow, Broward, Daytona Beach, Ft. Walton Beach, Gainesville, Homestead, Jacksonville, Key West, Miami, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tallahassee, Tampa, West Palm Beach): **A. W. Haymon,** 1421 S.E. 3d Ave., Ft. Lauderdale, Fla. 33316 (phone 525-4161).

GEORGIA (Athens, Atlanta, Savannah, St. Simons Island, Valdosta, Warner Robins): **D. L. Devlin,** 1651 McKinnon Dr., Savannah, Ga. 31404 (phone 234-0109).

HAWAII (Honolulu): **Campbell Palfrey, Jr.,** E. F. Hutton Co., Inc., 700 Bishop St., Honolulu, Hawaii 96813 (phone 521-2961).

IDAHO (Boise, Burley, Pocatello, Twin Falls): **Clarence E. Hall,** 3531 Winsdor Dr., Boise, Idaho 83705 (phone 344-7283).

ILLINOIS (Belleville, Champaign, Chicago, Deerfield, Elmhurst, O'Hare Field): **William A. Johnston,** 302 Harvard Dr., O'Fallon, Ill. 62269 (phone 632-2021).

INDIANA (Indianapolis, Lafayette, Logansport): **C. Forrest Spencer,** 910 W. Melbourne Ave., Logansport, Ind. 46947 (phone 753-7066).

IOWA (Des Moines): **Ric Jorgensen,** P. O. Box 4, Des Moines, Iowa 50301 (phone 255-7656).

KANSAS (Topeka, Wichita): **Don C. Ross,** 10 Linwood, Eastborough, Wichita, Kan. 67201 (phone 686-6409).

LOUISIANA (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Ruston, Shreveport): **Louis Kaposta,** La. Superdome, 348 Baronne St., New Orleans, La. 70112 (phone 422-5140).

MAINE (Limestone): **Alban E. Cyr,** P. O. Box 160, Caribou, Me. 04736 (phone 492-4171).

MARYLAND (Baltimore): **James W. Poultney,** P. O. Box 31, Garrison, Md. 21055 (phone 363-0795).

MASSACHUSETTS (Boston, Falmouth, Florence, Lexington, L. G. Hanscom Fld., Taunton, Worcester): **Arthur D. Marcotti,** 215 Laurel St., Melrose, Mass. 02146 (phone 665-5057).

MICHIGAN (Dearborn, Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Sault Ste. Marie): **Stewart Greer,** 18690 Marlowe Ave., Detroit, Mich. 48235 (phone 273-5115).

MINNESOTA (Duluth, Minneapolis, St. Paul): **Victor Vacanti,** 8941 10th Ave., Minneapolis, Minn. 55420 (phone 854-3456).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Wm. Browne,** P. O. Box 2042, Jackson, Miss. 39205 (phone 352-5077).

MISSOURI (Kansas City, Knob Noster, Springfield, St. Louis): **Robert E. Combs,** 2003 W. 91st St., Leawood, Kan. 66206 (phone 649-1863).

MONTANA (Great Falls): **George Page,** P. O. Box 3005, Great Falls, Mont. 59401 (phone 453-7689).

NEBRASKA (Lincoln, Omaha): **Lyle O. Remde,** 4911 S. 25th St., Omaha, Neb. 68107 (phone 731-4747).

NEVADA (Las Vegas, Reno): **Floyd White,** 3578 Algonquin Dr., Las Vegas, Nev. 89109 (phone 384-8077).

NEW HAMPSHIRE (Manchester, Pease AFB): **R. L. Devoucoux,** 270 McKinley Rd., Portsmouth, N. H. 03801 (phone 669-7500).

NEW JERSEY (Andover, Atlantic City, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Amos L. Chalif,** 162 Lafayette, Chatham, N. J. 07928 (phone 635-8082).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **John J. Dishuk,** 8204 Harwood Ave., N.E., Albuquerque, N. M. 87110 (phone 298-0788).

NEW YORK (Albany, Bethpage, Binghamton, Buffalo, Catskill, Chautauqua, Elmira, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Gerald V. Hasler,** P.O. Box 11, Johnson City, N. Y. 13760 (phone 754-3435).

NORTH CAROLINA (Charlotte, Fayetteville, Goldsboro, Greensboro, Raleigh): **Monroe E. Evans,** 607 Tokay Drive, Fayetteville, N. C. 28301 (phone 488-6008).

NORTH DAKOTA (Grand Forks, Minot): **Kenneth A. Smith,** 511 34th Ave., So., Grand Forks, N. D. 58201 (phone 722-3969).

OHIO (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Toledo, Youngstown): **Robert L. Hunter,** 2811 Locust Dr., Springfield, Ohio 45504 (phone 255-5304).

OKLAHOMA (Altus, Enid, Oklahoma City, Tulsa): **David L. Blankenship,** P. O. Box 51308, Tulsa, Okla. 74151 (phone 835-3111, ext. 2207).

OREGON (Corvallis, Eugene, Portland): **John G. Nelson,** 901 S. E. Oak St., Portland, Ore. 97214 (phone 233-7101).

PENNSYLVANIA (Aliquippa, Allentown, Chester, Erie, Homestead, Horsham, Lewistown, New Cumberland, Philadelphia, Pittsburgh, Washington, Willow Grove, York): **Frank E. Nowicki,** 280 County Lane Rd., Wayne, Pa. 19087 (phone 672-4300, ext. 62).

RHODE ISLAND (Warwick): **Matthew Puchalski,** 143 Sog Riang, Warwick, R. I. 02886 (phone 737-2100, ext. 27).

SOUTH CAROLINA (Charleston, Columbia, Greenville, Myrtle Beach, Sumter): **Burnet H. Maybank,** P. O. Box 126, Charleston, S. C. 29402 (phone 722-4735).

SOUTH DAKOTA (Rapid City): **Kenneth Roberts,** P. O. Box 191, Rapid City, S. D. 57701 (phone 342-0191).

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tullahoma): **James W. Carter,** 314 Williamsburg Rd., Brentwood, Tenn. 37027 (phone 834-2008).

TEXAS (Abilene, Austin, Big Spring, Corpus Christi, Dallas, Del Rio, El Paso, Fort Worth, Houston, Laredo, Lubbock, San Angelo, San Antonio, Sherman, Waco, Wichita Falls): **Stanley L. Campbell,** 119 Bluehill, San Antonio, Tex. 78229 (phone 342-0006).

UTAH (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Verl G. Williams,** P. O. Box 486, Clearfield, Utah 84015 (phone 777-5370).

VERMONT (Burlington): **R. F. Wissinger,** P. O. Box 2182, S. Burlington, Vt. 05401 (phone 863-4494).

VIRGINIA (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **Orland J. Wages,** 210 W. Bank St., Bridgewater, Va. 22812 (phone 828-2501, ext. 91).

WASHINGTON (Bellevue, Port Angeles, Seattle, Spokane, Tacoma): **V. Lee Gomes,** P. O. Box 88850, Seattle, Wash. 98188 (phone 543-3860).

WISCONSIN (Madison, Milwaukee): **Kenneth Kuenn,** 3239 N. 81st St., Milwaukee, Wis. 53222 (phone 757-5324).

WYOMING (Cheyenne): **Elmer F. Garrett,** 109 E. 19th St., Cheyenne, Wyo. 82001 (phone 632-9314).

Bob Stevens'

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