

APRIL 1976/\$1

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE



NERVES OF STEEL:
TAC'S AQM-34M
RECONNAISSANCE
RPV

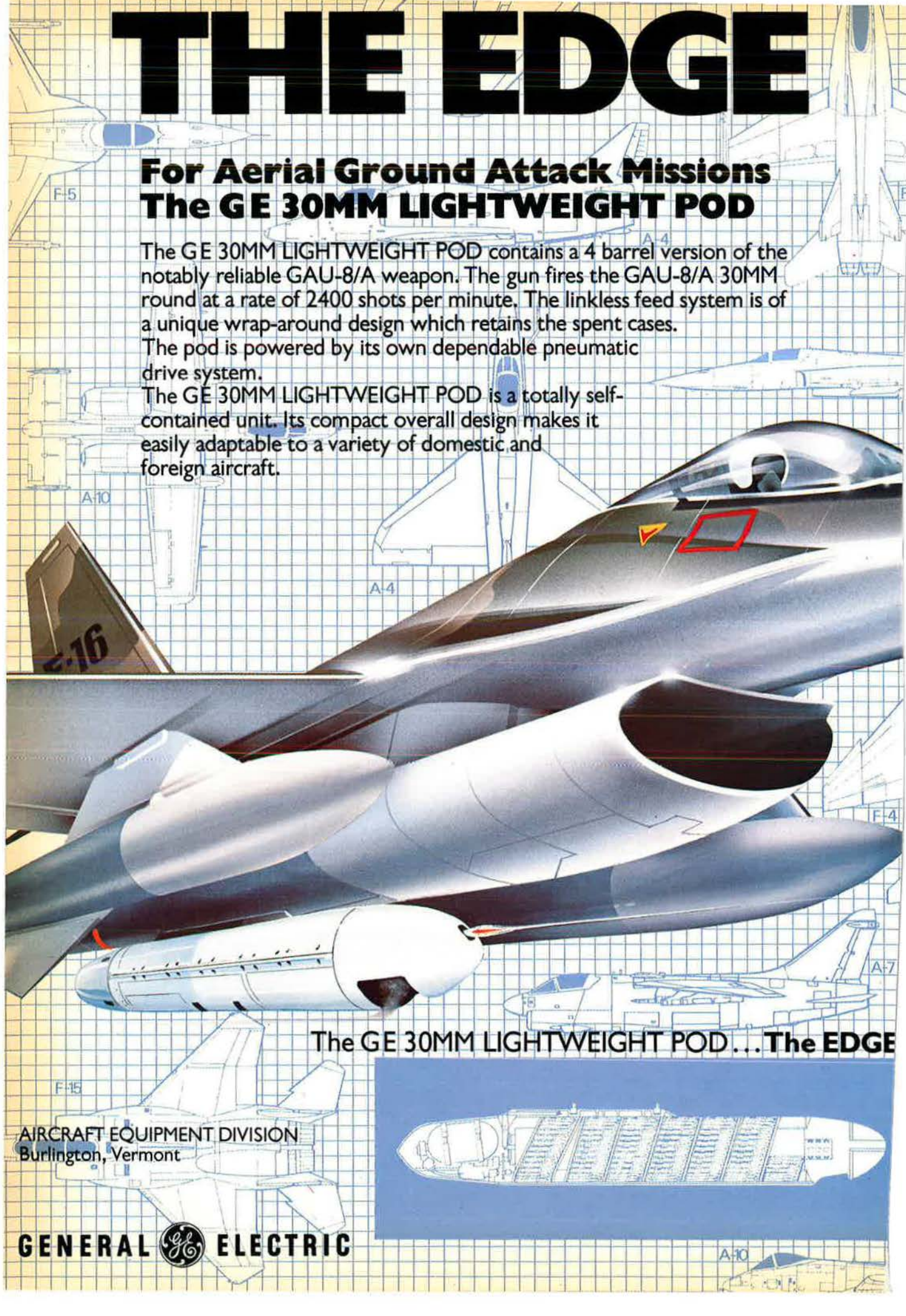
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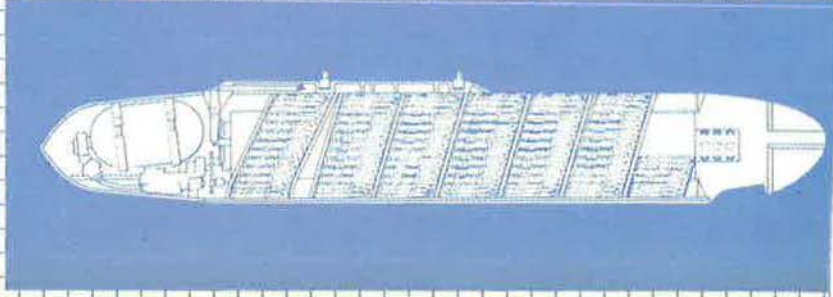
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The GE 30MM LIGHTWEIGHT POD... The **EDGE**

AIRCRAFT EQUIPMENT DIVISION
Burlington, Vermont

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AIR FORCE

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MAGAZINE

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Remotely Piloted Vehicles (RPVs), one of them shown in the cover photograph—a time exposure that created the green "ghosts" in the background—were used for the first time in Vietnam. They may prove to be a valuable member of the TAC team for reconnaissance and electronic warfare missions in high-threat areas. See "RPVs Are Fearless," beginning on p. 50.

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MX Advanced ICBM

The following policy paper was approved
by AFA's National Board of Directors at its meeting
in Las Vegas on March 4, 1978.

THE United States, the Air Force Association believes, stands at the crossroads of a decision that, for years to come, could affect our ability to deter nuclear war and to resist nuclear blackmail. At stake is the future of our land-based intercontinental ballistic missile (ICBM) force, keystone of this nation's strategic deterrent and thus of US politico-military effectiveness in general.

Modernization of the Soviet ICBM force proceeds at a rate that is awesome and far in excess of reasonable national security requirements. Every year, the Soviet Union installs between 100 and 150 modern new ICBMs. Each of the new missiles has from three to seven times the throw-weight and can deliver up to twenty times the megatonnage of the most advanced US ICBM, Minuteman III. The silos housing the new Soviet missiles are almost twice as hard as our most modern silos and thus more difficult to attack.

The three new ICBM types now entering the Soviet inventory—the fourth generation since Russia began building ICBMs—are being followed by yet another, even more advanced and threatening family of intercontinental missiles. At least four medium and large ICBM types as well as a thoroughly modified smaller missile system capable of mobile deployment are now in development and make up the Soviet Union's fifth ICBM generation. The US Defense Department warns—we believe with good cause—of potential Soviet "war-winning capabilities." This means the Soviets might conclude at some future time that they could destroy this country to a degree that would preclude recovery within a reasonable length of time while the Soviets could survive our retaliatory strikes with their military, industrial, and population base impaired but still intact.

In AFA's view, the relentless and—when measured against that nation's limited economic base—exorbitant Soviet drive to expand their ICBM capabilities is ominous: Within the coming decade, Soviet offensive

capabilities could reach a level where the US ICBM force, as presently constituted, might not be able to survive a Soviet first strike. Moreover, the rapidly increasing number of Soviet warheads and their steadily improving accuracy could support Moscow's belief that such an attack would tilt the balance of the two countries' remaining nuclear forces so far in the Soviet Union's favor that the United States would not dare to counterattack. Consequently, the Soviet strategic arsenal that remained after the strike—ICBMs kept in reserve as well as the full complement of submarine-based strategic missiles and strategic bombers—could be so overpowering that no rational US leader would retaliate. If he did, he could be certain that in the ensuing Soviet restrike most of the people of this country would be killed and the bulk of the facilities that make us a viable society destroyed.

If the capability to do that—perceived or real—were to come within the Soviet Union's grasp, the consequence would be intolerable instability. Such a preponderance of Soviet nuclear strength could invite attack or, at the least, promote an environment favorable to Soviet nonnuclear aggression and political coercion.

We realize that Minuteman force "survivability" of a certain kind can be obtained with the stroke of a pen by categorically committing the nation to a policy of "launch under attack," or even "launch on warning." Such policies would assert that the United States will launch its strategic missiles in a massive retaliatory strike against the Soviet Union, either upon detonation of the first enemy warheads or upon concluding that a major attack is under way. The Air Force Association believes firmly that the US should not provide a potential aggressor with the aid and comfort of foreswearing launch under attack. But neither must the nation degrade its force structure to the point where the force must be used or lost—where the only response would be an indiscriminate spasm launch against civilian targets. A future President thus could be forced into a "hair-trigger" choice that the aggressor might assume he would not make.

Lastly, such a curtailment of US strategic capability would snuff out all hope of confining nuclear war to military targets, should deterrence fail. The difference

between an attack on US strategic forces and one on US cities and industry could be ninety million American lives. It is our long-standing contention that any deterrent posture or doctrine that fails to dissuade Soviet attacks on the US civilian population is morally unacceptable as national policy.

Early in 1974, the Air Force started work on a weapon system to follow Minuteman—the "MX" advanced ICBM that would assure for decades to come the survivability of our land-based ballistic missile force, and provide the nation with the unique, vital deterrent capabilities that only such a force can furnish.

The advanced-technology MX would have four times the throw-weight and vastly greater radiation hardness than Minuteman III. With up to fourteen warheads—compared to three for Minuteman III—MX could be vastly more effective and survivable and thus could provide strategic stability even if only a limited number of weapons were deployed.

The MX ICBM's survivability—now undergoing rigorous examination and testing—stems largely from its basing mode. By combining mobility with a sharply increased number of "aimpoints" that an attacker must target—up to six times greater than for silo-based ICBMs—MX would be difficult to destroy.

The nation, in the view of the Air Force Association, stands to gain in three major ways from an operational MX force. With the advent of the survivably based MX, the already paid-for Minuteman force—far less costly to operate than either the fleet ballistic missile or the strategic bomber/cruise missile components of our strategic triad—would gain, in effect, the same degree of survivability as MX. Obviously, no national aggressor would attack Minuteman if he could not successfully attack MX.

Secondly, because the MX force would be survivable, such a weapon could make possible sharp reductions in the strategic arsenals of both the Soviet Union and the US, without endangering strategic stability and our national security.

Third, MX, with an accuracy equal to the improved Minuteman III, would retain for the US the option of

confining nuclear war to damage-limiting military targets, without automatic escalation to wholesale attack on the other side's civilian population. Such flexibility would greatly strengthen our deterrent across a spectrum of conflict.

Like all land-based ballistic missile systems, MX would force a potential aggressor to attack targets deep in US territory openly and with some advance warning—an act of utmost severity and thus likely to evoke a comparable response. The certainty of prompt retribution, therefore, increases the deterrent value of ICBM forces based in the sovereign territory of the defender.

In short, the intercontinental ballistic missile—with its speed, accuracy, low operational cost, constant high readiness, and short flight-time to target—will remain for the foreseeable future the principal means for fulfilling this nation's policy of deterrence through flexible, controlled response, and thus for terminating nuclear conflict below the level of massive assured destruction. The characteristics of MX, in turn, assure the long-term survivability of the land-based force, and, by extension, the continued effectiveness of the US strategic triad.

The weapon system's basing—from an environmental point of view—will physically disturb no more than several hundred square miles of public land. The estimated cost of the new system is no more than the cost of modernizing either of the other two members of the strategic triad.

MX, in the view of the Air Force Association, must be advanced into full-scale engineering development, in line with USAF's proposed, conservatively paced schedule. Otherwise, an atrophying land-based component of the triad could, from the mid-1980s on, provide the Soviet Union with strategic superiority by default and thereby increase the risk of nuclear blackmail or strategic war. ■

Airmail

Resolution Needs More Airing

Reference the AFA Policy Paper "Defense Manpower Issues," I notice the Annual National Convention delegates supported enactment of the Defense Officer Personnel Management Act (DOPMA).

While I am not opposed to DOPMA, I feel it has a serious impact on junior officers. In my civilian employment before my commission, I always found that if one adequately performed his/her job as laid out by superiors, he had job security, except for economic factors such as layoffs. His/her security does not depend on promotion.

In the military now, and certainly if the present form of DOPMA is passed, one could serve up to fourteen years and be fired simply for not being promoted.

Promotion presently is based on a number of variables. More and more, I feel that good Officer Effectiveness Reports (OERs) are given less and less for good performance of primary duties. Now, it seems that additional duties, special projects, additional education, and community service outweigh primary duty for that O-1 rating. These areas seem to be the deciding factor as most OERs attest to exceptional performance of primary duties. These are important, but should not enjoy such a high position for rating purposes. While this practice does not apply in all units, I am sure it exists in too high a percentage in too many units.

Under the present promotion system and the DOPMA proposal, job security in the Air Force is not guaranteed simply by good performance of primary duties. Sen. Sam Nunn's position would give junior officers now the promise of job security. In the *Air Force Times*, October 10, 1977, he said, "I'm not against up or out, but I think it needs to be modified. I think there needs to be some flexibility built in so that people with critical skills who want to stay can stay. You could let O-3s and O-4s stay in the service—even if they were passed over—to twenty and twenty-four years with the right

to be reviewed for promotion within that period of time."

There are many benefits to modifying or eliminating the up-or-out system. People could remain in the same job longer and gain far more expertise. Where are our Vietnam fighter pilots? Most are in staff jobs or out of the service. While stationed at Osan AB, Korea, I noticed the majority of the fighter pilots were lieutenants and captains. I believe with our present system we have lost much of our wartime expertise and practical experience. A corollary to this would be the resulting monetary savings. Fewer PCS moves and less training would be required.

To enhance these benefits, retirement should be gradually extended to a thirty- or forty-year career. As long as people physically qualify and do a good job, they should be retained. This would, of course, require certain controls to weed out the deadwood. When an individual does not meet standards of performance, he should be fired.

The DOPMA support resolution of the Convention needs more airing before being put forth as the position of all AFA members. I love serving my country in the Air Force. We should not let DOPMA force out good people while they still have valuable service to give.

Capt. Patrick M. Dunne
APO New York

Expressions of Regret

The death of Claude Witze is a grievous loss not only to his family and friends, but to the nation at large and particularly to those of us in the field of journalism.

Claude's expertise in national security affairs, the careful craftsmanship and clarity of his writing, and his unfailing integrity have been equaled by few, excelled by none.

Claude was—quite correctly—eternally suspicious of lofty rhetoric and undoubtedly would have struck that last paragraph had it been submitted to him for editing. In this instance, the rhetoric understates the case.

He was also a good friend, a genial companion, and a marvelous storyteller. His kind just does not pass our way too often—but when they do, they leave a lasting mark.

James D. Hessman
Editor-in-Chief
Sea Power
Washington, D. C.

I had the pleasure of working with Claude Witze at the then Piasecki Helicopter Corp. (now the Vertol Division of Boeing).

I concur with the feelings in your note in *AIR FORCE Magazine*. He was always ready to challenge a thought, no matter how entrenched it was. His imagination helped launch the heavy tandem transport helicopters into their many military roles.

We shall all miss him.

F. N. Piasecki, President
Piasecki Aircraft Corp.
Philadelphia, Pa.

To the many expressions of regret which are following the news of the death of Claude Witze, may we include our own personal and professional regret at the loss of a highly esteemed colleague. Because his candor was matched by his reportorial excellence, military journalism has lost a respected elder, and aviation has lost a strong, clear voice.

With best wishes and very respectful regards.

Cmdr. Robert P. Brewer,
USN (Ret.)
Executive Director, and
Cmdr. R. T. E. Bowler, Jr.,
USN (Ret.)
Publisher & Secretary-
Treasurer
United States Naval Institute
Annapolis, Md.

Neither Snow, Nor Rain

As was the case with Brig. Gen. Ross Hoyt's article on refueling the *Question Mark* [January 1974 issue] his article on the Air Corps's airmail operation, "Neither Snow, Nor Rain, Nor Gloom of Night," in the January '78 issue, brought back memories, some of which I would just as soon forget.

If someone were to ask me to describe my recollections as a pilot during the airmail mission in a few words, I would say: futility and frustration.

Futility because, at the end of a long and oftentimes hazardous flight I would arrive at my destination &

unload a sack of mail that weighed perhaps a hundred pounds—all that could fit in the baggage compartment of our fighters. I hoped, then, that the contents of the mail sack were of sufficient importance to justify the effort.

Frustration because I felt I was contributing damn little toward the accomplishment of the mission. It was like trying to empty the ocean with a spoon! Had I known at the time that the consequences of this mission would be so far-reaching as to eventually justify and enhance the creation of a separate Air Force, I would have felt differently.

Brig. Gen. Joseph G. Hopkins,
USAF (Ret.)
Menlo Park, Calif.

H.R. 8285 Protest

It is our sincere belief that Air Force men and women, everywhere, will rise up in professional and patriotic indignation against the impact of H.R. 8285 and similar legislation that may be proposed ["Should Your Ex-Spouse Get Your Benefits?" by Ed Gates, January issue].

After twenty years, the Air Force man is granted the opportunity to turn in his parachute and eventually receive a few retirement benefits. If the serviceman's spouse "toiled faithfully" to help him during those twenty years, then maybe she contributed to the defense of our nation.

But to grant "benefits" to a divorcee with five, or less, years of "duty" (?) is nothing more than a rip-off upon society.

Attorney Henry H. Foster may speak for a few divorce lawyers who find it convenient to scrape up a few ill-gotten crumbs for their female clients, but please remember that this viewpoint represents only a very small group of the profession.

We believe that jurisdiction of family problems should remain at the trial level in the State Court and not with the Department of Defense in Washington, D. C.

It is understood that Congressman Schroeder has good intentions, but she would do well to remember that when the divorcee joins the "new poor" (?) such membership was strictly voluntary. If Patricia Schroeder desires to help the former wives of servicemen, then we suggest that she introduce legislation that will give some help and assistance to the great multi-

tude of widows of deceased military men, wherein the former serviceman made an honest mistake in selecting the wrong option for retirement benefits. As a result, the widow was cut off for the rest of her life.

We sincerely believe that this is an area wherein all Air Force men would rally to Pat Schroeder's cause.

Lt. Col. DeVon W. Flaningam,
USAF (Ret.)
Attorney at Law
Crawfordsville, Ind.

"Dorm" Storm

I am writing with reference to the "Opposite Sex Dorm Visits" article, p. 80, "The Bulletin Board," in the February issue. General Evans's remark of "I hope they don't disappoint me" concerning enlisted people is disgusting and insulting!

Somehow there is a point completely missed here. These enlisted people are not all young kids or college students living off their parents' money or going to school on a scholarship (also someone else's money) who need an authority to replace that of their parents. They are full-time working people who are paying taxes, paying monthly bills, often are supporting a parent or a small family back home, as well as being actively engaged in our country's defense. They are professional working people.

Although many of these people are young in years, they carry much more responsibility than a dependent student of the same age. Still others in these "dorms" are single personnel with as high as fifteen to eighteen years in service, age thirty-five years and over. I feel they all deserve much more respect than to have their living quarters called "dorms" or to be policed by a 10:00 p.m. curfew on their visitors or to have to check visitors in and out.

The entire arrangement recalls my experience in a small conservative college dorm when I attended school back in 1962! But this is 1978 and these people are full-time working taxpayers. They deserve the freedom and respect to run

We suggest that readers keep their letters to a maximum of 500 words. The Editors reserve the right to excerpt or condense as required in the interests of space or good taste. Names will be withheld on request, but unsigned letters are not acceptable.

their own personal lives. In other words, their dorm rooms should be considered their private homes—and the Air Force should stay out! (Actually, I feel the best answer is to give the enlisted personnel more adequate housing, more like efficiency apartments, such as are now being constructed at Andrews AFB.)

I see the results of this kind of invasion of privacy when these people come to my office for loans—to move off base into an apartment, which many of them cannot really afford. I am a loan officer at a military credit union and the wife of an E-8.

Beverly J. Leibold
Andrews AFB, Md.

Astonishing Photo

As the Maintenance Control Officer for the 601st Tactical Control Wing from 1968 to 1972, I found your photo caption on page 34 of the February issue quite astonishing. Either the 407L System has acquired a radically new radar system (wonder what the receiver antenna looks like?) or the radio maintenance shop is *really* shorthanded to be allowing 303s at their equipment!

Regardless, the pictures brought back many pleasant memories of a most enjoyable five years in what was then cheap-enough-to-be-enjoyed Germany.

Lt. Col. George R. Hooper, Jr.
Bolling AFB, D. C.

• *Taken in by the caption submitted with the photo!*—THE EDITORS

Attention: Overlord Survivors

Here in Angers we have established a Second World War Association and in the course of our work we need to be in contact with people abroad to help us obtain information on the events that took place thirty-four years ago, on June 6, 1944. We are trying to make contact with officers and NCOs who took part in Operation Overlord.

We are especially interested in that particular day both because it marked the beginning of the liberation of our country and because we do not forget that in the dawn of June 6, 1944, hundreds of young men were cut down by the machine guns of the enemy. These men, who had crossed the seas to help restore to us the freedom that the people of France had awaited for four long years, have lain beneath our soil for more than thirty years.

Airmail

We hope to make contact with those who survived the terrible ordeal of that day. We believe that with their assistance we shall be able to obtain valuable accounts of the events of the time.

Patrick Asselain
65 Bd. J. Bedier
"Les Bouleaux"
49000 Angers, France

Couldn't Take the Excitement?

I, as countless others, enjoy "There I Was . . ." by Bob Stevens. But the January episode of ace Bruce Carr had me wondering. How come the pilot could not remember where the gear lever was in the borrowed Me-109? Surely the gear was down when he took off, and to make a belly landing he must have raised the gear. I assume the same lever both raises and lowers the gear. But then, of course, he flew without the help of other crew members!

Lt. Col. Wolf D. Ascher,
USAF (Ret.)
Navigator
Thousand Oaks, Calif.

18th Fighter Bomber Group

I would like to contact anyone who served in the 12th, 39th, and 67th Fighter Squadrons, 18th Fighter Bomber Group, flying the F-51 during the Korean War. I am working on an article and compiling a current address list of the group.

Warren E. Thompson
7201 Stamford Cove
Germantown, Tenn. 38138

Battle of Hamburg

I am writing a book about the series of air raids carried out by the USAAF and RAF Bomber Commands against the German city of Hamburg in July and early August 1943. I am particularly anxious to contact American airmen who took part in the raids of July 25 and 26. The units involved in attacking Hamburg on those days were the 91st, 303d, 351st, 379th, 381st, and 384th Bombardment Groups.

If any readers belonged to these groups in 1943, flew on these missions, and would be willing to help, please write to me giving just name, address, and Group number. I will then write to each man, giving more

details about the type of information I am seeking.

I would also be interested in hearing from any officer serving at Group, Wing, or Command level who may have played a part in planning and preparing these missions.

Martin Middlebrook
48, Linden Way
Boston, Linco. PE21 9DS
England

Memorabilia for the 480th

The 480th Tactical Fighter Squadron was activated November 15, 1976, at Spangdahlem Air Base, Federal Republic of Germany. We are trying to put together a complete history of the squadron and would appreciate hearing from any readers previously associated with it.

Any information on squadron operations, personnel, or activities would be of great value to us. In addition, information as to the whereabouts of old squadron scrapbooks, photographs, plaques, etc., would aid us quite a bit in trying to centralize all of the squadron's historical memorabilia with the current operation.

Thanks much for helping us out with our search for squadron historical information. The members of the 480th enjoy their copies of AIR FORCE Magazine very much, so keep them coming to us in Europe.

1st Lt. Thomas K. Mascot
480th TFS Historian
PSC Box 1553
APO New York 09123

97th BG Association?

I would like to know if a 97th Bomb Group Association has been organized. This group, composed of both B-17 and B-24 crews, participated in the Africa and Italy campaigns of 1943-44.

If an association has been organized, I'd be interested in attending a reunion.

Lt. Col. Ped G. Magness,
USAF (Ret.)
RR 1, Box 156
Toltec Rd.
England, Ark. 72046

P-51 in Action

I am an historian, starting a new project, and would like to hear from USAAF and USAF pilots who flew the P-51 Mustang in any type of operations, and in any theater, World War II or Korea. I would also like to hear from bomber crews who had experience with the P-51 in its

long-range escort role. I would also like to include in this the F-82 Twin Mustang.

My object is to gather first-hand personal accounts from such flyers as the basis for what might be called a biography of the aircraft and the men who flew it.

D. G. Clammer
The Poplars
21 Houghton Road
St. Ives, Huntingdon,
Cambs, England

Servicemen in England

I am currently in the early stages of research for a book dealing with the first American servicemen in England in 1942. My project centers mainly upon their first impressions of wartime London.

I should be pleased to hear from any former servicemen who were in England in mid-1942 who have personal reminiscences of London during this time and hearing about initial contacts with inhabitants of London, and of the Londoners' reactions to them. Details such as rank, unit, and date of arrival would also be a great help.

David Johnson
2164 Stecher Ave.
Union, N. J. 07083

Rattlesnake Bomber Base Vets

Ward County Texas will open to the public a museum of World War II Army Air Force relics pertinent to Rattlesnake Bomber Base at Pyote, Tex. The museum is seeking the use of photos, uniforms, and any other memorabilia pertinent to the base.

We would very much like to hear from anyone who was stationed there at any time in its history.

Jim Marks
P.O. Box 1403
Monahans, Tex. 79756

Fighter Insignia Collector

I am a collector of the major US aerospace companies' and defense related industries' fighter/attack aircraft patches. I am seeking company patches for the current generation of fighter/attack aircraft and also for the new generation air-superiority attack aircraft for the '80s. A special interest—a patch for the SR-71 or an SR-71 unit patch.

Would also like to hear from other interested in selling or trading aircraft insignia.

Steve Smith
1836 West Bayshore Rd., #1
Palo Alto, Calif. 94303

UNIT REUNIONS

AACS Alumni

The 2d AACS Alumni reunion will be held in Orlando, Fla., October 13-15. Reservations with deposit by June 1. Please contact

Wally Bailey
4688 Posada Dr.
Orlando, Fla. 32809

Association of Survivors

WW II Marine/Navy Paratroopers reunion will be held at the Half Moon Inn, Shelter Island, San Diego, Calif., June 23-25. Write

Association of Survivors
c/o Col. D. E. Severance,
USMC (Ret.)
P. O. Box 1972
La Jolla, Calif. 92037

Brookley AFB

AFA Chapter 101 in Mobile, Ala., will hold a reunion May 20 for all military and Civil Service personnel who served at Brookley AFB, Ala., during any period of time it was an active Air Force installation. For further details write

Dr. Frank M. Lugo
Pres., AFA Chapter 101
P. O. Box 464
Mobile, Ala. 36601

SAMFOX

99th Military Airlift Wing/1254th Air Transport Group/Wing; 89th MAS/1298th ATS; 99th MAS/1299th ATS—all officers, their wives, or widows, formerly assigned to this SAM operation interested in a reunion in the Andrews AFB, Md., area October 5-7, please contact *not later than April 30*

Col. Harley "Hap" L. Reed,
USAF (Ret.)
6416 Floridon Court
Springfield, Va. 22150

TAC Tanker Troops

A reunion of persons once assigned to the 4505th Air Refueling Wing, 4505th TAMS, 427th, 429th, 431st, and 622d TARS, will be held at Langley AFB Officers' Club on May 27. Also send names and addresses of personal acquaintances who may be interested. Contact

Lt. Col. Robert L. Frazier
4510th Support Squadron
Langley AFB, Va. 23665

Phone: Autovon 432-7795

or

Lt. Col. Clarence (Rocky) Weishar
2104 N. Armistead Ave.
Hampton, Va. 23666

Phone: (804) 838-1437

8th Composite BG, 11th AF

All bomber, fighter, and transport squadron personnel operating in the North Pacific-Aleutians, 1942-43, invited to a reunion celebrating the 35th anniversary of Attu-Kiska campaign, Hacienda Hotel, Sepulveda Blvd., El Segundo, Calif., Au-

gust 11-13. For information send self-addressed, stamped envelope to
Charles Pinney
Chamber of Commerce
P. O. Box 404
Hermosa Beach, Calif. 90254

31st Fighter Group

The 31st Fighter Group Officers' Association will hold a reunion at Colorado Springs, Colo., August 17-21. If interested send name, address, and telephone number to

Ed Dalrymple
31st FG Officers' Ass'n
Box 4984
Austin, Tex. 78765

P-40 Warhawk Pilots

The 7th reunion of the P-40 Warhawk Pilots Association will be held at the Hilton Inn, Albuquerque, N. M., June 22-25. Contact

George Koran, Sr.
5555 Montgomery, N. E., #23
Albuquerque, N. M. 87109

Phone: (505) 881-9696

P-47 Thunderbolt Pilots

The 17th annual reunion of the P-47 Thunderbolt Pilots Association will be held May 12-14 at the Playboy Towers Hotel and Club, Chicago, Ill. Contact

Kevin Brown, Chairman
P. O. Box 7682
Chicago, Ill. 60680

Phone: (312) 761-9731

49th Fighter Sqdn.

Members of the 49th Fighter Squadron, 14th Fighter Group, WW II P-38ers, are holding a reunion August 4-6, in New Iberia, La. Contact

S. D. Huff
3200 Chetwood Dr.
Del City, Okla. 73115

57th Bomb Wing

The 10th annual reunion of the 57th Bomb Wing will be held June 21-25, at Lake Placid, N. Y. Taking part will be the 310th, 319th, 321st, and 340th Bomb Groups along with the 308th Signal Wing. Provision has been made for a ladies organization of wing-member widows and a "Wing Tips" affiliate made up of children and grandchildren of members. For details contact

Harold G. Lynch
11720 Whisper Bow Dr.
San Antonio, Tex. 78230

305th Bomb Group

The 305th Bomb Group, 8th AF, Chelveston, England, WW II, reunion will be held August 10-13, in Dayton, Ohio. Contact

Abe Millar
Box 757
Sanger, Tex. 76266

355th Fighter Group

Gordon Hunsberger has announced a 1- to 2-week trip to England, May 14-28, in conjunction with the 91st Bomb

Group and 78th Fighter Group. For detailed information contact

Galaxy Tours
216 Goddard Blvd., #107
King of Prussia, Pa. 19406

Phone: (800) 523-7287
(215) 265-2778 (in Pa.)

384th Bomb Group

The 6th reunion of the 384th Bomb Group, 8th AF, will be held in Denver, Colo., August 3-6. For information write
384th Bomb Group, Inc.
P. O. Box 766
Wall Street Station
New York, N. Y. 10005

414th Bomb Sqdn.

A reunion of the 414th Bomb Squadron Association, 97th Bomb Group (H), will be held in Colorado Springs, Colo., August 2-5. Contact

Chuck Merlo
7335 Neckel
Dearborn, Mich. 48126

456th Bomb Group

A contact other than that announced in our January issue has been given for the 456th Bomb Group, 15th AF, reunion in Denver, Colo., June 15-18. Send stamped self-addressed envelope.

Jim Watkins
11415 Minor Dr.
Kansas City, Mo. 64114

463d Service Squadron

A reunion of the 463d Service Squadron, 309th Service Group, will be held August 11-13 at the Hawaiian Village, Tampa, Fla. Please contact

Edward A. Ellis
321 Clearfield Ave.
Norristown, Pa. 19401

464th Bomb Group

This year's reunion for all members of the 464th Bomb Group, 15th AF, based in Italy during WW II, will be held in Savannah, Ga., August 11-13. Further information from

H. Robert Anderson
4321 Miller Ave.
Erie, Pa. 16509

Phone: (812) 866-1465

485th Bomb Group

The annual reunion of the 485th Bomb Group will be held August 5-6 at the Sheraton Hotel, Newport Beach, Calif. Further information from

E. L. Bundy
5773 Middlefield Dr.
Columbus, Ohio 43220

709th Bomb Sqdn.

WW II's 709th Bomb Squadron, 447th Bomb Group, stationed at Rattlesden, England, 1943-45, will hold a reunion in Minneapolis, Minn., July 28-30. All members of this unit are invited. Contact

Myron P. Schreiber
21302 Park Wick Lane
Katy, Tex. 77450

Focus On...

The Folly of CTB

BY EDGAR ULSAMER, SENIOR EDITOR

Washington, D. C., March 1

For some months now, the United States, the Soviet Union, and Great Britain have been engaged in little-noticed negotiations on a treaty involving an obscure subject and bearing an even more obscure acronym: CTB, for Comprehensive Test Ban. But CTB, carried out in the shadow of the SALT negotiations, also in Switzerland, is fraught with dire meaning and loaded with pitfalls for the military security of the United States and the Western world. SALT II is meant to put a cap on the number, and to a degree the quality, of nuclear strategic weapons. CTB is more fundamental: Depending on its ultimate terms, it could halt the development of new weapons and within a number of years put the reliability and availability of existing weapons in doubt. Rep. Charles H. Wilson (D-Calif.) recently warned that "the combined effect of SALT II and a comprehensive test ban can, by 1985, easily leave us in a position where we are not only inferior in numbers but also where even the weapons we will have will be unreliable."

One of the nation's ranking nuclear weapons experts, Dr. Harold M. Agnew, Director of the Los Alamos Scientific Laboratory, University of California, informed the National Security Council early this year that "... I am forced to admit that we will not be able to maintain a viable stockpile [of nuclear weapons] over the long term under a CTB and in the environment in which we are presently forced to operate."

The US eagerness to limit or halt the testing of nuclear warheads is not new. The record goes back to the immediate post-World War II period and leaves no doubt about US good will. The same can't be said about good sense. A case in point was the self-imposed moratorium on all nuclear testing, put in effect on November 7, 1958, in or-

der to encourage Soviet reciprocity. It did just that—for about a year and a half—until the Soviets launched a massive test series culminating in the detonation of a fifty-eight-megaton device in the upper atmosphere, by far the most powerful explosion of the nuclear age. Upon completion of that test program—thought to have yielded valuable information unobtainable through laboratory or theoretical research—the Soviets nonchalantly offered to resume the testing moratorium. President Kennedy's response was acidulous: "We know enough now about broken negotiations, secret preparations, and the advantages gained from long test series never to offer again an uninspected moratorium. . . ."

Nevertheless, a number of agreements were signed in the ensuing years banning nuclear weapons from space and from the ocean floors, and outlawing nuclear weapons tests in the atmosphere, space, and under water as well as all underground nuclear explosions that produce radioactive debris outside of the territory of the nation conducting the test. About two years ago, twin agreements further limiting nuclear testing went into effect following protracted negotiations between the US and the Soviet Union: the Threshold Test Ban Treaty and the PNE (Peaceful Nuclear Explosions) Treaty. The first places a maximum yield "threshold" of 150 kilotons on underground tests; the latter puts an identical limit on individual peaceful nuclear explosions and an aggregate limit of 1,500 kilotons on group detonations.

There is strong reason to believe that the 150-kiloton limitation has caused major difficulties and uncertainties but no vital impairment of the US nuclear weapons program. There is also evidence that the Soviet Union is taking the "threshold" more lightly than the US. Yields of nuclear devices that

are tested the first time may range from significantly above to significantly below the explosive power that was sought. The ability of either side to measure medium- and high-yield tests through remote, mainly teleseismic means, also is confined to rough approximations. Because of the yield uncertainty, the US held its tests to devices somewhat below the 150-kiloton limit; the Soviet Union seems to have gone in the other direction.

In March 1977, President Carter told the United Nations that this country will "explore the possibility of a total cessation of nuclear testings. While our ultimate goal is for all nuclear powers to end testing, we do not regard this as a prerequisite for suspension of tests by the two principal nuclear powers." Subsequently, he also expressed the view that such a ban could exempt Soviet peaceful nuclear explosions (PNEs) for river-diversion and similar purposes. On the latter point, the President appears to be at odds with most Defense and other nuclear experts who remain convinced that practically the same amount of data can be gleaned from a PNE as from a pure weapons test. That point may be moot, however, because President Leonid Brezhnev hinted late in 1977 that in order to expedite a Comprehensive Test Ban, the Soviet Union might now be willing to announce a "moratorium" on PNEs. How long such a moratorium might remain in effect and what safeguards he would offer the US against being duped again, he did not say.

Its moralistic and emotional appeal notwithstanding, CTB is afflicted by an incurable, insidious flaw: Nobody knows of a way, now and in the foreseeable future, to verify and, thus, to enforce it. Rep. Melvin Price (D-Ill.), Chairman of the House Armed Services Committee, recently reminded the Administration that as far back as 1971, the Joint Committee on Atomic Energy concluded that Soviet underground tests below the five- to ten-kiloton level were not detectable. Counseling the Administration against "precipitous, unilateral action," he pointed out that "a hasty decision could significantly affect our current and future nuclear forces without imposing comparable restraints on other potential signatories to a comprehensive nuclear test ban."

Chairman Price's warning may

have been understated. Dr. Roger E. Batzel, Director of the University of California's Lawrence Livermore Laboratory (which, along with Los Alamos Scientific Laboratory, is responsible for designing all nuclear weapons in the US arsenal) recently informed Rep. Jack F. Kemp (R-N. Y.) that without a US monitoring system on Soviet territory, CTB would enable that country to "carry out a number of low-yield (five to ten kilotons) nuclear tests per year with only a small risk of detection by the United States using national technical [teleaseismic] means. Tests of larger yields, up to fifty to 100 kilotons, might be carried out on a more infrequent basis using decoupling cavities [underground chambers such as in the many salt domes north of the Caspian Sea or by] simulation of earthquakes."

Dr. Batzel also reported to Congress that even without using large underground caves, the Soviets could hide tests with a yield of up to twenty kilotons that are carried out in dry, loose ground. The teleseismic signal from a test in such a low-density medium is reduced by "more than a factor of ten over that produced by a nuclear explosion fired in hard rock or below the water table. . . . Appropriate geological formations are considered to be available to the Soviets. . . ."

Dr. Agnew makes a similar point: "I do not believe that a comprehensive ban on underground nuclear explosions is now verifiable by national technical means. However, I believe a threshold ban at a yield of about five or ten kilotons in hard rock is verifiable unless deliberate evasion tactics are used. With low yields the probability of detection by national technical means becomes more and more unlikely. Higher yields . . . could be tested in media having lower seismic coupling efficiency than hard rock."

US nuclear weapons experts believe that nonseismic means of CTB verification, whether space-based or situated in Soviet territory, would increase the risk and cost of cheating, but cannot provide reliable detection and identification. (On the other hand, if there is "venting" from a Soviet underground test, meaning that nuclear debris escapes into the air, the US could determine the nature of the weapon with considerable precision.) AEDS, the Atomic Energy Detection Sys-

tem, with strong support from the Air Force Technical Applications Center (AFTAC) at Patrick AFB, Fla., is the primary agency for monitoring Soviet nuclear testing. AEDS does its job with the help of sophisticated seismic arrays located around the world. Whether or not air-dropped ocean-bottom seismometer installations off the Soviet coastline—as recommended under AFTAC's now defunct VELA UNIFORM project—are included is not known publicly. AEDS can be augmented by nonseismic means to detect evidence of attempted evasion. These approaches, however, are hampered by the enormous area that must be monitored if the Soviet tests are carried out away from their normal location. Also, they do not provide unambiguous data.

Tests involving yields significantly below present detection limits could be spotted with some certainty if CTB permitted a network of fifteen to twenty unmanned seismic observatories on Soviet territory. The USSR would have the same privilege on US soil. While this possibility has been aired at the negotiations in Geneva, Soviet acceptance is unlikely. In order to be effective, such a system would have to be accessible to US personnel, be tamper-proof, and transmit sensor information around the clock. But not even such extreme precautions could eliminate the potential for cheating in the two- to three-kiloton range. Neither could on-site inspection.

By tenaciously confronting the government's political hierarchy with categorical evidence of CTB's incurable evasion potential, the nuclear scientific community may be close to winning a subtle but crucial concession: *comprehensive*, in the context of CTB, may not mean *complete*. At this writing, however, the

National Security Council has not so ruled and neither President Carter nor Paul Warnke, the Director of the Arms Control and Disarmament Agency, has as yet accepted this interpretation. If there were Administration concurrence, CTB might turn out to be an extension of the Threshold Test Ban Treaty with a limit lower than 150 kilotons.

The next question that arises—and which divides the nuclear weapons community—is what constitutes the lowest, safe threshold. The answer is wrapped up in another question: how much and what types of testing are really necessary? Two factors dominate here. Will the United States require new, different warheads in the future, or is what's in the inventory now all the country will ever need? If continued improvement will be needed—for example, a new warhead in the 200- to 500-kiloton range for MX—then a technical consideration crops up: Is it safe, in the face of past problems, to assume that a new weapon will work because its first stage tests out adequately, or is full-up testing required?

Details of nuclear weapon design are shrouded in secrecy. Congressional testimony suggests that most modern nuclear weapons work in stages and that new weapons often use one or several major components of existing designs. Whether or not a new weapon attains the desired yield depends to a high degree on the first stage producing the energy needed to carry the process up the line. If it doesn't, everything else is likely to go off with a whimper rather than a bang, or not at all.

Most modern designs use first stages whose full yield is a small fraction of the "full-up" yield of the weapon itself. Representative Price has pointed out "that a large percentage of US underground testing is below twenty kilotons. These are the tests that tell us what to expect from tactical and strategic systems." It can be adduced from this and similar statements that most nuclear weapons designers are content with confining testing to the first stage, presumably because the technology influencing the follow-on stages is in hand. Also, in both the US and the USSR, the trends are away from ballistic missiles with large single warheads and toward ICBMs and SLBMs that disperse a number of warheads of

Soviet Missiles for Cuba?

Rep. Charles H. Wilson (D-Calif.) recently told a Washington press conference that two Soviet SALT negotiators, Deputy Foreign Minister Vladimir Semenov and Col. Gen. Ivan I. Beletesky, have hinted that the USSR might put strategic missiles on Cuban territory if the US cruise missile technology is made available to Germany and other NATO nations.

relatively moderate yield against different targets (MIRVs).

The design challenge—especially for the US, whose relatively small ICBMs have far less throw-weight than the much larger Soviet missiles—is to maximize yield without increasing the size and weight of individual warheads. Witness the new MK-12A warhead of Minuteman III that doubles the yield of its predecessor without an increase in size or weight. The first, or fission, stage of a fusion weapon is inordinately bulky, heavy, and costly compared to other components and offers the best chance for major improvements in warhead efficiency.

The scientific community seems resigned, therefore, to an inevitable, further curtailment of the present 150-kiloton test limit, but remains adamantly opposed to halting *all* testing. Because of its strong public commitment to CTB, the Administration is likely to insist on either total cessation of testing or on a sharply lowered threshold to forestall possible charges of tokenism by the arms-control lobby.

Some nuclear experts take the position that testing levels should not come down so low that weapons designers are denied confirmation of theoretical data; others believe that some testing—even if only of marginal value to weapon modernization—is better than none.

Dr. Agnew's report summed up the dilemma: "I do not believe that testing below, say, five or ten kilotons can do much to improve (as compared to maintaining) strategic posture, but clearly it can provide improvements at the theater level, where yields of less than five kilotons are important. . . . I believe that it is to our [US and Soviet] advantage . . . to agree to meaningful reductions in our nuclear and conventional forces. However, if such agreements are not forthcoming, then I believe any restrictions on nuclear testing—even the [150-kiloton limit]—will be to our disadvantage." Dr. Betzel's assessment was similar: "Existing limitations associated with the Threshold Test Ban Treaty already foreclose some options, especially for new ballistic and cruise missile systems, which

the country may have wished to pursue in response to the Soviet buildup."

But as Dr. Batzel added, "Perhaps the most important national security concern relating to a CTB is the possible erosion of the reliability of the strategic nuclear deterrent force. Nuclear weapons are typically constructed of materials whose chemical stability provides an ultimate limit on their lifetime. . . . One test could be crucial for assuring the reliability of the strategic deterrent." Dr. Agnew stressed that "stockpile problems do arise, as they have in the past, and, in time, there may be no experienced personnel available to assess the severity of the problems or with a background adequate to provide a fix if one is indeed possible. . . . In a nutshell, if the USA wishes to have a nuclear weapon design capability and a reliable stockpile, then it must be able to conduct nuclear tests."

Those who advocate CTB as a means for stopping or slowing nuclear proliferation should ponder the consequences of waning confidence in the US nuclear deterrent, which binds our alliances together.

A powerful incentive for the industrial powers of the Western world—and for others who rely on the US strategic umbrella—to develop their own nuclear weapons, is to erode their confidence in the reliability of this country's nuclear weapons. An unverifiable, total ban on all nuclear testing, or worse yet, a bilateral total testing moratorium allegedly advocated by ACDA, would do just that.

Toward a "Wide-Open" Space Policy?

Congressional Administration-watchers are apprehensive about increasing White House interest in doing away with some if not all US "space secrets." The idea of "wide-open" space policy reportedly was suggested first by the scientific community and is premised on the contention that US national security and the national interest gain more from revealing than from concealing space-derived information and intelligence. This column was told the notion of showing the Soviet Union and other nations how clearly the US can see from space is winning strong Administration support.

The first step under consideration

is to share data from US nonmilitary satellites—such as NASA's Landsat and Seasat—with all national governments willing to invest in ground terminals. Such information would be made available in essentially real-time fashion through down-links and "data-dump." The quality of the information—infrared or standard photography—according to one school of thought should be improved by upping the presently proposed resolution level of twenty meters to ten meters. NASA satellite photography, of course, has been available publicly for some time and used occasionally by news media to show details of secret Soviet space launch complexes. A ten-meter-resolution picture is far below the quality of US military intelligence satellites—and presumably below comparable Soviet systems—but could be militarily useful to other countries.

In addition, there is the question of infringing the sovereignty of the nations that are being observed, or even invading personal privacy. Some countries have complained already to the United Nations about US dissemination of satellite data that discloses sensitive economic, resource, and industrial information. Ten-meter resolution is apt to increase these national sensitivities.

Of far greater concern to the defense sector are long-term, incipient plans to expand the proposed open space approach by also sharing with other nations—including the Soviet Union—information from US military satellites. Details of such a procedure are not firm, but allegedly would include provisions for screening or halting the information flow during periods of crisis or conflict. The pervasive dangers of such a radical step would seem to mandate a thorough airing of its effects on national security.

Whatever the ultimate shape of the nation's space policy, serious eventual overlap of nonmilitary and military/intelligence space data probably will be unavoidable. The reason is that already strong pressures from the commercial and scientific sectors for higher-resolution space data are certain to increase. The recent PRM (Presidential Review Memorandum) 23, which summarizes national space objectives, recommends that the government retain control over US satellite operations and data. That seems both valid and prudent. ■



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NORTHROP

Capitol Hill

By the Air Force Association Staff

Washington, D. C., Feb. 27

At this writing, the second session of the 95th Congress is several days into its second month. It is an election year; plans are to adjourn by late September or early October. At adjournment of the first session last December 15, the Senate had been in session more than 1,143 hours and the House more than 881 hours. During the session, 15,386 pieces of legislation were introduced—2,896 in the Senate and 12,490 in the House. However, only 223 Public bills and twenty-seven Private bills were enacted into law. Among them was Public Law 95-111, DoD Appropriations for Fiscal Year 1978.

New Legislation

As for national defense legislation, the second session of the 95th is off to a good start—if numbers mean anything. In addition to the Defense Procurement Authorization and Appropriations bills, the following are among legislation recently introduced and referred to appropriate committees:

- **H.R. 10537**, Brinkley (D-Ga.), to provide additional dental care for dependents of active-duty personnel;

- **H.R. 10485**, Duncan (R-Tenn.), to allow DoD civilian employees overseas to receive routine dental care in military facilities;

- **H.R. 10648**, Weiss (D-N. Y.), to provide economic adjustment to communities, industries, and workers adversely affected by reductions in defense contracts, military bases, and proposed arms-export and arms-control policies;

- **H.R. 10672**, Dodd (D-Conn.), to place certain limitations on exemption of members of the armed services from personal property tax of jurisdiction where member is stationed;

- **H.R. 10858**, Steers (R-Md.), to provide additional dental care benefits under CHAMPUS;

- **S. 1903**, Jackson (D-Wash.), to authorize use of health maintenance organizations (HMOs) under CHAMPUS; and

• **H.R. 19061**, Quillen (R-Tenn.), to provide survivor benefits in cases where armed forces members die before becoming entitled to retired pay for nonregular service.

Awaiting Further Action

A few defense-oriented bills have passed the House during the first few weeks of this second session and await Senate action. Among them is the Defense Officer Personnel Management Act (H.R. 5503) by a vote of 351 to 7. (See "Bulletin Board," page 84.)

Also passed by the House: H.R. 10341, to authorize Reserve enlisted members of the Army and Air Force to retire with twenty years of service, and H.R. 2637, to authorize the Secretary of the Air Force to contract with civil air carriers to provide greater cargo capacity for national defense emergencies.

The B-1

Late in the afternoon on George Washington's birthday, the B-1 program, with the exception of some continued R&D, officially came to an end. By a vote of 234 to 142, the House approved the deletion of \$462 million in FY '78 funds earmarked for B-1 aircraft numbers five and six, thus reversing its 191 to 166 decision of last December to retain the money. On February 1, by a vote of 58 to 37, the Senate stuck by its earlier rescission stand.

By virtue of the House action, the

CAPITOL HILL

This new department, compiled by the AFA staff, will appear in this space from time to time, as a service to readers and to supplement coverage of the activities of Congress that may appear in other sections of the magazine.

—THE EDITORS

Congress sent to the President his long-awaited \$7.8 billion FY '78 supplemental budget request, of which some \$2.7 billion is for defense—with \$544 million of that for the Air Force.

Veterans

According to an early January report by Sen. Alan Cranston (D-Calif.), Chairman of the Senate Veterans Affairs Committee, last year sixty-nine bills were introduced in the Congress on behalf of American veterans. Of this number seven became public law.

During the first few weeks of the second session of the 95th, more than three dozen bills, covering the full spectrum of veterans affairs, had been introduced.

Leaving the Hill

It appears a record-breaking number of members of Congress will not be running for reelection this fall. At the end of February, the total included thirty-five representatives and eight senators. Senator Griffin (R-Mich.) recently reversed his previously announced plan to retire.

The forty-three members represent several hundred years of service in the Congress. Among the nationally known representatives with consecutive years of service are: Mahon (D-Tex.) forty-four; Poage (D-Tex.) forty-two; Teague (D-Tex.) thirty-four; Burleson (D-Tex.) thirty-two; Flynt (D-Ga.) and Moss (D-Calif.) twenty-six each; Pike (D-N. Y.) and Waggoner (D-La.) eighteen each; and Leggett (D-Calif.) sixteen.

Among the senators who will not seek reelection are: Sparkman (D-Ala.) thirty-two; Curtis (R-Neb.) twenty-three; Pearson (R-Kan.) sixteen; and Hansen (R-Wyo.) eleven.

What They're Saying

"If someone were to crash-land in a small private plane—or a large one either; gets lost while hunting in some mountain wilderness; or a child wanders away from a vacation camp, who will come looking for him?"

"Chances are that among the searchers will be the members of the Civil Air Patrol (CAP), the official civilian auxiliary of the US Air Force which, on December 1, 1977, celebrated its thirty-sixth anniversary."
—Lester L. Wolff (D-N. Y.)

Blinding force. The U.S. Air Force EF-111.



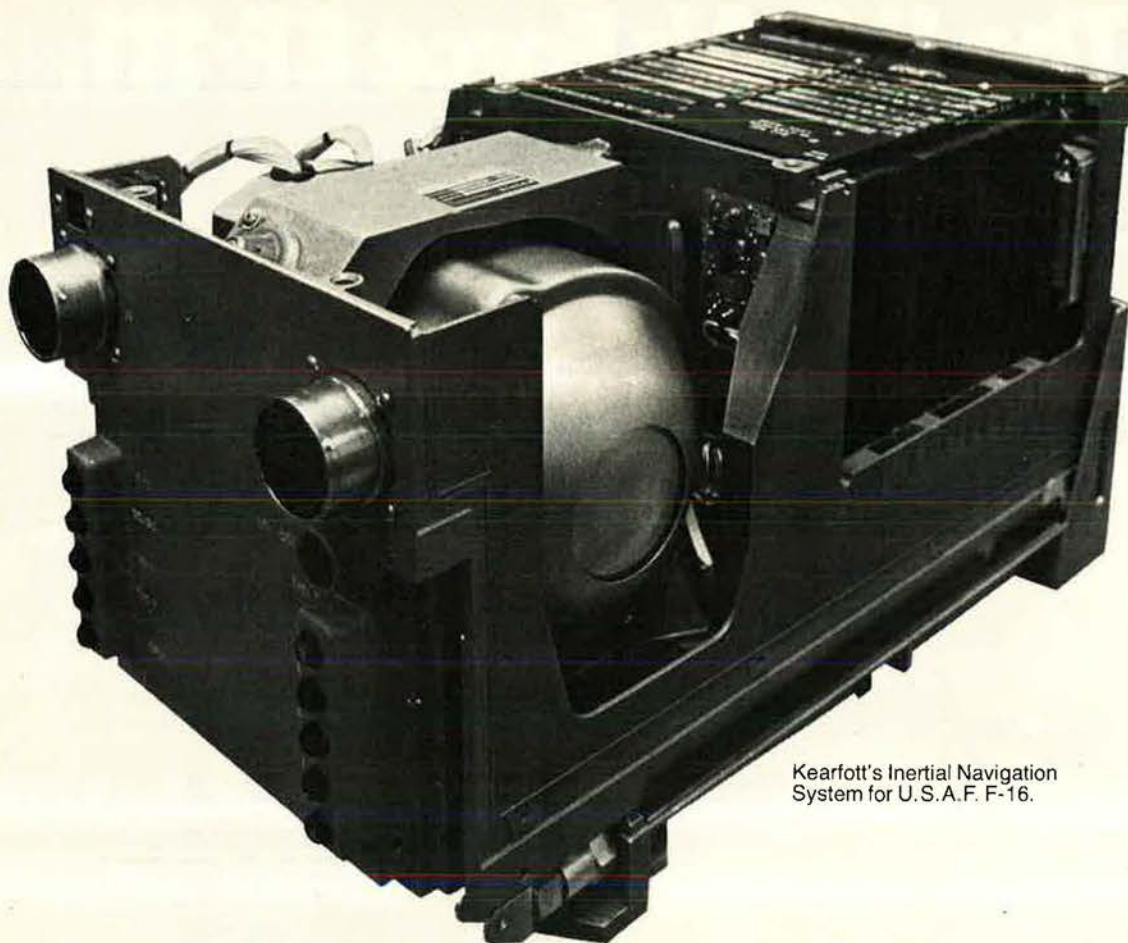
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- Position Update—Latitude and Longitude
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Gen. Daniel James, Jr.

1920-1978

GEN. Daniel "Chappie" James, Jr., former NORAD/ADCOM Commander in Chief who retired from the Air Force on February 1, died of a heart attack in Colorado on February 25. He was fifty-eight.

General James, a fighter pilot in three wars, was the first black in US history to attain the rank of four-star general.

Known for his patriotism and lifelong fight for civil rights, Chappie James was the youngest of seventeen children. From early childhood he was encouraged by his father and by his schoolteacher mother never to give up on causes he believed in, a characteristic he passed on to young blacks and members of other minorities following in his footsteps.

General James joined the Army Air Forces after serving at Tuskegee Institute in Alabama as a civilian instructor pilot in the Aviation Cadet Program and was commissioned in 1943. He flew 101 combat missions during the Korean War, and in the Southeast Asian conflict was Vice Commander of the 8th Tactical Fighter Wing, stationed in Thailand. He flew seventy-eight combat missions over Vietnam, among them the Bolo MiG sweep when seven MiG-21s were destroyed, for the highest number of air victories in any mission of the war.

Later, in the Pentagon, General James served as both Deputy Assis-

tant Secretary of Defense (Public Affairs) and Principal Deputy Assistant Secretary of Defense (Public Affairs). He was named Commander in Chief of NORAD/ADCOM on September 1, 1975, and promoted to four-star rank.

General James's many patriotic speeches were widely published and quoted. Among his civilian honors were the Arnold Air Society Zuckert Award for outstanding contributions to Air Force professionalism, and an AFA Citation of Honor. The air and industrial museum in Tuskegee was named in his honor.

General James's military decorations include the Department of Defense Distinguished Service Medal,

the Air Force Distinguished Service Medal with one oak leaf cluster, the Legion of Merit with one oak leaf cluster, Distinguished Flying Cross with two oak leaf clusters, Meritorious Service Medal, and Air Medal with thirteen oak leaf clusters.

General James's Air Force career spanned the beginning and the end of an era. That era opened with the establishment of the AAF flying school for blacks at Tuskegee—a crack in the barrier of discrimination, but not of segregation. It ended when his promotion to the highest military rank proved that no position in the armed forces is closed to any person of outstanding ability.

In the intervening years, Chappie James saw segregation outlawed in the armed forces. With good will, self-confidence, and remarkable optimism, he fought constructively within the system to eliminate segregation's twin evil, discrimination. He was proud of the Air Force record on that score, and he said so—often.

Along with other pioneers like Air Force Lt. Gen. Ben Davis, General James helped bring the armed forces—and the country—close to a final victory in the fight to achieve equal opportunity for all. To these men, but particularly to Chappie James, the nation owes a debt of gratitude for their dedication, not only to its security but to the cause of equality for all Americans. ■



Aerospace World News, Views & Comments

By William P. Schlitz, ASSISTANT MANAGING EDITOR

Washington, D. C., March 6
★ In reorganizing DoD's senior offices, Secretary of Defense Harold Brown has cut the number of assistant secretaries authorized for the Department of Defense and the three services from twenty-two to sixteen.

Three of nine Assistant Secretaries of Defense were eliminated: one each in the Army, Navy, and Air Force.

Also abolished were the posts of Director and Deputy Director of the Women's Army Corps, in order, according to the Secretary, to "recognize the role of women as full partners in our national defense, with full opportunity to progress

with their male counterparts." The Army is now in conformity with the other services in this matter.

In letters to pertinent leaders on Capitol Hill, Secretary Brown noted that the changes do not affect any major combatant functions (grounds on which the House or Senate could reject them), nor the JCS. Secretary Brown also said that the reversal in the trend toward ever-larger headquarters staffs is a major step toward more effective DoD management.

★ Skylab, in earth orbit since May 1973 and last occupied in February 1974, is faced with destruction unless a NASA plan is successful.

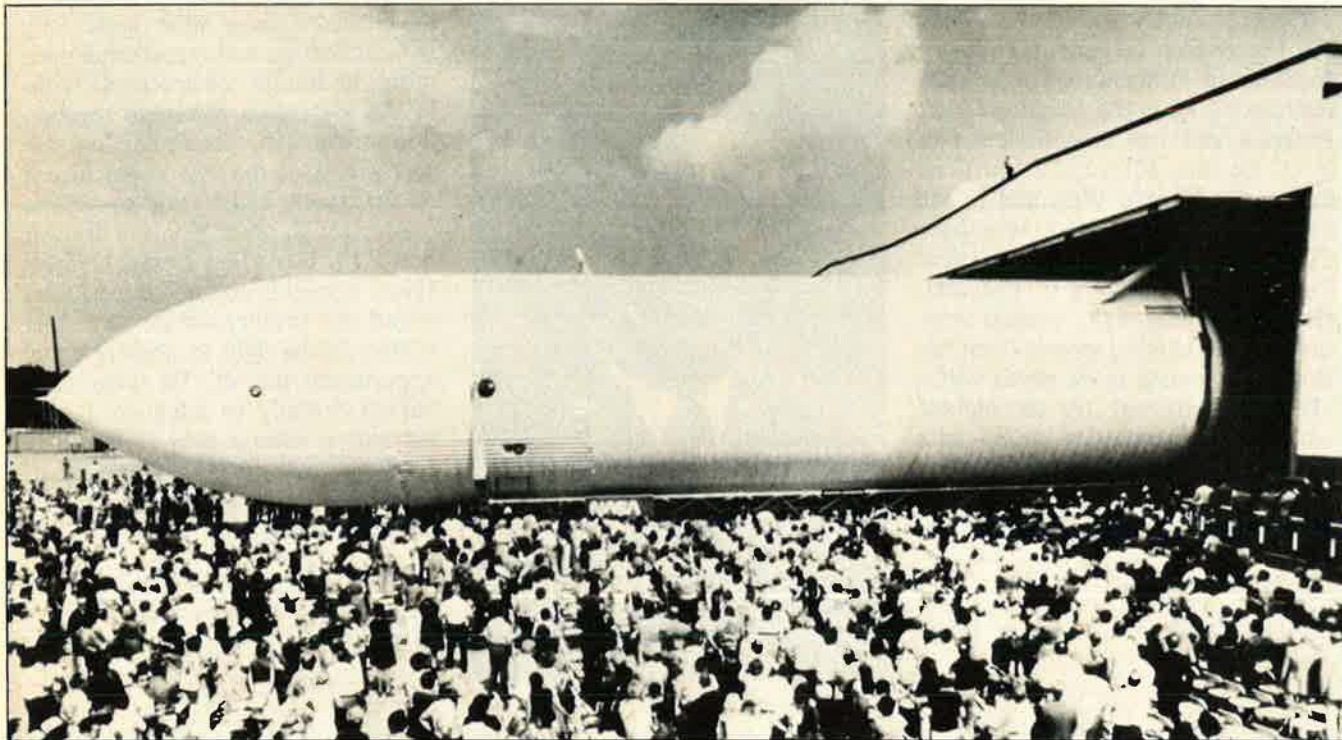
The space agency's timetable originally called for the rendezvous of a Space Shuttle Orbiter with the huge space station in October 1979. The Orbiter crew was to have installed a small rocket engine in the satellite's docking port, and then Skylab could be remotely boosted into safe orbit.

But with the inexorable decay of its present orbit, Skylab may enter the earth's atmosphere before a manned mission is possible. There is some concern that large jagged pieces could rain to earth after the eighty-five-ton space station plunges into the earth's atmosphere and breaks up. There is no predicting where the wreckage would fall.

So NASA technicians will attempt this spring to communicate with Skylab and command it to recharge its depleted batteries via its solar panels. At this time of year, Skylab enters the southernmost swing of its orbit and its panels are pretty much in line with the sun.

If all goes well, the batteries would have the power to fire Skylab's small jet engines and provide enough thrust to stem the orbital decay.

★ In mid-February, USAF gave the green light for initial production of



A unique rollout took place recently at the Martin Marietta assembly plant in New Orleans with the first public appearance of this huge "gas tank." It will be used for static test firings of the Space Shuttle's three main engines. Similar tanks will be used in actual Shuttle launches beginning next year.

the Pave Tack airborne weapon delivery system that is intended to enhance munitions delivery on three aircraft: the F-4E, RF-4C, and F-111F.

Under a \$48.5 million contract to Ford Aerospace & Communications Corp.'s Aeronutronic Division, Newport Beach, Calif., production is to begin on twenty-three systems with follow-on options for another 126 over a four-year period.

Pave Tack is an around-the-clock, adverse weather, electro-optical target acquisition, laser designator, and weapon-delivery system developed by AFSC's Aeronautical Systems Division, Wright-Patterson AFB, Ohio. The pod-mounted system includes cockpit display and control equipment.

Since flight tests began in September 1975, Pave Tack has been flown more than 200 times in F-4E and RF-4C aircraft in CONUS and Europe. It currently is being tested aboard the F-111F.

Pave Tack is an advanced version daylight-limited Pave Knife delivery system that was used successfully in SEA by USAF Phantoms and Navy A-6s in the surgical delivery of "smart" munitions.

In a major decision, US Army has selected a German-designed 120-mm gun to arm its new XM-1 main battle tank for the 1980s and beyond. The choice of the smooth-bore weapon was made over a British 120-mm rifled bore and the standard US 105-mm gun.

Reasons cited were the German gun's "better penetrating power" against improved armor of the future, and a long-sought goal: further standardization of NATO equipment.

The XM-1 tank will begin to enter the Army's inventory in significant numbers in 1980. Initially, perhaps as many as 1,500 of the new tanks will be armed with the US 105-mm weapon before the American version of the German gun becomes available, in 1984. The latter weapon is to be manufactured at the Army's Watervliet Arsenal near Albany, N. Y., with royalties paid to Rhein Metall, the German developer. Improved ammunition is to be supplied for the US 105, which will be used in early production models of the XM-1.

West Germany also plans to install its 120 mm in the new Leopard tank.

US Army has thus far approved

First Risner Trophy Presented

The Air Force on February 10 made its first award of the new Risner Trophy, which recognizes USAF's outstanding tactical fighter aircraft member. The trophy was presented to the Air Force by four former Vietnam POWs: Vice Adm. James B. Stockdale, USN; Col. Fred V. Cherry, USAF; Lt. Col. Orson G. Swindle III, USMC; and Lt. Col. Floyd J. Thompson, USA. Following acceptance of the trophy on behalf of the Air Force by Chief of Staff Gen. David C. Jones, it was presented to Capt. Timothy A. Kinnan, the first recipient, by retired USAF Brig. Gen. Robinson Risner, for whom the trophy is named.

Captain Kinnan, of the 3d Tactical Fighter Wing, Clark AB, Philippines, graduated in June 1977 at the top of his F-4 Fighter Weapons Instructor Class at the Tactical Fighter Weapons School, Nellis AFB, Nev. An Air Force Academy graduate, Captain Kinnan entered USAF in 1970 and earned a master's in aeronautical and aeronautical engineering at Purdue University in 1971.

General Risner, a highly decorated Korean War jet fighter ace, was a POW in North Vietnam for more than seven years. There, he served as senior ranking officer and later as Vice Commander of the 4th Allied Prisoner of War Wing, an organization created by the POWs to instill discipline and keep up prisoner morale. The new award commemorates the image he exemplifies and his accomplishments in the tactical air arena.



The Risner Trophy will be on display at the Air Force Academy.

The marble-based trophy is six and a half feet high and is a bronze-sculpted figure of its namesake dressed in flight suit. It was donated to the Air Force by friends of General Risner who were with him in Hanoi. The trophy, to be on permanent display at the Air Force Academy, will be inscribed with each annual winner's name. The winners will receive a smaller replica (see photo). Selection of the outstanding graduate of the Tactical Fighter Weapons School is based on class standing, demonstrated leadership, mission dedication, and combat readiness.

Many military and civilian notables attended the award ceremonies, including a number of former SEA POWs.



Capt. Timothy A. Kinnan, left, and Brig. Gen. Robinson Risner at recent award ceremonies at the National Air and Space Museum in Washington, D. C.

Aerospace World

\$4.8 billion for 3,300 new XM-1s, and hopes for an eventual buy of up to 10,000 for its armored units and for sale abroad.

★ In January began flight tests of a device that ultimately could help pilots contend with that unseen menace to airborne comfort and safety: clear air turbulence (CAT).

NASA and National Oceanic and Atmospheric Administration scientists have long noted the correlation between CAT and the presence of water vapor in the atmosphere. The detection device is actually an infrared radiometer that probes ahead

of an aircraft (in the tests, a Learjet flying out of Denver's Stapleton IA) to determine the amount of water vapor present.

If proved out, the device could provide a trustworthy and economical tool to allow pilots to prepare for CAT or avoid it altogether.

The link between water vapor and CAT was come upon accidentally by NOAA scientist Dr. Peter Kuhn, who was conducting astronomy research aboard a C-141 observatory aircraft.

Researchers are optimistic about a device that could be installed in any aircraft, operate unattended and with minimum maintenance, and produce an alert from four to fifteen minutes in advance of a CAT encounter.

★ MAC's fleet of Lockheed C-141 StarLifters recently logged 5,000,000 flying hours. After thirteen years of

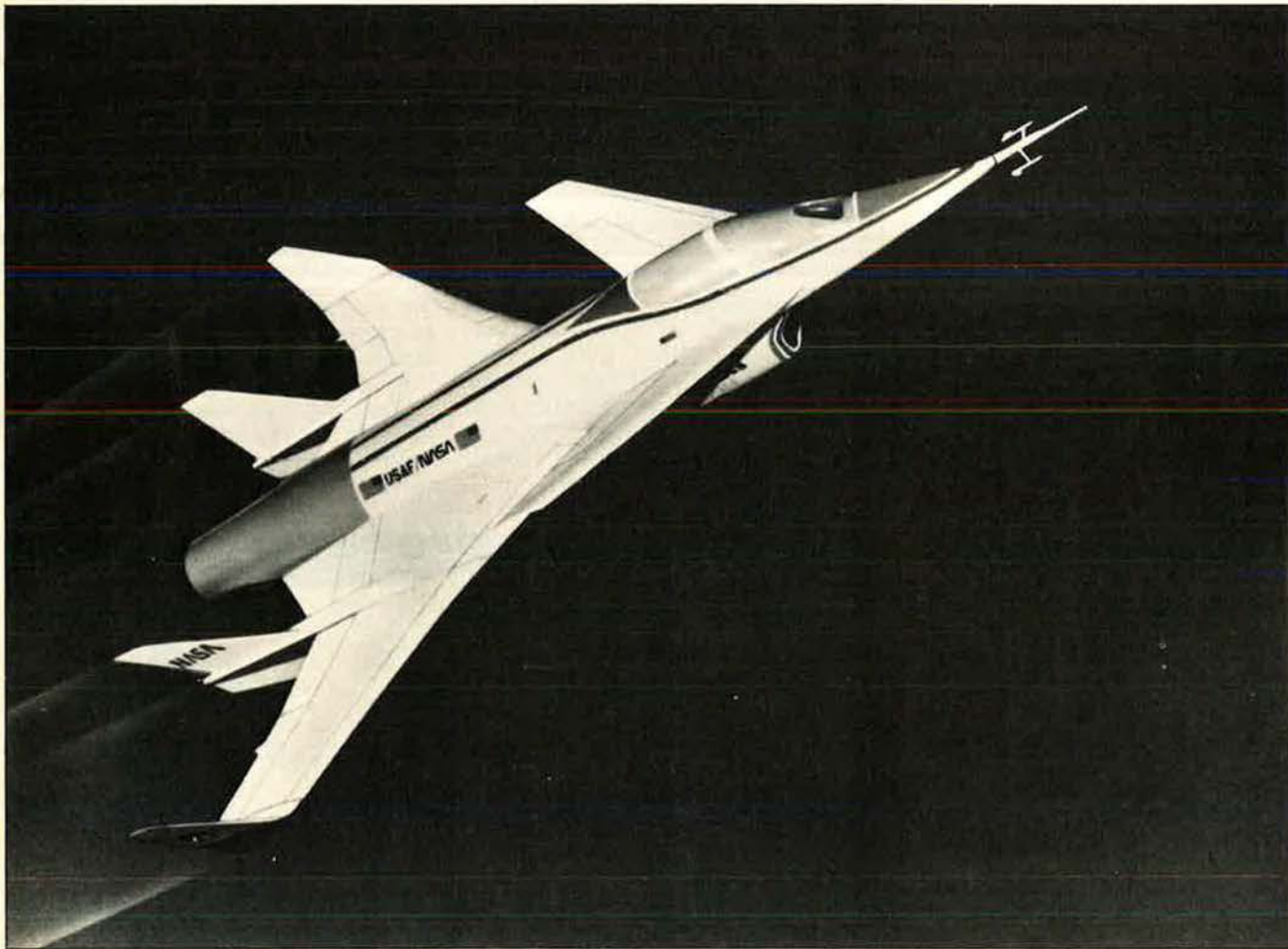
service, 271 of the original 283 transports are still operational.

The first purely jet aircraft designed specifically to military standards as a troop and cargo carrier, the StarLifter has compiled an outstanding safety record.

And the C-141 will be with us for some time to come, beyond the year 2000. On-going modifications include conversion to state-of-the-art inertial navigation systems, new weather avoidance radar, redesign of the aft door locking system, a stretched fuselage, and the addition of air refueling receiver capability.

★ The Air Force Museum, Wright-Patterson AFB, Ohio, hopes to enlist some 5,000 members in the first year of its recently initiated new program: "Friends of the Air Force Museum."

According to Museum Foundation



Artist's conception of a sleek, new, supersonic, unmanned aircraft that looks as if it might appear in a sequel to "Star Wars." The craft, developed and built by Rockwell International's Los Angeles Division, was rolled out early in March. Called HiMAT, for Highly Maneuverable Aircraft Technology, it is the first of two such craft being built for NASA and the Air Force Systems Command. The HiMAT program will look into the application of new technology to future fighters. The plane is expected to achieve eight-G turns at Mach 0.9 (about 620 mph) at 25,000 feet and six-G turns at Mach 1.2 (820 mph) at 30,000 feet.

Chairman Robert S. Oelman, "The 'Friends' membership will provide the Museum with an on-going, close-knit nucleus of individuals and organizations who are vitally interested in the continuing day-to-day operation of the world's largest and oldest military aviation Museum, and in so doing the members will themselves derive a number of important benefits . . . and all for \$10 in dues."

Museum officials intend to draw support from the 2,000 original charter members of the foundation and building fund contributors (other than those who donated through the USAF in-service fund drive), as well as the many others who have expressed interest in the Museum in past years. One key source will be aerospace-oriented industries and organizations.

A display and membership booth will operate at the Museum itself.

The annual \$10 dues will entitle members to, among other things, twenty percent discounts in the Museum gift shop; ten percent discounts in the bookstore; special Museum events; and a newsletter.

As incentives to renew, different gifts will be offered each year, officials said.

Applications may be obtained by writing the Air Force Museum Foundation, P. O. Box 1903, Wright-Patterson AFB, Ohio 45433.

★ The Charles A. Lindbergh Memorial Fund was the recent bene-



The eyes of Texas: Two state ANG F-101s sporting Lone-Star tail insignia over the San Jacinto Monument to salute April's Texas holiday commemorating the victorious battle for independence from Mexico.

fiary of a \$10,580 donation by the National Air and Space Museum, Washington, D. C., where Lindbergh's *Spirit of St. Louis* is on display.

The Fund has been established to award grants in those fields of most interest to the pioneer aviator: aeronautical and aerospace research, exploration, conservation, and natural sciences.

The Museum raised the donation through the sale of limited-edition reproductions of Paul Calle's portraits of astronaut Neil Armstrong and Lt. Gen. James H. Doolittle, cochairmen of the Lindbergh Fund. The numbered portraits in the series have been signed by the artist and by Armstrong or Doolittle.

Proceeds from continuing sales of the prints will also be donated to the Fund; they can be acquired for \$125 each from the National

Air and Space Museum, Washington, D. C. 20560.

★ A relatively new organization concerned with US security—the Association of Former Intelligence Officers—will hold its fourth annual national convention in San Diego, Calif., September 30 through October 4, 1978.

With a membership of more than 2,200, AFIO is made up of US citizens who have served with one of the US intelligence organizations; its purpose is to "promote public understanding of the role of American intelligence." AFIO also offers associate memberships to other US citizens who support its aims.

For information write: AFIO, 6723 Whittier Ave., Suite 303A, McLean, Va. 22101.

★ NEWS NOTES—The National

Intelligence Briefing...A Roundup

A white paper, prepared by the Paris-based Cambodian-Lao-Vietnamese Committee for the Defense of Human Rights, was presented to the UN in February for the General Assembly's consideration during its debate on human rights.

The 200-page document, written by a group of prestigious Asians, charges that:

- In Cambodia, mass murder of civilians—including children—by the Khmer Rouge Communists was being committed long before they attained final victory in April 1975.

According to a detailed account of the Committee white paper by *Foreign Report*, published by London's *Economist*, the terror continues. The population is being decimated by massacres, forced labor, starvation, and epidemics, with the white paper quoting eyewitness accounts of the atrocities. Also quoted is the Khmer Rouge slogan: "The war caused the death of hundreds;

the revolution requires the death of thousands."

- In Laos, according to the white paper, the Meo hill tribes, many of whom were aligned against the Communists, are systematically being rooted out and destroyed. Some 7,000 Meos were allegedly killed last November, when Vietnamese troops allied with Laotians used artillery, helicopters, and fighter aircraft in operations against them.

- And in Vietnam, the Paris document said, some 500,000 former officers and civil servants of the Saigon government, among others, are still being held under marginal conditions in "reeducation camps," while a substantial part of the population is being shifted to "new economic zones" in isolated areas. Ruthless measures are also being taken to suppress the Buddhists and Catholics, and the social and cultural structure of about 600,000 hill people in the central highlands is being destroyed.

Aerospace World

Space Club, Washington, D. C., has chosen **John F. Loosbrock**, former Editor and now Publisher and Editor in Chief of AIR FORCE Magazine (see February issue, p.19), to receive its annual **Space Club Press Award**.

For a number of reasons, outstanding among them the **possibility of serious biomedical effects**—DoD is attempting to locate all **civilian and military personnel** who participated in the **atmospheric nuclear tests** conducted from 1946 to 1963. Call the Defense Nuclear Agency's toll-free number (800) 638-8300 (Maryland residents only call collect (202) 295-0586). Or write in care of Armed Forces Radiobiology Research Institute, DNA, National Naval Medical Center, Bethesda, Md. 20014.

On February 22, fire destroyed **San Diego's Aerospace Museum and Aerospace Hall of Fame**. While damage is estimated in the millions, the loss of fifty major and other exhibits is incalculable. Investigators suspect arson by teenagers.

US Army's **Washington Military District**, the DoD agency responsible for all joint armed forces ceremonies in the nation's capital, is **recruiting women service members** for White House ceremonies.

The first overseas wing of the new **A-10 close support aircraft—the 81st TFW**—is to be stationed at RAF Bentwaters. The unit is currently equipped with F-4Ds. Transition training for pilots begins this August at Davis-Monthan AFB, Ariz., and the first A-10s are to arrive in England early in 1979.

In its propaganda campaign against Taiwan, **Peking recently offered bounties** to defecting Nationalist Chinese officers. **Rewards for equipment** ranged from \$2 million for a US-built F-5E fighter to \$5.7 million for a naval destroyer. While as yet no Nationalist pilots have defected, last summer Red Chinese Air Force pilot Yuan-yen landed his MiG-19 on Taiwan, the fifth pilot to flee the mainland.

On February 2, a **major milestone** in US Navy's **Tomahawk cruise mis-**



MSgt. William A. Fininis, of Texas ANG's 147th FIG, is one of only fifty-six sharpshooters US-wide invited to try out for 1978's All National Guard Rifle Squad. With more than 250 medals and trophies, his qualifications are obvious. Below, Capt. Flo Chesnick fires an M-60 machine gun in this year's Staff Soldiers Cup Competition hosted by a USAF unit in Germany and open to NATO. Her team of six nurses, the only USAF entry, outscored twenty-two other teams, placing fifth. Besides weapons, events included rappelling, obstacle course, rifle disassembly, and first aid.

ile development was passed with the first launches from a submarine off California. The first launch involved a fully guided land-attack test flight; the second, an antiship test flight, ended prematurely. Power loss in the missile's turbofan engine was suspected.

Died: Wellwood E. Beall, an aerospace engineer who had major roles in developing such famous aircraft as the **B-17, B-29, and Boeing 707**, in Santa Monica, Calif., in January. He was seventy-one. ■



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Our interests in the Middle East—an area outside the present boundaries of NATO—are supported by a meager US presence. Since alliance action is the name of the game today, we ought to think about . . .

CENTO and US Mideast Policy

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

A friend of mine was talking the other day about a recent visit he had made to the Middle East. The visit included a meeting with the Shah of Iran who, as is his custom, dispensed a little wisdom on the precarious nature of things in that part of the world. The essential theme of the Shah's discourse was that no nation in the Middle East, friendly to our side, could stand alone against a Soviet push. Even Iran with all its modern equipment could perform only a holding action until help came. And Iraq, that most intransigent of the Soviet Arab satellites, has the military capability to make short work of Saudi Arabia if no help were at hand.

The strange war going on between Ethiopia and Somalia is a matter of great concern to the Shah. While the Ogaden wasteland that we see on television does not seem worth fighting over, it is a war that has attracted extraordinary Soviet interest and support. The Ethiopians we trained and equipped in friendlier days were being defeated by the Somalis the Soviets trained and equipped before they were thrown out. Then the Soviets switched sides, and the Ethiopians, shored up by Russians and Cubans, now seem to be winning.

So far as the Soviets are concerned, their fickleness can be explained away easily enough: They want a base on the Gulf of Aden. Since the Somalis threw them out, what could be more logical than to go over to the side of the Somalis' enemy, Ethiopia?

A reasonable deal for all this Soviet and Cuban help would be, say, a ninety-nine-year lease on Berbera, the former Soviet base on the Somali coast, when their Cuban-reinforced Ethiopians capture it or, failing that, a base in Ethiopia. If domination of the oil-producing areas is a Soviet goal, their present activities make very good sense.

This particular scenario is one the Shah worries about. According to my friend, he does not think we worry enough. The matter of fighter airplanes for Saudi Arabia, for instance, seems to the Shah a perfectly sensible proposition. The Saudis have a stable government, they are anti-Soviet, and would seem to qualify not only as our friends, which they clearly are, but as the enemy of our enemy and, thus, an ally. Syria and Iraq, on the Saudis' northern border, are armed to the teeth with Russian equipment while we debate the wisdom of selling Saudi Arabia F-15s.

With these things in mind, it was encouraging to read Defense Secretary Harold Brown's remarks to the Los Angeles Foreign Affairs Council in February. He said, among other things, that "... the Middle East and the Persian Gulf cannot be separated from our security and that of NATO and our allies in Asia." He went on to say that we intend to safeguard oil production against interference by hostile nations. Naturally enough, he did not say how, but it is a question worth asking. We are not, after all, militarily much in evidence in that

part of the world. Nor do we have much in the way of uncommitted military resources. Our NATO obligations leave little for major contingencies. An obvious first step, then, is to trot out once more that idea of enlarging NATO's boundaries. It is an idea consistent with Harold Brown's position that NATO's security cannot be separated from the security of the oil supply. It is an idea, however, that even with the most optimistic timetable will take a long time to filter through. The danger in the Mideast appears to be more immediate. All right, let's try another idea.

There is an alliance closer at hand that might profitably be given a new lease on life. It is the Central Treaty Organization, CENTO, a cold-war survivor still in business, if not very active. Turkey belongs, along with Iran, Pakistan—troubled and remote but still a member—and the United Kingdom. We belong on a sort of observer basis with no forces committed but with some implied obligations signified by the fact that the CENTO military planning staff in Ankara always has as its chief a United States major general. Over the years CENTO has made a number of overtures to NATO for closer cooperation between the two alliances. NATO's response to these initiatives has been cool, and the cooperation thus far has been pretty superficial.

Unlike NATO, CENTO has no unified command. It is, however, an alliance, and judging from the consistent and bipartisan support NATO enjoys, alliances are a more respectable way of getting involved than going it alone. The Vietnam syndrome does not affect our NATO commitment. It seems peculiar to unilateral military propositions.

The CENTO alliance, a little torpid, perhaps, was conceived to deal with the Soviet threat, just like its famous sister alliance to the north. Before anything very productive could be done with CENTO, we would have to improve our relations with Turkey, relations that will continue to deteriorate so long as we try to pressure the Turks on the Cyprus matter. But assuming we can patch that up, CENTO might prove a very useful apparatus for a Mideast policy. It may not be much, but it's something.

Remembering my poker-playing days, something, even a pair, always beats nothing. Except, that is, when you cave in to a bluff. ■

Perspective

Comment & Opinion

By SSgt. William E. Hesselgrave, USAF, INCIRLIK, TURKEY

A View From Both Sides

Normally, an Air Force career combining enlisted and commissioned service would progress from airman to officer. I did it backwards.

Commissioned directly out of college, in the first class of Officer Training School (1959), I served fifteen years as an officer, achieving the grade of captain. I was finally forced out on my second passover to permanent major after five previous passovers to temporary major.

Offered the options of severance pay or enlistment and eventual retirement in my officer grade, I chose the latter. I was enlisted as an E-4 and am now an E-5 with two years remaining until retirement.

The transition from officer to NCO is not always a smooth one. In my case, it was smoother than I had anticipated. A positive attitude helps.

My adjustments were, for the most part, minor. There are, of course, the visual aspects such as wearing stripes instead of bars, and saluting and "sir-ing" lieutenants and captains.

Double takes due to age are common (What's with this forty-year-old buck sergeant?). Conversations often get around to: "You're a RIFed officer, aren't you?"

Answering the phone "Sergeant Hesselgrave," rather than saying "Captain Hesselgrave" requires continual concentration; it's tough to break a habit of fifteen years.

Then there's the reduced pay and allowances amounting to about forty percent of the formerly held higher grade. When your salary drops from \$20,000 to \$8,000 a year, you either have to lower your standard of living or seek supplementary income. My family of four did both.

Eight months after my enlistment, I made E-5 and my pay went up to \$10,000. This promotion is relatively easy to achieve due to the WAPS points awarded for time in grade,

which, for a prior service officer, amounts to total service time. Beyond E-5 the competition for advancement becomes exceedingly keen because time in grade is then on a par with contemporaries.

I believe it is best to change bases and enlist in a new environment. A fresh start eliminates many problems such as possible embarrassment to oneself and others, vengeful individuals, and potentially awkward situations like working for an officer you formerly supervised.

Sometimes you can read animosity in the faces of your co-workers. The major who regards RIF as a communicable disease. The staff who resents RIFed officers being allowed to enlist and compete with career NCOs for promotion. The young airman who wonders how you screwed up.

RIFed officers who enlist are loners. They are members of a minority group. They aren't officers and they aren't NCOs. Neither group can accept them. If you can hold on to your family, you're fortunate. A strong, loving wife and devoted children are definite assets.

In the final analysis, a RIFed officer makes it—with his job, his co-workers, and his family—by proving himself as a capable performer and human being.

Why am I telling my story? Despite the seeming disaster of being RIFed, there is valuable experience and insight to be gained from the situation. Prior-service officers who

have come up through the ranks have much the same insight, and I believe it enables them to be better supervisors and leaders.

I have a couple of observations to make—one to officers and one to NCOs.

Officers: One- and two-strippers are not backwoods idiots; most of them are very bright, enthusiastic, and eager to show you they can do a good job. Some of them have college courses under their belts. (You can't always equate college credits to intelligence, initiative, and common sense). And because they are, for the most part, capable, they want to be treated with respect, dignity, and humanity. I believe this now. I didn't when I was an officer.

NCOs: Second lieutenants are not backwoods idiots; most of them are very bright, enthusiastic, and eager to show you they can do a good job. Be patient with these young supervisors. They have the potential to become good leaders and commanders. You can help them develop their talents more rapidly by teaching them the ways of the Air Force, which is really nothing more than exposing them to clear methods of communication and a few well-chosen principles of human relations. After all, colleges do not provide adequate instruction in getting along with others and influencing people to do their jobs. You must fill this gap and get our future Air Force decision-makers off on the right foot.

Finally, I have an observation for supervisors and subordinates.

Supervisors like to give advice to subordinates. Much of it is very good advice. Subordinates, however, do not always like to heed advice; often, they have insufficient experience to realize that the advice is good. This situation frequently develops as a result of physical differences between supervisors and subordinates—age, sex, or color. Examples: A Caucasian dislikes working for a black; a man

HOW TO SHARE YOUR PERSPECTIVE

The purpose of this department is to encourage the presentation of novel ideas and constructive criticism pertinent to any phase of Air Force activity or to national security in general. Submissions should not exceed 1,000 words. AIR FORCE Magazine reserves the right to do minor editing for clarity, and will pay an honorarium to the author of each contribution accepted for publication.

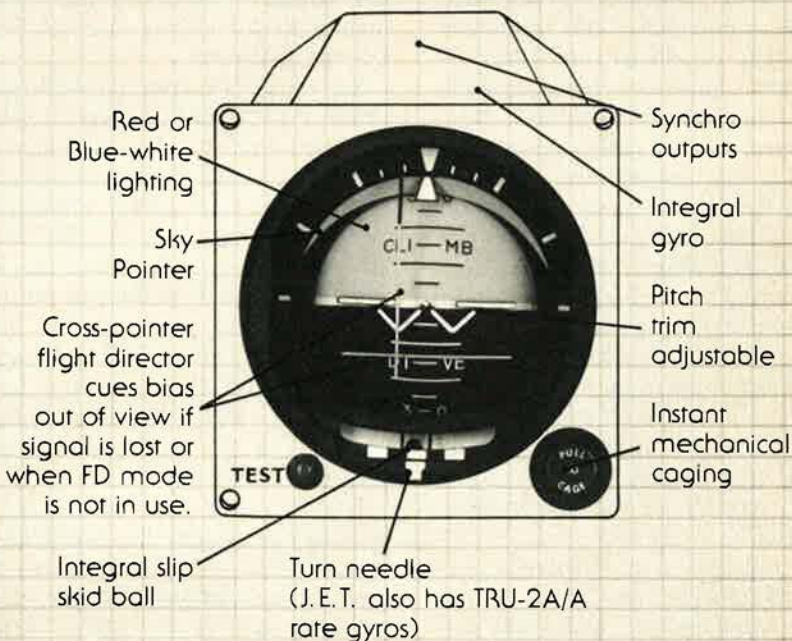
dislikes working for a woman; a young person dislikes working for an older person; a woman dislikes working for another woman, and so forth.

We've got to wake up to our biases—and we all have them. (Mine is women, but I'm starting to come out of it, thanks to Human Relations Phase Three.) No enterprise—including the US Air Force—can function effectively when workers allow petty and unalterable differences to affect job performance.

So, whether you're an officer, an NCO, an airman, male, female, under thirty, over forty—or a RIFed officer—you are a human being, as are those around you. Work with them, work for them, strengthen your job situation. Do it for all of us.

SSgt. William E. Hesselgrave (B.A., M.A., University of Michigan) is NCOIC of the Information Office, Incirlik Common Defense Installation, Turkey. A graduate of Squadron Officer School, he served ten years with AFROTC—first as an instructor at his alma mater and then as a curriculum specialist at AFROTC headquarters.

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In case of war with the Warsaw Pact, NATO's fate, most likely, would be determined in the skies above central Europe, much in the way airpower decided the outcome of the Battle of Britain. AIR FORCE Magazine reports from Europe on . . .

Airpower—NATO's Foremost Deterrent

BY EDGAR ULSAMER, SENIOR EDITOR

THERE are both pluses and minuses in the tactical air balance between NATO and the Warsaw Pact. On the minus side, "the systematic upgrading of Soviet and Warsaw Pact tactical air forces has continued. Their air defense capabilities have improved considerably. Soviet air forces in the forward area have converted from a defensive orientation to a modern conventional attack orientation to support the Pact's large mechanized forces. New aircraft have increased range, payload, and all-weather ground-attack effectiveness. . . . Contributing to the shift from defensive to offensive air capability has been increased surface-to-air missile (SAM) effectiveness, which has freed a large portion of the fighter force for offensive missions."

On the plus side, twenty-six tactical fighter squadrons and three tactical reconnaissance squadrons are stationed in Europe. "Additionally, deployment of combat-ready tactical air units from the continental United States permits quick reinforcement. . . . Significant improvements to the US tactical fighter force in Europe have occurred during the past year. Four F-111F squadrons were deployed, replacing less sophisticated F-4D aircraft. Additionally, three F-15 squadrons were deployed into the central European Region. The three F-4E squadrons that the F-15s displaced were retained in the theater. NATO's nuclear and night/adverse weather operational capability has been improved by the added F-111s, while the F-15s provide NATO with the most advanced air-superiority aircraft in the world."

These two statements on US/NATO tactical air capabilities rela-

tive to those of the Soviet bloc are from the just-released report on the US Military Posture by the Chairman of the Joint Chiefs of Staff, Gen. George S. Brown.

Secretary of Defense Harold Brown, in the FY '79 DoD Annual Report, disclosed that the Warsaw Pact is adding to its capabilities of launching nuclear or nonnuclear attacks on Western Europe that "might occur after some days or weeks of mobilization . . . but we cannot rule out the possibility that the powerful Pact forces already positioned in Eastern Europe would attack without reinforcements, and with little tactical warning, in the midst of a major East-West crisis."

NATO's response, according to Secretary Brown, is that "the United States alone plans to increase its 'heavied up' divisions to eleven of the total of sixteen regular Army divisions, acquire about 5,000 tanks and 18,000 antitank guided missiles for the Army, and purchase more than 2,000 tactical aircraft for the Air Force. Our allies, in the coming year alone, will add almost 2,000 antitank guided missile launchers and 14,000 antitank missiles to their capability in central Europe." Secretary Brown told Congress that "in FY '79, an additional squadron of F-15s and the first wing of A-10s will be deployed. The A-10 wing will be deployed under a new concept, utilizing a Main Operating Base (MOB) for maintenance and support, and forward operating locations (FOL) for daily operations. Our plans to equip the Air Force's twenty-six wings fully and to modernize its Reserves will also increase NATO's firepower." The A-10 will be assigned

to the 81st Tactical Fighter Wing, RAF Bentwaters.

The Pact Buildup

The promised boost in Alliance tactical airpower may be coming in the nick of time so far as NATO's crucial Central Region is concerned. In that area, the Pact has a four-to-one advantage in tanks and two to one in aircraft facing NATO's Allied Air Forces Central Europe, headquartered at Ramstein AB, Germany, under the command of Gen. William J. Evans, who also is Commander in Chief of United States Air Forces in Europe (USAFE). The present Pact air order of battle in the Central Region includes more than 3,000 tactical fighters and attack aircraft in the forward area, augmented by another 1,000 in the western USSR, and approximately 500 medium bombers.

Since 1969, the number of Pact combat aircraft in the forward area and three reinforcing military districts of the western USSR has increased by about ten percent. Most of the Soviet aircraft, General Evans told AIR FORCE Magazine, are capable of performing air-superiority as well as ground-attack missions. Of the more than 2,000 Pact aircraft with clear offensive capability facing the Central Region, more than half could be used for nuclear strikes.

Gains in the Pact's tactical air capabilities result mainly, however, from unprecedentedly rapid modernization of its inventory. Since 1973, there has been a complete turnover of Soviet combat aircraft in Europe, according to General Evans. Typical of the modernization and associated trend away from defensive to multirole or

purely offensive aircraft are: the Su-19 Fencer, which can carry six times the payload ten times as far as the MiG-17 Fresco can, thereby bringing even British bases within the mission radius of Soviet fighter-bombers stationed in the western USSR and Eastern Europe; and the multirole MiG-23 Flogger. About one-third of the latter assigned to Soviet Frontal Aviation are in the ground-attack configuration bearing the NATO designation of MiG-27 Flogger-D. In addition, several hundred Mi-24 Hind helicopter gunships are in the Pact's inventory and now seem to be its primary close air support weapon. USAFE experts term the Hind's capability "awesome," and stress that stopping Hind has become one of NATO airpower's more challenging tasks.

The Warsaw Pact's air forces enjoy the significant advantage of an extremely powerful air defense system made up of dense, sophisticated early warning and GCI networks that extend from the forward edge of the battle area (FEBA) to a stratified defense zone in the rear. In addition to more than 1,000 air defense fighters, there are several different SAM systems capable, in the aggregate, of launching more than 4,000 interceptor missiles without reloading. Vast numbers of antiaircraft artillery, including the highly effective ZSU 23-4 short-range air defense weapon, provide dense air defense coverage at low altitudes. The practical meaning of the Pact's lead in air defense capabilities is of major importance: The

Pact's Ground Forces are becoming less and less dependent on the Soviet Air Forces for protection, with the result that more and more of the new Soviet multirole aircraft could be released for offensive missions.

Electronic and Chemical Warfare

Two other key areas that warrant major concern, according to Lt. Gen. John W. Pauly, USAFE's Vice Commander in Chief, are Soviet chemical warfare (CW) and electronic warfare (EW) capabilities. On both counts, he said, "we have failed for so many years to give sufficient priority to these functions that we now have to play catch-up ball." There is evidence that the Soviets have an air-deliverable chemical warfare capability, involving aircraft and missiles. As a result, hardening and protecting NATO bases, aircraft, and crews to provide both survival *and* the ability to fight in a CW environment are considered imperative by USAFE.

USAFE planners expect the Soviets to capitalize on the asymmetry in EW, in the main ECM (electronic countermeasures) capability both in support of their forces and as an offensive capability. ECM tactics are practiced and refined regularly in the forward area. In the initial phases of conflict, the Pact presumably would use both ground and airborne ECM to screen mobilization activities and the arrival of reinforcements. Chaff, noise, and jamming would be applied from a standoff position as well as by penetrating aircraft. More than 100 medium bombers equipped for

support jamming are available to augment the organic ECM capabilities—such as ECM pods—of the penetrating strike force to blind NATO's command and control.

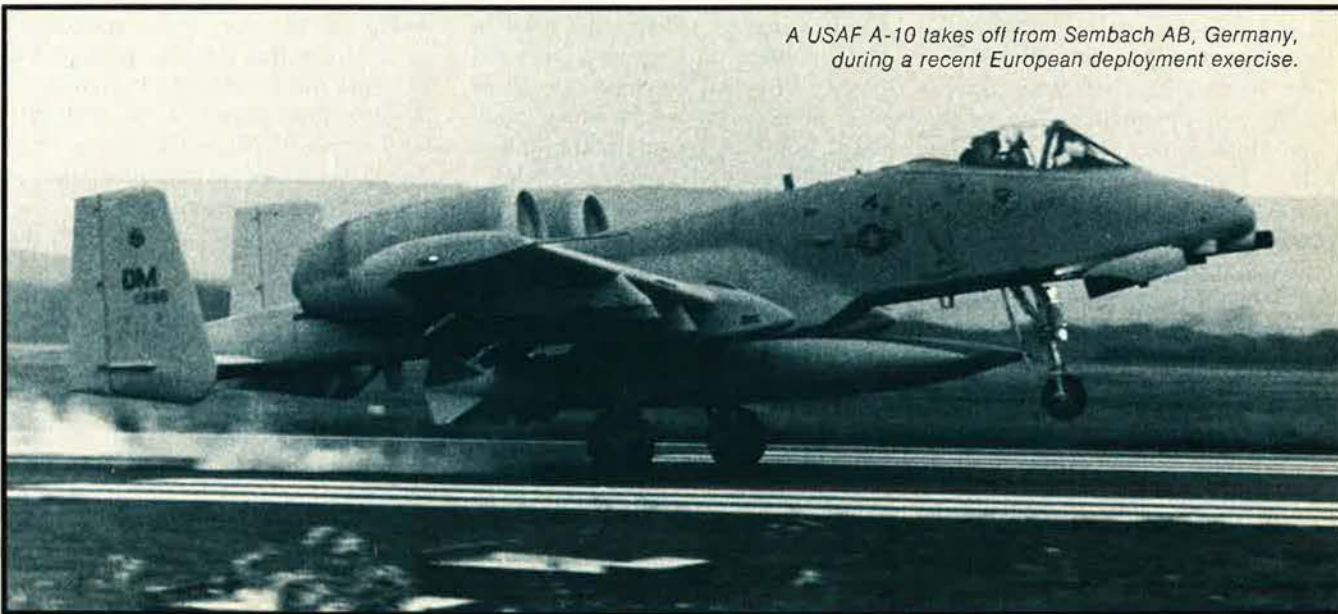
General Evans plans to counter Soviet EW capability in part through "procedural means, by how we apply NATO airpower and project our force with a reduced need for communications. At the same time, though, we must use technology in hand to create an AJ [antijam] command and control system that is impervious to that threat." USAFE's Project Creek Braille, he said, is designed to cut as much nonessential communications traffic from current force execution procedures as possible. Pivotal requirements to help offset the Soviet EW lead are the EF-111A tactical support jammer and the E-3A AWACS, according to General Evans. "It would be next to impossible to overstate their importance to NATO," he explained.

The E-3A, equipped with the joint tactical information distribution system (JTIDS), can provide a survivable command and control backup as well as a jam-resistant digital link augmenting the ground environment. The vast masking power of the EF-111A is essential for operations along the FEBA as well as in support of penetrating strike forces—both extremely critical requirements.

Pact Aircrew Training

There is increasing concern on the NATO side about rapid Soviet progress in "smart-weapons" technology.

A USAF A-10 takes off from Sembach AB, Germany, during a recent European deployment exercise.





Above: MAC's C-130s and C-141s are used to airlift people and material within the European theater. Right: F-5E Tiger II aircraft provide dissimilar aircraft training for USAFE crews.

Smart sensors, General Evans told *AIR FORCE Magazine*, are being used by the new, third-generation Soviet tactical aircraft as well as on new air-to-air and air-to-ground missiles. Both the Su-19 Fencer and the MiG-27 Flogger-D are equipped with laser designators for rangefinding and ordnance delivery. There are indications that the Soviets are also working toward "smart" EW capabilities, although not as rapidly as USAF. Secretary Brown reported to Congress that the state of Soviet avionics and electronic countermeasures technology—as reflected by the MiG-23s and -27s, Su-17s, and Su-19s—appears to be on a par with the F-4.

The Warsaw Pact's theater reconnaissance, in the main, is provided by the Mach 3-plus MiG-25B and D Foxbats, equipped with SLAR (side-looking airborne radar), that because of their high-speed, high-altitude capability are probably immune to most NATO interceptors. Space-based systems work in concert with Foxbat. Battlefield reconnaissance is performed by several Soviet aircraft, principal among which is the MiG-21 Fishbed-H. Late-model reconnaissance aircraft reportedly are equipped with television downlinks to provide real-time intelligence for ground commanders.

The vulnerability of Soviet tactical



air forces in Eastern Europe is being reduced significantly through construction of large numbers of hardened aircraft shelters at the Pact's main bases. At the same time, the increased range of the new Soviet combat aircraft reduces the need to station them at exposed forward bases. Dispersal to highway strips near main bases is still being practiced, however, to retain the option of emergency recovery. Reduced Soviet reliance on dispersal bases might curtail NATO's strategic warning, since massive Pact deployment to these bases used to be counted on for warning.

At least as important as hardware quantities and qualities are the qualities and training of the Pact's aircrews. General Evans believes strongly that "our training is more thorough than theirs. In addition, we are keyed to central control but decentralized execution with the result that our pilots are trained to be more

flexible and to exercise their individual prerogatives and initiatives to fit the given situations they may encounter. The Soviets, by contrast, still tend to retain control and execution at higher levels. As of late, however, we do see some movement away from this rigidity, presumably because the Soviets are beginning to realize that retention of authority and responsibility at the highest level could create an environment that is susceptible to disruption."

Recent changes in training, he added, probably are necessitated also by the Pact's shift toward offensive air warfare that requires the crews to operate more independently and outside of the Pact's radar net. Soviet tactics, doctrine, and training for operations within their ground control intercept (GCI) net—rated by NATO experts as complex, well integrated, and highly effective—capitalize on this investment. The end effect, in the view of NATO's analysts, is a

system that will work well as long as the NATO forces can't degrade the radar net. But the EF-111A, currently in prototype development and test, is tailor-made for the disruption and blinding of GCI nets.

New Soviet aircrew training and tactics, overall, tend to move closer to USAF's, according to General Pauly: "We see the evolution of a program that steps up tactical training as opposed to nonproductive training. They spend more and more time on the ranges, and training emphases appear to be related to the conversion to new aircraft." The focus on ground-attack training by the dual-capable aircraft is pronounced, he added.

Permeating all recent changes in Pact airpower is a reorientation toward sustaining air operations over prolonged periods—probably over a month—instead of the previous short-duration blitzkrieg posture, General Evans observed. An associated change, he said, is the emphasis on conventional warfare capabilities, with less than "total dependence on tactical nuclear forces. The application of conventional airpower seems to be projected against the background of the nuclear capability. This factor influences tremendously how the Soviets deploy and employ their forces since they realize that we have formidable theater nuclear forces, in addition to the strategic deterrent capability."

Airpower: NATO's First Line of Defense

While NATO's airpower at the outbreak of conflict probably would be outnumbered two to one, reinforcements from the US and elsewhere could narrow considerably—although not bridge—the numbers gap within a few days. The opposite condition is likely to obtain for ground forces. The Pact's lead in the number of combat divisions is likely to widen significantly beyond the initial two-to-one ratio during the first few days of conflict. (Soviet armored and mechanized divisions are smaller in manpower than US equivalents, but their armored divisions have as many tanks as similar US divisions, and their mechanized divisions nearly twenty-five percent more tanks.) The obvious concomitant is that air support must be

Allied Air Forces Central Europe

Allied Air Forces Central Europe (AAFCE), headquartered at Ramstein AB, Germany, was established in 1974 as one of NATO's major air commands. The command is an element of Allied Forces Central Europe (AFCENT) and consists of the 2d Allied Tactical Air Force at Moenchengladbach and the 4th Allied Tactical Air Force headquartered at Ramstein. AAFCE is commanded by Gen. William J. Evans, who also serves as Commander in Chief, United States Air Forces Europe (USAFE), headquartered at Ramstein AB. The AAFCE Commander assumes operational command of the two ATAFs in case of war, but in peacetime his role is confined to planning and standardization of training, procedures, and tactics.

Second ATAF, commanded by RAF Air Marshal Sir John Stacy, includes units from the German, Belgian, and Netherlands Air Forces, the RAF, and USAFE's 32d Tactical Fighter Squadron at Camp New Amsterdam, Holland. Fourth ATAF, headed by Lt. Gen. Carl-Heinz Greve of the German Air Force, is made up of units from USAFE, the German Air Force, and the Canadian Forces.

brought to bear fast and furiously, or else a quick, catastrophic defeat of NATO's outnumbered ground forces becomes a distinct possibility.

Arguing from this relatively safe premise, NATO airpower leaders make a number of predictions about the jobs airpower might be called on to carry out and about the fine line between success and failure. Given Soviet airpower's numerical lead, the instant and primary need is to "attrit" it as rapidly as possible in order to gain air superiority and thus be able to reassign, or "re-role," dual-capable aircraft. But there are imponderables. The initial, crucial contest for air superiority, most likely, will have to be fought with "in-place" forces. "Our ability to concentrate on the air-to-air mission—in order to gain early dominance over the opposing, numerically superior force through high sortie

rates and better kill ratios—is sensitive to the Army's ability to blunt the Pact's initial armored thrust. If the Army, at that time, doesn't need too much help, I can re-role the NATO air force, such as the F-4 squadrons, to the pure air-to-air role. But if the integrity of the ground force is jeopardized, then we would have to support it with a portion of NATO's air-to-air capability and thereby degrade it," General Evans told AIR FORCE Magazine. The latter condition would prolong the battle for air superiority and, conceivably, could lead to unfavorable attrition rates, and, by extension, to the inability to adequately support the ground forces.

It takes little more than a back-of-the-envelope calculation to conclude that the success of an air campaign under these conditions hangs by a perilously thin thread. Anything less than kill ratios close to the best achieved in USAF's history and an equally prolific sortie rate might spell failure. The same is true for management of the force. As General Pauly put it, "Every sortie we put up must be as effective as we can make it. For this we need finely honed readiness and efficient management which are tied closely to improvement of our command control and communications and intelligence capabilities. Fortunately, General [Alexander M.] Haig's [Supreme Allied Commander, Europe] call for C³ improvements and interoperability has drawn enthusiastic response throughout NATO and is showing results."

Security and Logistics

Clearly the ability to generate and sustain high sortie rates requires, among other factors, secure basing and the ability to turn around (service, refuel, and rearm) aircraft quickly. According to DoD's Annual Report, the program to construct shelters in Europe has "been accelerated, in part in recognition of NATO's willingness to share the costs of the program. To date, 779 aircraft shelters have been built or funded; they will protect most of our in-place, dual-based, and rapid-reactor aircraft assigned to Europe." By 1983, additional numbers of shelters are to be constructed, according to the FY '79 Defense Report. Other



A forward air controller, working with US Army personnel, requests an air strike against a simulated target. Right: During the 1977 REFORGER exercise, a C-141 StarLifter delivers NATO troops to Schiphol Airport in Holland.



plans call for constructing alternate runways, and providing rapid runway repair capabilities, hardened support facilities, and protecting personnel from chemical-weapons attack. Separate programs by other NATO countries parallel the US efforts, according to DoD.

Perhaps even more important is the collocated operating base (COB) concept that will reduce the long-standing problem of augmentation forces overloading bases and creating lucrative targets for Soviet airpower. General Evans ranks the COB concept—developed by USAFE to ease overcrowding of bases by USAF augmentation forces in wartime or during crises through diversion to other NATO air bases—among his top priorities. “This approach permits broad dispersion of our aircraft and reduces the number of aircraft per airfield, which of itself represents an excellent form of hardening.” A fringe benefit of COB is the impetus it provides for integration with other NATO air forces (nine European nations plus Canada). Arrangements for COBs are in effect with ten NATO nations and involve more than fifty bases. Some modification of support facilities at COBs is required and in progress.

Hand in glove with COB is a

NATO-wide program to enable bases operated by one NATO member to recover and service aircraft of another member’s air force. Considerable progress has been made, but major hurdles remain. The basic challenge, according to Maj. Gen. Billy M. Minter, USAFE’s Deputy Chief of Staff for Logistics, is the wide variance in available resources and services at individual locations, compounded by lacking standardization of weapon systems.

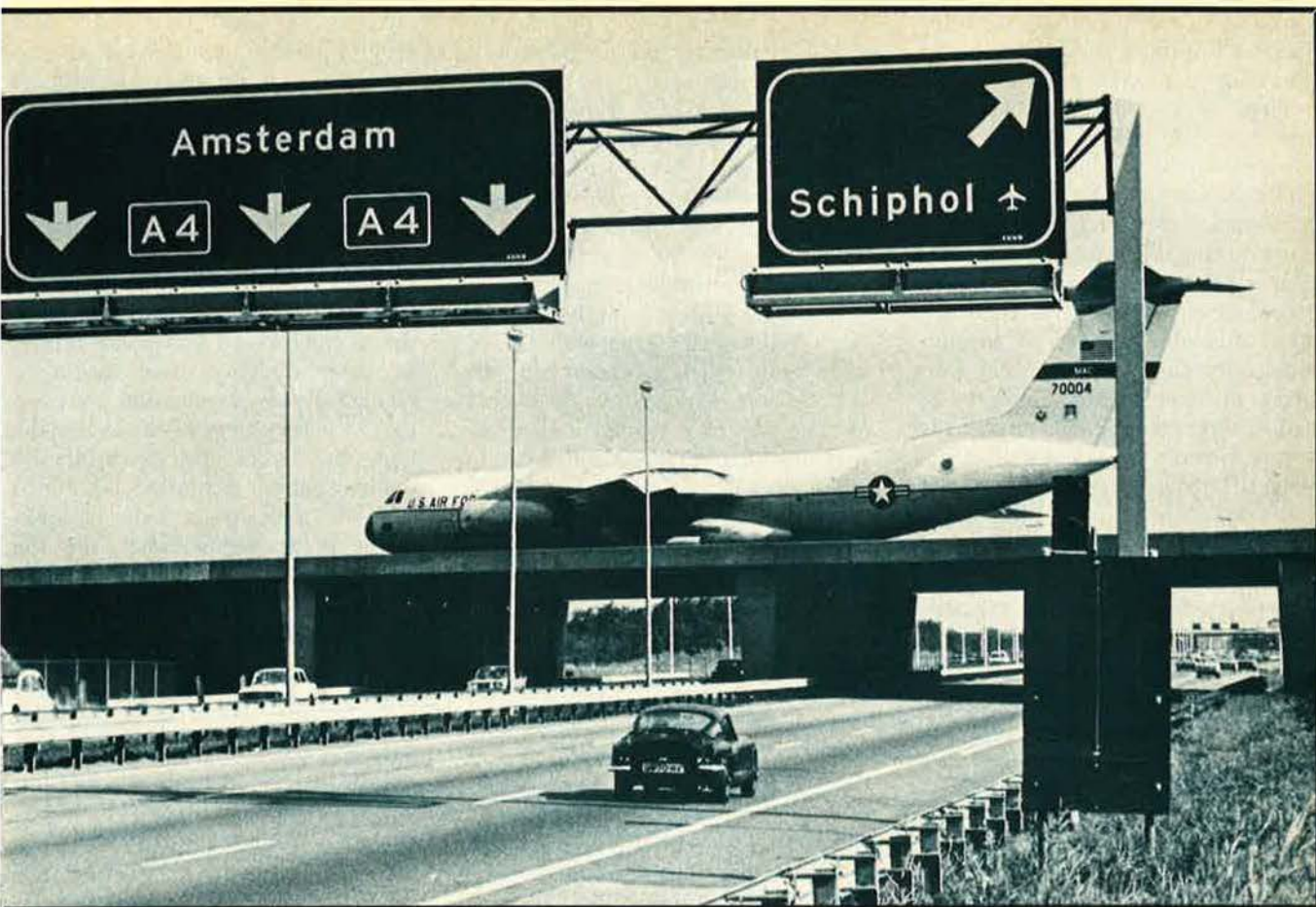
A key requirement is standardization of fuel, which is being tried first with British F-34 fuel, referred to by USAF as JP-8. Its flashpoint is higher than USAF’s JP-4 fuel. This reduces the risk of fire caused by enemy attack but, according to General Evans, has created some concern about the fuel’s air-start capability—that is, how readily USAF engines that have flamed out in flight will restart when using JP-8. Recent tests of adjusted F100 engines that power the F-15 and F-16 suggest that the problem can be solved, he added.

The advantages of standardizing on JP-8 are major, according to General Minter, aside from simplifying logistics. European refineries produce mainly JP-8, but not much JP-4. This would be a far-reaching advantage in wartime.

Provisions for reloading with standardized munitions—including air-to-air and air-to-ground weapons—at non-USAFE bases are being made. “The whole area of cross servicing and standardization has the potential for great payoffs from relatively small investments. The idea is not for individual member countries to use just one type of weapon and curtail their industrial capacities; the objective is to find the means for mating subsystems. If a USAFE aircraft recovers at a Belgian base, for instance, we wouldn’t expect the Belgian air force to carry our ammo, but we want to be able to use theirs. NATO plans to continue a reasonable munitions mix for the simple reason that standardization on just one set of ammo might make it easier for the Soviets to find ways of countering it,” General Evans said.

The Crucial Importance of Warning

Even though the Pact forces would enjoy significant numerical preponderance from the outset, it is not likely that they would launch an attack on



NATO without observable massing of both ground and air forces, coupled to an appreciable increase in C³ traffic. "We have a rather elaborate warning system that draws on a variety of indicators. By fusing them, we are confident we have a good idea of the Pact's status," General Evans pointed out. General Pauly conceded that the Soviets could launch a surprise attack, but in so doing would dangerously degrade their capabilities. A massive attack, he suggested, would entail about one to two weeks' preparation, and "less than halfway down the road we would certainly spot this activity. We don't believe that the Pact forces would gain much from masking an attack behind field maneuvers because we never take it for granted that they are in an exercise mode, and we focus our keenest attention on these events."

General Brown's Military Posture report to Congress concludes that "although not the most likely eventuality, the Warsaw Pact can attack Europe without waiting for reinforcements from the USSR. Such an attack would offer NATO only brief

warning and could place US and NATO forces in Europe at a distinct disadvantage. But an unreinforced attack is a high-risk venture for the Warsaw Pact from several points of view, not the least of which are a lower level of combat capability in the initial attack, less sustainability for attacking forces, the possible loss of undeployed forces en route to support the attacking forces, as well as the increased possibility that one side will be forced to consider early use of theater nuclear weapons."

For these reasons, most NATO commanders are confident that the Alliance will have probably between five and seven days of warning, with two days considered the rock-bottom minimum, even if the Pact were to attack without Soviet reinforcements. Whether the available warning time will be used effectively to deploy, mobilize, and reinforce the NATO forces, General Brown suggests, will depend on the "political decisiveness and resolve of the NATO members."

Based on frequently published Soviet descriptions of their offensive doctrine, NATO intelligence analysts

believe that an attack on Western Europe would involve an amalgam of several tactics, probably applied in sequence.

Probably the most trusted Soviet tactic harkens back to massive World War II breakthrough operations with regional ground and air advantages of at least four to one. Several massive probes would be launched at the same time, with large reserve forces standing by to be rushed to the area where the first breakthrough is achieved.

The next phase, the so-called "daring thrusts," would consist of multiple attacks across a broad sector to isolate Western forces in regimental-size action. This tactic would avoid massing, and by enmeshing NATO forces with Pact troops would make it difficult for the Alliance to use theater nuclear weapons. Thrusts of this kind would probably be augmented by larger forces, relying on the same principle of dispersion, but penetrating deeper into NATO territory.

There is consensus on the Western side that NATO's airpower is the

tool best suited for coping with any one or all of these tactics, AIR FORCE Magazine was told repeatedly.

There is also no room to doubt that the E-3A AWACS can provide a quantum jump in three capabilities, which in combination are likely to determine the Alliance's fate, especially during the initial phase of a Pact attack: warning and intelligence; force management and sortie rates; and effective use of the air-superiority forces. The recent purchase of nine Nimrod aircraft by British forces dealt NATO's plans to standardize on the US system a significant setback.

The Need to Reinforce

Initially, the NATO/Warsaw Pact airpower equation pits the former's qualitative advantage against the latter's lead in numbers. But it is problematical whether, without reinforcements, a smaller force that is charged both with providing air superiority and supporting the ground forces could endure when opposed by air forces that can concentrate on attrition. According to General Brown, "the effectiveness of US forces in early combat is . . . in large part a function of the amount of reinforcement that can be brought to bear early. At present, one ground division and forty Air Force squadrons can be deployed to reinforce in Europe within ten days of a decision to do so. Current efforts are to increase that early reinforcement to five divisions and sixty squadrons by 1983." Within a month, according to Secretary Brown's report to Congress, more than 2,000 fighter/attack aircraft could reinforce NATO's air forces at present, with yet greater capabilities scheduled for the coming years.

A system of pivotal importance to reinforcement and force augmentation, according to General Evans, is ATCA, the advanced cargo/tanker aircraft. "Whether you emphasize the 'T' or the 'C' in ATCA, we here in Europe depend on augmentation. And the only way we are going to get augmentation in a timely way is to have cargo airlift and tankers to get the fighters and transports over from the US. As a highly capable tanker, ATCA is not only vital in the deployment role but also, once it gets here, in terms of the capabil-

ity for sustained action that it provides for our fighters. It enables us to go farther and stay airborne longer, all of which translates into improved flexibility so far as timing is concerned. Also, we definitely count on ATCA to add to the survivability of our forces since it increases options for dispersal, a key factor in survivability."

The Air Force recently selected the McDonnell Douglas DC-10 wide-body trijet to serve in the ATCA role. Approximately twenty aircraft will be procured and modified. The first ATCA is scheduled to reach operational status in FY '81. The aircraft will be able simultaneously to refuel deploying fighters and transport the materials required for the fighters to be operational upon arrival. ATCA can offload more than twice the fuel of a KC-135 at 2,000 miles of range and five times as much at 3,000 miles.

Also of major importance for rapidly augmenting NATO forces, according to General Evans, are other Air Force programs that complement ATCA. Among them are a wing modification to assure the C-5's continued availability; stretching the C-141 to double its volumetric capacity and also make possible increasing payload, when moving tactical air units to Europe, from about sixteen short tons to full lift capacity of thirty-two tons; and the Civilian Reserve Air Fleet (CRAF) modification program. Of the 128 CRAF cargo aircraft, only thirty-four are wide-body DC-10 or B-747 freighters or convertible passenger/freighter aircraft. Present plans call for modifying eighty-seven 747 and DC-10 aircraft by adding cargo nose or side doors. The Joint Chiefs of Staff, according to General Brown, continue to view such a measure as the "most useful and cost-effective method for expanding the airlift mobility force. Our NATO allies are considering the possibility of a similar program and are monitoring our progress very closely."

The Air Munitions Challenge

High sortie rates, COBs, and the array of other measures tailored to improve NATO's chances in the initial air campaign could be thwarted if the Western force runs out of air munitions early on. "An

increase in war reserve air and ground munitions in Western Europe is now in progress, but more is required to bring these now-deficient reserve stocks up to the required level of fill," according to General Brown.

The present shortages, largely a function of lagging production rates so far as air-to-air munitions are concerned, probably can't be corrected fully in the immediate future. In acknowledging these shortages, General Evans pointed out, however, that "the versatility of the F-15—the fact that it is such a brilliantly maneuverable platform combined with its look-up as well as look-down radar—compensates for the shortfalls somewhat. The F-15 can get by with just its gun if it has to."

There is no shortage of gun ammo, but obviously the kill potential of the F-15 is reduced if the aircraft is deprived of its standoff all-weather AIM-7F Sparrow missile. Although now operational, this improved missile is in short supply. The FY '79 budget provides for buying 1,600 AIM-7Fs for both the Navy—its developer—and the Air Force. Efforts to increase the Air Force's share of the procurement are under way in the Pentagon.

A secondary problem affecting munitions stockpiles in NATO, AIR FORCE Magazine learned, stems from limited storage facilities as well as the concentration and vulnerability of such stores. Most other NATO air forces are thought to have fewer airborne intercept missiles than USAF. With the number of Pact aircraft available for the air-superiority role, the consequences of this deficiency, if allowed to persist, could be tragic.

The level of air-to-ground (AGM) munitions is sparse but adequate to support both the in-place and expected augmentation forces for a reasonable length of time. Whether or not the well would run dry before the Pact's stores are used up is not known, and probably not decisive. Replenishment of stores from the US probably could be expected before the local supply was exhausted, if such a conflict lasted that long. (*How NATO and USAF plan to meet the Pact's airpower challenge will be dealt with in a subsequent AIR FORCE Magazine report.*) ■

Compensation and the Military Institution

THE military compensation system has been scrutinized in a seemingly endless series of reports, hearings, and commissions. With the advent of the all-volunteer force—now in its sixth year—the underlying premise of the military organization along with its compensation system has come under redefinition. Cost-benefit analyses—themselves part of the redefining process—have dominated the debate on military compensation. Yet this mode of analysis, not always persuasive on its own terms of measuring cost efficiencies in military manpower, can be faulted on grounds of ignoring institutional considerations. This article examines how compensational issues bear on national security and the institutional integrity of the armed forces. In what ways is military service distinct from the occupational world of the civilian economy? Does the form of compensation have organizational outcomes separate from the total amount of compensation? Econometrically based studies tend not to ask these kinds of questions, but we must ask them.

An Institution or an Occupation?

Clearly discernible trends indicate that the American military is moving from an institutional form to one more and more resembling that of an occupation. Such a development is neither desirable nor inevitable. But only recognition of the occupational ascendancy can focus attention on measures to reverse it. The armed forces, moreover, have had and will continue to have elements of both institution and occupation. Distinguishing between the two is useful in understanding why compensation is an integral definer of military service. Even though terms like institution and occupation can be overdrawn, they do contain distinctive core con-

notations. These distinctions can be described as follows:

An *institution* may be defined in terms of values and norms; *i.e.*, a purpose transcending individual self-interest in favor of a higher good. Members of an institution are often seen as following a calling. They are commonly viewed, and regard themselves, as being different or apart from the broader society. To the degree one's institutional membership is congruent with notions of self-sacrifice and primary identification with one's role, it will usually enjoy esteem from the larger society. Although remuneration may not be comparable to what one might expect in the economy of the marketplace, this is often compensated for by social benefits associated with an institutional format, as well as psychic income. When grievances are felt, members of an institution do not organize into interest groups. Rather, if redress is sought, it takes the form of "one-on-one" recourse to superiors, with implications of trust that the institution will take care of its own.

Military service traditionally has had many institutional features. One thinks of the extended tours abroad, the fixed terms of enlistment, liability for twenty-four-hour availability, frequent movements of self and family, subjection to military discipline and law, and inability to resign, strike, or negotiate over working conditions. It is also significant that a paternalistic remuneration system has evolved in the military corresponding to the institutional model: compensation received in noncash form (*e.g.*, food, housing, uniforms), subsidized consumer facilities on the base, payments to service members partly determined by family status, and a large proportion of compensation received as deferred pay in the form of

One of the country's leading military sociologists examines the trends that have been moving the US military from an institutional to an occupational outlook, and analyzes the related impact of various compensation proposals.

BY CHARLES C. MOSKOS, JR.

“ . . . a salary system would set up an employer-employee relationship at variance with prevailing military norms.”

retirement benefits. Moreover, unlike most civilians for whom compensation is heavily determined by individual expertise, the compensation received by military members is primarily a function of rank, seniority, and need.

An *occupation* may be characterized in terms of the marketplace; *i.e.*, prevailing monetary rewards for equivalent competencies. Supply and demand are paramount. In a modern industrial society, employees usually have some voice in determining salary and work conditions. These rights are counterbalanced by responsibility for meeting contractual obligations. The cash-work linkage emphasizes a *negotiation* between individual and organizational needs, in contrast to the institutional ethic where individuals conform to organizational imperatives. The occupational model implies priority of self-interest rather than that of the employing organization. A common form of expressing employee- or self-interest in industrial—and increasingly in public—occupations is the trade union.

Traditionally, the military has sought to avoid the organizational outcomes of the occupational model; outcomes that blur the primacy of national security. This in the face of repeated recommendations of governmental commissions that the armed services adopt a salary system which would incorporate all basic pay, allowances, and tax benefits into one cash payment, and which would eliminate compensation differences between married and single people, thus conforming to the equal-pay-for-equal-work principle of civilian occupations. To be sure, even in the conventional military system there has been some accommodation to occupational requirements. Special supplements have been needed to recruit or retain highly skilled enlisted

people as well as doctors. Nevertheless, a salary system would set up an employer-employee relationship at variance with prevailing military norms. It would also fundamentally alter the view that military service is essentially noncomparable with civilian work.

Though not the first move toward an occupational model, the end of the draft provided visible impetus in that direction. Selective service was premised on the notion of citizen obligation, with concomitant low salaries for junior enlisted men. Even though the Army was the service most directly reliant on the draft, it is estimated that in the peacetime years of the late 1950s and early 1960s about forty percent of all Air Force and Navy “volunteers” were draft motivated. It was the occupational model, on the other hand, that clearly underpinned the philosophic rationale of the President’s Commission on an All-Volunteer Force (“Gates Commission Report”) in 1970. Instead of a military system anchored in the values of an institutional calling—captured in words like “duty,” “honor,” “country”—the Gates Commission explicitly argued that primary reliance in recruiting and maintaining an armed force should be on monetary inducements guided by marketplace conditions. Subsequent reports have seconded that philosophy. The 1977 Rand study entitled *Military Manpower and the All-Volunteer Force* epitomized this view of the military as an occupation. That study advocates recruitment and retention policies by which military compensation is calibrated to supply-and-demand variables in the civilian economy.

Actually, the move toward linking military compensation with the civilian sector preceded the all-volunteer force. It is worth remembering that from 1952 to 1964 military pay for

the first two years of service did not rise at all! Since 1967, however, military pay has been formally linked to the Civil Service and thus, indirectly, to the civilian labor market. From 1964 to 1974, average earnings in the private sector rose fifty-two percent, while regular military compensation—basic pay, allowances, tax advantages—rose seventy-six percent for representative grade levels such as lieutenant colonels and master sergeants. Even more striking, recruit pay from 1964 to 1976 increased 193 percent in constant dollars (from a base that was far below civilian standards), compared to ten percent for the average unskilled laborer. Indeed, the Rand report, cited above, concludes that career military personnel are now better paid than their civilian counterparts.

A shift toward the occupational model implies organizational consequences in the social structure of the armed forces. One change, in particular, has received widespread attention: the possibility of military unionization—barely more than a remote thought just a few years ago. Today, there are signs that it could happen. Reliance on supply-and-demand analyses and monetary incentives to recruit and retain military members is quite consistent with the notion of trade unionism. In 1977, however, the Department of Defense issued a directive that, while not banning unions outright, forbade any union from engaging in collective bargaining or job actions on a military installation. Additionally, bills have been introduced in recent congressional sessions that prohibit any attempts to organize the armed forces. To make military unions illegal, however, may unwittingly push organizing activities away from mainstream unions toward more politicized groups that see themselves as a continuation of the troop dissent

“... high pay motivates less qualified youth... to join the services, while having a negligible effect on more qualified youth.”

movement during the Vietnam War years. It would seem a fair judgment that developments of 1977 have only temporarily capped rather than halted the trend toward military unionization. The underlying dynamics of the trend toward occupationalism must still be reckoned with.

Termination of the draft, linking military pay with civilian rates, the reliance on monetary incentives, the possibility of military trade unionism, are only some of the changes in the contemporary military system. Other indicators are: unacceptably high rates of enlisted attrition (the services are willy-nilly backing into a form of indeterminate enlistments), the separation of work and residence locales, legal decisions narrowing the purview of military jurisdiction, court acceptance of standard contract principles in enlisted litigation, the growing tendency for military wives to define their roles as distinct from that of the military community, and the increasing reliance on contract civilians to carry out tasks hitherto within the domain of uniformed service personnel.

To describe the armed forces of the United States as shifting from an institutional to an occupational base can be criticized as presenting too monolithic a picture of trends. These trends can be reversed by program actions, and there are, of course, always countervailing forces in effect. But the institution vs. occupation dichotomy allows us to grasp the whole and to recognize the salient facts. In this way, proposed changes in the military compensation system can be appraised as to whether they accelerate or retard the trend toward occupationalism.

Compensation and Institutional Considerations

Military compensation blurs not only the so-called “X” factor—the

unusual demands of service life—but the corporate whole of military life. The military institution is organized “vertically,” whereas an occupation is organized “horizontally.” People in an occupation tend to feel a sense of identity with others who do the same sort of work, and who get about the same amount of pay. In an institution, on the other hand, it is the organization where people live and work that creates the sense of identity that binds them together. In the armed forces, being part of the service has been more important than the fact that military members do different jobs. The organization one belongs to creates the feeling of shared interest, not the other way around. The sense of community in the military thus runs up and down, not sideways, as in civilian society.

From this perspective we can appreciate the institutional ramifications of three key compensation issues: a military salary system, service entitlements, and the “competitive” pay model.

• **A Military Salary.** Four reasons are usually given to explain why a single, fully taxable military salary ought to replace the present system of basic pay, allowances, and entitlements. The first is that a military salary system is simple and improves the visibility of military pay, much of which is underestimated by service members. Second, and related, is the view that a more visible compensation system will aid recruitment efforts in the all-volunteer era. Third, it is argued that by having such a large share of the total compensation package taken up by entitlements, military benefits have become a target of civilian critics. Fourth, a salary system would be more equitable in the sense of providing equal pay for equal work with no bias in favor of married persons. Each of these arguments becomes less per-

suasive when examined in terms of institutional impact.

The data at first glance seem to support the proposition that military members undervalue the worth of their regular military compensation. But, and this cannot be overstated, the evidence also shows that longer-term service personnel have a better estimation of the actual worth of their compensation than do those in their early years of service. The point here simply is that when looking at those most committed to the military institution, discrepancies between perceived and actual compensation are least apparent. Moreover, how does one calculate, to use a mundane example, the institutional reinforcement of shopping at the commissary once a week over closing the commissaries but with a salary increase that matches previous commissary savings (assuming, by no means a surety, such a salary adjustment would occur)?

A large increase in military pay to recruit the all-volunteer force was a principal recommendation of the Gates Commission. A logical extension of this rationale is that by making cash incentives more explicit, a military salary system would make matters easier for recruiters. More visible pay can be a double-edged sword, however. Surveys show that high pay motivates less qualified youth (*e.g.*, high school dropouts, those with poor grades) to join the services, while having a negligible effect on more qualified youth. In fact, better qualified youth—the presumed target of all-volunteer recruitment—have a higher estimate of military compensation than do lesser qualified youth.

That a military salary would be more defensible to civilian critics than the present compensation system has only surface plausibility. That kind of criticism will become

Dr. Charles C. Moskos, Jr., Professor of Sociology at Northwestern University, is largely responsible for focusing attention on the institutional/occupational dichotomy that has beset US armed forces in recent years. He has written many articles and several books dealing with sociological problems relating to the military. Dr. Moskos gratefully acknowledges partial support from the Air Force Office of Scientific Research during preparation of this paper, and stresses that he is solely responsible for all interpretations and findings.

telling only when the armed services are publicly redefined as an occupation rather than an institution. A military salary system, in effect, has something of the self-fulfilling prophecy about it. In point of fact, it has been the recommendations of official commissions and government-funded studies that have generated most of what support there is for a salary system. It is very possible, moreover, that if service salaries were to become more visible there would be more critical public attention on military compensation than there is now.

A hallmark of the military organization is that it pays people partly on the basis of need rather than exclusively for the job they perform or the rank they enjoy. Military members with dependents receive greater proportional benefits than those who are single. Precisely because this contrasts with the equal-pay-for-equal-work formula of civilian employment, extra compensation based on need signals an institutional concern for its membership, a strengthening of the vertical aspects of the military system. This is most manifest in government housing, which anchors families of the career force in the military installation. Proposals for a "fair-market rental" system would cause net losses for married members now living on base and surely lead more families off base in those areas where local housing is available, thereby weakening the cohesion of the military community.

The special system of compensation for married personnel grew out of two social facts: the unusual demands of family life in the military, and the predominance of single men in the lower enlisted ranks. In the all-volunteer force, the former but not the latter is true. Since the end of the draft there has been an in-

crease in the recruitment of young men who have wives or who will marry soon after joining. This poses considerable new budgetary costs (as well as social costs) for the armed forces. Rather than pursuing the will-o'-the-wisp of "equity" by entirely abandoning compensational features that recognize need as a variable, it would be more institutionally supportive to consider innovations that would reduce the proportion of married young servicemen by attracting youths who reflect the national trend toward later marriage.

• **Service Entitlements.** Nothing has caused more malaise within the military community than actions and proposals to eliminate a host of military entitlements, *e.g.*, subsidies for commissaries and exchanges, health care for dependents, government housing, and major restructuring of the retirement system. The concern with "erosion of benefits" is understandable because nonpay elements make up a much larger share of military compensation than in most civilian compensation packages. Not so well understood is that some of the institutional features of the military system may have been traded off for the relatively good salaries enjoyed by military personnel in the all-volunteer force. A kind of "devil's bargain" may have been struck inadvertently when pay rates were geared to comparable civilian levels. There is little likelihood that service entitlements can be maintained at past levels if military salaries are to be comparable with civilian scales. Current dissatisfaction is great precisely because, while the military organization has moved in the direction of the occupational model, much of its membership harkens to the social supports of the older institutional format.

A root feature of career military compensation is the system of de-

ferred remuneration after active duty. No other entitlement goes as far in recognizing the unique demands of the military institution: the relentlessness of operational requirements, appallingly long hours, family separations, frequent relocations. All this is above and beyond the dangers inherent in military maneuvers and actual combat operations. It is unfortunate that this system of deferred compensation is referred to as retirement benefits. It would be better to think of it as a kind of retainer for past servitude. How many service persons actually "retire" on their post-active-duty military compensation? Even though it is highly unlikely that there will be any major change in retirement entitlements for presently serving career persons, the negative vibrations—"You can't tell what they might do next"—coming from career military members has a corrosive effect on the institutional commitment of first-term personnel.

It is also very important to rethink the conventional wisdom that increasing the proportion of career personnel in the all-volunteer military—one premise of cost-benefit analysts—is a desirable goal. To enlarge the proportion of career personnel is to place a time bomb in the military retirement system. Without a large turnover at the end of the first or second enlistment, it will be impossible to defend the present retirement system in the years to come.

The deep concern with erosion of service entitlements has resulted in a curious ambivalence among non-commissioned officers about military unions. When thinking of the military mission and the chain of command, the noncom finds the notion of unions abhorrent. But when looking at diminishing entitlements, trade unionism becomes a more congenial option. This corresponds with a growing feeling in the career force—

“... we must break the mind-set that sees the all-volunteer force as possible only in terms of the marketplace.”

and only some of it can be put down to normal grouching—that too much is being asked (and still being given) with too little appreciation. Whether the armed forces are regarded primarily as an institution or an occupation is an issue that will have profound consequences for the military's self-definition and, ultimately, for the duty commitment of its membership.

• The “Competitive” Pay Model.

It was to be expected that once the principle of pay comparability—bringing military salaries into line with allegedly corresponding workers in the private sector—was codified, the model of pay “competitiveness” would be the next step. And this is, in fact, what is now being seriously proposed. The competitive approach is to pay military personnel whatever is required—no more, no less—to man the military establishment. Supply and demand conditions, that is, are the determining factors. A competitive-pay model must necessarily place more emphasis on visible pay, rather than on entitlements. It also follows that to make competitiveness workable, there must be greater differentiation in compensation, according to amount of skill, education, the nature of the task, and so forth, thereby completely undermining the vertical nature of the military institution.

While the competitive approach seemingly rationalizes compensation, it ignores how “competition” actually operates in the real-life civilian economy for most workers. In the case of the nonunionized, there is the economic vulnerability of being undersold by those willing to work for lower—or, if one prefers, competitive—wages. It is precisely to avoid such vulnerability that unions exist. The clear and understandable purpose of unions is to maximize earnings by distorting as much as possible the direct impact of the

open labor market. In a competitive world, would military members opt for vulnerability or the protection of a union? These are the kinds of choices that would have to be taken into account to appraise our future national security readiness.

In the long term, the introduction of a competitive pay model will lead service people to identify with external reference groups in the civilian economy. Most military personnel inevitably will select a reference group that makes comparisons unfavorable to the armed services—a form of relative deprivation—not only in pay, but in work conditions as well. If a competitive military salary system were to be implemented, the present grumbling throughout the ranks, now limited to erosion of benefits, would then become a rumbling chorus of complaint.

Compensating the All-Volunteer Force

Most proposals for changes in military compensation foster a calculative and utilitarian approach to service life—an ever-receding horizon of civilian comparability. This can result in two undesirable consequences. It can lead to complete occupationalism, with a resultant confusion of the military role, internally and externally. It can also cause a backlash of deliberate conservatism on the part of those who will invoke traditional values as representative of the “real military.” The damaging effects on the armed forces of such confusion and dissension would be incalculable.

Even more fundamental, we must break the mind-set that sees the all-volunteer force as possible only in terms of the marketplace. We need not talk of bringing back conscription, but we can think of ways to recruit the analog of the peacetime

draft-motivated volunteer. One such approach is a civilian education package linked to military service. For example, there could be a program in which two-year enlistees would serve in low skill and labor intensive occupations with deferred compensation in the form of post-service educational benefits. For highly skilled technicians, the answer might be subsidized civilian education before active duty; that is, prescribed pre-engineering training in freshman and sophomore years to be followed by three or four years of active duty in a technical military assignment. These are only sketchy proposals, but there is some evidence that many qualified youths would choose a term in the military under such conditions.

The costs of such civilian educational packages would be partly balanced by lower attrition rates, less training time while on active duty, reduced recruitment outlays, and, most likely, fewer dependents of lower-ranking personnel. There is, moreover, some movement in the Administration and on Capitol Hill to provide financial relief for middle-income families with children in college. Whether the student aid program takes the form of tax credits for parents or expansion of federal grants to students, it is estimated this will cost at least \$1.5 billion—some say more than \$4.5 billion—annually. It is amazing that no public leader has thought to connect such student aid with military service. Attracting a representative, college-bound cross-section of American youth to serve in the military would help reinvigorate the ideal of military participation as a citizen's duty.

In the final analysis, the market system is not the way to motivate an all-volunteer force, nor is it the way to strengthen a service institution. ■

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Base Housing vs

BY CAPT. STEPHEN H. RUSSELL, USAF
Illustrations by Jack Pardue

Military families often have the option of choosing between base housing and buying in the civilian community. Here is a method of assessing which course is more advantageous financially.

REAL estate agents typically advise prospective home buyers: "Now is the time to buy a house; they aren't making any more land." Or they couch the argument in more direct terms: "Buy now before prices go up."

It is difficult to take issue with such logic, especially in an inflationary economy where property values are almost certain to rise. After all, home ownership is an ultimate objective of most families anyway, so why not ride the crest of escalating real estate values now, rather than be a victim of it in later years?

The answer to the question of whether to buy a house now is not as intuitively obvious as real estate sales people would lead one to believe. This is especially true for military families who have the unique option of living on base at a comparatively low monthly cost. To be sure, an owner-occupied house is generally an excellent investment—even for servicemen who must buy and market their houses every few years. However, a careful economic analysis of individual circumstances sometimes shows that military families are better off *financially* by living in government quarters.

The purpose of this article is to consider factors that

may help the serviceman determine whether the conditions he faces favor base housing or buying a house.

Some Pros and Cons

Let's look at the facts. Home ownership has two financial advantages over base housing. First, the deductibility of mortgage interest and property taxes from income tax liabilities can mean substantial tax savings. The typical \$4,000 or \$5,000 annual deduction for interest and taxes can translate into an effective government subsidy of your housing cost of \$80 or more per month. Second, home owners can expect the market value of their property to rise over time. This means a handsome profit potential when the property is sold.

On the other hand, the monthly dollar outlay for housing is considerably higher for the home owner than for the family living on base. When principal, interest, taxes, insurance, utilities, and upkeep are all brought together, a monthly housing bill several hundred dollars above the quarters allowance is not at all unusual. This means that the family in base housing will have a substantially larger amount of available cash each month than will their counterparts who own a home.

Because this increase in available monthly cash, arising from the difference between the total monthly outlay for purchased housing and the total monthly cost of base quarters is available to families who opt for government quarters, it can be viewed as a financial return analogous to the tax and property appreciation advantages of home ownership.

Consider the case of a captain with a monthly quarters allowance of \$271 who takes out a nine percent loan on a \$50,000 house, with ten percent down. His monthly debt service (principal and interest) for a thirty-year loan is \$362. The *total* monthly cost of housing (adding in



Buying a Home

property tax, insurance premiums, all utilities, and a small factor for upkeep and repairs) will probably average \$575 to \$625. The service member in this example will have a monthly cash outlay for purchased housing that is \$304 to \$354 a month greater than his quarters allowance.

(The nine percent loan rate used in this example is hypothetical. At this writing, conventional rates range from nine percent to ten percent, depending on geographic location and down-payment amounts. VA mortgage interest rates are presently 8.75 percent. However, prospective home buyers ought to realize that, even though the seller is required by law to pay the discount points tied to the buyer's VA financing, the cost of these points is frequently passed on to the buyer, making the effective VA rate greater than the nominal rate.)

Now, if this service member chose to live on base instead of buying, he would have this additional cash each month to bank or invest. Over a four-year period, this difference in available monthly cash could aggregate to nearly \$20,000, based on an eight percent return.

The accompanying table (p. 40) shows the aggregated return over a four-year period, using both the \$304 and the \$354 figures for a six percent return and an eight percent return. By way of example, assume the larger figure is correct. This service member, living on base, could save or invest \$354 a month for four years. At an eight percent compounded rate of return, he would have almost \$20,000 in liquid assets at the end of a four-year tour. Why is this a financial return for living on base? Because it is an option that home ownership forecloses. If the service member buys a house, the \$354 is absorbed by the total monthly housing cost.

But this isn't the only investment return from living in base housing. In purchasing a house, the service member ties up cash in closing costs, impound accounts for payment of insurance and taxes, and, in this example, \$5,000 in a down payment. Here, this initial cash outlay will total approximately \$6,100. The compounded return on this initial cash, if put into a savings or investment account instead of being applied to buying a house, would be \$1,641 or \$2,274, if compounded quarterly for four years at six percent or eight percent, respectively.

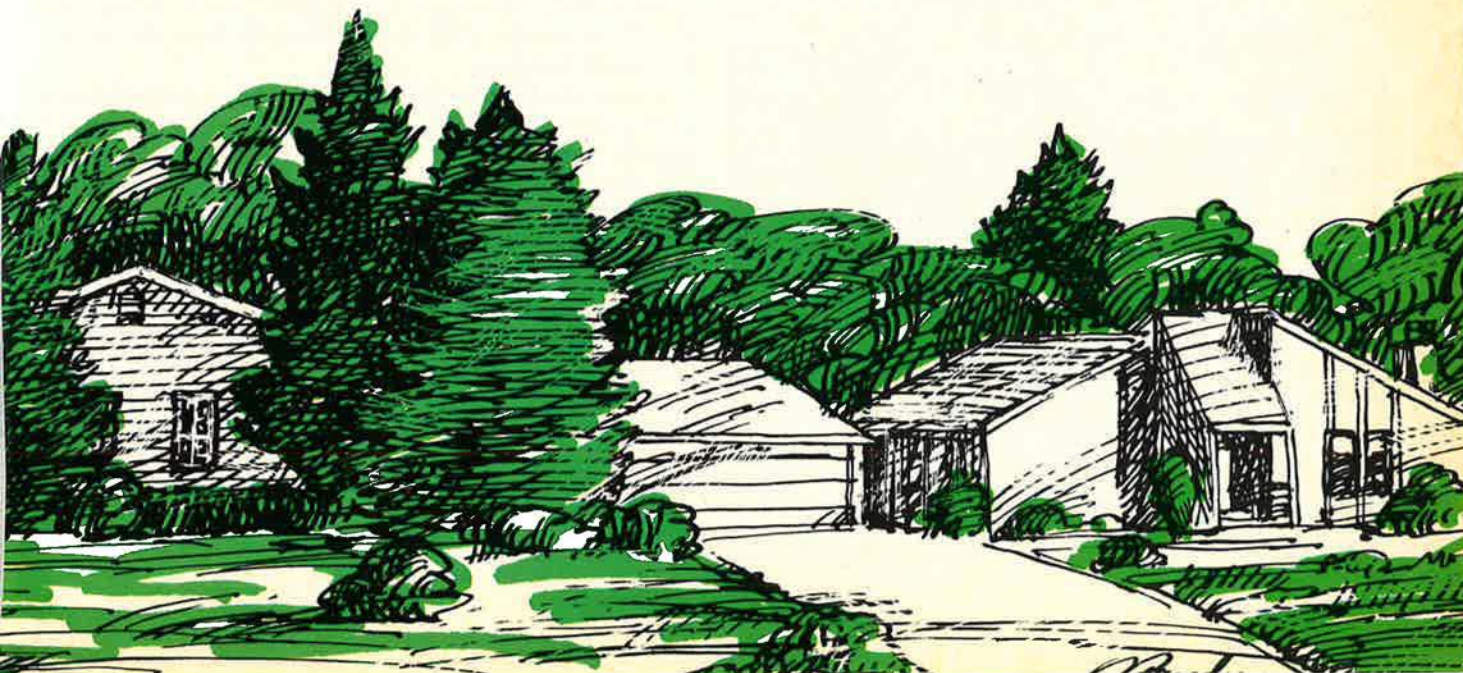
This means that, in addition to the return in the table, the family that chooses base housing over home ownership can realize growth on their original cash by not tying it up in a house. In this example, the potential total return for living on base ranges from \$18,087 to \$22,224 when these two returns are added together.

At the risk of oversimplifying a very difficult decision, we can say that, generally speaking, if the "cash accumulation" advantage of base housing is greater than the income tax and property appreciation advantages of buying a house, now is not the time to buy a house from a strict *financial* standpoint. Of course, making this determination is not easy. It relies critically on what property appreciation rate the service member uses for his decision to buy, as well as on other assumptions.

How to Compute Net Return

We can approach this problem more formally by using the worksheet provided on page 41. By completing the three parts of this worksheet, we are able to obtain an approximate net return to the home buyer based upon the facts and assumptions the decision-maker provides.

Part I of the worksheet yields the capital gain from selling the property Y years hence. It is the difference between the anticipated selling price and the purchase price. In this



example, assuming a growth in property value of eight percent per year, the capital gain is \$18,024.

In Part II, we pull together the total net costs over four years for interest, taxes, property upkeep, insurance, and all utilities, plus the costs associated with buying and selling the house. Note that in line (a) of Part II, allowance is made for the income tax savings associated with deductibility of mortgage interest and taxes. For example, if one's marginal tax rate for deductions (the tax savings rate associated with one more dollar of deductions) is fourteen percent, then by deducting property taxes and interest expense from your tax return, the true (net) cost for these items is only eighty-six percent of the stated value.

(In determining your own marginal tax savings rate for additional deductions, don't succumb to the common fallacy that all home-owner deductions are on the margin. This is rarely true when one considers the fact that those without mortgage interest and property tax deductions get a \$3,200 *standard* deduction. In other words, only if an individual has non-home-owner deductions of \$3,200 or more will the full value of his mortgage interest and property tax deductions be a base for incremental income tax savings.

(According to 1977 Tax Table B figures, a family of four with an adjusted gross income of \$16,000 and no home-owner deductions will pay \$1,591 in federal income taxes if they use the standard deduction. If this same family had mortgage interest and property tax deductions of \$4,850 in addition to, say, another \$1,000 in miscellaneous deductions, the 1977 federal income tax liability obtained by itemizing would be \$1,071. This suggests an "average" marginal federal tax savings rate for home-ownership deductions of eleven percent. Adding a three percent factor for state income taxes yields the fourteen percent rate used in this example.)

Table Showing Aggregated Return Over Four Years

Example of compounded cash over four years arising from a decision to occupy government quarters instead of buying a house:

Difference between quarters allowance and total monthly outlay for home ownership

Rate of Return	\$304/month	\$354/month
6%	\$16,446	\$19,151
8%	\$17,133	\$19,950

The compounded value of this monthly cash difference at return "r" after "n" periods may be obtained by using an annuity table, or by direct computation as follows:

$$V = D \frac{(1 + r)^n - 1}{r}$$

- where V = the compounded value of the cash difference
 D = the difference between the quarters allowance and the total monthly dollar outlay for home ownership
 r = the rate of return per period (expressed as a decimal fraction)
 n = the number of periods

The entries in this table assume monthly compounding at the rates .06/12 and .08/12 per month for forty-eight months.

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Part III of the worksheet reflects the difference between the capital gain and all net expenses over the entire period of ownership. This example, which assumes an annual growth in property value of eight percent for four years of ownership, yields a negative total net return of \$11,230.

We would normally expect a negative return. Only if the rate of appreciation is substantially greater than the mortgage interest rate (nine percent in this case) will we get a positive return and thereby "live for free." In this example, it would take an appreciation rate of more than twelve percent per year for the home buyer to "live for free."

If we divide the \$11,230 deficit return by the assumed forty-eight months of home ownership, we get a monthly net "cost" of home ownership of \$234. But if this serviceman lived on base, his cost of housing would be \$271 per month (the forfeited quarters allowance for the captain in this example). Therefore, in this example, the service member is better off financially if he buys a house. He is ahead \$37 a month. Right? Wrong!

Occupying government quarters also has its investment return, as explained earlier. The cash accumulation advantage will range between \$18,087 and \$22,224, according to our previous calculations in this example. Using the lesser figure, we get an average gross return for living on base (over the forty-eight months of occupancy) of \$377 per month. From this we subtract the monthly investment outlay of \$304 and obtain a positive net return of \$73 per month. Conceptually, this is the "return" for living on base. How does this compare with the results of the buy decision?

The monthly net "cost" of \$234 for the home owner in this example is offset by the receipt of the \$271 quarters allowance, which the occupant of base quarters does not receive. Hence the actual net "return" to the home owner is \$37 per month. This is less favorable than the renter's \$73 monthly return.

Is now the time for this captain to buy a house? Using a financial criterion, the rent decision in this example is slightly more favorable if this analysis reflects the decision-maker's most realistic assumptions on property appreciation rates, utility costs in the civilian community, house selling expenses, etc. Realistically, of course, one would give relevance to welfare considerations as well. For example, the assumed buy case (a \$50,000 house in this example) may offer a higher housing standard, which, to the prospective home buyer, *may* be worth the additional cost.

We can summarize by saying the financial advantages accruing to the home owner arise from a reduced income tax liability and from appreciation in property value. On the other hand, the decision to live on base frees initial cash and makes available a monthly flow of cash, both

WORKSHEET TO DETERMINE NET RETURN FROM HOME OWNERSHIP

Symbols:

- A = Assumed Annual Property Appreciation Rate, expressed as a decimal fraction
- C_C = Closing Costs
- C_{IT} = Net Annual Cost of Interest and Property Taxes
- C_{KNU} = Estimated Annual Cost of Upkeep, Insurance, and Utilities
- C_S = Selling Expenses
- D = Down Payment
- E = Total Net Expenses of Home Ownership over Y years
- F = Realtor Fee, expressed as a decimal fraction
- G = Capital Gain from Sale of Property
- i = Mortgage Interest Rate
- K = Estimated Monthly Cost of Upkeep
- L = Loan Principal
- M = Miscellaneous Selling Expenses (Owner's Title Policy, etc.)
- N = Estimated Monthly Cost of Insurance
- NR_H = Net Return from Home Ownership
- P₁ = Cost of Points to Seller (sometimes applicable if buyer does not assume seller's loan)
- P₂ = Prepayment Penalty to Seller (sometimes applicable if buyer refinances with a different mortgage lender)
- S = Selling Price
- t = Marginal Tax Rate
- T = Annual Property Taxes
- U = Estimated Monthly Cost of Utilities
- Y = Expected Number of Years Property will be Owned

PART I: Capital Gain from Sale of Property

(Example)

$$(a) S = (1 + A)^Y \times (L + D) = (1 + 0.8)^4 \times (45,000 + 5,000) = \$68,024$$

$$(b) G = S - (L + D) = 68,024 - (45,000 + 5,000) = \$18,024$$

PART II: Total Net Expenses of Home Ownership

$$(a) C_{IT} = (1 - t) \times L \times i + (1 - t)T = (1 - .14) \times 45,000 \times .09 + (1 - .14) \times 800 = \$4,171$$

$$(b) C_{KNU} = 12 \times (K + N + U) = 12 \times (\$20 + \$11 + \$115) = \$1,752$$

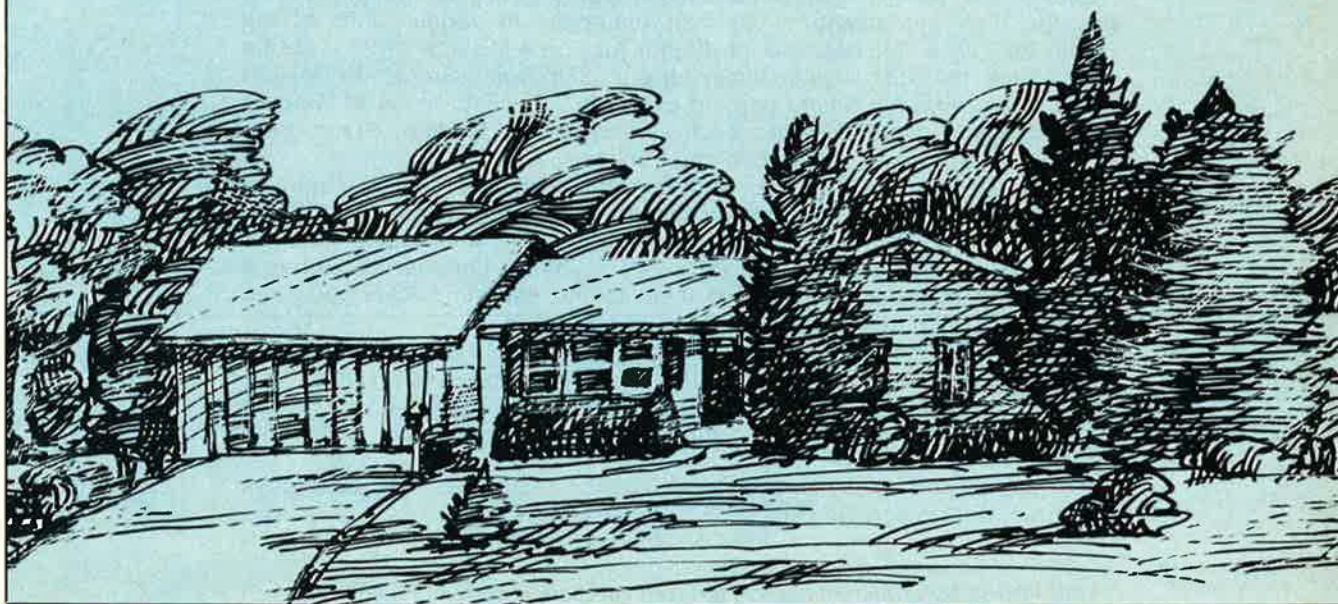
$$(c) C_C = \$500$$

$$(d) C_S = F \times S + M + P_1 + P_2 = .07 \times (68,024) + 300 + 0 + 0 = \$5,062$$

$$(e) E = Y \times (C_{IT} + C_{KNU}) + C_C + C_S = 4 \times (4,171 + 1,752) + 500 + 5,062 = \$29,254$$

PART III: Net Return from Home Ownership (exclusive of quarters allowance payment)

$$(a) NR_H = G - E = 18,024 - 29,254 = \$-11,230$$



of which can be invested on the open market. The optimal housing choice from a strict financial standpoint depends on which return is larger.

We have made some simplifying assumptions in this analysis, which should be pointed out. First, no allowance was made for changes in the quarters allowance over the assumed four years of occupancy. We thereby held the rental cost of base housing constant. Similarly, we have ignored rising rates to the home owner for property taxes, insurance, and utilities. By ignoring both the rising cost of renting and the rising monthly cost of home ownership, we have tacitly assumed that changes in both of these costs will be the same over time.

Second, we have treated the monthly mortgage interest payment as a constant, whereas in reality the interest payment declines very slightly each month as the loan principal is paid down.

Third, no consideration has been given to the tax liabilities on the returns.

Finally, the risk factor associated with the potential illiquidity of owning a home when a permanent change of station occurs has not been treated. (Illiquidity refers to the inability to make a timely disposition of an asset without substantial loss of principal.)

These assumptions were made to provide a simplified but approximately correct analysis mechanism. A more rigorous and thorough analysis of all factors impinging on this decision is available in *The Rent-Buy Decision for Military Families* (US Air Force Academy Technical Report, July 1977). Copies of this report may be obtained by writing the Defense Documentation Center, Cameron Station, Alexandria, Va. 22314, and asking for the document by its title. ■

BUFFALOBURGERS

By March 1942, the food shortage on Bataan and Corregidor was so acute that most of the American and Filipino troops were suffering from malnutrition and disease.

Dysentery and malaria further emaciated the pilots of the little Bataan Air Force.

Flyers returning from combat missions were so exhausted they had to be helped out of the cockpits of their P-40s.

Finally, Capt. William E. "Ed" Dyess, commander of the 21st Pursuit Squadron, went to higher headquarters and pleaded that his handful of pilots have their rations increased.

Before long, the Bataan Airfield mess hall received a shipment of meat.

The "beef" was from some old wild water buffalos, which until then had somehow miraculously escaped the crossfire between the American and enemy troops. The dark, strong meat was boiled in iron cauldrons and served to the pilots, but was so tough the men couldn't chew it.

Dyess finally came up with a recipe for cooking the beef: "You put a stone in the pot with the meat. When the stone melts, the meat is done."

—Contributed by S. Samuel Boghosian

ACHTUNG!

One of the lesser known but unusual aspects of the air war in the ETO was the high percentage of German-Americans in various units of the Eighth Air Force. For example, on Eighth Air Force Mission #894 to Berlin of 18 March 1945, the mission flimsy for our 486th Bomb Group, 4th Combat Bomb Wing, showed twenty percent of the B-17G pilots to be of German extraction and included names such as von Platen, Webber, Braun, Seaburg, Hueser, Schmitz, Vanderhof, and Pankow.

But the percentage was even higher in the early 56th Fighter Group of the 65th Fighter Wing, and when it supplanted the RAF at Horsham St. Faith, around 5 April 1943, Lt. Col. Hubert Zemke, the C.O., let his sense of humor get the better of him. According to the story, Zemke lined up his men in a quasi-review in order to introduce them to the departing RAF types and carefully arranged them before calling off their names.

"Gentlemen," he said stiffly and in the Prussian manner, "my pilots: Schilling, Goodfleisch, Ludwig, Schilz, Stulz, Vogt, Verhuesen, Heinemann, Lundberg." Stifling a sly grin and observing the shock in the RAF eyes, he continued: "Von Able, Weigle, Klibbe, Schreiber, Frederick, and I am Gruppenführer Zemke!"

He then clicked his heels, saluted, and concluded: "These last three guys are Burke, Kelley, and Goldstein!"

—Contributed by Maj. R. H. Hodges, USAFR

(AIR FORCE Magazine will pay \$20 for each anecdote accepted for publication.)

A Cuban soldier captured in the Ogaden region by Somali troops.



—WIDE WORLD PHOTOS

Fidel Castro's armed forces—trained and equipped by the USSR—have been organized into a foreign legion bent on waging war far from Cuba's shores.

THE war in Ethiopia has focused the world's attention on Cuba and its military adventures in Africa.

Clearly a tool of the Soviet Union, Cuba nevertheless is making its foreign legions felt from the Algerian desert in the north to the coasts of Mozambique on the southeast edge of Africa.

From an island-bound force of guerrilla-led troops, the Cuban armed forces have become an important military organization to be reckoned with around the world. With continued Soviet support, and in the absence of opposition from the US, the Cubans, under Fidel Castro as commander in chief, are on the move.

In Ethiopia, Cuban troops are in the forefront of the battle for control of the strategic Horn of Africa. Raul Castro, second only to Fidel in Cuba, flew to Ethiopia the first week of January. Within a month, the Ethiopian armed forces, backed by Cuban air and ground forces, launched an offensive against Somali guerrillas, supported by neighboring Somalia, in Ethiopia's Ogaden Province.

An estimated 12,000 Cuban troops were put into the early fighting. Cuban pilots, flying US-built F-5s that were sold to Ethiopia or provided under grant aid prior to 1975 and recently delivered Soviet-built MiG-21s, quickly gained control of the skies in the first days. On the ground, Cuban soldiers armed with Soviet T-54 tanks were sent into the battle.

THE CUBANS IN AFRICA

BY BONNER DAY, SENIOR EDITOR

Assisting the Ethiopians have been several thousand East German and Russian military advisors. Russian ships, according to some reports, shelled Somali troops from the Red Sea. The Russians are reported to have pledged more than \$800 million worth of arms and ammunition to Ethiopia, much of it delivered by a major Soviet airlift that began late last year. (See *March '78 issue*, p. 27.)

But it was the Cubans who provided the most combat troops. Many were brought in from Angola. Others came from Aden in the Arabian Peninsula. As the Ethiopian offensive developed, the question among African diplomats was whether Ethiopia and its allies would be content with recovering its Somali-occupied territory, or would push on into

Somalia. Somalia created an enemy in the Soviet Union when it broke relations last fall and ordered Soviet troops out of the Russian sea base and two airfields at Berbera on the Red Sea.

It is in Angola, however, that Cuba has had its biggest success so far. As many as 25,000 Cuban troops and another 6,000 technicians have been brought in to prop up the government of Agostinho Neto, in charge following the withdrawal of Portugal from its former colony. Up to 4,000 troops and some Cuban noncombatants have been killed or wounded in the war, which still continues. Wounded Cubans apparently are being sent to East Germany and the Soviet Union in an effort to play down war news in Cuba.

Most of the Cuban troops in Angola are fighting two antigovernment armies that control about one-third of the countryside, but no major cities. The rest of the Cuban forces are engaged in training guerrillas for insurrections in nearby African countries.

Continent-Wide Campaign

The Rhodesian government of Ian Smith is a major target of the Cuban forces and the guerrilla movements Castro backs. To the north of Rhodesia are some 400 Cubans in Zambia, charged with supervising the transfer of Soviet-supplied weapons from stockpiles in Angola to the camps of Joshua Nkomo's anti-Rhodesia guerrilla movement. Convoys of Soviet-made military trucks transport weapons and Nkomo guerrillas from training camps in Angola. The whole operation is run by a military team working from the Cuban Embassy in Lusaka, Zambia.

To the east of Rhodesia, up to 1,000 Cubans operate another set of training camps in Mozambique. Some soldiers are trained for the Mozambique government. Others are trained as guerrillas for Robert Mugabe, another black anti-Rhodesian revolutionist.

In Tanzania, the Nyerere government hosts 500 Cubans who are training troops for the Tanzanian government and also are preparing guerrillas to fight in Rhodesia.

In Congo (Brazzaville), there are some 1,000 Cubans. Some are used to support the Agostinho Neto government in Angola.

In Guinea, President Sekou Touré has a permanent garrison of 1,000 Cuban soldiers to keep him in power.

Guinea-Bissau has another garrison of several hundred Cuban troops, mostly military advisors.

In Libya there are 1,000 Cubans. Egypt claims they have been used to fight Egyptian troops in recent border skirmishes.

Cuban soldiers act as advisors to Sierra Leone's Internal Security

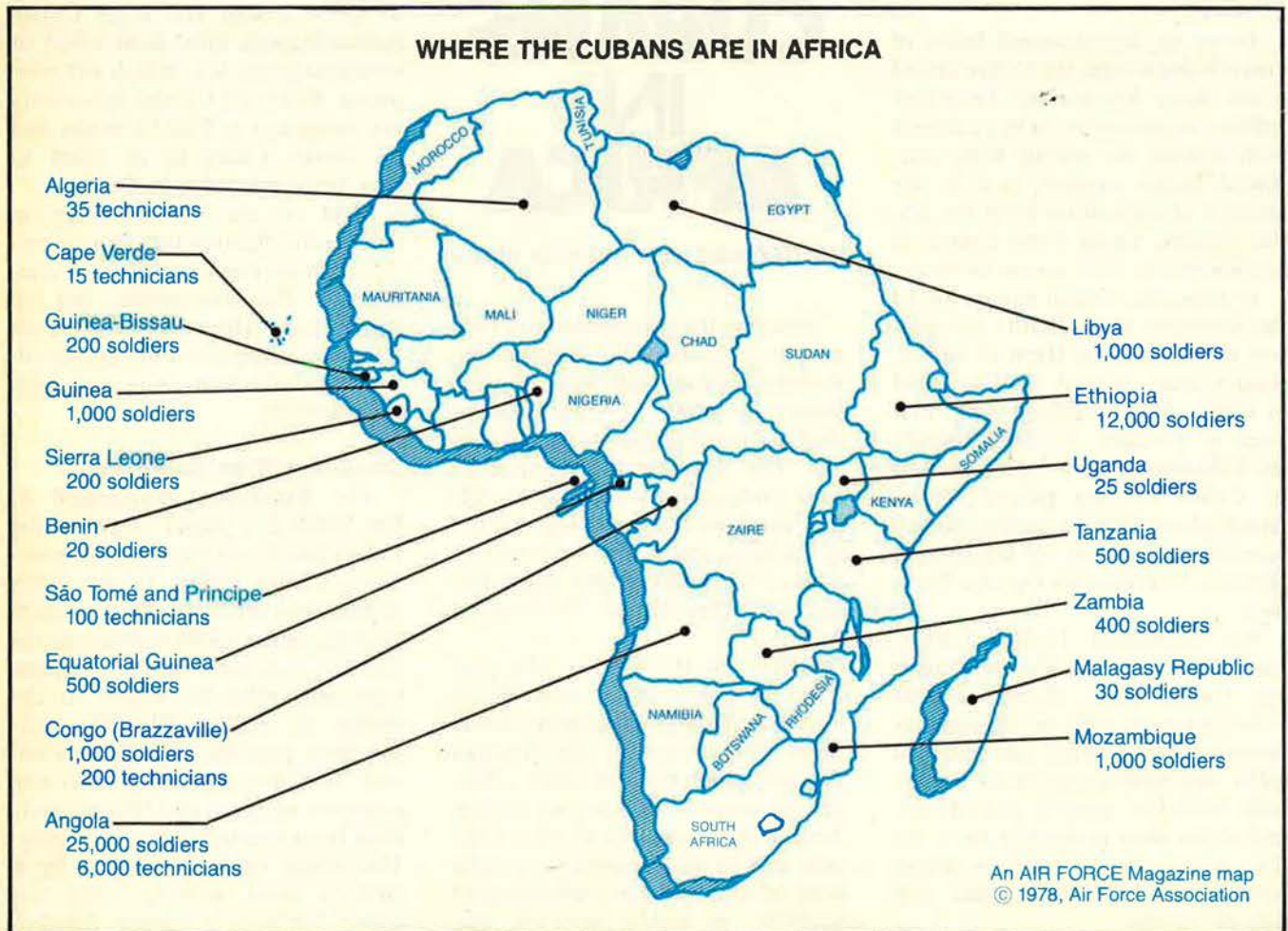


WIDE WORLD PHOTOS

Cuban President Fidel Castro has made it clear he prefers the adulation of the Third World as a military leader over any improvement of relations with the US.

Unit. About 200 Cuban troops are stationed in the suburbs of the capital, Freetown.

Cubans based in Algeria have been supporting the Polisario Front in the western Sahara region of



Morocco and Mauritania. The guerrillas have been fighting government forces of both Mauritania and Morocco, which now claim the territory.

Altogether, there are up to 42,000 Cuban troops in Africa, plus as many as 6,300 doctors and technicians. Other countries that have accepted Cuban troops and advisors include Cape Verde, São Tomé and Príncipe, Uganda, Equatorial Guinea, and the Malagasy Republic.

The Cuban armed forces have not been working alone. They have been supplied, encouraged, and, when necessary, transported to African battlefields by the Soviet Union.

Cuban Challenge—US Response

Why is Castro, who has severe

role in helping to power Agostinho Neto, a fellow revolutionary, has whetted his appetite for similar victories.

Says one government expert: "Castro will try to improve his relations with the US and at the same time continue his African adventurism. But if forced to choose, he will turn his back on the US with little hesitation."

The US, under both the Ford and Carter Administrations, has limited its response to public criticism for the most part, and held back support of African forces opposing the Cubans.

Many in the present Administration, following the lead of Sen. George McGovern (D-S. D.), want the US to mend its relations with Cuba and restore diplomatic and

ter of the world stage after some frustrating setbacks.

Castro's New Strategy

After his takeover in 1959, Castro focused his attention first on consolidating his hold on Cuba, and later on exporting revolution to Bolivia, Venezuela, Guatemala, and other Latin American countries.

There has been a Cuban military presence in Congo (Brazzaville) since the mid-1960s, and for years Castro has flirted with the radical leaders in Algeria and Libya. But his main early efforts, assisted by the Soviet Union, were in Latin America.

Then, after the death of Ernesto (Ché) Guevara in Bolivia in 1967, Cuban attempts to export revolution seemed to diminish in Latin Amer-

Raul Castro (right) confers with Soviet President Brezhnev and Defense Minister Ustinov shortly before the USSR and Cuba began military operations in Ethiopia.



TASS from SOVFOTO

economic problems at home, sending troops to Africa?

US experts on Cuba give three reasons.

First, the Cubans were ordered to Africa by Moscow. Castro, the beneficiary of billions of dollars of Soviet military and economic aid, could not refuse. Western analysts say there is evidence that Castro is being allowed to repay Moscow for its aid through these military operations, though it is unclear how the payments are calculated.

Second, Latin American experts consider Castro a dedicated revolutionary with a fanatical desire to export communism wherever possible.

Third, Castro enjoys the prestige that comes with a successful military venture. Castro's timely and vital

economic ties. The feeling is that with restored relations, the US can exert more influence on Cuba. Some, such as Ambassador to the UN Andrew Young, have gone further, arguing that the Cubans in Africa can be a "stabilizing" force.

Other advisors have warned the President that the Cuban presence, with its Soviet support, represents a dangerous threat to the freedom and independence of African nations, a threat the US, as leader of the free world, cannot ignore.

While the debate continues within the Carter Administration, the Cuban invasion of Africa shows no sign of drawing to a close.

From Castro's point of view, the African adventures have to be considered a major success and have returned him, personally, to the cen-

ica. In Cuba, economic problems increased and the people continued to suffer food, clothing, and other shortages.

Shortly after Ché's death, Moscow stepped in to take a stronger hand in Cuban military and foreign affairs. In 1970, the Cuban armed forces were reorganized along Soviet lines. Under the direction of Soviet advisors, the large standing army was cut forty percent in size, discipline in the reserves was tightened, training was improved, and equipment was modernized with the addition of the latest in Soviet tanks and planes. Cane-cutting duties, once a major occupation of the Cuban Army, were transferred to the newly created Youth Labor Army, and regular soldiers were freed to concentrate on their military jobs.

At about the same time, Castro, apparently under Soviet guidance, adopted a new strategy for exporting revolution. In Latin America, his earlier attempts to support guerrilla movements had been made without the backing of neighboring countries that might have been able to provide sanctuaries.

In Africa, however, Castro won invitations to several countries and the host countries in turn have been used as sanctuaries for supporting guerrillas.

Congo (Brazzaville), for example, was a sanctuary for Cubans and African guerrillas fighting in Angola, and now Angola is a sanctuary for Cuban efforts against Rhodesia, Namibia, and Somalia.

The strategy's success so far has made Castro a popular revolutionary in Africa, and given him new confidence. In response to questions about renewing diplomatic relations with the US, Castro has said:

"Our relations with Africa—that we cannot discuss, that we cannot

negotiate. . . . It has nothing to do with the United States."

Whether the US can continue to stand aside militarily while Cuba and the Soviet Union increase their hold in Africa is a question the Carter Administration and Congress will address in the months ahead.

What is sure is that the Cuban armed forces have come of age. Their invasion of Africa, and the subsequent victories, pose a danger much larger than numerical strength would suggest. ■

THE CUBAN ARMED FORCES TODAY

The Cuban armed forces have been transformed, over a period of eight years, from a large but poorly trained militia led by romantic guerrillas, to a somewhat smaller but more effective modern army.

The difference has been the Soviet Union, whose leaders decided to protect their massive investment in arms, training, and other aid to Cuba with a heavy hand. Already a significant community, the number of Russian military advisors in Cuba has been increasing in recent months.

The Soviet Union subsidizes the Cuban economy at the rate of \$500 million a year—almost double the budget of the Cuban Ministry of the Revolutionary Armed Forces. The Cuban armed forces have received an additional \$3 billion in Soviet aid since Fidel Castro took over, plus tanks, planes, ammunition, and other aid delivered to Cuban troops in the field in Africa.

The commander in chief of the Cuban armed forces still is Castro. But it is the Soviet arms and Soviet instructors that have changed a Latin guerrilla army into a modern military force and made it almost a part of the Soviet armed forces.

More important to the rest of the world, the mission of the Cuban armed forces was changed as they were poured into the Russian mold.

Once primarily concerned with resisting an invasion by the US or Cuban anti-Castro exiles, the Cuban armed forces now are focused on exporting communism, Soviet-style, to the Third World.

Universal compulsory service still is in effect, and agriculture still is a national priority. But only a small number of draftees with little military potential—those with low intelligence, little education, or lacking in discipline—are funneled into a special Youth Labor Army for agriculture chores.

Most conscripts are given concentrated military training under an increasingly sophisticated cadre of Cuban officers and NCOs advised by Soviet officers. In addition to military skills, emphasis is on physical conditioning and political indoctrination. Soldiers are fed a steady diet of Castro speeches and the writings of Lenin.

Cuba still has one of the largest standing armies in Latin America, second only to Brazil, a nation with ten times the population.

From a high of about 300,000, however, the armed forces have been trimmed to 200,000 or fewer. Added to this is a ready reserve, about 100,000 strong.

As in the Soviet Union, youths receive military training even before they enter active duty. This amounts in some cases to as much as nine months of rifle drill and classroom training. A number of high schools have been developed for youths with military officer potential.

Officers are trained at one Navy and three joint Army-Air Force academies.

Fidel Castro is the top man in the armed forces—and in every other organ of power in Cuba. Right behind him is his brother, Raul. With the four-star rank of General of the Army, Raul is Minister of the Revolutionary Armed Forces. He has

been closely supervising Cuban operations in Africa, using communications furnished by the Soviet Union, but also making periodic on-the-spot inspection trips.

The relation of the Communist Party to the military is much different from that in the Soviet Union, because of the military backgrounds of Cuba's leaders. The military in Cuba is in charge: There is no system of Communist Party representatives within the military to make it toe the party line. The entire government, on the other hand, is seeded with military officers, ensuring a military bias.

Within the military, however, about eighty-five percent of the officers are members either of the Communist Party or the Young Communist League, while twenty-three percent of the members of the Communist Party Central Committee, the highest party body, are in the armed forces.

The Army is the largest of the military forces, with approximately 150,000 on active duty. Equipment includes 600 tanks, 200 armored personnel carriers, artillery, antiaircraft missiles—all furnished by the Soviet Union.

The Navy is modernizing. Old ships given by the US prior to 1959 are being replaced with more than sixty new Soviet vessels, including some of the latest in cruise missile boats. About 9,000 Cubans are currently assigned to the Navy.

The Commander in Chief of the Cuban Air and Air Defense Force (DAAFAR), Maj. Gen. Francisco Cabrera Gonzalez, commands 12,000 airmen, including about 400 pilots. His deputy, Col. Edel Martin Hernandez, is chief of the Revolutionary Air Force.

The Air Force includes a fighter-bomber force of 100 MiG-21s and fifty of the older MiG-15s and MiG-17s. Another fifty jets or more, mostly MiG-21s, have been furnished by the Soviet Union for Cuban pilots in Africa.

Cuba has integrated its Cubana commercial airlines with the Cuban Air Force, though seventy of the 200 government transports are nominally assigned to commercial services. Transport planes in operation are the Soviet-built An-2, Il-14, and An-24. To get the bulk of its men and equipment to Africa, however, Cuba must rely on Soviet ships and planes.

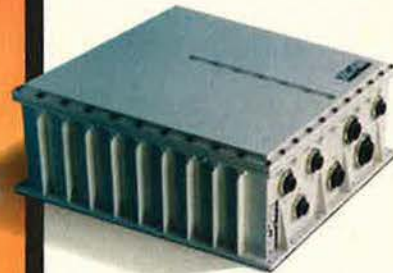
The Cuban armed forces have been tested in a series of guerrilla operations in Latin America, followed by a touch of conventional warfare more recently. Cuban tank crews fought for Syria against Israel in 1973. A Cuban advisor was captured in Guinea-Bissau, when the Portuguese army was there. Members of the Cuban armed forces participated in the Vietnam War, some taking part in the torture of American pilots.

But the biggest tests so far have been in Angola and Ethiopia. And there, the Cuban performance has generated admiration from allies and foes alike. The Cuban Air Force in particular has come in for praise for the skill of its pilots and ground crews. To receive some of the same training, a flood of Africans has poured into Cuba from Angola, Mozambique, and other countries—additional evidence that the Cuban armed forces have come of age.

—BONNER DAY



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Remotely piloted vehicles (RPVs), used extensively in Vietnam, now are operated by TAC's 432d Tactical Drone Group. Their future for operations in high-threat areas is, the author believes, "limited only by imagination and money." One thing is certain . . .

RPVs ARE FEARLESS

BY MAJ. JOE TILLMAN, USAF



Two AQM-34M remotely piloted vehicles suspended beneath the wings of a DC-130.

THE publicity generated by the cruise missile has rekindled interest in remotely piloted vehicles (RPVs). The cruise missile, a potential RPV, could perform some of the missions now assigned to manned aircraft, with the advantage of being launched from a standoff position. That possibility serves as a point of departure for thinking about the future of RPVs. But before we talk about where the Air Force is going with its RPV program, let's see where we are and how we got here.

* * *

RPVs are pilotless aircraft that fly a programmed profile, but also can be controlled in flight by airborne or ground-based personnel. Drones, on the other hand, cannot be controlled in flight. The heritage of today's RPVs includes both launch-and-watch drones and remotely piloted vehicles.

Drones were used as early as 1915, when a Navy seaplane was equipped for pilotless flight. (See "The World's First Cruise Missiles," October '77 issue.) The first radio-controlled commercial aircraft was the Curtiss Robin, built in 1928. Although the Robin was intended to carry ordnance, official interest waned and the project was dropped in 1932. Early attempts at radio controlling large aircraft included a B-24, fully loaded, flown against Axis forces in 1944. The first subsonic jet-powered RPV was built by Teledyne-Ryan and ground-launched in 1951. This target drone, the Firebee, was the forerunner of the Air Force's current fleet of RPVs.

Flight tests of today's operational RPVs began in 1963. The Firebee was modified with improved navigation gear and line-of-sight command guidance. The first operational unit to use RPVs was the Strategic Air Command's 4080th Strategic Reconnaissance Wing, which also operated the U-2, the high-flyer that gained fame with its Buck Rogers's capabilities and colorful pilots. SAC put a high priority on the 4080th SRW, and, when the unit deployed to Southeast Asia in 1965, the chain of command was shortened by several links, with the wing reporting directly to the Strategic Reconnaissance Center at SAC Headquarters.

This high level of visibility also resulted in a certain amount of invisibility. The wing and squadron were redesignated on August 1, 1966, as the 100th Strategic Reconnaissance Wing and 350th Strategic Reconnaissance Squadron, located at Davis-Monthan AFB, Ariz. The 350th's RPVs flew more than 3,000 combat missions, gathering critical reconnaissance data, but the squadron's work during this time was hidden in the shadow of secrecy.

Not all of the recce RPVs used in Southeast Asia made it back. More than 200 of them were lost in combat. That immediately underscores one of the RPV's advantages. More than 200 aircrews were saved from an all-expenses-paid

vacation at the Hanoi Hilton—or worse. More on that later.

Back at Davis-Monthan AFB, another unit, the 11th Tactical Drone Squadron (TDS), at that time under the 355th Tactical Fighter Wing, was testing electronic countermeasures (ECM) RPVs. The fact that two RPV units, both located at Davis-Monthan, were under separate major commands did not go unnoticed. The SAC and TAC RPV units were consolidated under Tactical Air Command in July 1976, with the 350th Strategic Reconnaissance Squadron redesignated as the 22d Tactical Drone Squadron. The two squadrons operate under the newly formed 432d Tactical Drone Group, inheriting the "Four-three-two, can-do"



A CH-3 returns an AQM-34M(L) to home base after making a midair recovery.



Top, note DC-130A's chin dome, housing microwave command guidance system (MCGS). Above, members of 432d Drone Generation Squadron "button up" an AQM-34M drone.

attitude. The 432d has a long and proud heritage, including the famous "Hunters" of the 432d TAC Fighter Wing of Southeast Asia fame.

The System in a Nutshell

While the missions and equipment of the two operational squadrons differ a bit, the 432d TDG's system of launching, controlling, and recovering RPVs is basically similar. A modified C-130 Hercules tactical transport called a DC-130 launches the RPV, which is preprogrammed to maintain a flight profile. Four crew members in the back of the DC-130 are responsible for the RPV: an airborne remote control officer (ARCO), an airborne radar technician (ART), and two launch control officers (LCO). While the ARCO and the LCO plan the RPV's route before a mission is flown, the DC-130 navigator plots out the launch and monitor routes. Mission planning is not limited to the DC-130 crew, however. A CH-3 helicopter crew is responsible for recovering the RPV in midair at the end of its mission. The chopper crew members are busy planning their flight so they will be in position to make the "catch."

The LCO is responsible for preflighting, starting, and launching the RPV. The ARCO monitors and controls it in flight, and the ART keeps the microwave command guidance system (MCGS) antenna locked on the RPV to provide control capability. The ART, usually an ex-ground radar specialist, also provides inflight maintenance of the complex RPV gear. The RPV may also be monitored and controlled by a remote control officer (RCO) on the ground, working in a mobile van.

The range of the RPV permits launch, monitor, and recovery of the vehicle well on the friendly side of the forward edge of the battle area (FEBA). Once the drone has completed its mission, the engine is shut down and a drag chute deploys. At 15,000 feet, the main chute and engagement chute deploy. The RPV then is recovered by the CH-3, using its Mid-Air Recovery System (MARS).

The helicopter is equipped with a computerized winch and a pole and cable system that extends about twelve feet below the fuselage. The hooks of the extended poles snag the engagement chute of the descending RPV. The winch, like a giant fishing reel, pays out cable at a preset tension. After the hooks engage the chute, the main chute releases and the RPV is winched approximately 500 feet up to a stowed position twenty feet beneath the CH-3, and flown to the recovery base. A stabilization chute at the tail of the RPV minimizes oscillations during the trip home.

In addition to the two chopper pilots, a pole operator (PO) and winch operator (WO) in the CH-3 combine forces in order to ensure a successful catch. Both squadrons have CH-3 aircrews assigned for the critical catch phase of the mission.

Tactical Electronic Warfare Support (TEWS)

The 11th TDS aircrews launch and control the AQM-34V, known within RPV circles as the "Victor." The Victor is equipped with chaff pods under the wings and minijammers in the nose. Its purpose, of course, is to disrupt enemy radar sites. After its launch from a DC-130, the Victor would, in a typical mission profile, climb out to a position where it could jam enemy radars, orbit while jamming, then return to friendly territory to be recovered. In a European scenario, the Victor could be the bird that "throws a nickle in the grass" for the fighter folks.

The 11th Tactical Drone Squadron's DC-130As have four pylons for RPVs, and large internal fuel tanks to compensate for the lack of external tanks. Controlling the four RPVs requires four launch control panels but only two launch control officers, with each LCO operating two panels. The DC-130Es of the 22d TDS control two RPVs, and also use two

LCOs, since each can control only one panel. Another minor difference is that the LCOs on the DC-130A visually monitor their drones through specially designed windows in the aft section of the aircraft, while the E model utilizes closed-circuit TV. The Victor will be worth its weight in coffee in a radar-rich, high-threat environment.

Reconnaissance

The 22d TDS operates several different RPVs, but the current workhorse is the AQM-34M. Although the squadron owns some of the earlier AQM-34Ls, the addition of an improved navigation system (including a radar altimeter) and an updated camera with a larger film capacity resulted in the M. The AQM-34M has put the older L on the back shelf.

Both these RPVs saw action in Vietnam, and provided results that dramatically underscored one advantage of unmanned aircraft . . . they literally have nerves of steel. "Drones are fearless" is more than a bumpersticker; it's a fact.

Since a goodly portion of a typical recon profile is flown at low altitudes, the flight time is normally limited to about forty-five minutes. If a longer range is required, the profile may be changed and external fuel tanks added. The AQM-34M's 6,400-foot film capacity and proven low-altitude capability can provide a wealth of bonus targets for our intelligence gatherers.

Two other recon RPVs are available to the 22d TDS—the AQM-34M(L) and -34L(TV). The M(L) model incorporates a highly accurate LORAN navigation system that is a super addition when pinpoint accuracy is required within an area of LORAN coverage.

The L(TV) is simply a basic L-model with the recon camera and a closed-circuit TV system installed in the nose, giving it a near real-time intelligence capability. Data is videotaped by the DC-130 crew, or the TV camera may be used simply to give the ARCO a set of "eyes" to help him cover the required targets. The obvious advantage of the L(TV) is that a photo interpreter in the DC-130 can compile intelligence data as it's happening. If the RPV should be destroyed, the information gathered up to that point is still available on videotape.

Unrelated to the unit mission, but an additional task enjoyed by recon aircrews is Navy support. Compatible Navy target drones are launched from the 22d's E models in support of Mobile Sea Range operations, exercising the fleet's air defense capability. The BQM-34A/S has proven to be a tough target for shipboard defenses.

Since the 22d is a "kill 'em with film" unit, the squadron includes a Photo Processing and Interpretation Facility (PPIF). This highly qualified team is a mobile, self-supporting unit that would accompany the squadron, even during short-notice deployments.

Group Maintenance

RPVs are aircraft, and they need maintenance support to keep 'em flying. The 432d Drone Generation Squadron (DGS) does that, and does it well. Naturally the LCOs and ARCOs work closely with the people in DGS. An AFTO Form 781 (Maintenance Log) is kept aboard the DC-130 when the RPVs are uploaded, and problems are written up and discussed during the aircrew maintenance debriefing with the C-130 and CH-3 crews. This squadron also maintains the microwave command guidance system. Obviously, the majority of the RPV write-ups involve electronic problems and most of the specialists in the squadron are "pinball wizards." There is other work to be done, however—



An RPV took this photograph of the Dong Ha bridges in December 1973, during North Vietnam's buildup in the South following the cease-fire.

engine maintenance, RPV and chaff pod uploading, and camera maintenance—jobs that are every bit as critical as ensuring electronic bugs have been removed.

The 432d Aircraft Generation Squadron maintains the DC-130s and CH-3 helicopters. The men and women of the AGS have a demanding task since they not only have to cope with maintaining two different models of the Hercules and highly modified CH-3s, but they also must take care of very special equipment critical to this very special unit. If you are looking for a cushy job, steer away from the 432d DGS and AGS.

There is no Air Force unit that is so dependent upon close coordination between the operations and maintenance sides of the house. It begins with planning and programming and doesn't end even after a mission, because a recorder near the ARCO panel provides much valuable information to the maintenance troops. Maintainers interface with the group's operations force at every level, including the RPV trainer, where ARCOs and ARTs train and new RPV routes are test "flown" to determine if

Maj. Joe Tillman, a lieutenant colonel selectee, is Assistant Operations Officer of the 22d Tactical Drone Squadron, 432d Tactical Drone Group, at Davis-Monthan AFB, Ariz. A C-130 aircraft commander, he logged 600 combat hours in Vietnam, flying out of CCK Air Base in Taiwan. Prior to joining the 432d TDG, Major Tillman was editor of Tactical Air Command's safety magazine, TAC Attack.

there are glitches in planning and/or programming. Even the PPIF has its own maintenance section. The complexity of equipment needed to keep 'em flying necessitates many "specialists' specialists." We're lucky to have them.

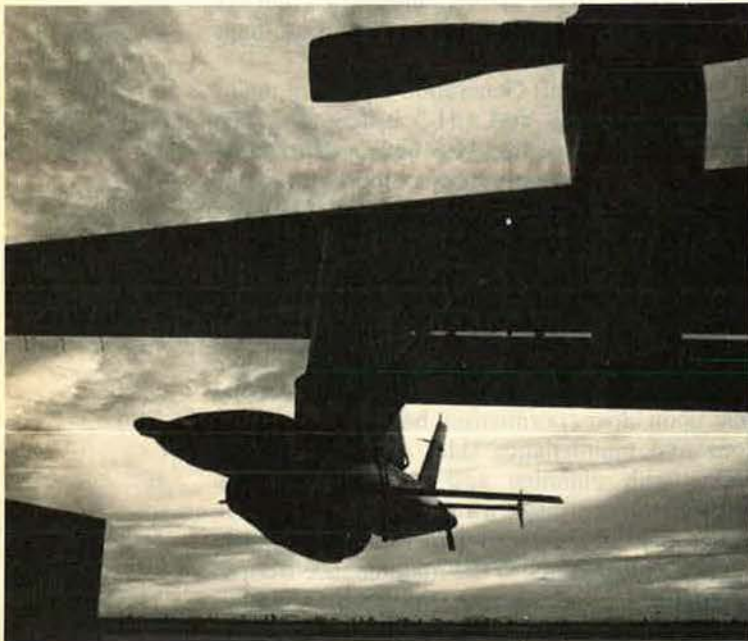
Why RPVs?

It is important to remember that the role of currently operational RPVs in armed conflict is limited. Although we are working with equipment that is good, it is not state of the art. I believe one of the problems in improving our current force was made clear by the author of a short article entitled "Drone Patrol" in the October 8, 1973, issue of *Newsweek Magazine*:

"Politically, RPVs suffer a poor image among older pilots who see them as a challenge to their individuality. 'How can you be a tiger, sitting behind a console?' asks one veteran."

My answer is, "Any pilot who wants to fly the typical RPV profile in a high-threat area has one log short of a cord."

RPVs have limitations, but what they're designed to do they do very effectively. The RPV mission, as demonstrated in such realistic joint training exercises as Red Flag and Brave Shield, will dovetail with manned aircraft operations. We know that it will work, but it does take



Small size and minimal radar signature make RPVs tough targets for enemy anti-aircraft.

considerable coordination and planning, and we have some refinement to do in this area. The future of combined manned aircraft/RPV operations is bright indeed, and as we integrate with our fighter brethren, our presence will become greatly appreciated . . . especially in the high-threat environment. This is one answer to the question, "Why RPVs?"

During hostilities, sophisticated enemy radar tracking systems may not permit us to use manned photo-recce and threat-suppression aircraft. With nerves of steel, the RPVs can get in, do their thing, and get out. If an RPV doesn't make it, we've lost a "vehicle," not a crew and a multimillion dollar aircraft, which brings me to advantage number two—cost. Operational RPVs now cost between one-half and one million dollars each. Since they don't need expensive life-support gear or cockpit instrumentation, RPVs cost from four to ten times less than manned reconnaissance or ECM aircraft.

With no need for aircrew niceties, the RPV comes in a small package (thirty feet long with a fourteen-foot wingspan)—advantage number three. It's a tough target for IR, radar, and visual trackers. Relatively fast—normally cruising between 400 and 500 knots—with a small engine that doesn't produce much of an infrared signature, and with minimal radar cross-section, it's going to take a seven-level gunner to score a hit. One AQM-34L, named Tom Cat, flew sixty-eight combat missions over North Vietnam before being knocked down by anti-aircraft defenses.

So that, briefly, is where we are. The potential of the RPV is staggering. As mentioned earlier, tests are being conducted to assess the feasibility of applying RPV principles to the cruise missile. The range of the cruise missile and the accuracy of its Terrain Comparison (TERCOM) guidance provide some exciting concepts down the road. RPVs have been tested in the air-to-ground mode, delivering iron bombs and Maverick missiles with surprising accuracy. Data links with satellite relay stations may reduce the time-delay problem inherent in photo recce operations and provide real-time intelligence data to the theater commander. Sophisticated new sensors, a field in which the US leads the world, have potential uses in unmanned aircraft. An air bag ground recovery system and a mobile ground launcher would add considerable flexibility. We are constrained only by imagination and money.

Our current RPVs, limited as they are, provide a flexible combat capability by providing the theater commander with several additional options. Like any other aircraft, however, they are only as good as the people who maintain and "fly" them. We in the 432d Tactical Drone Group feel we have added a strong member to the TAC team. ■

TWO BITS GET YOU SEVEN...

...or one will get you six, which is even better for some purposes. What we're getting at is that we have demonstrated our digital image processor on a wide range of subjects. This pair of pictures of an army tank is an example. One was made at a rate of six bits per sample, the other at one bit per sample. The one-bit-per-sample image has great advantages for communications, of course, and it provides ample detail for targeting guided weapons and other ordnance or for RPV scouting of hostile territory.

We used the seven-to-two compression ratio on Landsat earth-resources imagery and there was little or no difference between the original and compressed images.

The key to low-cost data compression techniques is sound application of the latest microelectronics technology, such as charge-coupled devices. TRW is designing CCDs not only for extremely compact, low-power, low-cost sequential memories but also to perform arithmetic and logic. Using such components, and taking advantage of new and improved algorithms (developed by our math specialists), our systems people are now designing ultra-miniature, low-cost video signal processors to cover an increasingly wide range of applications.

If you'd like to know more about TRW's advanced capabilities in this area, with a view to applying this development work to your needs, please contact H.M. DiMond, TRW Defense and Space Systems Group, One Space Park, Redondo Beach, CA 90278. Phone: (213) 536-1977.



IMAGE DATA COMPRESSION

from a company called **TRW**

ARMS CONTROL AND STRATEGIC STABILITY

This article, which examines the positive and negative impacts of existing and proposed arms-control agreements on US defense policy, is adapted from a staff study done by the author at the request of Rep. Robin Beard of Tennessee. It will be part of a book, *US Defense Policy Alternatives*, edited by James E. Dornan, to be published later this year.

BY PETER HUGHES

DEBATE on the publicly revealed terms of the proposed SALT II agreement has led to an emotionally charged controversy obscuring the substantive issues that merit attention. There has been little criticism of the Administration's selective use of leaks as a means to generate support for proposed SALT II terms, but those expressing concern over the US negotiating position have been charged with opposing arms control. That charge may appear justified to advocates who see a self-fulfilling value in arms control as a means of attaining world peace.

Unfortunately, history has shown that arms control, that is, efforts to control or reduce the level of great-power armaments, has no direct correlation with military stability. On the contrary, improvident arms-control efforts have served as catalysts to instability and conflict.

It is perhaps not surprising that the claim by Administration supporters that the proposed SALT II agreement is better than no agreement at all has met with some skepticism.

Dr. Fred Ilké, a long-time advocate of arms control and a former Director of the US Arms Control and Disarmament Agency (ACDA), recently pointed out that our negotiations with the Soviet Union have focused on somewhat



The cruise missile (above) could be a stabilizing influence by removing the Soviet incentive for a first strike with its missiles (right) while not, at the same time, giving the US a first-strike capability.

loosely and inadequately defined numerical limits without adequate attention to the destructive power of the weapons involved. It is quite possible that a future SALT agreement could increase the vulnerability of our deterrent forces, thus defeating our objective of maintaining a militarily stable balance.

Most discussions of US-Soviet strategic and arms-control policies tend to assume ideological overtones, attributing aggressive intent to Soviet global objectives. Such assessments are neither necessary nor always prudent. It is quite possible to judge US military requirements in relation to actual Soviet military capabilities and our ability to respond to that threat.

It is also possible to measure an arms-control agreement in terms of its compatibility with those requirements the US has defined as necessary and prudent for maintaining a credible US deterrent.

US Strategic Policy

US strategic policy has evolved over three decades, and represents the composite view of many administrations. We believe a credible deterrent rests on our ability to absorb a Soviet surprise attack on our strategic forces and to meet presently prescribed objectives in retaliation. Our primary objective is, of course, deterrence, and for that reason we want to be able to maintain what is commonly known as crisis stability and escalation control. Should deterrence fail, we want to terminate hostilities on terms

favorable to the United States and our allies by denying the Soviets the ability to recover more quickly than the US. The United States also wants to maintain a secure strategic force in reserve, to deny the Soviets military domination in the post-attack period. Finally, the Carter Administration has publicly affirmed its commitment to a policy of "essential equivalence," *i.e.*, Soviet forces should not be allowed any real or perceived superiority over US forces so that military power could not be viewed as a credible instrument for political leverage, diplomatic coercion, or military superiority.

These policy objectives have been criticized as unthinkable because of the horrors of nuclear war. Yet, as President Carter's National Security Advisor Zbigniew Brzezinski recently pointed out, nuclear conflict, no matter how unthinkable or immoral in terms of our national values, would not mean the end of functioning society. Both government and nongovernment analyses have shown that the Soviets might lose fewer people than they did in World War II, and substantially fewer than they themselves destroyed for political purposes during the Stalin purges of the 1930s. Thus, as Dr. Brzezinski points out, it would be improvident to ignore the Soviet objective (whether real or imagined) of achieving what the US Joint Chiefs of Staff have called a "war-fighting, war-winning capability" relative to the United States.

The likelihood of deterrence working is greater if the Soviets recognize that they cannot hope to gain a signifi-



cant or decisive military-political advantage from nuclear war, than it would be if the US could only inflict some level of massive destruction on the USSR.

Whether present US strategic policies and capabilities are necessary for deterrence and national security may well deserve to be reconsidered. In the absence of such a review, however, any future strategic arms-control agreement should be measured in terms of its contribution to national security in accordance with presently prescribed national policy.

The following discussion offers an analytical review of several issues relating to proposed SALT II treaty terms as they apply to presently prescribed US strategic objectives and requirements for strategic stability.

Strategic Stability

According to recent congressional testimony by Dr. William Perry, Director of Defense Research and Engineering:

Strategic stability exists when neither side has the actual or perceived capability to initiate a strategic nuclear conflict with the expectation of gaining a significant relative military advantage.

Within that definition of national policy, is the present strategic balance stable? That question cannot be answered by merely comparing the static forces of the US and USSR. Instead, it is necessary to examine the relative

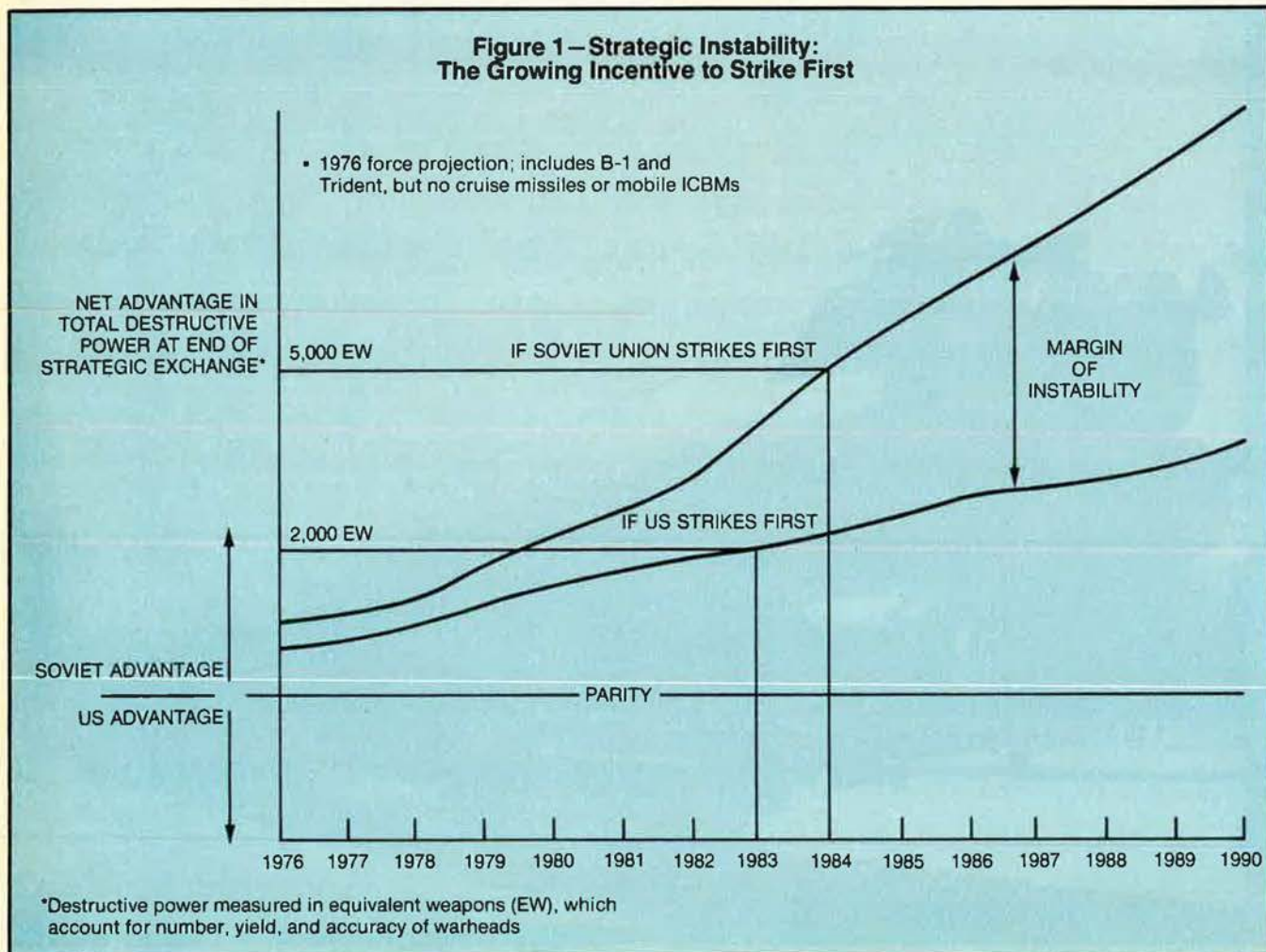
advantages, as viewed by each side, of attacking first as opposed to being attacked first. Figure 1 shows the relative or net advantage at the end of a strategic exchange in which both combatants seek maximum advantage. If the Soviet Union strikes first, its advantage will be greater than if the US had struck first. Similarly, Figure 1 shows that the United States has an incentive to strike first in order to reduce its margin of disadvantage, as compared to letting the Soviet Union strike first.

The data demonstrate that the strategic situation is presently unstable, with the margin of instability steadily worsening. It could, of course, be argued that, from the Soviet point of view, the situation is somewhat stable since the United States—even by striking first—would emerge at a serious disadvantage. However, in a grave crisis, the United States could judge—either correctly or incorrectly—that the Soviets were likely to attack and that circumstance might provide an incentive to preempt, thus placing what is popularly called the “hairtrigger” on nuclear war.

A major reason for the instability illustrated in Figure 1 is the unconstrained growth of Soviet strategic forces. The United States, on the other hand, has shown significant restraint in enlarging and improving its strategic forces since almost the middle of the last decade.

Strategic stability has been a continuing goal of SALT—a principal goal if public pronouncements are believed. However, as Dr. Iklé has noted, the basic thrust of SALT is the exact opposite of what would produce stability. According to him:

**Figure 1—Strategic Instability:
The Growing Incentive to Strike First**



If we are not careful, a SALT agreement might even increase the vulnerability of our deterrent. Because of the way we started the negotiations—trying to freeze the number of missiles and bombers—we have become locked into counting the number of missiles while imposing only loose constraints on their destructive power. In addition, the ceiling on the number of missiles with multiple warheads is far too high for strategic stability. If we were starting today to design a system for achieving stability, we would want just the opposite of what we have: we would want restrictions that kept all missile launchers small and with single warheads only, but that permitted each side to have a rather large (and equal) number of individual launchers. Such a force could never be eliminated by an adversary's first strike.

The accuracy of Dr. Iklé's judgment can be illustrated by comparing alternative limits on silo-based ICBM forces—a type of force recognized as a serious source of instability. Equal forces limited to only 100 missiles, each allowed to carry ten one-megaton (MT) warheads, would be extremely unstable; whichever side struck first would destroy more of the defender's force than it would expend of its own, thereby improving its advantage over the other side (see Figure 2). On the other hand, the same amount of megatonnage deployed in 10,000 single-warhead missiles would be stable even if extremely good accuracies are assumed, *i.e.*, there would be a serious disadvantage in striking first.

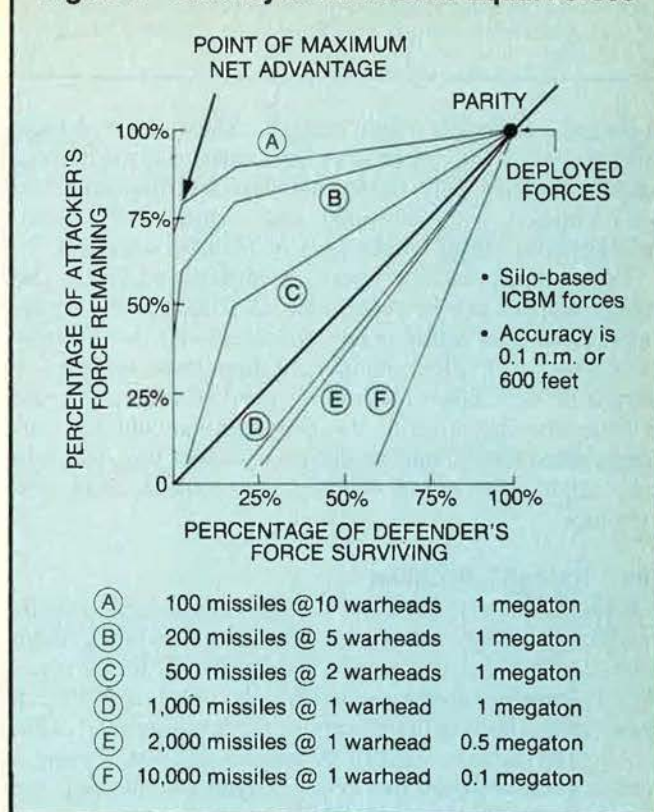
Disturbing Discoveries

The discovery that the concepts being pursued in SALT were inconsistent with stability proved to be extremely frustrating to some of the arms negotiators in both the Department of Defense and ACDA. The concept of limiting launchers had developed so much political momentum that it apparently became impossible to change. In theory, this inherent defect in the SALT approach could have been corrected by limiting the number of ICBMs carrying multiple independently targetable reentry vehicle (MIRV) payloads. As Figure 2 would imply, a non-MIRV force would be much more stable.

Figure 3 illustrates the influence on stability of reducing the number of ICBMs that may be MIRVed. It shows that ICBM MIRV limits of 500 or greater do not improve stability; the Soviet incentive to preempt would remain relatively constant. A limit of 200 would be required to eliminate any incentive to preempt, a point that validates Dr. Iklé's contention that the MIRV ceiling, now reported to be 820, "is far too high for strategic stability." Indeed, the data show that an 800 to 850 MIRVed ICBM limit results in near-maximum instability.

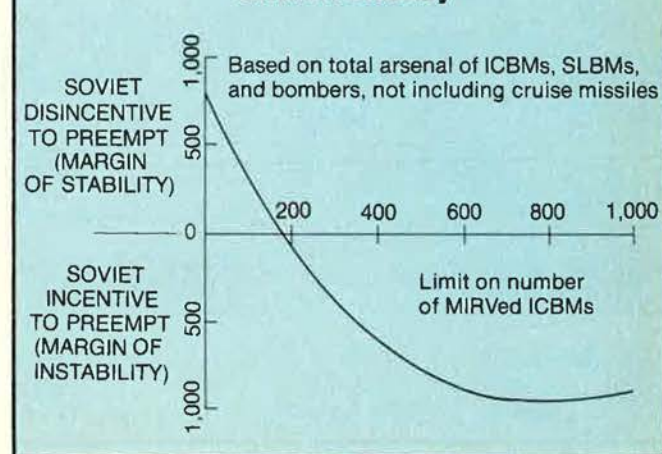
The preceding illustrations have assumed continued improvement in strategic missile accuracy. Accuracy has long been recognized as a major contributor to potential strategic instability, and there have been diligent efforts in the US Congress to restrain accuracy improvements to our strategic missile systems. The Soviets have shown no signs of comparable restraint, which has led some members of the Congress to advocate SALT restrictions on strategic missile accuracy improvements. Although this is a good idea in principle, there are several reasons why such a limitation could never be verified. For example:

Figure 2—Stability of Alternative Equal Forces



- Guidance hardware is concealed within the missile and the Soviets could easily prevent the US from knowing what hardware is being used or how well it performs.
- System accuracy will continue to improve as geodetic, geodesic, and weather forecasting knowledge improves.
- ICBM guidance hardware could be fully developed using spaceflights because injection of orbital payloads permits more precise calibration of guidance performance than is provided by ICBM tests.
- A quantum improvement in missile accuracy could be gained by developing a terminal homing warhead. Normal steps to develop such a device are not easily detected and with simple precautions in the test program could be made indistinguishable from "legal" testing. Specifically, the sensors could be developed by dropping

Figure 3—Influence of ICBM MIRV Limit on Stability



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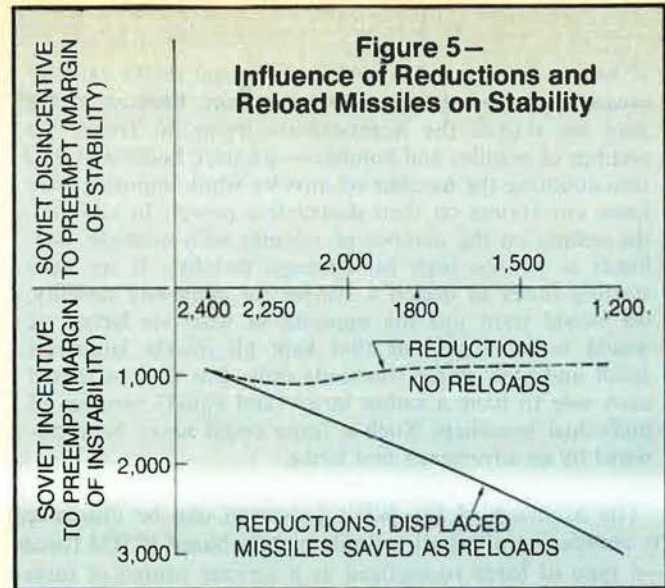
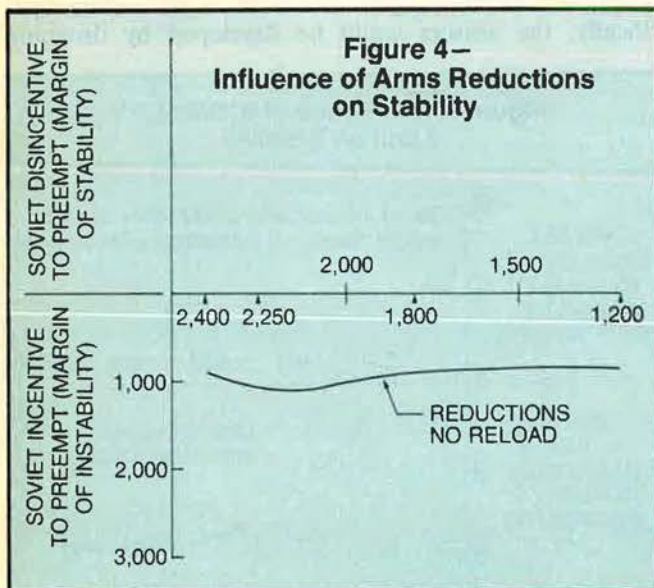
“boosted” warheads from aircraft. Since these devices must necessarily be tested over land areas, and the homing feature operates only during the last few thousand feet before impact, even full-range tests could not be distinguished from “legal” flight tests of ballistic warheads.

There are a great many ways to improve accuracy, and many of them are not amenable to limitation by agreement. Even more worrisome is the likelihood that halfway measures (e.g., limiting numbers of flight tests) intended to impede or slow down the improvement of accuracy could increase the incentive to develop terminal homing warheads, since these could be designed so that very few full-range flight tests would be needed to validate their performance.

The “Reload” Problem

If the concept of limiting numbers of launchers (missile silos) is politically attractive, the idea of reducing them seems to have become totally irresistible. Reducing numbers of launchers, however, tends to be more destabilizing than merely limiting them because the launchers for older, less capable missiles tend to be phased out first, leaving a greater proportion of the newer, larger systems that are the worst contributors to instability.

Figure 4 illustrates the consequences of this approach to reductions. The initial reductions below a limit of 2,400 were the less-capable systems resulting in a worsening of the margin of instability. Further reductions, in which the USSR was assumed to preferentially retain its ICBMs and the US its SLBMs and bombers, only restores the instability to its present level. Reductions, then, do not improve stability unless the more capable systems are phased out first. President Carter’s SALT proposal in March of last year apparently was based on this fact, and would have cut by half the Soviet SS-18 heavy missile force. This constructive proposition was rejected by the Russians.



A particularly troublesome issue at SALT is that reductions apply only to launchers, which can be reloaded with missiles designed for that purpose. There is no limit to the number of missiles that either side can produce and store. Also, the number of missiles is unverifiable; there is no magic way to see inside the buildings where missiles could be built or stored.

The “reload” problem was easy to solve for anti-ballistic missile (ABM) systems; to be effective, the extra missiles would have to be brought into firing position within a few seconds, a possibility easily foreclosed by the ABM Treaty prohibition of rapid-fire launchers. ICBM launchers, however, need not be reloaded rapidly. Reload within a few days or a week would meet the requirements of Soviet doctrine, which envisions fighting on until the enemy is vanquished. Indeed, a ban on rapid-fire ICBM launchers would prohibit something that probably no one would be foolish enough to do, namely reload the ICBM launchers before the adversary had expended his retaliatory weapons. Moreover, a requirement that extra missiles be kept at some distance from the nearest launcher (analogous to another provision of the ABM Treaty) would have no effect on reload time unless the distance were greater than could be traveled in two days, that probably being the time needed to refurbish the launcher before loading another missile.

The existence of reload missiles on either side could also create a destabilizing incentive for an opponent to attack preemptively, in an effort to destroy missile construction and storage facilities. The negative effect on stability of a reload capability is illustrated in Figure 5, which assumes that only those missiles displaced by treaty-imposed reductions are retained as reloads. If missile production is allowed to continue, the instability is even worse than is shown in Figure 5.

Unless reload missiles are effectively limited, a SALT agreement could be considered militarily meaningless and reductions could be counterproductive. The barrier preventing resolution of this problem is the Soviets’ refusal to allow on-site inspection. If the Soviets are committed to limiting the so-called arms race, and to promoting strategic stability, the restrictions that prevent the two

sides from establishing a verifiable limit on reload missiles need to be resolved.

Can Stability Be Achieved?

Since the two superpowers appear locked into a negotiating framework that is inherently contrary to the principles of stability, can stability be improved within that framework? The answer is, yes; it is possible. The key is to maintain a proper balance between survivability and destructive potential. To illustrate: Although ICBM forces were once a stabilizing influence, continued improvement in Soviet missile accuracy is reducing US ICBM survivability to a level inadequate to the purposes of this force. Also, the increasing destructive potential of Soviet ICBMs outweighs the survivability of their launchers. By the mid-1980s, one Soviet ICBM could destroy four US ICBMs, which could have destroyed six Soviet ICBMs. Hence, the Soviets have a six-to-one incentive to strike first.

A popular solution—dismantling all ICBMs—not only is nonnegotiable with the Soviets, but it would not automatically bring about stability. The reason is that from one-third to about one-half of all US submarine-launched ballistic missiles (SLBMs)—those being overhauled or in port—could be destroyed by only a handful of Soviet warheads or bombers. There is also substantial leverage to be gained by attacking US bomber bases. To maintain stability despite the partial vulnerability of these forces requires that the *surviving* US forces be able to cause enough damage to Soviet reserve forces to negate any advantage the Soviets could achieve by striking the bomber and the SLBM bases.

The Cruise Missile

The most immediately available option to improve stability is the cruise missile. This weapon is so accurate that, following a Soviet strike on US forces, it could destroy enough of the Soviet reserve forces to compensate for the Soviet damage to US ICBMs, bombers, and SLBMs. The effect, shown in Figure 6, is to arrest the growing Soviet incentive to strike first, and by 1982 to gain a position of neutral stability.

A unique virtue of the cruise missile is that it removes the Soviet incentive to strike first without at the same

time giving the US a first-strike capability. The twelve to eighteen hours required for cruise missiles to reach their targets make them unsuitable as first-strike weapons.

Relying on the cruise missile as the sole barrier to instability would, however, be unwise. There are two basic reasons:

First, it would place an extremely high premium on a bolt-out-of-the-blue attack, designed to take advantage of the fact that in peacetime the vast majority of the B-52s that will carry the cruise missile are not on alert and could be destroyed easily. However, it probably will be at least ten years before the Soviets will have enough urban-area shelters to risk a nuclear exchange without first evacuating their people—a step that would surely alert the US bomber force.

Second, Soviet air defenses could become an extremely destabilizing factor if the cruise missile became America's sole source of stability. Again, time is an important consideration. According to DoD officials, it would take seven or eight years for the Soviets to deploy their new SA-10 SAM system in numbers sufficient to destroy a large portion of the cruise missile force.

Time, then, is on the side of the cruise missile. If we deploy it quickly, it could be operational for many years before the Soviets could counter it. That is why the cruise missile has become a hotly contested issue in SALT, with the Soviets seeking limits that would make it easy to counter the cruise missile and thus deny the US a means of stabilizing the strategic relationship.

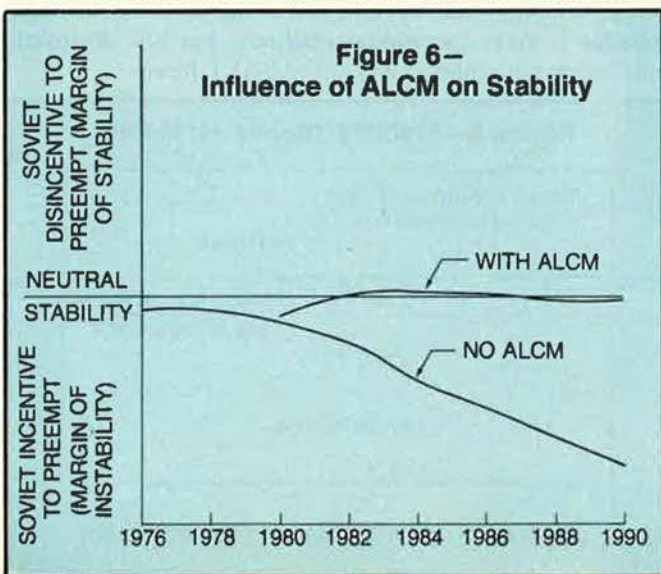
The original US negotiating position in SALT I was oriented toward stability; no offensive weapon would be limited unless the defenses opposing it were also limited. For example, the agreement to limit ABM systems led to limits on ICBMs and SLBMs.

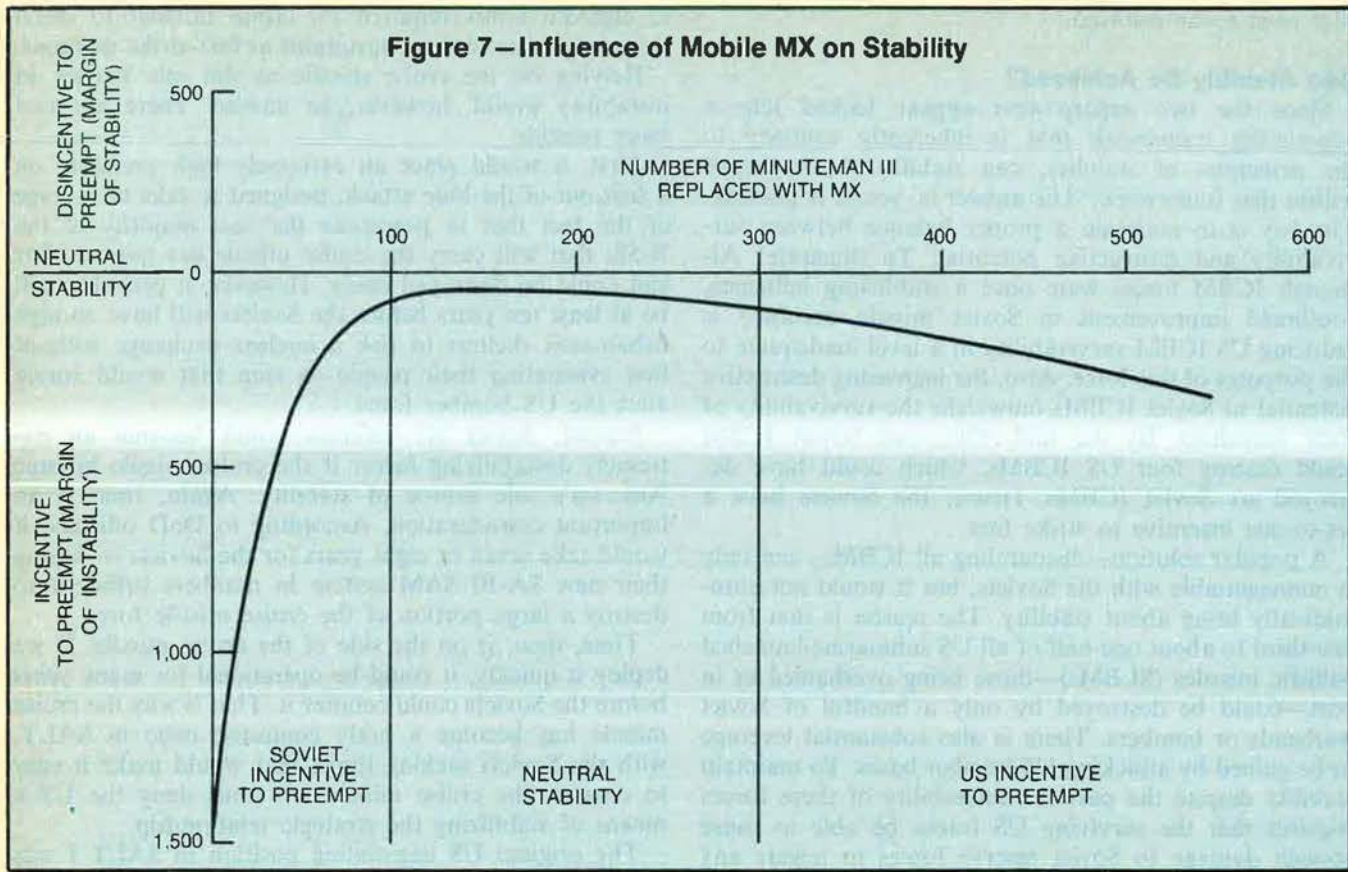
Yet, early in SALT II, the US weakened its position, agreeing to limit numbers of bombers but not the weapons they carried. Now the US apparently has agreed to limit cruise missile range and the numbers of aircraft that may carry them. All these concessions were made without any Soviet agreement to limit the air defenses that have created the requirement for the cruise missile. The effect of these SALT concessions is to make it easier for the Soviet Union to negate the stabilizing influence of America's planned cruise missile deployment.

For example, imposition of a limit on cruise missile range makes it possible for the Soviets to erect an air defense barrier to shoot down cruise missile carriers before they could get close enough to launch their missiles. A barrier defense 800 miles from the Soviet borders would deny cruise missiles access to well over half of Soviet targets, while a barrier at 1,200 miles would almost completely negate the cruise missile. Thus, limits imposed on the cruise missile would handicap our efforts to regain stability while giving the Russians a free hand to undermine it.

The MX Mobile ICBM

A second option to improve stability is the MX mobile ICBM. Some people claim that MX is destabilizing and would invite a Soviet first strike. They ignore the fact that the MX design is overbalanced in favor of survivability compared to capability. Soviet expenditures in an attack would exceed the MX losses by two or





three to one, and would offer the USSR no incentive to strike first.

Figure 7 shows the improvement in stability obtainable by deploying the mobile MX. Between 100 and 300 of these missiles would overcome the instability that otherwise will exist in the late 1980s and would regain a condition of neutral stability.

The usual counterargument is that the Soviet Union would respond to an MX deployment by building a mobile ICBM of its own, a response depicted as somehow harmful to US interests. In reality, Soviet mobile ICBMs would probably improve stability. Under a SALT limit, Soviet mobile ICBMs would reduce force capabilities, particularly the throw-weight advantages currently enjoyed by their silo-based ICBMs, and dramatically improve the survivability of the Soviet force. With mobile ICBMs deployed by both countries, a condition of positive stability could be obtained, because whichever side struck first would lose. The heavier the attack, the greater would be the loss. As Dr. Iklé put it, "The requirement that we count missiles argues against permitting mobile missiles, which are hard to count. Yet, for stability, concealed mobile missile launchers are better than the easier-to-count fixed ones."

While mobile ICBMs offer greater stability than cruise missiles, the MX will not be available until at least 1986 (and probably much later). The cruise missile appears the most realistic option to regain stability during the early 1980s. In the late 1980s, the MX would supplement the cruise missile and hedge against destabilizing developments in Soviet air defenses. Figure 8 illustrates this point.

Despite its potential contribution to strategic stability,

a US mobile ICBM may be prohibited by a SALT II agreement, thus allowing the ICBM leg of the Triad to reach a level of vulnerability Defense Department officials consider unacceptable.

The Soviets apparently would not be comparably restricted. A *New York Times* article, citing Pentagon sources, reported that the Soviet Union already has produced "at least 100" of the SS-16 mobile missiles, and is "storing them in warehouses and bunkers." (Subsequently, the Defense Department announced that some SS-16s have been deployed in silos.) The *Times* article noted that these weapons could be "deployed quickly, probably in a matter of days." At the current rate of production, the Soviet Union could, by 1985, have nearly 1,000 of these missiles in near-operational readiness but not deployed, and hence not counted within the SALT limits.

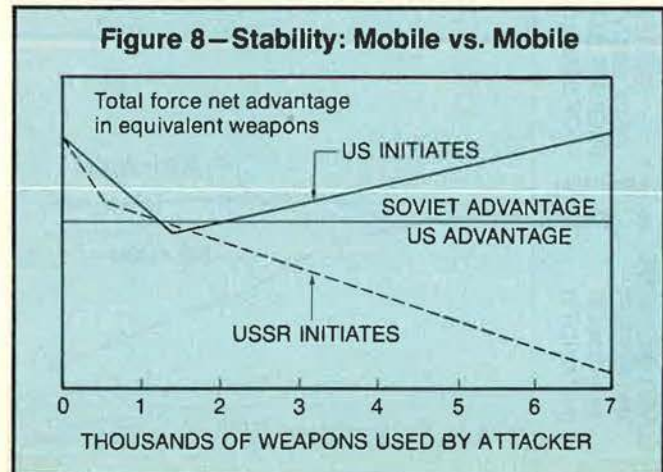


Figure 9—Destructive Capability After Soviet First Strike

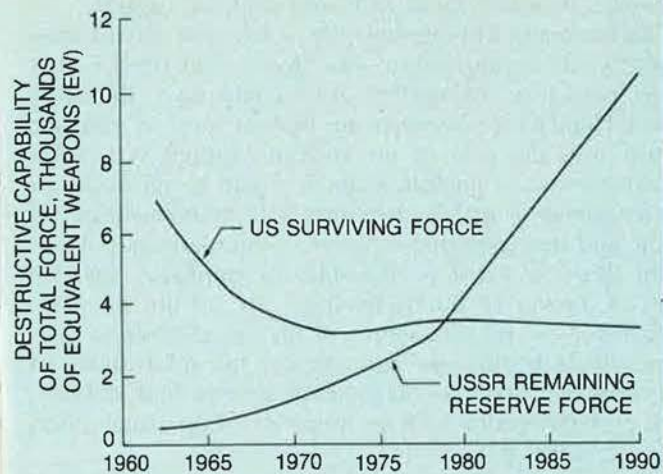
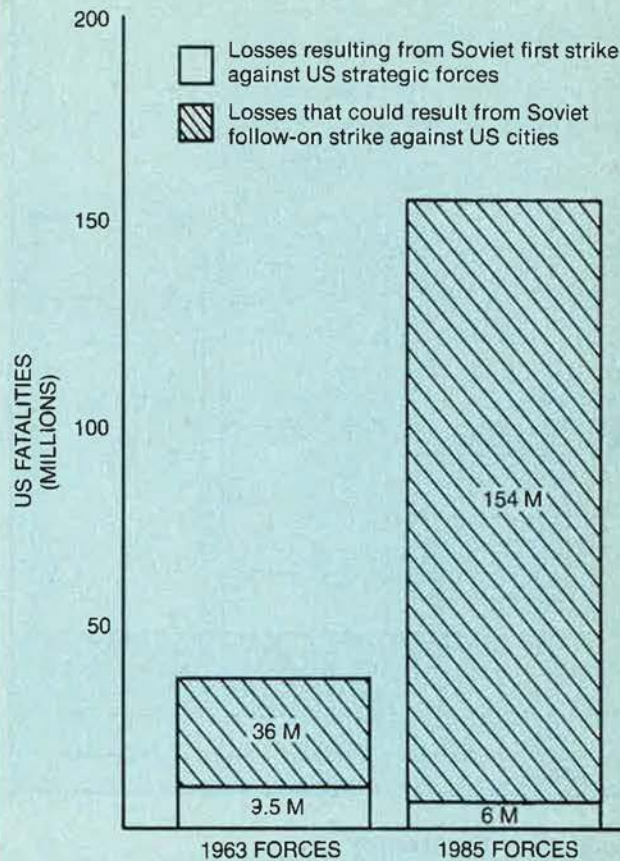


Figure 10—The Worsening Consequences of Retaliation



Barriers to Stability

Despite potentially serious US-Soviet strategic asymmetries, strategic stability can be regained by the United States if we continue to believe that objective is desirable. We certainly have the necessary technology and resources. In spite of this, it appears doubtful that the SALT agreements will help to regain stability, since the Soviet programs that are the greatest sources of instability will be allowed to continue unabated. A SALT agreement that hampers or prohibits US efforts to ensure strategic stability would, therefore, seem unwise, unless US policy is changed to the "minimum-deterrence, assured-destruction-only posture" that is popular with many US arms-control advocates.

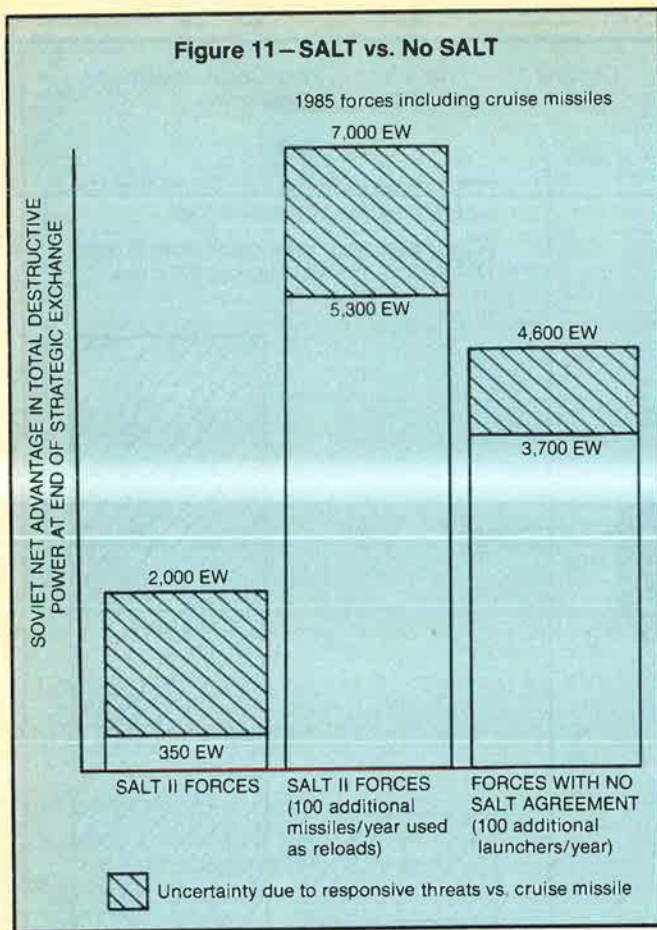
Figure 9 shows US destructive power that would survive a Soviet first strike today is only about half what it was in the early 1960s. Moreover, in their belief that nuclear war is winnable, the Soviets have continued to improve and expand their civil defenses, particularly since the 1972 Treaty limiting ABM defenses. As mentioned earlier, Soviet casualties in a nuclear war might be considerably lower than their World War II losses if the Soviets carried out their civil defense plans for evacuating and sheltering their people. These studies also show that a preemptive US attack on the Soviet Union would, as one member of the House Armed Services Committee recently observed, be "suicidal." The US capability to inflict unacceptable damage in a retaliatory attack can no longer be taken for granted. Further, an examination of Soviet strategic doctrine indicates a belief on the part of the Soviets that they can survive a nuclear war and recover to a position of dominance more rapidly than could the United States.

Perhaps of more fundamental concern, the credibility of US retaliation has been dramatically eroded. In 1963, when the deterrence concept was conceived, the Soviets would have used as much as three-fourths of their much smaller strategic force in an attack on US strategic forces. With Soviet forces substantially exhausted, retaliation by the US was highly credible, particularly since the US surviving force would have outweighed the remaining Soviet forces by fifteen to one.

Figure 9 shows how drastically that situation has changed. Today, the Soviet force remaining after a first strike would nearly equal the capability of the surviving US force. Further, trends favoring the Soviets are accelerating. By 1985, the Soviet remaining force will have twice the destructive power of the US surviving force. In that condition there is serious doubt that the US would be willing to retaliate. As former SALT negotiator Paul Nitze has observed, the Soviets might come to view our deterrent as being deterred.

The changing consequences of retaliation, and hence its declining credibility as a deterrent, are illustrated in Figure 10. In 1963, the US would have lost 9,500,000 people in a Soviet attack against US forces. Had we retaliated, we could have lost an additional 36,000,000, if the remaining Soviet arsenal were targeted against US cities. Under those conditions, retaliation might have been credible; the US, although badly damaged, would have survived and recovered much more quickly than the Soviet Union.

By 1985, the possible consequences to the US of retaliation will have increased fourfold. According to current projections, the United States would then lose as many as 154,000,000 Americans in such a scenario. Would any US president be willing to risk three-quarters of our population to avenge the deaths of the 6,000,000 Americans who would be lost in an initial Soviet attack on our strategic forces? More important, under those conditions, could we expect the Soviet leadership to attach any credibility to US doctrine?



Credible US Deterrence

What actually constitutes credible deterrence evokes an endless debate. Present US policy prescribes a number of elements considered necessary for preserving deterrence. Those elements revolve around an understanding of strategic stability. Therefore, if there is to be a workable SALT agreement, it should be one that helps rather than hinders the restoration of stability.

If the Soviets will not accept an agreement that contributes to stability, the US might do well to forego a SALT agreement at the present time, as some members of Congress have argued, with the hope that an equitable and balanced agreement can be achieved in the future. The counterclaim—that without a SALT agreement the United States would be infinitely worse off than under the current SALT proposal—presupposes that, in the absence of an agreement, the Soviet Union would produce more weapons than they will under the contemplated agreement. Projections of increased Soviet weapons-building in the absence of an agreement assume 100 percent success in everything the Soviets might attempt.

More realistically, the Soviets will be less than fully successful. Also, their productive capacity probably is now near its limits. Further, additional weapons production has always been evaluated in the context of deploying more launchers for the extra missiles. In fact, if additional productive capacity does exist, the proposed SALT agreement would not prohibit the Soviets from using this capacity to build extra missiles as a reserve force, possibly in a reload mode.

Figure 11 shows that if the Soviets built additional mis-

siles, it would be to their advantage to store them for reloads rather than to deploy them in additional launchers. Thus, the contemplated SALT agreement would only channel the Soviet Union's extra missiles in ways detrimental to US national security and strategic stability.

The response to objections that a US civil defense program would make nuclear war "more thinkable" is that deep reductions of nuclear arms could have the same effect. Somewhere between the present level of strategic forces and the goal of no nuclear weapons is a point where the use of nuclear weapons would be thinkable. A better course of action, therefore, is to make nuclear war futile and thus unusable as a tool of international politics.

In this context, it is important to emphasize that we are the master of our technology; we are not its slave. Technology is not the source of the so-called arms race, but with technology we can enhance the survivability of our strategic systems, maintain deterrence and stability, and probably get by with less weaponry than would otherwise be required.

Melvin Price, Chairman of the House Armed Services Committee, recently observed that there seemed to be an inadequate appreciation of technical expertise in formulating some of the US SALT proposals. Concern focused on the notion that through SALT we could somehow verifiably restrict improvements in Soviet ICBM accuracy, and thus diminish the threat to the US silo-based ICBM force.

In point of fact, as a senior US Department of Defense official recently conceded, that genie is out of the bottle. Neither the US comprehensive SALT proposal of March 1977 nor any proposal discussed since then, can in a verifiable way diminish or significantly delay the Soviet threat to the US silo-based ICBM force. And it is primarily this Soviet capability that so dramatically threatens strategic stability early in the next decade. Secretary of Defense Harold Brown has said the number of US ICBMs that would withstand a Soviet surprise attack early in the next decade could be unacceptably low.

* * *

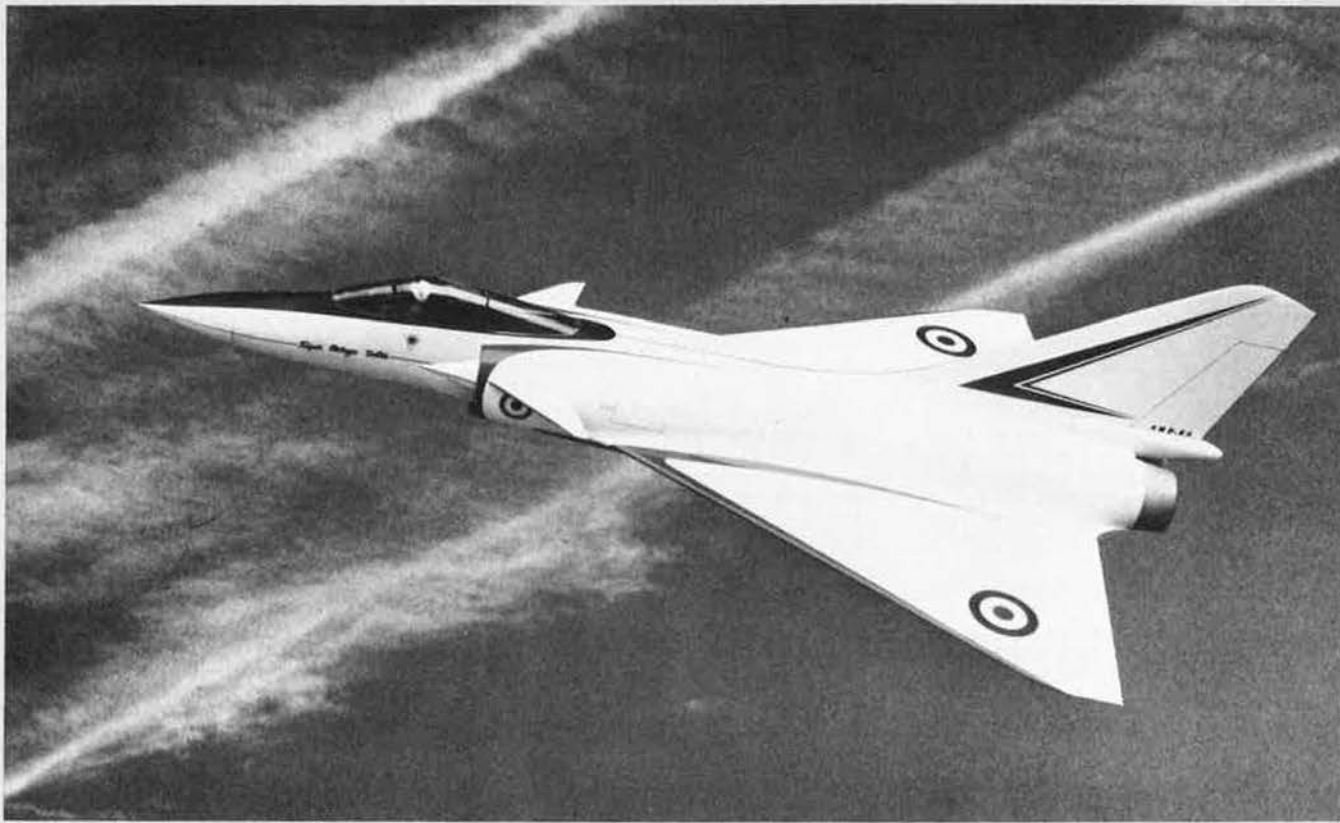
A national debate over the merits of a strategic arms-limitation agreement is both prudent and necessary.

The United States may decide that a SALT II agreement that does not promote strategic stability as presently defined is in the national interest. The Administration and the Senate may believe that enough of our strategic forces could survive a surprise Soviet attack to make such an attack unlikely. But it is also worth reiterating that arms control of itself does not automatically enhance our security, strategic stability, or world peace. On the contrary, an improvident agreement can make achievement of those objectives less likely.

We cannot look to SALT as the sole means of preserving our national security. If we are not prepared to develop and deploy the weapon systems necessary for stability and security, it is unlikely that a SALT agreement would really contribute to those objectives. Finally, unless we are prepared to deal factually and analytically with national defense issues, we could set in motion precisely those forces we have sought to contain. Actions—or inaction—that undermine the credibility of the US deterrent would be likely to result in an extremely unstable strategic balance. ■

JANE'S

ALL THE WORLD'S AIRCRAFT SUPPLEMENT



Model of Dassault Super Mirage 4000 in clean configuration

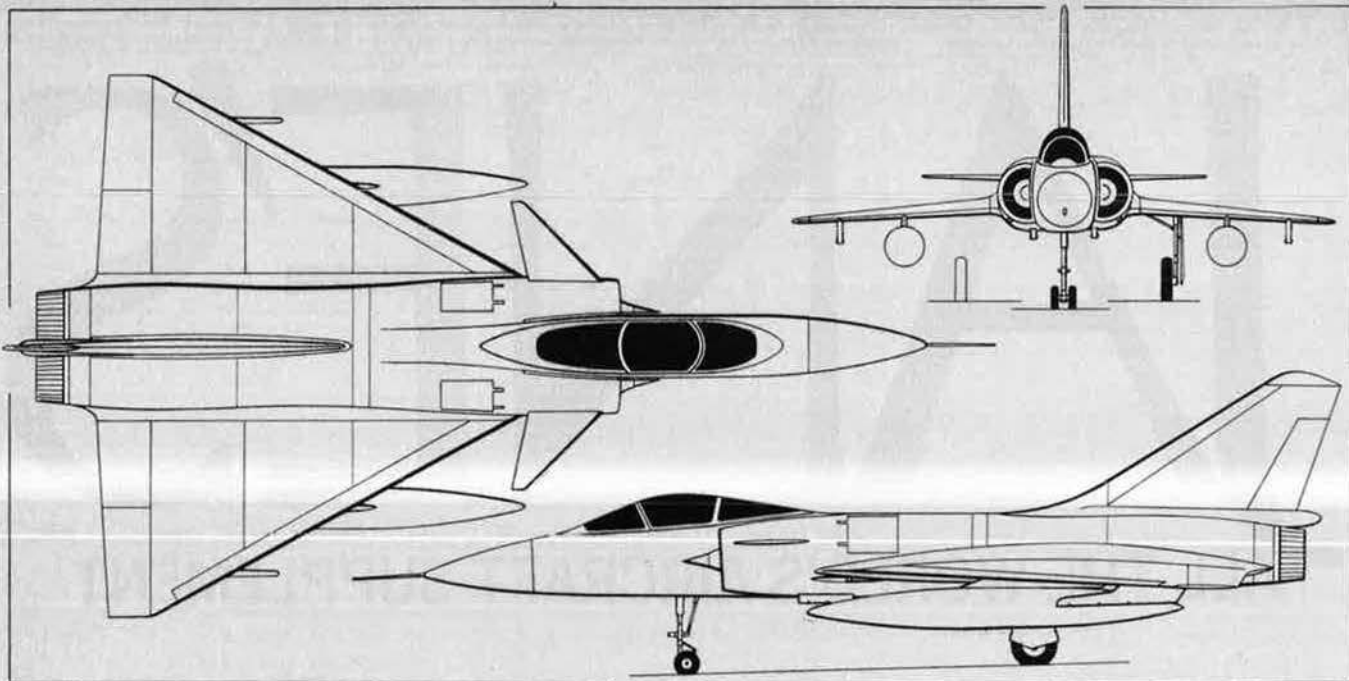
DASSAULT-BREGUET
AVIONS MARCEL DASSAULT/BREGUET AVIATION; Head Office: 27 rue du Professeur Victor Pauchet, 92420-Vaucresson, France

DASSAULT SUPER MIRAGE 4000

When the French Air Force abandoned development of the ACF (Avion de Combat Futur) programme, in favour of the less-costly single-engined Mirage 2000, M Marcel Dassault commented that no country should

be without a twin-engined combat aircraft. He announced in December 1975 that Dassault-Breguet would develop at its own expense a twin-turbofan counterpart of the Mirage 2000, intended primarily for interception and low-altitude penetration attacks on targets a considerable distance from its base. Potential export customers were assured that the new aircraft would offer overall performance superior to that of any aircraft in its class known to be in production or under development.

A mockup of the new type, now designated Super Mirage 4000 (originally Super Mirage Delta), was unveiled in December 1977. At the same time, it was announced that a prototype would fly in October 1978, six months after the planned first flight of the Mirage 2000. Its general configuration is shown in the accompanying illustrations. Dimensions, weights, performance, and details of armament are classified; but installation of two engines of the type fitted in the single-jet Mirage 2000 will give the Super



Provisional three-view drawing of Dassault Super Mirage 4000 (Pilot Press)

Mirage 4000 a power:weight ratio above 1:1 in an interceptor role.

The Super Mirage 4000 has computer-derived aerodynamics, with a rearward CG made possible by a fly-by-wire active control system. Other features include foreplanes very like those fitted to the Israeli Kfir-C2 development of the Mirage, a blister-type cockpit canopy giving a 360° field of view, a larger nose radome, and extensive use of composite structures.

The following details should be regarded as provisional:

TYPE: Single-seat multi-role combat aircraft.

WINGS: Cantilever mid-wing monoplane of delta planform, with computer-derived aerodynamics. Large-radius root fairings.

Full-span automatic leading-edge flaps operate in conjunction with two-section elevons which form entire trailing-edge of each wing, to provide variable camber in combat and during landing approach. Fly-by-wire active control system for elevons and flaps. No tabs.

FUSELAGE: Conventional semi-monocoque structure, 'waisted' in accordance with area rule. Door-type airbrake in each intake trunk above wing-root leading-edge.

TAIL UNIT: Cantilever fin and inset rudder

only; latter actuated by fly-by-wire control system. No tab. Fixed-incidence swept canard foreplane near lip of each engine air intake duct.

LANDING GEAR: Retractable tricycle type, with twin nosewheels, and single wheel on each main unit. Hydraulic retraction, main units inward. Oleo-pneumatic shock-absorbers. Electro-hydraulic nosewheel steering.

POWER PLANT: Two SNECMA M53-5 turbofan engines side-by-side in rear fuselage, each rated at 88.3 kN (19,840 lb st) with afterburning. Movable half-cone centrebody in each air intake. Provision for a large jettisonable fuel tank under each wing. Fuel tankage in fin.

ACCOMMODATION: Pilot only, under sideways-opening (to starboard) transparent canopy; 360° field of view.

ELECTRONICS AND EQUIPMENT: Large-diameter radar in nose, reported to provide search range of up to 65-70 nm (120-130 km; 75-80 miles). Digital autopilot, multi-mode displays, and inertial navigation system.

ARMAMENT: Will include two 30 mm DEFA guns in bottom of air intake trunks, and a rail under each outer wing for a Matra 550 Magic air-to-air missile.

RFB

RHEIN-FLUGZEUGBAU GmbH (Subsidiary of VFW-Fokker GmbH); Head Office and Main Works: D-4050 Mönchengladbach 1, Flugplatz, Postfach 408, Germany

RHEIN-FLUGZEUGBAU FANTRAINER

This tandem two-seat training aircraft was first projected by Rhein-Flugzeugbau (RFB) in 1970, at which time a model was exhibited at the Hanover Air Show. It utilises a ducted fan propulsion system which, in the original concept, comprised a Dowty Rotol variable-pitch fan, integral with the rear fuselage and driven by a 224 kW (300 hp) Wankel four-disc rotary engine.

Since the Fantrainer project was initiated, RFB has gained experience of ducted fan propulsion with the Sirius I and II powered sailplanes and the Fanliner two-seat light aircraft.

In March 1975 it was announced that the Federal German Defence Ministry had awarded the company a contract to develop and build two Fantrainer prototypes. These are to be evaluated as potential replacements for the Piaggio P.149D primary trainers now used by the Luftwaffe, and conform to US FAR 23 specifications in the Aerobatic and Utility categories. It is suggested that pupils might be able to make a direct transition from the Fantrainer to the Alpha Jet. If flight testing proves the practicability of such a scheme, it is possible that Fantrainers may be seen in service from 1979.

The power plant of the first prototype, which has the type designation AWI-2, comprises two Wankel engines, driving a variable-pitch fan through a reduction gearbox, and with airbrakes in the fan shroud. The second prototype, which has the type designation ATI-2, is powered by a turboshaft engine. Later versions with turboshaft engines of up to 597 kW (800 shp) are under consideration. They include the ATI-2-K1 advanced trainer with an Avco Lycoming LTS 101 turboshaft; the ATI-2 armed variant for COIN, helicopter escort, and anti-helicopter roles; and the AWI-4/ATI-4 for transport pilot and combat observer training and liaison duties.

Dowty Rotol in the UK announced on

Full-scale mockup of Super Mirage 4000 multi-role combat aircraft



13 January 1976 the receipt of a £30,000 order from RFB for the supply of three variable-pitch ducted propulsor fans for the Fantrainer programme.

The general appearance of the Fantrainer AWI-2 can be seen in the accompanying illustrations. The first prototype flew for the first time in October 1977; the second prototype was scheduled to fly in the Spring of 1978.

TYPE: Two-seat basic and IFR training aircraft.

WINGS: Cantilever mid-wing monoplane. Dihedral from roots. Sweepforward 6° at quarter-chord. Constructed mainly of glass-fibre and plastics tube sandwich. Conventional ailerons and electrically-actuated Fowler-type trailing-edge flaps. No tabs.

FUSELAGE: The load-carrying structure of the forward and centre fuselage is of metal, with non-load-bearing glassfibre skin, sections of which are removable for servicing purposes. Cruciform metal rear fuselage is connected to the centre fuselage at three points. The integral fan duct is free of structural loads. Large airbrake on each side of fan duct, operation of which causes no lift or stability changes.

TAIL UNIT: All-metal T-tail of light alloy, with conventional rudder and elevator. Servo tab in trailing-edge of each elevator. Trim tab in rudder.

LANDING GEAR: Retractable tricycle type, with single wheel on each unit. Electro-hydraulic actuation, with manual emergency extension. All units retract into fuselage, nose-wheel forward, main units upward into wing roots. Leaf-spring legs, of glassfibre-reinforced plastics.

POWER PLANT: First AWI-2 prototype has two 112 kW (150 hp) Audi NSU/RFB Wankel EA 871-L rotating-piston engines, mounted one above the other in centre of fuselage, and driving a Dowty Rotol seven-blade variable-pitch ducted fan via a KHD gearbox. In case of an engine failure, the freewheel clutch between the engines and gearbox provides continued power from the remaining engine. Four integral fuel tanks in wings.

ACCOMMODATION: Two seats in tandem cockpit, meeting US MIL specifications in terms of dimensions and layout. Seats and rudder pedals adjustable. Provision for seat and back parachutes. Fighter-type side consoles. Canopy over each seat hinges sideways independently.



Prototype RFB AWI-2 Fantrainer tandem two-seat training aircraft

SYSTEM: Electrical system for actuation of landing gear and flaps.

DIMENSIONS, EXTERNAL:

Wing span 9.60 m (31 ft 6 in)
Wing chord at tip 0.55 m (1 ft 9¾ in)
Wing aspect ratio 6.65
Length overall 8.94 m (29 ft 4 in)
Height overall 2.90 m (9 ft 6 in)

AREA:

Wings, gross 13.90 m² (149.6 sq ft)

WEIGHTS AND LOADING:

Weight empty, equipped 915 kg (2,017 lb)
Max T-O weight, Aerobatic category 1,350 kg (2,976 lb)
Max T-O weight, Utility category 1,580 kg (3,483 lb)
Max wing loading 113.7 kg/m² (23.3 lb/sq ft)

PERFORMANCE (estimated, at T-O weight of 1,350 kg; 2,976 lb, except where indicated):

Max level speed at S/L 191 knots (354 km/h; 220 mph)
Max level speed at 6,100 m (20,000 ft) 170 knots (315 km/h; 196 mph)
Max cruising speed at S/L 172 knots (320 km/h; 199 mph)
T-O to 15 m (50 ft) at 1,100 kg (2,425 lb) AUV 305 m (1,000 ft)
Landing from 15 m (50 ft) at 1,100 kg (2,425 lb) AUV 410 m (1,345 ft)

Range with max fuel:
at S/L 701 nm (1,300 km; 808 miles)
at 6,100 m (20,000 ft) 998 nm (1,850 km; 1,150 miles)

Endurance at max cruising speed, no reserves:
at S/L 3 h 45 min
at 6,100 m (20,000 ft) 5 h 0 min
g limits (Aerobatic) +6; -3

MCDONNELL DOUGLAS

DOUGLAS AIRCRAFT COMPANY (a Division of McDonnell Douglas Corporation); Head Office: 3855 Lakewood Boulevard, Long Beach, California 90846, USA

MCDONNELL DOUGLAS DC-9 Super 80

The Douglas Aircraft Company is to add a sixth basic model to its highly successful series of DC-9 twin-turbofan short/medium-range transports, of which more than 870 examples have been delivered to 52 operators, including the USAF, USN, and USMC. Designated DC-9 Super 80, this new aircraft has been evolved specifically to meet the needs of operators on short/medium-range routes who require an aircraft of increased capacity, and the basic design has been modified to offer improved economy in operation, reduced fuel consumption, and far quieter engines. Contributing to these operational advantages are a lengthened fuselage to accommodate a maximum of 172 passengers in a five-abreast commuter layout, a new wing of increased area, and refanned Pratt & Whitney JT8D engines which provide increased thrust and a lower specific fuel consumption.

The new wing is increased in span to 32.87 m (107 ft 10 in) by the insertion of wing root plugs, and the provision of an 0.61 m (2 ft 0 in) wingtip extension on each wing, giving a wing area 28% greater than that of the DC-9 Series 50. Full-span leading-edge slats have three position settings.

The fuselage is extended in length by 4.34 m (14 ft 3 in), achieved by the insertion of a 3.86 m (12 ft 8 in) plug forward of the wing, and by an 0.48 m (1 ft 7 in) segment aft of the wing. This will allow a typical cabin arrangement of 12 first class and 125 coach seats, but there are several alternative options. The cabin will have 'wide look' decor, with large enclosed overhead baggage compartments, acoustical ceiling and soft fluorescent lighting. The increase in fuselage length provides also underfloor cargo holds of increased capacity; an additional cargo door is provided in the starboard side of the new forward fuselage plug, and the existing aft cargo door is increased in size and relocated. A new servicing door is installed on the port side of the fuselage, forward of the engine. The landing gear track is increased, the wheelbase extended, and the landing gear is strengthened to cater for the new higher maximum take-off weight.

RFB AWI-2 Fantrainer (two Audi NSU/RFB Wankel engines)





Artist's impression of the McDonnell Douglas DC-9 Super 80 in airline service

Power plant will comprise two Pratt & Whitney JT8D-209 turbofan engines, each rated at 82.3 kN (18,500 lb st) for take-off and having an emergency thrust reserve of 3.3 kN (750 lb st) which is available automatically in an engine-out condition. Refanned with a larger-diameter single-stage fan, this new version of the proven JT8D engine has a bypass ratio of 1.68, by comparison with 1.00 of earlier engines, resulting in a lower specific fuel consumption and reduced noise emission. In addition, sound suppression materials applied to the inlet, fan duct, and tailpipe duct of each nacelle will reduce engine noise to new low levels. Predicted noise levels for the Super 80 are significantly below the requirements of FAR Pt 36, and will also satisfy the more stringent requirements of ICAO CAN 5 established recently for new aircraft designs. Standard fuel capacity is increased by 5,754 litres (1,520 US gallons) as a result of the larger wing.

Improvements to the systems of the Super 80 include a new digital electronics integrated flight guidance and control system; introduction of a 'dial-a-flap' system to permit more accurate selection of flap angle for optimum take-off and landing performance; the provision of flow-through cooling of the aircraft's electronics compartment; a larger capacity APU; and a new recirculating system for ventilation air. In addition, structural modifications are to be introduced to extend the airframe's life to 50,000 landings.

It was announced in late October 1977 that Swissair had placed a firm order for 15 DC-9 Super 80 aircraft, with delivery scheduled between March 1980 and March 1981, as well as registering options for a further five aircraft. Other customers include Austrian Airlines (8) and Southern Airways (4).

TYPE: Twin-turbofan short/medium-range civil transport.

WINGS: Cantilever low-wing monoplane. Sweepback 24° 30' at quarter-chord. All-metal construction, with three spars inboard, two spars outboard, and spanwise stringers riveted to skin. Glassfibre trailing-edges on wings, ailerons, and flaps. Single hydraulically-controlled aileron on each wing. Wing-mounted speed brakes. Full-span leading-edge slats with three position settings. Hydraulically-actuated double-slotted trailing-edge flaps. Detachable wing-tips. Thermal anti-icing of leading-edges.

FUSELAGE: Conventional all-metal semi-monocoque structure.

TAIL UNIT: Cantilever all-metal structure with electrically-actuated variable-incidence

T-tailplane. Manually-controlled elevators with servo tabs. Hydraulically-controlled rudder with manual override. Glassfibre trailing-edges on control surfaces.

LANDING GEAR: Retractable tricycle type of Cleveland Pneumatic manufacture, with steerable nosewheel. Hydraulic retraction, nose unit forward, main units inward. Twin Goodyear wheels on each unit. Goodyear brakes. Hydro-Aire Hytrol Mk IIIA anti-skid units.

POWER PLANT: Two Pratt & Whitney JT8D-209 turbofan engines, each rated at 82.3 kN (18,500 lb st) for take-off, with emergency thrust reserve of 3.3 kN (750 lb st), pod-mounted on each side of rear fuselage. Engines fitted with target-type thrust reversers for ground operation only. Standard fuel capacity 21,875 litres (5,779 US gallons).

ACCOMMODATION: Crew of two on flight deck, plus cabin attendants. Normal accommodation in main cabin is for 137 passengers in mixed class, 155 economy class, and maximum of 172 in commuter class with reduced facilities. Four-abreast first class, five-abreast coach/economy seating, with centre aisle 0.48 m (1 ft 7 in) wide extending full cabin length. Fully pressurised and air-conditioned. Toilets at front and rear of cabin. Provision for galley. Passenger door at front of cabin on port side, with electrically-operated built-in airstairs. Servicing and emergency exit door opposite on starboard side; second servicing door on port side forward of

engine nacelle. Optional ventral stairway. Underfloor freight and baggage holds, with two doors forward of wing and one door aft of wing. All doors are on starboard side.

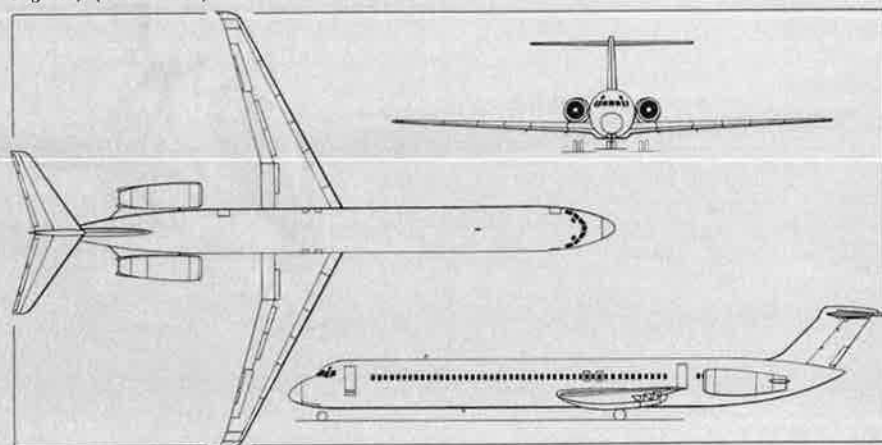
SYSTEMS: Dual automatic electronic pressurisation system; electronic engine synchronisation system. Two separate hydraulic systems, pressure 207 bars (3,000 lb/sq in), each powered primarily by one variable-displacement engine-driven pump. The starboard system includes an electrically-driven auxiliary pump. A hydraulic motor-pump connects mechanically the two systems, and serves as an alternative source of power for the landing gear in the event of a starboard hydraulic system failure, and as a backup source of power for the port system. System pressure reduced to 103.5 bars (1,500 lb/sq in) by pilot action during flight to increase service life. APU provides electrical and pneumatic power for main engine starting; air-conditioning and electrical power during ground functions; auxiliary electrical power during flight.

ELECTRONICS: Digital integrated flight guidance and control system; weather radar with digital display; dual nav/com systems.

DIMENSIONS, EXTERNAL:

Wing span	32.87 m (107 ft 10 in)
Length overall	45.06 m (147 ft 10 in)
Height overall	9.04 m (29 ft 8 in)
Tailplane span	12.24 m (40 ft 2 in)
Wheel track	5.08 m (16 ft 8 in)
Wheelbase	22.07 m (72 ft 5 in)

Three-view drawing of the DC-9 Super 80 (three Pratt & Whitney JT8D-209 turbofan engines) (Pilot Press)



Passenger door (port, fwd):
 Height 1.83 m (6 ft 0 in)
 Width 0.86 m (2 ft 10 in)
 Height to sill 2.23 m (7 ft 4 in)
 Servicing door (stbd, fwd):
 Height 1.22 m (4 ft 0 in)
 Width 0.69 m (2 ft 3 in)
 Height to sill 2.18 m (7 ft 2 in)

DIMENSIONS, INTERNAL:

Cabin:
 Max width 3.07 m (10 ft 1 in)
 Floor width 2.87 m (9 ft 5 in)
 Max height 2.06 m (6 ft 9 in)
 Freight hold (underfloor)
 35.48 m³ (1,253 cu ft)

AREA:

Wings, gross 118.82 m² (1,279 sq ft)

WEIGHTS:

Manufacturer's empty weight
 33,767 kg (74,444 lb)

Max space-limited payload
 18,235 kg (40,203 lb)

Max T-O weight 63,503 kg (140,000 lb)

Max ramp weight 63,956 kg (141,000 lb)

Max zero-fuel weight 53,523 kg (118,000 lb)

Max landing weight 58,060 kg (128,000 lb)

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

Max cruising speed, max cruise thrust at
 7,620 m (25,000 ft)

485 knots (898 km/h; 558 mph)

FAA T-O to 10.6 m (35 ft)
 2,195 m (7,200 ft)

FAA landing field length (at max landing
 weight) 1,402 m (4,600 ft)

Range with typical payload, domestic reserves,
 200 nm (370 km; 230 miles) alternate
 2,060 nm (3,815 km; 2,370 miles)

MCDONNELL DOUGLAS DC-10 ADVANCED TANKER/CARGO AIRCRAFT

The USAF announced on 20 December 1977 that, following evaluation of the Boeing 747 and McDonnell Douglas DC-10 to meet its requirement for an Advanced Tanker/Cargo Aircraft (AT/CA), the latter aircraft had been selected to fulfil this role. The provision of a fleet of AT/CAs will increase enormously the ability of the USAF to deploy combat aircraft, men, and supplies on a global scale. This point was emphasised in a USAF submission to Congress in which the spokesman commented that 40 Boeing KC-135 tankers and a number of cargo aircraft would be needed to fuel an F-4 fighter squadron and carry its personnel and equipment from the US to the Middle East. Just 17 of the proposed DC-10 AT/CAs could fulfil the same task, more economically and efficiently. USAF Military Airlift Command's need for support by such aircraft was highlighted after the 1973 Arab-Israeli war, when many countries denied landing rights to MAC freighters. From these circumstances came the decision to develop an AT/CA to support the strategic airlift fleet, under the operational control of USAF Strategic Air Command.

The initial \$28 million contract awarded to McDonnell Douglas covers the funding to initiate production engineering, tooling, and other long-lead activities. A second \$429,425 contract is for initial work on a commercial logistics programme covering support of the entire DC-10 military tanker fleet. The USAF's initial requirement is for 20 of these aircraft, and it was anticipated in early 1978 that, towards the end of the year, the USAF would take up two of the five procurement options offered by McDonnell Douglas. The initial option would finance construction of the first test and evaluation AT/CA; the second would provide for the first batch of production aircraft. If these options are exercised, the first DC-10 military tanker could be completed in February 1980 and begin its six-month flight test pro-



Artist's impression of the McDonnell Douglas Advanced Tanker/Cargo Aircraft flight refuelling an F-15

gramme two months later.

The commercial DC-10 Series 30CF convertible freighter is the basic airframe chosen for conversion to the AT/CA role, and is currently certificated for operation at a maximum take-off weight of 259,455 kg (572,000 lb). However, as a result of structural analysis and flight tests, the AT/CA will have a design take-off weight of 267,620 kg (590,000 lb) without any need for structural changes.

The modifications necessary to convert the DC-10-30CF to the new AT/CA configuration include the installation of fuel cells in the lower cargo hold; the provision of accommodation for a boom operator; the development of an advanced refuelling boom; installation of a refuelling receptacle, improved cargo handling system, and military electronics systems. No windows will be provided in the main cabin, and various seating layouts will be available in the forward area to permit the transport of a fighter squadron's essential ground crew.

Seven bladder fuel cells are to be installed in the lower cargo deck, three forward and four aft of the wing, mounted within framework that will restrain and support the cells. These will contain a total of 53,297 kg (117,500 lb) of fuel, which will be interconnected with the aircraft's basic fuel system, comprising 108,182 kg (238,500 lb). All can thus be used for extended range; or fuel from the lower-deck cells and a quantity from the aircraft's basic fuel system can be used for flight refuelling. The lower cargo hold containing the fuel cells will not be pressurised, and thus will require the main cabin floor to be strengthened.

The refuelling station, to which access will be gained from the upper main deck, will be sited in the lower aft fuselage and

will be able to accommodate a crew of three, although only a single boom operator is needed for a refuelling operation. The station will have a rear window, and a periscope observation system to give a wider field of view, and will be pressurised and air-conditioned.

The advanced refuelling boom, which is being developed by McDonnell Douglas, is expected to provide greater flexibility than that installed in the KC-135: in particular, it will have a transfer flow rate some 50% greater, being rated at 6,814 litres (1,800 US gallons)/min. A hose/reel unit for probe and drogue refuelling will be installed also, so that the AT/CA can service USN and USMC aircraft, as well as older types of fighter still serving with Reserve and ANG units.

The provision of a refuelling receptacle, above the flight deck of the AT/CA, will allow greater flexibility on long-range cargo or refuelling operations, extending the range beyond the nominal 6,000 nm (11,112 km; 6,905 miles) with 45,359 kg (100,000 lb) payload. The improved cargo handling system, by comparison with the DC-10-30CF, will include an increased floor area covered by ball mats, installation of power rollers, and provision of a USAF-furnished winch system for moving cargo fore and aft.

Changes to the electronics are concerned chiefly with the deletion of equipment intended specifically for commercial operations, and its replacement by UHF and secure com systems, Tacan, IFF, and military radar.

The following details are based on those for the DC-10 Series 30CF:

TYPE: Military flight refuelling/cargo aircraft.

WINGS: Cantilever low-wing monoplane of all-metal fail-safe construction. Several dif-

ferent wing sections of Douglas design are used between wing root and tip. Thickness/chord ratio varies from slightly more than 12.2% at root to less than 8.4% at tip. Dihedral 5° 14.4' inboard, 3° 1.8' outboard. Incidence ranges from positive at wing root to negative at tip. Sweepback at quarter-chord 35°. All-metal inboard and outboard ailerons, the former used conventionally, the latter only when the leading-edge slats are extended. The inboard ailerons droop symmetrically with the flaps to a maximum of 13° 12'; their differential operation as ailerons is superimposed on top of their symmetrical deployment as flaps. Double-slotted all-metal trailing-edge flaps mounted on external hinges, with an inboard and outboard flap panel on each wing. Five all-metal spoiler panels on each wing, at the rear edge of the fixed wing structure, forward of the flaps. All spoilers operate in unison as lateral control, speed brake, direct lift control, and ground spoilers. Full-span two-position all-metal leading-edge slats. Ailerons are powered by hydraulic actuators manufactured by Bertea Corporation, spoilers by hydraulic actuators manufactured by Parker-Hannifin Corporation. Each aileron is powered by either of two hydraulic systems; each spoiler is powered by a single system. All leading-edge slat segments outboard of the engines are anti-iced with engine bleed air.

FUSELAGE: Aluminium semi-monocoque fail-safe structure of circular cross-section. Except for lower cargo hold and auxiliary areas, the entire fuselage is pressurised.

TAIL UNIT: Cantilever all-metal structure. Variable-incidence tailplane, actuated by Vickers hydraulic motors. Longitudinal and directional controls are fully powered and comprise inboard and outboard elevators, each segment powered by a Bertea tandem actuator; upper and lower rudder, each powered by a Bertea actuator. Rudder standby power supplied by two transfer motor pumps manufactured by Abex Corporation.

LANDING GEAR: Hydraulically-retractable four-unit type, with gravity free-fall for emergency extension. Twin-wheel steerable nose unit. Main gear comprises two outboard four-wheel bogies and one dual-wheel unit mounted on the fuselage centreline. Nose-wheel unit and fuselage centreline main unit retract forward, outboard main units inward into fuselage. Oleo-pneumatic shock-absorbers on all units. Goodyear nosewheels and tyres size 40 x 15.5-16, pressure 12.41 bars (180 lb/sq in). Four-wheel bogie main units and centreline unit have Goodyear wheels and tyres size 52 x 20.5-23. The former have a pressure of 11.38 bars (165 lb/sq in), the latter 9.65 bars (140 lb/sq in). Goodyear disc brakes and anti-skid system, with individual wheel control.

POWER PLANT: Three General Electric CF6-50C1 turbofan engines, each rated at 233.5 kN (52,500 lb st), two of which are mounted on underwing pylons, the third above the rear fuselage at the base of the fin. All engines are fitted with both fan and turbine reversers for ground operation. Engine air inlets have load-carrying acoustically-treated panels for noise attenuation, and each engine fan case and fan exhaust is similarly treated. Basic aircraft fuel system comprises four integral wing fuel tanks and an auxiliary tank in the wing centre-section, with a connected structural compartment fitted with a bladder cell, giving a total capacity of approximately 135,510 litres (35,800 US gallons). Oil capacity 34.1 litres (9 usable US gallons).



This impression shows the McDonnell Douglas AT/CA, based on the DC-10, with refuelling boom retracted

ACCOMMODATION: Flight crew on flight deck. Various seating arrangements for limited number of essential ground crew at forward end of main cabin. Flight refuelling station, with accommodation for boom operator, instructor, and student observer, at aft end of lower fuselage compartment. Five passenger doors on main deck. A 2.59 m x 3.56 m (8 ft 6 in x 11 ft 8 in) cargo door on the port side of the fuselage will permit loading of standard Air Force 463L pallets, bulk cargo, or wheeled vehicles. Maximum capacity will be 25 pallets with access from each side of hold, or 27 pallets with a single aisle. No windows in main cabin.

SYSTEMS: Three parallel continuously-operating and completely separate hydraulic systems supply the fully-powered flight controls and wheel brakes. Two of these supply power for nosewheel steering. Normally, one of the systems supplies power for landing gear actuation; two reversible motor pumps deliver power from the other two systems for standby operation of landing gear. Each hydraulic system is powered by two identical engine-driven pumps, capable of delivering a total of 265 litres (70 US gallons)/min at 207 bars (3,000 lb/sq in) at take-off. An AiResearch TSCP-700-4 APU provides ground electrical and pneumatic power, including main engine starting, and auxiliary electric power in flight.

ELECTRONICS AND EQUIPMENT: Will include military electronics comprising nav, com, ILS, Tacan, IFF transponders, and radar. Seven fuel cells mounted in lower cargo compartment, with combined capacity of 53,297 kg (117,500 lb) fuel, interconnected into the basic aircraft fuel system. Flight refuelling boom mounted under rear fuselage, plus hose/reel unit for probe and drogue refuelling. Flight refuelling receptacle mounted on fuselage upper surface above flight deck.

DIMENSIONS, EXTERNAL:

Wing span	50.41 m (165 ft 4.4 in)
Wing chord at root	10.71 m (35 ft 1.8 in)
Wing chord at tip	2.73 m (8 ft 11½ in)
Wing aspect ratio	7.5
Length overall	55.50 m (182 ft 1 in)
Height overall	17.70 m (58 ft 1 in)
Tailplane span	21.69 m (71 ft 2 in)
Wheel track	10.67 m (35 ft 0 in)
Wheelbase	22.05 m (72 ft 4 in)

AREAS:

Wings, gross	367.7 m ² (3,958 sq ft)
Ailerons, inboard (total)	7.68 m ² (82.7 sq ft)
Ailerons, outboard (total)	9.76 m ² (105.1 sq ft)
Trailing-edge flaps (total)	62.1 m ² (668.2 sq ft)
Leading-edge slats (total)	43.84 m ² (471.9 sq ft)
Spoilers (total)	12.73 m ² (137.0 sq ft)
Fin	45.92 m ² (494.29 sq ft)
Rudders (total)	10.29 m ² (110.71 sq ft)
Tailplane	96.6 m ² (1,040.2 sq ft)
Elevators (total)	27.7 m ² (298.1 sq ft)

WEIGHTS AND LOADING (estimated):

Operating weight empty, tanker	108,747 kg (239,747 lb)
Operating weight empty, cargo	110,664 kg (243,973 lb)
Max cargo payload	77,123 kg (170,027 lb)
Design max T-O weight	267,620 kg (590,000 lb)
Max wing loading	727.8 kg/m ² (149.06 lb/sq ft)

PERFORMANCE (estimated):

Critical field length	3,353 m (11,000 ft)
Max range with max cargo	3,800 nm (7,040 km; 4,375 miles)

CSIR

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (Aeronautics Research Unit, National Mechanical Engineering Research Institute); Address: PO Box 395, Pretoria 0001, South Africa

CSIR SARA III

The prototype CSIR (ARU) SARA II (South African Research Autogyro) made its first free flight in Pretoria during November 1972. Following initial flight trials various modifications were made, and a description of the SARA II (ZS-UGL) in its November 1974 form appeared in the 1975-76 *Jane's*.

A new, modified SARA III (ZS-UIT) was designed and constructed during 1976-77, and techniques were developed for the design and manufacture of glassfibre-reinforced plastics rotor blades. This aircraft made its first public appearance at the 1977 Air Africa International display.

The rotor head of SARA III is of novel design (patent applied for) which makes pos-

CSIR SARA III two-seat experimental autogyro



sible remarkably short take-off runs. The design incorporates a simple but fully-automatic variable-geometry head which allows high-speed rotor spin-up on the ground at zero-lift blade pitch angle, but changes the angle to 4°, as required for flight, when the rotor disc is tilted backward during the take-off run. The change of angle is brought about by the blades coning upward along an oblique hinge line, against stops.

TYPE: Two-seat experimental autogyro.

ROTOR SYSTEM: Single two-blade teetering rotor with fully-automatic variable-geometry head. Blades, which are of constant chord and NACA 23015 section, are constructed of glassfibre-reinforced plastics. No rotor brake.

ROTOR DRIVE: For rotor spin-up only, the aircraft has a belt/clutch power take-off connected to a dog clutch on the rotor by steel tube shafting via a two-stage 90° gearbox.

FUSELAGE: Space-frame structure of light alloy, with fairings of glassfibre-reinforced plastics.

TAIL UNIT: Twin fins and rudders, bridged by a fixed-incidence tailplane and supported on twin strut-braced tailbooms. All tail surfaces of light alloy stressed-skin construction. Half-span trim tabs on tailplane.

LANDING GEAR: Non-retractable tricycle type. Steerable nosewheel. Oleo-pneumatic shock-absorber and single wheel on each unit.

POWER PLANT: One 134 kW (180 hp) Lycoming O-360-A flat-four engine, driving a Hartzell two-blade pusher propeller. Power take-off for rotor spin-up. Spherical glassfibre-reinforced fuel tanks in fuselage, capacity 80 litres (17.6 Imp gallons). Oil capacity 9 litres (2 Imp gallons).

ACCOMMODATION: Crew of two, with dual controls, on side-by-side seats. Access by means of forward-opening transparent 'bubble' canopy.

SYSTEMS AND EQUIPMENT: 12V battery and radio.

DIMENSIONS, EXTERNAL:

Rotor diameter 10.50 m (34 ft 5½ in)
Rotor blade chord 0.322 m (1 ft 0¾ in)
Length of fuselage 3.78 m (12 ft 4¾ in)
Width of fuselage 1.35 m (4 ft 5¼ in)
Height to top of rotor hub 2.69 m (8 ft 10 in)

Wheel track 2.15 m (7 ft 0¾ in)
Wheelbase 1.95 m (6 ft 4¾ in)
Propeller diameter 1.83 m (6 ft 0 in)

DIMENSIONS, INTERNAL:

Cabin:
Max width 1.20 m (3 ft 11¼ in)
Max height 1.00 m (3 ft 3¼ in)

AREAS:

Rotor disc 86.59 m² (932.05 sq ft)
Rotor blades (each) 1.51 m² (16.25 sq ft)
Fins (total) 1.40 m² (15.07 sq ft)
Rudders (total) 0.49 m² (5.27 sq ft)

Tailplane 1.24 m² (13.35 sq ft)
WEIGHT:
Max T-O weight 735 kg (1,620 lb)
PERFORMANCE (at max T-O weight):
Max level speed at S/L 81 knots (150 km/h; 93 mph)
Normal cruising speed at S/L 59 knots (110 km/h; 68 mph)
Min speed in level flight 26 knots (48 km/h; 30 mph)
Max rate of climb at S/L 300 m (984 ft)/min
T-O run, still air 20 m (66 ft)
T-O to 15 m (50 ft), still air 85 m (279 ft)
Landing from 15 m (50 ft), still air 75 m (246 ft)
Landing run, still air 10 m (33 ft)

CHINCUL

CHINCUL S.A.C.I.F.A.; Head Office: 25 de Mayo 489, 6° Piso, Buenos Aires, Argentine Republic

CHINCUL (PIPER) CHEROKEE ARROW TRAINER

In January 1978, Chincul was flight testing the prototype (LV-X67) of a military training aircraft which it has developed from the Piper Cherokee Arrow four-seat light aircraft. The principal modifications from the standard Arrow are a more powerful engine, a two-seat cockpit with new canopy,

revised internal equipment, and provision for a built-in machine-gun and underwing weapons for armament training. Although the basic airframe of the Arrow is retained, this has been entirely restressed in order that the aircraft may be certificated to carry out a full range of aerobatic manoeuvres. Production is planned to begin in late 1978.

TYPE: Two-seat military trainer.

WINGS, FUSELAGE, TAIL UNIT, AND LANDING GEAR: Generally similar to those of Piper Arrow (see current edition of *Jane's*), but with fuselage modified in cabin area and a more rounded fin-tip. Entire airframe restressed for aerobatic flying.

POWER PLANT: One 194 kW (260 hp) Lycoming AEIO-540 series flat-six engine, driving a two-blade propeller with spinner. Fuel tank in each wing leading-edge.

ACCOMMODATION: Seats for instructor and pupil side by side under rearward-sliding framed canopy. Dual controls standard.

ELECTRONICS AND EQUIPMENT: Two VHF and one HF com; two VOR; one ILS; one DME; two ADF; audio selector panel; oxygen system.

ARMAMENT: Provision for one 7.62 mm machine-gun in lower front fuselage; underwing pylons for bombs and rockets.

DIMENSIONS, EXTERNAL:

Wing span 10.67 m (35 ft 0 in)
Wing chord (constant portion inboard of ailerons) 1.60 m (5 ft 3 in)
Wing chord at tip 1.07 m (3 ft 6¼ in)
Length overall 7.25 m (23 ft 9½ in)
Height overall 2.23 m (7 ft 3½ in)
Tailplane span 3.92 m (12 ft 10½ in)
Wheel track 3.05 m (10 ft 0 in)
Wheelbase 2.40 m (7 ft 10½ in)

AREA:

Wings, gross 15.79 m² (170.0 sq ft)

WEIGHTS AND LOADINGS:

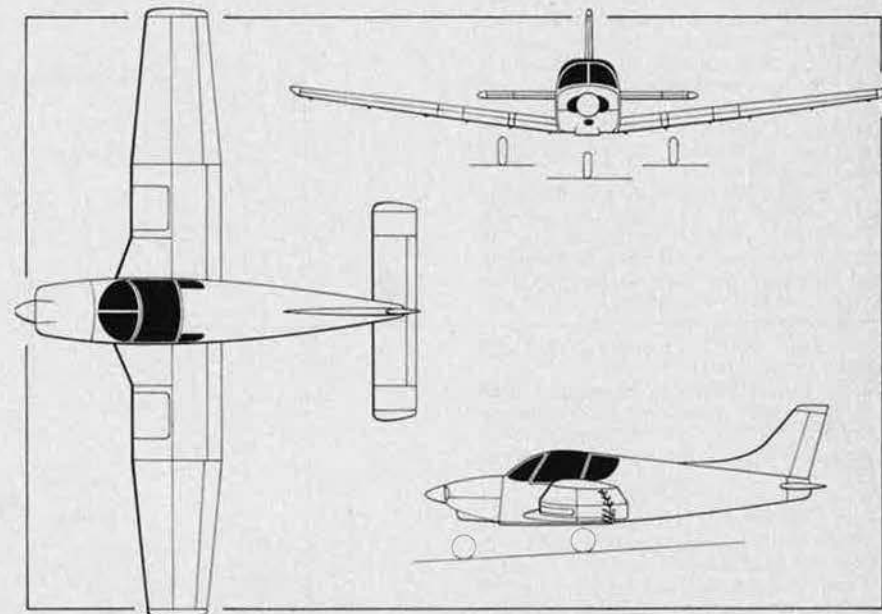
Weight empty 785 kg (1,730 lb)
Max T-O weight 1,315 kg (2,900 lb)
Max wing loading 83.25 kg/m² (17.06 lb/sq ft)

Max power loading 6.78 kg/kW (11.15 lb/hp)

PERFORMANCE (at max T-O weight):

Max level speed 169 knots (314 km/h; 195 mph)
Max cruising speed (75% power) 156 knots (290 km/h; 180 mph)
Speed for optimum climb 87 knots (161 km/h; 100 mph)

Chincul (Piper) Cherokee Arrow Trainer (Lycoming AEIO-540 engine) (Michael A. Badrocke)





Prototype of the two-seat aerobatic military trainer developed by Chincul from the Piper Arrow lightplane

Stalling speed, flaps and landing gear down	54 knots (100 km/h; 62 mph)
Max rate of climb at S. L.	238 m (780 ft)/min
Service ceiling	3,962 m (13,000 ft)
T-O run	302 m (990 ft)
Landing run	227 m (744 ft)
Range (75% power, optimum mixture, at optimum altitude)	729 nm (1,352 km; 840 miles)
Fuel consumption (75% power)	54.5 litres (2 Imp gallons)/h

CHINA (PEOPLE'S REPUBLIC)

STATE AIRCRAFT FACTORY; Address: Shenyang, People's Republic of China

CHINESE UTILITY AIRCRAFT

First details of this new Chinese twin-engined utility aircraft were given on 26 August 1977, in the publication *New China*, which stated that it had been designed and developed by the Chinese aerospace industry and had subsequently entered production. Intended for use primarily in agricultural and forestry applications, it was described as "a new contribution towards speeding up the modernisation of agriculture" in China, and in June/July 1977 underwent operational trials for crop-dusting and spraying missions.

In overall size and general configuration the Chinese aircraft, for which no name or designation was quoted, approximates to those of the Australian GAF Nomad, in which the Chinese government reportedly expressed an interest in 1976-77. Its general appearance is shown in the accompanying three-view drawing.

The engines have not been identified positively, beyond the fact that they are air-cooled radials, probably in the 224-261 kW (300-350 hp) class. A possible choice might be a version of the Vedenev-developed Ivchenko AI-14RF nine-cylinder radial, perhaps developed in China.

TYPE: Twin-engined agricultural and general-purpose aircraft.

WINGS: Braced high-wing monoplane, with constant chord from root to tip. No dihedral. Ailerons and two-section flaps along full span of trailing-edges. Leading-edge slats from nacelle to tip of each wing, with smaller inboard flap or slat on each side between nacelle and fuselage. Small stub-wings at cabin floor level support the main landing gear units; there is a main bracing strut from each stub-wing out to approx mid-span, and a shorter,

inboard strut from the same pickup point to the wing root.

FUSELAGE: Conventional semi-monocoque structure of basically rectangular cross-section, swept upward at rear.

TAIL UNIT: Cantilever non-swept structure, with low-set tailplane and small dorsal fin. Horn-balanced rudder and elevators. Inset tab in rudder and port elevator.

LANDING GEAR: Non-retractable tricycle type, with oleo-pneumatic shock-absorbers on all units. Twin-wheel main units, attached to underside of stub-wings. Single steerable nosewheel. Small bumper under tailcone.

POWER PLANT: Two approx 224-261 kW (300-350 hp) seven- or nine-cylinder radial air-cooled engines, underslung from wings and fitted with cold-air baffle plates in front of cylinders to minimise risk of icing.

ACCOMMODATION: Crew of two on flight deck, with separate door(s) for access. Cabin accommodation for an estimated maximum of eight passengers or equivalent cargo. Cargo/passenger double door on port side of fuselage, in line with wing

trailing-edge. Underside of rear fuselage, aft of this door, probably lets down to act as a loading ramp for bulky cargo.

ELECTRONICS AND EQUIPMENT: Radio; operational equipment (e.g., crop dusting or spraying gear) according to mission.

DIMENSIONS, EXTERNAL:

Wing span	17.00 m (55 ft 9¼ in)
Length overall	12.00 m (39 ft 4½ in)
Height overall	4.64 m (15 ft 2¾ in)
Wheel track (c/l of shock-absorbers)	approx 3.00 m (9 ft 10 in)
Wheelbase	approx 3.70 m (12 ft 1¾ in)

DIMENSIONS, INTERNAL:

Cabin: Length	3.58 m (11 ft 9 in)
Width	1.70 m (5 ft 7 in)
Height	1.48 m (4 ft 10¼ in)

AREA:

Wings, gross	34.00 m ² (365.97 sq ft)
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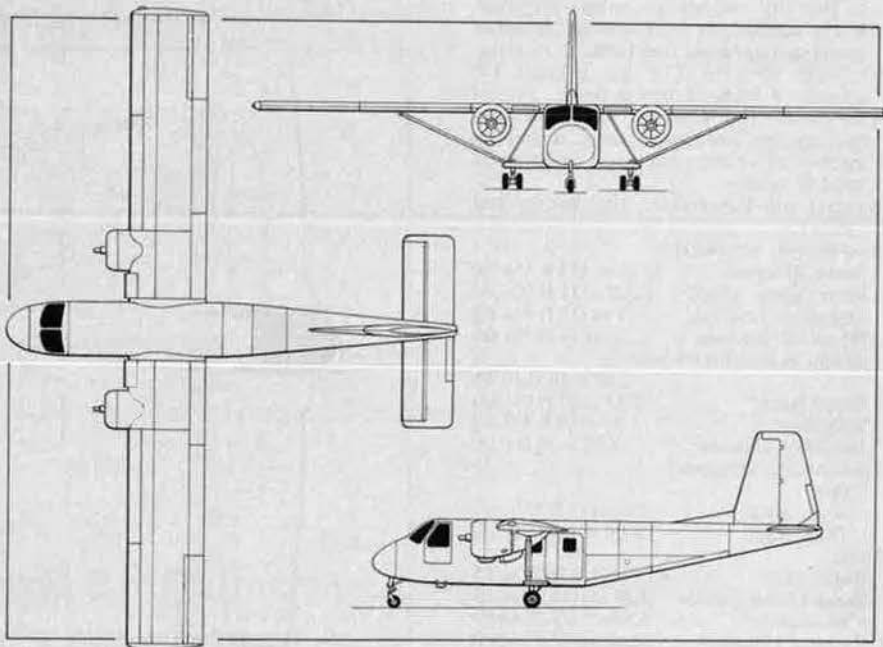
WEIGHTS:

Weight empty	2,050 kg (4,519 lb)
Payload	800 kg (1,763 lb)
Fuel load	210 kg (463 lb)
Max T-O weight	3,250 kg (7,165 lb)

PERFORMANCE:

No details known

New utility aircraft designed by the Chinese aerospace industry; based on information in *New China* magazine (Michael A. Badrocke)



USAF leaders are straining to bring thirty-one percent of the active-duty force—the 253,000 civilian employees—into the mainstream of Air Force life and steer many of them into new career-development programs leading to more rewarding, better paying jobs. It's one facet of a many-pronged drive to boost their morale and make them more productive.

This spate of new civilian improvement projects includes acknowledging civilians in the service's basic directive and tripling logistics personnel quotas in government-sponsored graduate schooling.

Officials were embarrassed to discover, when the drive got under way, that Air Force Manual 1-1 omitted civilian employees as major elements of the force. And the Chief of Staff's introduction to that most significant of all regulations stated that all officers should study it, but made no mention of civilians. These deficiencies are being corrected, officials say.

USAF leaders also are ending civilian exclusion from Commander's Call, the service's important internal information project. The emphasis is now on urging civilian participation. When one command—for the first time ever—invited

civilian employees recently to attend Commander's Call, there was an overflow turnout. "The people were enthusiastic and glad to participate. We were somewhat surprised, but it was a rousing success," a command spokesman said. "It's improving rapport between the two groups," he added.

Expanding all internal communications channels to civilians is a priority thrust of the new effort. (See "Speaking of People," November '77 issue.) Air Force Information Director Brig. Gen. H. J. Dalton, Jr., is quarterbacking this phase.

Other activities are being orchestrated from the Office of Civilian Personnel Operations (OCPO) at Randolph AFB, Tex. What the USAF Military Personnel Center is to blue-suiters, the still-expanding OCPO should soon be to USAF civilians.

Change in Authority

In Washington, D. C., the Hq. USAF Civilian Personnel Office and the Civil Service Commission set the basic policies. But OCPO manages the civilian people programs service-wide. It is absorbing various functions that bases and commands heretofore have managed exclusively.

More civilian recruiting, for example, is being centralized at the OCPO. The organization forecasts service-wide civilian losses by skills, grade, and areas, thus improving overall planning, assignments, and recruiting. Detailed promotion guides in logistics and other job areas, aimed at helping workers get ahead, also are beginning to spew forth from the Randolph office.

OCPO, now 135 members strong, is headed by George Mullins, a former head of the Tinker AFB, Okla., civilian personnel office. Tinker has more than 16,000 civilian workers. When fully operational in a year or so, OCPO will have 310 employees. OCPO currently is phasing in its most significant project yet—a career-development plan called "Civilian Career Management."

Helping officers plot their own careers—through broadening assignments, special training, advanced military and civilian schooling—has long been standard USAF operating procedure. It has reached a high degree of sophistication under the Palace Team operation at MPC. Officers hone their own skills and expand their talents, while the service benefits as competition for high-level staff and command jobs intensifies. The Palace Team effort,

The Air Force has launched a comprehensive program to make more efficient use of the talent and experience of the more than 250,000 people who constitute almost a third of its work force—its civilian employees. Channeling them into the mainstream of Air Force life will mean . . .

BRIGHTER CAREER PROSPECTS FOR USAF'S CIVILIAN EMPLOYEES

BY ED GATES, CONTRIBUTING EDITOR

"Some... must be prepared to transfer if the

officers generally agree, has been a winner, paying off in a sharper, more aggressive, and probably more satisfied force of military executives.

But there's been nothing like it for USAF's civilian side. Yet here is a knowledgeable and experienced group averaging forty-three years in age and sixteen years of job experience. Among their quarter-million members are 24,000 GS-12s and above serving in executive and senior technician posts. Some are unhappy at their inability to plan ahead and vie for bigger things. But formalized career advancement programs for Air Force civilians in the past did not exist.

Below the GS-12 level are thousands of younger employees who, for lack of a formal system for developing their talents, also have not enjoyed the promotion opportunities many desire.

New Opportunities

All this is changing, officials insist, with the current launching of the new career-management effort. The program's ingredients hold promise of opening important doors for numerous employees who otherwise might continue to produce below their potential. Some of them, however, must be prepared to transfer if they elect to participate. "Mobility," as USAF calls it, is an ingredient of the new project. Such transfers, officials explained, may vary from within the immediate organization, to cross-country and overseas.

Indeed, even a few top-level transfers to and from the Air Force are on the horizon, under a sweeping overhaul of the Civil Service advanced by the President. His reform package, among other things, calls for creating a Senior Executive Service. It would be comprised of career and political appointees who would man key posts throughout the

USAF's Civilian Employees —By the Numbers

USAF's civilian force has undergone a thirty percent reduction since 1969. Now down to 253,000 members, it is slated to shed 4,000 more by September 1979.

The force currently includes 129,000 white collar, or General Schedule (GS) employees, 81,000 Blue Collar (Wage Grade) workers, 21,000 foreign nationals, and 22,000 Air Guard technicians. Six percent of the USAF civilian establishment is retired military.

There are about 24,000 Air Force GS-12s and above, but they are being reduced with the elimination, last year and this year, of 500 GS-13 to GS-15 billets. About 44,000 are hired and 8,000 are retired annually. Air Force says it separates—fires—1,100 civilian employees each year.

More than seventy percent of the USAF force is unionized. The Air Force withholds \$3 million annually in union dues. There are 220 negotiated agreements with locals.

Employment of women and minorities increased eleven percent last year. At year's end, women comprised thirty-one percent of the work force, minorities 18.5 percent. Twelve percent of the GS-9s and over are women and nine percent are minorities.

Air Force leads major government agencies in hiring handicapped workers and Vietnam veterans. These veterans account for eighteen percent of all new employees during the past three years.

federal bureaucracy. They would transfer frequently, often to other agencies. The project, at press time, lacked final Administration clearance and congressional endorsement.

The launching platform for USAF's civilian career management program is the newly published AF Regulation 30-110. It explains that the Air Force must develop executive talent for future needs, encourage promising civilians to stay aboard, provide them a rewarding work experience, and help them to improve their skills and to progress through the organization.

The project breaks down white-collar jobs into fifteen groups or "career families." The largest group, covering all logisticians including supply, maintenance, materiel, and transportation employees, is now being implemented from the OCPO. The others will follow shortly.

In mid-February, thirteen experienced USAF civilian logisticians and three civilian personnel specialists were brought into the OCPO. They have developed detailed data on logistics career patterns, career ladders, promotion plans, education and training information, and other essentials of career development in those specialties.

Similar material has also been readied for members of the commissary career family. Comparable material will soon begin to surface for employees in each of the thirteen other groups, OCPO officials said.

Phone Counseling Service

The functional managers for logistics people are also setting up a phone counseling service. This will permit, for example, a GS-7 supply-distribution specialist at a base where advancement is not promising to make a government-paid AUTOVON call for career help.

OCPO advisors might suggest that he start working for an associate degree. They also would describe his cross-training options and give him a service-wide picture of opportunities in his specialty. And the OCPO advisor he talks with doubtless would point out that mobility to different commands and geographic areas might be required, if he's to advance to GS-9 or higher.

OCPO's functional managers, in short, are there to field questions from employees about their careers and desires, and how best to attain them. They will, of course, remind employees that Air Force needs come first.

The functional managers, in addition, track the job situation service-wide. In the logistics area, they know there are 3,500 GS-12 and above positions and that about one-third of them are considered "executive force" posts. They know where these jobs are. They can estimate with accuracy that USAF will lose about twelve percent of them annually through separation or retirement.

What that boils down to is about 153 logistical executive force openings this year. Employees who stay in touch with the OCPO obviously can learn a great deal about where and when advancements are likely to open up.

Before long it will be the same for other USAF white-collar workers. Each group will soon have its own career development program, and Palace team. The goal in each case is to see that the right person is matched with the right job at the right time.

The timetable calls for the logis-

Office of Civilian Personnel Operations

USAF civilian employees with assignment, promotion, or other career problems will soon have a place to turn for answers—the Office of Civilian Personnel Operations at Randolph AFB, Tex.

The charter of this expanding facility, established in 1976, calls for OCPO to "direct, develop, manage, and evaluate civilian personnel programs and systems which implement policies established by the Air Staff or higher authority."

OCPO already is starting to run specific civilian "people" projects. It is gradually taking over functions formerly performed exclusively at bases and commands, including position classification, labor-management relations, recruiting, appeals and grievance cases, and equal employment opportunity complaints.

From its central vantage point, OCPO is supervising thirteen bases that have been slow to fill civilian vacancies. One section of the office is studying ways to control grade creep. Another is looking for root causes of gripes and complaints throughout the service.

OCPO chief George Mullins says that commands aren't overjoyed at finding their authority trimmed. He claims, however, that the resulting economies and management improvements are well worth it.

tics, commissary, and personnel career functions to be fully operational by mid-summer; communications and computer resources, comptroller and financial management, and engineering and service areas to be in business by October; and the following career groups to phase in throughout FY '79: administration, inspector general, intelligence, JAG, information, plans-operations, R&D, security, and surgeon general.

Not for Everyone

Many USAF civilian employees, of course, aren't interested in the full career development treatment. They like their locations and what they are doing, and would resist transfers of any distance. A prominent GS-13 at Hq. USAF, for example, told AIR FORCE Magazine his military service during World War II included "enough uprooting to last a lifetime." He said he joined Civil Service to stay put and to establish roots. But he welcomes the Air Force effort to extend such opportunities to its civilians.

Other veteran USAF civil servants agree that it is especially important for younger employees. Employees at various age and experience levels are equally concerned that the service carry through with its recent promises to improve military-civilian communications and to keep the civilian employee community better informed on policies and military programs.

Formal career management is not for everyone. Logisticians who want the full executive development treatment—individualized career planning and guidance, special consideration for career broadening and development assignments, service-wide promotional opportunities, and improved career visibility—can apply for selection into what is called the "executive development" phase.

Final selections, determined by the Hq. USAF Deputy Chief of Staff for Systems and Logistics, will

“... the [promotion] message is clear.”

be based on projected USAF executive logistics vacancies. Once chosen, the person must agree in writing to transfer to any position, Air Force-wide, for which he or she qualifies. That could turn some candidates off.

To help the program, Air Force plans to put thirty civilian logisticians into Institute of Technology graduate programs each year, starting in 1979. About ten has been the practice.

Promotions Affected

Oscar Goldfarb, Deputy for Supply and Maintenance in the Office of the Assistant Secretary of the Air Force (Installations and Logistics), has played a key role in establishing the logistics career program.

“We’re launching it slowly to make sure we get it right,” he told *AIR FORCE Magazine*. He feels it will help the rank and file of civilian employees by making them “aware of the opportunities available and how they can go about attaining them.” While the new program is for GS-5s and above, it may be expanded later to include wage board—blue-collar—employees, Mr. Goldfarb said.

Applicants not selected at first for executive development will retain chances of getting in later. It was also made clear that the counseling services OCPO staffers will provide apply to anyone in the work force, not just those embracing the formal program.

As for promotion, the message is clear: Opportunities improve for those going the executive develop-

ment route. One official says those who will participate will be “USAF’s future supergraders.”

OCPO’s Mullins said, “Employees who decline to participate won’t be hurt. They’re certainly not obligated to sign up. But as time passes, we expect more and more people will opt for the program. And this probably will make it tougher for nonparticipants to reach the GS-13 level.”

Service officials, meanwhile, say they won’t ease off on the civilian improvement drive but will continue to develop new projects. Newly established Project Crossfeed is an example. Crossfeed is based on the proposition that an exchange of staffers, military and civilian, between MPC and the OCPO, and between other headquarters, will help both groups better understand and appreciate what the other side is doing. It will draw them closer together, or so it is hoped.

It is generally agreed that the two groups haven’t been close in the past. As the official Crossfeed report declares: “Military personnel are almost completely ignorant of the civilian personnel system, and civilians have a similar level of knowledge about the military system.”

So the MPC and OCPO are exchanging staffers. They’ll learn how their counterpart’s programs work, then spread the information. The goal is better understanding all around. Similar exchanges are being tested at Air Training Command, Air Force Logistics Command, and Military Airlift Command headquarters. And there are plans to send more military people to civilian personnel courses and more civilian employees to military courses.

Spreading the Word

Air University’s Leadership Management Development Center is developing new courses to help each

side learn more about the other. Another initiative envisions more civilians attending Air Command and Staff College.

General Dalton and his information aides report that civilian personnel are being spotlighted more frequently in base newspapers and other Air Force publications, including radio-TV spots and the Air Force Policy Letter for Commanders. Some 84,000 copies of the latter go to officers, supergrade NCOs, and GS-10s and above each month.

Logistics Command is producing a new series of videotapes called Pacer Flicks. Patterned after the Palace Flicks project, Pacer will clue civilian employees in on the latest information on training, promotions, retention rights, transfers, etc.

Elsewhere, the service is expanding the successful INTRO program that welcomes military newcomers to bases to include civilian personnel. This is designed to make civilians and their families feel more comfortable when they make a move. Related thrusts in the works include a mid-July civilian-military communications workshop hosted by Air Training Command at Randolph, a Logistics Command survey to measure changes in attitudes in the work force, and a call for civilian employees to represent the Air Force in public meetings and as official spokesmen in the Speakers Program.

Commands also are attacking the problem. One command even reports that it has appointed a senior civilian to address the problem. His job description directs that “he develop a program to improve civilian-military understanding.” ■

Airman's Bookshelf

Hiroshima Revisited

Enola Gay, by Gordon Thomas and Max Morgan Witts. Stein & Day, New York, N. Y., 1977. 327 pages. \$11.95.

Enola Gay, the most famous B-29 ever built, was named for the mother of Paul Tibbets, the man who trained the 509th Composite Group and who flew the plane that dropped the first atomic bomb at Hiroshima. The authors have specialized in reporting natural and man-made catastrophes, so the subject of the bomb that dissolved a city was made to order for their craft. They spent hours with retired Brigadier General Tibbets and interviewed seventy subjects in all. They also consulted an impressive list of private papers and came to lean heavily, perhaps too much so, on diaries and papers left by Maj. Gen. Leslie Groves who deserved great credit for bringing the MANHATTAN DISTRICT Project to success. But they muff the role of the man they refer to as General "Henry" Arnold—hardly anybody ever called him that.

Thomas and Witts have fitted many points of view together in a detailed mosaic that culminates in a climactic event. It makes for good reading. They interviewed the then-Mayor of Hiroshima, and they talked to Tatsuo Yokoyama, a young lieutenant of anti-aircraft artillery who watched a lone Superfort wing its leisurely way across the city. A blinding flash erupting 5,000 feet overhead at 9:15 a.m. changed the course of human history.

A valuable contribution is the clarification of a public misperception about Maj. Claude Eatherly, one of the 509th pilots and the one who drew the assignment of flying the weather plane on the day of the Hiroshima mission. Though he had shown signs of instability in

training, Eatherly was allowed to stay on because of his superior flying ability, though others were brusquely shifted out of the group for minor infractions of conduct or security. After the war, Eatherly went through a broken marriage, was convicted for forgery, and ended up briefly at a VA hospital. Careless local reporting in Fort Worth, Tex., was amplified in a national news-weekly. It seemed that Eatherly had suffered deep remorse for his role in the bombing, hence his troubles. Like a magnet, that account drew William Bradford Huie, well-remembered in the Pentagon for "The Case Against the Admirals," a tract that aggravated interservice relations for years afterwards. Huie's account, a book that was titled *The Hiroshima Pilot*, won for Eatherly misplaced sympathy among groups who were angry at President Lyndon Johnson, and especially the US Air Force, about the war abuilding in Vietnam.

General Arnold chose Tibbets for what was the most important single operational mission in World War II. That selection, we are told, was opposed by Maj. Gen. Curt LeMay who wanted a more seasoned pilot in charge. That sounds reasonable, but the rest of the story is incredible. Tibbets proved his flying ability to LeMay in a curious way, according to this account. Tibbets took a bomb-laden B-29 off from Tinian. As he left the runway, he feathered one propeller, soon feathered its mate on the same wing, and then dared to turn into the dead engines. As the craft shuddered dangerously near a stall, Tibbets pulled it out, flew on to neighboring Rota Island (at that time still occupied by Japanese forces and used as a punching bag for advanced training of B-29 crews), dropped his 5,000-pound bomb right on target, finished off with a few more maneuvers, and

landed back at Tinian, much to the relief of Col. William "Butch" Blanchard, LeMay's Operations Officer, who had sweated out the mission in the engineer's seat. After that demonstration, there were no more questions about Tibbets's flying ability.

General LeMay takes strong exception to this story. In a recent letter to this reviewer, he wrote: "If I had known anyone had flown a B-29 in such a manner, I would have grounded him and relieved him of command." LeMay also regards as dubious another account that credits Tibbets rather than LeMay with the idea of a single-plane mission. In fact, LeMay recalls the disagreeable rumor that MANHATTAN DISTRICT officials (presumably Groves) wanted to surround the bomb-carrying plane with every available B-29 to ensure its safe arrival over the target. LeMay says he never considered sending out any but a single-plane mission, only at the last minute relenting to have a second plane accompany the *Enola Gay* at a discreet distance to gauge the blast.

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Airman's Bookshelf

Perhaps the most critical error in the book involves a meeting in General Arnold's office, including General Groves, evidently the source of this account. If the meeting was held on June 23, 1945, Arnold was not in attendance. He was just starting back from the Pacific theater where LeMay and staff had literally "popped" the Old Man's eyes by a briefing conducted on Guam. LeMay convinced Arnold the B-29s could finish the war without an invasion, without using the atomic bomb.

Arnold sent LeMay back to give that briefing to the JCS—the real reason for LeMay's return, missed by the authors. Imagine the scene with Gen. George Marshall, Adm. Ernest King, and all the top brass staring down the thirty-six-year-old major general who told them their long and costly preparations to invade Japan five months hence were unnecessary. Margaret Truman's biography of her father states that General Arnold was the only senior military officer to counsel the President against using the atomic bomb, that the B-29s using conventional weapons could bring Japan to surrender. The opinion that they could have done the job by September or October 1945 is strongly supported by the *U.S. Strategic Bombing Survey*.

—Reviewed by Dr. Murray Green, who is working on a biography of General Arnold.

New Books in Brief

Abbreviations Dictionary, by Ralph DeSola. Where else can you run across "bup-bup-bup-bum" and find that it's Beethovenian kettle drumming? This fifth edition contains more than 160,000 abbreviations, acronyms, appellations, contractions, eponyms, geographical equivalents, initials, and slang shortcuts to provide an up-to-date and easy-to-use source for locating the more elusive elements of English. Includes a comparison of civil and military time systems, abbreviations for the world's airlines, international civil aircraft markings, the Russian alpha-

bet, the Richter Scale, and astronomical constellations, stars and symbols, and much more. Elsevier North-Holland, Inc., New York, N. Y., 1977. 654 pages. \$27.50.

Astronaut Observations from the Apollo-Soyuz Mission, by Farouk El-Baz. One goal of the Apollo-Soyuz mission was to visually study and photograph specific earth features in support of on-going research in geology, oceanography, hydrology, meteorology, and environmental science. This book is a detailed account of the experiment objectives, training of astronauts, aids they used, and the results. Stunning photos and charts, dialogue, glossary, and abbreviations. Smithsonian Institution Press, Washington, D. C., 1977. Available from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. 400 pages. \$10.25.

The Directory of Defense Electronic Products and Services, Electronics Industries Association. Here in the fourth edition is what the US electronics industry has to offer those interested in acquiring defense products and services in telecommunications, command and control, navigation, digital switching, air traffic control, and electronic countermeasures. Each product takes up a page and includes detailed text and pictures. Index. Information Clearing House, Inc., New York, N. Y., 1978. 173 pages. \$20.

The Eagle Has Returned, edited by Dr. Ernst A. Steinhoff. This volume contains the proceedings of the International Space Hall of Fame dedication, during which space pioneers from eight nations were honored as the first inductees. The week-long conference probed the state-of-the-art and future of spaceflight. American Astronautical Society, 1976. Distributed by UNIVELT, Inc., P. O. Box 28130, San Diego, Calif. 92128. 355 pages. \$30.

Encyclopedia of Aviation, by Reference International. Airplanes, manufacturers, instruments, navigation systems, aeronautical design, military aviation, airlines, technical concepts, pioneer pilots, and many other significant aerospace details are organized alphabetically and described in more than 700 entries written by leading British aviation writers. Photos, illustrations, index.

Charles Scribner's Sons, New York, N. Y., 1977. 218 pages. \$14.95.

The End of an Era in Space Exploration, by J. C. D. Blaine. The early Space Age was characterized by Soviet-American rivalry while latest developments have been more cooperative. In this nontechnical historical treatise, the author follows this evolving relationship from early rocketry to the Space Shuttle to emphasize the need for increased international cooperation in exploring and using space. Bibliography, index. American Astronautical Society, 1976. Distributed by UNIVELT, Inc., P. O. Box 28130, San Diego, Calif. 92128. 199 pages. \$25.

The Growing Dimensions of Security, The Atlantic Council. A working group under the direction of Ambassador Harlan Cleveland and Gen. Andrew Goodpaster was convened by the Council two years ago to examine in detail the future of NATO in the changing context of world security. This report is the result. It covers military security, NATO, and arms control; military security outside NATO; and the nonmilitary aspects of security. Includes critical comments by Timothy Stanley and Herbert Scoville. The Atlantic Council, 1616 H St., N. W., Washington, D. C. 20006, 1977. 86 pages. \$5.

The High Frontier, by Gerard K. O'Neill. A Princeton University physicist, selected as the greatest contributor to aerospace during 1975, began studying the humanization of space in 1969. In this updated edition of his first book published a year ago, he tells how people can live in a self-sufficient colonial paradise located somewhere between earth and moon. Now that scientists and engineers are involved in planning future high-orbital communities, the author predicts that human space colonies, where manufacturing, farming, and all human activities are carried out, will be established by the end of the century. Notes, appendix, index. Bantam Books, New York, N. Y., 1978. 344 pages. \$2.75.

Lunar Impact: A History of Project Ranger, by R. Cargill Hall. The Ranger Project, which spanned 1959-65 and culminated in closeup television pictures of the moon, was the first successful American project

of lunar exploration. Here, in detail, are the conflicting interests, the power struggles, and the contrasting objectives of individuals, groups, and institutions that brought Ranger to a successful conclusion. Appendices, illustrations, notes. National Aeronautics and Space Administration, 1977. Available from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. 405 pages. \$6.25.

Now Is the Time! To Prepare a Guide for Your Survivor, by Benjamin Katz. This valuable volume, updated to include tax revisions affecting estate and gift taxes, can help any person prepare a guide for his survivor. Funeral plans, burial, survivor benefits, finances, records, taxes, legal matters, probate, settling the estate, do's and don't's, and a timetable to avoid penalties and fines are among the many items covered. Overlook Co., 910 N. Overlook Drive, Alexandria, Va. 22305, 1977. 46 pages. \$2.35.

The Panama Canal Controversy: U.S. Diplomacy and Defense In-

terests, by Paul B. Ryan. First in a series of international studies published by the Hoover Institution Press, this volume analyzes seventy years of US-Panamanian relations against the changing background of world politics. Index, appendix. Hoover Institution Press, Stanford University, California 94305, 1978. 198 pages. \$5.95.

Two Hundred Years of Flight in America: A Bicentennial Survey, edited by Eugene M. Emme. Here are the remarks of participants in a day-long history symposium held in 1976 at the National Air and Space Museum. Topics ranged from ballooning and airships to instrumented utilization of space and manned spaceflight. Appendices, illustrations, index. American Astronautical Society, 1977. Distributed by UNIVELT, Inc., Box 28130, San Diego, Calif. 92128. 310 pages. \$25.

U.S. Foreign Policy in the 1980s: A Speculation, by Robert J. Pranger. In his address before the Twelfth International Affairs Symposium, Pranger speculates about America's

future foreign policy. In the '80s, he says, the US should avoid giving the impression that it is bent on superiority or dominance over the Soviets while insisting they not seek advantage over us. While Pranger believes public support can be generated for an American policy that seriously addresses American international responsibilities in areas of power, diplomacy, defense, and trade, he sees current US policy as ill-defined and caught between realism and moralism. American Enterprise Institute, 1150 17th St. N.W., Washington, D. C. 20036, 1977. 10 pages. 35¢.

These recently released Adelphi Papers will interest students of military/political affairs: *The Role of Arms Control in the Middle East*, by Yair Evron, 43 pages. *Sea Power and Western Security: The Next Decade*, by Worth H. Bagley, 40 pages. Copies may be ordered from The International Institute for Strategic Studies, 18 Adam St., London WC2N 6AL, England. The cost is \$1.50 postpaid.

—Reviewed by Robin Whittle

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Airpower Pioneers

This is the first of a series of short articles on the men who made lasting contributions to the development of airpower as strategists, tacticians, managers, and leaders. The articles will appear from time to time, but not necessarily in chronological order. Here a distinguished Air Force leader writes about the first American to develop a coherent concept for the employment of tactical and strategic air forces . . .

Edgar Gorrell's Concept of Air War

IN THE dusty archives of the War Department's World War I records, there is evidence that a US Army Air Service colonel named Edgar S. Gorrell was the pioneer who developed in detail the basic concepts that the US Air Force still follows sixty years later. While his Italian and English contemporaries, Douhet and Trenchard, were, in broad terms, advocating bombing to create terror and disruption, Gorrell was persuading Gen. John J. Pershing and his American Expeditionary Force (AEF) staff that we should develop and use airpower strategically to destroy the sources of the Central Powers' armaments, and their transportation system. Airpower, he held, should be used tactically to support the troops that had to come out of the trenches in that stalemated war.

Gorrell's ideas were developed while he was serving in France in 1917, and were embodied in his 202 Squadron Program, which called for that number of US squadrons to be at the front by July 1, 1919. The program laid out in detail the air bases, logistics, target systems, and day-and-night operations needed to win the war by applying

BY GEN. LAURENCE S. KUTER, USAF (RET.)



Col. Edgar S. Gorrell, American pioneer in the employment of airpower.

principles of air warfare as he conceived them.

The 202 Squadron Program became the basic document that governed America's growing World War I strength in the air. After the war, the program, and the airpower concept it supported, were filed and forgotten.

In 1920, Gorrell, a 1912 graduate of West Point with a master's degree from the Massachusetts Institute of Technology, resigned from the Air Service. During the war, he had watched ground officers promoted and pushed over Brig. Gens. Bill Mitchell and Benny Foulois. After the Armistice, he and his contemporaries were reduced to their much lower peacetime ranks, with nothing ahead but the slow seniority process of a peacetime Army that had little interest in aviation.

For a man of great talent and energy who was not yet thirty, the chance he was offered to head Northdyke Marmon Co. was irresistible. He later became president of the Stutz Motor Car Co., and finally the founder and long-time president of the Air Transport Association. Gorrell's last association with the Air Corps was in 1934, when

He served as a civilian member of the Baker Board. He died in Washington in 1945 at the age of fifty-four.

In World War II, another generation of airmen conceived an air plan to defeat Germany and Japan (AWPD-1). It followed in extraordinary degree the concept of Gorrell's 202 Squadron Program, vindicating the early work of this airpower pioneer.

Gorrell's Strategic Concept

In June 1917, the Army sent a large mission to Europe, headed by Maj. Royal C. Bolling. Its purpose was to gather technical information pertinent to developing an American air force. As a member of the Bolling Mission, Gorrell was charged with determining the requirements of the Air Service as part of the AEF. He surveyed the theater of operations and talked to the Chief of Air Service of the First Army, Brig. Gen. Billy Mitchell; the Chief of Staff, Col. Thomas DeWitt Milling; and others in the field and at several staffs. At the time, Mitchell was heavily engaged in organizing and equipping our 1st Day Bombardment Group and the 1st and 2d Pursuit Groups.

Gorrell proceeded to develop the 202 Squadron Program, which was approved in early December by his immediate chief, Brig. Gen. Benny Foulois, then Chief of Air Service, Zone of Advance, AEF. After Foulois's approval, it was sent to General Pershing with copies to his Chief of Staff, Brig. Gen. James G. Harbord, and to the senior officers of Pershing's operations staff, Cols. Fox Conner and Hugh A. Drum. The staff reported that the plan merited General Pershing's personal attention.

On January 5, 1918, General Pershing convened his top staff to meet with General Foulois and Colonel Gorrell. Gorrell made an oral presentation of the entire plan.

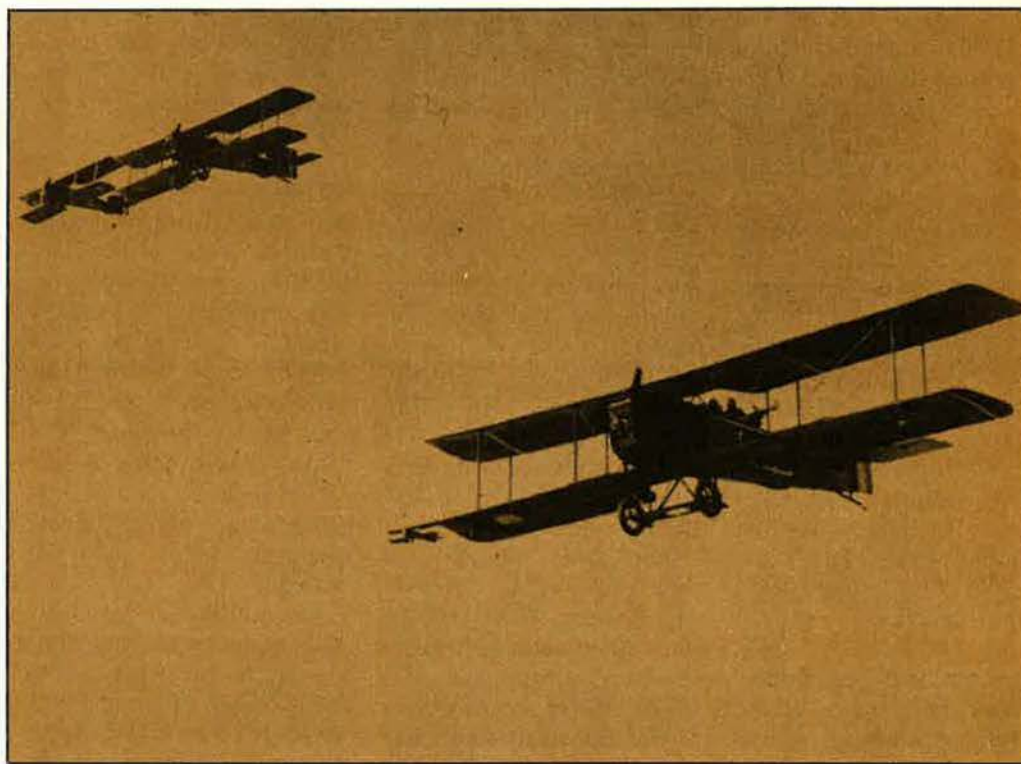
He opened with intelligence reports that some twenty-five German airplane factories were being expanded and at least part of the Zeppelin works converted to build Gotha bombardment planes. After reviewing the damage that an expanded German Air Force could do to the Allies, he urged that we build a

against objectives in the Mannheim, Ludwigshafen, Frankfurt, Dusseldorf, Cologne, and Saar Valley areas. Pinpointed within these groups of targets were steel mills, airplane factories, ammunition works, the Mercedes engine plant, the Bosch Magneto works, and the like. These objectives could be reached from air base complexes in the Ostende, Souilly, and Toul districts.

To be effective against those objectives and to meet tactical needs, Gorrell established a requirement for 202

needed to move those prefabricated hangars from seaports to the air base areas. He established the number of troops that could be billeted with the civil population in the air base areas and the number and nature of the barracks needed for the balance. He outlined the requirement for an air weather service, air navigation maps, a voice communications net, objective folders, and other items that in 1918 were new and visionary.

Colonel Gorrell concluded by pressing for im-



Obsolete Breguet bombers flown by American units had little effect in the final months of World War I.

bomber force to cripple the German war industry before it could apply airpower strategically against the Allies.

He described the tactical employment of our air force in support of ground forces, then went into considerable detail on the more complicated strategic employment. His strategic concept marks the 202 Squadron Program as the original expression of modern airpower.

Gorrell outlined the operations to be conducted

squadrons to be equipped with 2,000 new single-engine DH-4 day bombers using Liberty engines and, for night operations, a lesser number of the bigger Handley Page and Caproni bombers.

His plan was complete in detail that would have done credit to a large, well-trained staff. For example, he determined the number of temporary hangars that would have to be produced in the US and the number of French railroad cars

mediate action lest the Germans use their Gothas to do to the Allies what he proposed to do to Germany. After some discussion, the AEF Commander in Chief inscribed the 202 Squadron Program "Approved in full. J. J. Pershing, January 5, 1918, Chaumont, France."

The plan was then no longer just a brilliant concept by a twenty-seven-year-old planner, but rather the basic directive on which the War Department and American industry began to move. Walnut groves had to be searched out and cut to make the thousands of propellers called for by the plan. Liberty engines had to be produced on production lines far larger than had ever before been contemplated. A vast undertaking had been initiated.

Gorrell was successively assigned as Chief of the Technical Section (Procurement) and finally to the G-3 Division, GHQ AEF, where he could have guided the growing number of squadrons. But the Armistice was signed long before 202 squadrons could materialize. In fact, the first American-made DH-4 arrived in France too late to see much action.

Too Late and Too Soon

Why the concept of the 202 Squadron Program was never implemented is obvious from the calendar. There simply wasn't enough time. Not so obvious is the reason it was forgotten and,

by some, completely discredited. That reason is not a matter of official record, but is clearly implied by the performance of our 1st Day Bombardment Group.

On June 12, 1918, Billy Mitchell and his Chief of Staff, Tommy Milling, dispatched the 96th Bombardment Squadron, under Maj. C. W. Atkinson, on its first combat mission. The 96th was flying Breguets, which the French had withdrawn from combat and relegated to training. On July 10, 1918, the 96th was able to get six of these old and fragile aircraft in commission for the squadron's fifth mission. For reasons never explained, all six landed in enemy territory. Over the home base of the 96th a German airplane appeared out of nowhere and dropped a note reading, "Thanks for the Breguets. We'll keep the pilots and observers. What should we do with the Major?"

The 96th was eventually joined by the 11th, 20th, and 166th Squadrons, all initially equipped with Breguets, to form the 1st Day Bombardment Group.

For three months and three days, every mission was dispatched against the short Montmedy-Longuyon-Conflans railway line over which heavy traffic supported the thirty-four German divisions facing the Allies at St. Mihiel and the Meuse-Argonne. There is no record of any substantial shortages in those divi-

Gen. Laurence S. Kuter, one of the four principal authors of the plan for employing US airpower in World War II, was an early Eighth Air Force wing commander, the US Deputy Commander of the Northwest African Tactical Air Force, and General Arnold's representative at the Yalta Conference. After the war, he commanded MATS (now MAC), Air University, Far East Air Forces, PACAF, and NORAD. Following his retirement in 1962, he was for several years Executive Vice President of Pan American World Airways. He now lives in Naples, Fla.

sions. There also is no record that any bombs ever scored the direct hits needed to cut rail lines.

One highly significant written record does support discrediting the use of strategic aviation against vital rail lines. General Pershing's diary of October 16, 1918, contains the entry, "Discussed with Mitchell better employment of aviation. . . ."

At the opening of the Meuse-Argonne battle, the 1st Day Bombardment Group was ordered to stand by for targets of opportunity consisting of enemy elements arriving as reinforcements or retiring, all within six or eight kilometers of our front line. The Group was ordered to attack "such targets at low altitude in order to cause confusion and material damage."

General Pershing and his able senior staff approved the airpower concepts of the 202 Squadron Plan in January 1918. Ten months later they were using the only available air striking force to confuse small bodies of troops that were within range of their artillery.

It is safe to conclude that the 202 Squadron concept was discredited or forgotten because of the performance of our 1st Day Bombardment Group. That Group was put into operations long before it was up to strength, long before crews were equipped with bombsights of any nature, and with battle-scarred, beaten up, obsolete light aircraft. Untrained and ill-equipped, the crews were rushed into battle far too early. Although their courage, enthusiasm, and patriotism were of the highest order, they were unable to accomplish their strategic mission.

The 1st Day Bombardment Group's ineffectiveness was a sharp setback to Edgar S. Gorrell's vision and judgment. Despite this setback, he was vindicated a quarter of a century later when the application of his concept was a major factor causing the surrender of Germany and Japan in another world war.

Gorrell remains the pre-eminent American pioneer in the employment of strategic and tactical air forces. ■

When this picture of the 11th Day Bombardment Squadron was taken at Maulan, France, late in 1918, the squadron had been reequipped with DH-4s.



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The Bulletin Board

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

DoD to Senate: "Move DOPMA"

"For several years now, the officer corps has been hearing about improvements in the personnel system which are of vital importance to them and their careers. Yet, nothing has been done. This uncertainty needs to be removed. . . [and] I urge Congress" to act on the DOPMA bill. So declared the Defense Department's top personnel official, Assistant Secretary (Manpower, Reserve Affairs and Logistics) John P. White, to different Capitol Hill committees in February and March.

He was really directing his message to Sen. Sam Nunn (D-Ga.), chairman of the Senate Armed Services subcommittee that has blocked DOPMA for so many years. White's demand came in the wake of the House's 351-7 vote approving DOPMA. Two years ago, the House, by a similar margin, also approved the measure, only to see it die in the Senate. One thing that irritates service officials is that, as Mr. White noted, the Pentagon drafted DOPMA originally under a congressional mandate. The lawmakers have looked the other way ever since.

A possible note of encouragement is that the Nunn subcommittee plans to hold DOPMA hearings later this spring. If it does act, chances seem good that a continuation rule allowing numerous passed-over captains to remain for twenty-year careers will be inserted. The measure already would allow the services to keep to twenty years majors not chosen for lieutenant colonel. Senator Nunn and some other lawmakers and even various military officials favor relaxing the tough up-or-out rules applying to those O-3s and O-4s.

DOPMA, of course, would let the

services early-retire numerous less-productive O-5s and O-6s. Normal tenure for O-5s would be reduced from twenty-eight to twenty-six years. Single promotion lists—and promotion boards—would be created for each grade.

USAF officials are primed to throw the switch on DOPMA and phase in its many provisions over the two-year transition period. They still plan to offer Regular commissions to most non-Regulars as they near the eleven-year service point and to most of those with more than eleven years' service.

The promotion phase point to major, meanwhile, is slipping further. USAF earlier envisioned officers making O-4 in their tenth year under DOPMA, but that is now moving closer to the twelfth year. An authority pointed out that the Air Force currently is limited to 69,425 Regular officers, but under DOPMA there would be no overall ceiling.

DOPMA does contain the permanent ceilings on field graders that USAF needs to keep the promotion program breathing. However, if the Senate falters again, the Air Force this fall will again have to go begging—for the ninth time—for temporary grade relief.

Should DOPMA be approved, there is some feeling that the grade tables eventually will need revision to accommodate likely changes in the retirement system. The Presidential pay commission, for instance, has been talking about deferred annuities and extended service to qualify for retirement.

In approving DOPMA the second time, the House raised officer separation pay from \$15,000 to \$30,000.

Bureaucracy Ensnares Veterans

A service member in Austin, Tex., is retiring in six months. He hasn't

yet lined up a second career, but he wants to get established. So he applied for a VA home loan and the local lender approved it. The papers then went to VA's regional office in Waco, and guess what—they turned him down flat.

"Approving a loan based on income that won't continue beyond six months," a VA spokesman said, is "inconsistent with proper underwriting methods," and his upcoming retirement income alone is insufficient to make the loan a good risk. A sort of "Catch-22."

According to the Austin firm trying to get the man housed, VA's policy is not generally known by lenders, realtors, base personnel affairs offices, and service members. The VA spokesman, however, said his agency's "credit underwriting standard" is published and sent to all lenders in the VA loan program.

If nothing else, the flap points up the broad difference in the way Uncle Sam treats different groups of citizens: play hard-nosed with those who have served their country long and honorably, but let hundreds of thousands of youths welch on repaying government student loans.

AFA Expands Salute Plan

The Air Force Association is now offering one-year complimentary memberships to new officers of the various Air Force medical services. To secure their memberships, they will be offered applications when they enter service. Persons eligible for this complimentary membership who are already AFA members may also complete the form so that their memberships can automatically be extended for an additional year.

In 1972, as a means of commemorating the twenty-fifth anniversary of the Air Force, AFA initiated its "Salute Program" by extending one-year complimentary memberships to new NCO Academy graduates and new line second lieutenants. The program was expanded this past January to accommodate the medical and other health service officers.

Pilot Commitment: Seven Years

What a difference a couple of years makes. In early 1976, the Air Force, reeling under a glut of pilots, slashed undergraduate pilot training (UPT) spaces. It detoured hundreds of AFROTC graduates ear-

marked for UPT into navigator school, nonrated duties, or Reserve service. It encouraged young pilots to take early releases.

Now, with the surplus disappearing and training slots increasing, USAF has decided that youths entering UPT and helicopter training after June 14, 1979, must serve six years—instead of the present five—after winning their wings. Counting training time, that's seven years, probably the longest service commitment in the armed forces.

The aim is to get more mileage out of these expensively trained

people, increase the rated experience level, and stabilize the officer force. In related changes:

- Rated officers will now receive active-duty service commitments (ADSC) for any formal flying training, including requalification and special crew qualification. Previously, they got an ADSC only if the training resulted in crew upgrade, such as pilot to aircraft commander.

- Headquarters has opened UPT to senior coeds in AFROTC. A board was to select eleven of them early this spring, with the first six entering training next fall. The thirty Air

Force women who have become pilots so far were, when selected, already on active duty or in the Reserve or Air Guard.

After about two years of shaking down the female pilot experiment, Air Force now envisions a requirement for twenty women pilot "candidates" annually through 1981, with AFROTC providing half. Twenty "candidates," of course, does not necessarily mean that many new distaff flyers, for washouts can take their toll.

"It's only a matter of time," Air Force officials say, before AFROTC

AFA Believes . . .

World War I Vets: Tomorrow May Be Too Late

Veterans' benefits. The term conjures up thoughts of the GI Bill, job preference, home loan assistance, and so on.

But how about this picture: a train ticket home and a one-time payment of \$60? Doesn't sound like much, does it? But that is exactly what the veteran of World War I received when he was mustered out. And, except for those with direct service-connected disability or those whose total income fell below a bare-bones \$2,000 a year, that remains the total package of World War I veterans benefits.

If you didn't know that, it's not surprising, since more than seventy-five percent of Americans alive today were not yet born when that conflict ended. If such treatment raises your hackles, it should—for while not many AFA members are World War I veterans, most of us are veterans.

This year some recompense may be provided to this almost-forgotten group. Early in 1978, Congress held hearings on H.R. 9000, a bill authored by Rep. Glenn M. Anderson (D-Calif.), which would fund a pension of \$150 a month for World War I veterans. As of this writing, more than 200 members of the House had joined in cosponsorship.

In support of his bill, Congressman Anderson said: "It is a disgrace that we have given so little to those who have given so much. No group of patriots has been so often overlooked and so long neglected."

According to Mr. Anderson, about half of the World War I survivors receive no pension at all. A few do receive some pension assistance based strictly on need, but its effects have been eroded over time. This is particularly apparent when one considers some startling figures from an unpublished Census Bureau survey. More than half of the World War I vets (many with one dependent) have a *total* annual income of less than \$6,000. One hundred and fifteen thousand of them survive on less than \$3,000 a year. The current pension law will provide just enough supplement to other income to keep a World War I veteran precisely at the poverty level. One of Congressman Anderson's constituents, for example, receives \$8.80 a month.

To make matters even worse, when one of these veterans (or his survivors) receives a Social Security increase (and some are not even entitled to basic Social Security, which wasn't enacted until 1935), the amount of that increase is "passed through" and deducted from his meager veterans pension. Commenting on this, Rep. John M. Ashbrook (R-Ohio) has said, "The present situation is ridiculous. What the veteran receives in one hand is taken away from the other. I strongly support enactment of a provision assuring that no veteran will receive a reduced pension check as a result of increased Social Security." He went on to say that, in his

opinion, "World War I veterans have never received a fair shake from the government. . . . In short, the economic status of World War I veterans is abysmal."

The last pension (as opposed to compensation for disability) that this country provided nondisabled or nonpoverty status veterans was for veterans of the Spanish-American War, authorized some twenty years after that conflict. A pension based on dire need was granted to World War I veterans in 1934. It now is available to veterans of all wars. So, in that regard, we might say that all veterans are "equal." But Rep. Mark W. Hannaford (D-Calif.) has put this "equality" in sharp perspective. Speaking to a House subcommittee on pensions, he said:

Even the most cursory review of benefits indicates the unequal treatment accorded to our World War I veterans as compared to veterans of later wars. Veterans of American wars after the First World War received educational assistance, reemployment rights, preferential employment status, vocational counseling, and greatly expanded vocational rehabilitation assistance. They received guaranteed home loans, mobile home loans, real estate loans, non-real estate loans, farm loans, business loans, and, most recently, educational loans.

Veterans of the First World War received none of these but, instead, received a [few] dollars and a slap on the back. . . .

Certainly the great deprivations suffered by the men who fought in World War II or Korea or Vietnam are not any greater than those suffered by the men who fought in World War I, yet the veterans of the later wars are entitled to more assistance and benefits than are veterans of World War I. Some may reply that wars in different times result in different troubles that require different solutions. I disagree. . . . Since eighty-year-old veterans and their dependents have little use for educational assistance, vocational counseling, or farm loans, the only fair thing to do is to give them a general pension.

That is what H.R. 9000 would give them.

The Census Bureau estimates that fewer than 700,000 of the 4,734,000 men who served in World War I are living today. Their average age is eighty-two, and each year their number is decreasing by about 100,000.

Simple arithmetic tells us that little time remains in which to help these fellow veterans. Simple justice indicates that the time to consider it is *now*.

—JAMES A. McDONNELL, JR.

The Bulletin Board

women will be eligible for undergraduate navigator training and missile-launch duty. AFROTC officials report they are surveying the cadet coeds to determine their interest in careers as military flyers. If it's widespread, the quotas could be increased.

Baggers, Store Patrons Hit

The government has set July 30 as the day commissary baggers and carryout helpers will become non-appropriated fund employees and, instead of tips, receive the minimum hourly wage. It will amount to \$2.69 to \$3.14, depending on location. The decision, laid on by the Civil Service Commission even though the military community alone will suffer the adverse impact, probably will knock enlisted members trying to earn extra cash in tips out of their bagger jobs.

Commissary customers will pay for the employees' wages through a two percent user's fee. Thus, a customer who buys \$100 worth of groceries will pay \$2 for the service, but without the tips the actual shopper costs should be about the same as now. The user's fee will be calculated separately from the four percent surcharge. Customers, if they object to paying the fee, will be able to bag their own groceries, but this appears likely to create mass confusion at checkout counters. Air Force Commissary officials acknowledged that "there will be problems."

Reps. Dan Daniel (D-Va.) and Les Aspin (D-Wis.) are backing legislation that would exempt baggers from the minimum wage law.

AFR, ANG Strengths Inch Up

Air Force's Reserve components are planning modest personnel strength increases during the next two years, some of them tied to upcoming unit modernization. Active-duty manpower cuts continue.

The Air Force Reserve, after a manpower drop the previous year, increased last year to about 50,600 (Selected Reserve) members, or ninety-seven percent of authorized

figures. Plans call for the AFR to average 53,200 members next year and 54,400 in 1980.

The Air Guard, with 91,200 participants late last year, was at ninety-nine percent of authorized strength. Plans call for it to average 92,400 members next year and 94,000 the following year. Pentagon authorities feel the Air Force components and the Naval and Marine Corps Reserves, both fully subscribed, can continue to meet their strength goals. But they're scrambling to find ways to shore up the severely depleted ranks of the Army Reserve and Army Guard. Those organizations already have a special reenlistment bonus program, but Defense doesn't have a firm fix on whether it's doing any good. The other components, in any event, aren't likely to get the bonus authority.

Modernization of Air National Guard units during FY '79 will add 760 new manpower spaces to the outfits involved. Most of the conversions involve replacement of F-100s with F-4s; others will be shedding old aircraft for A-7s, C-130Hs, A-10s, and F-105s. The only AFR unit on the conversion list is the 79th AEW&C Sqdn., Homestead AFB, Fla. It is slated to change its mission and give up its EC-121s for F-4Cs and add 102 billets in the process.

Anti-Union Bill Moves

Senate-passed legislation outlawing military unions received House Armed Services Committee approval in late February. Unlike the Senate measure, the House committee version permits unions with Reserve Forces technicians to remain alive. The Defense Department, meanwhile, continues to fight any anti-union legislation. It insists it can keep unions out by using the anti-union directive it issued last October.

VA: "Give Vets OJT Chance"

America's veterans organizations can contribute in many ways to helping jobless Vietnam-era vets. That's the word from VA Administrator Max Cleland, who said that frequently service organization members, like many in AFA, are also industry and business leaders with direct hiring authority.

"They can say 'yes' to veterans applying for OJT under the GI Bill.

Most know of private sector job-training opportunities and of veterans seeking training jobs. They can bring these opportunities and the veterans together," the VA chief told AIR FORCE Magazine.

When training positions are created, VA helps finance it. Cleland explained that an eligible single vet, training full time, is entitled to a monthly GI Bill allowance of \$226 the first half year of training. This stipend declines during the three subsequent six-month training periods as his entrance wage, which must be at least half the wages paid for the specific job, is increased.

All kinds of veterans legislation, meanwhile, is being introduced in Congress. For example, Rep. G. V. Montgomery (D-Miss.) is backing new plans to boost dependency-indemnity compensation for dependent parents, improve veterans government insurance programs, and liberalize the death and disability pensions for veterans from the Mexican border skirmish through the Vietnam War. Sen. Spark M. Matsunaga (D-Hawaii) is pushing a bill to permit service-connected disabled vets who are also retired military members to receive VA compensation concurrently with retired pay. Rep. Ray Roberts (D-Tex.) wants to provide dental care for all veterans since World War I who have a service-connected disability rated fifty percent or higher.

Retirees, Hear This

Air Force retirees, their families, and surviving spouses now have a toll-free telephone line they can use to call the service's Retired Activities Branch at the Military Personnel Center, Randolph AFB, Tex. The office will field queries on any retiree-related matter except pay, a subject handled exclusively by the Air Force Finance Center, Denver, Colo.

The Branch's main toll-free phone number is 1-800-531-7502, to be used for all CONUS calls except those originating in Texas. For calls within the Lone Star State, the number is 1-800-292-5222. (The number for the Finance Center, which is not toll-free, is 303-320-7051, or AUTOVON 926-7051.)

When the Army, with about 400,000 retirees, established toll-free phone service for its retirees a year ago, it was "swamped" with

calls, a spokesman said. Air Force has about 430,000 retirees, more than any of the other services.

290 PA Commissions Set

It's official. The long-awaited direct commissioning program for Air

Force's enlisted physician assistants got under way the first of this month. Officials estimate that of the 337 PAs on active duty and the eighty-five in training, 290 will eventually be commissioned, all in the Biomedical Sciences Corps.

Grades awarded will depend on

education, experience, and performance. Most will be offered second or first lieutenantcies, but there "will be a few captains," the Air Force Surgeon General's Office said. A bachelor's degree is required; those without one have six years to earn it. PAs already fully

Ed Gates . . . Speaking of People

USAFSS: People Proud of Their Mission

More than 16,000 USAF members are assigned to a command that is up to its eyebrows monitoring Soviet communications and collecting other hard-nosed intelligence. The command's standards are so high that only six of every 500 recruits who complete basic training qualify for membership. More than half its people serve abroad, at scores of listening posts in twelve foreign countries. Most officers in the organization come from within its enlisted ranks.

The outfit is the USAF Security Service, with headquarters at Kelly AFB, Tex., and operators at some 100 locations in the US and abroad. USAFSS isn't exactly a household word within the military community, but that's not surprising, because for years the government didn't want to discuss it, or any other government intelligence activity—even if the potential enemy already knew about it.

Times have changed. According to USAFSS spokesman Maj. Rallin A. Aars, "We want to get the command's story out. We're proud of our mission. Our people do important work and deserve recognition. And, anyway, intelligence activities generally are no longer hush-hush. The other side knows what we're doing, so there's no point trying to hide it," he told AIR FORCE Magazine recently.

Instead, USAFSS is now inviting reporters, editors, civic groups, and others to visit command headquarters, talk with officials, and receive the excellent unclassified briefing. And spread the word.

The briefing was put together and delivered by Capt. David A. Shroads who in 1973, after fifteen years in USAFSS assignments as an NCO, went to OTS. Shroads worked his way up to O-3 and won his degree via off-duty work from the University of Nebraska.

The Security Service is headed by Maj. Gen. Kenneth D. Burns, a 1954 graduate of the Naval Academy. Its main job is to collect, analyze, and report intelligence information about foreign countries. The communications signals it collects range from Morse to high-speed teletype. They are gathered at sophisticated listening posts in West Berlin, ideally located 110 miles behind the Iron Curtain, and other strategic sites, including Clark AB, P. I.; Osan, Korea; Iraklion, Crete; San Vito, Italy; RAF Chicksands, U. K.; Athens, Greece; Masawa, Japan, and Elmendorf and Eielson AFBs in Alaska. Many of the smaller detachments are manned by as few as five or six airmen.

Working at USAFSS ground sites and from aircraft, operators monitor foreign conversations in many different languages and record them on magnetic tape. They also home in on electronic transmissions from foreign radar and weapon systems that have intelligence value.

Because all intelligence information is not transmitted within the range of ground stations, some monitoring is conducted by USAFSS operators on board RC-135 aircraft.

USAFSS intelligence analysts immediately pass along critical information, while the rest is stored and analyzed to extract every possible bit of intelligence.

In times of crisis, two USAFSS mobile intelligence-gathering units are positioned in direct support and under the direct control of the local commander. One unit presently is located at Hahn AB, Germany; the other is at San Antonio. Both are ready to move to wherever they may be needed on short notice.

The command also develops countermeasures against Soviet and other foreign efforts to intercept US secrets. Another command mission is eavesdropping on US military units and individuals. It's necessary, command spokesmen say, to assure that classified data isn't being given away unintentionally. Monitor teams taps US military telephones or hook headphones into government switchboards. "All Air Force personnel are informed that their military conversations can legally be monitored for security reasons," one official explained.

And those constant reminders to protect classified information, which appear on service bulletin boards and elsewhere service-wide, originate at USAFSS headquarters.

Security Service training is intensive. A typical newcomer may receive language training in one of twenty-four foreign tongues at the Defense Language Institute, Monterey, Calif. Morse code operators learn their trade at Keesler AFB, Miss. Other collection operators are schooled at a triservice facility run by the Navy at Pensacola, Fla.

The command's headquarters is at Kelly AFB, Tex., a Logistics Command base. Goodfellow AFB, Tex., is the only base operated by USAFSS, and that's where the cryptography people, communications traffic analysts, and signals intelligence officers are trained. It's also where new linguists qualify in the special equipment and techniques they will use on the job.

The Security Service's NCO Academy, Leadership School, and other professional military education programs for noncoms, also located at Goodfellow, have won high praise throughout the service. They are credited with helping to create an unusually sharp, dedicated group of NCOs.

Many of the USAFSS skills are unique to intelligence activities, which tends to curb moves to other commands. "Our people, more than most USAF members, make an effort to stay in their command," one ten-year member said. He was on orders from Kelly to the USAFSS detachment at San Vito, Italy.

"It's not like a big command such as SAC or TAC, where you may not know anyone at a new base," he continued. "When we transfer, we always bump into old friends. It's like homecoming, and it makes the move more pleasant."

Officials help promote this tight-knit feeling. In each issue of the *Spokesman*, the command newspaper, lists are printed of upcoming transfers to keep USAFSS members informed. A separate roster in the paper names members about to retire. And both lists refreshingly vary that tired old military practice of listing people in order of rank. The *Spokesman* does it in reverse—the lowest-ranking enlisted member tops the list, while the highest-ranking officer is the anchor man. Nice touch. ■

The Bulletin Board

qualified can fire in their applications for bars promptly.

The Air Force, though scheduled to drop 5,000 active-duty spaces next fiscal year, is gaining 500 officer spaces. Thus, it can comfortably accommodate the new PA officers-to-be who are currently E-8s and E-9s. The other services' PAs were elevated earlier.

Air Force PAs must complete a stiff two-year health care course, take 100 hours of AMA-approved continuing health education every other year, and retake National Boards every six years.

The services, meantime, are about 1,000 physicians short of authorized strength, and health care would be much more of a problem than it is if there were no PAs. The Defense Department is now telling Congress that with expected improved doctor recruiting and retention, the services will attain authorized physician strength "by the mid-1980s."

Congress Challenged on UHPT

Congress has often scored the services for not consolidating similar training programs. So one might think that when the Pentagon advances a responsible plan to merge undergraduate helicopter pilot training (UHPT) at Fort Rucker, Ala., the lawmakers would approve, especially since exhaustive studies show the merger would save the taxpayers big money and not compromise the quality of training. But congressional opponents objected to losing the Navy chopper school at Pensacola, Fla., and the plan was defeated. Defense, however, has now urged the lawmakers to reconsider. The consolidation, DoD declares, would save more than \$100 million over the next four years!

Short Bursts

The portion of the **military budget** channeled into **personnel-related outlays is dropping**. According to new statistics from the Pentagon, the figure is now **fifty-seven percent**

and will drop to fifty-six percent next year. The peak, Defense says, was sixty percent in 1974. These percentages include retirement payments, which in the opinion of some, should not be considered, since they have no direct relationship to current national security spending. Omitting retired pay expenditures, the current portion of the Defense budget devoted to people costs is **fifty-three percent** and will dip to fifty-one percent next year, Defense says.

The latest **retiree pay raise**, a 2.4 percent boost effective last month, also increases the dual-compensation limit for retired Regular officers employed by the government. They can now **keep the first \$4,320.36 plus fifty percent** of their remaining retired pay. The limit previously was the first \$4,219.10 plus fifty percent of the rest. The next retiree hike, based on January-July CPI growth, will take effect in September.

All the services **except the Air Force** will soon **reduce the length of recruit training**, Navy by nine days (to less than seven weeks); the Marine Corps from eleven to nine weeks; and the Army will trim the processing time for its seven-week program by two days. USAF's basic training program will remain at six weeks. The cuts are part of a broad DoD scheme to conserve training dollars.

Legislative proposals have gone to Capitol Hill to make permanent the variable incentive bonuses and other special pays now provided **officers of the medical services** on a temporary basis. The payments, extended last year, will expire next fall unless Congress acts. It's a virtual certainty that they will be extended.

The Air Force Office of Special Investigations is shopping for airmen qualified to become **special agents and serve in Iran, Turkey, or Korea**. Language qualification, which can be attained at language school—for Iran it is Persian—is required. See AFR 39-11.

The new **wartime skill program** called WARSKIL has moved forward, Air Force personnel officials report. Launched in January, it quickly got under way at **twenty-six CONUS bases** and will soon be **extended overseas**. WARSKIL regs should be in the field this month. As reported in the January "Bulletin Board," the program provides special OJT (for members in support skills) into "wartime-critical" skills.

These are jobs they would take over in an emergency.

The services wage board—"blue collar"—employees, of which Air Force has approximately 81,000, are paid **about eight percent more than the going wages for comparable jobs in private industry** throughout the country. Accordingly, the Pentagon wants legislation evening up the outlays, which, officials say, would reduce the Defense budget by \$136 million in FY '79 and about \$513 million annually by FY '83. Congress ignored the request last year, but Defense is back for another try.

Senior Staff Changes

RETIREMENTS: B/G Tedd L. Bishop; Gen. Robert J. Dixon; Gen. William V. McBride.

CHANGES: M/G (L/G selectee) John G. Albert, from V/C, AF Acquisition Log. Div., AFLC, Wright-Patterson AFB, Ohio, to Cmdr., AF Acquisition Log. Div., AFLC, Wright-Patterson AFB, Ohio, replacing L/G (Gen. selectee) Bryce Poe II. . . **Gen. Lew Allen**, from Cmdr., Hq. AFSC, Andrews AFB, Md., to VC/S, Hq. USAF, Washington, D. C., replacing retiring Gen. William V. McBride. . . **L/G (Gen. selectee) Wilbur L. Creech**, from Asst. VC/S, Hq. USAF, Washington, D. C., to Cmdr., Hq. TAC, Langley AFB, Va., replacing retiring Gen. Robert J. Dixon. . . **Col. (B/G selectee) James L. Gardner, Jr.**, from Cmdr., 438th MAW, MAC, McGuire AFB, N. J., to V/C, 22d AF, MAC, Travis AFB, Calif.

B/G Walter R. Longanecker, from Mobilization Asst. to Dep. ACS/Intel., Hq. USAF, Washington, D. C., to Mobilization Asst. to ACS/Intel., Hq. USAF, Washington, D. C. . . **Col. (B/G selectee) Gerald E. McIlmoyle**, from Cmdr., 341st SMW, SAC, Malmstrom AFB, Mont., to Asst. DCS/Plans for Plans & Policy, Hq. SAC, Offutt AFB, Neb. . . **Col. (B/G selectee) George B. Powers, Jr.**, from Cmdr., 63d MAW, MAC, Norton AFB, Calif., to Cmdr., 437th MAW, MAC, Charleston AFB, S. C. . . **L/G (Gen. selectee) Alton D. Slay**, from DCS/R&D, Hq. USAF, Washington, D. C., to Cmdr., Hq. AFSC, Andrews AFB, Md., replacing Gen. Lew Allen. . . **M/G (L/G selectee) Thomas P. Stafford**, from Cmdr., AF Flight Test Center, Edwards AFB, Calif., to DCS/R&D, Hq. USAF, Washington, D. C., replacing L/G (Gen. selectee) Alton D. Slay. ■

May 27 at The Broadmoor, Colorado Springs, Colorado

THE NINETEENTH ANNUAL OUTSTANDING SQUADRON DINNER

Saluting the 1978 Outstanding Squadron at the United States Air Force Academy
Cosponsored by the Air Force Association and its Colorado Springs Chapter

More than 600 guests—including parents and friends of the cadets, together with aerospace, AFA, and government leaders from throughout the country—will pay tribute to the Academy Squadron as it receives from AFA the Academy's most outstanding award of the year for excellence in all elements of cadet life, from academic standings and military leadership to drilling and intramural athletics.

Reception 6:15 p.m., Dinner 7:00 p.m., Dancing 10:00 p.m.; the International Center of The Broadmoor.

Dress: Black-tie for civilians, Summer Mess Dress for Military.

Cost: \$35 single, \$60 per couple.

Hotel reservations may be made direct with: The Broadmoor, Colorado Springs, Colorado 80901, telephone (303) 634-7711, Singles \$57-\$77, Doubles \$60-\$80; the Antlers Plaza Hotel, Chase Stone Center, Colorado Springs, Colorado

80903, telephone (303) 473-5600, Singles \$33, Doubles \$39; or the Four Seasons Motor Inn, 2886 S. Circle Drive, Colorado Springs, Colorado 80906, telephone (303) 576-5900, Singles \$28, Doubles \$34. Be sure to mention AFA when writing or calling for accommodations.

Golf and tennis tournaments will be conducted at The Broadmoor on Friday, May 26. Please write to AFA for details.

Dinner Reservation Form

Return to: Air Force Association, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006

THE OUTSTANDING SQUADRON 1977



Please make the following reservations for me at AFA's 1978 Outstanding Squadron Dinner:

_____ Singles @ \$35 \$ _____

_____ Couples @ \$60 \$ _____

Enclosed is my check for \$ _____

Please send information on the golf and tennis tournaments.

Name _____

Address _____

City _____ State _____ ZIP _____

Telephone (_____) _____

AFA News

By Don Steele, AFA AFFAIRS EDITOR



Robert Cyril is the top AFA membership recruiter in the First Connecticut Chapter—and, perhaps, in the country. Last year, he personally recruited fifty-three of the 228 new members obtained by the Chapter. This year, as of December 31, 1977, he had recruited seventy-eight of the Chapter's 138 new members. And, to top it off, he's not reaching just the choir—they're all civilians! In recognition of his outstanding accomplishment, the Chapter presented him a citation. In the photo, Bob accepts an application from new Patron Lucille Ricciardi.

Noel A. Bullock, Director of Aerospace Education for the Colorado State AFA and the CAP's Rocky Mountain Region, was the recipient of the Colorado Wright Brothers Memorial Award at a dinner sponsored by the Colorado Chapter of the Wright Brothers Memorial Foundation. Shown following the presentation are, from left, James C. Hall, Vice President for AFA's Rocky Mountain Region; Mr. Bullock; retired Maj. Gen. Joe C. Moffitt, former Colorado Adjutant General; and Colorado State AFA President Edward C. Marriott.



George Abbey, Director of Flight Operations for NASA's Space Shuttle program, was the guest speaker at a recent meeting of AFA's Llano Estacado Chapter in Clovis, N. M. Shown visiting following the presentation are, from left, Al Crews, NASA aircraft operations officer at the Houston Space Center; Chapter President Joe Turner; Mr. Abbey; and Col. Joe Moore, Commander, 27th Tactical Fighter Wing, Cannon AFB.



Lt. Gen. Richard L. Lawson, Commander, 8th Air Force (SAC), was the guest speaker at a recent dinner meeting sponsored by AFA's Topeka, Kan., Chapter. Shown are, from left, Maj. Gen. Edward R. Fry, Adjutant General, State of Kansas, who introduced the speaker; General Lawson; Mrs. Wortham; and Chapter President Wilbur R. Wortham, Jr.

chapter and state photo gallery



The official presentation to the seven holders of the winning ticket on a Piper Cherokee, the prize in a recent raffle sponsored by AFA's Thomas B. McGuire, Jr., Chapter, included, from left, Col. (Brig. Gen. selectee) James L. Gardner, Jr., 438th Military Airlift Wing Commander; Arnie Andresen, Piper Administrator of Div. Sales; Marjorie Fagella, one of

the winners; Maj. Gen. Thomas M. Sadler, 21st AF Commander; Al Koontz, Piper Vice President for Finance; Chapter President Bill Demas; and five of the winners, Patricia Carbone, Lawrence Moody, Mary Polvoorde, Gil Maupin, and Jay Worth. The seventh winner, Tom Metz, was unable to be on hand for the presentation.

COMING EVENTS . . .

Massachusetts State AFA Convention, Hanscom AFB, April 22 . . . Alaska State AFA Convention, Fairbanks, April 28-29 . . . Florida State AFA Convention, Fort Walton Beach, April 28-30 . . . Tenth Annual Bob Hope AFA Charity Golf Tournament, March and Norton AFBs, Calif., April 28-30 . . . South Carolina State AFA Convention, Myrtle Beach AFB, May 5-6 . . . Virginia State AFA Convention, Charlottesville, May 6 . . . North Carolina State AFA Convention, Seymour Johnson AFB, May 6 . . . Ohio State AFA Convention, Granville Inn, Granville, May 13 . . . Colorado State AFA Convention, Pueblo, May 12-13 . . . California State AFA Convention, Mansion Inn, Sacramento, May 19-21 . . . New Jersey State AFA Convention, Golden Eagle Inn, Cape May, May 19-21 . . . Utah State AFA Convention, Ogden, May 20 . . . AFA Golf and Tennis Tournaments, The Broadmoor, Colorado Springs, Colo., May 26 . . . AFA Board of Directors and Nominating Committee Meetings, The Broadmoor, Colorado Springs, Colo., May 27 . . . AFA's Nineteenth Annual Dinner honoring the Outstanding Squadron at the Air Force Academy, The Broadmoor's International Center, Colorado Springs, Colo., May 27 . . . Connecticut State AFA Convention, Howard Johnson Conference Center, Windsor Locks, June 3 . . . New York State AFA Convention, Niagara Falls, June 9-10 . . . Oklahoma State AFA Convention, Vance AFB, June 16-17 . . . Kansas State AFA Convention, McConnell AFB, June 17 . . . Texas State AFA Convention, Kahler Green Oaks Inn, Fort Worth, July 28-30 . . . AFA's 32d Annual National Convention, Sheraton-Park Hotel, Washington, D. C., September 17-20 . . . AFA's Aerospace Development Briefings and Displays, Sheraton-Park Hotel, Washington, D. C., September 19-21 . . . AFA National Symposium, Los Angeles, Calif., October 26-27 . . . Seventh Annual Air Force Ball, Century Plaza Hotel, Century City, Calif., October 27.



Since the New York State AFA's 1977 "Man of the Year"—Thomas Connitt, right, Immediate Past President of the Lawrence D. Bell Chapter—could not attend the State AFA's 1977 Convention to accept his award, State AFA President Ken Thayer, left, made the presentation during a recent dinner meeting sponsored by the Chapter. AFA President Gerald V. Hasler was the guest speaker.

AFA State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

ALABAMA (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **Donal B. Cunningham**, 1 Keithway Dr., Selma, Ala. 36701 (phone 205-875-2450).

ALASKA (Anchorage, Fairbanks): **Daniel C. Crevensten**, Box 60184, Fairbanks, Alaska 99706 (phone 907-452-5414).

ARIZONA (Phoenix, Tucson): **E. D. Jewett, Jr.**, 7861 N. Tuscany Dr., Tucson, Ariz. 85704 (phone 602-297-1107).

ARKANSAS (Blytheville, Fort Smith, Little Rock): **Gordon W. Smethurst**, RR #2, Box 43D, Cabot, Ark. 72023 (phone 501-374-2245).

CALIFORNIA (Apple Valley, Edwards, Fairfield, Fresno, Hawthorne, Hermosa Beach, Long Beach, Los Angeles, Marysville, Merced, Monterey, Novato, Orange County, Palo Alto, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, San Mateo, Santa Barbara, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Dwight M. Ewing**, P. O. Box 737, Merced, Calif. 95340 (phone 209-722-6283).

COLORADO (Aurora, Boulder, Colorado Springs, Denver, Ft. Collins, Grand Junction, Greeley, Littleton, Pueblo, Waterton): **Edward C. Marriotti**, 11934 E. Hawaii Cir., Aurora, Colo. 80012 (phone 303-934-5751).

CONNECTICUT (East Hartford, North Haven, Stratford): **Joseph R. Falcone**, 14 High Ridge Rd., Rockville, Conn. 06066 (phone 203-565-3543).

DELAWARE (Dover, Wilmington): **Hal Hester**, 159 S. Fairfield Dr., Dover, Del. 19901 (phone 302-378-9845).

DISTRICT OF COLUMBIA (Washington, D. C.): **Ricardo R. Alvarado**, 900 17th St., N. W., Washington, D. C. 20006 (phone 202-872-5918).

FLORIDA (Bartow, Broward, Cape Coral, Ft. Walton Beach, Gainesville, Jacksonville, New Port Richey, Orlando, Panama City, Patrick AFB, Redington Beach, Sarasota, Tallahassee, Tampa): **Eugene D. Miniotta**, Box 286A, Route 1, Oviedo, Fla. 32765 (phone 305-420-3868).

GEORGIA (Athens, Atlanta, Rome, Savannah, St. Simons Island, Valdosta, Warner Robins): **William L. Copeland**, 1885 Walthall Dr., NW, Atlanta, Ga. 30318 (phone 404-355-5019).

HAWAII (Honolulu): **James Dowling**, 2222 Kalakaua Ave., Honolulu, Hawaii 96815 (phone 808-923-0492).

IDAHO (Boise, Pocatello, Twin Falls): **Ronald R. Galloway**, Box 45, Boise, Idaho 83707 (phone 208-385-5247).

ILLINOIS (Belleville, Champaign, Chicago, Elmhurst, O'Hare Field, Peoria): **C. W. Scott**, P. O. Box 159, O'Fallon, Ill. 62269 (phone 618-632-7003).

INDIANA (Indianapolis, Logansport, Marion, Mentone): **Donald Thomas**, 215 S. Illinois St., Delphi, Ind. 46923 (phone 317-564-4324).

IOWA (Des Moines): **Ric Jorgensen**, 4005 Kingman, Des Moines, Iowa 50311 (phone 515-255-7656).

KANSAS (Topeka, Wichita): **Cletus J. Pottebaum**, 6503 E. Murdock, Wichita, Kan. 67206 (phone 316-681-5445).

KENTUCKY (Louisville): **Stanley P. McGee**, 5405 Wending Ct., Louisville, Ky. 40207 (phone 502-368-6524).

LOUISIANA (Alexandria, Baton Rouge, Bossier City, Monroe, New Orleans, Shreveport): **Bessie Hazel**, 155 E. Herndon Ave., Shreveport, La. 71101 (phone 318-221-7005).

MAINE (Limestone): **Alban E. Cyr**, P. O. Box 160, Caribou, Me. 04736 (phone 207-492-4171).

MARYLAND (Andrews AFB, Baltimore): **Stanley E. Stepnitz**, 11304 Maryvale Rd., Upper Marlboro, Md. 20870 (phone 301-981-4765).

MASSACHUSETTS (Boston, Falmouth, Florence, Hanscom AFB, Lexington, Taunton, Worcester): **Albert A. Kashdan**, 910 Watertown St., West Newton, Mass. 02165 (phone 617-271-2198).

MICHIGAN (Battle Creek, Detroit, Kalamazoo, Lansing, Marquette, Mount Clemens, Oscoda, Petoskey, Sault Ste. Marie, Southfield): **James N. Holcomb**, 6242 Broadbridge, Marine City, Mich. 48039 (phone 313-466-4154).

MINNESOTA (Duluth, Minneapolis, St. Paul): **David J. Little**, 1888 Princeton Ave., St. Paul, Minn. 55105 (phone 612-699-3600).

MISSISSIPPI (Biloxi, Columbus, Jackson): **Billy A. McLeod**, P. O. Box 1274, Columbus, Miss. 39701 (phone 601-328-0943).

MISSOURI (Kansas City, Knob Noster, Springfield, St. Louis): **Donald K. Kuhn**, 3238 Southern Aire Dr., St. Louis, Mo. 63125 (phone 314-892-0121).

MONTANA (Great Falls): **Jack R. Thibaudeau**, P. O. Box 2247, Great

Falls, Mont. 59403 (phone 406-727-3807).

NEBRASKA (Lincoln, Omaha): **Lyle O. Remde**, 4911 S. 25th St., Omaha, Neb. 68107 (phone 402-731-4747).

NEVADA (Las Vegas, Reno): **William S. Chairsell**, 2204 Westlund Dr., Las Vegas, Nev. 89102 (phone 702-878-6679).

NEW HAMPSHIRE (Manchester, Pease AFB): **William W. McKenna**, RFD #5, Strawberry Hill Rd., Bedford, N. H. 03102 (phone 603-472-5504).

NEW JERSEY (Andover, Allentown, Belleville, Camden, Chatham, Cherry Hill, E. Rutherford, Forked River, Fort Monmouth, Jersey City, McGuire AFB, Newark, Trenton, Wallington, West Orange): **Leonard Schiff**, 246 Franklin Ave., Cliffside Park, N. J. 07010 (phone 201-861-2950).

NEW MEXICO (Alamogordo, Albuquerque, Clovis): **M. J. Loftus**, P. O. Drawer 1946, Clovis, N. M. 88101 (phone 505-769-1905).

NEW YORK (Albany, Bethpage, Binghamton, Buffalo, Catskill, Chautauque, Griffiss AFB, Hartsdale, Ithaca, Long Island, New York City, Niagara Falls, Patchogue, Plattsburgh, Riverdale, Rochester, Staten Island, Syracuse): **Kenneth C. Thayer**, R. D. #1, Ava, N. Y. 13303 (phone 315-827-4241).

NORTH CAROLINA (Charlotte, Fayetteville, Goldsboro, Greensboro, Raleigh): **William M. Bowden**, P. O. Box 1255, Goldsboro, N. C. 27530 (phone 919-735-4716).

NORTH DAKOTA (Grand Forks, Minot): **Ernest J. Collette, Jr.**, Box 345, Grand Forks, N. D. 58201 (phone 701-775-3944).

OHIO (Akron, Cincinnati, Cleveland, Columbus, Dayton, Newark, Toledo, Youngstown): **Edward H. Nett**, 1449 Ambridge Rd., Centerville, Ohio 45459 (phone 513-461-4823).

OKLAHOMA (Altus, Enid, Oklahoma City, Tulsa): **David L. Blankenship**, P. O. Box 51308, Tulsa, Okla. 74151 (phone 918-835-3111, ext. 2207).

OREGON (Corvallis, Eugene, Portland): **Phillip G. Saxton**, 2899 Timberline Dr., Eugene, Ore. 97402 (phone 503-687-9475).

PENNSYLVANIA (Allentown, Beaver Falls, Chester, Dormont,

Erie, Harrisburg, Homestead, Pottsville, King of Prussia, Lewistown, Philadelphia, Pittsburgh, State College, Washington, Willow Grove, York): **Lamar R. Schwartz**, 390 Broad St., Emmaus, Pa. 18049 (phone 215-967-3387).

RHODE ISLAND (Warwick): **Charles H. Collins**, 143d TAG (RIANG), Warwick, R. I. 02886 (phone 401-737-2100).

SOUTH CAROLINA (Charleston, Columbia, Greenville, Myrtle Beach, Sumter): **Edith E. Callham**, P. O. Box 959, Charleston, S. C. 29401 (phone 803-577-4400).

SOUTH DAKOTA (Rapid City): **Ken Guenther**, P. O. Box 9045 Rapid City, S. D. 57701 (phone 605-348-0579).

TENNESSEE (Chattanooga, Knoxville, Memphis, Nashville, Tri-Cities Area, Tullahoma): **Thomas O. Bigger**, Sverdrup/ARO, Inc. AEDC Div., Arnold AFS, Tenn. 37389 (phone 615-455-2611, ext. 243).

TEXAS (Abilene, Austin, Big Spring, Commerce, Corpus Christi, Dallas, Del Rio, Denton, El Paso, Fort Worth, Harlingen, Houston, Kerrville, Laredo, Lubbock, San Angelo, San Antonio, Waco, Wichita Falls): **T. A. Glasgow**, 502 Tammy Dr., San Antonio, Tex. 78216 (phone 512-536-3656).

UTAH (Brigham City, Clearfield, Ogden, Provo, Salt Lake City): **Leigh H. Hunt**, 1107 S. 1900 E Salt Lake City, Utah 84108 (phone 801-582-0935).

VERMONT (Burlington): **James W. McCabe**, RFD, Monroe, N. H. 03771 (phone 603-638-4932).

VIRGINIA (Arlington, Danville, Harrisonburg, Langley AFB, Lynchburg, Norfolk, Petersburg, Richmond, Roanoke): **Jon R. Donnelly**, 8539 Sutherland Rd., Richmond, Va. 23235 (phone 804-649-6424).

WASHINGTON (Port Angeles, Seattle, Spokane, Tacoma): **Marie F. Iafrae**, 10613 Douglas Dr., S.W., Tacoma, Wash. 98499 (phone 206-584-6191).

WEST VIRGINIA (Huntington): **Ralph D. Albertazzi**, 1550 Kanawha Blvd., E., Charleston, W. Va. 25311 (phone 304-345-1776).

WISCONSIN (Madison, Milwaukee): **Charles W. Marotske**, 7941 S. Verdev Dr., Oak Creek, Wis. 53154 (phone 414-762-4383).

WYOMING (Cheyenne): **Norman L. Hanson**, P. O. Box 1244, Cheyenne, Wyo. 82001 (phone 307-634-7779).

AFA News photo gallery



A recent meeting of the Denton, Tex., Chapter featured an address by AFA National Director Vic Kregel. Shown visiting during the social hour are North Texas State University Angel Flight Commander Robyn Rutledge, left, and Texas State AFA Executive Vice President Frank Jones.



AFA's Colorado Springs Chapter recently donated \$250 to the Colorado School for the Deaf and Blind to be used to purchase athletic equipment. In the photo, Chapter President H. A. "Kort" Kortemeyer, right, presents the check to Joe Sisneros, the school's athletic director. The school recently won the Colorado State Class A football championship.



Gerald C. "Gerry" Frewer, a Florida State AFA and Cape Canaveral Chapter officer for many years, was to have received AFA's Exceptional Service Award at the 1977 National Convention. However, a serious illness kept him from accepting his award. Recently, a group of Chapter officers and friends visited Gerry, and Florida State AFA Past President John H. deRussy, right, presented the award.

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**NEW HIGHER
AVIATION DEATH
BENEFITS**

Dependable Protection from Y

Air Force Association

Important Benefits!

COVERAGE YOU CAN KEEP. Provided you apply for coverage under age 60 (see "ELIGIBILITY") your insurance may be retained at the same low group rates to age 75.

FULL TIME, WORLD WIDE PROTECTION. The policy contains no war clause, hazardous duty restriction, combat zone waiting period or geographical limitation.

DISABILITY WAIVER OF PREMIUM. If you become totally disabled at any time prior to age 60 for at least a 9-month period, your coverage will be continued in force without further payment of premiums as long as you remain disabled.

FULL CHOICE OF SETTLEMENT OPTIONS. All standard forms of settlement options, as well as special options agreed to by the insured and United of Omaha, are available to insured members.

CONVENIENT PAYMENT PLANS. Premium payments may be made by monthly government allotment (payable to Air Force Association), or direct to AFA in quarterly, annual or semi-annual installments.

DIVIDEND POLICY. AFA's primary policy is to provide maximum coverage at the lowest possible cost. Consistent with this policy, AFA has provided year end dividends (20% for 1976) to insured members in twelve of the past fifteen years, and has increased the basic amount of coverage on four separate occasions.

Additional Information

Effective Date of Your Coverage. All certificates are dated and take effect on the last day of the month in which your application for coverage is approved, and coverage runs concurrently with AFA membership. AFA Military Group Life Insurance is written in conformity with the insurance regulations of the State of Minnesota. The insurance will be provided under the group insurance policy issued by United of Omaha to the First National Bank of Minnesota as trustees of the Air Force Association Group Insurance Trust.

EXCEPTIONS: There are a few logical exceptions to this coverage. They are: **Group Life Insurance:** Benefits for suicide or death from injuries intentionally self-inflicted while sane or insane will not be effective until your coverage has been in force for 12 months.

The Accidental Death Benefit and Aviation Death Benefit shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity, poisoning or asphyxiation from carbon monoxide, or (4) During any period a member's coverage is being continued under the waiver of premium provision, or (5) From an aviation accident, either military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved, except as provided under AVIATION DEATH BENEFIT.

Eligibility

All active duty personnel of the Armed Forces of the United States and members of the Ready Reserve* and National Guard* (under age 60), Armed Forces Academy cadets*, and college or university ROTC cadets* are eligible to apply for this coverage provided they are now, or become, members of the Air Force Association.

*Because of restrictions on the issuance of group insurance coverage, applications for coverage under the group program cannot be accepted from cadets or Reserve or Guard personnel residing in Florida, New York, Ohio or Texas. Members in these states may request special application forms from AFA for individual policies which provide coverage quite similar to the group program.

Please Retain This Medical Bureau Prenotification For Your Records

Information regarding your insurability will be treated as confidential. United Benefit Life Insurance Company may, however, make a brief report thereon to the Medical Information Bureau, a nonprofit membership organization of life insurance companies, which operates an information exchange on behalf of its members. If you apply to another bureau member company for life or health insurance coverage, or a claim for benefits is submitted to such a company, the Bureau, upon request, will supply such company with the information in its file.

Upon receipt of a request from you, the Bureau will arrange disclosure of any information it may have in your file. (Medical information will be disclosed only to your attending physician.) If you question the accuracy of information in the Bureau's file, you may contact the Bureau and seek a correction in accordance with the procedures set forth in the federal Fair Credit Reporting Act. The address of the Bureau's information office is P.O. Box 105, Essex Station, Boston, Mass. 02112. Phone (617) 426-3660.

United Benefit Life Insurance Company may also release information in its file to other life insurance companies to whom you may apply for life or health insurance, or to whom a claim for benefits may be submitted.

CURRENT BENEFIT TABLES

AFA STANDARD PLAN

PREMIUM: \$10 per month

Insured's Attained Age	Basic Benefit*	Extra	
		Accidental Death Benefit*	Total Benefit
20-24	\$75,000	\$12,500	\$87,500
25-29	70,000	12,500	82,500
30-34	65,000	12,500	77,500
35-39	50,000	12,500	62,500
40-44	35,000	12,500	47,500
45-49	20,000	12,500	32,500
50-54	12,500	12,500	25,000
55-59	10,000	12,500	22,500
60-64	7,500	12,500	20,000
65-69	4,000	12,500	16,500
70-74	2,500	12,500	15,000

Aviation Death Benefit:*
Non-war related \$25,000
War related \$15,000

AFA HIGH OPTION PLAN

PREMIUM: \$15 per month

Insured's Attained Age	Basic Benefit*	Extra	
		Accidental Death Benefit*	Total Benefit
20-24	\$112,500	\$12,500	\$125,000
25-29	105,000	12,500	112,500
30-34	97,500	12,500	110,000
35-39	75,000	12,500	87,500
40-44	52,500	12,500	65,000
45-49	30,000	12,500	42,500
50-54	18,750	12,500	31,250
55-59	15,000	12,500	27,500
60-64	11,250	12,500	23,750
65-69	6,000	12,500	18,500
70-74	3,750	12,500	16,250

Aviation Death Benefit:*
Non-war related \$37,500
War related \$22,500

*The Extra Accidental Death Benefit is payable in the event an accidental death occurs within 13 weeks of the accident, except as noted under **Aviation Death Benefit** (below).

***AVIATION DEATH BENEFIT:** The coverage provided under the Aviation Death Benefit is paid for death which is caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. Under this condition, the Aviation Death Benefit is paid in lieu of all other benefits of this coverage. Furthermore the non-war related benefit will be paid in all cases where the death does not result from war or an act of war, whether declared or undeclared.

OPTIONAL FAMILY COVERAGE

(may be added to either Standard or High Option Plan)

PREMIUM: \$2.50 per month

Insured's Attained Age	Life Insurance Coverage for Spouse	Life Insurance Coverage for each Child*
20-39	\$10,000	\$2,000
40-44	7,500	2,000
45-49	5,000	2,000
50-54	4,000	2,000
55-59	3,000	2,000
60-64	2,500	2,000
65-69	1,500	2,000
70-74	750	2,000

*Between the ages of six months and 21 years, each child is provided \$2,000 coverage. Children under 6 months are provided with \$250 coverage once they are 15 days old and discharged from hospital.

Bob Stevens'

"There I Was..."

OVERSEAS WE HAD:

THE SAD SACK



(GEO. BAKER)

Winnie the Wac*



(VIC HERMAN)

* ~~AND~~ WAFFS, WRENS
AWASS, AWALS, WENLS
etc., etc.

3.2 BEER



(OZZIE ST. GEORGE)

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(OH, THAT LUCKY HARRY JAMES!)



Elsie

(ALA PETTY)



SLOGANS:

"REMEMBER PEARL HARBOR!"
"A-SLIP-OF-THE-LIP-CAN-SINK-A-SHIP!"
"BUNDLES FOR BRITAIN"
"When the lights go on again all over the world"

WHILE BACK HOME SOME OF THE 4FERS WORE "ZOOT SUITS" and OGLED OUR WOMEN...



(P.S. ALL POSTER PILOTS LOOKED LIKE TYRONE POWER)



"WINNIE"

ANDREWS SISTERS HAIRDO



7-FT KEY CHAIN

TO BE CONT.

Bob Stevens



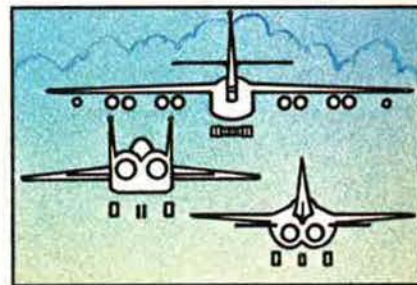
If the Red Baron had a Westinghouse Tail Warning Set, he might still be flying today.

Air combat has changed dramatically since the days of the Red Baron and the first aerial duels. In those early contests, Tail Warning was simply a glance over the shoulder. Today, threats come too quickly to rely on visual contact, and survival is a matter of split-second timing.

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Protect your aircraft with the AN/ALQ-153 Tail Warning Set.



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McDonnell Douglas is developing an integral rocket ramjet-powered ASALM for the USAF that can keep the B-52 fighting for years to come.

McDonnell Douglas in rockets and ramjets? Yes. We were flying ramjets on rocket-launched Talos missiles in 1951. We never stopped our research in the field. Today we've joined booster rocket to ramjet engine in a most ingenious manner.

McDonnell Douglas in missiles? Yes. We've built more than 100,000 guided missiles for America's armed forces.

McDonnell Douglas in missile integration? Yes, from the tiny Dragon man-carried missile to the satellite-boosting Delta; from the Harpoon which flies from ships, planes and subs to new designs for advanced strategic and tactical missiles.

Mission experience? Yes. Air-to-surface—Harpoon, Skybolt, Gargoyle, Roc, Kingfisher. Surface-to-surface—Honest John, Dragon, Harpoon, Thor. Surface-to-air—

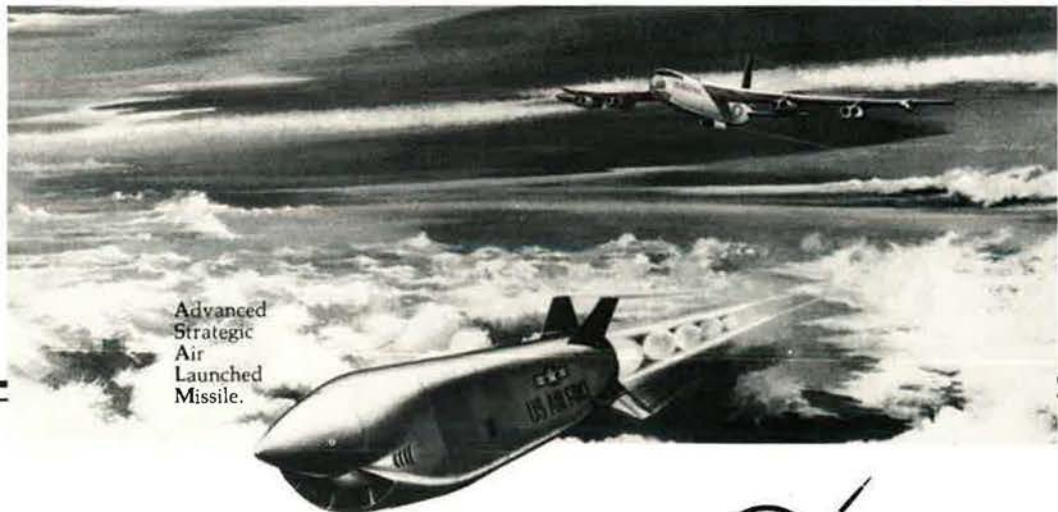
Nike Series, Zeus, Spartan, Talos, Typhon. Air-to-air—Genie, Sparrow, Bird Dog. Decoy—Quail. Undersea-to-surface-to-air—Harpoon.

Aircraft integration? Yes. We've been marrying missiles to airplanes since before there were jets.

Supersonic/hypersonic airframe experience? More than anyone! Lifting body programs—Alpha Draco, BGRV, ASSET. Space—Mercury, Gemini, S-IVB and Shuttle propulsion modules. Aircraft—thousands of F-4 and F-15 fighters.

Missile guidance experience? Yes, as guidance contractor for the nation's cruise missiles, whether fired from land, sea or air.

McDonnell Douglas in ASALM? Yes! We've been at it since the USAF asked, "Is it possible?"



Advanced
Strategic
Air
Launched
Missile.

MCDONNELL DOUGLAS

