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AIR FORCE

MAGAZINE

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AMERICA'S NEWEST STRATEGIC WEAPON

SRAM—

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The T-38 Talon, the world's first supersonic trainer, has completed ten years of service with the U.S. Air Force Training Command. It possesses the best safety record of any supersonic jet aircraft. The T-38 is also used by NASA's astronauts, the German Air Force, and the U.S. Navy.

Throughout this period of military aircraft development and production, Northrop has met all of its contract cost commitments. And, cost underruns on some contracts have meant significant savings to our customers. For example, after the first five years of production, each new T-38 cost 60 per cent less than when deliveries were begun; and each new F-5A/B cost one-fourth less—despite inflation and cost escalation.

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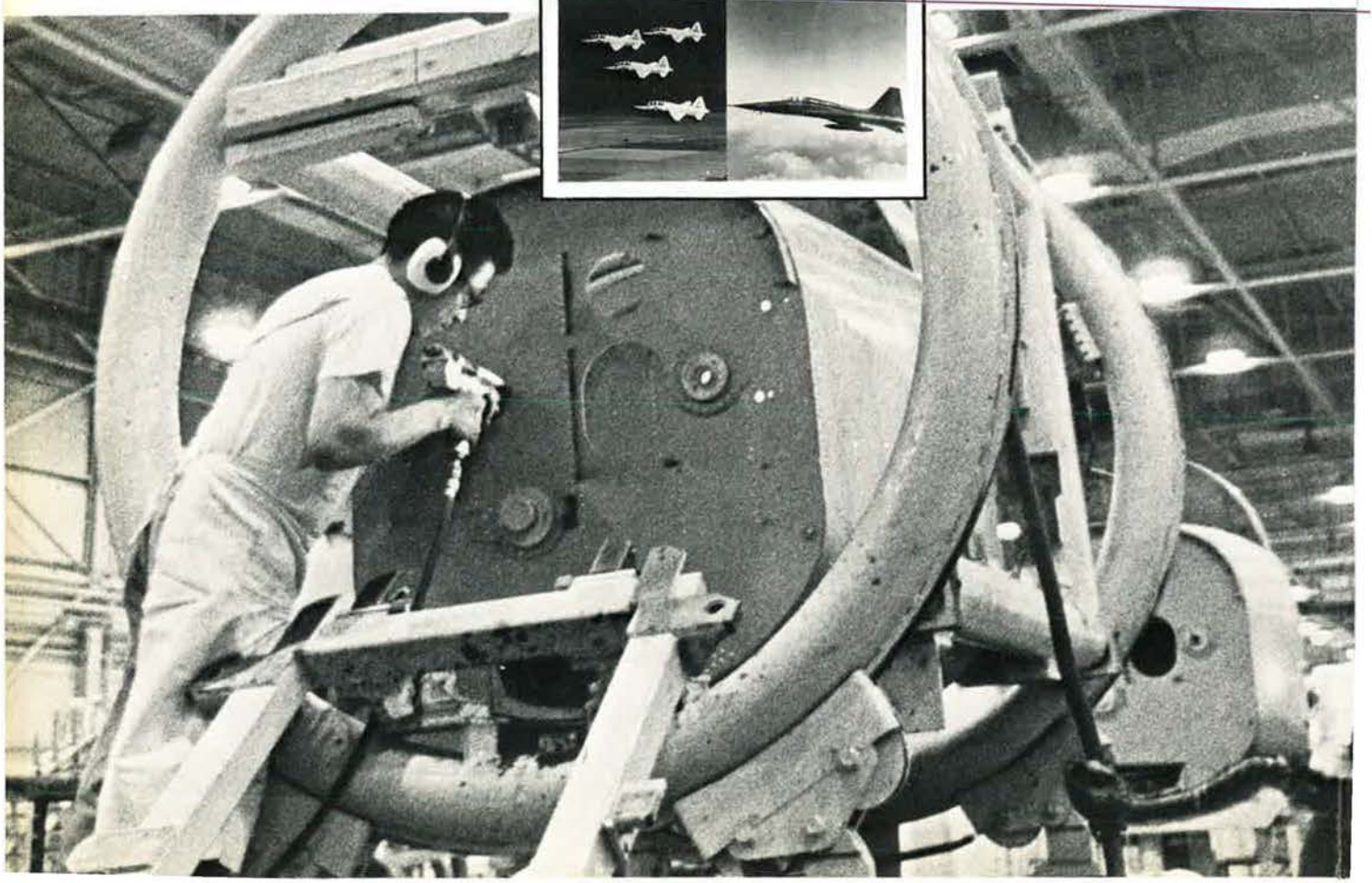
NORTHROP



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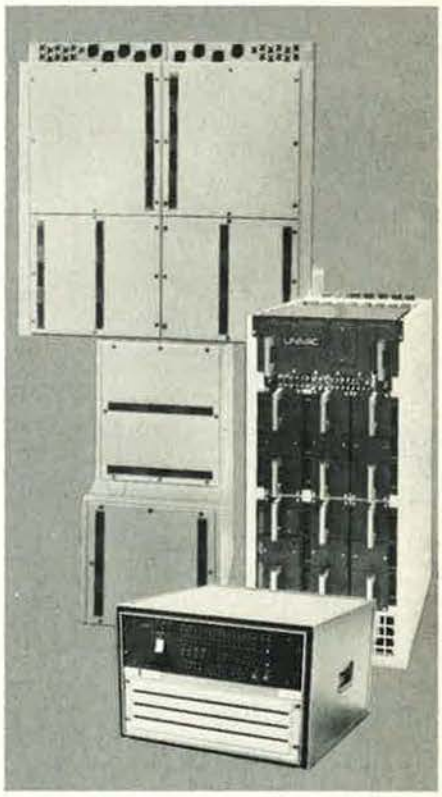

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UNIVAC

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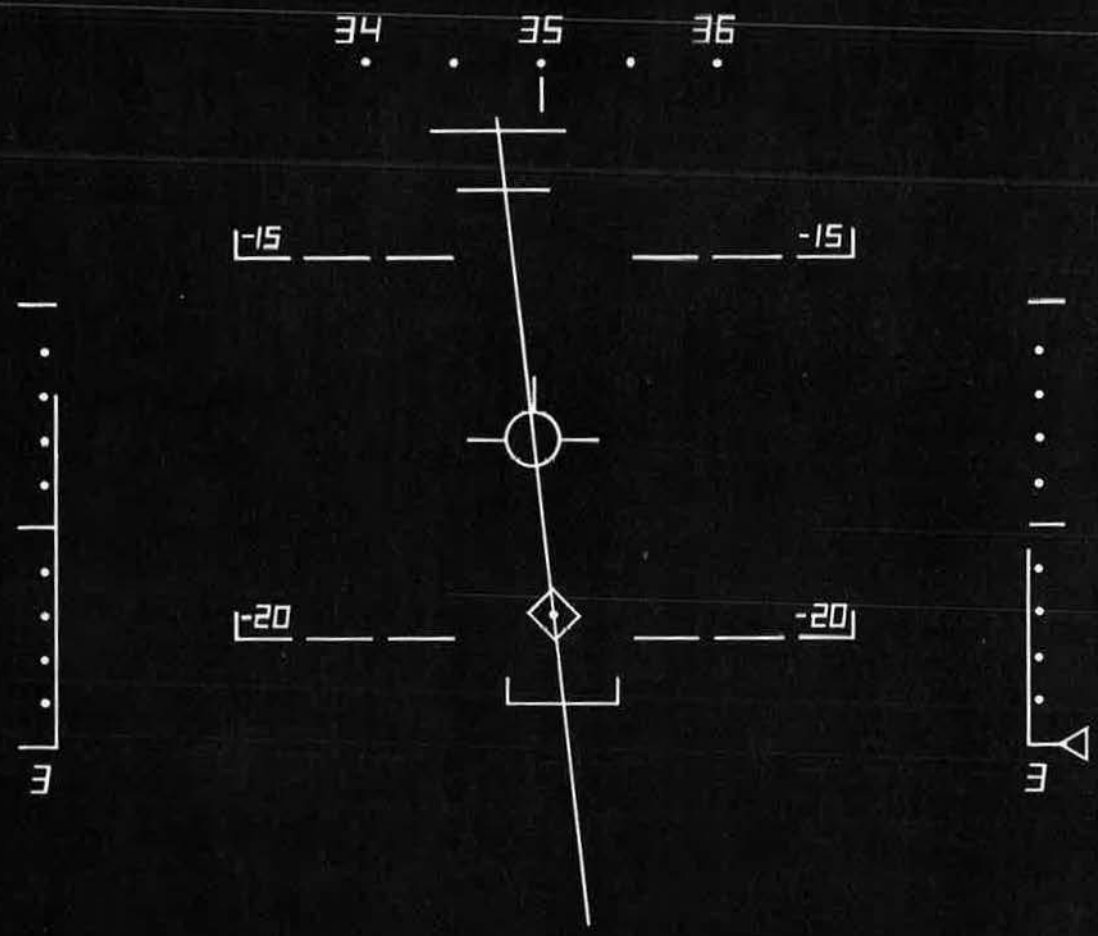

The A-7 makes ground movement after dark a nightmare.

In combat, the devastating accuracy of this aircraft is being applied to an increasing number of night attack missions.

The A-7 is equipped with the most advanced navigation weapon delivery systems in service. The Head-Up Display, shown above, gives the pilot eye-level information required for weapons delivery.

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So when the A-7 prowls at night, enemy ground movement plans go up in smoke.

LTV AEROSPACE CORPORATION
VOUGHT AERONAUTICS

AIR FORCE MAGAZINE

Published by the Air Force Association

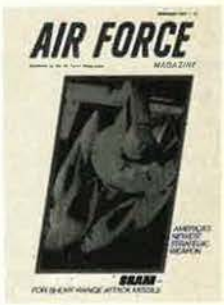
VOLUME 55, NUMBER 2

FEBRUARY 1972

THIS MONTH

THIS MONTH'S COVER . . .

These SRAM missiles on a B-52 rotary launcher symbolize the power and sophistication of this latest addition to our deterrent arsenal, described in the report beginning on page 28.



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An Editorial

Technology: Master, Slave, or Friend?

By John F. Loosbrock
EDITOR, AIR FORCE MAGAZINE

THE President's decision to proceed with development of the Space Shuttle is welcome news. The prospect of enormous enlargements of basic human knowledge must encourage all of us who believe that solutions to the world's ills need all the help that science and technology can provide.

Not everyone, and certainly not all politicians, share this view. No sooner was the Space Shuttle program announced than mutterings of "Who needs it?" began to emanate from those who find political capital in stimulating the mistaken belief that the quality of life can somehow be improved by retreating into blissful ignorance.

In this context, we were pleased to find, in the January issue of the *Bulletin of the Atomic Scientists* (a publication with which we have often differed in the past), an exceptionally articulate and persuasive article by the *Bulletin's* editor, Eugene Rabinowitch. We commend it to your attention. It is larded with fresh and wise perspectives. We cite a few herewith:

"The only effective defense against knowledge is more knowledge. It is popular today to emphasize the need of counteracting the fear and despair created by exploding technology by restoring the emphasis on the humanities, on ethical value systems. They alone, it is said, could give people stability and strengthen their will to assert themselves against soulless technology. But man cannot return from the maturity of knowledge to the innocence of ignorance. Mankind needs a new sense of values, a new philosophy, perhaps even a new religion, but these must incorporate and not exclude scientific knowledge. We must make full use of and not throw away our technological capabilities."

With reference to the ecology enthusiasts, Dr. Rabinowitch pointed out that malaria—the greatest single killer of men—was brought under reasonable control by DDT spraying which, for example, doubled the life expectancy of newborn infants in Ceylon. Alarm over the toxic side effects of DDT caused the Ceylonese government to abandon spraying. "The next year," reports Dr. Rabinowitch, "the number of deaths from malaria rose from practically zero to one million, and Ceylon appealed for a new supply of DDT.

"We need," he writes, "not a flight back into ignorance but a more rational use of our knowledge; not abandonment of pest control and chemical fertilizers but more sophistication in their use. . . . The answer to bad side effects of technology is not to turn back and abandon technology, but to go forward toward better and safer technology."

On the topic of nuclear war, which many see as the ultimate outrage spawned by technology, Dr. Rabinowitch strikes a reasonable note:

"What makes progress toward nuclear disarmament elusive is that the race in nuclear armaments is but one thread in the complex weave of international power competition, in which the possibility of war is an essential 'limiting condition.' Without a believable threat of war, there can be no believable power politics; and without a convincing effort directed at 'winning the arms race,' there can be no plausible threat of war.

"To escape the deadlock of the nuclear arms race, many seek salvation in violent, emotional reactions They attempt to withdraw from the reality of a highly organized society and to escape into a primitive anarchism and emotional antimilitarism. These outburst provoke opposite, equally irrational, emotional response of the more traditional type—patriotic, nationalistic militaristic."

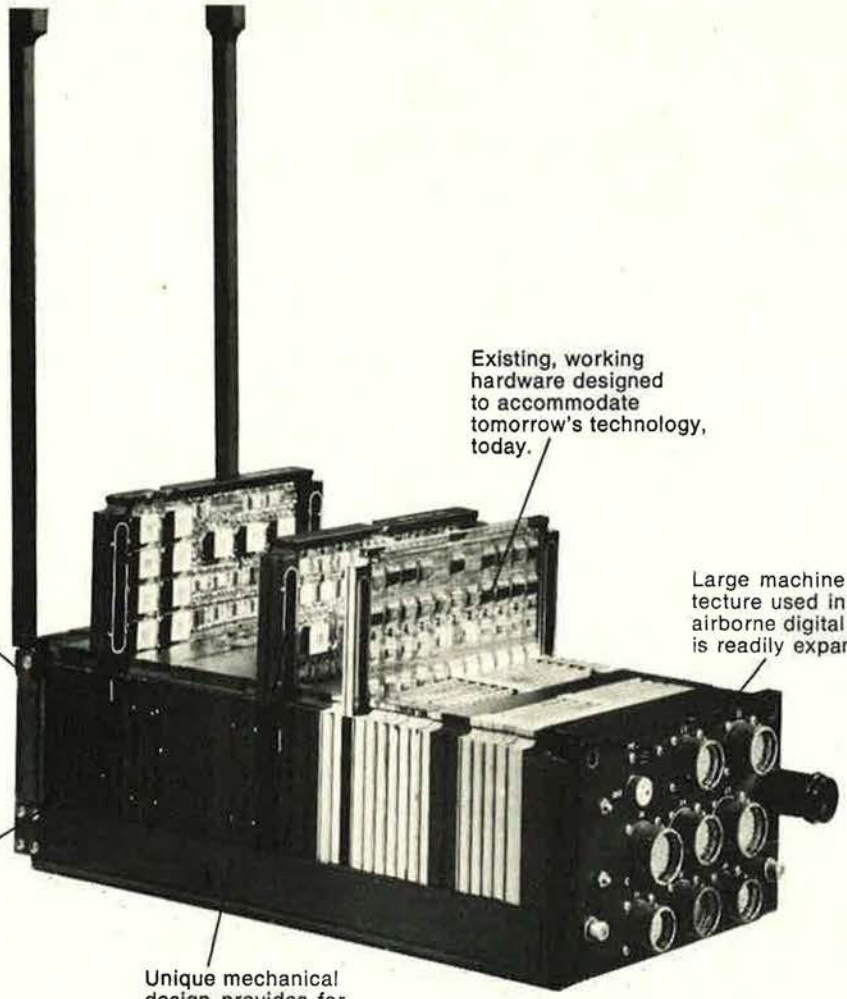
Dr. Rabinowitch seems to be reiterating the ancien truth, today almost forgotten, that wars are made b men—not by weapons, or technology, or science. An the same is true of all the other ills for which tech nology is being blamed today.

A striking point on the same subject is made b Peter Drucker in the January issue of *Harper's Maga zine*. He points out that "practically every environ mental task demands huge amounts of electrical energy way beyond anything now available. Sewage treatmer is just one example; the difference between the trad tional and wholly inadequate methods and a moder treatment that gets rid of human and industrial waste and produces reasonably clean water is primarily elec tric power and vast supplies of it. This poses a difficu dilemma. Power plants are major polluters. And on of their pollution hazards, thermal pollution, is some thing we do not yet know how to handle."

Permit us, now, to close this loop back to the Spac Shuttle. One of its greatest potentials is the exploratio in space, of new power sources, such as pollution-fre controlled nuclear fission, and the possibility, not nece sarily remote, of supplying earth's energy needs fro electrical power plants in space—not only eliminati pollution but conserving shrinking natural resources f future generations.

See how it all hangs together?

The mini-maxi machine. Kearfott SKC-2000 Airborne Digital Computer.



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Typical Characteristics (CPU)	
Number Systems	Binary, floating point and two's complement fixed point
Data words, Floating Point	24 bit mantissa, 8 bit exponents
Data words, Fixed Point	32 bits including sign
Instruction Words	16 bits short, 32 bits long
Instructions	99 total long & short
Address Modes	Direct, indirect, relative, immediate
Average Execution Times For 1.9μ sec memory (LSI)	Add-2.125μ sec, multiply-5.875μ sec Divide -5.875μ sec
Memory words directly addressable	131,072

Airmail

And Our Thanks to *You*

Gentlemen: . . . I received the check for payment on my claim on behalf of my wife's hospitalization.

I take this opportunity to express not only my gratitude but my complete and enthusiastic appreciation for the prompt and efficient manner in which the claim was handled. I've had dealings with large administrative functions before but never, not ever, have I experienced the swift, no-nonsense, red-tape free, consideration afforded me by AFA.

Thank you for a wonderful service well done.

RAYMOND J. TELICZAN, SR.
Mascoutah, Ill.

Our Best Hope?

Gentlemen: Reference "The Military Balance 1971–72" and Edgar Ulsamer's "ABRES . . . The Cutting Edge of the US Nuclear Deterrent," in the December '71 issue.

The articles were good, but they pose questions the public needs the answers to. I agree that credible deterrence includes the ability of our warheads to penetrate even the most sophisticated defense nets and, I might add, to destroy missile sites. Our deterrent posture, however, loses some of its credibility under meaningful examination.

A true assessment must include a detailed analysis of the offensive and defensive main thrust missile capability of each country. Offensively, the Russian SS-9, with its twenty-five-megaton warhead, appears to be capable of destroying the majority of our Minuteman sites with a surprise attack in the near future. The questions, then, are: What do we have left as a deterrent? What chance do our other sea and land missiles of low payload have of getting through Russian ABM defenses and destroying hardened SS-9 sites?

The main offensive capability of the United States is its Minuteman. . . . This missile, with its improved versions II and III, still has only a one-megaton payload. Advanced designs are three years away. Is it realistic to assume that this weapon can now or in the future continue to be an effective deterrent against the mounting odds Russia has in its sophisticated defense and superior offensive missiles resting in their impregnable, hardened silos?

American and Russian cities would not be considered a primary target, consequently, not a primary factor in the above question, although the newspaper propaganda bit about "overkill" is all the public hears. What the public needs to know is how to apply the various missile statistics to the question of how serious is the new Russian threat to our defense. I am no missile expert, but I see an emergency need for an ABM system to safeguard our missile sites and an all-out effort to increase our missile payload.

We certainly don't want SALT to catch us with our missiles down, either defensive or offensive.

LT. COL. G. D. BURLESON,
USAF (Ret.)
Mountain Home, Tex.

• *The questions raised by Colonel Burleson are logical and valid. They coincide with some of the points stressed at AFA's Symposium on Strategic Requirements reported on in this issue (see page 58). The easiest answer, obviously, is proliferation of existing offensive and defensive systems. The political reality being what it is, this happens to be unthinkable. Ergo: ABRES may well be our last best hope for retaining a viable strategic deterrence capability.*—THE EDITORS.

Supporting the Commanders

Gentlemen: Due to my having just been reassigned to SEA and my attending various survival schools, traveling, etc., I have just recently been able to obtain the October '71 issue of AIR FORCE Magazine. . . .

I read with interest Lt. D. R. "Chip" Terrill's letter ["Airmail," p. 10] in the October issue. As a FAC stationed in SEA, I do not claim to have the political expertise of such individuals as Lieutenant Terrill, Miss Jane Fonda, and Mr. Donald Sutherland. I do know, however, that our commanders are privy to information more directly relating to targeting and the general conduct of military operations. As one of Lieutenant Terrill's classmates at the Academy, I learned some of the responsibilities and difficulties regarding decision-making in the military organization.

Our commanders are making decisions in good faith, and it is our responsibility as officers to support them. If this process is morally objectionable to an individual, then I feel that individual is in the wrong business.

1ST LT. THOMAS C. WASKOW
APO San Francisco

Ground Crews Slighted

Gentlemen: Your article, "Best Hit '71," by Lt. Col. Harold A. Susskind, published in the October 1971 edition, rubbed me the wrong way. After reading the story I find that the entire ground crews [mentioned] for all nations involved totaled five—those pictured on page 51. These five men must not have any names because I notice on all the other photos in the article the author has taken great care to fit names with the pictures. I wonder if the fact that all the other photos are of officers has anything to do with it?

The photo at the lower right on page 50 shows some Air Force F-4Es with SUU-21A practice bomb dispensers. I take it that these were loaded by the pilots! Strange, however, in my four years as a weapon mechanic I don't remember a pilot loading his own bombs.

What I'm getting at is this: I feel the author should have covered the entire event. In this type of event there is usually keen competition amongst *all* members of each crew. *Not* just the aircrews. The next time how about a line or two about those guys who keep the birds in the air!

STEVE MELTSNER
New London, Conn.

Air Age '73

Gentlemen: I was pleased to note the section on "Unit Reunions." . . . I would appreciate word being spread that the 100th Bomb Group (H), sometimes known as the "Bloody 100th," will hold its quadrennial reunion in Milwaukee, Wis., July 27–29, 1973. At the present time, the 100th Bomb Group (H) is scheduled to hold its reunion in Milwaukee either concurrently with the 100th or immediately thereafter. It is hoped that both of these reunions will coincide with the Air Age '73 air show, held annually at Mitchell Field, Milwaukee. . .

Hopefully, we would like to have a B-17, a B-25, and any other World War II aircraft possible as part of the show. Any other organization interested in holding a reunion in Milwaukee during that time is asked

contact the writer, a former crew member and adjutant of the 100th Bomb Group (H). We can promise a good time, lots of publicity, and fun for the whole family.

FRED S. DAIGER,
Executive Director
Milwaukee Convention and Visitors Bureau, Inc.
828 North Broadway
Milwaukee, Wis. 53202

Wings, Badges, and Patches

Gentlemen: . . . I have been a reader for eighteen years and I enjoy the magazine very much. As USAF history is my hobby, I am hoping some readers might be able to help me. I am trying to complete my collection of Air Force wings and badges. I need the following items and thought that possibly some members might have an old pair they would send me:

USAAF Glider Pilot Wings.
USAAF Liaison Pilot Wings.
USAAF Navigator Wings.
USAAF Flight Nurse Wings.
USAF Command Pilot Wings.
USAF Master Navigator Wings.
USAF Parachutist Badge.
USAF Nurse, Dentist, and Physician Badges.

Also need any USAAF or USAF unit patches. Age and condition of these items doesn't matter.

KENT KISTLER
918 Georgia Dr.
De Pere, Wis. 54115

Wanted

Gentlemen: I would be very grateful if former members of the Army Air Forces of World War II would send me one good shoulder patch of the AAF they were in—from the First through the Twentieth.

LEONARD R. GODBOLD
P-47 Thunderbolt "Jug" Historian
104 Rhoda Ave.
Nesconset, N. Y. 11767

UNIT REUNIONS

Aviation Cadet Class 42-B

The 30th reunion of Mather and Luke Pilot graduates is scheduled for February 17–20, 1972, at the Town and Country Hotel, San Diego, Calif. Details may be obtained from

W. E. Radtke
March and McLennon
One Bush St.
San Francisco, Calif. 94104
Phone: (415) 981-1900
or
R. E. Monroe
4462 Elm Tree Lane
Irvine, Calif. 92664
Phone: (714) 833-2238

Oberwiesenfeld Signal Depot

I am trying to locate all officers who were stationed at Oberwiesenfeld Signal Depot, Munich, Germany, during the years 1946–1948, for the purpose of organizing a reunion, either toward the end of the summer Olympics or immediately afterward. If interested please write

Lt. Col. Guilbert L. Regnier, USAF (Ret.)
65 Via Havarre
Merritt Island, Fla. 32952

Senior Chiefs

Original Chief Master Sergeants in the USAF (those with date of rank December 1, 1959, and May 1, 1960) interested in the 1972 National Convention please contact

CMSgt. Edward A. Richmond
Coordinator
Box 3923
APO New York 09283

8th and 13th Bomb Squadrons

The Association of the 8th and 13th Bomb Squadrons, B-57 Canberra units in Vietnam, plan a reunion during the summer of 1972 in Stockton, Calif. All former members of the units, which go back to 1917 as Aero Squadrons, are cordially invited to attend and are asked to check in with a position report. They should send current address and known addresses of other former squadron members to

Lt. Col. Frank (Smash) Chandler, USAF (Ret.)
Information Officer
Sharpe Army Depot
Lathrop, Calif. 95330
Phone: Autovon 462-2561

8th Tactical Fighter Wing

The annual reunion of the 8th Tactical Fighter Wing will be held February 25–26 at the Sheraton-Park Hotel, Washington, D. C. For further information contact

Lt. Col. F. N. Markey
Hq. USAF (XOXFTJ)
Washington, D. C. 20330
Phone: (202) OX 7-6838/5-7545
or
Lt. Col. R. L. Markey
1111 - 19th St.
(AF/SAGF)
Arlington, Va. 22209
Phone: (202) OX 4-8571

20th Air Force and Former AF Members

Two reunion tours at reduced rates are planned for 1972 through the Western Pacific. The first, scheduled for April, will be through the Trust Territory, including visits to Guam, Saipan, Tinian, Truk, Ponape, Palau, and Hawaii. The second tour, in September, will be to the Marianas, Hong Kong, Tokyo, and Hawaii. Full details from

20th Air Force Association
4465 MacArthur Blvd.
Washington, D. C. 20007

40th Troop Carrier Sqdn.

The 30th reunion of the 40th Troop Carrier Squadron, 317th Troop Carrier Group, will be held on July 21–24, 1972, at the Royal Host Motel, Anaheim, Calif. Contact

B. B. Runkle
1683 W. Palais Rd.
Anaheim, Calif. 92802
Phone: (714) 772-0842

56th ACW/SOWg

The 4th annual "Truck Killer" reunion will be held April 21–23, 1972, at Fort Walton Beach, Fla. All officers who have been assigned or attached to the 56th Air Commando/Special Operations Wing at Nakhon Phanom, Thailand, are encouraged to attend. For reservations and further information write

56th ACW Reunion
P. O. Box 7
Mary Esther, Fla. 32569

58th Bomb Wing, 20th Air Force

The 58th Bomb Wing will hold its 15th annual reunion August 2–6, 1972, at Harlingen, Tex., home of the Confederate Air Force. All former 20th Air Force personnel are invited. Contact

Joe Pokraka
1730 La Porte Ave.
Whiting, Ind. 46394
or
Glenn Bercot
Confederate Air Force
Harlingen, Tex. 78550

92d Bomb Group, 1st and 11th CCRC

The 30th reunion of the 92d Bombardment Group and the 1st and 11th Combat Crew Replacement Centers, stationed at Bovingdon, England, during World War II, will be held April 26–30, 1972, at Dayton, Ohio. Write to

Col. John R. Mitchell, USAF (Ret.)
2525 Ocean Blvd., F-4
Corona del Mar, Calif. 92625

94th Troop Carrier Squadron

The 94th Troop Carrier Squadron (439th Troop Carrier Group) is having its first reunion since World War II in September/October of 1972. All those who served with the squadron at any time from Sedalia, Mo., through Europe (1943–1945) and would like to attend are urged to get all details as soon as possible. This will be a two-phase reunion, consisting of a two-day affair followed by a European trip for those who will be able to make it. Contact

Adam Parsons
44 N. Highland Ave.
Akron, Ohio 44303

384th Bomb Group

The fourth annual reunion of the 384th Bomb Group, 8th Air Force, will be held at the Hilton Inn, San Francisco, Calif., July 20–22, 1972. For information contact

Col. Nathan H. Mazer, USAF (Ret.)
c/o Weber County Industrial Development Bureau
2433 Adams Ave.
Ogden, Utah 84401

Airpower in the News

By Claude Witze
SENIOR EDITOR, AIR FORCE MAGAZINE

Airpower: Front and Center

WASHINGTON, D. C., JANUARY 10

For the moment, the war between Henry Kissinger and columnist Jack Anderson has pushed the war in Vietnam out of the top headlines. It will not be for long. It was in the month of February a few years back, you should remember, that you read about the Tet offensive. That was the one during which the Communists deliberately buried alive several thousand people at Hué. Some of the same men running for President now, in 1972, were running then, in 1968. Senators McCarthy and McGovern were and are among them, and we remember commenting then that neither of them raised a word of protest against the North Vietnamese atrocities.

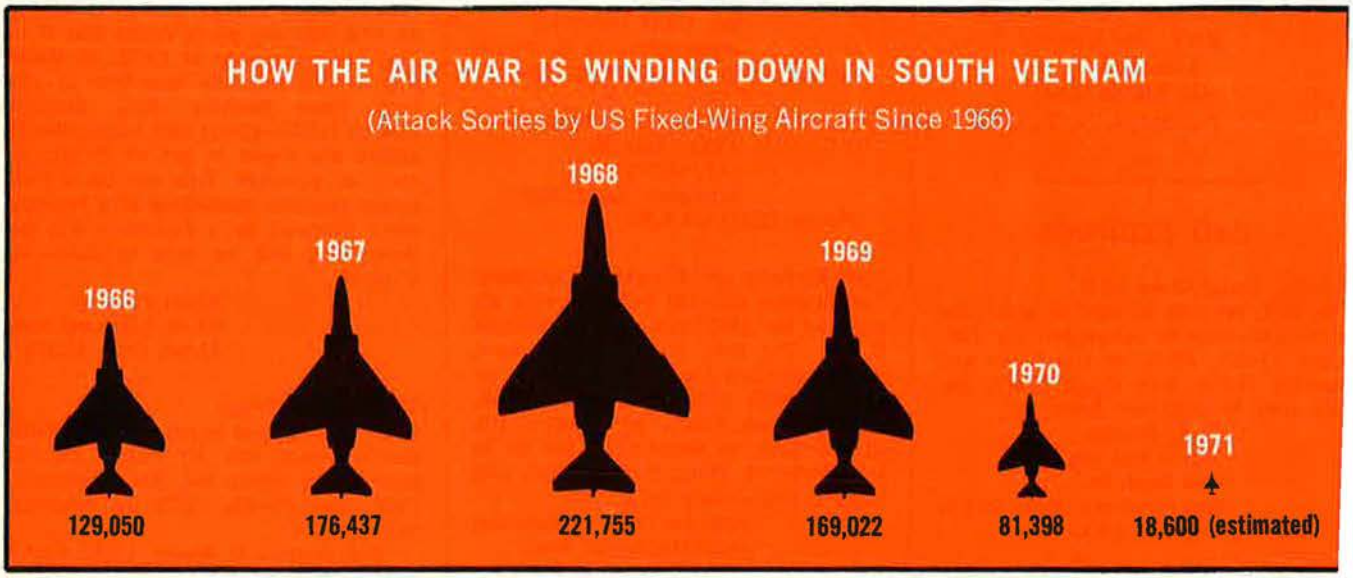
The reason for recalling this is that we are going to press, here in early January, faced with strong indications that before our readers get this magazine there will be another Tet offensive, possibly more gruesome than the one of four years ago. If it does not turn out this way, it will be American airpower that prevents it.

To begin with, there is no reason why the use of our Air Force and Navy bombing capability in this situation should surprise anyone. The political and editorial outrage that steamed and exploded in the press as 1971 drew to a close had no foundation in fact. "Why Do We Bomb the Way We Do?" was the headline on a local editorial. Reporters at the Pentagon, the White House, and the State Department pressed daily for another Administration explanation of the bombings that resumed in late December. In fact, the press challenge was not so much a demand for an explanation as for justification.

The answer is more than a year old. The American people want their ground forces brought home from Vietnam, and nobody disagrees with this objective. Most people feel the troops never should have been sent to Vietnam in the first place. The now-ancient injunction that we should not try to fight a ground war in Asia has never been anything but good advice. President Nixon knows this, and he said more than a year ago he was going to bring home the troops and rely on airpower to defend what remaining interests we have in the theater.

The President said at a news conference in December 1970 that he would accept no restrictions on the use of American airpower in Indochina and that, if Hanoi threatened his objective of preserving a non-Communist South Vietnam, he would bomb the North. On January 4, 1971, in a television interview from the White House, Mr. Nixon said:

"I have no desire to resume the bombing of North Vietnam. We do not want to go back to the bombing of strategic targets in North Vietnam, and we do not want even to bomb military targets unless it becomes necessary to do so . . . and this is the key point . . . to protect American forces. . . . When they fire on those planes, I have given instructions that we will take out the SAM site or whatever it is that has fired upon them. . . . The President of the United States, as Commander in Chief, holds a responsibility to [US ground forces] to see that they are not subjected to an overwhelming attack from the



Figures disclosed by USAF Secretary Seamans show trend in attack sorties carried out by US fixed-wing planes in South Vietnam. Much of this burden is being taken over by the South Vietnamese Air Force as Americans press withdrawal.

HAZARDOUS HAULING ON THE HO CHI MINH TRAIL

(How Air Force Truck-Busters Keep Cargo Tonnage Down)

Much of what goes in does not come out. USAF data show how airpower has taken increasing toll of the supplies North Vietnam pours into the Ho Chi Minh Trail. This effort is aided by improved gunships and sensors to locate trucks.

North. That is why we must continue reconnaissance, and that is why, also, if the enemy at a time we are trying to deescalate . . . starts to build up its infiltration, starts moving troops and supplies . . . I will have to order bombing strikes."

It was nearly a year before the President was forced to take action. The critics then took off in a pack, led by Senator Muskie, portraying the attacks as an outrageous assault on innocent peasants. It was, of course, no such thing, just as it was not an escalation of the air war.

The latter point was made most clear by Air Force Secretary Robert C. Seamans, Jr., at a press conference on December 16. Reporting on a visit to Southeast Asia, the Secretary presented charts depicting how the air war has been tapering off since the peak in 1968. Dr. Seamans said he can demonstrate that "no matter how you slice it," the trend of American air activity is down by fifty percent or more in the past three years. The number of US attack sorties in Southeast Asia by USAF and Navy tactical airplanes and B-52 bombers in calendar 1971 comes to about thirty-nine percent of what it was in 1968. The number of American attack aircraft in Southeast Asia has dropped from about 1,200 to about 350.

In terms of basing, we are operating out of five bases in South Vietnam, as opposed to fifteen four years ago. Bases in Thailand have been cut from seven to five. On the subject of air munitions delivered, the Secretary's chart for 1971 was not complete, but it indicated that the 1971 total tonnage dropped in Southeast Asia will be not more than half that used in 1968.

Possibly the most interesting chart shown by Dr. Seamans was concerned with the tonnage of supplies put into the Ho Chi Minh Trail by the North Vietnamese, compared with the tonnage they managed to get through. The figures are shown graphically in the chart on this page. What the chart shows is that in 1971 the enemy increased his effort, and airpower took a major bite out of his results. In this period, USAF introduced an improved AC-130 gunship and put twelve of them in operation. The B-57 was in the operation. Bombs have become smart, guided by laser beams, and the trail sensors work well at keeping track of the trucks. This year there will be six more AC-130 gunships, of the "E" version that will provide more endurance, and improved sensors will be in place.

The Air Force Secretary reported a buildup in the North Vietnamese truck inventory. We have been destroying or damaging three times as many trucks as we did a year ago, but he estimates the enemy still has about 3,000 vehicles in the panhandle of Laos at any one time, 1,000 of them in motion at night. Just as important, there is a buildup of new trucks and spare parts under way at this time in parks around Haiphong, Hanoi, and north of Hanoi. USAF estimates there are 7,000 or 8,000 trucks in areas where there were few six months ago. They are of Russian and Chinese origin.

Since Dr. Seamans' report, the word from Saigon is that North Vietnam is gearing up for new action. The enemy is described as having stockpiled a record amount of war materiel, and one intelligence officer is quoted as saying, "He's in a frame of mind to make a push, and that's what we are going to see."

The enemy will get his answer from the air. It is an approach President Nixon embraced many months ago and one that airpower advocates have endorsed since we first got involved during the Kennedy Administration.

The Wayward Press

Because it has not been mentioned elsewhere, to our knowledge, readers of AIR FORCE Magazine should be told that the Columbia Broadcasting System has prepared and released a "detailed analysis of the main issues" in the controversy over the year-old documentary called "The Selling of the Pentagon."

A Washington spokesman for the network says CBS "would have preferred not to stir the ashes any more than we could help," but "could not avoid or put off making an answer" to criticisms of the show. He said the lengthy document was made available to "professional societies and other groups" that had asked for the network's explanation.

It does not appear, at this writing, that the distribution list included any of the critics of CBS. It did not include

Airpower in the News

the editors of AIR FORCE Magazine, despite the fact that CBS News President Richard S. Salant promised months ago to provide us a copy. It did not include the Special Subcommittee on Investigations of the House Committee on Interstate and Foreign Commerce, or its counsel, Daniel J. Manelli. It did not include Accuracy in Media, the Washington-based monitor group that posed a list of questions last March and has had no reply.

The distribution did include the Radio-Television News Directors Association, whose president, Chet Casselman, passed it on to Congressman Ogden R. Reid of New York, who is not a member of the Interstate and Foreign Commerce Committee, the one that investigated the Pentagon show. Mr. Reid, however, put the text in the *Congressional Record,* which appears to be the only place it has had public exposure. The CBS apologia is so long Mr. Reid was forced to release it in two installments, covering nearly ten pages in the *Record.* They appeared December 15 (page E13493) and on December 17 (page E13697).

It seems clear from the text that it was prepared, for the most part, by the same men who wrote the script and did the editing of "The Selling of the Pentagon." It is a defense of their brand of television journalism. The document says film editing is a subjective procedure, and reasonable men can differ on how it should be done. It also says the editor's decisions questioned by his critics last winter "did not substantially affect the substance of the broadcast." The outright misrepresentations and rearrangement of film that were placed under scrutiny by the House subcommittee in hearings last spring are posed as innocent and reasonable exercises of journalistic judgment.

From time to time, there is an acknowledgment that the film could have been more accurate, or "a fuller answer could have been broadcast." The intent, CBS says at one point, "was to condense and clarify, not to deceive."

The unmentioned truth is that CBS had ground rules, dating at least back to 1959, that were violated by the editors of the program. More significant, from the standpoint of TV viewers and the House subcommittee, is that this stirring of the ashes by CBS includes no reference to the fact that on June 28, 1971, the network laid down a new set of operating standards—guidelines—that make it impossible for this editing performance to be repeated by any conscientious employee.

From that date on, editing must reflect what was said without distortion. If the juxtaposition of questions and answers is changed in an interview, this must be made clear. Excerpts from speeches or statements must not be rearranged into a different order, unless that also is made clear to the audience. There must be "no distortion or alteration of content or meaning."

Well, that's what the row was all about. If CBS editors now live up to the new rules, critics of "The Selling of the Pentagon" will have made their point, resulting in better electronic journalism. The ashes may not warrant further stirring, but vigilance must not be relaxed.

* * *

In case anyone is still interested, "The Selling of the Pentagon" is available for rental. It can be obtained for a fee of $65 from American Documentary Films, a nonprofit educational organization with offices at 336 West 84th St., New York, N. Y. 10024, or from 379 Bay St., San Francisco, Calif. 94133.

American Documentary Films advertises that it circulates "Films for Agitation." In addition to the CBS masterpiece, you can select from a list that includes, for example, "79 Springtimes," described as "a brilliant impressionist biographical tribute to Ho Chi Minh." And there is "Hanoi, Martes 13," which is a "moving salute to the Vietnamese," presumably those in North Vietnam. Then there is available, "Stagolee: Bobby Seale in Prison," a film in which the Panther leader speaks out, and another picture in which Angela Davis tells it like it is, from her viewpoint in jail.

The American Documentary Film catalog does not include "Road to the Wall," a documentary produced by CBS for the Department of Defense in 1962.

* * *

There are moments, in our examination of the Wayward Press, when we run across items that are so ludicrous it is difficult to dignify them with a rebuttal. We will make an exception this month and call attention to an interview in the Washington *Post* of New Year's Day, hoping it is not a portent of the shudders we will experience throughout 1972. A reporter named Phil Casey interviewed a former $75,000-a-year editor of the *Saturday Evening Post* named Clay Blair, Jr. The occasion seems to be that Mr. Blair has written a novel and the local newspaper wants to help him publicize it. The novel is a story about a Navy captain, and the author took the opportunity to demonstrate to the Washington *Post,* and its readers, that he is fully qualified as an expert on Navy matters.

He took as an example the new Undersea Long-range Missile System (ULMS). According to the interview, Mr. Blair told Mr. Casey:

"I don't understand why there is no discussion of ULMS in the newspapers or anywhere else. . . . It never gets mentioned. . . . This program, if it was to go through, would cost the country about $100 billion. And there is no discussion of it, no investigation of it!"

The first Navy officer we showed this to said, "Where has he been, in Manchuria?"

Our own ULMS file, by no means complete, contains public statements and speeches about ULMS that go back at least to early 1969. Newspaper clippings, many of them from page one of the Washington *Post,* are erupting from the envelopes. The Air Force Chief of Staff, Gen. John D. Ryan, has mentioned ULMS in his speeches. The House Democratic Study Group issued a report on ULMS in March of 1970. Vice Adm. Hyman G. Rickover, a man Clay Blair says he knows well, has testified on the subject and been widely quoted. This magazine has carried editorial discussions of the project. There are hundreds of words of testimony on the subject in published hearings of House and Senate committees.

Mr. Blair's estimate that the program will cost $100 billion can be based on nothing less than an estimate that the Navy will build a hundred ULMS systems. This has never been projected, and has not been suggested even as far back as 1968, when the studies started.

The earliest reference we can find in our own files to the ULMS project is in hearings of the Preparedness Investigating Subcommittee of the Senate Armed Services Committee, held in March of 1968. The project name, ULMS was deleted by the censors at that time, but it is clear that it was the project under discussion. In 1968, the single civilian who knew the most about ULMS was the Secretary of the Navy, and he was a witness before Chairman John Stennis and his colleagues. His name was Paul R. Ignatius. Mr. Ignatius later became president of the Washington Post Co., publishers of the newspaper that printed the interview in which Clay Blair said ULMS "never get mentioned." Mr. Ignatius has resigned from the newspaper, for reasons he described as personal.

SCIENCE/SCOPE

A self-cooling sunshade to prevent aperture loading and a rotary joint to carry cooling fluid across the gimbal interface are two unique features that promise longer life for the celestial mapper aboard a U.S. Air Force satellite. The electro-optical system, developed by Hughes for USAF's Space and Missile Systems Organization, is a highly sensitive instrument that will collect radiometric data on the natural celestial background. During early tests it mapped 80 percent of the sky during three revolutions of the earth.

Can the U.S. protect itself against missiles launched from submarines close off the coast? A Hughes team is studying the problem under the direction of a joint Army-Navy steering group. They are examining all potential threats of nuclear subs along America's 12,000-mile coastline, working out the best countermeasures, and making recommendations for defensive roles. Their goal is to develop a multi-faceted defense posture so credible it will dissuade enemy attack.

A long-life solar cell power supply system for orbiting satellites, now being developed for the U.S. Air Force by Hughes, will be capable of operating at altitudes between 200 and 22,300 nautical miles, or higher, for at least seven years. It will incorporate technology which Hughes developed for USAF's FRUSA (Flexible Rolled-Up Solar Array) program, a system of extendible solar cell panels unfurled like windowshades in space to convert the sun's energy into electrical power.

A missile with an all-plastic airframe was successfully test-fired on the first try by the U.S. Army Missile Command at Huntsville, Ala. The new technology, which Hughes developed last year for the U.S. Air Force Materials Laboratory, may prove practical for mass production of a variety of missiles and rockets. Plastic could have several advantages over metal: better aerodynamic heating performance, fewer corrosion problems, reduced radar reflectivity, fewer accidental dents and scars resulting from typical field handling, and low cost.

Two new series of lightweight digital computers have been developed by Hughes for central avionics, ECM, missile guidance, RPV, and other military applications. The HCM-230, latest of a line of Hughes airborne computers spanning 20 years, is a 24-bit, 92-instruction, truly modular computer with a throughput of 400,000 operations per second. The Mini-HDP is a low-cost minimal unit. Though very small (20 cu. in. including 8K of memory), it is a 19-instruction, 16-bit-word-length LSI computer of about 600,000 operations per second.

The U.S. Army has awarded a $99.6-million contract for production of TOW missiles to Hughes, developer of the wire-guided anti-tank weapon system. The award was based on Hughes' low bid in a fixed-price-per-missile, winner-take-all competition.

The governments of Iran and The Netherlands will equip their armies with TOW missiles. Iran will deploy TOW with armored infantry, helicopter, and infantry units, the Royal Netherlands Army with anti-tank units at the brigade level. They will purchase the missiles from the U.S. Army Missile Command, Huntsville, Ala.

Aerospace World

News, Views & Comments

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C., JAN. 12

The deteriorating situations in Laos and Cambodia . . . the threat to South Vietnam by enemy resupply along the Ho Chi Minh Trail . . . the loss of control of the air war posed by increased MIG and antiaircraft activity . . . the desire to protect American troops withdrawing from SEA.

These and other reasons have formed the core of speculation concerning President Nixon's decision to initiate in a period from late December through early January a bombing campaign in SEA by US aircraft.

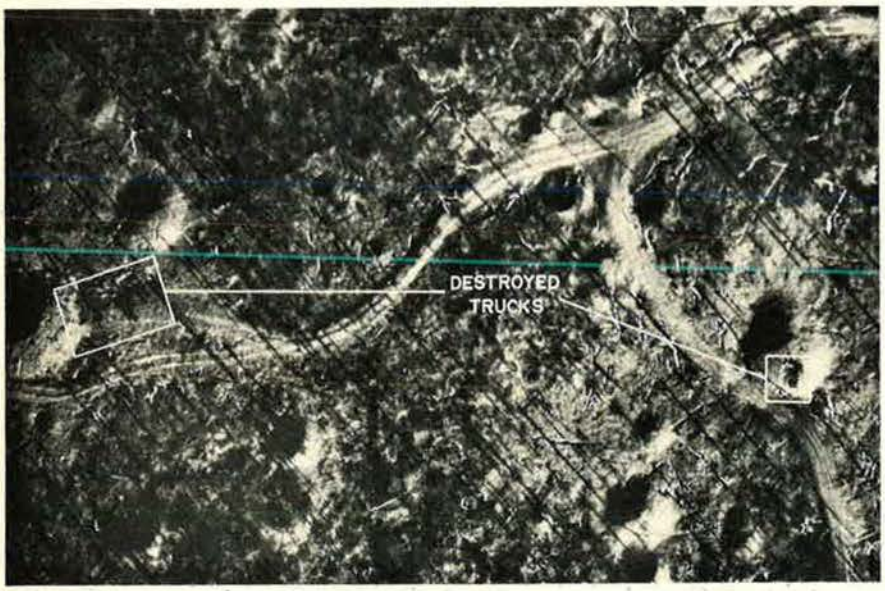
In a CBS television interview, the President himself pointed to increased enemy infiltration and attacks on unarmed reconnaissance planes as reasons for his decision.

"Under those circumstances," he said, "I had no other choice but to bomb, in this case selected military targets and supply buildup areas."

The President went on to link his intent to maintain a residual US military force indefinitely in Vietnam to the MIA/POW situation. He asserted that such a course was necessary to ensure a bargaining point with the enemy. He posed the question: "Can the President . . . withdraw all our forces as long as the enemy holds one American as a prisoner of war? The answer is no. If POWs are still retained in North Vietnam, in order to have any bargaining position at all with the North Vietnamese, we will have to continue to retain a residual force in Vietnam, and we will have to continue the possibility of air strikes on the North Vietnamese."

The President's statements caused consternation among those MIA/POW families who have grown to believe that only with the complete withdrawal of American forces from SEA—or at the very least an agreement to that effect—will the prisoners be released.

Although of limited duration, the intensive air strikes—and the President's revelation of his policy decisions—created as much stir as any in the long chain of controversies resulting from the US effort in Southeast Asia.



Bomb craters line a section of the Ho Chi Minh Trail in Laos. This USAF aerial photo shows that F-4 Phantoms have been successful in a mission against truck traffic. Air Force and Navy jet fighter-bombers are responsible for patrolling a total of about 3,000 miles of roadnet.

For an analysis of the US Department of Defense position on the bombing offensive, see "Airpower in the News," p. 8 of this issue.

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The 1971 Aerospace Industry Review and Forecast, compiled by the Aerospace Industries Association, Washington, D. C., contained but sparse indications that light would appear soon at the end of the aerospace tunnel *(see "What They're Saying . . ." on p. 21 for remarks by Karl G. Harr, Jr., head of AIA).*

Charts prepared for 1972 mostly continue the downturn of previous years. Aerospace sales during the year are expected to slip to $22.9 billion from $23.3 billion in 1971. The decline is in both space and commercial sales.

In human terms, unemployment will also follow its expected downward course, with layoffs from December 1971 to December 1972 of 56,000. This means a decline from 931,000 to 875,000—a hefty percentage. (Although the industry continues to be the nation's largest manufacturing employer, aerospace scientists and technicians are being hard hit; from a peak in that category of 235,000 in June 1967, a decline to 147,000 is expected by June 1972.)

One bright spot in the report is that sales to the Department of Defense will see an increase to $14 billion in 1972 from $13.3 billion in 1972.

A rallying point in 1971, the report indicated, was the rise in commercial aerospace sales, due primarily to the delivery of wide-bodied jet transports; these sales totaled $4.903 million compared with $4.578 million in 1970. This trend, however, is expected to decline in 1972, as production-line activity thins out.

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The Air Force has implemented a voluntary early-out program for rated officers whose separation dates fall on or before June 30, 1972.

The program is the result of budget limitations and the strength adjustments affecting all the services now that reduced personnel tables have been scheduled.

For support officers, including cha

lains and judge advocates and those medically exempted from flying duties (Code-2 rated), early release will be permitted for those with separation dates extending to June 30, 1973. For all officers separating early, release will take place not later than February 29, 1972.

Excluded from the program are medical officers and officers participating in student programs, as well as those tagged for overseas posts prior to February 29 or serving in short-tour areas scheduled to return on March 1 or later.

Another Air Force program will excuse from flying duties about 500 rated officers by June 30, the end of this fiscal year. Officials cited the austerity budget and actual or projected reductions in the aircraft inventory for the move.

USAF was quick to point out that the effect on the aircraft inventory has been "a retention of maximum combat capability from within the remaining aircraft resources and a loss of pilot-support capability."

First on the list for excusal from flying duties will be colonels in support duties and officers "assigned to the controlled rotation portion of the rated supplement," USAF said. The latter includes primarily older pilots.

—Wide World Photos

At the Western White House, President Nixon and NASA Administrator Dr. James Fletcher discuss plans for the forthcoming Space Shuttle project (see below). In January the President authorized the expenditure of more than $5.5 billion on the project, which could mean the creation of some 50,000 new jobs.

US Army Gen. John L. Throckmorton has been named Commander in Chief of the US Readiness Command (see item below and on p. 14).

☆

The unified US Strike Command was deactivated at the end of the year

Space Shuttle Go-Ahead

On January 5, President Nixon told NASA to proceed with development of the Space Shuttle. Involved is a commitment of more than $5.5 billion over the next six years to build a manned system designed to be launched like a rocket and, after its mission in near-earth orbit, return for aircraft-like landings.

NASA Administrator Dr. James Fletcher said that his agency has already completed preliminary designs for the system and that requests for proposals to contractors will be issued this spring. A prime contractor for the Shuttle's development and procurement phase will be selected sometime during the summer.

Expected to compete for the contract are McDonnell Douglas Corp., General Dynamics Corp., Boeing Co., Lockheed Corp., Martin Marietta Corp., Grumman Corp., and North American Rockwell Corp.

The Shuttle development will mean a shot in the arm to the US's lagging aerospace industry *(see opposite page)* and the prospect over the six-year period of the creation of more than 50,000 jobs.

Still in question are the launch and landing sites for the Shuttle, the resolution of which will mean additional jobs and perhaps another $300 million in funding, Dr. Fletcher said.

Great things are anticipated for the Shuttle, including the most prominent factors—sharply reduced costs and complexity for earth-orbit launches. The Shuttle is visualized as performing any number of roles, from weather observation to surveys of earth's resources.

The President's proposed Shuttle configuration meets all key military requirements in terms of size and payload.

SSgt. Tony Godwin of the 509th BW, Pease AFB, N. H., instructs Pam Cullom on B-1 mockup at SAC bomb meet, McCoy AFB, Fla. (see p. 14).

after more than ten years of service. It was replaced immediately on January 1, 1972, by the US Readiness Command, which will carry on its predecessor's primary mission of providing a CONUS-based, combat-ready reserve of general-purpose forces to reinforce other US unified commands when needed.

The US Readiness Command is headquartered at MacDill AFB, Fla. Its ground forces (the US Army Forces Readiness Command) are comprised of two Army Corps—the III Corps (Fort Hood, Tex.) and the XVIII Airborne Corps (Fort Bragg, N. C.). These include armored, mechanized infantry, and airborne units, plus Special Forces and support elements. Headquarters is at Fort Monroe, Va.

The air muscle of Readiness (the US Air Force Readiness Command) is supplied by the three numbered Air Forces—the Ninth (Shaw AFB, S. C.), the Nineteenth (Seymour-Johnson AFB, N. C.), and the Twelfth (Bergstrom AFB, Tex.)—of TAC, headquartered at Langley AFB, Va. The three provide combat-ready tactical fighter, reconnaissance, and assault airlift squadrons, Special Operations Forces, and air support units.

Visitors view the special photo exhibit of USAF's twelve outstanding airmen for 1971 at the Air Force Museum, Wright-Patterson AFB, Ohio.

—Wide World Photos

The new Marine Commandant, Gen. Robert E. Cushman, Jr., right, has now joined the Joint Chiefs of Staff. From the left, the others are Navy Adm. Elmo R. Zumwalt, Jr., Army Gen. William C. Westmoreland, Adm. Thomas H. Moorer (Chairman), and Air Force Gen. John D. Ryan.

An F-106 Delta Dart of the Aerospace Defense Command's 48th Fighter Squadro scrambles on a mission. The 48th, with headquarters at Langley AFB, Va., an the job of protecting the eastern seaboard from Washington, D. C., to th Florida keys, has been awarded the Hughes Trophy for 1971 (see p. 16 The 48th also helps protect the President when he's at Key Biscayn

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The 449th Bombardment Wing, Kincheloe AFB, Mich., won top hor ors—and the Fairchild Trophy—in th 1971 SAC Bombing and Navigatic Competition held at McCoy AFI Fla., in December.

The 449th racked up 1,234 of possible 1,650 points to take the Fai child award, earned by the bombe tanker unit amassing the highest tot score in tanker navigation, bomb

IN MEMORIAM

Professor W. Barton Leach, who died on December 15.

Gen. Emmett O'Donnell, who died on December 26.

IN THE span of less than a fortnight in December, two important shapers of the Air Force died—the one a great intellectual force, the other a fighting commander.

W. Barton Leach, seventy-one, who died on December 15 in Waltham General Hospital in Massachusetts, exemplified how fruitful can be the cross-fertilization between the academic world, in which his accomplishments were enormous, and the world of military policy, to which he made equally important and far-reaching contributions.

As a professor in the Harvard University Law School, Bart Leach was an acknowledged authority on the law of property. As a colonel in the AAF in World War II, he was the prime mover in establishing the Operations Analysis Division. In postwar years, he served as consultant to every Secretary of the Air Force from Stuart Symington to Harold Brown. He was a central figure in establishing and articulating Air Force policy with respect to unification and later in the B-36 controversy. He became a brigadier general in the Air Force Reserve.

An Army private in World War I, Professor Leach received his A.B. from Harvard in 1921 and an LL.B. *cum laude* in 1924. He then spent a year as secretary to Associate Justice of the Supreme Court Oliver Wendell Holmes. After private practice in Boston, he joined the Harvard Law faculty in 1929, became professor of law in 1931, and Story Professor of Law (an endowed chair) in 1950.

In 1955, Professor Leach persuaded Harvard to set up, as an elective seminar in the graduate school, the Harvard Defense Studies Program. It was designed to examine the impact of American defense policy on government, economics, and politics, and to encourage graduate students to seek careers in defense administration.

Professor Leach was the first director of the program. The most famous and influential of his associates in the program is Henry Kissinger, now Assistant to the President for National Security Affairs. Dr. Kissinger once served as deputy director of the program under Professor Leach.

Bart Leach provided much wise counsel to USAF and to the Air Force Association, serving for a number of years on AFA's Policy Committee. He was a friend and mentor of the Editor of this magazine and contributed a number of articles to its pages, notably one entitled "Nine Reasons Why Our Airpower Is Lagging," September 1955 issue, p. 55. Bart Leach loved his country and his Air Force and he gave much of himself to both.

GEN. Emmett (Rosy) O'Donnell, who died at sixty-five at his home in McLean, Va., on December 26, was a bit of a different breed of cat. He wrote his name in the combat sky over the Pacific in World War II and later in the Korean War. A tough, cocky Brooklyn Irishman, he starred in football at West Point and later coached there. Commissioned a second lieutenant of infantry on graduation in 1928, he quickly opted for flight training and pilot's wings in the Army Air Corps.

By 1941, Rosy O'Donnell was a major, and in September of that year he led a squadron of nine B-17s overwater from Hawaii to Manila. He wrote one of the few glorious chapters of the Pearl Harbor period when Clark Field in the Philippines was attacked by the Japanese. General O'Donnell took to the air, attacked two Japanese warships, and landed safely despite two flat tires.

It was pure O'Donnell when, their planes destroyed and flying fields lost, he and his men took up rifles and fought on in what he called "a dismounted bombardment group." He and a few survivors escaped and General O'Donnell eventually found himself in Washington as a special assistant to Hap Arnold, who had an eye on him for bigger things.

In 1944, by then a brigadier general, he took over a heavy bomb group equipped with the then new B-29. From Saipan, in the Marianas, he piloted the lead bomber in the first American raid on Tokyo since Doolittle's—a round trip of 3,200 miles. "It was a start," he said, "and a lot better than getting run out of the Philippines."

General O'Donnell later commanded AF bombing operations in Korea and served as Deputy Chief of Staff, Personnel. He headed the USO after his retirement in 1964. Rosy O'Donnell was a hard-fisted air leader, but a warm human being and a loyal friend. His like comes along too seldom. —JOHN F. LOOSBROCK

navigation, and bombing missions. The 449th beat out the runner-up—the 19th Bomb Wing, Robins AFB, Ga.—by thirty-four points.

For its part, the 17th Bombardment Wing, Wright-Patterson AFB, Ohio, captured both the Mathis and Bombing Trophies.

The 17th scored 960 of a possible 1,150 points to take the Mathis Trophy and 646 of 800 for the Bombing Trophy. Mathis is awarded for the best bomber crew in combined bombing and navigation.

Winners of the 449th bomber crew —Capts. Gary C. Atkins, Joseph T. Vida, James L. Williams, Russell A. Duffner, and Lynn T. Burleson, and TSgt. Dennis J. Kennedy. Tanker crew—Majs. John J. Brooks, Jr., Michael G. Garcia, Capt. Keith C. Keller, and MSgt. Donald T. Howell.

Flying the winning bomber for the 17th BW—Maj. G. M. Alfierie, Capts. J. M. Spencer, R. L. Simpson, J. W. Rice, and D. J. Chesnut, and TSgt. T. J. Smith.

Brig. Gen. W. T. Galligan, Air Force Academy Commandant of Cadets, pins AF Commendation Medals on C/3C Jerry L. Dones, Sellersburg, Ind., and C/3C Richard B. Estes, Dallas, Tex. The two went to the aid of the injured victims of a sewer explosion.

Air Force Academy TSgt. Jim Griffis accepts the Rocky Mountain Sertoma Club's "Outstanding Citizen Award" from club president W. D. Saip. Griffis received the club's first presentation of the award for work with industry in arranging jobs for veterans.

Outside the Pentagon, a real farewell. Defense Secretary Laird joins in tributes to David Packard, who served as his deputy for three years and left with plaudits from industry and the military.

In conjunction with SAC's 1971 bombing competition, the Air Force Association sponsored a two-day program that featured a major symposium on "The Strategic Requirement." *(For a full report on the well-received program, see Senior Editor Edgar Ulsamer's article beginning on p. 58.)*

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The Aerospace Defense Command's 48th Fighter Interceptor Squadron, Langley AFB, Va., has been awarded the Hughes Trophy for 1971. The trophy is the highest honor a fighter squadron can receive.

The Air Staff presents the award each year to the best USAF fighter-interceptor squadron. The 48th, which also has F-106 Delta Dart aircraft stationed at Homestead AFB, Fla., is responsible for the defense of the eastern US, from Washington, D. C., to the Florida keys.

In 1971, the squadron scrambled on more than 300 missions. Assignments included protection of the President when he visited Key Biscayne, and on occasions involving aircraft of other nations, narcotics smugglers, hijacked airliners, lost aircraft, and aircraft in distress.

The Hughes Trophy was presented on January 7 in a formal ceremony at Langley.

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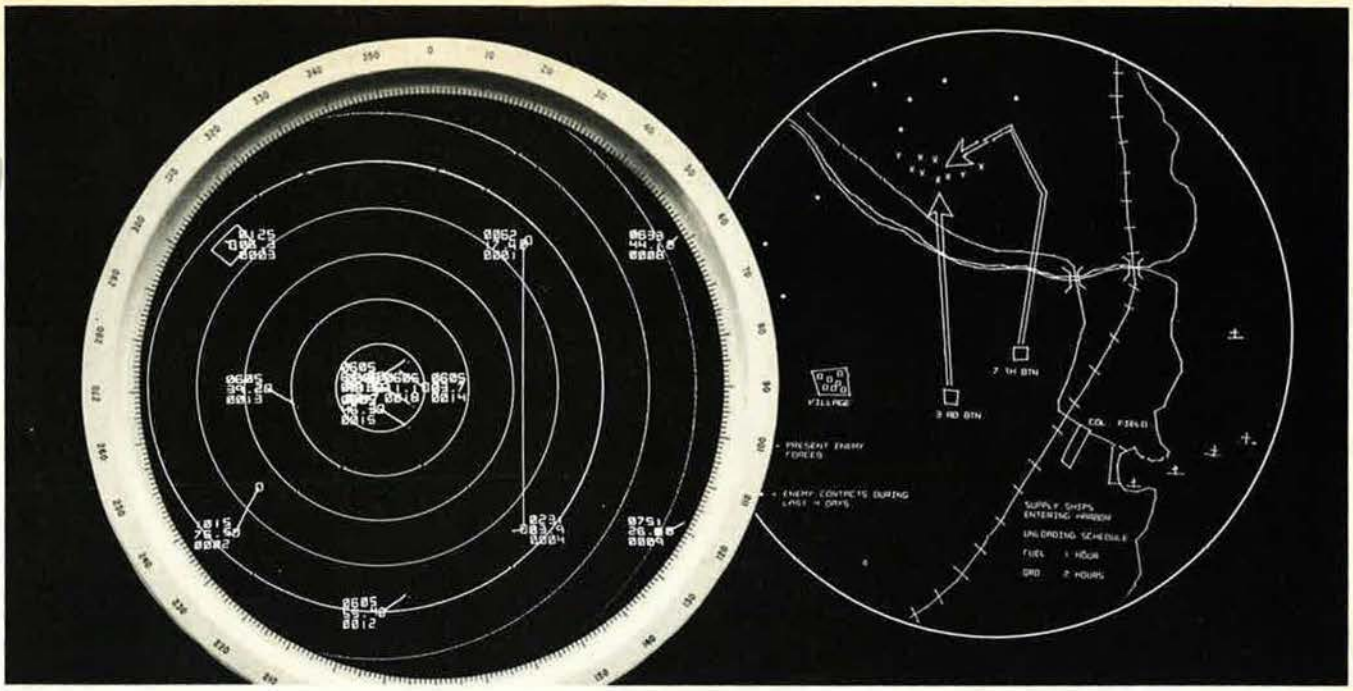
One of the US's staunchest allies in Asia—Australia—has now pulled all of its combat forces out of Vietnam and has reverted to a training and advisory role there (involving a total of only about 150 men confined to South Vietnam and forbidden to enter Laos or Cambodia).

A country small in population, Australia paid a heavy price for backing the US in SEA. At the height of their part in the conflict, the Aussies had a task force of about 8,000 men in Vietnam, with Royal Australian Air Force providing a squadron of Canberra bombers, a transport squadron, and a squadron of helicopters for close air support. Casualties in and out of combat have been estimated at about 4,000, with some 500 men killed.

In terms of percentages of national population, equivalent deaths among US forces would have been 8,000.

But the most serious effect of Australia's participation in the war—aside from lives and national treasure lost—has been the extremely divisive effect



Motorola's two-faced Totalscope display

value

When Motorola first demonstrated the Totalscope at Rome Air Development Center, Electronics magazine wrote that it "... approaches science fiction."

Since then we've developed the 16" model for volume production at volume production prices.

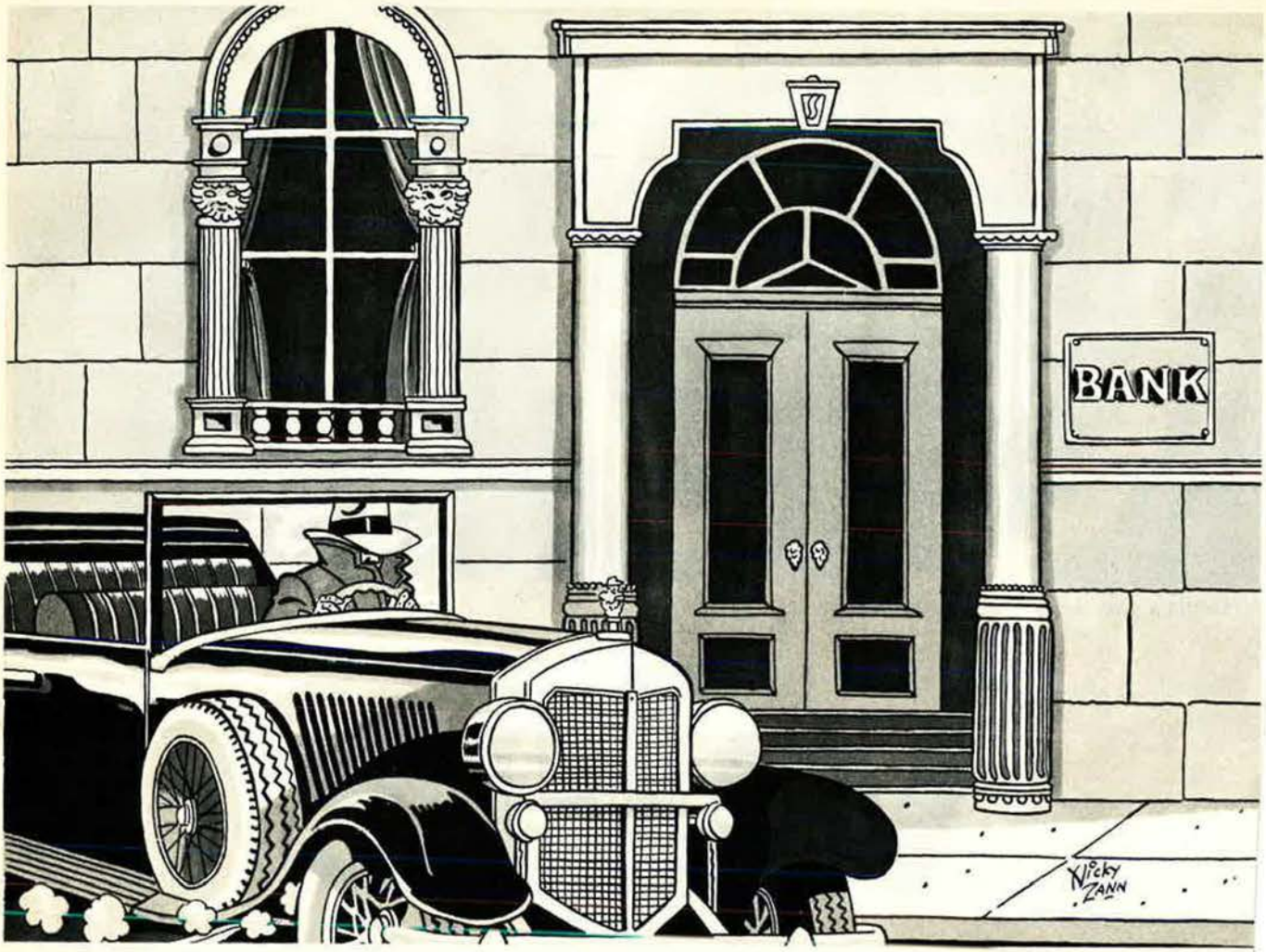
The features that made the original unit unique have been retained and new ones added. Totalscope can operate in a radar mode clearly displaying raw video, vectors, symbols, and stroke-written alphanumerics. Software and/or simple module changes let you convert within minutes to the management mode. This provides alphanumerics and full graphic capability. High-speed, random access digital capabilities also allow you to mix radar and management functions.

Options include a CRT with up to four colors to make image identification even simpler and faster, plus a projector to display color slides.

The advanced solid-state design assures you of an MTBF of over 2000 hours, requires little power, and cuts mean-time-to-repair to under 15 minutes. The system is ideal for land, sea, and airborne use because its total weight is just 100 pounds including power supplies.

Totalscope will qualify to MIL-specs. Contact us for the new price and fast delivery. Motorola Government Electronics Division, Radar Operations, 8201 E. McDowell Rd., Scottsdale, Az 85257.

MOTOROLA



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on its society, mirroring the US experience.

Partisan feeling within the government, for example, has been particularly vitriolic during the last several years of the Australian commitment (Aussie advisers began serving in Vietnam in 1962).

Just what will be the effect on Australia's image in Asia remains to be seen.

☆

The Defense Department has indicated "strong support" for legislation offered by Sen. John Tower (R-Tex.) that would help ease the adjustment to civilian life by retiring military personnel.

The bill, S-1321, is currently pending in the Senate Armed Services Committee. Part of its package would allow members of the services three years instead of one year to select a retirement location. It would also then authorize transportation including that for the dependents, and the shipment of baggage and household effects.

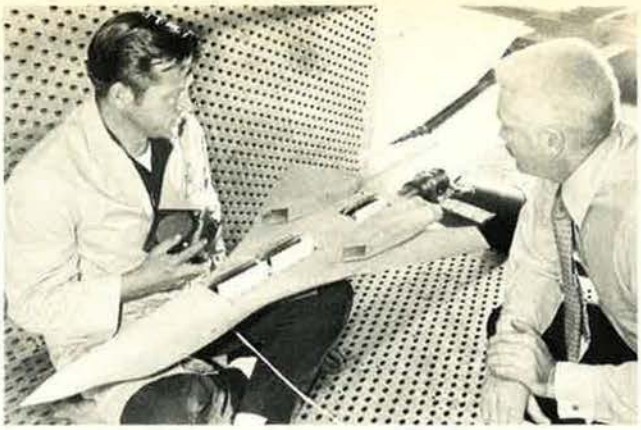
Aim of the bill is to further increase the attractiveness of military life. Specifically, its provisions would allow retired military job hunters additional time in looking over employment opportunities. DoD's backing was voiced in a letter to the Senate committee from Richard J. Borda, Assistant Secretary of the Air Force for Manpower and Reserve Affairs.

☆

Shortly before the new year, USAF picked Philco-Ford Corp. to develop a caseless ammunition aerial gun system for possible use in the new F-15 air-superiority fighter.

Philco-Ford won out over General Electric Co. following a four-month evaluation competition at Eglin AFB, Fla., during which each contractor fired more than 10,000 rounds of caseless ammunition.

Some $10 million of the $36 million-plus contract was obligated to the company to conduct a three-year, full-scale development of the weapon system, known as the GAU-7/A (gun aircraft unit). It is a Gatling-gun weapon that will fire a projectile imbedded in a cylindrically shaped mass of propellant that is totally expended during operation. Brunswick Corp., Elgar Grove, Va., will develop the 35-mm caseless ammunition for the gun.



AF Systems Command's Arnold Engineering Development Center was the scene of wind-tunnel tests for launch of Short Range Attack Missile from B-1 bomber. For a story by Senior Editor Edgar Ulsamer on SRAM capabilities, see p. 28.

Capt. Lester O'Brien, second from left, of Tampa, Fla., and Maj. William T. Stanley, third from left, of Goldsboro, N. C., puff cigars after twenty-three hours in the jungles of Laos after their F-4 Phantom had gone down. USAF pararescuemen Sgt. William D. Brinson, left, of Crowley, La., and MSgt. Leon Fullwood of Aguiler, Colo., made the save in mid-December.

The F-15 is currently designed to carry the M-61A1 Vulcan 20-mm cannon, which came into being during the 1950s. After a flight-test program, USAF will decide whether to make the switch to the GAU-7/A for the F-15—and eventually all other USAF combat aircraft as well.

☆

Logistics management of the new A-X Specialized Close Air Support Aircraft has been assigned to the Air Force Logistics Command's Sacramento Air Materiel Area, McClellan AFB, Calif.

A-X is visualized as a single-place, twin-engine aircraft with a maximum speed of 400 mph. Built for survivability, the STOL aircraft will carry a new 30-mm gun as well as conventional rockets and bombs.

Northrop Corp.'s Aircraft Division and Fairchild Industries' Republic Aviation Division each are building prototypes that will compete in a flyoff demonstration at Edwards AFB, Calif., late this year.

☆

The Navy in mid-December awarded United Aircraft Corp.'s Pratt & Whitney Aircraft Division a $65.8 million contract to build jet engines for the Navy's new F-14A, and its A-4M and EA-6B aircraft.

About $46 million of the total will fund production of forty-nine engines for the F-14A—the carrier-based fighter currently under a test program and built by Grumman Corp. The Marines fly the A-4M, a light attack plane, and the EA-6B is a carrier-based electronic countermeasures aircraft.

☆

The Gill Robb Wilson Memorial Aeronautical Science Center, currently under construction on the campus of Embry-Riddle Aeronautical University, in Florida, will be dedicated April 15, 1972, according to Brig. Gen. William W. Spruance, committee coordinator of the Gill Robb Wilson Memorial Committee.

The campaign for matching funds to construct a living memorial for one of aviation's best-loved spokesmen, Gill Robb Wilson, began in December 1969.

The Aeronautical Science Center on

Aerospace World

the new campus at Embry-Riddle will cost $1.4 million. A federal grant of $707,400 was matched by gifts from friends of Mr. Wilson, aviation enthusiasts, and those interested in helping young people receive a higher aviation education. Some $320,000 in cash and pledges was raised from private sources during the campaign. Dedicatory donations are still being accepted by the memorial committee. The balance necessary to match the federal grant, over and above cash and pledges, so construction could start was secured through loans against the assets of the private, nonprofit university.

The Aeronautical Science Center is a complex of three buildings. The complex will provide for flight operations, dispatch, aviation weather, briefing, and classrooms, a simulator laboratory, and library.

Embry-Riddle is the only private, nonprofit, coeducational, totally aviation-oriented university in the world. It was founded in 1926. During World War II it trained many thousands of mechanics and pilots for the AAF. Located in Miami, Fla., until 1965, it then moved to Daytona Beach with 259 students. Today almost 1,800 students are enrolled.

General Spruance is an AFA Director, while Jack Hunt, President of Embry-Riddle, serves on AFA's Aerospace Education Foundation Board of Trustees.

☆

Air Force Systems Command has developed a miniature guidance system that enables pinpoint bombing of a specific target within a large complex.

The Optical Aimpoint Guidance (OPTAG) system correlates previously made photographs with actual scenery, which means that the target does not have to be visible and, therefore, enemy camouflage is no deterrent to bombing accuracy.

By turning photographic and optical scenes into electronic images, the system cues control fins to keep a bomb or missile on course. Any deviation between the true scene and the photograph is eliminated through fin manipulation.

The guidance system also can home in on any target a pilot can see or locate.

Simulated flight tests and "captive" flight tests have been successful. Actual drop tests will be conducted at White Sands Missile Range, N. M.

The guidance system will be fitted onto the standard 2,000-pound general-purpose Mark 84 bomb for the tests.

USAF's Avionics Laboratory contract for $5.6 million with Goodyear Aerospace Corp. will fund the test bombs.

☆

NEWS NOTES—USAF/Boeing Co. report that the first 150 advanced Minuteman IIIs have been emplaced at Minot AFB, N. D., ahead of schedule and $6 million below programmed cost. MM III modernization is under way at Ellsworth AFB, S. D.

The twenty-eighth annual V/STOL forum of the **American Helicopter Society** will be held May 17–19 in Washington, D. C.

Late last year, the **Air Force Academy Cadet Parachute Team** won its **fourth consecutive national intercollegiate parachute championship** at Deland, Fla. ■

The last C-47 Skytrain in operation at Rhein-Main AB, Germany, is dwarfed by its younger companion, a C-5. Some beloved "Gooney Birds" are still flying after twenty-five years and more of service to USAF.

Eddie Rickenbacker joins David Scott and other Apollo-15 astronauts—James Irwin and Alfred Worden—at the Air Force Museum to authenticate fabric insigne from Capt. Eddie's WW I fighter. Apollo-15 took the fabric fragment to the moon.

Index to Advertisers

What They're Saying . . .

(From time to time, AIR FORCE Magazine will publish in this space excerpts from speeches pertinent to defense and aerospace matters.)

Sen. Howard W. Cannon, at the Wright Brothers Memorial Dinner on December 17, in Washington, D. C.:

In the decade of the '70s, our mission in space may prove to be more concerned with military matters than with continued peaceful exploration. We may find it not simply feasible or practical but *necessary* to realign these programs to secure the defense of our portion of the world against space-launched attack. Nuclear-propelled space vehicles as well as satellite probes all have clear military applications to which we may have paid too little attention until now and to which we may have to give more careful consideration in the future.

Karl G. Harr, Jr., President of the Aerospace Industries Association, before the Aviation Space Writers Association in Washington, D. C., on December 16:

While it will not impact significantly on the volume of defense sales in 1972, I think it is significant that preliminary indications on the trends in the Fiscal Year 1973 federal budget anticipate increased funding for major weapons systems which will be reflected in the level of the industry's activity in future years. This should bring to a halt the erosion in the high technology industrial base on which effective military deterrence is so heavily dependent and provide for its improvement.

Sir George Edwards, Chairman of the Board of British Aircraft Corp., before the American Chamber of Commerce in London, on December 15:

You have a problem in the United States with some of your famous companies getting into difficulties because the rigors of competition have got out of hand.

I suggest to you that a sensible path for us to follow would be to extend to the USA the collaboration which is now deeply embedded in Europe.

It seems to me much more sensible for you to build an advanced version of the Concorde in collaboration with us than to go off on your own many years behind us in an advanced technology which could well cost you the earth and in which you still could very well come unstuck. It is for you to decide. If you wish to join, then I for one would be delighted. If you do not, then that is your problem and you can leave us to go from strength to strength in building up a European technological industry on the back of the work already done with the Concorde, which we started ten years ago.

Dr. John S. Foster, Jr., DoD's Director of Defense Research and Engineering, speaking before an AFA audience in Orlando, Fla., December 15:

Our plans are to concentrate on maintenance of our technological leadership—on quality. Whether the USSR will make the same choice or strive for numbers—or for both—we do not know.

For our part, we deliberately concentrate on maintaining technological superiority. You can see this in the Nixon Administration's defense budget request for the current fiscal year. The President asked for an additional $800 million for research, development, test, and engineering while sacrificing levels of operational weapons in a fixed budget total.

It is most unfortunate that the Congress has just cut the requested RDT&E increase in half while accepting—and even adding to—the Administration's proposed reduction in numbers of weapons. Trading quantity for quality was, I believe, a wise decision by the Secretary of Defense and the President. Sacrificing both was, it seems to me, an unwise decision.

Still, in our kind of government, a good argument can always be made a second time. I believe Secretary Laird will make the same argument again. The budget to be submitted to the Congress next month probably will ask again for additional funds in the R&D program.

Gen. Bruce K. Holloway, SAC's Commander in Chief, before an AFA audience in Orlando, Fla., on December 16:

Strategic requirements for the proximate future, then, must be washed in a solution of stringent funding, antimilitarism, negotiable limitations, and general public apathy and misunderstanding—despite aging equipment, despite expanding responsibility, despite the sobering threat. It is within the framework of these limitations and these needs that we have attempted to form this synthesis of strategic requirements. The complexities of our hardware make it expensive to buy, man, and operate; and sobering to consider. We do not attempt to evade these truths. Yet the proposals you have heard and will hear are especially considered to be the most economical feasibilities in terms of cost and operation and least provocative in international deliberation.

Maj. Gen. Douglas T. Nelson, B-1 Program Director, also in Orlando, Fla., December 16:

Both ICBMs and SLBMs have one feature in common that makes them quite inflexible: Once launched toward their targets, the commitment to attack that target with a nuclear warhead has been irrevocably made. The fact leads one to derive a rather sobering premise: It is highly probable that an actual nuclear attack against this country must have reached the stage where the opposite side's weapons are detonating on target, and this fact must be unmistakably clear to our national command authority before that fateful decision to launch our ballistic missiles will be made. It is simply inconceivable, to me at least, that a retaliatory ballistic missile strike would ever be ordered, based upon warning alone. This inflexibility, were it not counterbalanced by complementing features of the manned strategic bomber force, would perhaps cause our potential opposition to develop a level of confidence that would seriously threaten our deterrence. ■

Airman's Bookshelf

Hero of the Soviet Union

Zhukov, by Otto Preston Chaney, Jr. University of Oklahoma Press, Norman, Okla., 1971. 512 pages with appendices, bibliography, and index. $10.00.

Only Marshal Georgi K. Zhukov has received the Soviet Union's highest military distinction, the title of Hero of the Soviet Union, four times. This first attempt at a biography of Zhukov covers his public career and the years following his retirement in 1958; as such, it is an unusually successful depiction of Zhukov and the political-military system which enabled him to rise to such heights.

On May 8–9, 1945, Marshal Zhukov and representatives of the United States, Great Britain, and France accepted the surrender of Germany. Stalin's selection of Marshal Zhukov for this signal honor was appropriate and symbolic. Zhukov represented the Communist Party, the Red Army, and the people of Russia. Born into a poor family, he fought as a conscript in the Tsarist army but made his career as a member of the Red Army. In 1919 he joined the Communist Party and remained loyal to its ideological tenets, despite occasional professional military conflicts with party organizational demands. More important, perhaps, in the context of World War II, was the frequent appearance of Marshal Zhukov as a representative of the Soviet *Stavka* (General Headquarters), a command position without an equivalent in the United States Army. Indeed, it is difficult to conceive of his great success apart from that position. As a direct result of the *Stavka's* functioning, Zhukov was a participant in most major battles of the Soviet-German theater, acting, in the author's words, as the *Stavka's* "fireman" and "troubleshooter" on many fronts.

Throughout his career, Zhukov appears as a progressive and dynamic figure. Germany's failure to recognize the reservoir of command talent surviving Stalin's military purges of 1937 to 1938 was a serious error. Zhukov commanded the Soviet-Mongolian forces that defeated the Japanese on the Khalkin-Gol River in 1939, and his prewar views on the use of tanks, although unacceptable to Stalin, later proved correct. Much later, as Minister of Defense (1955–1957), he contributed to a candid discussion of pressing military problems and a realistic adjustment to the use of nuclear arms.

A biography of this type is immensely difficult to write because of the tendentious nature of Soviet sources. However, the author, a lieutenant colonel in the US Army, made careful and thorough use of Soviet materials, balancing them with a judicious selection of Western sources. This well written and stimulating biography will remain the standard work on Marshal Zhukov for some time.

—Reviewed by Capt. Carl W. Reddel, Department of History, USAF Academy.

World War II Turning Points

The Ninety Days, by Thomas N. Carmichael. Bernard Geis Associates, New York, N. Y., 1971. 339 pages. $10.00.

During the last three months of 1942, the course and ultimate direction of World War II drastically shifted to the hands of the Allies. The ninety-day period beginning on October 4, 1942, and ending on New Year's Day in 1943 would see five different military campaigns that would decisively turn the tide of the conflict. So writes Thomas Carmichael in *The Ninety Days*. Providing the reader with an interesting but straightforward account of military strategy and leadership in World War II, Carmichael has chosen five battles that served as turning points: Guadalcanal, El Alamein, Operation Torch, Stalingrad, and the Barents Sea campaign. What unfolds is a unique picture of people and events, and certainly one of Carmichael's assets is his ability to portray the sensitive problems of the soldier and the statesman in time of crisis.

After setting the stage for the reader with a brief look at how each campaign developed into a significant turning point in 1942, Carmichael proceeds to analyze in detail the elements of military and political leadership, as well as the strategies involved in the Allies' five-pronged attack against the Axis. Interspersed throughout the book are excellent maps and diagrams to aid the reader in not only understanding but also appreciating the significance of each battle.

Historically, Carmichael avoids several key issues that need additional treatment. Among them: the significance of both the Coral Sea and Midway campaigns in 1942, which paved the way for Allied victory at Guadalcanal; and the overall importance of the Mediterranean theater for the Allies and the critical problems that emerged in the Anglo-American coalition, which posed a serious threat to Allied wartime cooperation.

Carmichael's style is objective and clear-cut. Although *The Ninety Days* offers no new facts or theories about the efforts of the Allies to break the Axis yoke in World War II, it does present an interesting approach to wartime strategy and leadership which should have widespread appeal.

—Reviewed by Capt. Donald W. Nelson, Assistant Professor of History, USAF Academy.

Policy Decisions Behind BMD

Ballistic Missile Defense, by Benson D. Adams. American Elsevier Co., New York, N. Y., 1971. 274 pages with bibliography and index. $12.50.

To our knowledge, this is the first—certainly the most comprehensive—study of policy issues underlying de cisions first to develop and later t deploy (under changing strategic con cepts) a US ballistic missile defens system. The author, who does no slight the technical aspects of the mat ter, traces the evolution of our BMI policy from 1955 to 1970, with onl minor emphasis on the pre-McNamar years.

Once the technical problem of mis sile interception had been solved—o at least a solution was in sight—polic decisions on continued developmen and deployment were affected in major way by Executive Branch view of strategy, international politics, eco nomics, and domestic political reali ties. From 1965 through most c 1967, nondeployment of BMD was key element in a policy of unilater arms control, to which the USS didn't respond.

In the author's opinion, the Johnso Administration's decision to go ahea with limited deployment was base almost entirely on domestic politic considerations. Subsequent shifts deployment concepts (from a th

urban defense to primarily missile-site defense, then back to a combination of the two) were determined at least as much by political factors, in the broad sense of the word, as by technical and defense realities.

Dr. Adams believes that the ultimate orientation of the US BMD system has always been conceived of as against a Soviet threat, and that the incipient Chinese threat so often cited by former Secretary of Defense McNamara was never more than a device to placate critics who saw BMD as a principal stimulus to a never-ending arms race with the USSR. But under either the Johnson or the Nixon Administration, he judges that the dominant role of BMD has been in arms control, rather than in military defense.

This detailed case study is instructive to all who have an interest in policy-making, but particularly to those who cling to the idea that favorable decisions on military R&D and deployment will be made, based only on need and technical feasibility. In a democracy, the policy-making process is not that simple.

Dr. Adams—who is now at George Washington University in Washington, D. C.—has been a defense analyst with the Foreign Policy Research Institute; Booz, Allen Applied Research; and Analytical Services, Inc. In his Preface, he identifies himself as "a firm believer in the strategic defense of the United States." By his definition, that includes BMD. Nevertheless, the book is an objective look at the evolution of a policy, not a panegyric for more and better ballistic missile defense.

—Reviewed by John L. Frisbee, Senior Editor, AIR FORCE *Magazine.*

Maxims and Mausers

German Machineguns, by Daniel D. Musgrave and Smith H. Oliver. MOR Associates, Box 39022, Friendship Station, Washington, D. C. 20016, 1971. 457 pages with index. $17.50.

This large-format book covers the history of machinegun development and production in Germany. There is, according to the authors, no modern machinegun anywhere that does not include some features of German origin. The book includes hundreds of photographs, drawings, and reproductions of technical data on German machineguns and accessories used for ground, antiaircraft, and air-to-ground or air-to-air fire. There also is a detailed discussion of the organization of German machinegun R&D, which gradually replaced earlier trial-and-error methods.

The book is understandable to the novice, but detailed enough to satisfy the expert's need for a comprehensive reference work.

Mr. Musgrave is an independent consultant on government operations. Mr. Oliver, a former staff member of the Smithsonian Institution, also spent ten years as a foreign ordnance expert with the US Army. They are the authors of an earlier book, *The World's Assault Rifles.*

Hitler the Military Commander

Hitler's Battles for Europe, by John Strawson. Charles Scribner's Sons, New York, N. Y., 1971. 246 pages with bibliography and index. $8.95.

Strawson's basic objective is to answer the question: How great a commander was Hitler? His theme is somewhat of a new approach. He examines those battles in which Hitler had a direct influence and discovers that until late 1942 Hitler was "right" and his generals were "wrong."

By gaining absolute control of the German armed forces, Hitler was assured complete and comprehensive direction of the Nazi war effort. This, combined with his willingness to accept new technology and ideas on tactics and organization, was the key to the German Army's development of the *Panzer* strike forces. Using the tactics of *Blitzkreig,* the Nazis overwhelmed Europe in the brief span of three years. According to Strawson, Hitler must be given the credit for directing the German war machine to such awesome heights. He must also be singled out for the ultimate dissipation and collapse of the German armed forces and empire.

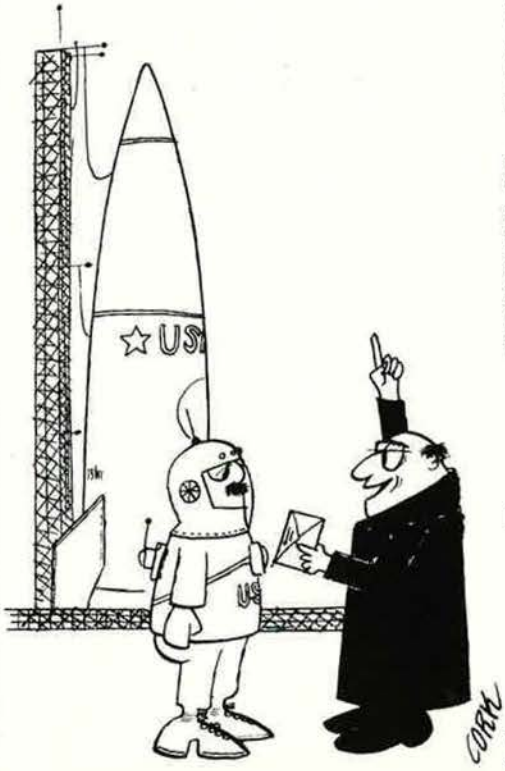
Intuition, political cunning, and willpower caused Hitler's phenomenal success, but his ignorance of battlefield realities and his almost total reliance upon his will—rejecting professional military arguments contrary to his insights, especially after 1942—was root cause of his miserable collapse.

Strawson correctly points out that ". . . however well willpower might complement military strength, it was no substitute." In his final analysis, Strawson concedes Hitler does not deserve to be called "the greatest strategical genius of all time." On the other hand, Hitler was no "facile amateur" and, considering his dazzling successes between 1938 and 1942, he must be considered a great leader and a strategist of the highest order. Curiously, Strawson considers Stalin to be the "greatest strategical genius . . ." of the Second World War, but does not attempt to justify or develop this view.

The author relies, for source material, principally upon Hitler's war directives, the memoirs of high-level German officers (whose accounts are almost always suspect), and numerous secondary accounts of World War II (*e.g.,* Trevor Roper, Alan Bullock, Alan Clark). The weakest feature of the book is the total lack of documentation.

Although this study does not really present a new interpretation of Hitler, it is the first attempt to analyze him solely as a military commander. The book should be of value to those desiring a thin, general background of Hitler's impact on the management of German military operations during World War II.

—Reviewed by Capt. Norman I. Lee, USAF, Assistant Professor of History at the Air Force Academy.



Media Machinations

The News Twisters, by Edith Efron. Nash Publishing, Los Angeles, Calif., 1971. 218 pages, plus appendices. $7.95.

One critic says this book about network newscasting is dishonest, inaccurate, unscientific, and pretentious.

Airman's Bookshelf

On the air, we heard it called an assault on common sense by Malice in Wonderland.

Others write that it is a vitally important book, that it should have historic impact, that it is a devastating indictment, fantastic and shocking.

You can take your choice. We are inclined to believe Miss Efron is right, that network newscasters do indulge in a great deal of distortion, or twisting, as she calls it. We also like her solution, which is to let the networks alone to distort if they want to, leaving the pressure of the marketplace to force an end to the evil where it exists. Hurray for the First Amendment, which applies to all of us, not only the New York *Times* and the Washington *Post*.

We also happen to see a great deal of merit in what Miss Efron's detractors have to say about her methodology. In the hot part of the 1968 presidential campaign she tape recorded the early evening news broadcasts for seven weeks. The tapes were transcribed and Miss Efron tried to separate sheep from goats. She isolated what she called opinion "for" and opinion "against." It was more meticulous than that. She counted the words "for" and the words "against." The charts are all here.

Well, this reporter has been in this business for nearly four decades and he doesn't believe it can be done, *The News Twisters* to the contrary. In other words, Miss Efron is right, to our collective sorrow, but she has to find a new way to prove she is right. This one will not do.

—*Reviewed by Claude Witze, Senior Editor of* AIR FORCE *Magazine.*

Up-dated Favorite

Modern Airmanship (4th Edition), edited by Neil D. Van Sickle, Maj. Gen., USAF (Ret.). Van Nostrand Reinhold, New York, N. Y., 1971. 895 pages plus index. $15.95.

This encyclopedic volume ranges from basics to some pretty advanced stuff in aerodynamics, propulsion, meteorology, instruments, and flying techniques. Because of its range and diversity, it should continue to appeal to both the Sunday pilot and to the professional.

All of the chapters have been brought up to date, and the latest edition includes a new chapter on the theory and practice of soaring. There is a long and quite detailed discussion of the problems of sustained supersonic flight above Mach 3.0. The original chapters of the first edition were all written by professional airmen and engineers, and each chapter has been revised by one or more highly qualified experts.

The writing is clear and concise, and there are plenty of illustrations, schematic drawings, and diagrams. Prior to his retirement from the Air Force, Editor Van Sickle had headed both the USAF flying-training and flight-safety programs.

New Books in Brief

Aircraft of the Vietnam War, by Lou Drendel. Sixty-four pages—mostly pictures—of the USAF, Navy, Marine Corps, and Army aircraft that have fought and supported the air war in Southeast Asia. The book also has some of the author's paintings of air action in SEA, and a foreword by Air Force Brig. Gen. Robin Olds. Arco Publishing Co., New York, N. Y., 1971. 64 pages. $3.95 paperback.

Armed Forces of the World (Third Edition), edited by Robert C. Sellers. This is a reference book containing pertinent information on defense budgets, populations, military manpower, and equipment of the armed forces of nearly every nation in the world. Appendices contain data on defense agreements, treaties, munitions production, nuclear potentials, military space developments, and the locations of defense headquarters in each country covered. The book is similar in scope to *The Military Balance*, published by the International Institute for Strategic Studies in London, but contains no text; hence no analysis of the balance between major military powers and alliances. Praeger, New York, N. Y., 1971. 296 pages. $15.00.

Forgotten Fighters and Experimental Aircraft, US Army 1918–1941, by Peter M. Bowers. Here are fifty-five fighter aircraft developed by or for the US Army between the World Wars. Some went into production and thence to oblivion; many never got beyond prototypes. Most of them contributed in some way to the advancement of fighter aviation. There are at least two pictures of each fighter, a brief history of its development and use, and full specifications. Included are some weirdos that most of us never heard of. Arco Publishing Co., New York, N. Y., 1971. 95 pages. $3.95.

Fly the Wing, by Jim Webb. The author, a 20,000-hour DC-9 captain for Eastern Airlines, has put together a book ". . . specifically intended for those who already have a commercial license and instrument rating," and who aspire to be airline or executive pilots. He covers techniques, duties, and philosophies of operation as he has developed and taught them to many students. Iowa State University Press, Ames, Iowa 50010, 1971. 227 pages with index. $10.50 paperback.

Stuka at War, by Peter C. Smith. The Junkers Ju-87 first saw action in the Spanish Civil War. During the early part of World War II, it was "Hitler's secret weapon," spearheading the Nazi's drive into Poland and west to the English Channel. The author recounts the history of this legendary dive-bomber, illustrating his book with more than 150 photographs. Arco Publishing Co., New York, N. Y., 1971. 192 pages. $6.95 hardcover.

Thirty Year History of the 49th Tactical Fighter Wing, by William E. O'Keeffe. The 49th TFW Historian has compiled a unit history, primarily for newcomers to the Wing. A few copies are available at no cost to former members of the Wing and to other interested readers of AIR FORCE Magazine. Write to the author at 49th TFW, Holloman AFB, N. M. 88330.

World Flight: The Earhart Trail, by Ann Holtgren Pellegreno. In 1967, the author, accompanied by navigator Bill Polhemus and Air Force Colonel William R. Payne, flew a rebuilt Lockheed 10 Electra (sister ship to Amelia Earhart's) around the world along a track close to that from which Miss Earhart disappeared near Howland Islands in the Pacific thirty years earlier. This is Mrs. Pellegreno's story of the flight. Iowa State University Press, Ames, Iowa 50010, 1971. 225 pages, illustrated. $6.95.

Six recent additions to Ballantine's Illustrated History of the Violent Century series are: *Bir Hakim: Desert Citadel,* by Richard Holmes; *Fall of the Philippines,* by Ward Rutherford; *Flying Tigers: Chennault in China,* by Ron Heiferman; *P-51 Bomber Escort,* by William Hess; *The Rape of Ethiopia 1936,* by A. J. Barker; and *Tanganyikan Guerrilla: East African Campaign 1914–18,* by Maj. J. R. Sibley. Ballantine Books, New York, N. Y., 1971. Each volume 160 pages, $1.00 paperback.

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MIA/POW Action Report

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

Cadet 1C John Cignata of Baltimore, Md., stands before a photographic display of Air Force Academy graduates who are POWs or missing in Southeast Asia. Cadet Cignata originated the idea for the exhibit, and the Academy's Cadet Wing contributed $1,100 to build it. Sixty-three graduates of the Academy's first ten classes are represented, with eighteen having been identified as prisoners.

Through the dwindling weeks of 1971, MIA/POW families across the nation viewed the holiday season—and the coming year—with conflicting emotions.

For some families it was the eighth Christmas in a row that the traditional season of hope was overshadowed by the absence of men missing or prisoners in foreign lands. Of course, family members live the year through with chronic doubts about the eventual return of their men.

Many MIA/POW families during the season contributed efforts to their cause, motivated by the desire to prop up lagging spirits and accomplish something worthwhile with the time at hand. Organized activities ranged from fund raising, via sales of MIA/POW-theme Christmas cards and seals, to group candlelight ceremonies.

Many prominent people brought attention to bear on the MIA/POW situation. Among them, comedian Bob Hope, on his yearly trip to entertain US troops around the world, flew into Vientiane, Laos, to talk to North Vietnamese officials. In conversations described as "cordial," he offered to travel to Hanoi to entertain the US prisoners there and also to raise $10 million in exchange for their release—the money to be earmarked for the benefit of North Vietnamese children. The North Vietnamese rejected both offers.

In another effort, New York television producer Melvin Bailey organized local cable TV companies across the country to tape short video messages by MIA/POW family members, hoping that the North Vietnamese would allow them to be shown to the prisoners during the Christmas season. In Paris, Hanoi's delegation to the peace talks refused to accept the tapes, reportedly turning them over to the Paris police.

The plight of the American captives was given recognition by the Administration on December 16, when Vice President Spiro Agnew, filling in for President Nixon, dedicated the National Christmas Tree in a ceremony in the Nation's Capital. "The missing men should remain uppermost in our thoughts this Christmas," he said, noting that "this is the eighth Christmas—the longest period of any war in our nation's history—that some of the families have observed without their loved ones." With the national and state trees on display on the Ellipse behind the White House was a special tree in honor of the MIA/POWs.

In what the US Department of Defense termed "an unannounced and indefensible action that violates its own established policy," North Vietnam refused to accept more than 900 gift packages mailed to the MIA/POWs in August and October. (Apparently, the North Vietnamese did allow the eleven-pound Christmas packages Hanoi said in November it would accept.)

The refused packages were returned to the US Postal Service by the Soviet Postal Administration, through which they are customarily routed to North Vietnam.

Since 1969, Hanoi has allowed prisoners to receive a 6.6-pound package every two months. On a number of occasions individual packages have been returned with the incorrect claim in most cases that they were overweight.

Hanoi did not offer an explanation as to why the substantial number of packages was returned.

With the increased tempo of the air war over Southeast Asia late in 1971

Brig. Gen. Daniel "Chappie" James, Jr., Deputy Assistant Secretary of Defense for Public Affairs, regards a unique American Fighter Pilots Association special award he received at the recent annual awards banquet. General James was honored for his contribution to the Air Force and to the MIA/POW cause. Maj. Gen. Francis Greenlief, head of the NG, left, and ANG Director Maj. Gen. I. G. Brown look on.

and into the new year *(see "Aerospace World," p. 12)* came word of downed US aircraft and the inevitable photos of newly captured American pilots on display in Hanoi. This, coupled with the heavy atmosphere of discouragement among MIA/POW families, turned many toward advocacy of a political policy on the part of the League of Families—which thus far has shunned such a course.

It was at this point—and just hours before Christmas—that Hanoi chose to release a backlog of 1,001 letters US prisoners had written to their families in the months past. (Among them was a letter from a US Marine reported to have been killed in action.) The North Vietnamese also turned over to the Committee of Liaison With Families of Servicemen Detained in North Vietnam—a political action group opposed to the war in Vietnam —a list of eighteen names of Americans not known by previous enemy admission to be in captivity.

While receipt of the letters did much to restore the Christmas spirits of joy and hope to many of the families, not all of them received letters from men they know to be in enemy hands.

And while Hanoi's Christmas largesse was a blessing, what motivation—certainly more political than humanitarian—led the enemy to hold back the letters instead of letting them come through as a normal and decent course of events?

Deeply disturbing was that, despite the release of the Christmas flood of letters, mail from the prisoners in 1971 declined to 1,500 pieces, down from 2,700 the year before. Hanoi's attitude is inexplicable.

On Behalf of MIA/POWs

In late November, a group of more than 100 League members had visited the United Nations headquarters to present a petition to the UN's Commission on Human Rights, the first such "class" (concerning a specific category of people, *i.e.,* Americans captive in Southeast Asia) petition ever rendered.

The petition contained a slim list of seven basic humanitarian provisions, including requests for impartial inspection of detention facilities and repatriation of the sick and wounded. Such seemingly uncomplicated considerations by the enemy have been the unsuccessful goal of MIA/POW families for many years.

While no meaningful UN action was expected to result from presentation of the petition, the visit was "one more effort on behalf of the men by family members who are doing everything they can to help," said Mrs. Evelyn Grubb, a leader of the group and League of Families National Coordinator whose Air Force husband has been a prisoner in North Vietnam since January 1966.

The UN visit was not considered a complete washout, however, since elements of the group were able to discuss their situation with the UN delegation of such countries as Algeria and Romania—third parties whose contact with North Vietnam might bring additional pressure to bear.

* * *

And from California comes word that the Santa Ana-Orange-Tustin Board of Realtors has established an emergency trust fund for MIA/POW families by selling stamps inscribed "They Can't Forget—Can We?"

To keep public attention focused on the problem, the businessmen hosted a dinner attended by several MIA/POW family members. Each city in the board's jurisdiction also has adopted a MIA/POW as "theirs" until the men are returned.

Within four months the realtors have sold more than 1,000 bracelets that identify the wearer with one of the more than 1,600 who are either missing or captured.

In addition, the realtors are distributing the General Telephone Co. pamphlet, "His Dreams of Freedom Depend on You," along with MIA/POW bumper stickers. ■

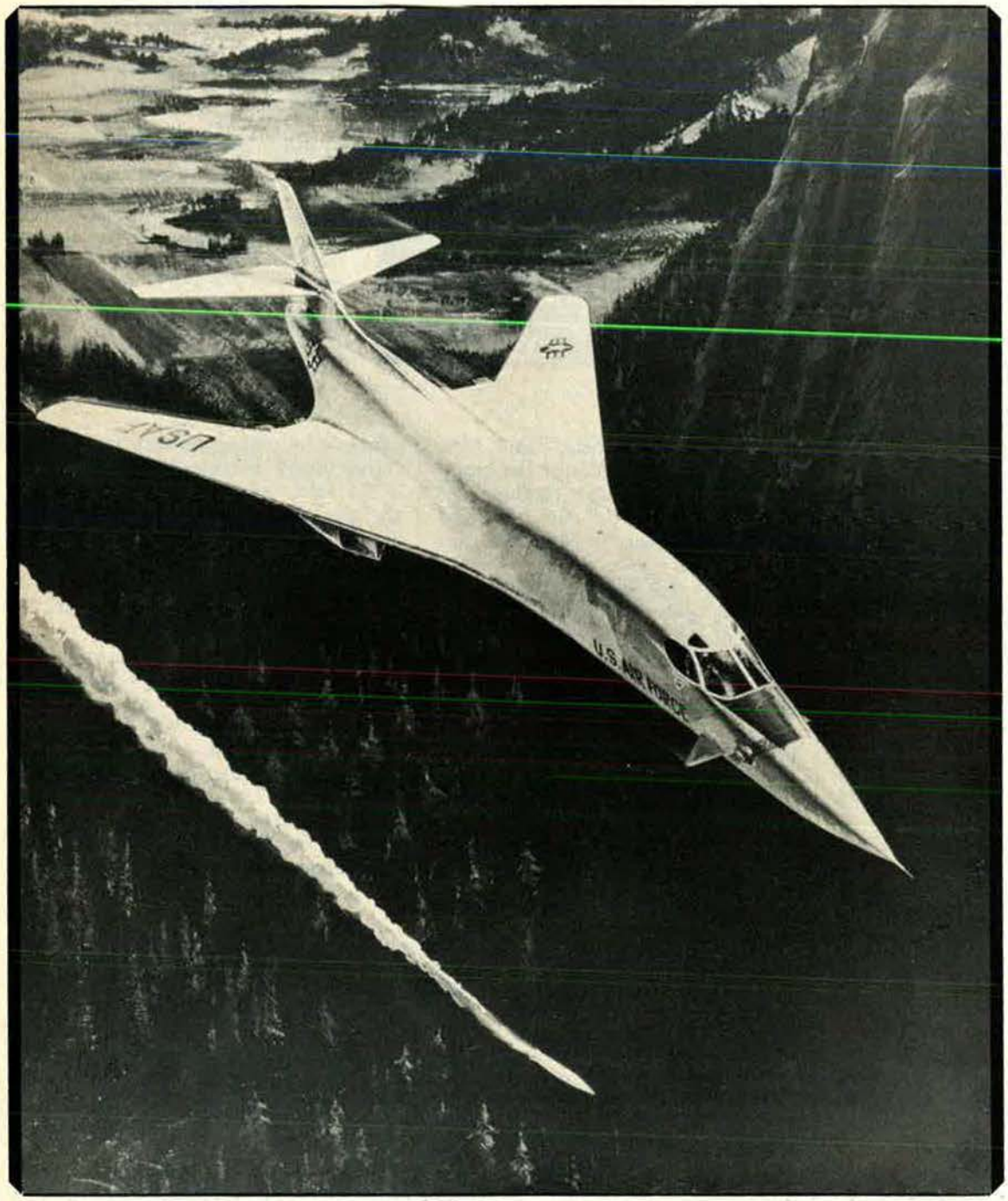
A1C Ron Arney signs a petition expressing concern for the MIA/POWs while A1C Gary Kenn and Mrs. Robert Higginbotham look on. Mrs. Higginbotham was a volunteer worker at the booth, sponsored by the McCoy AFB, Fla., wives' clubs, that was featured at the recent SAC bombing and navigation tourney at McCoy AFB.

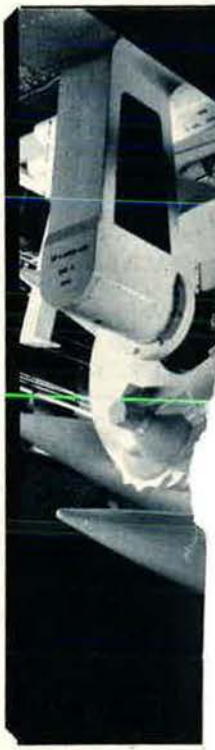
A USAF Reserve officer who has served on active duty in Vietnam, Capt. Constance Makela at the Air Reserve Personnel Center shows a special interest in the MIA/POW campaign. On an active-duty tour at the Denver, Colo., facility, she volunteered to sell bumper stickers, stamps, bracelets, and other items at the Center cafeteria during lunch time. Helping her is SMSgt. Joe Carlone, administrative aide to the Commander of the Air Force Accounting and Finance Center.

Tennessee AFA President Brig. Gen. James W. Carter, Deputy Chief of Staff of the state's ANG, reads the text of a certificate of honor presented to Kathy Sawyer, a reporter for the Nashville Tennessean, *for her articles on the POW issue. Witnesses are, middle left, Lt. Col. Donald N. Edmands, USAF (Ret.), Middle Tennessee AFA Chapter President, and Lt. Col. Tom Swalm, Commander of the Thunderbirds, guests at an AFA function.*

USAF's Newest Strategic Weapon

Bristling with more than 10,000 SAM launchers, generously equipped with more than 3,000 interceptors, and feverishly at work expanding an already extensive ground-based and airborne radar capability, the Soviet Union has established quantitative, if not qualitative, air defense superiority. In order to assure that the US manned bomber fleet can penetrate sophisticated defense nets, the Air Force has developed and is now deploying . . .





An artist's conception depicts a SRAM launch from a B-1 strategic bomber while both operate in a low penetration mode. Photo in upper right shows rotary SRAM launcher.

SRAM

AIR FORCE
FEBRUARY 1972 MAGAZINE

THE LAST WORD IN DEFENSE SUPPRESSION

By Edgar Ulsamer
SENIOR EDITOR, AIR FORCE MAGAZINE

SRAM (Short Range Attack Missile), the Air Force's newest strategic weapon system, is now entering the inventory. In a practical sense, the system will become fully operational later this year, after the first wing of B-52 aircraft has been modified to carry it. The SRAM program, officially designated AIM-69, is on schedule and within its budget. With a nuclear punch comparable to that of a single Minuteman III warhead, with accuracies at least equal to the newest ICBMs, and because, once launched, it is practically impervious to interception and countermeasures, SRAM will significantly boost the national nuclear deterrence capability.

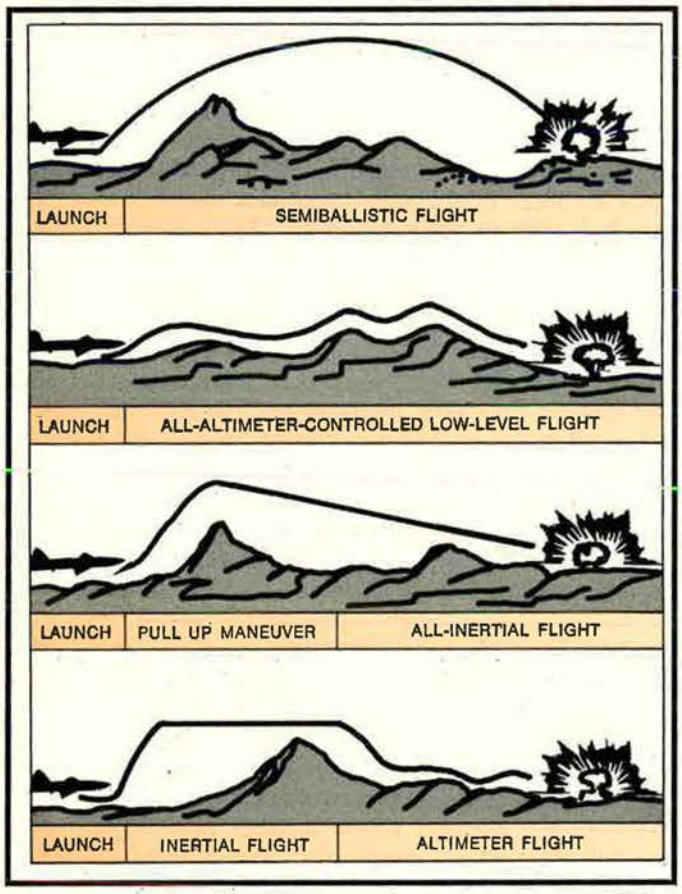
More than 1,000 SRAMs are to be procured by the end of FY 1975, at a cost of about $1 billion, and deployed on 282 late-model B-52s as well as on seventy-two FB-111 aircraft. If the B-1 strategic bomber goes into production, the Air Force will presumably acquire additional numbers of the solid-propellant missile. The B-1 will be able to carry twenty-four SRAM missiles internally in its three weapons bays; the B-52 can accommodate up to twenty missiles on wing pylons and in its single bomb bay; and the FB-111 can carry a pair of SRAM missiles internally and an additional four missiles externally on its wings. The B-52 and the B-1 will be capable of using SRAM in conjunction with a special rotary launcher that can fire eight missiles at a rate of one every five seconds in Gatling-gun fashion. The same rapid launch rate can be attained with conventionally mounted SRAM missiles.

Flexible, Versatile, and Effective

SRAM's System Program Director, Col. Lawrence A. Skantze, told AIR FORCE Magazine that the missile is capable of either defense suppression or primary target kill, stressing that "SRAM can perform either mission equally well." In the defense suppression role, SRAM can knock out enemy radars and surface-to-air missile sites to enable the carrier vehicle to penetrate to its primary target, which it can then attack either with its remaining SRAMs or with gravity bombs.

SRAM is fourteen feet long, eighteen inches in diameter, and weighs about 2,200 pounds. It has a range well in excess of its specifications in all flight modes *(see diagram, p. 30)*, according to Colonel Skantze. While its specific circular error probability (CEP) as established by the missile's flight-test program is classified, it is known to be well within the lethal radius of its warhead.

The missile is powered by a two-pulse, solid-propellant motor and is inertially guided and controlled. A small radar cross section makes it practically invisible on the enemy's radar screens, and SRAM penetrates at speeds several times that of sound. While the time between launch and arrival at the target is affected by a number of variable factors, in addition to distance, SRAM's total flight time will almost always be less than three minutes.



The four basic SRAM trajectories are depicted here, showing the flexibility with which the missile can be adapted to operational needs.

When operated in the semiballistic mode, the missile, inertially guided and controlled, flies an arcing trajectory to the target. The flight profile consists of three distinct segments: the boost pulse, the sustaining pulse, and the coasting phase, during which the missile relies on its intrinsic aerodynamic characteristics and its three control fins. Because the motor is equipped with a variable time-delay mechanism, the interval between the boost and the sustaining pulse can be varied from as short as one and one-half seconds to as long as eighty seconds. This means that SRAM's trajectories can be programmed for an almost infinite number of flight paths, ranging from maximum penetration speed and short range to maximum range with lower penetration speed.

In order to gain maximum range, Colonel Skantze explained, the missile will be programmed to fly a ballistic trajectory by firing the boost and sustaining pulses "back to back." If the missile is to attain great range without entering into a ballistic trajectory, SRAM can be programmed to activate the boost pulse, coast aerodynamically for about a minute with the aid of body lift and its three fins, and then fire its sustaining pulse to coast to its target. During the extensive and highly successful flight-test program, which was completed in mid-1971, the missile demonstrated range capabilities in both flight modes substantially beyond the requirements of the development contract. (The two-year test program involved launches from FB-111 and B-52 aircraft at subsonic as well as supersonic speeds.)

Terrain-Masking Flight Profile

Because SRAM's paramount performance criterion is the ability to penetrate the most sophisticated defense environment that can be reasonably postulated, an optimum penetration trajectory has been provided in the form of a low-level flight mode. For this purpose, SRAM is equipped with a radar altimeter that guides the missile in ground-hugging fashion over varying terrain. SRAM's radar signature is miniscule (about four times better than required by the design specifications) when the missile is being tracked head on or at any angle up to thirty degrees from head on. Add to this the short duration of its flight and its extremely high velocity and "there appears to be virtually no chance for even the most advanced air defense systems to track and intercept SRAM, especially not in the low-mode operation," Colonel Skantze told AIR FORCE Magazine. He added that, in theory, SRAM could be tracked by radar so located that it sees the missile's broadside over a prolonged period of time but, "even in such an eventuality, the time the enemy has to track, compute, and intercept appears to be too short for effective action." (Recent studies by non-Air Force weapons analysts rated SRAM's invulnerability, when operated in the low-level mode, as almost absolute.)

To increase SRAM's flexibility, the missile is able to operate in a combination of both the inertially controlled and the radar-altimeter-controlled modes. When operated in this so-called mixed mode, the missile flies part of the way at altitude and then descends to treetop-level altitude for final penetration. In addition to the variable trajectories that make it possible to tailor SRAM to diverse mission requirements, the missile's penetration velocity can be varied, at the expense of range, to thwart intercept attempts. This is accomplished by delaying the sustaining pulse and using its momentum

to drive SRAM into the target at ultrahigh speeds. (If interception is possible at all, it would have to take place in the terminal phase.)

SRAM can fly "doglegs" and also can be launched in any direction from the carrier, regardless of the latter's flight path. As a result, it is possible to launch a salvo of SRAMs, each of which will follow a different trajectory, yet arrive at the target at the same time. An ancillary benefit of this capability is the fact that the mother ship can launch from any point within SRAM's range and take full advantage of terrain masking to assure its own safety.

While nuclear interception of SRAM is not likely, because of danger to the defender's own territory, the missile is nevertheless "highly survivable in a nuclear environment," according to Colonel Skantze. This is the result of the missile's high thermal hardening required to withstand the kinetic heating SRAM encounters in high-speed flight. This thermal shielding provides automatic protection in a nuclear blast environment.

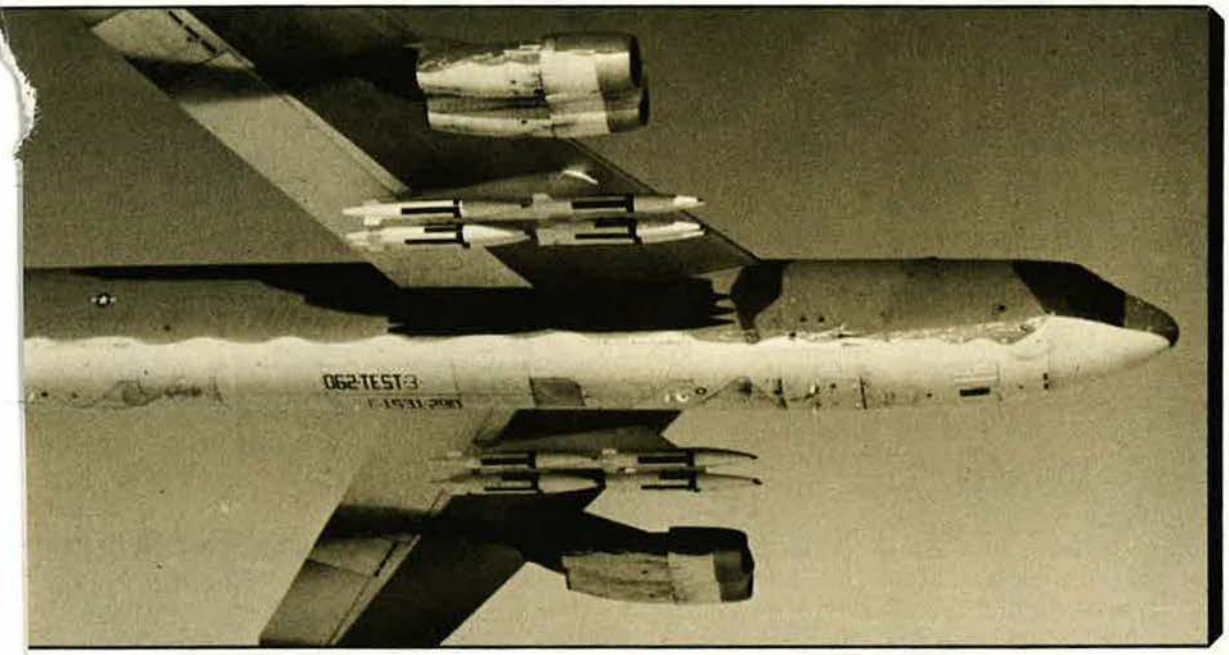
SRAM in Action

While SRAM requires an aircraft as its launch platform, the Air Force views SRAM as a weapon system rather than a component, because the system consists of both the missile and special on-board equipment (CAE, standing for carrier aircraft equipment), which enables the mother ship to accommodate the missile. In addition, special aerospace ground equipment (AGE) covers the missile, as well as the associated onboard equipment.

When deployed on the Air Force's B-52G and H models and FB-111s (and eventually the B-1), SRAM will in no way affect the reaction time of these carrier aircraft, according to Colonel Skantze. "Target tapes have to be inserted into the aircraft's master computer prior to takeoff, whether SRAM is used or not. The missile requires no monitoring or testing during ground alert. Subject to the receipt of proper orders, only minimum actions by the aircrew are required: the decision to start the system, determining when to acquire radar checkpoints and when to perform the alignment maneuver, and permitting the system to enter the automatic launch procedure. The system is not turned on until after the carrier is airborne. Warming up and aligning SRAM's IMU (Inertial Measurement Unit) with the IMU of the carrier aircraft requires only a few moments during the outbound flight. From then on, the SRAM system is constantly computing its position relative to the target and requires only one final alignment maneuver and position update with the help of the aircraft's radar, just prior to entering the target area," he explained.

Once the pilot and the weapon system officer have decided to prearm the missile for launch, known as granting "nuclear consent," SRAM can function fully automatically. The moment the system gets within range of the target, a "safe and in range" light flashes on and the missile is automatically launched unless overridden by the crew. The system automatically determines when the carrier is within missile range of any "stored" target complex.

This determination is made in terms of the



SAC's B-52Hs will be the first aircraft to accommodate SRAM, both under their wings and in their bomb bays.

Col. L. A. Skantze is SRAM Program Director.

missile's capability to fly the particular trajectory as well as the penetration velocity selected for a specific target. The computer allows for such variables as air density, Mach number, and altitude as it calculates the so-called "targeting footprint." This is necessary because atmospheric conditions affect SRAM's range and velocity to a significant degree. (The SRAM system includes an important safety feature in the form of an override, which automatically prevents either manual or automatic launch against targets that are so close that the warhead would destroy the launch vehicle.)

Under certain tactical conditions, target information may have to be reprogrammed during a mission. This can be accomplished either by direct link to the aircraft's attack radar or by the weapon system officer manually inserting target information.

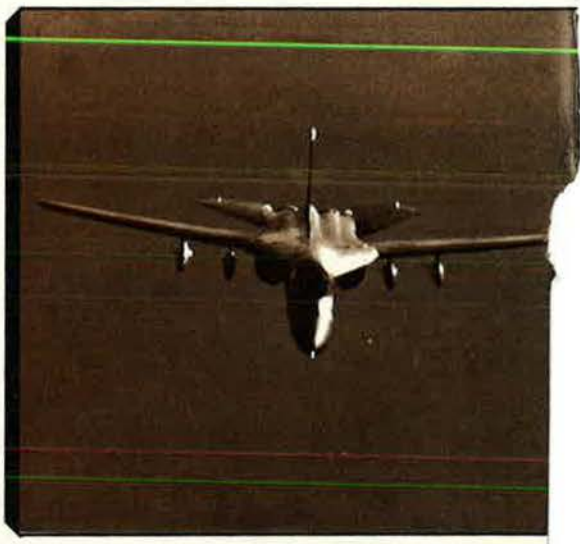
A number of features provide the weapon with high reliability, according to Colonel Skantze. First, the system is self-checking. The system's status is being monitored automatically by its computer at all times during operation. The self-checking feature enables the system to order alternate trajectories in case of certain faults or to cancel out a faulty missile altogether. (Individual SRAMs are not programmed to specific targets or trajectories until actually launched.) Backup power protects the system against disabling power variations. Any fault that occurs while the system is in operation is reported to the master computer and, upon completion of the mission, is printed out by the ground equipment. Because of the modular design of the system, corrective maintenance in most cases will require only replacing faulty modules.

SRAM's accuracy is determined by a number of factors, according to Colonel Skantze. The most crucial one, he emphasized, is the quality of the navigation system on the carrying aircraft. It accounts for about ninety percent of whatever "miss distance" is encountered. (While the accuracies experienced during the concluding phase of the system's flight-test program met or exceeded the design specifications, the test program also revealed that SRAM launches from FB-111s consistently achieved better CEPs than those from B-52s because of the FB-111's more advanced navigation system, Colonel Skantze revealed. Presumably, the more sophisticated avionics of the B-1 would provide SRAM with even greater accuracies.)

Also affecting accuracy are faulty alignment of the carrier's and SRAM's own inertial guidance units, faulty missile guidance during free flight, and geodetic and geophysical errors in the information inserted into the mission program.

Fastidious Program Management

Both Colonel Skantze and Boeing's (the prime contractor) program director, Mr. C. T. Wilkinson, stressed to this reporter their determination "to make SRAM as reliable and cost-effective a weapon system as is humanly possible." The Air Force and the contractor are sanguine with regard to these goals. The last eight test firings of the flight-test program were, in the words of Colonel Skantze, "eight consecutive successes, exceeding in most instances the reliability, accuracy, and range requirements in spite of test criteria much more stringent than can be expected under operational conditions."



FB-111 can carry up to six SRAMs.

During the current phase of transition from hand-crafted, fine-tuned prototypes to machine-shop manufacturing of large numbers of production articles (101 missiles are involved in the Fiscal Year 1971 buy and about 465 in

FY 1972), the Air Force and Boeing, along with the subcontractor team, are applying unprecedented precautions to assure high quality control. "For this reason, we have imposed a so-called Production Reliability Verification Test, a grueling fifty-hour torture test of some fifteen critical components. Each must survive prolonged and severe shake table and temperature cycles from minus sixty to plus 145 degrees without failure," Colonel Skantze explained.

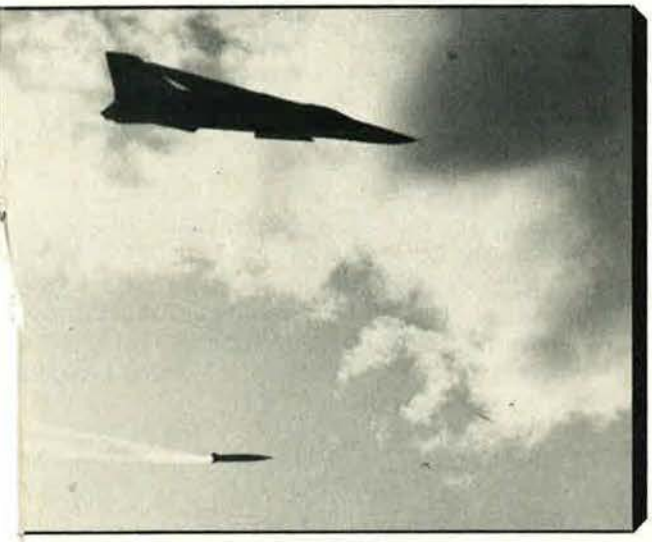
Because the reliability of operational systems depends as much on the operator as on the designer/manufacturer, the SRAM System Program Office has set up a special IOC (initial operating capability) steering committee comprised of senior representatives from the Strategic Air Command, the Air Training Command, the Air Force Logistics Command, and Colonel Skantze. The committee takes into account all requirements with respect to the actual fielding of the system and to providing SRAM repair capabilities at AFLC depots. During the past six months, Colonel Skantze said, "We succeeded in identifying and solving a number of significant potential problems that otherwise could have led to serious difficulties."

A similar approach was used under USAF aegis about a year ago by Boeing and the North American Rockwell B-1 development team in order to assure full compatibility in terms of mechanical linkage between SRAM and the proposed new strategic bomber. No firm interface specifications have been set up in the electronics area as yet, because the avionics package of the B-1 has not been defined in full specification detail, Colonel Skantze said. "By the same token, the B-1 designers do have a precise idea of the SRAM electronic-interface requirements so that if and when they go ahead with the full complement of B-1 avionics there should not be any surprises on either side," according to Colonel Skantze.

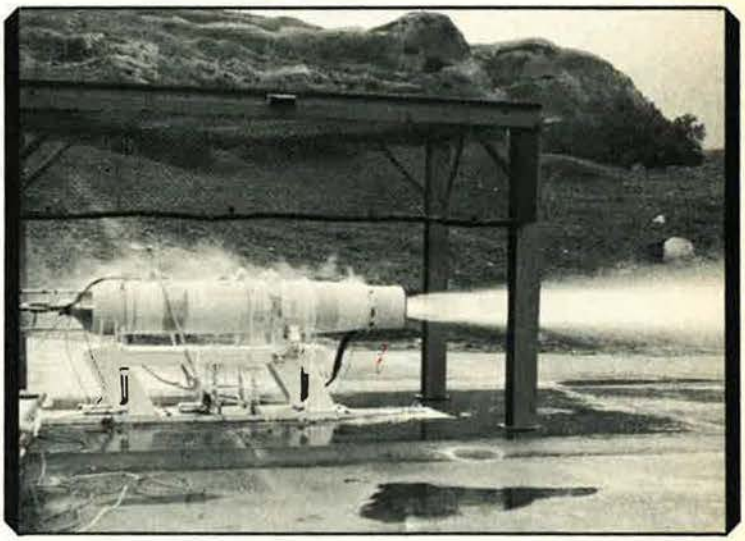
Because the system's reliability and costs are considered to be of overriding importance, all major improvement efforts by the SPO and the industrial contractor team are directed at these objectives rather than at increasing SRAM's performance. Colonel Skantze said he sees "no requirement at this time to step up the missile's capabilities in any key area because the original specifications meet all required operational needs adequately. In addition, we have extra latitude because the flight-test program demonstrated better performance than stipulated by the specifications in all critical areas. From now on, therefore, we will concentrate our efforts on managing the system in order to bring SRAM's price down and increase its reliability." (Boeing's Mr. Wilkinson emphasized that his company felt that SRAM's long-term success depends on the program management's ability to streamline costs to the maximum extent.)

"We have singled out a number of changes and plan to introduce them on a block change basis [a series of changes put into effect simultaneously rather than piecemeal] as soon as practical. Also, we are increasing the competitive nature of the program in the crucial propulsion area," Colonel Skantze pointed out.

Late last year, the Air Force awarded a contract that directs Boeing to initiate "second-source qualification" with respect to the SRAM propulsion system. Boeing subsequently selected the Thiokol Chemical Corp. for this task. If Thiokol can successfully qualify as a second-source supplier of the SRAM engine within the nineteen-month period specified by its contract with Boeing, "the Air Force has an option to award that company a portion of the



An FB-111 SRAM launch in supersonic flight.



SRAM motor during static firing test.

FY 1973 motor buy and permit Thiokol to compete against the present supplier for the FY 1974 and FY 1975 procurement," Colonel Skantze told AIR FORCE Magazine.

To date, Lockheed Corp.'s Lockheed Propulsion Co. has supplied the SRAM motor. "The reason for this [second-source] action is not that we are dissatisfied with Lockheed's technical performance, which has been very good, but rather stems from the desirability to increase production assurance, broaden the technician base, and introduce a competitive factor. While we plan no other second-source subsystem arrangement at this time, we do have tentative plans for direct purchase of some of the articles that at present are being supplied by the prime contractor. This technique [GFE —government furnished equipment] avoids the cost loading which the government experiences on all items the prime contractor provides through outside sources. We will shift to GFE at the first realistic opportunity because one of this program's top priorities is to get the missile's unit cost down as much and as rapidly as possible," Colonel Skantze said.

The Program Director predicted that the unit cost of SRAM, based on FY '71 and FY '72 negotiated contracts and averaged out over the presently planned programmed procurement, "will be about $450,000 or less." Boeing's Mr. Wilkinson said he expected the unit cost could eventually reach as low as $150,000.

SRAM's Contractor Structure

Boeing was selected to develop SRAM in October 1966, following an intensive design competition, and in January 1971 the company was awarded a fixed-price-plus-incentives production contract. More than sixty primary subcontractors provide Boeing with components for the SRAM program, whose final assembly takes place at Air Force facilities near Ogden, Utah. Principal subcontractors, in addition to Lockheed, are as follows:

- General Precision, Inc.'s Kearfott Division provides the missile-guidance system.
- Universal Match Corp.'s Unidynamics Division makes the missile's safe-arm fuze system.
- North American Rockwell's Autonetics Division furnishes the master computer for the FB-111 and B-52 carrier aircraft.
- Litton Industries' Guidance and Control Division furnishes the inertial measurement unit for B-52 carriers.
- Stewart-Warner's Electronics Division makes the missile radar receiver/transmitter.
- General Motor's Delco Electronics Division furnishes the missile computer.

Under the present production contract, Boeing provides the SRAM missile with all associated avionics and ground-support equipment, assists in the integration of the SRAM system into the Air Force inventory, conducts initial training of Air Force instructors, and furnishes operational and maintenance manuals, spare parts, and depot-level maintenance.

Multipurpose Missions?

While the Air Force and the contractor teams involved in the SRAM program deliberately avoid any development efforts and extensive studies that adversely affect the paramount task of introducing the missile system on schedule and within the budget, "some tentative thoughts have been given to secondary applications of the system," according to Air Force and contractor program officials.

While the Air Force officially has not expressed interest in SRAM as a potential candidate for a future Bomber Defense Missile (BDM), it is "evident that SRAM, with some changes in its computer programming, could be used for this purpose," Colonel Skantze said. He emphasized that "it is, of course, not an optimal vehicle for the bomber defense mission, but it does have some capabilities." Boeing officials claim that, on the basis of preliminary studies, a SRAM BDM, used aboard a carrier aircraft equipped with good avionics, "could be effective against such advanced Soviet interceptors as Foxbat and Fishbed."

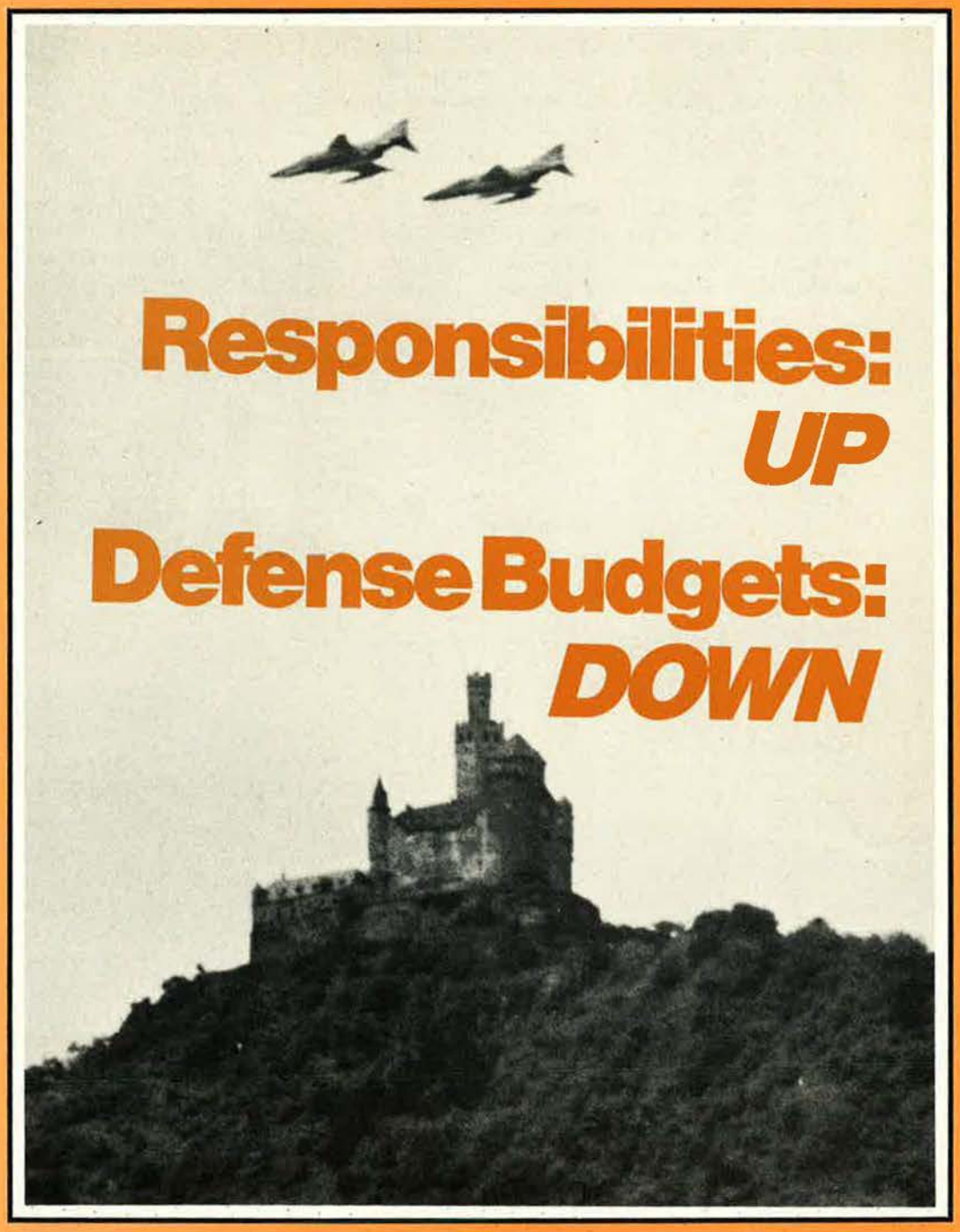
Colonel Skantze also indicated that space has been provided in the missile's interior to accommodate an antiradiation homing (ARH) system. Coupled with a passive onboard detection device, such a system could provide another option to attain reliable kill capabilities against mobile radiating targets whose location is unknown on takeoff.

Other SRAM applications being explored by Boeing involve the possible deployment of SRAM aboard the Air Force's F-4 and A-7 fleet if there were a need to increase the nation's tactical nuclear capabilities.

Boeing is also exploring possible Navy applications of SRAM. Perhaps the most significant naval concept involving SRAM may be its use in the ASW (antisubmarine warfare) field. It is believed that SRAM's reaction time and warhead effectiveness might provide a significant enhancement to the Navy's ASW capabilities.

These proposed additional SRAM uses would, of course, reduce the missile's unit cost and provide additional returns for the taxpayer's investment. But the USAF/industry program team is presently conserving all its resources for one vital activity—the activation of the first SRAM-equipped B-52 unit, which will be SAC's 42d Bomb Wing at Loring AFB, Me., by mid-1972, in order to "provide the Strategic Air Command's manned bombers with a major enhancement of the manned bomber's effectiveness."

With the loss of clear-cut US strategic superiority, responsibility for deterring encroachment on NATO's territories and interests rests ever more heavily on Alliance air forces, with US Air Forces in Europe the dominant element of NATO airpower. How USAFE is improving its ability to meet heavier responsibilities in a period of lighter US defense budgets is discussed in this special report . . .



Responsibilities: *UP* Defense Budgets: *DOWN*

By John L. Frisbee
SENIOR EDITOR, AIR FORCE MAGAZINE

USAFE... THE UPS AND DOWNS

WIESBADEN, GERMANY

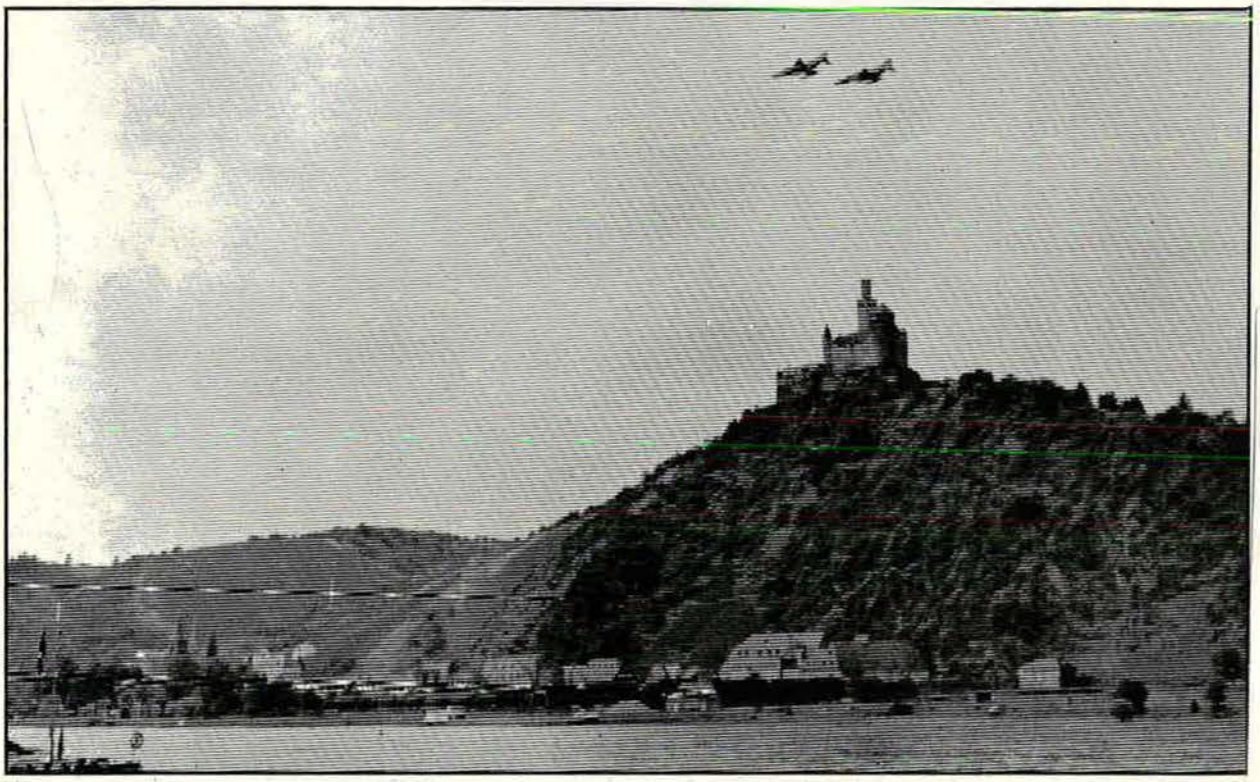
NO ONE has better reason to be aware of the Soviet Union's massive military buildup than have the men and women assigned to US Air Forces in Europe (USAFE). They stand almost literally eyeball to eyeball with Russian and other Warsaw Pact airmen. The nearest Pact airfields are only eight minutes flying time from USAF bases in Europe. But that's not all.

While the strategic nuclear balance has swung from a position of clear US superiority over the USSR to—at best—parity, the numerical balance between European-based forces of NATO and those of the Warsaw Pact has shifted by a significant margin—in favor of the Pact. During the past decade, US forces assigned to NATO and based in Europe have shrunk from 434,000 to 310,000. In the last five years, USAF strength in Europe has been cut from more than 60,000 military personnel to about 50,000. During these same five years the USSR has beefed up its ground forces in central Europe from twenty-six to thirty-one divisions, with a commensurate increase in supporting air units.

The current balance in active-duty military manpower stands at 1,345,000 Warsaw Pact troops in Europe, compared with 1,105,000 in NATO, according to "The Military Balance 1971–1972," published by the International Institute for Strategic Studies and appearing in the December 1971 issue of AIR FORCE Magazine. Nearly 700,000 of the Pact troops are Russian. The Pact holds an almost three-to-one advantage in tanks (21,700 compared to NATO's 7,750), and close to a two-to-one edge in tactical aircraft (5,360 to 2,850).

There are other advantages on the side of the Warsaw Pact—and also some serious disadvantages. On their plus side, to take one example, the Pact countries operate entirely on internal lines of communication, while major reinforcements for NATO would have to come from the United States. Pact forces also enjoy an advantage in weapons standardization. Virtually all of their armaments are Soviet-built or designed. Standardization is much less extensive in NATO.

The Pact's numerical advantage is less significant than numbers alone would indicate,



USAFE's European-based tac fighters and reconnaissance units are now completely equipped with F-4s and RF-4s. Many of them, like these two Phantoms, are based near the Rhine River as part of NATO's defense force in central Europe.

however. Under most circumstances, an attacker needs larger forces than does the defender. Next, the quality of troops, and in most cases of equipment, is higher on the NATO side. Western Europe's highly developed transportation net provides the potential for far greater mobility than do the much less extensive facilities of the Pact nations.

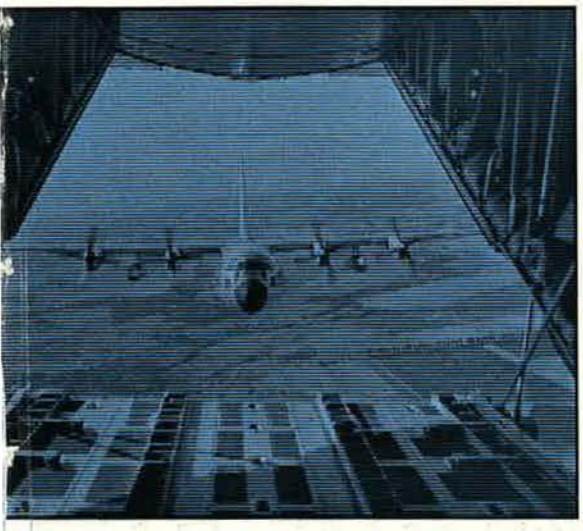
Finally, the ultimate mobilization potential of NATO, in terms of both manpower and resources, is greater than that of the Pact countries. The key to success here lies in the survival of air terminals, ports, and transportation facilities in the NATO area. Assuring that these essential elements will survive has become a somewhat stickier problem with the loss of US strategic superiority.

Why is this so? Let's take a look at the USSR's medium and intermediate-range, nuclear-armed ballistic missiles—a type of weapon that NATO does not have. There is no way of defending the targets on which NATO's reinforcement potential depends against attack by these missiles. Nor is there any theater ballistic missile defense system in NATO plans. But so long as the US had clear-cut strategic nuclear superiority over the USSR, it could safely be assumed that Soviet planners would not consider using their MRBMs and IRBMs against NATO targets. That would have drawn down an immediate response on the USSR by SAC's ICBMs and manned bombers—or at least the Soviets had to accept that as a likelihood. The umbrella of US strategic deterrence extended over all of NATO. Now the viability of US extended deterrence becomes questionable as the USSR has reached strategic parity with the US. If the momentum of the Soviet strategic program continues and we do nothing to counter it, the effectiveness of US extended deterrence will have evaporated.

For the immediate future—perhaps indefinitely, depending on the outcome of the SALT talks—the defense of Western Europe, the most vital of all US external vital interests, rests largely on NATO's ability to:

a. deter Soviet use of missile- or aircraft-delivered nuclear weapons by maintaining a superior tactical-nuclear capability in its manned aircraft;
b. maintain a degree of air superiority that will deter the USSR from launching a crushing conventional attack to rapidly destroy and overrun the air- and seaports on which NATO is dependent for reinforcements from the US and other overseas areas.

Whether NATO can maintain an effective deterrent at both the tactical-nuclear and conventional levels is largely dependent on US support embodied in USAFE. US Air Forces in Europe provide one-third of the tactical fighters and interceptors and one-fifth of the reconnaissance aircraft in the NATO inventory. In both areas, USAFE elements have the most advanced equipment and the highest level of combat experience.



Two rotational C-130 squadrons provide USAFE logistical airlift and aerial delivery of cargo and troops during frequent training exercises.

The aircraft shelter program, now nearing completion, has greatly improved force survivability in the event of a conventional attack.

USAFE's New Look

How is USAFE shaping up to the task? To answer that question, it's necessary to look at both the machines and the men.

USAFE force modernization was delayed for several years by the heavy demands of Vietnam. But by the end of 1971, the command's aircraft inventory had been brought

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up to date. USAFE now is primarily an F-equipped command, with one wing of seventy two F-111Es based in the United Kingdom. There are twenty squadrons of F-4s in place in Europe, most of them D models. Intercepto units are equipped with the F-4E.

The reconnaissance force of five European-based squadrons flies RF-4s. In addition to these tactical fighters and recce aircraft, four fighter and three recce squadrons and one electronic warfare squadron are dual-based, with their home bases in the US, but rotated frequently for training to assigned bases in Europe. Tactical Air Command provides two squadrons of C-130 transports, which are under the operational control of USAFE.

THE ECONOMY OF USABLE FORCES

By Gen. John D. Ryan, USAF
Chief of Staff, United States Air Force

The ability of the Air Force to rapidly project great military strength overseas makes a major contribution to our country's effort to keep the peace. Because of the global nature of United States economic and political interests, successful deterrence depends on our ability to defend not only our homeland, but certain other areas as well.

We must have military forces that convince potential aggressors of our ability to protect our country against surprise nuclear attack and to fight at a variety of other levels if necessary. To provide a credible deterrence against lower levels of conflict, the United States stations air, ground, and naval units at bases around the world.

Our overseas bases fall into two categories: those with forces present twenty-four hours a day, every day of the year, and those that serve as resupply and staging locations to allow the units they support to operate elsewhere. Our allies, who daily face potential aggression from large, neighboring forces, as in Europe or in Korea, are especially sensitive to this difference. Consequently, in some areas of the world, where our interests are vital, in-place forces are required as tangible evidence of the depth of our commitment.

I want to point out that this strategy has worked. When, in the face of serious external threat against an ally, we have made firm commitments and have underwritten these commitments by garrisoning ground and air units in the sovereign territory of our ally, there has been no aggression. It has worked in Europe with NATO, and it has worked in Korea since 1953.

In other areas, the *assurance* of our assistance is enough to deter aggression. Airpower is one of the primary means of providing this assurance. Our ability to get to an ally's side rapidly gives us a "presence" there that can bolster the ally's strength and determination, and can discourage stronger nations from moving against him.

I know some people suggest that political constraints imposed during a crisis will not permit the Air Force to use bases in a number of nations. They argue that base rights would not be granted during an international emergency. But this argument does not face the fact that any nation desiring the assistance of the United States will make bases available.

We can move a force, fully capable of conducting sustained operations, virtually anywhere in the world. When deploying to a previously established base, a unit can launch its first sorties within a few hours after arrival.

To further increase our flexibility and mobility, we have developed a bare-base capability which includes all the direct and indirect support facilities and equipment normally found on any tactical base. This equipment can be transported to any place that has a usable runway, parking areas, and water supply. Right now, we have identified some 1,400 such sites outside the continental United States. We have operationally demonstrated that by using the bare-base capability we can deploy to a remote location and be ready for operations within seventy-two hours. Naturally, such deployments would be totally by air.

Our nation relies on our global air mobility as proof that we can, in fact, provide assistance to our allies quickly, when necessary. And by using bases overseas, plus our bare-base system at selected locations worldwide as well as other jet-age capabilities, the Air Force is providing the kind of strength that makes the most realistic and economical use of our resources.

The command's combat forces actually in urope total nearly 500 tactical fighters and ightly fewer than 100 tactical reconnaissance lanes—the largest number of combat aircraft upplied to NATO by any of its fifteen member ations.

There is an increased emphasis on electronic countermeasures, but in the opinion of most USAFE operators, not enough ECM aircraft, considering the extensive array of radars and surface-to-air missiles deployed in the Warsaw Pact area. The command now has eighteen main operating bases—not enough from an operational viewpoint, but too many when it comes to the heavy demands of base housekeeping.

Under the TAB-VEE (Theater Air Base Vulnerability) Program, more than 350 of the programmed 430 aircraft shelters had been completed at the close of 1971. Most of these shelters, which assure a high level of survivability in a conventional attack, are in Germany with a few in the Mediterranean area. The shelters are being equipped with doors to increase their effectiveness.

TAB-VEE includes other related survivability measures: a rapid runway-repair capability, tone-down (camouflage) of buildings, more secure combat operations centers, shelters for some support facilities.

USAFE's most urgent operational need is improved all-weather capability. This has been a perennial problem, particularly in the north and central European areas where the best flying weather is, on an average, worse than the worst in the US. The Soviets are said to have excellent tactical command and control in territory bordering NATO.

Despite its smaller size, USAFE's combat capability is better today than at any time in the past. Newer aircraft, an improving basing posture, an inventory of electro-optically guided "smart" weapons, improved ECM, and vastly better survivability through the TAB-VEE program add up to a harder-hitting and more capable force in both air defense and conventional or tactical-nuclear strike roles.

Under the European Defense Improvement Plan, other members of NATO will invest about $1 billion over the next five years in measures similar to those already completed or under way in USAFE. The Federal Republic of Germany has increased its 1972 defense budget by more than eleven percent and is buying 175 F-4s at a cost of more than a billion dollars. USAFE spokesmen feel that the other NATO members are doing more for defense of the Alliance than they get credit for in the US.

So far as USAFE is concerned, Commander in Chief Gen. David C. Jones expressed to AIR FORCE Magazine a general satisfaction with the command's progress in improving its conventional combat capability. Still, his forces are spread very thin. General Jones pointed out the vast geographical area over which his command is dispersed or for which he has some defense responsibilities: Western Europe, the United Kingdom, the Mediterranean Sea area, the Persian Gulf, the Red Sea, and the Middle East land mass to the eastern border of Iran.

In a crunch, could USAFE operate effectively in the Mediterranean? General Jones believes it could. USAFE maintains in the Mediterranean a force comparable to the Sixth Fleet's air arm. While operating bases are not plentiful in the east central Mediterranean, USAFE does have a good bare-base capability and is supported by SAC's KC-135 tankers based in Spain. Under most circumstances, the General believes that enough bases would be available to support a substantial force of USAF combat aircraft.

The command's all-weather offensive capability has been given added clout by a wing of seventy-two F-111Es, based in the United Kingdom.

People Problems and Solutions

It is no secret that the US Army in Europe has serious morale and disciplinary problems. How about the Air Force? The consensus gathered in informal conversations and interviews with airmen, junior and senior officers is: Problems—yes. Serious problems—no; not yet and not likely.

Why has USAFE so far escaped the tribulations that afflict its sister service in NATO?

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There are a number of commonly given answers.

First, the Air Force is a volunteer service, even though many of its volunteers admittedly were draft-inspired. Air Force living conditions are generally better than those of the Army. Air bases are, for the most part, located near larger cities where recreational facilities are abundant, while many Army units are in relatively remote sites. Another point: Air Force people are productively busy. USAFE is manned at about eighty-five percent of its authorizations, but always has about twelve percent of its manpower in the pipeline. As a result of this and continual training operations, there are few idle hands. Maintenance people and weapons loaders, for example, work nearly a sixty-hour week in some units; staff personnel in support areas about a forty-five-hour week. That's one of the best deterrents to trouble.

A USAFE forward air controller directs an F-4 to its close-support target during a joint Army/Air Force exercise at a NATO maneuver area.

Without exception, the airmen and officers we talked with felt USAFE was serving a worthwhile and necessary purpose—another positive morale factor. And one young airman said, with apparent pride, that USAFE's morale problems are comparatively small "because the Air Force is a more disciplined organization than the Army." That came as something of a surprise. Most older (and former) blue-suiters have always thought of the Air Force as less disciplined—at least in a formal sense—than the other services.

There was a universal feeling among senior officers interviewed that junior officers a NCOs are of higher caliber and professior competence than at any previous time USAFE's twenty-six-year history. Junior office who do not intend to stay in the service ar with rare exceptions, doing a good job an looking for more, rather than less, responsi bility. There is, of course, a high percentage o Vietnam veterans throughout the command. I shows. The F-4 and RF-4 squadrons we visited in Col. William F. Georgi's 26th Tactical Reconnaissance Wing at Ramstein fairly exuded professional know-how and confidence in their ability to do the job in the face of unfavorable numerical odds, if the whistle should blow. Two very impressive outfits.

How about first-term airmen? One wing commander felt that their quality is dropping, particularly in nontechnical areas. He attributed it to shortcomings of basic training, which he felt is not tough enough. In his opinion, new airmen aren't psychologically prepared to take their place in a combat unit.

Obviously in a command of 50,000 people spread from the Arctic Circle to the Persian Gulf there are going to be some disciplinary and morale problems. Drug use is one of them. It's worrisome, but not widespread—apparently less than one percent, command-wide.

There have been instances of racial friction, but so far they have not flared into a serious situation. There is some feeling, largely among the younger airmen—particularly blacks—that the Germans don't want Americans in their country. And there are, as always, some people who just don't want to be in uniform or in Europe, and some who resent genuine or imagined infringements of personal rights and dignity, or administrative hangovers from simpler days, which detract from mission effectiveness and act as personal irritants.

General Jones is determined that no one with a legitimate complaint will go unanswered or the complaint uncorrected. As Brig. Gen. Brian Gunderson, USAFE's Chief of Staff, pointed out, people problems were to some degree neglected during the height of the Vietnam War. Drawdowns of people and equipment and delayed modernization forced a heavy emphasis on mission accomplishment with fewer people and obsolescent tools. As force modernization progresses, it has become possible—and necessary—to focus more attention on making Air Force life more rewarding.

General Jones's philosophy for coping with personnel problems is, "Don't advertise what you're *going* to do. Do it—then advertise." He is convinced that young people will respond to understanding leadership, and through a series of related programs is moving toward what he calls "participatory management of people." This does not mean a relaxation of the discipline that is essential to any combat-ready military organization. It means, simply, giving

veryone in the command a chance to explain is views and to make suggestions directed oward raising professional standards.

One example of this approach is USAFE's Direct Line program, which encourages members of the command to register complaints and suggestions with their unit commanders. The unit commander is required to answer every query and to report to his superior the action he has taken. All Direct Line items are referred on up the line to USAFE Headquarters for review. According to General Gunderson, it is not just a *pro forma* review.

During a three-month period in the fall of 1971, 392 Direct Line items were forwarded to USAFE. Eighty-seven percent of them had been resolved satisfactorily at base level.

Another channel for surfacing new ideas, inequities, or inefficiency is the NCO/Airman councils that USAFE has set up in every unit of each base. Each of these unit councils then is represented on the base NCO/Airman council.

There are differences of opinion at USAFE level and within some of the units as to the effectiveness of the Direct Line program, but none as to its desirability. Its effectiveness depends on the receptivity and understanding of commanders at all levels. That has not been uniformly enthusiastic or enlightened, but General Jones intends that it shall be. He has started a series of one-week seminars for wing commanders on leadership, human relations, and equal opportunity, and plans to have all first sergeants report to USAFE Headquarters at Wiesbaden for similar training. He also has established what might be called a mini-NCO academy on leadership, for NCOs down through the three-stripers.

The USAFE commander believes that all personnel in the command need to know more about black culture and customs, and, at the time of our interview, was working out a program for that purpose. He has also put out a fair-housing regulation which must be accepted by civilians in the USAFE area who want to rent to Air Force people.

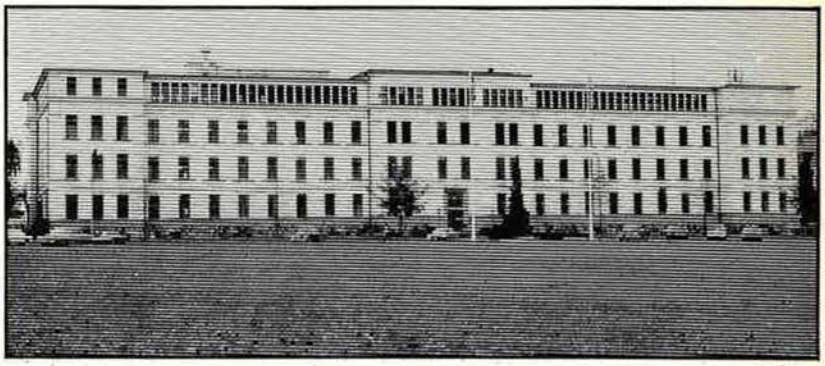
General Jones talked enthusiastically about his educational reinforcement program that aims to improve the educational background of airmen. It is not vocational training, but rather instruction in English and basic mathematics, which will enable airmen to participate successfully in other kinds of training designed to make them better able to compete either in the Air Force or in civilian life. The program is voluntary, conducted during duty hours, and taught by base school faculty members or qualified active-duty people.

Putting It All Together

Effective deterrence—synonymous with combat effectiveness—is a product of superior weapons, training, and morale. With enlightened and imaginative leadership, USAFE is putting it all together in the new NATO world of the 1970s. And it *is* a new, more dangerous world as the umbrella of US strategic superiority has been folded and perhaps is about to be put away for all time.

NATO is not a military anachronism, facing a phantom threat, as it has been represented by advocates of unilateral force reductions. The Soviet conventional and tactical nuclear threat is growing in parallel with the USSR's drive for strategic superiority. That has been recognized as a fact of life by ten NATO member nations who announced in December 1971 a $1 billion increase in their 1972 defense budgets.

It is hoped that the Soviets are serious about proposed negotiations for mutual and balanced force reductions in Europe. But they have not, as this is written, agreed to begin negotiations. And negotiations, once begun, would not quickly yield tangible results. In any event, now—prior to whatever negotiations may take place—is not the time for reducing US forces assigned to NATO. Nevertheless, despite increased contributions by our NATO partners and President Nixon's assurance that the US will not cut its NATO forces, it must be anticipated that pressure for reductions will continue in the Congress and elsewhere. Those who advocate that course are courting potential disaster.



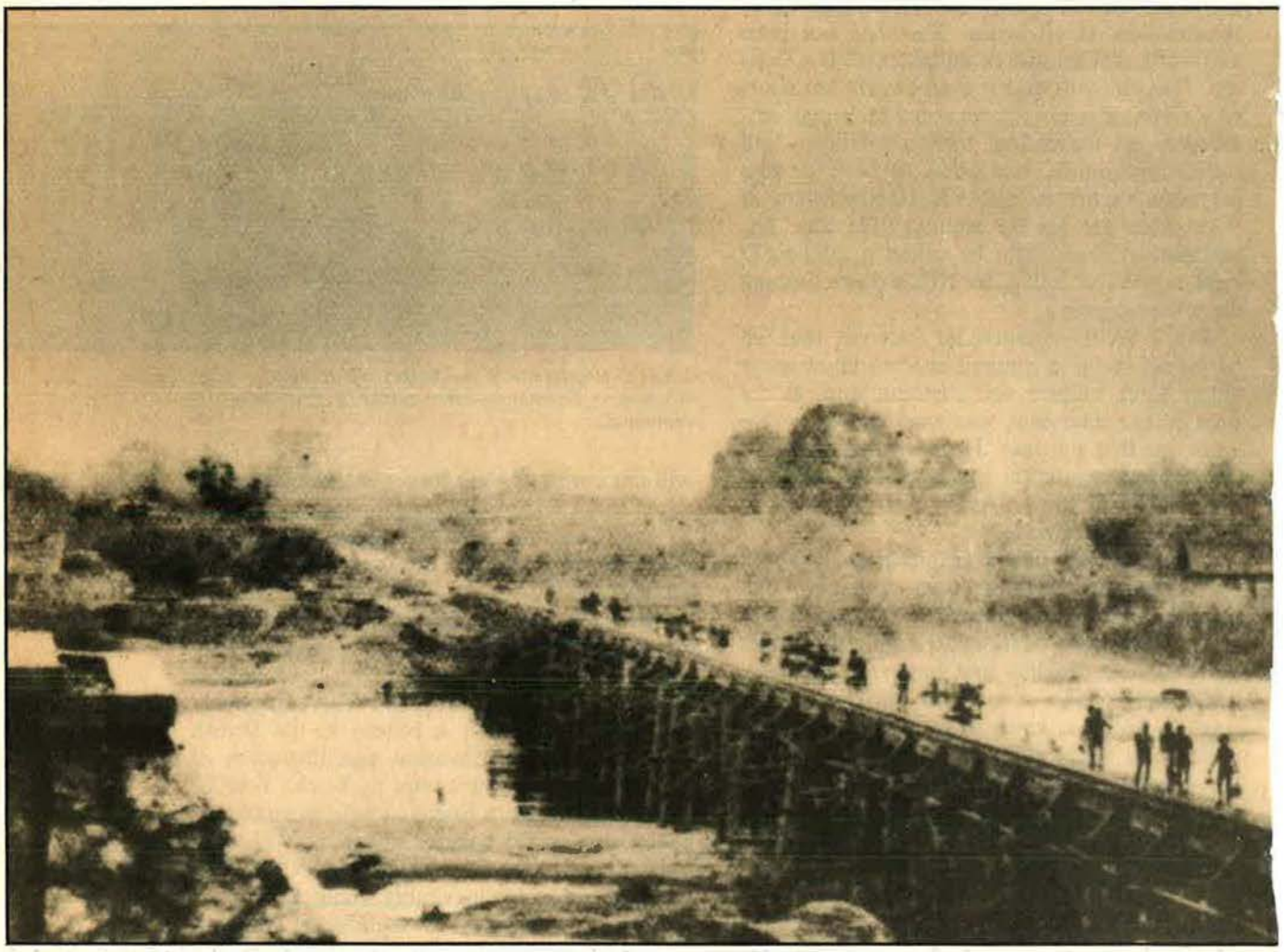
USAFE Headquarters at Lindsey Air Station, Wiesbaden, Germany—nerve center of a far-flung command.

With the loss of US strategic superiority, conventional deterrence of a Soviet move against Western Europe assumes even greater importance than in the past. There probably could never again be a retreat to the British Isles, followed by invasion and liberation of the continent, as there was in World War II. The loss of Western Europe would permanently change the world balance of power, with consequences for the US which cannot be fully foreseen but which inevitably would be bad.

NATO is the key to security of Western Europe. Airpower is the steel that gives the key its strength. USAFE is the indispensible alloy in that steel. ■

Fictional accounts of historical events often cloud the facts and sometimes submerge the role of actual participants. So it was with a popular novel that later was the basis for an award-winning motion picture that thrilled millions. The theme of both dealt with the destruction of a strategic bridge built in Thailand by prisoners of the Japanese during World War II. Here the true story is told by a man who was there . . .

ABOUT THAT BRIDGE ON



This photo of the wooden Kwai bridge is believed to have been taken late in 1944. Seen from an attacking aircraft later, it "looked like the thin edge of a knife blade . . ."

THE RIVER KWAI

By Lt. Col. William A. Henderson, USAF

MILLIONS OF movie-goers and TV viewers can conjure up a vivid mental image of the "Bridge on the River Kwai," immortalized in the 1958 film adapted from Pierre Boulle's novel.* As though they had been there, they can visualize the massive, intricate structure—and the climactic deaths of the British colonel and his Japanese captor in the seconds before the bridge was finally blasted into oblivion.

It didn't happen that way. I know. I was there when the bridge was actually destroyed.

But it was not until many years later that I was able to bring the factual account of that dramatic event into focus. I first had to go back in memory to April 3, 1945, and—twenty-six years later—to Kanchanaburi, a village on the banks of the Mae Klong River in Thailand. This is the story of what I found during that journey through time and space.

Facts and Fiction

By mid-1942, Allied submarines and aircraft were closing the sea route to Rangoon via Singapore and the Strait of Malacca. Increasingly desperate for an overland route to supply its troops in Burma, the Japanese Imperial General Headquarters directed its army to build a single-track railway from Thailand to Burma. The railroad was to carry 3,000 tons of supplies a day from Ban Pong in Thailand via the Three Pagodas Pass on the Thai-Burmese border to the Burma railway at Thanbyuzayat, located between Moulmein and Ye.

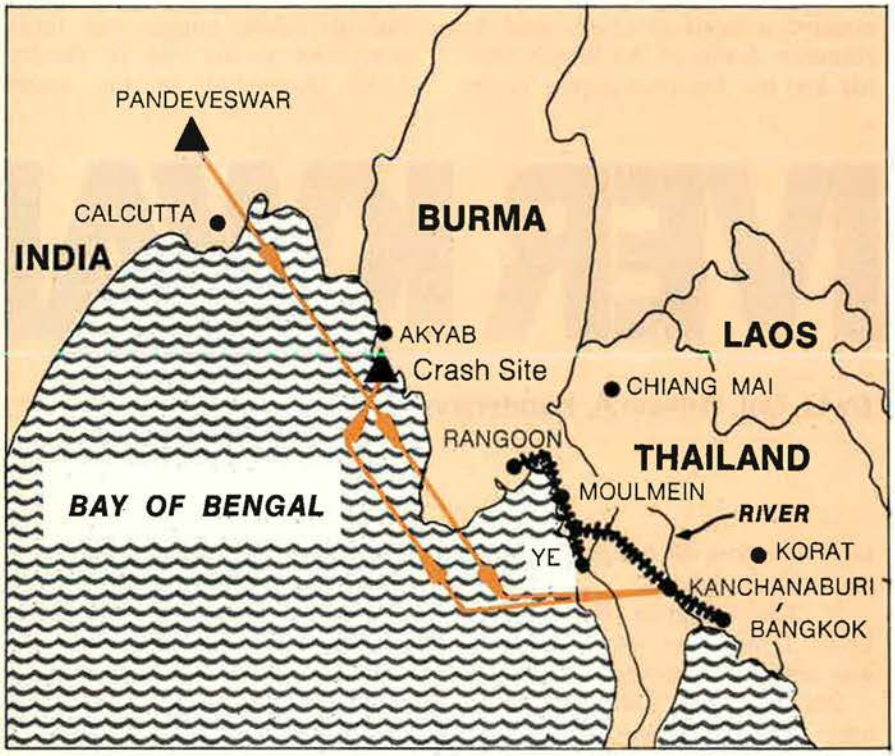
Work was begun in October 1942 with an August 1943 deadline for completion. The more than 250 miles of track, much of it through dense jungle, was finally completed at the end of October 1943. According to the United States Air Attaché in Bangkok, Thailand, more than 16,000 prisoners of war and many impressed laborers, including Chinese, South Indians, Malays, Burmese, Javanese, and Dutch-Indonesian Eurasians died building the railway. Most of the deaths were from disease, malnutrition, and exhaustion.

Actually, two bridges were built across a branch of the Mae Klong River. This river is referred to by some of the former prisoners who worked on the bridges as the Kwai-Noi or just as the Kwai. A wooden bridge was completed about February 1943, and a steel bridge, brought in piecemeal from Java by the Japanese, was ready some three months later. The wooden bridge was located 100 meters downstream from the steel bridge. Since these bridges were long and vulnerable, their destruction was a key to choking off the Japanese overland supply route.

I first saw the movie, "Bridge on the River Kwai," in 1958. It

* Boulle, Pierre, *Bridge Over the River Kwai,* Vanguard Press, New York, N. Y., 1954.

ABOUT THAT BRIDGE ON THE RIVER KWAI



Here are shown the approach and departure courses the author's aircraft used on April 3, 1945, during the bridge-busting mission. Damaged by enemy antiaircraft, the B-24 later crash-landed on the Burmese coast.

later appeared on television—on one occasion as a special feature that drew an audience of millions of viewers. Many readers will remember that the story dealt with British prisoners of war who were gathered into a large camp on the Kwai River. They were forced to work on a wooden bridge across the broad expanse of the river. The Japanese lacked the engineering skill to build the bridge, and for months the project foundered as the mistreated prisoners selected rotten timber, failed to properly align the curved approaches to the bridge, and lost valuable materials and time in a poorly selected river bed foundation.

The British troop commander, a colonel, played in the film by Alec Guinness, convinced the Japanese that by treating the prisoners properly and allowing him a free hand in organization and construction techniques, he could build the bridge and meet time schedules. As the bridge neared completion, the Allies, who had been shadowing the operation for months, parachuted in a demolition team to blow it up. According to Boulle's book, the British colonel, whose perspective had been destroyed by his pride in the bridge, cut the high-explosive detonator wires when he accidentally discovered them, and thus saved the bridge. In the movie, he regained his senses at the last moment and, though mortally wounded, fell on the detonator and blew the bridge.

When I saw the movie for the first time I felt that I'd been there before. The more I thought about it, the stronger the feeling grew. The pieces began to fall into place as I reconstructed my World War II experiences in South Asia.

Libs Out of India

My B-24 Liberator crew, part of the 436th Squadron, 7th Bomb Group, reached India in Octob 1944. Stationed about eighty mil north of Calcutta in eastern Indi we were temporarily diverted fro our bombing missions and sent t China in December 1944. Ther our job was to haul gasoline fron central China, across Japanese occupied territory, to the sur rounded and isolated US and Chinese air bases in eastern China.

Upon our return from China in February 1945, we learned that one of our crews, which had stayed in India, had been credited with cutting the steel bridge over the Mae Klong (or Kwai) at Kanchanaburi.

In March, the 7th Bomb Group made at least two very-low-level attacks against the wooden bridge that paralleled the steel span. They used fixed-angle aiming techniques to give the enemy antiaircraft gunners minimum sighting time. The results were poor; the wooden bridge still stood.

The Japanese were using the wooden bridge as a bypass for the destroyed steel bridge. We called the wooden structure the Kanchanaburi bypass bridge.

We knew about the POW compound at the water's edge on the Kanchanaburi side of the river. The camp's location—its nearness to the strategic bridges—was in complete violation of the Geneva Convention. Crews that might be assigned to attack the bridge were carefully instructed not to release bombs if bombsight crosshair drift indicated a possible hit in the POW area. Our intelligence knew nothing of the Japanese camp headquarters located under the trees beside the POW buildings. Neither did we know of the terrible plight of the POWs in the camp. Our intelligence briefings were usually very good, but, as I later learned, we were not fully knowledgeable in this particular area.

On April 2, our crew was alerted for a mission the next day. This began a sequence of events that had some peculiar facets from the beginning. For example, our mission briefing was just past midnight at 0030 on April 3, with a 0230 takeoff time. (Our missions usually took off at dawn or later.)

When the target chart curtains were parted and the mission revealed, a murmur expressing more

han normal impending danger went ıp from the crews. New cruise-con-rol techniques and use of bomb-bay anks had made it possible for the B-24 to fly missions of more than fifteen hours' duration. This would be *one of those*. It was the wooden bridge at Kanchanaburi. Our 436th Bomb Squadron was to be the lead unit, and my crew was the lead bridge-bombing crew.

Busting a Bridge

Since the previous attacks at very low level had been unsuccessful because of the necessity of using fixed-angle bombsight techniques, this mission was to be flown at from 4,000 to 6,000 feet. That was the most accurate altitude for synchronous bombing using the Norden bombsight. It was also an extremely accurate altitude for enemy antiaircraft batteries. But with the steel bridge already breached, a break in the wooden bridge was essential, regardless of the risk.

The pattern of attack was to be single aircraft in an extended bomber stream. An antiaircraft-suppression plane was to arrive with the lead bridge bomber. Its mission was to drop antipersonnel fragmentation bombs on the AA batteries. The bombers were loaded with six "bridge busters" in the forward bomb bay and gasoline tanks in the rear bay. Every bomber was to drop two bombs on each of three bomb runs.

Takeoff and navigation to the target area were normal except for the long flight at low altitude over water and remote jungles to avoid enemy detection, and the slow airspeeds to conserve fuel. As we neared the target, the flak was light and we noted that the frag bomb carrier that was to hit antiaircraft sites had not yet arrived.

For some reason only one of my bombs went away on the first pass at the bridge. But it was a direct hit on the ten-foot-wide bridge, which looked like the thin edge of a knife blade even at this low altitude. My lone bomb destroyed a large part of the eastern section of the wooden bridge.

The two bombs on the second pass were near misses; there was also a notable increase in ground fire. With three bombs remaining, we began the final run as the flak-suppression plane and the next bridge-bombing aircraft arrived.

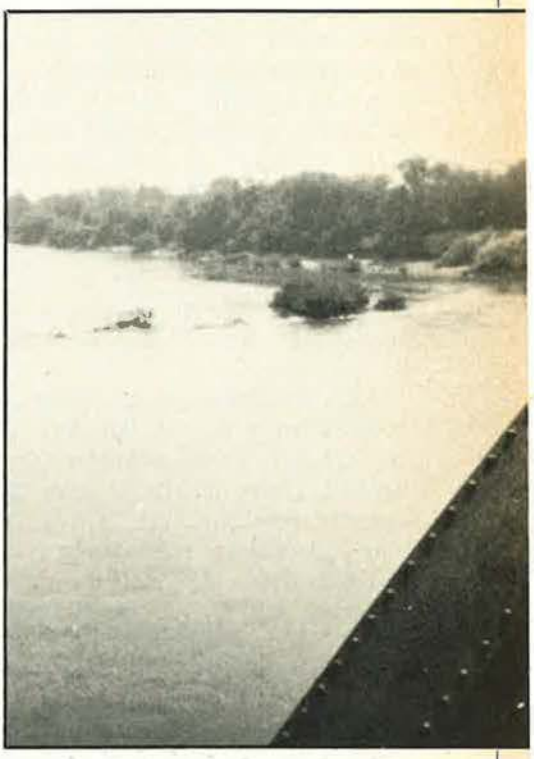
When my remaining three bombs dropped, everything looked perfect for another hit. The gunners reported flak getting heavier and closer, but I requested the pilot to hold a steady heading for a few seconds longer so we could get photos of the impacts. This move almost cost us our lives.

I gave the "okay to turn" when the bombs hit and, as the wings went rapidly near-vertical in the turn, we were hit by multiple bursts of flak. VHF and Command radio communications were destroyed but, worse yet, the aileron cable was severed, leaving little control of the aircraft. We were frozen into a turn, and as we swept in an ever-widening arc around the bridge and camp, I recall thinking of having to parachute into enemy hands and help rebuild the bridge I had just destroyed. After circling the area one and a half times, the wings finally leveled and, by using full throttles and rudder, we were able to head for the Bay of Bengal.

Now that the target was behind us, we realized that survival was much more likely. We elected to fly across the Bay of Bengal, south of Rangoon. The possibility of being picked up by Allied shipping looked like a better bet than a trek through the triple-canopy jungle of Japanese-occupied Burma. Fortunately, the aircraft held together, and after much debate the aircraft commander decided to crash-land on a wide beach after passing over friendly lines. (Even though the aircraft was demolished, the only injuries were minor ones to the tailgunner and myself.) We were picked up by Allied trucks, taken to a British forward camp, and finally returned to our Indian base.

I believe this was the last US strike against the "Bridge on the River Kwai"—the Kanchanaburi bypass bridge as it was known by our aircrews, or "Tamarkan" by Allied POWs who had built the two bridges and had been forced to keep them repaired. Former POWs in the camp have written me that the British made subsequent air strikes on the bridges while under repair, but the wooden bridge was never rebuilt. The steel bridge came back into service at about the end of World War II *(see photo, p. 46)*.

A recce aircraft took this aerial photo of the bridge area as a follow-on to the April 3, 1945, attack.



Viewed from the steel bridge in 1971, all that's left of the celebrated wooden bridge is silt and broken pilings.

ABOUT THAT BRIDGE ON THE RIVER KWAI

Return to Thailand

Nearly ten years after I first saw "Bridge on the River Kwai" on the movie screen and began to wonder if I really had been there before, I was back in Thailand. It was during the buildup of USAF forces in that area, and there was no time to solve the puzzle. The site we bombed on April 3, 1945, had two bridges—one steel and one wooden. In the book and the movie, there was only one. Could my bridge have been the one about which Boulle wrote his fictional account?

After I returned to the States in 1968, I wrote the US Air Attaché in Bangkok. He confirmed that Boulle's bridge had been near the town of Kanchanaburi, that there were two bridges, and that the steel one still stood. The Attaché mentioned a Mr. Boonpong Sirivejapahdh, who had managed a canteen in the POW camp at Kanchanaburi during the war, and later became a successful businessman in Bangkok. Boonpong had secretly helped many of the POWs to survive.

Two years later, I volunteered for a second tour in Southeast Asia, arriving in the Central Highlands of South Vietnam during August 1970. In January 1971, I was able to get six days of R&R in Bangkok. The Bangkok *Post* arranged for me to meet Boonpong.

Boonpong recalled the day the wooden bridge was put out of commission. Though it had previously been damaged, Boonpong and a former POW both confirmed that the April 3, 1945, strike was the only time the wooden bridge was breached and spans brought down. Most specific in Boonpong's memory was the unusual time—0930 in the morning, when usually the strikes occurred in the afternoon—and the wide circling of the aircraft "as if it were taking photos of other aircraft coming in."

Without my mentioning it, he also recalled that "many small high-explosive bombs hit between the bridge sites and Kanchanaburi that day, following the bombs that hit the wooden bridge." This coincides with the location of the AA batteries and the late arrival of the flak-suppression plane.

After our conversation, I made the trip to Kanchanaburi to see the spot where I had dropped bombs so many years ago. There is a Japanese memorial near the east end of the site where the wooden bridge formerly stood. It contains the ashes of Japanese soldiers who lost their lives building the bridges. And near Kanchanaburi is another cemetery where 8,544 Allied soldiers are buried. Located in a valley surrounded by towering mountains, it is one of the most beautiful cemeteries I have seen. The land was donated by Thais who were friends of the prisoners during the war, and the site is maintained by the Commonwealth War Graves Commission in London.

A Thai tourist-information brochure states that Kanchanaburi is the site of Pierre Boulle's bridge. A signboard explains that a wooden bridge once stood a hundred meters downstream from the still-used steel bridge, but mistakenly notes that it was dismantled after the steel bridge was completed. This is disproved by photos taken from one of our mission aircraft (my film was destroyed when we crash-landed). Correspondence with former POWs and pictures they have sent all show that the wooden bridge was intact and in use until I dropped my first bomb on the morning of April 3, 1945.

Pierre Boulle wrote a novel, not a history of actual events. The Thai Tourist Bureau has correctly identified the setting of Boulle's novel. But neither is right about the way the bridge met its end.

I now know that it was shattered by the 436th Bomb Squadron of the 7th Bomb Group. And I was part of the team which dropped the bomb that destroyed the "Bridge on the River Kwai." ■

The rebuilt steel bridge as it appears today. The original three spans were replaced by two longer spans following the war. At nearby Kanchanaburi is the final resting place for many who labored on the Kwai River bridges.

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A Foreign Service Officer who has held policy-level positions with both the US Air Force and Army observes that arms control—which deserves a high national priority—offers no guarantee of solving defense complexities or of greatly reducing defense budgets. He warns that prudence must be the watchword in an objective appraisal of . . .

THE HARD REALITIES OF ARMS CONTROL

By Raymond J. Barrett

ARMS CONTROL is very much in the news these days. The strategic arms limitation talks (SALT) between the United States and the Soviet Union are the most prominent, the most complex, and the most significant effort toward that goal. A treaty to ban nuclear and other weapons of mass destruction from the seabeds was recently concluded under the aegis of the United Nations. An earlier treaty prohibited these weapons in outer space. Also placed on the books in recent years were the Limited Test Ban Treaty and the Nuclear Non-Proliferation Treaty. The feasibility of banning or controlling antiballistic missile defenses (ABMs) and multiple independently targeted reentry vehicles (MIRVs) has been an important consideration in recent public discussions of defense budgets and programs.

Arms control deserves one of our highest national priorities. While prudently maintaining sufficient strength to ensure ourselves against crippling attack, we must seek ways to diminish the present awesome potential for violence in this world. The best solution to our defense problems would be to limit or eliminate the external threats. In short, we must seek actively and imaginatively for a better world.

A Simpler, Cheaper World?

The very importance and desirability of arms control suggest that two of its aspects should be more clear than they seem to be at present. The first is that arms control will not make our defense problems fewer or easier. It does not free us from the great complexities and excruciating dilemmas that now torture us in trying to decide on and develop a defense for the United States that is sufficient, but not excessive. To the contrary, arms control adds new complexities and worries, and increases the al-

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ready catastrophic penalties if we decide incorrectly.

Reducing or limiting the number, deployment, proliferation, or development of weapons—particularly those of mass destruction—*does* tend to reduce the danger of war. But it is not simply the reduction or limitation of arms that is important. In fact, as we shall see later, reductions or limitations of certain types of weapons or facilities may increase the danger of war, rather than reduce it. The essence of arms control is that any reductions or limitations must be conducive to a situation in which no one would view a decision to attack as beneficial.

The second noteworthy point about arms control is that, in itself, it costs a great deal of money. It is true that arms-control agreements may enable us to reduce spending on some weapon systems and related military costs. Explicit or implicit in many arms-control discussions is the assumption that such agreements will actually produce considerable financial savings; for instance, that an agreement between the US and the USSR banning or sharply limiting antiballistic missile defenses would reduce US defense spending by billions of dollars. But the systems needed to implement an acceptable arms-control agreement generate additional costs that could reduce or perhaps even eliminate any savings. For the foreseeable future, arms-control measures are not likely to produce great reductions in overall spending. Arms control undoubtedly is most desirable—but it is neither an operational nor an economic panacea. Certainly it should not be regarded as a means of diverting vast sums of money from defense to the amelioration of domestic problems.

Arms Control Alternative

In arms control, the watchword must be "prudence." A prudent approach requires that we assess the threat that confronts us. The simple fact is that the Soviet Union possesses, in abundance, ballistic missiles and nuclear weapons capable of destroying our society. We do not have to debate Soviet motivations or intentions. Nor are we talking about a Communist bogeyman. The fundamental point is that, if we did not have the means to deter the Soviets from using this military might, they could coerce us as they wished. What would happen to our freedoms if we could be ordered about by others under the threat of nuclear attack that we knew we could not counter? The stakes are great, and no prudent man would be willing to accept such great risks.

There are two ways of avoiding unacceptable risk to our security and freedom. The first —and at present the only reasonably certain way—is to deter attack on the US. In this era of nuclear intercontinental ballistic missiles, is no longer feasible to defeat an attack without grievous damage to our society. What we must do is maintain a situation in which any attacker stands to lose as much as or more than he can gain. We must maintain a credible second-strike capability which, of course, deprives a potential attacker of a first-strike ability.

In order to have forces able to survive an attack and still inflict on an aggressor a level of damage that he is unwilling to risk, we have little alternative but to seek relentlessly to develop new or improved weapons and defenses as the technology becomes available. This places a high premium on constant, aggressive research. Operating thus at the very frontiers of human knowledge means that developing and deploying new weapons will be highly complex. And it also means that the weapons will be very costly, since highly reliable equipment must be designed and built to do things that have never been done before.

Some Arms-Control Problems

The second way to reduce risks to our security is to agree with the other side on limitation of particular weapons. This is arms control. But this approach does not reduce our problems of complexity and cost, as pointed out earlier. Let's look at some more specific reasons for the cost and complexity of an acceptable arms-control environment.

Confidence that an agreement does, in fact, reduce the risk of attack or nuclear blackmail is essential. We must be confident that we can verify whether any agreements we enter are adhered to by the other side. Remember that the penalty for error is enormous.

The means of verification—observation satellites, electronic sensing, and other monitoring systems — are themselves extremely complex and costly. They involve the very boundaries of technology, with all the practical problems just enumerated. And we will have to keep these systems abreast of a rapidly advancing technology. We will have to anticipate and be ready to counter an opponent's technical advances, *e.g.*, means of foiling our monitoring devices or disabling our satellites that would interfere with our verification procedures. If we cannot verify his compliance with an agreement, we immediately face uncertainties and a significant increase in the risk to ourselves.

We must also actively and imaginatively pursue weapons technology, even if there is an arms-control agreement. We must do so to be sure we can evaluate anything that we may find the other side to be doing. We must be sure we can identify any technological breakthroughs in weapons development that we could not verify or that could be rapidly translated into hardware. Either of the latter possi-

ilities would give the other side an opportunity apidly to shift the weapons balance in its favor.

Our efforts must encompass, in addition to esearch, some attention to weapons prototypes and production facilities. At any point, if the other side broke the balance, we must be able expeditiously to produce and deploy the most up-to-date weapons needed to counter the other side's move.

Some indication of what would be involved in doing all this is suggested by our experiences under the Limited Test Ban Treaty. Compared to strategic arms limitation, this agreement is narrow in content and implications. It simply prohibits nuclear explosions in the atmosphere, outer space, or underwater. Yet monitoring this treaty has been far from easy or inexpensive. The direct facilities needed to resume atmospheric testing, if necessary, have cost us several tens of millions of dollars a year. Pursuing our research and maintaining expertise in these areas have cost a good deal more. And to these items must be added a portion of the costs of developing, deploying, and operating our elaborate detection systems that monitor Soviet nuclear activities.

Seeking Stability

Stability—the kinds of situations in which neither side is likely to believe it profitable to attack first—is another crucial concept in making arms control feasible. It was noted earlier that making it impossible for an enemy to destroy our weapons in an initial attack is the key to deterring attack. Obviously, stability is not a static concept when technology is constantly developing, resources are subject to so many demands, and uncertainties always are present. It may even be impossible. However, measures in the direction of stability can often be conducive to viable arms control.

Accordingly, arms control does not involve only, or always, limiting or reducing weapons. It may require additive measures in some directions to make feasible constraints or reductions in other directions. For instance, deploying an effective antimissile defense of intercontinental ballistic missile sites would make it more difficult to destroy those missiles in a first strike. An airborne warning and control system would be far harder to target and destroy than a geographically fixed one, and thus be more likely to survive and direct a counterattack. Sheltering aircraft and dispersing units to many scattered fields would make it unlikely that all aircraft could be destroyed in a first strike and would, accordingly, increase the likelihood that units would survive and counterattack.

As can be seen, measures such as these make it less likely that one side could carry out an effective first strike. They thus increase stability and create the kinds of circumstances that make possible arms-control agreements that limit, constrain, or reduce other weapon systems.

Measures to strengthen stability, however, can add another dilemma. They sometimes complicate verification, the central importance of which has already been noted. Aircraft shelters, for instance, can conceal or obscure the numbers and types of aircraft actually available. Thus, in seeking to create conditions that make arms control feasible, measures to increase stability can work at cross purposes to verification and the confidence in compliance that is essential.

The net result is that to increase stability and security through arms-control agreements that limit or reduce some kinds of weapons may require an increase in other categories of weapons, or in facilities and funds. The situation is not simply one of net reductions, as it may seem at first glance.

The Trilateral Equation

The complexities of arms control take on further difficulties when viewed from a broader perspective than that of bilateral strategic deterrence. How, for instance, can Communist China be incorporated in strategic arms limitations when it eventually has a significant nuclear capability? To illustrate this dilemma, assume that a reasonably symmetrical balance between the US and the USSR is feasible. In arms control based on "stability" and deterrence, a Chinese strategic nuclear capability would throw out of balance the US-USSR bilateral "stability." Would we accept the Soviets retaining "enough" to balance us, plus adding "some more" to deter China? Would not that give the Soviets more than "enough" to balance us, *i.e.*, "something extra" that could equally well be used against us? Stability does not seem possible in a three-sided equation because any two sides could always combine against the third.

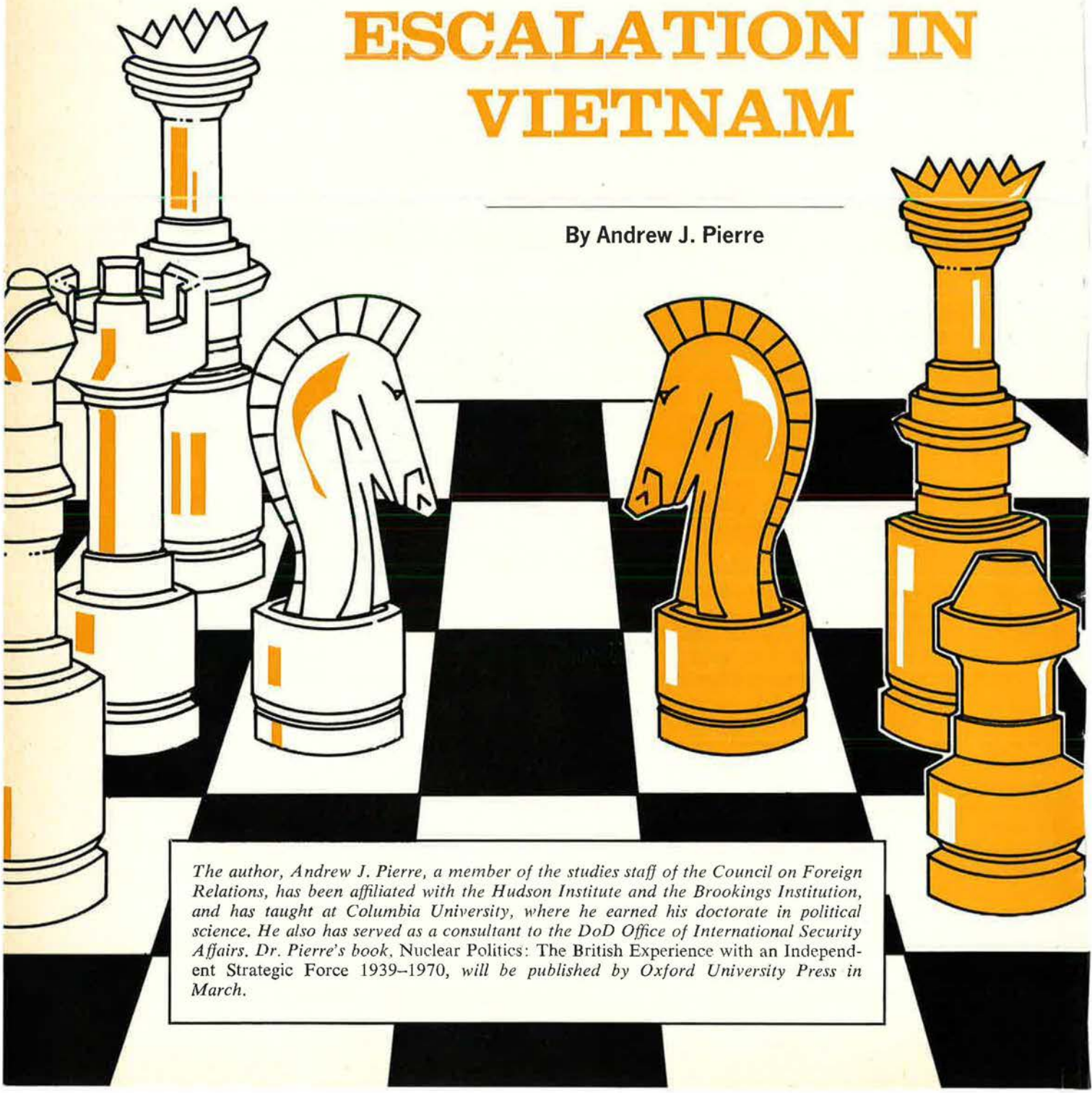
The pertinence of these observations is, again, that arms control, far from easing our defensive problems, can severely complicate them. The penalty for error in assessing these added complications is enormous, for they relate closely to our prospects for national survival.

Arms control, as this review of some of its realities brings out, is exceedingly complex, and it can be costly. In our hopes for lasting peace, we must work actively for viable arms control. But there should be no illusions, as there now seem to be, that it will produce great savings of money or that it will ease the nerve-racking problems of protecting our way of life in a dangerous world. Nevertheless, realism and prudence do not rule out hope or an active search for conditions conducive to peace. ■

The strategy of Controlled Escalation, associated with the Vietnam War, is not necessarily faulty; it was, in fact, never fully applied. The author points out certain limitations that are likely to affect any US strategy governing the use of military force for political purposes, and analyzes five constraints that have limited the effectiveness of . . .

CONTROLLED ESCALATION IN VIETNAM

By Andrew J. Pierre



The author, Andrew J. Pierre, a member of the studies staff of the Council on Foreign Relations, has been affiliated with the Hudson Institute and the Brookings Institution, and has taught at Columbia University, where he earned his doctorate in political science. He also has served as a consultant to the DoD Office of International Security Affairs. Dr. Pierre's book, Nuclear Politics: The British Experience with an Independent Strategic Force 1939–1970, *will be published by Oxford University Press in March.*

VIETNAM will be examined for years to come as a laboratory for the doctrine of limited war. Because so many of the expectations of American policy-makers remained unfulfilled, and because so many plans went awry, the temptation to draw up a list of the "lessons of Vietnam" will be strong. Such a review will and ought to be made precisely because the American intervention in Vietnam was so often touted by policy-makers in the early- to mid-1960s as a "test case" of our ability to cope with "wars of national liberation" and to compete with communism in the Third World. One must be cautious, however, in deducing from the Vietnam experience lessons applicable to other limited wars. Vietnam contained some unique characteristics: a twenty-five-year history of nationalist struggle, the leadership of Ho Chi Minh, the military skill of General Giap, and a severely fragmented society in the South. Other conflicts in which the United States could become involved will present quite different indigenous qualities.

In order to put the subsequent analysis in perspective, we must first recall the origins of the concept of limited war as it had evolved through the early 1960s. It was the fear of general nuclear war which produced the desire to keep future wars limited. From Korea the conclusion was drawn that, because of the nuclear deadlock between the superpowers, the United States could still be drawn into subnuclear wars, and it was therefore necessary to exercise great prudence by setting careful limitations on the use of force in order to avoid a nuclear imbroglio. Another belief, widely accepted by 1960 as the European balance stabilized, was that the competition with the Communist world would shift to the Third World, where nationalist sentiments were rampant and the former colonial powers were quickly disengaging. The announced Communist intention of aiding and abetting "wars of national liberation" therefore came to be seen as the principal challenge to America's containment policy. The danger perceived in the fall of any one country to Communist aggression was regarded to have less to do with the intrinsic value of that country than with the risk that a Communist "success" anywhere might encourage further subversion or aggressive acts by China or the Soviet Union. Hence, the domino theory: the notion that successful Communist pressure at any given spot could engulf an entire region whose security was a vital US interest.

Vietnam was viewed by the Kennedy Administration, in this light, as an example of the type of war the United States would be facing in the future. Accordingly, US military forces were to be organized and trained for counterinsurgency warfare, the Army's Special Forces were given greater emphasis, and troop-lift capabilities were expanded. Vietnam was seen as the testing ground for meeting the Communist challenge through a strategy of counterinsurgency and controlled and flexible response. At the time, the question of adequate American domestic support for such a strategy in the Third World—so crucial later on—was virtually ignored. Our political leaders did not sense that changes in public willingness to support overseas involvements were beginning to occur in the early 1960s. With hindsight, it seems clear that the goals of policy-makers and the currents of popular opinion were moving in opposite directions.

The use of the military instrument to compel a political outcome was most pronounced in the three and a half year period between the spring of 1965 and the fall of 1968. This was the period of major escalation, and therefore deserves close examination. It began on March 2, 1965, with "Rolling Thunder," the graduated bombing campaign against North Vietnam. Four days later, two Marine Corps battalions were sent to Da Nang, raising for the first time the total US military forces in South Vietnam to over 25,000. The period reached its climax—though not its final end—on March 31, 1968, with Lyndon Johnson's decision not to run for reelection and not to bomb above the 20th parallel. The conclusion came on October 31, 1968, when a total bombing halt was announced. Johnson's March 31 announcement also marked the decision not to escalate further by refusing to fulfill General Westmoreland's request for another 206,000 troops to augment the 500,000 men already in Vietnam.

BOMBS AND TROOPS

"Controlled escalation," defined as the increased use of pressure to achieve intended goals through a tacit bargaining process, underlay the US bombing policy in the North and to a lesser extent the sending of troops to the South. The bombing was to have a crescendo effect by moving along a path of gradual intensification and was to be carefully controlled through the selection of targets. The ground forces were originally introduced in South Viet-

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This is an excerpt from Dr. Pierre's article, "America Down, Russia Up: The Changing Political Role of Military Power," which appeared in the Fall 1971 issue of Foreign Policy *Magazine. Another excerpt from the same article was published in the January '72 issue of* AIR FORCE *Magazine, under the title "The Dynamics of Parity." This material is copyrighted 1971 by National Affairs Inc., and is reprinted here by permission.*

—THE EDITORS

nam in order to save the Saigon regime from a not improbable collapse at a time when it was under heavy Viet Cong pressure. Subsequently they were used in "search and destroy" missions. This was a strategy focused more on manpower attrition than territorial accretion. But since the number of enemy troops killed never reached a level unacceptable to the Communists, the element of compellance never took hold. Moreover, these ground forces always had a defensive role in US strategy. They might signal to the enemy that the US would not allow the Saigon government to succumb to Communist pressure, but they could not be effectively used to halt that same pressure. This was to be the function of the air sorties over the North.

Many aims could be assigned to it, but the over-all goal of the graduated bombing program was to punish Hanoi for its support of the Viet Cong insurgency in the South. Sufficient damage to North Vietnam's physical plant, industrial capacity, countryside, and morale would presumably deter Hanoi from further aiding the insurgents, make it "reasonable," and perhaps even engage it to press the National Liberation Front (NLF) to call off its insurgency. (A constant matter of internal Washington dispute was the degree of North Vietnamese influence and control over the NLF). A corollary military goal was the interdiction of the infiltration of men and supplies from the North to the South. Several other aims were ascribed to "Rolling Thunder" by various of its supporters, as the Pentagon study revealed by the New York *Times* confirms, and there was never a solid consensus on the specific purpose of the massive bombardment. Additional aims supported by some included the desire to: (1) bolster the confidence of a shaky Saigon regime through the reassurance that the enemy was being made to pay a penalty; (2) improve the bargaining position when negotiations started; (3) provide an added insurance that the war would not be "lost"; and (4) prevent the collapse of the American position in Southeast Asia.

"Controlled escalation" through bombing was a coercive strategy designed to "squeeze" the enemy until he said "ouch" and gave in. A calculated dose of force through gradually increasing air strikes, it was believed, would force Hanoi to cease its insurgency in the South. The initial expectation in early 1965 was that the other side would "buckle" in two to six months. But, refusing to play the American script, Hanoi never did. It was the United States which gave in because we were not willing to inflict punishment on North Vietnam beyond certain levels. Hanoi was prepared to suffer and accept greater punishment than we were willing to inflict.

The United States could have taken additional escalatory measures in order to coerce North Vietnam. But it chose not to: Hanoi was not destroyed, Haiphong harbor was neith mined nor blockaded, major industrial targe were not bombed, dikes vital to the econom were not eliminated, North Vietnam was nc invaded and nuclear weapons were neither use nor threatened. In other words, escalation wa not taken the whole way until it succeeded ir its aims.

We were self-deterred. There were two principal constraints on American policy-makers which inhibited the actions we were prepared to take. One was the fear of provoking a wider war, one in which Communist China or even the Soviet Union might feel impelled to take part. The other was created by the divisions and doubts within American society concerning the war. Without broad public support, the President felt unable to take the steps which might be necessary to coerce Hanoi. In time, any stick big enough to have the intended effect on the North Vietnamese would have been counterproductive because of the reaction it would have provoked at home in a country which was not persuaded by the Johnson Administration either on the issues said to be at stake or their importance to the security of the United States. Perhaps a third internal constraint, not unlike the second, was also at work. American leaders are not so thoroughly ruthless as to be able to carry out a strategy of complete persuasion-by-devastation. At the very least, any decision to "flatten Hanoi" would have provoked a major internal blowup in Washington.

LIMITS TO LIMITED WAR

Any lessons to be drawn from the Vietnam experience concerning limited war must be applied with the greatest caution. The theory behind the strategy of "controlled escalation," of inflicting pain in order to achieve gain, is not necessarily faulty, since in this case it was not applied to its full measure. Hanoi, consequently, was never persuaded that it could not achieve its own long-term objectives. And Washington, in turn, had not calculated the coercive steps it was prepared to implement in relation to the steps which might be necessary.

We can, nevertheless, deduce from our Vietnam experience certain limitations on the effective use of military force for political purposes. They may be put under five headings, as follow:

1. *Constraints created by the nature of the opponent*—In North Vietnam we were probably dealing with an unusually intractable, highly motivated opponent, still led by first-generation nationalist leaders who had been at war for a quarter century and for whom the United States was the second major Western foe. (Hanoi had behind it the confidence of already having defeated the French.) The net effect of the bombing effort was to stiffen,

ther than soften, Hanoi's backbone—despite ıe pervasive American belief that if we suffiently demonstrated our determination, the ther side would cave in. Moreover, the Hanoi eadership felt betrayed by its experiences in ıegotiations with France in 1946 and in the Geneva Conference of 1954 which led to an agreement less favorable than expected. The disposition to compromise deeply held aims was therefore low. Hanoi had great staying power.

2. *Constraints created by lack of knowledge of the opponent*—American decision-makers had only a very superficial knowledge of North Vietnam's culture, history, or its governmental and decision-making process. Yet they wished to affect its behavior. If we had known more of Hanoi's "bureaucratic politics," of the debates within the government and the attitude of the population, we *might* have been better able to know what pressure points would work, what carrots and sticks to apply, and when to apply them. The French war with the Viet Minh, like the earlier American military aid experience in Indochina in 1950–54, was discounted and hardly examined. Our comparative lack of understanding of the enemy's mentality, his operational code, and the intensity of his motivations probably led us to make some erroneous assumptions regarding his willingness to bend to our pressures. "Rolling Thunder," it has been said, was really aimed at the minds of the Central Committee in Hanoi, but we knew relatively little about that Committee's political lineup and internal debates. We were also uncertain how much influence China and the Soviet Union had over North Vietnam.

3. *Constraints caused by asymmetries in the stakes*—For North Vietnam the stakes were high and the objectives deeply held. The American objective—a non-Communist South Vietnam—though a desideratum was not seen by everyone as absolutely crucial to US foreign policy. Indeed, much of our own national debate was concerned with whether there was a sufficiency of US interests in the war to justify a high level of commitment (and of destruction). Because Hanoi's stakes were comparatively much higher than those of the United States, our opponents were willing to pay more and this was consistently undervalued by us. The United States *underestimated* the level of North Vietnam's commitment to victory in the South and *overestimated* the effectiveness of military pressure in weakening its resolve. A gap existed between the fundamental concessions expected from the enemy and the limited military measures America was prepared to undertake in order to "break" Hanoi's will. In short, Hanoi was willing to suffer and take more punishment than we were willing to inflict. It was also prepared to last the war out longer than Washington. For the United States the struggle was ultimately peripheral. For the Communists it was total, perceived almost as a matter of life or death.

4. *Constraints created by domestic political costs and unclear objectives*—By rough estimate, domestic dissent to the war seems to have risen in close parallel to the escalation of the US involvement. More combat troops in the South meant more soldiers killed and more money being spent. A deeper involvement led to deeper questioning of the involvement: its legality, its morality, and its goals. It might have been possible to wage a relatively low-scale war for a long time, but as the manpower and material commitment to the war were raised, the domestic pressures on Washington increased. The Johnson Administration was unable to persuade large segments of the public that it had sufficient and credible objectives related to vital American interests. The failure over time to achieve some "victory" induced an erosion of public support for the war, a desire to get it over with. By 1967–68, many Americans believed that if the bombing were halted, serious negotiations might follow; whereas, ironically, the bombing was started and continued in part in order to compel the opponents to negotiate. If nothing else, the Vietnam War has demonstrated the restraints placed on the President by public opinion and domestic politics.

5. *Constraints created by difficulties of skillful management*—Waging limited war for precise political purposes requires careful management to keep it limited. In Vietnam, for example, US actions had to be weighed for their direct impact upon the Viet Cong, Hanoi, China, and Russia, plus, more indirectly, upon the other nations of Southeast Asia and our worldwide allies. Limited war is more demanding in many ways than a Second World War with a total commitment of nonnuclear resources. Many observers of Washington during the 1960s have concluded that too much time and attention were given to Vietnam in relation to other problems. Such an absorption of the political leadership may have been less marked if the war had been less unpopular. Nevertheless, the application of controlled escalation, particularly a coercive instrument such as the bombing of selected targets, is complex and difficult. It must be coordinated with negotiating overtures and with the transmittal and reception of intended "signals" to the other side. This requires constant attention and skillful management at the highest levels of government. Such management was not always available during the Johnson Administration.

The conclusion to be drawn from the strategy of controlled escalation in Vietnam seems to be simply this: *Know thyself* and *know thy opponent*. Before intervening or starting to climb the escalatory ladder, try to calculate the effects on the behavior of yourself, as well as on the behavior of your opponent. ■

The Air Force officer promotion system always commands intense interest, but is often poorly understood. A variety of factors converge to determine how many officers—and which ones—can be promoted each year . . .

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT PROMOTIONS*

*(BUT DIDN'T KNOW WHO TO ASK)

By Capt. John T. Correll, USAF

The author, Captain Correll, is assigned to the staff of AIR FORCE *Magazine under the Education With Industry (EWI) program.*

FOR ALL his intense opinions on the Air Force promotion system, the average Air Force officer doesn't know much about it. He knows roughly when he can expect a promotion board to consider him for the various grades but, beyond that, his information thins out rapidly.

He isn't sure how many cracks he gets at each grade, or what happens to him if he doesn't make it. He's aware that what he regards as the actual promotion is temporary, and that permanent promotions seem to come along unheralded a couple of years later on. Below-the-zone promotions are a mystery.

He's heard conflicting tales of how promotion boards work. He's been told that it's all a matter of effectiveness reports, but he also hears that's only part of it. If he doesn't fly, he's convinced that flyers have the edge; he's a lot less sure of that if he does fly, especially if he's a navigator. He knows that promotion boards have quotas, but not much of what determines how big the quota is, or whether it comes earmarked, say, for so many Regulars vs. so many Reservists.

Even if he believes the system is internally fair, he is dissatisfied because he believes the other services promote faster, and he instinctively feels that the Air Force could somehow do better if it really wanted to.

Above all, he doesn't see any tangible way to predict the answer to his most important question of all: Am I going to get promoted?

If he doesn't quite get the hang of the promotion system, though, he can be faulted only to a degree. The thing *is* complicated, and hard to understand.

To begin with, in layman's terms there isn't *a* promotion system at all, but rather three major ones and several minor ones, all based on

different laws and having different rules and ramifications.

Most of the time when an officer talks about promotion, what he has in mind is *temporary* promotion, because it is nearly always the one that means he has to buy new insignia.

Line officers—Regulars and career Reservists alike—are considered by the same board for their temporary promotions, but for *permanent* promotions, they go their separate ways. The Regular officers are considered by a board that looks only at Regulars. Most career Reservists get their ROPA (Reserve Officer Personnel Act) promotions simply by applying after they make temporary promotions. Others, though, compete with inactive Reservists before selection boards for their ROPA promotions.

Failure before the temporary promotion board carries unequal peril for the two categories. The Regular cannot be separated just because he doesn't make a temporary grade. But a Reservist passed over two times for any temporary grade through major (or once to first lieutenant) is subject to involuntary release from active duty.

Special categories of officers—physicians, dentists, nurses, chaplains, biomedical specialists, and veterinarians—compete under still other promotion systems. For most of them, "constructive service," or time spent in professional schools or civilian practice, can count as longevity for promotion purposes. In some cases, selection boards have the option of promoting every eligible aspirant in these categories. Legal officers have a foot in each camp: JAGs are awarded constructive service to begin with and normally enter the Air Force as captains, but thereafter they compete with line officers in the temporary, permanent Regular, and permanent Reserve deliberations.

Finally, there is the matter of advancement to star rank. The results of the boards convened for the general-officer promotion system are eagerly awaited, not only by the contenders, but also by thousands of others curious to see the Air Force's top leadership emerge.

Promotion boards operate either on the basis of "fully qualified" or "best qualified."

"Fully qualified" means that the board can promote everybody before it if they are qualified. "Best qualified" means that the quota is something less than 100 percent of the eligibles, so the top performers will be selected, and some people must be passed over.

In either case, the quota given a promotion board is an upper limit, not a minimum. The board is under no obligation to use the whole quota if members feel that not enough of that particular group of eligibles can measure up to standards of quality.

Aside from general-officer selection (about which more later), interest in promotion centers on the grades of major, lieutenant colonel, and full colonel. Advancement to first lieutenant and captain is on a "fully qualified" basis, so competition does not exist.

Furthermore, it is the field grades of major, lieutenant colonel, and colonel in which temporary promotion authorizations depend for their very existence on the grade ceilings Congress is willing to allow. Right now, the Air Force is in the midst of a crunch on those grade ceilings *(see box, p. 57).*

The promotion sequence begins with deciding how many people can be promoted to a given grade this time around, and who will be considered.

The quota, of course, depends on vacancies, which are, in turn, a function of the approved fiscal year-end strength, grade ceilings, separations, and the configuration of the force profile. A top-heavy force structure stifles promotion.

It is difficult to say which of these is the chicken and which are the eggs. The Air Force personnel people are plotting years ahead on their computers with TOPLINE—the new comprehensive plan for the officer force—so, if they do their work right, the number of promotion eligibles should match up with enough vacancies and the desired level of selection opportunity when the time comes.

Peaks and Valleys

Ironically, the Air Force's good retention rate has limited its number of promotion vacancies. More than thirty percent of the line-officer force has between ten and nineteen years of service—about double, for example, what the Navy has in those year groups.

Lt. Gen. Robert J. Dixon, USAF Deputy Chief of Staff for Personnel, explained at a dining-in at Goose AB, Labrador, recently:

"The Air Force has had a problem of peaks and valleys in its officer-force structure for all of its twenty-four years. When you get one of these force humps, like the ones that developed from the World War II and Korean War buildups, the hump gets in the way of people coming along behind it. It contributes, among other things, to a slowdown in promotions. . . .

"Today's hump is toward the upper end of the force structure—and will vanish through attrition in the not too distant future. Now let's computer age the force up to 1980 and see what happens if we continue to allow it to free flow.

"Skipping over the details, here's what will have happened: The force will be on the verge of recreating itself in today's image, complete with humps and valleys, blocking a consistent career-development program and keeping promotion opportunity down.

"Knowing this in advance, we *can* do something about it before it happens."

TOPLINE, General Dixon said, decides how many officers and what kind—Regular, Reserve, pilot, navigator, and support—are needed in each year group, and sets quotas to avoid either over- or under-retention. Thus, it gives reasonable assurance that when an officer reaches the phase point for promotion, there'll be a vacancy for which he can compete.

Setting the quota is further compounded by the sliding-scale nature of temporary grade ceilings. If the Air Force had on duty only its

permanent Regular authorization of 69,425 officers, the number of them allowable in each field grade would be constant and precisely fixed. But for more than two decades the Air Force has always needed more officers than that. So the provisions of congressional grade limitations apply and, if the size of the total officer force drops, the number who can be in the higher grades goes down with it.

The Army's recent experience illustrates:

The Army buildup during Vietnam—a forty-six percent increase in total officers between 1965 and 1968—swelled its size and thus its field-grade authorizations. Furthermore, the Army had never enjoyed anything approaching the Air Force's retention rate, so it had even more vacancies to promote officers into. The result was an accelerated promotion system—majors with seven to eight years of service—which the Air Force couldn't rival.

But when the size of the Army began dropping in the Vietnam scale-down, field-grade authorizations dropped, too. Consequently, the Army has already involuntarily separated numbers of its officers. This has also had a decided impact on promotions. The Air Force, which increased its officer strength by only 7.5 percent during the same period, is not finding such action necessary.

Zones of Eligibility

Who will be considered for promotion is established by the "zones" of eligibility. These are periods during which an officer's current temporary date of rank must fall if he is to be considered for promotion this round.

For most officers, temporary promotion will come in the primary zone, which they normally enter after ten years' commissioned service for promotion to major, sixteen years for lieutenant colonel, and twenty years for colonel. Once an officer hits the primary zone, he will be considered each year until he is promoted or released from active duty. Officers in the "sanctuary"—those with over eighteen but less than twenty years of service—can stay on until retirement, even if they are not promoted.

An officer can be promoted early—up to three years ahead of normal to major or lieutenant colonel, two years early to colonel—if he makes it each time in the secondary zone, which is also referred to as "below the zone." With three below-the-zone promotions, an officer conceivably could make major with eight years' service, lieutenant colonel with eleven, and colonel at thirteen.

Opportunity

The Air Force has developed levels of promotion opportunity to each field grade—ninety percent to major, seventy-five percent to lieutenant colonel, and fifty percent to full colonel. (These are up from seventy-five percent, seventy percent, and thirty-five percent just a few years back.)

This opportunity, though, is based on the number of *new* eligibles in the primary zone, not on the *total* number of eligibles. For example, about 2,000 lieutenant colonels go into the primary zone for colonel next year, so the quota will be around 1,000. Out of that, the board must also promote any below-the-zoners and previously passed-over officers it picks.

Annual Screening

An officer's records go to the promotion board automatically if he's in the primary zone. In addition, major commands each year screen their records and identify officers they want to nominate for below-the-zone promotion. If an officer survives the preliminary winnowing, he then goes before the promotion board to compete with other nominees as well as with people senior to him.

Only about one nominee in six can *possibly* be promoted below the zone, and the fallout may be even greater.

The board has the option of allotting up to certain portions of its quotas to the secondary zone: five percent to major; seven and a half percent to lieutenant colonel; and fifteen percent to colonel.

The boards get the promotion quotas without any part earmarked for a particular group of eligibles.

The size of the promotion board depends on the number of people it will consider, and how long it has to do its job. Its makeup varies with the grade it is evaluating officers for.

The FY 1971 temporary majors board that met in December 1970, for example, was made up of a major general and forty-nine colonels, working in five-man panels. By contrast, a temporary colonels board would have a lieutenant general as president and major generals heading the panels, which would be composed of brigadiers.

They meet in the chambers of the Selection Board Secretariat at the Military Personnel Center, Randolph AFB, Tex. (Permanent Reserve boards meet at the Air Reserve Personnel Center in Denver, where the procedure is essentially the same.) Great care is taken to make the composite experience level of each panel as equal as possible.

Proceedings open with briefings,

PROMOTION PROSPECTS AT A GLANCE

PROMOTION TO	PHASE POINT YEAR	PERCENT OPPORTUNITY
Colonel	21	50%
Lieutenant Colonel	17	75%
Major	11	90%
Captain	3	100%
1st Lieutenant	1½	100%

This is what the typical line officer can expect from temporary promotion in the primary zone. The phase point is the year in his career he puts the new rank on. For example, he'll be chosen for major between his tenth and eleventh years, the promotion effective sometime later in that year. Opportunity is calculated on the basis of new primary zone eligibles. Maintaining these promotion prospects, of course, depends on congressional grade relief.

THE GRADE RELIEF ISSUE

Grade relief legislation, which the Air Force is presently sweating out, is a vital underpinning of the promotion system. The permanent ceiling on the proportion of its officers the Air Force can have in the field grades was established nearly two decades ago, and is inadequate by today's standards. To maintain reasonable promotion opportunity, the Air Force has needed more grade spaces than that permanent ceiling provided. This July, the 1966 grade relief legislation, which has allowed the Air Force to exceed its authorizations for majors, lieutenant colonels, and colonels, will expire.

Observers expect the Congress to approve some sort of relief before then, but if it should fail to do so, the Air Force will find itself without billets for about 1,000 of its colonels and 4,500 of its lieutenant colonels. In addition to the immediate turbulence, long-range promotion opportunity would suffer severely.

The 1947 Officer Personnel Act (OPA), as modified, authorizes an officer force of no more than 69,425 Regulars. OPA also gave the Secretary of the Air Force authority to make temporary promotions whenever more officers were needed than the ceiling permitted. The only congressional limitation on temporary promotions was through approval of the budget to support them.

Ever since, of course, Air Force has *always* needed more officers than its permanent Regular authorization. Although the size of the force has been dropping, the Air Force expects to have approximately 120,000 officers on board at the end of this fiscal year.

Tighter congressional control on temporary promotions came in 1954 with the Officer Grade Limitation Act (OGLA). It did not specify how many officers each service could have on duty—that was still to be a function of the budget—but it did prescribe what portion of them could be serving in each of the field grades (major, lieutenant colonel, and colonel).

OGLA was more restrictive to the Air Force than to the other services because its officer force was younger and, at that time, it needed fewer field-grade authorizations because fewer of its officers had enough time in service to be on the threshold of promotion to those grades.

Given a hypothetical officer strength of 100,000 for both the Army and the Air Force, then under OGLA, the Army could have 5,002 colonels, 12,265 lieutenant colonels, and 17,060 majors, while the Air Force was limited to 4,440 colonels, 8,620 lieutenant colonels, and 18,530 majors.

The Air Force soon felt the pinch, and up to 1966 Congress repeatedly approved short-term relief from the OGLA limitations. That year, Congress gave the Air Force grade relief in a six-year package. The 1966 measure, which expires this summer, in effect gave the Air Force grade parity with the other services and allowed for improved promotion planning.

Both to meet its manpower needs and to make possible the kind of promotion system it wants to sustain, the Air Force is seeking permanent grade relief, but with the distribution of grades tied less tightly to precise force sizes.

which include various analyses of this particular group of eligibles, and comment on the trend of their effectiveness reports. Next the board moves on to a practice session with sample records chosen by the Selection Board Secretariat as a cross-section of the total group of eligibles.

The trial run is a crucial part of the operation, and considerable time goes into preparing a board so that a common standard of quality will be used when real scoring begins.

Then the board sits down to work. Each member begins with a stack of twenty selection folders.

He assigns each record a score on a scale that runs from six to ten with half-point increments (6.5, 7, 7.5, etc.). When he finishes scoring his first stack of twenty records, his ballot is collected and that group of records is passed to another member. This process is repeated until all five members have scored the record.

Point spreads of more than a point and a half indicate something is wrong, and are unacceptable. So if a record receives four 9s and a 7, the panel is asked to resolve the split. This is the only case where panelists ever discuss a record. If they cannot resolve the difference, the record goes to a new panel for evaluation.

The scale must work, because splits do not happen very often.

Into a Computer

At the end of the day, all the scores are fed into a computer, and the scoring behavior of each board member can thus be determined. If any panel's or any member's scoring is inconsistent with that of the board as a whole, or if it appears that evaluation standards have changed since the first stack of records was scored, an immediate check is ordered. The Secretariat staff reviews enough records either to confirm the change or identify a quality difference in the selection folders involved. If a variation in scoring standards is confirmed, the board president has the selection folders reevaluated.

This doesn't happen very often, either.

The board completes its scoring of the primary zone records first, and then moves on to the secondary zone.

Distributions of scores in both zones are then presented together. Up to this point, not even the board members know the score required for selection, but now they can readily compare quality level in both zones, and must decide how many to promote from each. Selections from the secondary zone are at the expense of the primary-zone quota.

Selection folders contain the following documents:

- A photo;
- All effectiveness or training reports since 1951;
- An Air Force Form 11 (Officer Qualification Record);
- Citations or orders for awards and decorations;
- Record of Article 15 or court-martial actions;
- An officer selection brief—a computer document with data from the Uniform Officer Record, such as aero rating, flying hours, service dates, date of birth, date of separa-

(TEXT CONTINUES, PAGE 81)

AFA Symposium in Orlando

The Air Force Association's fundamental purpose is to foster public awareness of the nation's defense needs, with special emphasis on the aerospace sector. Few events sponsored by AFA in recent years have offered more concrete and comprehensive information on the external dangers faced by the country—and the resultant strategic needs with respect to the US Air Force and the other services—than a two-day symposium on the strategic requirement staged by AFA in conjunction with the Strategic Air Command's 1971 Bombing and Navigation Competition at McCoy AFB, Fla. It was a penetrating look at . . .

The Strategic Requirement

By Edgar Ulsamer

SENIOR EDITOR, AIR FORCE MAGAZINE

"THE SOVIET UNION now has a payload capacity in her intercontinental and submarine-launched missiles that is potentially capable of delivering eight times as many nuclear warheads as the United States. This buildup so far exceeds any plausible requirement for a policy of deterrence that we can only conclude that the Soviet Union has developed that extraordinary capacity for use in support of her own diplomacy, a diplomacy whose historic goals have always been aggressive."

In a perceptive and frank keynote speech, from which the foregoing is quoted, Sen. James L. Buckley (Conservative-Republican of New York) set the stage for a unique symposium on "The Strategic Requirement," sponsored by the Air Force Association in cooperation with the Strategic Air Command in Orlando, Fla., December 15 and 16, 1971.

Some 500 industry and community leaders from around the country attended the AFA symposium, which was held in conjunction with SAC's 1971 Bombing and Navigation Competition. The two-day event represented one of the most candid and comprehensive briefings on the nation's strategic posture ever presented in public. Chaired by the Commander in Chief of the Strategic Air Command, Gen. Bruce K. Holloway, the symposium also featured DoD's Director of Defense Research and Engineering Dr. John S. Foster, Jr., and experts from SAC, the Air Force Systems Command, and the US Navy. Air Force Association participants included President Martin M. Ostrow, Chairman of the Board George D. Hardy, Board Member and Symposium General Chairman Martin H. Harris, and Executive Director James H. Straubel.

THE CENTRAL ISSUE

The nation, Senator Buckley declared at the opening luncheon, "has been in the grip of a blind antimilitarism which has forced drastic cutbacks in large categories of defense spending which are essential to our security, and all in the high-sounding name of reordered priorities. As a result, we are not only falling behind in the necessary business of military research and development, but we have allowed our existing forces to deteriorate to a point where the ability of the President of the United States to assure the defense of vital national interests may be in jeopardy. . . .

"If we assume that Russia's production-line technology is equal to our own—as we must—then the existing 300 Soviet SS-9s could each be equipped with between three and six independently targeted warheads having a yield of from two to five megatons each. This would give their SS-9s the present capacity to deliver between 900 and 1,800 warheads, each capable of attacking and destroying one of our Minuteman ICBMs. If we assume further that the Russians employ guidance technology equivalent to that available to us for our Minuteman III and Poseidon missiles, then a 'first-strike' attack by their SS-9s could destroy on the ground or in port about ninety percent of our land-based ICBMs, fifty percent of our aging B-52 bombers, and one-third of our Polaris submarines before we could consider a retaliatory strike. And this destruction of our deterrent force would be significantly increased by advanced guidance technology which our own research has already shown to be feasible."

In case of such an attack, Senator Buckley suggested, "the Soviets would have left over sufficient strategic forces to pose a continuing threat to our remaining forces and to our cities. This remaining capacity would include over 900 SS-11s, over 400 submarine-launched ballistic missiles, and nearly 200 bombers. We would, as of the present, still have the suicidal capacity to inflict devastation to those Russian cities not protected by ABM systems, but even this remaining deterrence could be reduced to levels acceptable to the Communist mentality by either a major breakthrough in Russia's antisubmarine warfare capability, by an expansion of her ABM defenses, or an upgrading of her SA-2 and SA-5 air defense missiles to an ABM role."

Senator James L. Buckley (Conservative-Republican, N. Y.), delivered the symposium's keynote address, pointing out that the declining strategic capabilities of the United States place in jeopardy the country's ability to protect its vital interests.

Senator Buckley pointed out the "dramatic cutback of our investment in our strategic forces over the course of the past ten years or so. In the late 1950s, we were spending $13 billion to $15 billion a year on our strategic forces. . . . Today we are spending about $8 billion on these forces. . . . Thus, in terms of stable dollars, we are spending today in this critical area less than half as much as we were just a decade ago, despite the dangers inherent in the rapid deterioration of America's relative strategic strength."

In a carefully qualified endorsement of the SALT talks, Senator Buckley cautioned that "we cannot hope

for success if we hide from the cold realities of life, if we let ourselves be carried away by euphoria over every small concession. Let us keep in mind that the SALT talks are now entering their third year and that we have experienced powerful pressures here at home to defer any buildup of our forces or of our purely defensive systems pending the outcome of these talks. Yet, since President Johnson's announcement in early 1968 that the SALT talks had been agreed to, the Soviets have deployed over 800 additional ICBMs, more than doubling the number which were deployed in late 1968."

SAC's Commander in Chief, Gen. Bruce K. Holloway, led off the symposium and summarized the Air Force presentations. He stressed the Air Force's unequivocal commitment to the strategic Triad.

He emphasized that recent evidence indicates that the Soviets are continuing the deployment of ICBMs, including "that of two or three new designs for which we have no counterparts."

Concomitantly, the Senator argued that "we can no longer afford to defer further development of our strategic offensive and defensive capabilities in the hope that successful negotiations will have made the expenditure unnecessary. And we must take particular care that any agreement reached with the Russians will not have the effect of freezing them in a position of decisive superiority."

THE NATURE OF THE THREAT

The obvious and central factor driving the strategic requirement of the United States is the Soviet threat. Fittingly, Russia's military and R&D efforts were the opening subject of the symposium, presented comprehensively by SAC's Deputy Chief of Staff for Intelligence, Brig. Gen. Harry N. Cordes.

General Cordes disclosed that by 1975 Russia could have a force of "well over 2,000 hardened ICBMs." Stressing that during the past two years "there has been more research and development testing of ICBMs the Soviets than any time since the beginning of th [nuclear missile] program," he explained that recen detected large new missile silos might signal the i pending deployment of several types of new ICB missiles, known to be under development, or they cou be designed to accommodate improved versions of th SS-9, SS-11, or SS-13.

With respect to a Soviet fractional orbital bombard ment system (FOBS), observed during tests in con junction with the SS-9, General Cordes said such a weapon "could be operational today." He added that the United States "has developed nothing comparable to this system."

(Asked whether or not the United States is considering its own FOBS, General Holloway said: "There is a study going on with respect to FOBS; that's all I can say.")

Augmenting the Soviet intercontinental missile force are about 600 medium and intermediate-range missile launchers, the SS-4 and SS-5, deployed mainly along the western border of the USSR, General Cordes said, adding: "The MR/IRBM force has remained fairly constant over the past ten years; however, there are indications that it may be augmented or replaced by a solid-fueled, mobile system, such as the SS-14, or Scamp, as it is called. The MR/IRBM force represents a threat of about 600 missiles to our overseas bases and forces, as well as to our allies. The coverage by these shorter range systems allows the Soviets to concentrate their bombers and ICBM weapons against the United States."

With regard to defensive systems, General Cordes said Russia "has deployed the most extensive, integrated air defense system ever known. Systems included range from conventional antiaircraft artillery to antimissile missiles, and a broad-based program is under way to further expand and improve these systems. With a land area not quite three times that of the United States, the Soviets have from five to over twenty-five times as many radars, surface-to-air missiles, and interceptors. Through a steady pattern of growth and modernization the Soviets have achieved, quantitatively speaking, overall defensive superiority." He cited these points in support of his assessment:

- A network of thousands of technically advanced radars providing complete warning and interceptor control throughout the USSR. An intensive program to improve the ability to detect low-flying bombers is under way.

- A new airborne warning and control system (AWACS), code-named Moss, and developed from the TU-114 commercial jetliner, can extend Soviet detection of penetrating bombers by about 200 miles and could spot low-flying aircraft against the background of a calm sea.

- A force of more than 3,000 fighter-interceptors as well as a like number of tactical fighters, many of which also have an air defense role, is in being. Most of these aircraft have good all-weather capability and include three advanced designs introduced into the inventory during the past five years: the Mach 3, 700-nautical-mile-radius, 65,000-pound Foxbat; the Mach 2, 750-nautical-mile-range, 80,000-pound Fiddler; and

Dr. John S. Foster, Jr., DoD's Director of Defense Research and Engineering, was introduced by AFA's National President Martin M. Ostrow as the principal speaker at the symposium's banquet session. Senator Barry Goldwater is looking on.

the Mach 2 plus, 350-nautical-mile-range, 35,000-pound Flagon. The Soviets have launched an extensive program to assure the survivability of their interceptor force through the use of "hardened hangarettes."

• In addition to a huge arsenal of AAA weapons, the Soviet Union deployed about 10,000 surface-to-air missiles capable of performing a variety of intercept missions, ranging from extremely low to extremely high altitude. The SA-5 missile is in the latter category and, in SAC's view, is suitable for an ABM role, in addition to its basic function as an air defense weapon.

SOVIET ABM CAPABILITIES

General Cordes painted an equally grim picture with respect to the Soviet antiballistic missile defense capabilities.

The Soviets have increased their efforts to counter US ICBMs and Polaris/Poseidon missiles in a number of areas, he said. A principal element is the elaborate system deployed in the Moscow area. Its mainstay is the Galosh, a multistage, hybrid-fueled missile, believed to have a range of several hundred miles and a nuclear warhead in the megaton range. As now deployed, General Cordes said, "it gives the Soviets a limited defense against our Minuteman and Poseidon missiles in northern trajectories. Completion of the system is expected to be two or three years away when the half a dozen 'henhouse' installations around the Soviet Union are operational."

In addition, General Cordes said, "testing of an improved ABM interceptor is under way. This ABM would loiter—that is, once fired, it could coast out to a general intercept area, select its target, restart, and maneuver to the incoming warhead."

By the mid-1970s, Russia could have as many as 2,000 ABM launchers deployed, according to General Cordes.

THE MOUNTING SLBM THREAT

An area of prime concern, General Cordes reported, involves the Soviet SLBM force, which has tripled over the past five years. (Dr. Foster announced in his speech at the symposium that the Russians "are now building Polaris-type submarines at a rapid rate. Some twenty-five of these submarines are now operational. Enough additional ships are on the ways to permit the Soviets by 1973 to surpass our own ballistic missile submarine fleet in size.")

General Cordes said the Soviets recently stepped up the building rate of their Yankee-class subs (equivalent to the US Navy's Polaris subs) from seven or eight per year to eight to ten per year. At least fifteen subs, presently being outfitted or under construction, may be equipped with a new missile that could double the present strike range of about 1,300 nautical miles. An area containing about fifty percent of the US population and eighty percent of the nation's industrial base "could come within range of the SLBMs carried by the Yankee submarines continually on patrol off our coasts," he said.

General Holloway indicated that press speculation about depressed trajectory capabilities with regard to Soviet SLBMs is "not based on observable" evidence. Such trajectories could sharply reduce the warning time available to SAC's strategic bombers in case of a concerted nuclear attack, a possibility cited frequently by opponents of the B-1 manned bomber.

Dr. Foster acknowledged, however, that the growing Soviet SLBM threat "could seriously threaten the survivability of our present coastal-based B-52 and FB-111 forces" and that a series of "fixes" is being applied: "First, we can give bombers more warning time. Our satellite early-warning system is progressing well. We can improve communications to the bombers. The new World Wide Military Command and Control System Policy Council will provide guidance for development and operation of better strategic communications.

"Second, we can move planes further inland and thereby give them more time to take off before the arrival of a missile. We are currently dispersing onto twelve auxiliary bases in addition to the twenty-nine main operating bases. . . .

"Third, we can reduce further the reaction time of bombers and tankers by placing aircraft closer to the end of the runways, by quick engine starts, and by placing the crews closer to the aircraft."

THE SOVIET BOMBER FLEET

The Soviet bomber inventory, General Cordes said, has remained relatively constant at about 900 aircraft. About 200 of these are Bison and Bear heavy bombers, which are capable of carrying air-to-surface missiles and can be refueled in flight. Some 700 are medium-range Blinder and Badger bombers. Some of the latter,

General Cordes said, have been "revitalized by the addition of air-to-surface missiles." The medium-range bombers, deployed at northern staging bases, he said, could be "a threat to the US on one-way missions." He added that the Soviets maintain a "large network of staging bases in a broad swath across their Arctic littoral. . . . We believe the Soviets would use a significant portion of their Badger and Blinder bombers, operating through these bases on one-way missions, in an all-out attack against the North American continent."

The Soviet strategic bomber inventory is likely to be beefed up in the mid-1970s through the addition of the Backfire, a variable-sweep, supersonic aircraft currently in a prototype stage, General Cordes said. Dr. Foster elaborated by saying that the Soviets "are currently testing several copies of a swingwing supersonic strategic bomber. In size, it is about two and a half times the weight of the FB-111, but smaller than the B-1. It could be operational in the next few years.

"The new Soviet bomber will have a radius of 2,500 to 3,000 miles unrefueled at high altitude, compared with about half that for the FB-111. With a speed of roughly Mach 2 at altitude, it will be comparable with the FB-111. Presumably it will have modern avionics, but probably not as good as those of the FB-111. It will have a payload double that of the FB-111." Dr. Foster added that the B-1 "should be superior to the Soviet bomber in performance, avionics, ordnance, growth potential, and overall flexibility."

During the summation segment of the symposium, General Holloway said the Soviet Union "potentially offers the greatest physical threat to viability that the United States has ever faced. . . . America's antagonists of former times damaged its structure but could not destroy it as a nation, even after years of war. Soviet Russia could do it before lunch today, though it would be destroyed in return. The remoteness of such a probability cannot make it a lesser consideration for those charged with national defense."

STRATEGIC REQUIREMENT AND THE TRIAD

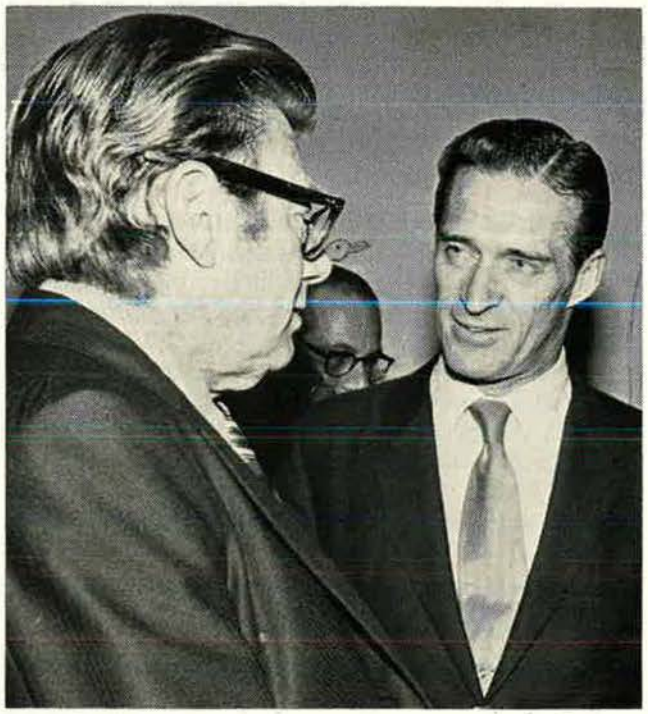
As stated at the symposium's outset by General Holloway, and subsequently underscored by Dr. Foster, the United States principal means for countering the Soviet threat is, and must continue to be, the strategic triad of manned bombers, ICBMs, and SLBMs.

Lt. Gen. Russell E. Dougherty, Commander of SAC's Second Air Force, stressed the flexibility and reusability of the manned bomber and pointed out that it is the only member of the Triad with a proved capability and reliability in war.

Dr. Foster stressed that "without bombers, we would diminish both in [deterrence] capabilities and in our confidence in these capabilities, and the risk of thermonuclear war would rise. . . . Bombers, like missiles, cannot provide our country sufficient assurance *by themselves* of successful, permanent deterrence of nuclear war. Bombers do offer a different approach to survival and penetration and, therefore, to security—their alert posture on the runways, their ability to flush and be recalled, their ability to select and overwhel parts of the defense and safely ignore most of it."

He added: "Existing bombers, existing basing prac tices, existing penetration techniques are effective an are a necessary contribution to deterrence, but they wi not remain effective forever. . . . We must modify ou bomber forces just as we must modify our missil forces."

A currently pending key modification of the B-52 force was described by General Dougherty in detail: "In the nuclear environment in which B-52 nuclear strikes would be conducted, much of the penetration and strike routes must be flown in a 'closed-curtain' cockpit configuration, closed to protect the crew against nuclear effects—particularly flash blindness. We plan to fly penetrating low-level missions with reference only to instruments and radar imagery.



Radio-TV personality Arthur Godfrey is shown in animated conversation with DDR&E's Dr. John S. Foster, Jr., during a break in the symposium's sessions.

"The visual sensor system will utilize two forward-looking scanners mounted on the chin of the B-52 nose. One of these scanners contains a low-light-level television camera and the second is a forward-looking infrared radar system . . . sensor technology that has proved extremely effective in our gunships operating nightly in Southeast Asia.

"The visual sensors will allow the crew to see the actual terrain in front of them [with] the picture displayed on . . . TV-like monitors. There will be four of these monitors—two for the pilots and two for the navigator/radar operator. Other information can be superimposed, [such as] aircraft instrumentation, terrain-avoidance radar, etc.

"This display would enable the B-52 to penetrate at lower altitudes, which will increase the probability of

voiding enemy detection and intercept. Also, it will nable the crew to make prestrike assessment of the rget, and to withhold, or to alter aim point, or to roceed."

In describing the recently instituted satellite basing or a portion of SAC's manned strategic bomber fleet, General Dougherty revealed that "normally, we use major airfields that are involved in pilot training, airlift, missile support, or the like; airfields where priority utilization of the runways for emergency launch of SAC's strategic forces can be accomplished with a minimum or no additional costs for support or airfield maintenance."

Equally important to SAC's efforts to reduce the vulnerability of the bomber force on the ground, he said, are reliable, timely warning systems. "With warning, we can offset ground-based vulnerability with variable alert postures and quick-reaction, fast launch procedures."

General Dougherty cited a number of requirements for SAC's manned bomber force, which include deployment of the B-1 and SRAM, replacement of the ADM-20 (Quail) decoy missile by an improved decoy called SCAD (for Subsonic Cruise Armed Decoy), and replacements for the KC-135 tanker and the EC-135 "Looking Glass" airborne command and control aircraft. "We are reaching," he said, "the limit of capability of the EC-135 to meet the total job requirement in future years, and are actively pursuing a program for improved, modernized, and increased airborne capabilities—utilizing one of the larger airframes and the improved engines we now find on the jumbo jets entering active service. These expanded aircraft will accommodate additional needed radio gear, computers, and battle staffs. They will provide increased on-station time and enhanced survivability," General Dougherty emphasized. With respect to the fleet of 600 KC-135 tankers, General Dougherty said: "The first of our tankers were delivered in 1955, and we got the last one in 1964. Also, the offload capability—adequate for many routine operational requirements—is inadequate for optimum tactics and for most efficient employment of our bombers and fighters."

General Holloway added this comment: "We have reached the state of weapons development where no fixed facility is totally secure. Fixed command centers are especially vulnerable. SAC's solution to the predicament has been its Airborne Command Post and supporting Post Attack Command Control System. Some of this system's capacity has been necessarily austere. Airborne data automation promises commanders secure airborne command control throughout any conflict environment. We see the Advanced Airborne Command Post as a mandatory tool for future commanders."

THE B-1 REQUIREMENT

The need for the B-1, currently confined to a preproduction development stage, to enter into production and USAF's inventory was highlighted in a special presentation by Maj. Gen. Douglas T. Nelson, the Air Force Systems Command's B-1 System Program Director. Following a comprehensive review of the B-1's role within the Triad concept, General Nelson described a number of new design details:

- The B-1 will have a degree of nuclear hardening never before incorporated into a large aircraft. This includes the ability to withstand high heat pulses and the structure's ability to absorb extreme gust and overpressure loads. There is an intensive effort under way to protect the aircraft against the EMP (electromagnetic pulse) phenomenon.
- The B-1's radar reflectivity will be approximately one-twentieth that of the B-52. Because of special design features, enemy radar must face straight into the B-1's long inlet duct in order to "see" the engine, one of the most radar-reflective components of any aircraft.
- To accelerate reaction time, the B-1's engines can be started by an externally located start button which the crew activates before climbing aboard.
- Airframe lifetime is such that the B-1 can be retained in the inventory until after the year 2000.
- The three test aircraft currently under construction are *not prototypes*, but are being designed for producibility. "They are also being designed to be maintained in the field by the using command. We are not shortcutting either of these—we will not have to redesign either the airframe or engines to go smoothly to production and then on to the SAC inventory," General Nelson said.
- One B-1 engine produces the same thrust as both F-4 engines combined, yet it weighs one-third less, has one-third less volume, and uses about one-third less fuel.

Gen. George S. Brown, Commander of the Air Force Systems Command, presents Mathis Trophy for best crew score to Col. Thomas Rew of SAC's 17th Bomb Wing.

• In terms of payload, it takes six FB-111s to do the job of one B-1. Since each FB-111 requires as much air-refueling offload as one B-1 on a typical mission, six times as many air-refueling KC-135 tankers are needed by the FB-111. In addition, the FB-111's range limits preclude its deployment against critical targets deep inside the Eurasian land mass.

Dr. Foster, in a strongly worded advocacy of the B-1 program, said the aircraft, as now conceived, "should be able to cope with the most vigorous offensive efforts of a future enemy."

General Nelson stressed that "erroneous claims to the contrary, the B-1 does not require a new tanker for *any reason*; it is fully compatible with the KC-135. The fact that the Air Force requires a new tanker is not affected by the B-1."

Dr. Foster commended the Air Force's management of the B-1 program, stressing that "as of today, in terms of constant 1970 dollars, there has been no cost growth in the B-1 program. I feel there is a good chance that the strong Air Force management team can maintain this excellent record. . . ."

General Nelson reported that the currently estimated program cost of the B-1, based on a projected buy of 241 aircraft, is $11.1 billion or, when adjusted in terms of inflation, $100 million below the estimate of June 30, 1970. If the cost of research and development is included, the B-1's so-called program cost (flyable aircraft plus supporting equipment and initial spares), will be $45.6 million.

THE BALLISTIC MISSILE REQUIREMENT

The ICBM requirement was presented by Maj. Gen. Richard D. Reinbold, Vice Commander of SAC's Fifteenth Air Force, who indicated that the accuracies attained with the MIRVed Minuteman III warhead over its more than 5,000-mile, thirty-minute trajectory "are close enough to win the current bombing competition." He said the prime improvements of MM III over MM II are "a larger third stage—for greater range—and a new reentry system incorporating a post-boost control arrangement, which have dramatically improved reliability and missile performance." He said, "Ultimately we hope the [ICBM] force will be either all Minuteman III or a follow-on ICBM with improved accuracy and greater yield."

Minuteman's future, General Reinbold said, "appears unlimited. . . . As technology develops, so will Minuteman." Some immediate advances include hardness upgrading of the Minuteman silos and eventual deployment of a hard-site defense system. Even more important is the acquisition of a command data buffer, which would permit launch crews to insert new targets into the missile on orders received from SAC Headquarters.

General Holloway pointed out that Minuteman, by design, does not have the rapid retargeting flexibility of "other weapons, particularly the bomber but also Polaris. We need this capability [for Minuteman] and there is some effort going on in this area." He explained that the ability to react faster to a massive nuclear attack, and in a way other than a "spasm response," would enhance the nation's deterrence posture "considerably."

General Holloway told a questioner that at present SAC estimates that the number of ICBMs surviving an all-out first strike by the Soviet Union would "be plenty good enough to serve the policy of deterrence as stated in past years." He warned, however, that unless a number of steps are taken to improve the ICBM survivability, "this number [of surviving missiles] is going to decrease steadily."

Yet another form of protection of the US ballistic missile force, General Holloway said, might be derived from mobility. "Land mobility is much discussed, but I am not yet aware of such a system which seems entirely feasible. Sea mobility offers present advantages and I am a believer in the sub-launched ballistic missile as a vital and continuing portion of our Triad. For the future, effective mobility would seem best served through the three-dimensional medium of airpower. A viable air mobile system would be a significant advance because it represents a rapidly moving target—at a speed of 500 knots, or even faster if necessary—and operates in an envelope that extends some 60,000 feet up from the earth's surface."

Vice Adm. Frederick H. Michaelis, the Deputy Director of the Joint Strategic Target Planning Staff of the Joint Chiefs of Staff, briefed the audience on the Fleet Ballistic Missiles (FBMs), revealing that recent advances in the fire-control system "can prepare missiles for launch at a rate faster than one per minute."

Discussing the future of sea-based systems, Admiral Michaelis said: "Polaris and Poseidon—classed as intermediate-range ballistic missiles—in some cases must operate in relative proximity to the targets of potential aggressors. In the ULMS [Undersea Long-range Missile System], in the planning stages since 1968, mating of ICBMs and SSBNs will greatly expand the ocean area in which sea-launched systems can operate and remain within range of targets."

In response to questions about the US Navy's tracking capabilities of advanced Soviet missile-carrying submarines, General Holloway and Admiral Michaelis agreed that, while such a capability existed, "the real question is, how good is it?"

Other symposium speakers included Brig. Gen. Warren D. Johnson, SAC's Deputy Chief of Staff for Personnel, and Brig. Gen. Robert T. Cardenas, Chief of the National Strategic Target List Division of the Joint Strategic Target Planning Staff. General Holloway ended the symposium with a fitting tribute to the people of SAC:

"The people of America do not lightly grant, nor do we lightly accept, the authority to control nuclear weapons. We work for all our people to have lives of productivity and to enjoy relative comfort and security, but expect much more in return. We demand absolute conformity and near perfection from them in certain aspects of their jobs. We accept legitimate questioning, but not disobedience. No action can be allowed which might betray our great trust. You don't buy people who live up to those specifications. They have to believe in their jobs and their country." ■

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT

The first of eight Lockheed S-3A Viking research and development aircraft (two General Electric TF34-GE-2 turbofan engines)

LOCKHEED
LOCKHEED-CALIFORNIA COMPANY (A Division of LOCKHEED AIRCRAFT CORPORATION); Head Office: Burbank, California 91503, USA

LOCKHEED S-3A VIKING

On 4 August 1969 Lockheed announced the receipt of a $461 million contract from the US Navy to develop a new anti-submarine warfare aircraft under the designation S-3A. It is being developed by Lockheed in partnership with Vought Aeronautics Division of LTV Aerospace, Dallas, Texas, and Univac Federal Systems Division of Sperry Rand Corporation, St. Paul, Minnesota. LTV is designing and building the wing, engine pods, tail unit, and landing gear, and Univac is responsible for the digital computer, the heart of the weapons system, which provides high-speed processing of data essential for the S-3A's ASW rôle.

Other sub-contractors include Cubic Corporation, San Diego, California: sonobuoy reference system; Genisco Technology Corp, Compton, California: analogue tape recorder; Hoffman Electronics Corp, El Monte, California: tactical aircraft navigation, radar altimeter, and altitude warning system; Echo Science Corp, Pasadena, California: digital magnetic tape unit; Resdel Engineering Corp, Arcadia, California: sonobuoy receiver; Teledyne Ryan Aeronautical Co, San Diego, California: Doppler ground velocity set; Litton Systems Inc, Woodland Hills, California: carrier aircraft inertial navigation system; Bertea Corp, Irvine, California: primary flight control servos, damper assembly, mixer assembly; Garrett AiResearch, Los Angeles, California: air-conditioning and pressurisation system; McDonnell Douglas Corp, Long Beach, California: ejection seat system; Collins Radio Co, Cedar Rapids, Iowa: HF and UHF radios, data terminal set, HF antenna coupler and quadrantal/error corrector; Singer Co, Link Division, Silver Spring, Maryland: weapons system trainer; Lear Siegler Inc, Grand Rapids, Michigan: attitude and heading reference system, inertial navigation system interface; Williams Research Corporation, Walled Lake, Michigan: gas turbine auxiliary power unit; Bendix Corp, Teterboro, New Jersey: automatic flight control system, central air data system, flight display interface, and MAD signal conditioner; Sanders Associates, Nashua, New Hampshire: acoustic data processer; Hartman Systems Co, Huntington Station, New York: INCOS panels; IBM Federal Systems Division, Oswego, New York: electronic countermeasures; Instruments Systems Corp, Huntington, Long Island, New York: communications control and intercom system; Loral Corp, The Bronx, New York: tactical displays; Texas

Instruments Inc, Dallas, Texas: scan converter/RIU, radar/IFF antenna, and FLIR. Lockheed is building the fuselage, integrating the avionics, and is responsible for final assembly at Burbank, California.

The selection of Lockheed-California as contractor for this aircraft followed more than a year of intensive competition between North American Rockwell, McDonnell Douglas, Grumman Aircraft Engineering Corporation, Convair Division of General Dynamics, and Lockheed-California Company in conjunction with LTV Aerospace Corporation. Proposals submitted by these five companies in April 1968 were evaluated by Naval Air Systems Command (NASC), and in August 1968 General Dynamics and Lockheed were requested to provide additional contract definition and to make further refinements to their proposals.

The final proposals of these two companies were submitted in late December 1968, and a detailed technical evaluation was carried out by NASC. Prior experience with Navy programmes was taken into consideration, and finally the Service Selection Authority of NASC awarded the contract to Lockheed-California.

The Lockheed team is responsible for development, test, and demonstration of the aircraft and its weapons systems. The first prototype was rolled out on schedule on 8 November 1971 at Burbank, California, and the first flight was expected to be made in early January 1972, well in advance of the first flight deadline of 15 March. Introduction into the fleet is scheduled for early in 1974. There is now an increased ceiling of $494 million on the contract, to be funded over a five-year period, and this provides for production of eight research and development aircraft in two lots, with an option for the Navy to procure 191 production models of the S-3A in four lots.

The S-3A is intended for operation from aircraft carriers and will have a crew of four, comprising a pilot, co-pilot, tactical co-ordinator (Tacco), and acoustic sensor operator (Senso). The pilot will maintain command of the aircraft, while the Tacco formulates strategy and instructs the pilots on the necessary manoeuvres for a successful submarine attack. In addition to flying duties, the co-pilot will be responsible for the non-acoustic sensors (such as radar and infra-red) and navigation; the Senso will control the acoustic sensors.

The development of quieter submarines has led to the design of sonobuoys of increased sensitivity, and advanced cathode ray tube displays will be provided in the S-3A to maintain flexibility of operation with a limited crew. In particular, a cathode ray tube will be utilised to monitor the acoustic sensors. The information formerly stowed in roll form from paper plotters will, instead, be stored in the Univac 1832A computer and become available for instant recall. Other functions of the computer include weapon trajectory calculations and pre-flight navigation. Magnetic anomaly detection (MAD) equipment will be of increased sensitivity, in order to detect submarines at greater depths than is possible at the present time.

Before the S-3A is delivered to the fleet in February 1974, its avionic systems will have undergone nearly 2½ years of flight testing on board a specially modified P-3A Orion. Advanced weapon training will be provided by the use of Weapons System Trainers manufactured by the Link Division of the Singer Company.

Shipboard maintenance will be simplified by the provision of computerised fault-finding equipment, built-in test equipment (BITE), and versatile avionic shop test (VAST) compatibility. Complete deck-level servicing accessibility contributes to the attainment of a quick turnaround time.

The performance characteristics of the S-3A will make possible future design variants, including tanker, utility transport, ASW command and control, and a variety of electronic countermeasures aircraft. To cater for future growth, the airframe is stressed for a maximum take-off weight in excess of 50,000 lb (22,680 kg) and the fuselage volume is such as to allow for a 50 per cent expansion of avionics equipment.

All available details follow:

TYPE: Twin-turbofan carrier-borne anti-submarine aircraft.

WINGS: Cantilever shoulder-wing monoplane. Sweepback at quarter-chord 15°. All-metal fail-safe structure. Wings fold upward and inward hydraulically, outboard of engine pylons, for carrier stowage. Single-slotted Fowler-type trailing-edge flaps, operated by hydraulic power with an integral electric motor for emergency operation. Electrically-operated leading-edge flaps, extending from engine pylons to wingtips, are fully extended after 15° of trailing-edge flap movement. Ailerons augmented by under- and over-wing spoilers for roll control. All primary flight control surfaces are actuated by irreversible servos powered by dual hydraulic systems. Loss of either hydraulic system results in loss of half the available hinge movement, but the remaining system can meet all control requirements. Automatic reversion to manual control in the event of failure of both hydraulic systems. In emergency operation the spoilers are inoperative. Wing anti-icing by engine-bleed air, but portions of wing leading-edges are cyclically heated to reduce consumption of bleed air.

FUSELAGE: Semi-monocoque all-metal fail-safe structure, incorporating split weapons bays with clam-shell doors. Two parallel beams form a keelson from nose gear to tail-hook, strengthening the fuselage and improving cabin structural integrity by distributing catapult and arrester loads throughout the airframe. Launch tubes for 60 sonobuoys in belly. No provision for in-flight reloading of these launch tubes. Frangible canopy and windows in top of fuselage are so designed that the crew can eject through them in emergency. Avionics bays with external access doors in forward fuselage. An illuminated in-flight refuelling probe, mounted within the fuselage on the top centreline, is operated by an electric drive and protected by a positive-seal door. It can be extended or retracted in emergency by a hand crank. MAD boom, extensible flight, housed in fuselage tail.

TAIL UNIT: Cantilever all-metal structu with swept vertical and horizontal su faces. Fin and rudder are folded dow ward by hydraulic servos for carrier stow age. During fin-folding sequence the ped input to the rudder servo is disconnecte to allow the pilot to steer the nosewhee by the rudder pedals. Variable-incidenc tailplane, electrically controlled. Elevato and rudder controlled by hydraulic servos. Trim-tabs in elevator and rudder. Anti-icing of tailplane leading-edges b engine-bleed air.

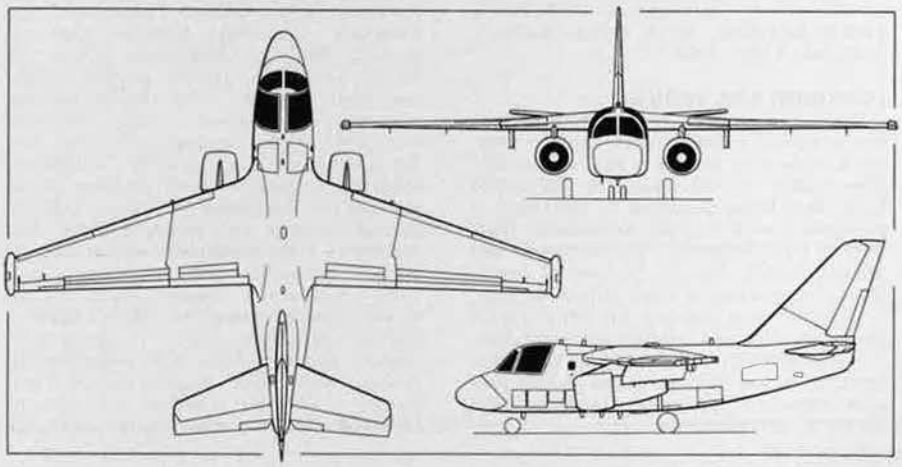
LANDING GEAR: Hydraulically-retractable tricycle type. Main units, similar to those of the Vought F-8 Crusader, are fitted with single wheels and retract rearward into wheel wells immediately aft of the split weapons bays. Nose unit similar to that of the Vought A-7 Corsair II, with twin wheels and catapult towbar, retracts rearward into fuselage. Nosewheel steerable by hydraulic power. Hydraulic brakes.

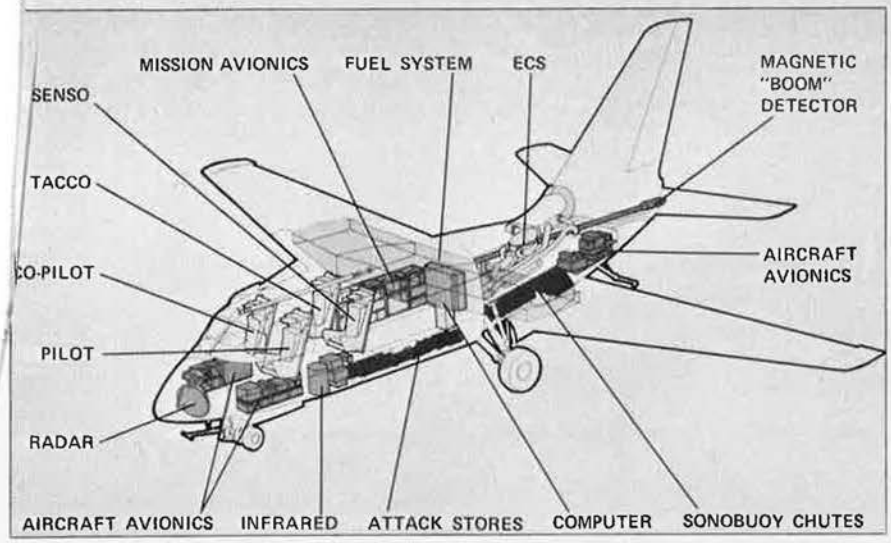
POWER PLANT: Two General Electric TF34-GE-2 high by-pass ratio turbofan engines, in the 9,000 lb (4,082 kg) st class, pylon-mounted beneath the wings. Fuel contained in integral wing tanks, entirely within the wing box beam, one on each side of the fuselage centreline and inboard of the wing fold-line. Usable fuel capacity approximately 1,900 US gallons (7,192 litres). Two 300 US gallon (1,136 litre) jettisonable fuel tanks can be carried on under-wing pylons. Single-point pressure refuelling adapter located on starboard side of fuselage aft of main landing gear door. Internal tanks may also be gravity fuelled through over-wing connections. Fuel jettison system. Anti-icing of engine inlet nozzles by engine-bleed air.

ACCOMMODATION: Crew of four. Pilot and co-pilot side-by-side on flight deck with transparent canopy. Tacco and Senso accommodated in aft cabin, under individual polarised windows. All crew on McDonnell Douglas ESCAPAC 1-E zero-zero ejection seats. Each seat has a rigid seat survival kit (RSSK), which can be opened during descent for inflation of life raft. Electric windshield wipers. Windshield surfaces electrically heated; side canopy is de-fogged with conditioned air. Liquid rain-repellent system to augment action of windshield wipers. Cabin pressurised and air-conditioned, and each crewman's anti-exposure suit is ventilated with conditioned air from this system.

SYSTEMS: Garrett AiResearch environmental control system, with engine-bleed air sup-

The Lockheed S-3A Viking twin-turbofan carrier-borne anti-submarine aircraft





Interior arrangement of the Lockheed S-3A Viking

ply and air-cycle refrigeration unit. Pressurisation system operates on a differential of 6–8 lb/sq in (0.42–0.56 kg/cm²), maintaining a cabin altitude of 5,000 ft (1,525 m) to a height of 25,000 ft (7,620 m) and 11,500 ft (3,505 m) cabin altitude to 40,000 ft (12,190 m). Two engine-driven pumps supply hydraulic power for two completely independent 3,000 lb/sq in (210 kg/cm²) systems. The port system supplies landing gear, flaps, brakes, wing and tail fold, arrester hook, and weapons bay doors. Its secondary function is to power one side of the primary flight control servos. The starboard system powers only the primary flight controls, energising one side of the dual servo actuators, while the port system energises the other. Electrical system includes two 75kVA generators supplying 115-120V AC at a frequency of 400 Hz. Secondary DC power is obtained from two transformer-rectifiers that deliver 28V DC at 200A. Williams Research Corporation gas turbine APU has a 5kVA generator for emergency electric power, providing 115-120V AC at 400 Hz to the essential AC bus and 28V DC at 30A through the transformer-rectifiers. Emergency electric power is adequate only for essential capabilities such as night flight under instrument conditions.

ELECTRONICS: ASW data processing, control and display includes Univac 1832A general-purpose digital computer, acoustic data processor, sonobuoy receiver, command signal generator, and analogue tape recorder. Non-acoustic sensors comprise AN/APS-116 high-resolution radar, forward-looking infra-red (FLIR) scanner in retractable turret, KB-18A panoramic camera, AN/ASQ-81 MAD and compensation equipment, and passive ECM receiving and instantaneous frequency-measuring system housed in wingtip pods. Primary navigation system composed of ASN-92(V) CAINS inertial navigator, AN/APN-200 Doppler ground velocity system (DGVS), central air data system (CADS), attitude heading reference system (AHRS), sonobuoy reference system (SRS), radar altimeter and altitude warning system (RAAWS), LF/ADF and UHF/DF radio navigation aids, TACAN, and the aircraft's flight displays and interface system (FDIS). Communications equipment includes a 1,000W HF transceiver for long-range communication, dual UHF transceivers, AN/ARA-63 receiver/decoder set for use with shipboard ILS, data terminal set (DTS), integral intercom system (ICS) and IFF/SIF units with altitude reporting, and AN/ASW-25B automatic carrier landing system (ACLS) communication set. Search stores are designated as LOFAR (SSQ-41), R/O (SSQ-47), DIFAR (SSQ-53), CASS (SSQ-50), DICASS (SSQ-62), and BT (SSQ-36) sonobuoys.

ARMAMENT: Split weapons bays equipped with BRU-14/A bomb rack assemblies can deploy either four MK-36 destructors, four MK-46 torpedoes, four MK-82 bombs, two MK-57 or four MK-54 depth bombs, or four MK-53 mines. BRU-11/A bomb racks installed on the two wing pylons permit carriage of SUU-44/A flare launchers, MK-52, MK-55 or MK-56 mines, MK-20-2 cluster bombs, Aero 1D auxiliary fuel tanks, or two rocket pods of type LAU-68/A (7 FFAR 2.75 in), LAU-61/A (19 FFAR 2.75 in), LAU-69/A (19 FFAR 2.75 in), or LAU-10A/A (4 FFAR 5.0 in). Alternatively, installation of TER-7 triple ejector racks on the BRU-11/A bomb racks makes it possible to carry three rocket pods, flare launchers, MK-20 cluster bombs, MK-82 bombs, MK-36 destructors, or MK-76-5 or MK-106-4 practice bombs under each wing.

DIMENSIONS, EXTERNAL:

Wing span	68 ft 8 in (20.93 m)
Wing span, wings folded	29 ft 6 in (8.99 m)
Length overall	53 ft 4 in (16.26 m)
Length overall, tail folded	49 ft 5 in (15.06 m)
Height overall	22 ft 9 in (6.93 m)
Height overall, tail folded	15 ft 3 in (4.65 m)
Tailplane span	27 ft 0 in (8.23 m)

DIMENSIONS, INTERNAL:

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

AREA:

Wings, gross	598 sq ft (55.56 m²)

WEIGHTS:

Weight empty	26,000 lb (11,793 kg)
Normal ASW T-O weight	42,500 lb (19,277 kg)
Max landing weight	37,700 lb (17,100 kg)

PERFORMANCE (estimated):

Max level speed	440 knots (506 mph; 814 km/h)
Max cruising speed	over 350 knots (403 mph; 649 km/h)
Loiter speed	160 knots (184 mph; 296 km/h)
Stalling speed	84 knots (97 mph; 157 km/h)
Rate of climb at S/L	over 4,200 ft (1,280 m)/min
Service ceiling	above 35,000 ft (10,670 m)
Combat range	more than 2,000 nm (2,303 miles; 3,705 km)
Ferry range	more than 3,000 nm (3,454 miles; 5,558 km)

McDONNELL DOUGLAS

McDONNELL AIRCRAFT COMPANY (Division of McDONNELL DOUGLAS CORPORATION); Head Office: Box 516, St. Louis, Missouri 63166, USA

McDONNELL DOUGLAS PHANTOM II

Since the 1971–72 edition of *Jane's All the World's Aircraft* went to press, the Federal German government has decided to order for the Luftwaffe a new two-seat version of the Phantom II, designated F-4F, instead of the single-seat F-4E(F) which had been projected specifically to meet German requirements. Although generally similar to the F-4E, the F-4F will embody some of the modifications requested by the Luftwaffe to optimise their aircraft for an interception rôle, including the installation of wing leading-edge slats. Unlike the F-4E(F), the F-4F will retain the standard Sparrow III air-to-air missile system. It will be suitable for operation by a one-man crew if required.

The prototype F-4F is scheduled to fly for the first time by early 1973. Deliveries of production aircraft will begin one year later and will be completed in February 1976. The current order is for a total of 175 aircraft.

LYULKA

ARKHIP MIKHAILOVICH LYULKA, USSR

Although he is one of the select group of Soviet aircraft and engine designers to hold the title of General Constructor—enabling him to head his own design bureau and have his products designated by his personal initials—Lyulka is little known in the West and his long history of work on gas turbines has been practically unknown. During the late 1930s he worked on the design of an axial turbojet that became an early war casualty. In 1942 he planned a more advanced engine that finally materialised as the TR-1, of 2,866 lb (1,300 kg) st, run on the bench in 1944 and used in the Ilyushin Il-22 four-jet bomber and Sukhoi Su-11 twin-jet fighter prototypes, both of 1947. Ultimately, in 1948, this pioneer Soviet-designed turbojet was developed to give 3,307 lb (1,500 kg) st.

In 1946 Lyulka began the design of a very ambitious axial engine to give a thrust of 9,920 lb (4,500 kg), and in 1950 this began bench trials under the designation AL-5. Although of basically simple, single-shaft configuration, with a seven-stage compressor and single-stage turbine, the AL-5 was more powerful than all Western engines apart from the prototype Olympus and J57. By 1951 it was rated at 10,140 lb (4,600 kg) st and flew in the prototype Ilyushin Il-30 twin-jet bomber; later in 1951–52 uprated AL-5 engines, giving a static thrust of 11,023 lb (5,000 kg), powered the Il-46 twin-jet bomber and the transonic Lavochkin La-190 and Yakovlev Yak-1000 fighters. Advanced civil versions of the same engine, the AL-5 rated at 12,125 lb (5,500 kg) st, powered the Tu-110 four-engined derivative of the Tu-104 airliner that never went into production (at the time, in 1959, this en-

A Sukhoi Su-7, most successful of the many Soviet designs that have been powered by Lyulka turbojets (Tass)

gine was reported in the West as the "Lu-4").

By the time the AL-5 was running, Lyulka had conducted extensive research with axial compressors having supersonic airflow through some or all of the stages. It was clear that, if problems of flow breakdown and inefficiency could be resolved, such a compressor would enable turbojets to be made much smaller and lighter for a given thrust and with greater thrust per unit frontal area, and thus much better suited to the propulsion of supersonic fighters. By 1952 a supersonic-compressor engine had been designed and built. This, the AL-7, is today Lyulka's greatest success and one of his few designs to have been rewarded by large-scale production.

LYULKA AL-7

The first AL-7 ran on the bench late in 1952 and the first production version was cleared for use in 1954 at a design rating of 14,330 lb (6,500 kg) st. Its initial application was on the Il-54, yet another Ilyushin twin-jet bomber that failed to see production despite the fact that its speed at low altitude of 714 mph (1,150 km/h) was probably unrivalled by any other bomber in 1955. In the same year the Sukhoi Su-7 single-seat ground-attack fighter was designed around the AL-7F afterburning version of this engine, with thrust increased by about 40 per cent (see data below). By 1956 the Su-7 was flying, and the AL-7F had also been chosen for the basically similar Su-9 all-weather fighter. By 1958 a further-developed version of the basic non-reheat engine, the AL-7PB, had been chosen by Beriev for the Be-10 reconnaissance flying-boat which—apart from being the only pure-jet flying-boat ever to go into service anywhere—set up a number of world records for speed, load-carrying and altitude. Other versions of the AL-7, in both cases of the -7F afterburning family, powered the unsuccessful Tu-98 bomber and La-250 strike fighter of 1956.

TYPE: Single-shaft axial-flow turbojet, available with or without reheat.

AIR INTAKE: Annular type surrounding central bullet fairing. Main intake unit has 14 fixed aerofoil struts anti-iced by compressor bleed air.

COMPRESSOR: Nine-stage axial-flow type (probably eight stages in original AL-7 design). First two stages widely separated axially, with variable stators ahead of second stage. Each stage has blades inserted in centreless disc held by peripheral spacers at correct distance from adjacent discs, the whole being coupled finally together by central drive-shaft in tension. Pressure ratio probably about 8:1.

COMBUSTION CHAMBER: Annular type with perforated inner flame tube. Multiple downstream fuel injectors inserted through cups in forward face of liner. Liner outer casing provided with multiple inward secondary-air injection ducts.

TURBINE: Two-stage axial-flow type. Both wheels overhung behind rear bearing; front disc bolted to flange on hollow tubular drive-shaft which, in turn, is splined to rear of compressor shaft running in main centre bearing which locates compressor axially against end loads.

AFTERBURNER: In AL-7F series, afterburner (reheat jet-pipe) comprises upstream diffuser and downstream combustion section. Pilot combustor on turbine exit cone includes single nozzle ring and flameholder; main spray ring and gutter flameholder assembly located further downstream at greater radius. Refractory liner in combustion section. Variable-area nozzle with multiple hinged flaps which govern nozzle size and profile according to signals from reheat control system based on turbine exit temperature and throttle lever position.

ACCESSORIES: Fuel pump and control unit, oil pumps, hydraulic pump, electric generator, tachometer, and other items grouped into quickly replaceable packages beneath compressor casing.

PERFORMANCE RATINGS:

Max rating:

AL-7F, cold (no reheat)	15,432 lb (7,000 kg) st
AL-7F, max reheat	22,046 lb (10,000 kg) st
AL-7PB	14,330 lb (6,500 kg) st

BOEING/AERITALIA

AIRFRAME PRIME CONTRACTORS:
The Boeing Company, PO Box 370
Seattle, Washington 98124, USA
Aeritalia SpA, Piazza le V. Tecchio 51/A
80125 Naples, Italy

PROGRAMME MANAGER:
C. S. Howell (Boeing)

DEPUTY PROGRAMME MANAGER:
Fausto Cereti (Aeritalia)

BOEING/AERITALIA BA-751

First announced at the Paris Air Show in May 1971, the BA-751 is a joint US-Italian project for a new civil transport aircraft in which the main emphasis will be placed on STOL performance and low operating noise levels. Italian government approval was granted late in 1971 for Aeritalia to proceed, with Boeing, in the development of this aircraft, although work had effectively begun several months earlier. Development costs are to be shared equally between the two companies, both of which will manufacture the aircraft in its production form.

Development of the BA-751 will proceed in four basic phases, with a review of the programme at the end of each phase before proceeding to the next one. The initial phase, which began in the Summer of 1971 and is now completed, was concerned with the study and exchange of preliminary technical and market information between the two companies. For this purpose, 40 engineers from Aeritalia were assigned to work at the Boeing facility at Renton, which itself allocated 150 employees to this phase of the programme. The second phase, now in progress, will cover the completion of configuration research and design definition, and is due to be completed in the Summer of 1972.

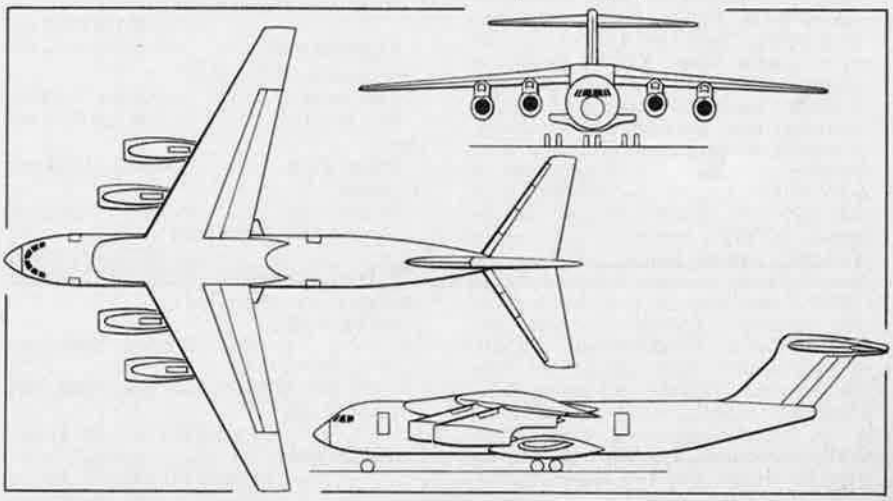
Phase 3 of the development programme will be conducted mainly in Italy. It will be concerned with the refinement of detail design and with the flight testing of two prototype aircraft, the first of which is scheduled to fly in 1975. The fourth phase will be concerned with series production and marketing of the BA-751, with assembly lines in both Italy and the USA. First deliveries of production aircraft are planned for late 1978 or early 1979.

The general appearance of the BA-751 can be seen from the accompanying three-view drawing.

TYPE: Four-engined STOL transport aircraft.

WINGS: Cantilever high-wing monoplane, of all-metal construction. Sweptback wings, with anhedral from centre-section, mount-

The Boeing/Aeritalia BA-751 four-engined STOL transport aircraft (provisional)



:d above fuselage to leave interior unobstructed.

SELAGE: All-metal semi-monocoque structure of basically circular cross-section, upswept at rear.

IL UNIT: Cantilever "T" tail, with sweepback on all surfaces.

NDING GEAR: Retractable tricycle type. Four-wheel main bogies, each consisting of two pairs of wheels in tandem, retracting inward into fuselage. Twin-wheel nose unit.

WER PLANT: Four turbojet or turbofan engines in individual underwing pods. Up to December 1971 no announcement had been made as to the choice of engine, but this is expected to be in the 22,000–26,000 lb (9,980–11,790 kg) thrust class. A Boeing official has referred to the possibility of using a derivative of either the projected new SNECMA/General Electric CFM56 civil turbofan or of the Pegasus 15 vectored-thrust turbofan by Rolls-Royce/Pratt & Whitney. An indication of intake doors and auxiliary nozzles at front and rear of the engine pylons, just below the wings, suggests that the possibility of utilising the de Havilland Canada "augmentor wing" concept is also being considered.

ACCOMMODATION: Seats for 100–150 passengers. Four passenger and service doors, on each side of fuselage forward and aft of wings.

DIMENSIONS, EXTERNAL:

Wing span	119 ft 6 in (36.42 m)
Length overall	147 ft 8 in (45.01 m)
Length of fuselage	128 ft 4 in (39.12 m)
Height overall	35 ft 10 in (10.92 m)
Tailplane span	53 ft 6 in (16.31 m)

PERFORMANCE:

Typical range 825 nm (950 miles; 1,530 km)

AGUSTA

COSTRUZIONI AERONAUTICHE GIOVANNI AGUSTA SpA; Address: C.P. 193, Cascina Costa, Gallarate, Italy

AGUSTA A 109 HIRUNDO (SWALLOW)

This twin-engined helicopter, developed from the original single-engined A 109, of which details were given in the 1966–67 *Jane's;* it was previously designated A 109C. The basic version accommodates a pilot and seven passengers, and has a large luggage compartment in the rear of the fuselage. Alternatively, the Hirundo can be adapted for freight-carrying, as an ambulance, or for search and rescue. Military loads can also be carried.

Three company-funded prototypes are being built, and the first of these (NC7101) flew for the first time on 4 August 1971. The other two were due to have flown by the end of 1971, and a fourth airframe is being built for static and fatigue testing. Certification by the RAI and FAA is anticipated during 1972, with deliveries beginning before the end of the year.

TYPE: Twin-engined general-purpose helicopter.

ROTOR SYSTEM AND DRIVE: Fully-articulated four-blade single main rotor and two-blade semi-rigid delta-hinged tail rotor. Main transmission assembly is housed in fairing above the passenger cabin, driving the main rotor through a coupling gearbox and main reduction gearbox, and the tail rotor through a 90° gearbox. Main rotor blades can be folded back for stowage. Main rotor/engine rpm ratio 1:15.62. Tail rotor/engine rpm ratio 1:2.88. Rotor brake fitted.

FUSELAGE AND TAIL UNIT: Pod-and-boom type, of all-metal construction, built in four main sections: nose, cockpit, passenger cabin, and tail-boom. Sweptback vertical fin and non-swept elevators mounted on rear of tail-boom. Tail rotor on port side.

First prototype of the Agusta A 109 Hirundo (two 400 shp Allison 250-C20 turboshaft engines)

LANDING GEAR: Retractable tricycle type, with single main wheels and self-centering steerable nosewheel. Hydraulic retraction, nosewheel forward, main wheels upward into fuselage. Brakes on main wheels, locking mechanism on nosewheel. All wheels size 5.00 x 5. Combined wheel/ski gear available optionally.

POWER PLANT: Two Allison 250-C20 turboshaft engines (each 400 shp, max continuous rating 346 shp), mounted side-by-side in upper rear fuselage and separated from passenger cabin and from each other by firewalls. Fuel in single main tank in lower rear fuselage, capacity 121 Imp gallons (550 litres). Oil capacity 1.2 Imp gallons (5.5 litres) for each engine and 1.6 Imp gallons (7.5 litres) for transmission. For search missions, internal auxiliary fuel tanks may be fitted.

ACCOMMODATION: Crew of one or two on flight deck, which has door on each side. Dual controls. Main cabin seats up to six passengers, in two rows of three, with large space at rear for baggage. A seventh passenger can be carried in lieu of second crew member. Door to passenger cabin on each side. First row of seats removable to permit use as freight transport. Ambulance version can accommodate two stretchers, one above the other, and two medical attendants, in addition to the pilot, when the forward cabin bulkhead is removed. Cabin heating and ventilation standard.

SYSTEMS: Utility hydraulic system for landing gear operation, wheel and rotor braking and nosewheel locking. Two separate hydraulic systems provide for dual flight servo-controls. 28V DC electrical system, using two 150A starter-generators, and one 28V 23Ah battery. 115V 400Hz AC power supplied by 250VA static inverter.

ELECTRONICS AND EQUIPMENT: Standard flight instrumentation and VHF transceiver. Additional instrumentation and equipment to customer's requirements, including provision for VHF-AM, VHF-FM, UHF-AM, VOR (with Area Navigation if required), ILS, DME, and ADF.

ARMAMENT AND OPERATIONAL EQUIPMENT: Provision for 2,205 lb (1,000 kg) capacity under-fuselage cargo sling for freight-carrying, or 330 lb (150 kg) capacity electrically-operated rescue hoist on port side. When the latter is fitted, the single port-side main cabin door is replaced by double doors. For armed missions, the aircraft can be fitted with stores pylons

The prototype Agusta A 109 Hirundo as first flown, without engine cowlings and fairing over tail rotor shaft

on each side of the lower fuselage. These can carry, typically, four TOW missiles (with XM-58 tracking and T10K teleguidance equipment installed in cabin); two XM-157 launchers, each with seven 2.75 in rockets, and associated SFOM 83-A3 sighting gear; or two 7.62 mm Miniguns or MG-3 machine-guns with a total of 5,000 rounds of ammunition. Provision for search radar in "thimble" radome on port side of nose.

DIMENSIONS, EXTERNAL:
- Diameter of main rotor: 36 ft 1 in (11.00 m)
- Diameter of tail rotor: 6 ft 6¾ in (2.00 m)
- Length of fuselage, tail rotor turning: 36 ft 7 in (11.15 m)
- Length of fuselage: 36 ft 0¾ in (10.99 m)
- Height to top of main rotor hub: 9 ft 6 in (2.90 m)
- Height overall: 10 ft 6 in (3.20 m)
- Width over main wheels: 8 ft 0½ in (2.45 m)
- Passengers doors (each): Width: 3 ft 7 in (1.10 m)

DIMENSIONS, INTERNAL:
- Cabin, excluding flight deck: Length: 5 ft 3¾ in (1.62 m)
- Width: 4 ft 5½ in (1.36 m)
- Height: 4 ft 2½ in (1.28 m)
- Volume: 100 cu ft (2.82 m³)
- Baggage compartment: Volume: 18.4 cu ft (0.52 m³)

AREAS:
- Main rotor disc: 1,022.6 sq ft (95.00 m²)
- Tail rotor disc: 33.8 sq ft (3.14 m²)

WEIGHTS:
- Weight empty: 2,645 lb (1,200 kg)
- Max T-O weight: 5,070 lb (2,300 kg)

PERFORMANCE (estimated at 4,850 lb; 2,200 kg AUW. A = ISA, B = ISA + 40°F):
- Max level speed at S/L (max cont power):
  - A: 149.5 knots (172 mph; 277 km/h)
  - B: 138 knots (159 mph; 256 km/h)
- Max level speed at 6,560 ft (2,000 m):
  - A: 148.5 knots (171 mph; 275 km/h)
  - B: 136.5 knots (157 mph; 253 km/h)
- Econ cruising speed at S/L:
  - A: 120.5 knots (138.5 mph; 223 km/h)
  - B: 122.5 knots (141 mph; 227 km/h)
- Max rate of climb at S/L:
  - A: 2,060 ft (630 m)/min
  - B: 1,320 ft (402 m)/min
- Rate of climb at S/L, one engine out:
  - A: 460 ft (138 m)/min
  - B: 90 ft (30 m)/min
- Service ceiling:
  - A, B: 17,400 ft (5,300 m)
- Service ceiling, one engine out:
  - A: 8,850 ft (2,700 m)
  - B: 2,450 ft (750 m)
- Hovering ceiling in ground effect:
  - A: 11,810 ft (3,600 m)
  - B: 8,370 ft (2,550 m)
- Hovering ceiling out of ground effect:
  - A: 9,190 ft (2,800 m)
  - B: 5,250 ft (1,600 m)
- Max range at S/L:
  - A, B: 337 nm (388 miles; 625 km)
- Max range at 6,560 ft (2,000 m):
  - A: 397 nm (457 miles; 735 km)
  - B: 394 nm (453 miles; 730 km)
- Max endurance at S/L:
  - A: 3 hr 28 min
  - B: 3 hr 24 min
- Endurance in search and rescue role, at 100 knots (115 mph; 185 km/h), with 570 lb (260 kg) auxiliary fuel:
  - A: 5 hr

The Shackleton Mk 2 is the only British operational aircraft that is piston-engined and fitted with a tailwheel landing gear

HAWKER SIDDELEY

HAWKER SIDDELEY AVIATION LTD; Address: Richmond Road, Kingston upon Thames, Surrey, England

HAWKER SIDDELEY (AVRO) SHACKLETON

At Bitteswell, Warwickshire, Hawker Siddeley Aviation is engaged on the conversion of 12 Shackleton MR. Mk 2s for service as airborne early warning aircraft. The first of these (WL745) flew for the first time on 30 September 1971, and delivery of all 12 is scheduled to be completed during the first quarter of 1972.

The modified Shackletons will supplement the present Gannet AEW. Mk 3s of the Royal Navy until completion of the rundown of the latter's aircraft carrier force, after which they will take over complete responsibility for AEW support of maritime surface forces and enhancement of low-level radar defence of the UK. Deliveries are being made to No 8 Squadron of the RAF, which is forming at Kinloss, Scotland, in the first weeks of 1972 and will transfer

First of 12 Hawker Siddeley Shackleton Mk 2 airborne early warning aircraft for the Royal Air Force

ventually to Lossiemouth as its operational base. Other, unmodified Shackleton MR. Mk 2Cs continue to serve with Nos 203 and 204 Squadrons.

The AEW modification includes revision of the existing weapons bay, deletion of the retractable "dustbin" radome installed previously aft of this bay, and installation just forward of the weapons bay of a large, fixed "guppy" type radome housing APS-20 search radar of the kind fitted to the Gannet AEW.3. Other external changes from the standard Shackleton MR.2C include a variety of aerials, antennae, and equipment fairings along the top of the fuselage, beneath the weapons bay doors, and around the area occupied formerly by the retractable radome.

HAWKER SIDDELEY NIMROD

The following additional version has been announced:

Nimrod R.Mk 1. Designation of three aircraft (additional to the 38 Nimrod MR. Mk 1s ordered initially for RAF Strike Command) delivered to No 51 Squadron, RAF, at Wyton, Huntingdonshire. These aircraft are reported to be replacements for Comet 2 aircraft that were employed for electronic reconnaissance and to monitor hostile radio and radar transmissions, although official statements have referred only to radio/radar calibration duties connected with RAF equipment.

BELLANCA

BELLANCA AIRCRAFT CORPORATION (Subsidiary of MILLER FLYING SERVICE, INC); Head Office: Municipal Airport, Alexandria, Minnesota 56308, USA

BELLANCA (CHAMPION) 7AC CHAMP

Aeronca built more than 7,200 of the original Model 7AC Champs between 1946 and 1948. It is estimated that approximately 3,500 of these are still in use.

In 1951, when Champion Aircraft Corporation acquired manufacturing rights to all Aeronca Model 7 aircraft, it was decided not to produce the Champ. Following the merger with Bellanca, a reappraisal suggested that there would be a demand for an improved version of the design and a decision was made to put the Champ back into production.

The main difference in the new model is use of a 60 hp Franklin 2A-120-B power plant to replace the original 65 hp Continental engine, which is no longer in production. This has necessitated re-design of the cowling and air scoop, resulting in improved forward visibility. Other new features include a lightweight cantilever spring-steel main landing gear, solid rubber tailwheel, and the utilisation of modern materials to provide a clean and durable interior.

TYPE: Two-seat lightweight cabin monoplane.

WINGS: Braced high-wing monoplane with Vee steel-tube bracing struts each side. Wing section NACA 4412. Two-spar structure with spruce spars, light alloy ribs, and fabric covering. Ailerons of light alloy construction with fabric covering.

FUSELAGE: Welded steel-tube structure with fabric covering.

TAIL UNIT: Wire-braced welded steel-tube structure with fabric covering. Fin integral with fuselage. Adjustable trim-tab in port elevator.

LANDING GEAR: Non-retractable tailwheel type. Cantilever spring-steel main gear with 5.00 x 6 wheels and tyres. Solid rubber tailwheel. Dual hydraulic brakes.

POWER PLANT: 60 hp Franklin 2A-120-B two-cylinder horizontally-opposed air-cooled engine, driving a Sensenich two-blade wooden fixed-pitch propeller, diameter 5 ft 0 in (1.52 m). Fuel capacity 14 US gallons (53 litres).

ACCOMMODATION: Enclosed cabin seating two in tandem. Dual controls standard. Stowage for 40 lb (18 kg) baggage.

EQUIPMENT: Optional equipment includes a starter-generator-battery package to permit electric starting of engine; a Genave battery-powered communications radio that can be used independently of an installed electrical system; flight instruments and an electrically-powered vacuum pump for their operation. Navigation and beacon light wiring is standard.

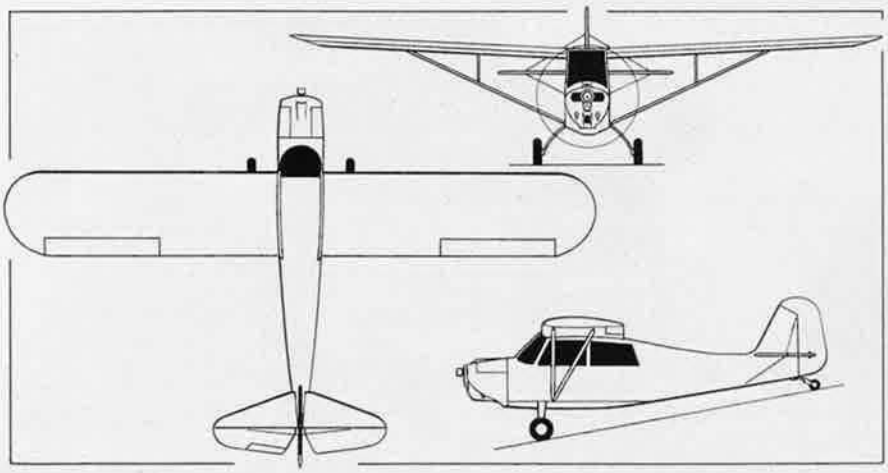
DIMENSIONS, EXTERNAL:

Wing span	35 ft 1½ in (10.71 m)

Bellanca (Champion) 7AC Champ two-seat lightplane (60 hp Franklin 2A-120-B engine) (Don Downie)

Bellanca (Champion) 7AC Champ, the lowest-priced production lightplane currently available in the USA (Don Downie)

The Bellanca (Champion) 7AC Champ tandem two-seat light aircraft



Length overall	21 ft 9½ in (6.64 m)
Height overall	7 ft 0 in (2.13 m)
AREA:	
Wings, gross	170 sq ft (15.79 m²)
WEIGHTS AND LOADINGS:	
Weight empty	750 lb (340 kg)
Max T-O weight	1,220 lb (553 kg)
Max wing loading	7.17 lb/sq ft (35.07 kg/m²)
Max power loading	20.33 lb/hp (9.22 kg/hp)
PERFORMANCE (at max T-O weight):	
Max level speed	79 knots (91 mph; 146 km/h)
Max permissible speed	112 knots (129 mph; 207 km/h)
Cruising speed, 75% power at 4,000 ft (1,220 m)	75 knots (86 mph; 138 km/h)
Stalling speed	34.7 knots (40 mph; 64 km/h)
Rate of climb at S/L	460 ft (140 m)/min
T-O to 50 ft (15 m)	900 ft (274 m)
Range with max fuel	260 nm (300 miles; 483 km)

The first prototype of the Bell KingCobra armed helicopter (1,800 shp Pratt & Whitney T400-CP-400 coupled turboshaft)

BELL

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

BELL KINGCOBRA

Bell Helicopter Company announced on 28 September 1971 the construction of an advanced armed helicopter which it has named KingCobra. A development of the AH-1J SeaCobra, this prototype has been built as a company-funded project by Bell and its subcontractors.

The KingCobra expands the proven armed helicopter concept of the AH-1G HueyCobra and AH-1J SeaCobra and is powered by an 1,800 shp Pratt & Whitney (UACL) T400-CP-400 coupled free-turbine turboshaft power plant (military version of the UACL PT6T-3 Turbo "Twin Pac" power plant). Further development of this turboshaft engine is expected to provide a rating of 1,970 shp, with further potential growth to 2,400 shp. A second prototype, to be completed in the first half of 1972, will be powered by a Lycoming T55-L-7C turboshaft engine of 2,850 shp, flat-rated to 2,000 shp, and will have working systems.

By comparison with the AH-1J, the KingCobra has a slightly lengthened (49 ft; 14.93 m) and strengthened fuselage, but retains the same general configuration. Other changes include a modification of the nose to accommodate a stabilised multi-sensor sight and enlarged ammunition bay for the linkless ammunition drum; greater span of the stub wings (13 ft; 3.96 m) to increase fuel capacity to 2,300 lb (1,043 kg) and allow the carriage of more under-wing weapons; strengthened landing gear; provision of a ventral fin for increased longitudinal stability and a tail-boom extension to compensate for the larger rotor.

The main rotor, of 48 ft (14.63 m) diameter, has wide-chord blades of high-lift section, and swept tips which reduce noise and improve high-speed performance. The rotor hub incorporates elastomeric and Teflon-faced bearings which require no lubrication. Rotor transmission and drive train are rated at 2,000 hp for take-off and 1,650 hp continuous, and this design, which has been tested extensively on the HueyTug and HueyPlus, has accumulated more than 1,000 flight hours since 1968.

As a result of these improvements, the KingCobra can hover out of ground effect at 4,000 ft (1,220 m) at 95°F (35°C) at a gross weight of 14,000 lb (6,350 kg); the first prototype, which began its flight test programme on 10 September 1971, has already exceeded a speed of 200 knots (230 mph; 370 km/h) in a dive, and has exceeded 3*g* manoeuvres at cruising speed.

Sophisticated equipment will enable the KingCobra to operate as an advanced armed helicopter capable of performing anti-armour missions in the most adverse weather, terrain, and threat environments.

Bell Helicopter Company has provided the stability control augmentation system (SCAS), and attitude retention unit (ARU). Other major subsystems include stabilised multi-sensor sight with 3x and 12x day optics, 2x and 6x night optics, neodymium laser, computer and electronics, head-up display (HUD) and fire control integration, supplied by General Electric, Binghampton; helmet sights by Sperry Rand, Univac; night fire control, including FL-33 forward-looking infra-red (FLIR), FLIR power supply and compressor by Texas Instruments; pilot's night vision 40/25 low light level television (LLLTV) by Dalmo Victor; 20/30 mm turret and ammunition storage system by General Electric, Burlington; lightweight aerial warning system (LAWS) by ITEK, Applied Technology; LN-30 inertial navigator by Litton, Systems Division; and APN-198 radar altimeter by Honeywell, Aerospace Division.

Bell Helicopter Company intends to offer the KingCobra to the US Marines and Army in slightly differing versions to meet their specific requirements.

The KingCobra combines the slim profile of the AH-1J and AH-1G with new nose sensors and heavier armament

Typical KingCobra weapon load includes 19-rocket pod and four anti-tank missile launchers under each stub-wing

The Bulletin Board

By Capt. John T. Correll, USAF

TOPREP

The Air Force has decided on what it thinks is the ideal personnel situation for the Air Reserve Forces, and spells out ways of achieving it in TOPREP, the newest volume of the USAF Personnel Plan.

The heart of TOPREP is its "before" and "after" diagrams of Air Guard and Reserve force structures, but its seventeen implementing actions will probably stir more immediate interest, at least at the individual level. Among the most significant:

- A major expansion of the Reserve Mobilization Augmentee program, under which Reserve officers would fill support jobs vacated by pilots and navigators recalled to the cockpit during wartime.
- A new evaluation/promotion system for Reserve Forces airmen, resulting in WASS (Weighted Airman Screening System). At present, there is no evaluation system for enlisted Reserve Forces people, and promotion is limited, for the most part, to unit vacancies. The rating form to be developed for staff sergeants and above will resemble the active-duty airman performance report, but will be simpler, with no narrative.

A package proposal on WASS is now being staffed.

- The eventual phase out of the unpaid reinforcement designees, replacing them with a pool of paid Reservists who will train as units, but who would be called up on an individual basis. The reinforcement designees are those veterans who sign Ready Reserve service agreements, giving them priority for recall in the event of mobilization.
- Severance pay for some Reserve Forces officers and airmen who are involuntarily separated short of retirement.
- Award of Air Force specialty codes for skills attained in civilian occupations.
- Retirement options prior to age sixty.
- A souped-up recruiting program that will attempt to attract a full twenty-five percent of the active-duty separatees into the Reserve or Guard each year.
- Survivor benefits for dependents of Reserve Forces members who die during periods of active duty.
- A "selection in" screening of those eligible to retire, and a limit to the number of people with twenty years or more of creditable service who actively participate in the Reserve Forces.

As yet, some of the implementing actions are essentially statements of intent. Details and effective dates for them have not been determined. Some will require funding and legislation.

TOPREP will operate on a computer model, projecting the long-range results of the gamut of personnel actions and pointing out what needs to be done—in procurement, promotion, separation, and the rest—to keep on track toward the ideal force structure.

Guard, Reserve Realignments

Nine Air Guard and Reserve units are getting new aircraft, and, in some cases, new names to go with them. The realignment will give the Guard thirty-one more drill pay spaces and sixty-seven more Air Guard technicians or other civilians. The Reserve will lose 202 drill pay spaces, but gain ten Air Reserve technicians and other civilians.

The lone Guard unit affected is the 155th Tactical Reconnaissance Group at Lincoln AFB, Neb., which will convert from RF-84s to RF-4s earlier this year than previously announced.

Changes for the Reserve: The 908th Tactical Support Group, Maxwell AFB, Ala., gets C-7s to replace its U-3s, and becomes the 908th Tactical Airlift Group; the 303d Aerospace Rescue and Recovery Squadron at March AFB, Calif., switches from HC-97s to HC-130s; the 918th Military Airlift Group, Dobbins AFB, Ga., converts from C-124s to C-7s and will be designated the 918th Tac-

AFROTC is now open to women at ninety-four percent of all colleges that have both an AFROTC detachment and women students, WAF staff directors were told at their recent conference at Andrews AFB, Md. Attendees included (from left) Lt. Col. Rita Lawler, AFSC; Lt. Col. Norma Brown, USAFSS; Maj. Gwen Hawkins, SAC; Lt. Col. June Vorce, ATC; and Maj. Jessie McGraw, PACAF.

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tical Airlift Group; the 917th Military Airlift Group, Barksdale AFB, La., converts from C-124s to A-37s and becomes the 917th Special Operations Group.

Also, the 905th Military Airlift Group, Westover AFB, Mass., goes from C-124s to C-130s, and is renamed the 905th Tactical Airlift Group; at Selfridge ANGB, Mich., the 305th Aerospace Rescue and Recovery Squadron will convert from HC-97s to HC-130s; the 907th Special Operations Group, Lockbourne AFB, Ohio, will delay its earlier-announced conversion from C-119s to C-123Ks until spring of 1973; and the 911th Military Airlift Group, Greater Pittsburgh Airport, Pa., will change from C-124s to C-123Ks, and be redesignated the 911th Tactical Airlift Group.

The C-7 Caribou and the HC-130 Hercules are new to the Reserve inventory.

Joining the Air Force Reserve inventory is the versatile C-7 Caribou, a STOL utility transport that has seen extensive service in Vietnam, airlifting troops and equipment to isolated landing fields.

Search range and emergency response time will improve for the Reserve units reequipping with the HC-130, a modified version of the Hercules transport especially designed for rescue and recovery operations.

Retired Pay Recommendations

DoD is currently looking over the report of the President's Interagency Committee on military retirement and survivor benefits. While the portion on survivor benefits is similar to already-pending legislation *(see "The Bulletin Board," January '72 issue)*, the report proposes some far-reaching changes in the area of retired pay.

For the vast majority of service retirees, the report notes, the military is only the first part of a two-career lifetime. Nondisability retirement can come as early as age thirty-seven. So, where military retirement pay once functioned strictly as an old-age annuity, it is now primarily an income supplement for many recipients for a number of the years they receive it.

The committee proposes a variable retirement income, lower in the years when the retiree is working at his second career, higher—providing annuities at least as large as under the present system—in the true retirement years.

Once they hit the "old-age threshold," the retirement pay of those who had twenty-five years or more of service would be computed on a higher percentage than now.

All retirement pay would be based on an average of the three consecutive years when an individual's basic pay was highest—for most, the last three years—rather than on terminal basic pay, as now.

A retiree's Social Security benefit is now added to his retirement pay when he reaches age sixty-five. The committee holds that the government, as the retiree's employer while he was on active duty, has already contributed to his old-age earnings through Social Security, so the amount accruing from those federal contributions should be deducted from the sum he receives.

The report urges annuity benefits at age sixty for those who separate with between ten and nineteen years' service. (Twenty years is the present minimum for any sort of retirement income.) As an option, separatees could choose a lump-sum settlement.

The present method of adjusting annuities by the Consumer Price Index (CPI) should be continued, the committee said.

The present Reserve retirement system, the committee believes, provides more economic incentive than is necessary to meet manpower requirements. A Reservist's retired pay is computed on wage scales in effect when he begins drawing his annuity at age sixty, not those when he was actively participating in the Reserves.

The report recommends that annuities be based on an average of the three years of highest pay before the member enters the retired Reserve, and then be CPI-adjusted until time of payment. As now, annuities would be CPI-adjusted so long as they are paid.

At present, Reserve annuities are payable no earlier than age sixty. The report urges that they begin at age fifty for those with at least twenty-five years' creditable service. Furthermore, annuities would be computed at a higher percentage for Reservists with more than twenty-five years of service.

Other Reserve provisions include: lump-sum terminal pay for Reservists with ten good years, but not enough service for the present twenty-year retirement; and options of an actuarially reduced annuity as early as age fifty, or a lump-sum settlement at any time before retirement pay begins. No integration of retirement and Social Security benefits was recommended for Reservists.

The committee recommended that some of the changes be achieved by transition. Reduction in annuities during the "second career" years would be spaced over ten pay raises, a little of the reduction effective with each. The integration of Social Security and retirement benefits would be effective only for government contributions paid after implementing legislation. The "high three" base for retired pay would not involve any time period prior to implementing legislation. A retiree would be guaranteed that his benefits will be no less than those of any similar member (same grade and length of service) who retired before him.

The report recommends the one-time recomputation of retired pay reported in the November issue of AIR FORCE (p. 15).

AFA is awaiting with interest the legislation DoD develops after review of the Interagency Committee report. AFA's many advisory councils are scheduled for briefings on the committee's recommendation.

Insignia Miniatures

The Air Force has announced a test-wear program for miniature plastic and metal enlisted grade insignia on raincoats, lightweight blue jackets,

)pcoats, utility shirts, and organiza- onal white uniforms. Such insignia ere recommended in a resolution by ie AFA Airman Advisory Council 1 1968.

Briefs

• A year-long food service price st is planned for airmen on separate tions at Shaw AFB, S. C. The pro- ram will determine the feasibility of elling food items in the dining halls on an item-for-item basis, rather than as a complete meal.

• Members of the USAFR Medical Service Flight at L. G. Hanscom Field, Mass., recently volunteered to assist Public Health Service personnel in administering measles vaccine to some 10,000 disadvantaged youngsters in the Lowell, Mass., area.

• The nation's first eighteen-year-old draft board member is Michael A. Simmons of Marysville, Pa.

• A Civil Air Patrol ground search team has been credited with saving the only survivor of the crash of a Beech Bonanza near Garden City, Kan., on November 25.

• A program to double black strength in the National Guard is under way. The plan calls for all states except Hawaii to recruit 5,000 more Army Guardsmen and 908 more Air Guardsmen than their June 30, 1971, strength. Also, 394 black "full-timers" are being sought for the Army Guard and 276 for the Air Guard.

• Maj. Gen. Rollin B. Moore, Jr., Commander, Air Force Reserve, ended a four-year active-duty tour January 26, and reverted to Ready Reserve status as Commander, Western Air Force Reserve Region, Hamilton AFB, Calif. General Moore was the first to command the Air Force Reserve, established August 1, 1968, to replace Continental Air Command, which had previously administered the Air Force Reserve program. Brig. Gen. Alfred Verhulst, Vice Commander of AFRes, will serve as acting commander until General Moore's successor is named.

• There are 28.3 million veterans of military service in the United States, of whom two million are under twenty-five years of age, according to figures released by the Veterans Administration. Total male population in the United States is 98.9 million.

• Only female instructor at the Air Force Academy is Maj. Vivienne Sinclair, one of nine Spanish teachers in the Department of Foreign Languages.

• Some 125,000 officer selection folders are now being transferred to microfilm at the USAF Military Personnel Center. The second phase of the project will convert the remaining officer record documents to microfilm, and conversion of master airman personnel records will begin in 1973. Meanwhile, the Air Reserve Personnel Center in Denver has completed the transfer of 11,000 Air National Guard officer selection folders to microfilm, and expects to have all Air Force Reserve master personnel records on microfilm in about two years.

Senior Staff Changes

B/G Charles I. Bennett, Jr., from Cmdr., 93d Bomb Wg., SAC, Castle AFB, Calif., to V/C, 8th AF, SAC, Andersen AB, Guam, replacing M/G Leo C. Lewis . . . **M/G Ernest T. Cragg,** from Dir., Aerospace Programs, to Asst. DCS/Programs & Resources, Hq. USAF, replacing retiring M/G Sherman F. Martin . . . **Dr. Wendell A. Dwyer,** from Chief, Operations Analysis, to Special Asst. for Operations Analysis, Hq. MAC, Scott AFB, Ill. . . . **M/G James A. Hill,** from Dep. Dir., to Dir., Aerospace Programs, DCS/Programs & Resources, Hq. USAF, replacing M/G Ernest T. Cragg . . . **B/G (M/G Selectee) James D. Hughes,** from Military Asst. to the President, Washington, D. C., to V/C, 12th AF, TAC, Bergstrom AFB, Tex. . . . **M/G George M. Johnson,** Jr., from Cmdr., Oklahoma City AMA, AFLC, Tinker AFB, Okla., to DCS/P&O, Hq. AFLC, Wright-Patterson AFB, Ohio . . . **Mr. Dennis C. Jones,** from Contract Specialist, GS-15, to Chairman, Procurement Committee, GS-16, DCS/Procurement and Production, Hq. AFSC, Andrews AFB, Md.

M/G Leo C. Lewis, from V/C, 8th AF, SAC, Andersen AB, Guam, to V/C, 15th AF, SAC, March AFB, Calif., replacing M/G Richard D. Reinbold . . . **M/G Richard D. Reinbold,** from V/C, 15th AF, SAC, March AFB, Calif., to Cmdr., Oklahoma City AMA, AFLC, Tinker AFB, Okla., replacing M/G George M. Johnson, Jr. . . . **Mr. Donald E. Rellins,** from Procurement Analyst, GS-15, Directorate of Procurement Policy, Office, Asst. Secretary of Defense (Installations and Logistics), Washington, D. C., to Dep. for Small Business, GS-16, Directorate of Procurement Policy, DCS/Systems and Logistics, Hq. USAF . . . **Col. (B/G Selectee) Brent Scowcroft,** from Special Asst. for Joint Matters, Jt. Staff, OJCS, to Military Asst. to the President, Washington, D. C., replacing B/G (M/G Selectee) James D. Hughes . . . **B/G Harold A. Strack,** from Cmdr., 90th Strategic Missile Wg., SAC, F. E. Warren AFB, Wyo., to Chief, Studies, Analysis & Gaming Agency, Office, JCS . . . **Mr. Heinrich J. Weigand,** from Scientific Adviser, Directorate of Development, to Scientific Adviser, Directorate of Space, DCS/R&D, Hq. USAF . . . **Mr. Arthur Weimer,** from Chief Scientist, to Scientific Adviser, Director of Laboratories, Hq. AFSC, Andrews AFB, Md.

RETIREMENTS: B/G Victor N. **Cabas;** M/G Earl L. **Johnson.** ■

The WAF pinstripe uniform (left) will soon be a thing of the past. The Air Force is phasing it out, and, eventually, the overblouse and skirt combination (right) will be the required warm-weather uniform.

AFA's Committees and Councils

An invaluable adjunct to the Air Force Association President are the AFA Committees and Advisory Councils, whose members for the current year are shown on these and the following pages. These hard-working men and women make up part of what could be thought of as AFA's "All-Volunteer Force." Except as noted, the chairmen and members are appointed annually by the AFA President, who serves as an ex-officio member of all the Committees and Advisory Councils . . .

Executive Committee

Composed of the President (who also acts as Chairman), Secretary, Treasurer, and five additional members of the National Board of Directors, the Committee acts on behalf of the Board of Directors between meetings of the Board. The Executive Committee also functions as the Resolutions Committee. Members are Martin M. Ostrow, Beverly Hills, Calif., Chairman; Will H. Bergstrom, Colusa, Calif.; Jack B. Gross, Harrisburg, Pa.; George D. Hardy, Hyattsville, Md.; Martin H. Harris, Winter Park, Fla.; Nathan H. Mazer, Ogden, Utah; Joe L. Shosid, Fort Worth, Tex.; and Jack Withers, Dayton, Ohio.


Ostrow


Bergstrom


Gross


Hardy


Harris


Mazer


Shosid


Withers

Finance Committee

Composed of the Treasurer and seven other members as appointed by the President, the Committee is responsible for recommending fiscal policy to the AFA President. Members are Jack B. Gross, Harrisburg, Pa., Chairman; George M. Douglas, Denver, Colo.; Gerald V. Hasler, Johnson City, N. Y.; Sam E. Keith, Jr., Fort Worth, Tex.; Maxwell A. Kriendler, New York, N. Y.; Jess Larson, Washington, D. C.; Earle N. Parker, Fort Worth, Tex.; and Robert W. Smart, Washington, D. C.


Gross


Douglas


Hasler


Keith


Kriendler


Larson


Parker


Smart

Membership Committee

One of the oldest standing committees of AFA, its function is to promote membership in the Association and to advise the National President on ways and means to increase and maintain Association membership at the highest possible level. Members include Paul W. Gaillard, Omaha, Neb., Chairman; William Berkeley, Redlands, Calif.; Dr. Dan Callahan, Warner Robins, Ga.; Arthur O. de la Garza, San Antonio, Tex.; and George M. Douglas, Denver, Colo.


Gaillard


Berkeley


Callahan


de la Garza


Douglas

Constitution Committee

Responsible for a continuing review and updating of the Association's Constitution and By-Laws, and for recommending to the President necessary amendments to the Constitution and/or By-Laws. Members are Hugh W. Stewart, Tucson, Ariz., Chairman; John G. Brosky, Pittsburgh, Pa.; and Howard T. Markey, Chicago, Ill.


Stewart


Brosky


Markey

Convention Site Committee

Responsible for recommending to the President a listing of those cities suitable for a National Convention. Members are Martin M. Ostrow, Beverly Hills, Calif., Chairman; George D. Hardy, Hyattsville, Md.; and Jack B. Gross, Harrisburg, Pa.


Ostrow


Hardy


Gross

AFROTC Committee

A newly formed committee that recommends to the Association President policies and procedures in support of all elements of Air Force ROTC, including the senior programs at colleges and universities and the Junior ROTC program at the nation's high schools. Members are Robert S. Lawson, Los Angeles, Calif., Chairman; Col. Phillips J. Copeland, Los Angeles, Calif.; Melvin H. Gerhold, Groveport, Ohio; John H. Haire, Huntsville, Ala.; and William H. Kelly, Savannah, Ga.


Lawson


Copeland


Gerhold


Haire


Kelly

Civil Air Patrol Committee

A newly formed committee that recommends to the Association President policies and procedures in support of all elements of the Civil Air Patrol, especially the CAP Cadet Program. Members are Kenneth A. Rowe, Richmond, Va., Chairman; Noel A. Bullock, Aurora, Colo.; Charles E. Miller, Jr., Savannah, Ga.; Dick Palen, Edina, Minn.; and Dr. Robert H. Saber, Orlando, Fla.


Rowe


Bullock


Miller


Palen


Saber

Organizational Advisory Council

This year, the Council is composed of the Vice Presidents for AFA's twelve regions. In its deliberations, the Council considers matters pertaining to State and Chapter programming, membership solicitation, reporting procedures for field units, and the like. Members are Chuck W. Burnette, Anchorage, Alaska, Chairman; Joseph E. Assaf, Hyde Park, Mass.; John G. Brosky, Pittsburgh, Pa.; B. L. Cockrell, San Antonio, Tex.; William D. Flaskamp, Minneapolis, Minn.; Alexander E. Harris, Little Rock, Ark.; William H. Kelly, Savannah, Ga.; Robert S. Lawson, Los Angeles, Calif.; Stanley Mayper, Omaha, Neb.; Bernard D. Osborne, Dayton, Ohio; Jack C. Price, Clearfield, Utah; and A. A. West, Newport News, Va.


Burnette


Assaf


Brosky


Cockrell


Flaskamp


Harris


Kelly


Lawson


Mayper


Osborne


Price


West

Government Advisory Council

A Council established this year to advise the Association President on policies and procedures affecting AFA relations with all elements of the Federal Government. Members are Winston P. Wilson, Arlington, Va., Chairman; Harry Charles, Washington, D. C.; Robert E. L. Eaton, Washington, D. C.; Jess Larson, Washington, D. C.; and Robert W. Smart, Washington, D. C.


Wilson


Charles


Eaton


Larson


Smart

Airmen Council

Created as a standing committee in 1961 by convention resolution, the Airmen Council advises the Association President on all matters pertaining to the interests and well-being of Air Force enlisted personnel, both active duty and in the Reserve components. Two members of this year's Council are former Outstanding Airmen of the USAF. Members are CMSgt. Freddie J. Walton, Hamilton AFB, Calif., Chairman; CMSgt. Paul J. D. Barton, Nellis AFB, Nev.; CMSgt. Jimmie Collins, Vandenberg AFB, Calif.; MSgt. Lyle W. Ganz, USAFR, Wauwatosa, Wis.; CMSgt. William M. Goyer, Fairfax, Va.; CMSgt. Richard E. Vincent, Alcoa, Tenn.; and MSgt. Elmer F. Williams, Lajes Field, Azores. Consultant to the Council is Chief Master Sergeant of the Air Force Richard D. Kisling, Washington, D. C.


Walton


Barton


Collins


Ganz


Goyer


Vincent


Williams


Kisling

Junior Officer Advisory Council

The JOAC was formed in 1967 to help convey AFA's interest in officer career motivation and retention, and to stimulate interest among young officers in AFA activities at both the national and local levels. It advises the AFA President on matters pertaining to active-duty junior officers. Membership is rotated among the major air commands. This year's membership includes Capt. Douglas A. Patterson, Scott AFB, Ill., Chairman; Capt. David R. Casey, Langley AFB, Va.; Capt. Richard L. Farkas, McConnell AFB, Kan.; Capt. Gil L. Gillespie, Randolph AFB, Tex.; Capt. Ronald T. Haywood, Scott AFB, Ill.; Capt. John H. Pronsky, Washington, D. C.; and Capt. Albert C. Rock, III, Ent AFB, Colo. Consultant to the Council is Maj. Gen. John W. Roberts, Washington, D. C.


Patterson


Casey


Farkas


Gillespie


Haywood


Pronsky


Rock


Roberts

itary Manpower Council

y the Retired Council, the name was changed in 1968 he group's scope of interest was broadened to encompass segments of the military population, such as veterans, erm enlistees, and draftees. The Council still devotes much time to such retiree matters as recomputation of pay, compensation, job opportunities, and survivors' benefits. the only AFA Council to have representation from the other es. Members are Gen. Jacob E. Smart, USAF (Ret.), Washn, D. C., Chairman; Maj. Robert E. Frank, USAF, Columbus, ; Maj. Gen. James F. Hackler, USAF (Ret.), Myrtle Beach, C.; Maj. David L. Hosley, USAF, Washington, D. C.; Lt. . Sam Maddux, Jr., USAF (Ret.), San Antonio, Tex.; Col. liam C. Robinson, USAF (Ret.), Alexandria, Va.; and Maj. omas F. Seebode, USAF, San Antonio, Tex. Consultants are n. Charles L. Bolté, USA (Ret.), Alexandria, Va., and Capt. ederic A. Wyatt, USNR, North Hollywood, Calif.


Smart


Frank


Hackler


Hosley


Maddux


Robinson


Seebode


Bolté


Wyatt

Medical Advisory Council

dvises the AFA President in areas affecting Air Force medical ersonnel, both in the active establishment and the Reserve orces, and military medical programs for the benefit of all r Force personnel. This year's Council includes active Reservists, uardsmen, and a retiree from the Regular Air Force. The embers are David Waxman, M. D., Kansas City, Mo., Chairman; an Callahan, M. D., Warner Robins, Ga.; Bruce J. Morrow, . D. S., Macomb, Ill.; Dalton S. Oliver, M. D., Baton Rouge, La.; awrence V. Phillips, M. D., Temple Hills, Md.; Ralph A. Skowron, . D., Cherry Hill, N. J.; James L. Tucker, M. D., Abilene, Tex.; nd Barnett Zumoff, M. D., Brooklyn, N. Y. Consultant to the ouncil is M. I. Marks, M. D., El Paso, Tex.


Waxman


Callahan


Morrow


Oliver


Phillips


Skowron


Tucker


Zumoff


Marks

ecommends to the AFA President policies in support of the Air Force serve. One of AFA's oldest advisory groups, it is concerned with proams and legislation affecting both units and individual Reservists. is year, the Council is composed of representatives from both the it and individual training elements of the program. Members are Brig. en. Campbell Y. Jackson, McGuire AFB, N. J., Chairman; Capt. Douglas Bennett, Washington, D. C.; Maj. Gen. J. Clarence Davies, Jr., New rk, N. Y.; Hon. Orval Hansen, Washington, D. C.; Col. Harry J. Huff, II, arch AFB, Calif.; Maj. Gen. William C. Lewis, Jr., Washington, D. C.; l. Charles Michael, Travis AFB, Calif.; and Col. Joseph Ryan, Washgton, D. C. Consultants are Col. Benjamin S. Catlin, III, Denver, Colo.; aj. Gen. Robert E. L. Eaton, USAF (Ret.), Washington, D. C.; and Col. lton E. Mitler, Washington, D. C.

Air Reserve Council


Jackson


Bennett


Davies


Hansen


Huff


Lewis


Michael


Ryan


Catlin


Eaton


Mitler

Air National Guard Council

Recommends to the AFA President policies and appropriate methods by which the Association can demonstrate its support of the Air National Guard in the most effective manner. Council members are chosen to represent all elements of the Air National Guard. Members include Maj. Gen. George W. Edmonds, Sacramento, Calif., Chairman; Brig. Gen. James Carter, Nashville, Tenn.; Col. Ralph Cowgill, Charleston, W. Va.; Capt. R. Clark Higgins, Andrews AFB, Md.; Col. Curtis J. Irwin, Syracuse, N. Y.; Col. Alexander P. Macdonald, Fargo, N. D.; Lt. Col. Edmund C. Morrisey, Jr., Alcoa, Tenn.; and Maj. Gilbert E. Petrina, Harrisburg, Pa. Consultants are Col. Raymond C. Higgins, USAF (Ret.), Washington, D. C.; Brig. Gen. W. W. Millikan, Andrews AFB, Md.; and Maj. Gen. Benjamin J. Webster, Fort Ruger, Hawaii.


Edmonds


Carter


Cowgill


Higgins


Irwin


Macdonald


Morrisey


Petrina


Higgins


Millikan


Webster

Civilian Personnel Council

Advises the President on matters pertaining to the effective utilization of Civil Service employees of the Air Force, and seeks to promote greater understanding between civilian employees and uniformed members of the Air Force at all levels. Members include Robert L. Hunter, Springfield, Ohio, Chairman; George F. Brennan, Washington, D. C.; Arthur O. de la Garza, Kelly AFB, Tex.; John A. Lang, Jr., Greenville, N. C.; Nolan W. Manfull, Salt Lake City, Utah; William A. Owen, Randolph AFB, Tex.; Robert M. Watson, Wright-Patterson AFB, Ohio; and John A. Watts, Washington, D. C. Consultants are Robert T. McLean, Washington, D. C.; James B. Minor, Kensington, Md.; and John E. Zipp, Denver, Colo.


Hunter


Brennan


de la Garza


Lang


Manfull


Owen


Watson


Watts


McLean


Minor


Zipp

Arnold Air Society Alumni Council

One of AFA's newest advisory bodies, the Council replaced the AAS Alumni Division in 1969. It recommends to the AFA President ways and means by which the Association can increase its support of the Arnold Air Society and AFROTC in general. Members are 2d Lt. Charles P. Azukas, Wright-Patterson AFB, Ohio, Chairman; 2d Lt. Susan Coats, Chanute AFB, Ill.; 2d Lt. Rick Knapp, Pease AFB, N. H.; Capt. Fredric Lynch, Washington, D. C.; 2d Lt. J. Parker Owens, Maxwell AFB, Ala.; Denis A. Sujdak, Des Plaines, Ill.; and Lt. Richard H. Wainscott, Grissom AFB, Ind. Consultant to the Council is AAS Brig. Gen. Norman R. Flemens, Austin, Tex.


Azukas


Coats


Knapp


Lynch


Owens


Sujdak


Wainscott


Flemens

'PROMOTIONS'

(CONTINUED FROM PAGE 57)

on, and source of the commission;

- In the case of permanent promotions, a letter from the individual officer if there is something special he wants to say to the board;
- For Reservists not on active duty, the folder also contains a Form 190 (USAF Reserve Personnel Record card for Retention, Promotion, and Retirement), and Form 712 (retirement credit summary), but no computer printout or photo.

What Counts?

What in all this makes the difference as to whether or not an officer gets chosen? There isn't any formula like the Weighted Airman Promotion System (WAPS), which tells enlisted people how many points toward promotion they get for such factors as performance ratings and test scores.

Officer promotion boards operate on a "whole-man" concept, which essentially means that the members weigh all the information they have about an individual and decide, on balance, what they think of him. It is important to note that officers are not evaluated on the basis of past performances alone—but on *demonstrated potential* as well.

On the face of it, there are a number of ways to make distinctions in quality among officers by looking at their selection folders.

The most obvious of these is the Officer Effectiveness Report (OER). Admittedly, inflation has driven the typical OER rating up, and the markings tend to cluster toward the "outstanding" side of the form, but there are still noticeable variations.

Do boards really read effectiveness reports, or do they just look at where the Xs fall on the rating form? Promotion board veterans say members at least scan OERs, and some analyses of board actions indicate that the written part of the report has, at times, decisively influenced the result.

Other ready areas for comparison are education, the level of responsibility the officer has shown he can handle, versatility, and combat achievements.

Pilots do enjoy a better selection rate, but the difference is less than is sometimes thought. Analysis of how first-time eligibles fared in temporary major promotions, FY 1969–71, reveals that percentages for pilots, navigators, and support (nonrated) officers were close. Pilots were well ahead in making lieutenant colonel but, beyond that, the gap again narrowed. The results of the colonels boards show support officers trailing pilots by only one percent, with navigators eight percent behind the pilots. The trend varies from board to board. In FY 1969, for example, support officers did three percent better than pilots in full colonel selections.

The prime task is to select the best candidates for the next higher grade, but the boards also look at a man in terms of potential beyond that. This is especially true in below-the-zone considerations. The generals and colonels are sizing up an officer as an eventual replacement for themselves. You can't hire a four-star general from the want ads. So a superspecialist who might make the best lieutenant colonel action officer in the business may not look so promising in a pool from which, say, future air division commanders must come.

There's no formula, no set weight for any factor. Board members consider the sum of the information, and then decide which of the contenders seem most capable of meeting the Air Force's manpower needs.

If You Don't Make It

What happens if you don't make it? If you're a Regular, nothing. There's no force-out for temporary nonselection, and every year there are a few Regulars who missed temporary grades but who make it on the permanent board and change insignia then.

For a Reservist, two passovers to either temporary captain or major are grounds for involuntary release. But, if he makes the temporary grade, he can apply for his permanent Reserve promotion, and is assured of getting it. If, however, he should reach the mandatory phase point for ROPA promotion before he is selected for the corresponding temporary grade (for example, because he has more time in the Reserve than on active duty), then he must compete for his permanent grade.

Not so for the Regular, who always competes for permanent grades. The size of the permanent Regular quota builds in some nonselection. Two passovers for permanent captain, major, or lieutenant colonel and the Regular is discharged or retired.

There is no force-out for passovers to the temporary grade of lieutenant colonel or to either temporary or permanent colonel.

Promotees do not start counting against grade authorizations until they pin their new rank on, so the promotions will become effective in increments spaced out to fill vacancies. The selection list is arranged by seniority, those with the earliest previous dates of rank assuming their new grades first.

No other part of the promotion system, however, approaches the toughness and intensity of competition for general-officer rank.

Each year, major commands and other agencies, including Headquarters USAF, screen all their eligible colonels and nominate the best—about 750 of them—to a central board, which chooses 300 to vie for sixty to seventy temporary brigadier general promotions.

The other three general-officer selection actions—permanent brigadier, temporary and permanent major general—are done by central boards at USAF level.

Most of the general officers today are pilots—376 of them. All fourteen of the four stars are pilots. Nine generals are navigators, fifteen are flight surgeons, and twenty-nine have no aeronautical rating.

But the junior support officer with his eye on the stars may be encouraged to know that three of the Air Force's lieutenant generals are nonrated: Lt. Gen. Duward L. Crow, Comptroller of the Air Force; Lt. Gen. Gordon T. Gould, Jr., Director of the Defense Communications Agency; and Lt. Gen. Glenn A. Kent, Director, Weapons System Evaluation Group, Office of the Director of Defense Research and Engineering. ■

AFA News

By Don Steele

AFA AFFAIRS EDITOR

The **Alabama AFA's** 1971 state convention was held in Birmingham's Parliament House Motor Hotel, October 8–9. The most enjoyable program included a golf tournament, a bus tour of the city for the ladies, two receptions, an awards banquet followed by dancing, a luncheon and fashion show for both men and women, a business session, and the annual convention banquet followed by dancing.

The principal speaker at the banquet was **Dr. Max Rafferty**, Dean of the School of Education at Troy State University. In his address, Dr. Rafferty said, "It seems to me that the first duty of the nation's schools is to preserve that nation. After all, if the nation goes under, so do the schools.

"I say," he continued, "that we had better make certain as need be that Uncle Sam stays around a while longer. And I'm sure that this will involve bringing home to our children in a very real and vital way the truths embodied in our American heritage. Whatever we may have to do to achieve love of country in the hearts and minds of the generation now growing up around us, we had better do, and not fool around about it."

At the awards banquet, **Cecil Brendle**, Secretary of the Alabama AFA, was named the State AFA's **"Man of the Year for 1971." "Chapter of the Year"** honors went to the **Tennessee Valley Chapter** of Huntsville. During the program, prizes were given to the following winners in the golf tournament: **Jack Hall**, longest drive; **Brig. Gen. C. O. "Buck" Williams**, USAF (Ret.), low gross; **Harry Moore**, low net; closest to the hole, **Max Gilmer**; and high gross, **Don Diehl.**

In conjunction with Alabama's recent convention in Birmingham, Gov. George Wallace signs a proclamation commemorating the twenty-fifth anniversary of AFA. Attending, from the left, are Robert Hudgens, Montgomery Chapter President; William Brown, State Committeeman; Governor Wallace; Alabama AFA President John Haire; and Birmingham Chapter Secretary J. L. Shannon.

At the business session, delegates reelected incumbent State President **John H. Haire** to serve another year. Other officers elected are: **Cecil G. Brendle** and **C. W. Himes**, Vice Presidents; **Mrs. J. McWhorter**, Secretary; and **J. E. Hall**, Treasurer.

To Alabama AFA President Jack Haire, to Dr. Max Gilmer, President of the Birmingham Chapter and chairman of the convention, and to all the committee chairmen and members, we offer our congratulations o a most enjoyable convention.

Brig. Gen. Daniel "Chappie" James, Jr., Deputy Assistant Secretary of Defense (Public Affairs), was the guest of honor and speaker at the **Michigan AFA's** convention banquet on November 6.

At the convention's business session, delegates elected **Stuart Greer** to succeed **Richard W. Hoerle** as State President for 1972. Other officers elected for the coming year are: **Richard V. Mossoney,** Vice President; **Virginia VanHamm,** Secretary; and **Mary Gill Rice,** Treasurer.

Meeting at the Ramada Inn, Waukesha, Wis., delegates to the **Wisconsin AFA's** 1971 convention elected **Gene M. Grobschmidt** to serve as President of the state organization for 1972, succeeding **Lyle W. Ganz**, who was elected chairman of the State AFA's **executive council.** Others elected to serve in 1972 are: **Ronald Keck,** Vice President; **Kathryn Arthur,** Secretary; and **Cecelia Stanton,** Treasurer.

The convention banquet featured an address by **Brig. Gen. Howard T. Markey**, USAF Reserve, a former AFA National President and now a permanent member of AFA's Board of Directors.

During the program, awards were presented to **Mr. Agner A. Andersen**, head of the Industrial Arts Department, Bay View High School; and **Mr. Marlyn Tibbetts**, Instructor, Industrial Arts Department, Bay View High School. They were honored for "outstanding dedication to instruction of aeronautical education by construction of two aircraft by the students of the Bay View High School industrial arts classes." The awards were presented by Mr. Ganz.

The State AFA's newly elected officers were installed by **Bernard D. Osborne,** Vice President for AFA's Great Lakes Region.

The **Arizona AFA's** first state convention was held in Scottsdale on November 13. A variety of daytime activities were centered at the Scottsdale Rodeway Inn, and the convention

nquet was held at Mountain adows Resort.

The program, cosponsored by the rizona AFA and **Williams** and **Luke ir Force Bases**, featured a presentaon by **Dr. Harrison Schmitt**, Apollo-7 scientist-astronaut. Dr. Schmitt resented an outstanding program on he objectives of Apollo-16 and -17, nd the entire space program, and an xcellent film showing the achievements of Apollo-15.

During the dinner program, attended by more than 200 persons, including representatives of all military services in the Valley of the Sun, **Nick Volcheff,** a Past President of **AFA's Phoenix Chapter** and chairman of the military affairs committee of the **Phoenix Chamber of Commerce**, presented a Certificate of Appreciation to **Brig. Gen. Richard Cross**, Commander, 26th Air Division, a strong and enthusiastic AFA supporter.

At the business session, delegates elected **William P. Chandler** of Tucson to succeed **William F. Barns** as State President for 1972. Others elected to state office are: **N. J. Volcheff**, Vice President, and **Clarence M. Black**, Secretary/Treasurer.

In conjunction with the **Strategic Air Command's Bombing and Navigation Competition** *(see story on p. 58)* recently held at **McCoy AFB, Fla., AFA's Central Florida Chapter** of Orlando operated an AFA booth in the hangar housing the SAC Unit Display Rooms and Industrial Exhibits. The Chapter's booth was colorfully and strikingly decorated with pictures of Air Force aircraft, past and present, and murals of Orlando's points of interest, including Disney World. **Mr. and Mrs. B. A. Palmer** were in charge of the booth, and they and other Chapter members dispensed orange juice to visitors, distributed copies of AIR FORCE Magazine and AFA membership applications, and explained the mission and objectives of AFA to interested visitors. From all reports, a number of new AFA members were recruited as a result of this effort.

For many years, **AFA's San Diego Chapter** has had to exert extra effort at "identification" because of its location in a traditionally "Navy town." Early in 1971, after a team from the **751st Air Defense Group**, which is based at San Diego County's **Mt. Laguna Air Force Station**, won top recognition in the **1971 William Tell Weapons Meet** at Tyndall AFB, Fla., leaders of the San Diego Chapter decided the Group deserved more attention than it had been receiving from the local community.

The first step was a meeting with **Capt. Alan B. Trego** from the Mt. Laguna AFS. He briefed members on the need for support in three principal areas: housing, employment of newly retired personnel, and community acceptance and involvement.

Next, the Chapter held its membership meeting at the Station. The program included a tour of the Station and a discussion with representatives of the Group concerning future activities.

At the October meeting of the Chapter's Council, President **Bill Parker** presented a perpetual trophy to **Capt. Ronald R. Mucha,** Maintenance Officer of the 751st, who accepted on behalf of the Group's "Noncommissioned Officer of the Year," **TSgt. Carl E. Jones**, and "Airman of the Year," **A1C Wayne Bertrand.**

A dinner is planned to honor the "Airmen of the Year" and their wives. Individual trophies will be presented.

Col. Arby J. Thompson, the Group's new commander, has ex-

Maj. Gen. D. T. Nelson, center, SPD of USAF's B-1 program, admires Texas Command Pilot Spurs presented to him by Dallas Chapter President Vic Kregel, right, following his B-1 briefing at December's Chapter meeting. Chuck Wilcox, Texas Section, Society of Experimental Test Pilots, looks on.

Dr. Harrison Schmitt, second from right, Apollo-17 scientist astronaut and speaker at Arizona AFA's convention, with, from left, R. S. Lawson, Vice President for AFA's Far West Region; Arizona AFA President W. F. Barns; Tucson Chapter President W. P. Chandler; and Col. Ralph Maglione, Commander, 3525th Pilot Training Wing, Williams AFB.

Capt. Ronald R. Mucha, left, Maintenance Officer for 751st Air Defense Group, Mt. Laguna AFS, Calif., accepts perpetual trophy from San Diego Chapter President William Parker for Group's "Noncom of the Year" TSgt. Carl E. Jones and "Airman of the Year" A1C Wayne Bertrand.

This Is AFA

The Air Force Association is an independent, nonprofit airpower organization with no personal, political, or commerc axes to grind; established January 26, 1946; incorporated February 4, 1946.

Membership

Active Members: US citizens who support the aims and objectives of the Air Force Association, and who are not on active duty with any branch of the United States armed forces—$10 per year.

Service Members (nonvoting, nonofficeholding): US citizens on extended active duty with any branch of the United States armed forces—$10 per year.

Cadet Members (nonvoting, nonofficeholding): US citizens enrolled as Air Force ROTC Cadets, Civil Air Patrol Cadets, Cadets of the United States Air Force Academy, or a USAF Officer Trainee—$5.00 per year.

Associate Members (nonvoting, nonofficeholding): Non-US citizens who support the aims and objectives of the Air Force Association whose application for members meets AFA constitutional requirements—$10 per year.

Objectives

• The Association provides an organization through which free men may unite fulfill the responsibilities imposed by the impact of aerospace technology on mo ern society; to support armed strength adequate to maintain the security and peac of the United States and the free world; to educate themselves and the public s large in the development of adequate aerospace power for the betterment of a mankind; and to help develop friendly relations among free nations, based o respect for the principle of freedom and equal rights to all mankind.

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FA News

ressed his approval of the program nd his appreciation to the San Diego Chapter.

We congratulate the officers and members of the Chapter and commend them on a most effective and worthwhile contribution to AFA's mission.

Early in December, **AFA's Concho Chapter** of **San Angelo, Tex.,** hosted a dinner for the newly formed Air Force ROTC Detachment at **Angelo State University.** More than 250 members and guests attended the dinner at the Goodfellow AFB Officers' Club, at which the cadets of the newly formed unit were honored guests.

During the program, Chapter President **Albert V. Bush** presented an **Arnold Air Society** charter to **Cadet Norman Schaule,** commander of the newly organized **Grissom, White, and Chaffee Squadron** of the Arnold Air Society.

There are forty-two cadets enrolled in the AFROTC program at the university, and twenty-three cadets in the newly chartered Arnold Air Society Squadron. AFA's Concho Chapter, the AFROTC Detachment, and the AAS's Grissom, White, and Chaffee Squadron look forward to the formation of an Angel Flight at the university.

We congratulate the Concho Chapter members on an outstanding program, and commend them on their support of the AFROTC and their contribution to AFA's mission.

Joe Higgins, the Dodge Safety Sheriff of TV fame and a Past President of AFA's Los Angeles Chapter, was the guest speaker at a dinner sponsored by **AFA's Tucson Chapter** on November 8 at the Davis-Monthan AFB Officers' Club.

During the program, **1st Lt. Thomas Mills, Jr.,** USAF, of the **803d Combat Support Group,** Security Police Squadron, presented Sheriff Higgins with an honorary membership in the Davis-Monthan unit.

The dinner served as the kickoff of the Chapter's membership campaign and featured installation of the Chapter's newly elected officers for 1972. They are: **Clarence M. Black**, President; **O. R. Davis, Lawrence A. Gammon,** and **Dr. G. P. Schnabel**, Vice Presidents; **Charles D. Yankauer**, Secretary; and **Charles T. Niblett,** Treasurer.

Maj. Gen. Roger K. Rhodarmer, Commander of the **Ninth Air Force** with headquarters at **Shaw AFB, S. C.,** was the guest speaker at the quarterly dinner meeting of the **Grand Strand Chapter**, held recently in the Officers' Open Mess at Myrtle Beach AFB, S. C.

In his address, General Rhodarmer told the more than 200 members and guests attending the dinner of plans for development of the USAF's **F-15,** a Mach 2-plus tactical fighter.

The dinner meeting, which included a social hour and dancing, was hosted by **Col. Thomas M. Knoles**, Commander of the **354th Tactical Fighter Wing** at Myrtle Beach AFB.

CROSS COUNTRY . . . At the **Columbus Chapter's Third Annual Air National Guard Awards Dinner,** recently held at the NCO Club at Lockbourne AFB, Ohio, awards were presented to the Outstanding Airman, Outstanding NCO, and Outstanding Junior Officer of the 121st TAC Fighter Wing, Ohio Air National Guard. They are: **Sgt.** (then Airman) **Jeffery Taylor, Sgt. Joe Wilson**, and **Lt. Michael Harold** . . . **Greater Pittsburgh Chapter** President **Edmund J. Gagliardi** was chairman of an Airmen's Dining-In recently held in the NCO Club at Greater Pittsburgh Airport. **Brig. Gen. Donald J. Campbell,** Deputy to the Chief of Air Force Reserve, was the guest speaker. A number of the trophies presented were donated by AFA leaders and units. The donors included National Director **Carl J. Long**, the **Pennsylvania AFA Western Region, Greater Pittsburgh Chapter President Gagliardi**, the **Joe Walker Chapter**, and the **Steel Valley Chapter.**

CONGRATULATIONS . . . to **Col.**

Concho Chapter President A. V. Bush, left, presents AAS charter to Cadet Norman Schaule of the newly formed Grissom, White, and Chaffee AFROTC Squadron at Angelo State University.

From the left, J. Raymond Bell, Chairman of the Iron Gate Chapter's fund-raising Air Force Salute for 1971 and again for 1972, with famed Washington, D. C., hostesses Perle Mesta, Anna Chennault, and Gwen Cafritz, and AFA National Treasurer Jack Gross, at Madame Chennault's reception, at which the proceeds of the 1971 Salute were presented to Air Force charities.

AFA News

Randolph E. Churchill, USAF (Ret.), Vice President of **AFA's Gold Coast Chapter** of Fort Lauderdale, Fla., on his marriage to the former **Mrs. Robert H. Fay** of Quincy, Mass., on December 28 . . . to AFA National Director **Carl J. Long** of Pittsburgh, Pa., who was recently elected president of the **Electric League of Western Pennsylvania** for 1972.

COMING EVENTS . . . Iron Gate Chapter's Ninth Annual Air Force Salute, New York City's Hilton Hotel, on March 24 . . . **California AFA convention**, Palo Alto, April 14–16 . . . **Massachusetts AFA convention,** Hanscom AFB, April 22 . . . **Flori AFA convention,** the Tides Hotel, Bath Club, Redington Beach, M 4–7 . . . **AFA's Dinner honoring Outstanding Squadron at the Force Academy,** the Broadmo Colorado Springs, Colo., June 3 . **New York AFA convention,** Plat burgh, June 24 . . . **AFA's Twent sixth National Convention and Aer space Development Briefings,** Shor ham and Sheraton-Park Hotels, Wash ington, D. C., September 17–21.

Grant L. Hansen, second from left, Asst. Air Force Secretary (R&D) and speaker at H. H. Arnold Chapter's Fall Dinner Meeting, with, from left, F. X. Battersby, Chapter Executive Council Chairman; Col. H. Davis, USAF; and Chapter President Walter Petersen. More than 200 aerospace industry personnel attended.

Ted Stell, President of AFA's Silver and Gold Chapter at the Air Force Accounting and Finance Center, Denver, Colo., presents a personalized stein to SSgt. Gerald Van Gorp, named the Center's "Outstanding Airman of the Year."

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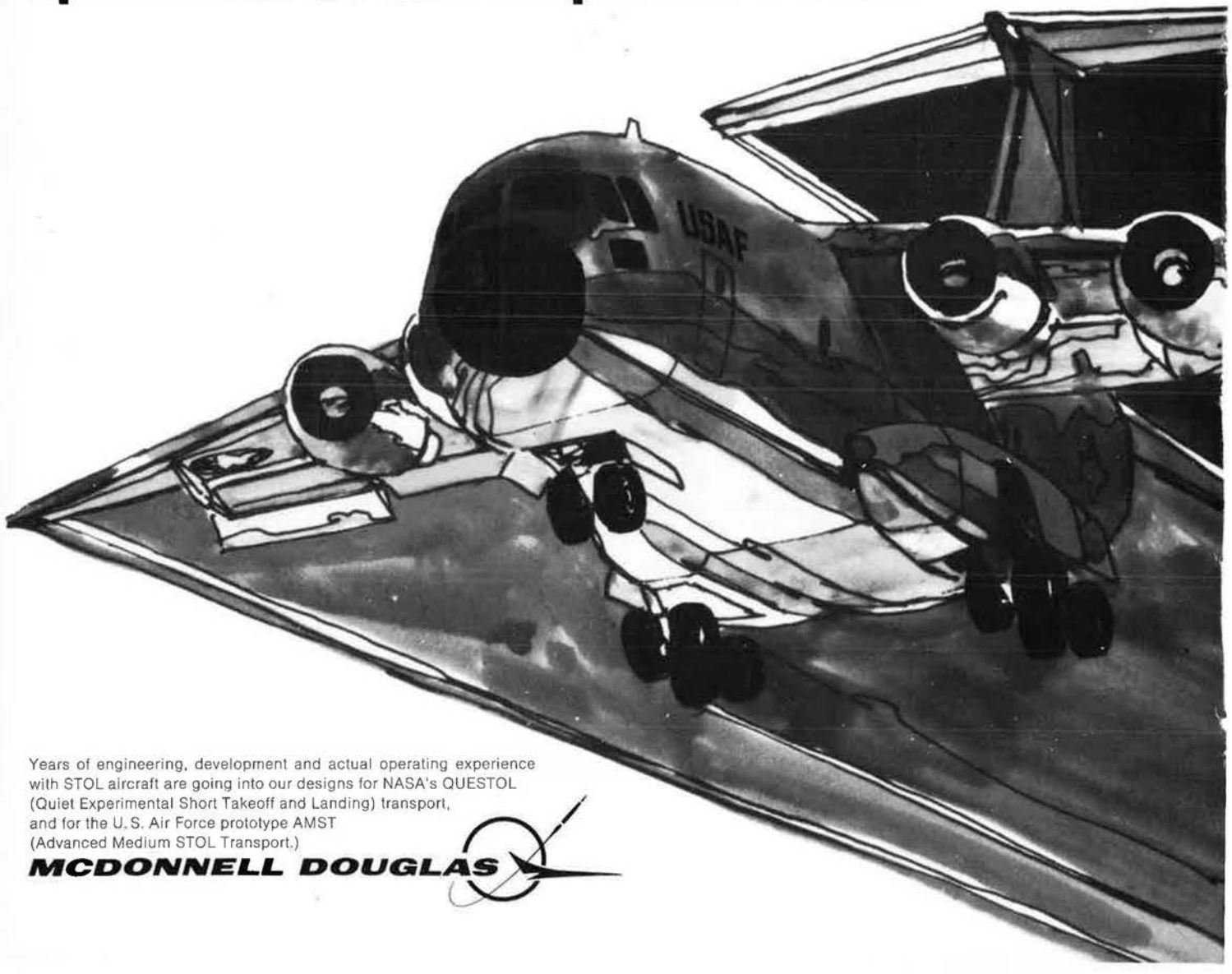

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