JANUARY 1980/$1

AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

The C-141B: Larger Loads, Longer Legs

Air Force Power

TF34-POWERED A-10 CLOSE AIR SUPPORT AIRCRAFT

CF6-50-POWERED KC-10A ADVANCED TANKER/CARGO AIRCRAFT

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"Vive la République," shouted Coutelle from aloft. As one revolution was saved, another was being born.

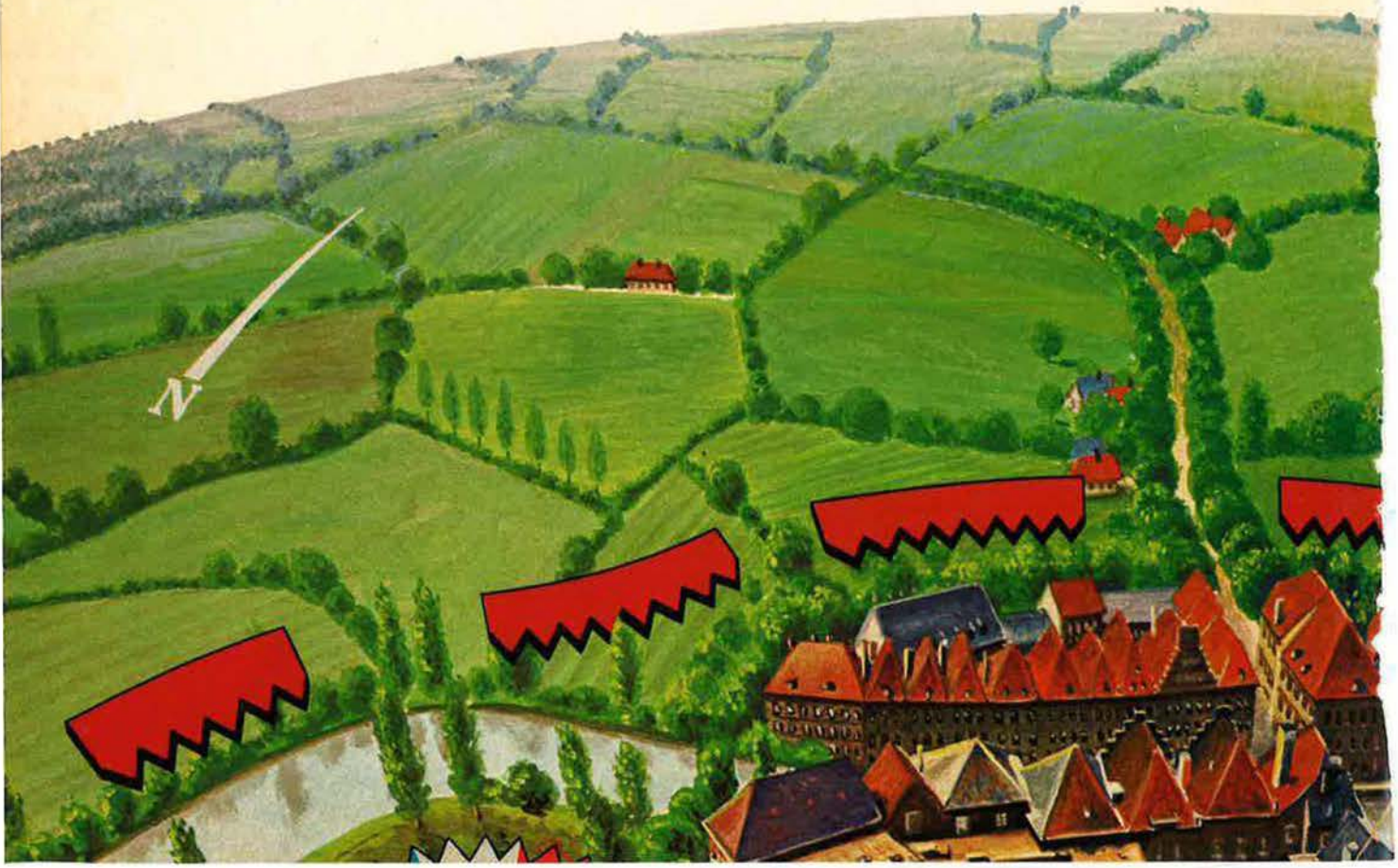
By holding Maubeuge, the French turned back a threat to their Revolution. Meanwhile a revolution in warfare began taking shape as Jean Marie-Joseph Coutelle's pioneering aerial reconnaissance mission opened up a whole new dimension in intelligence gathering. As it happened, this mission served only to boost French morale in the embattled town. The intelligence didn't reach battlefield headquarters where it was needed.

Just weeks later, however, the same balloon played a more direct tactical role. At the battle of Fleurus, the French adjutant general went up with Coutelle, observed Austrian movements, and dropped frequent dispatches. According to some who were present, these influenced the French general's tactical decisions—which produced a victory that led to French occupation of the Low Countries and the capture of Brussels.

These flights were the beginning of airborne command, control and communications. C^3 has come a long way since then. Today's Air Force E-3A Sentry aircraft, for example, carry sophisticated radar that can peer deep into hostile territory. And the on-board IBM data processor quickly translates these

1. May 1794. Reacting to French Revolution, pro-monarchy Allied forces, chiefly Austrians (shown as red bars), have pushed from Low Countries to Sambre River in campaign to capture Paris and crush new government. French government reinforces and consolidates its army (tricolor bars), succeeds in stopping Allied drive.

2. Newly formed French military balloon company, the world's first air corps, enters blockaded but still French-held Maubeuge despite bombardment by Allied force.



many inputs into information that is immediately useful to tactical commanders. Strategic commanders have similar advantages. In one program, SAC bases and missile sites are being linked to command posts by IBM terminals that embody state-of-the-art technology.

To meet the Navy's needs, IBM is providing processors and software for multiple communications systems for submarines.

All of these systems are components of the Worldwide Military Command and Control System (WWMCCS)—for which IBM developed the architecture. Each one posed unique problems. In areas such as integration, information handling, security, reliability. Problems IBM understands and has proven able to solve.

Complex projects like these benefit from IBM's special skill: our ability to marshal many specialized systems to a common purpose. We've applied this skill in avionics, antisubmarine warfare systems, sonar systems, and space systems.

In fact, the greater the challenge of new complex systems, the more IBM can help. IBM Federal Systems Division, Bethesda, MD 20034.

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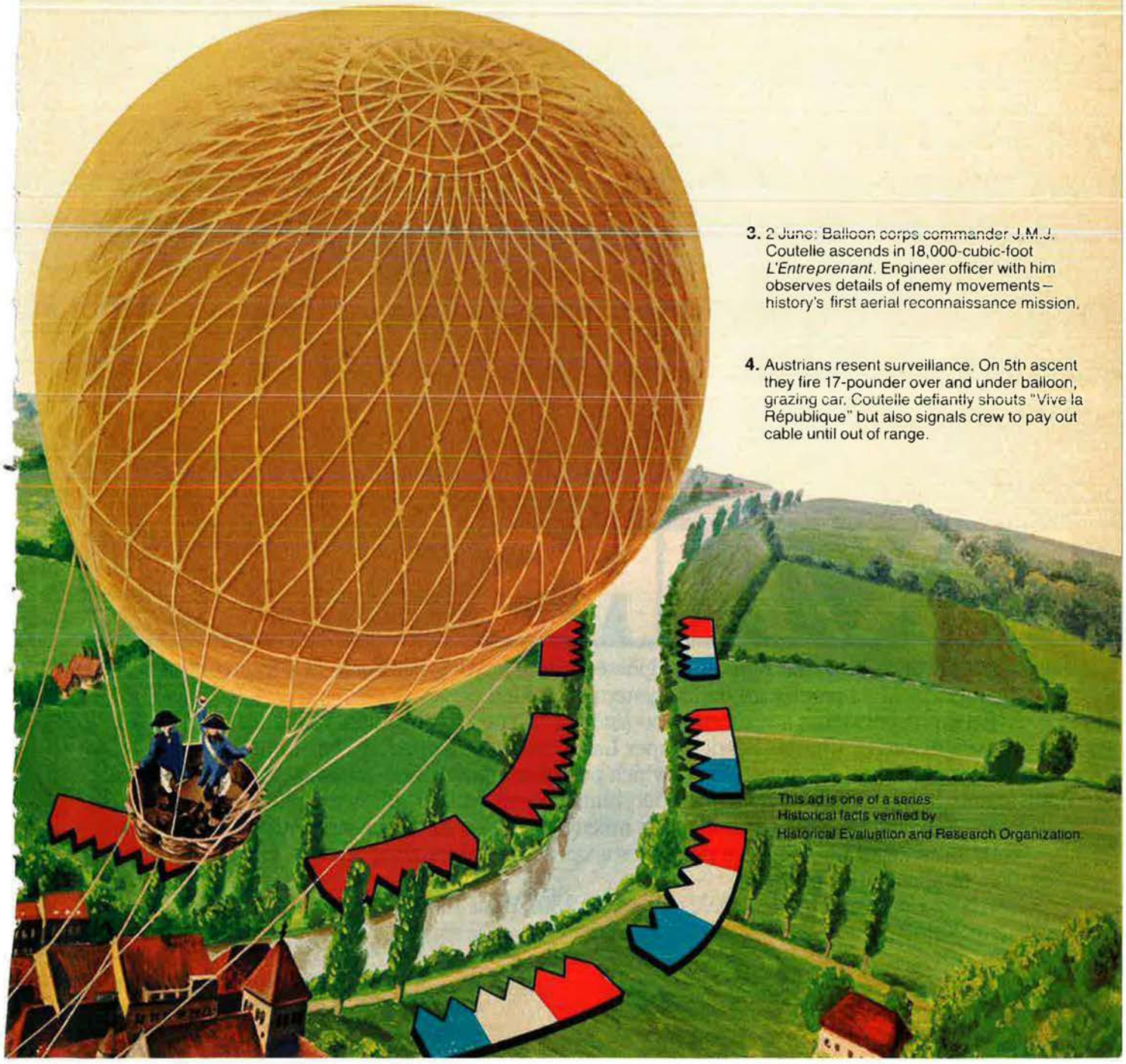
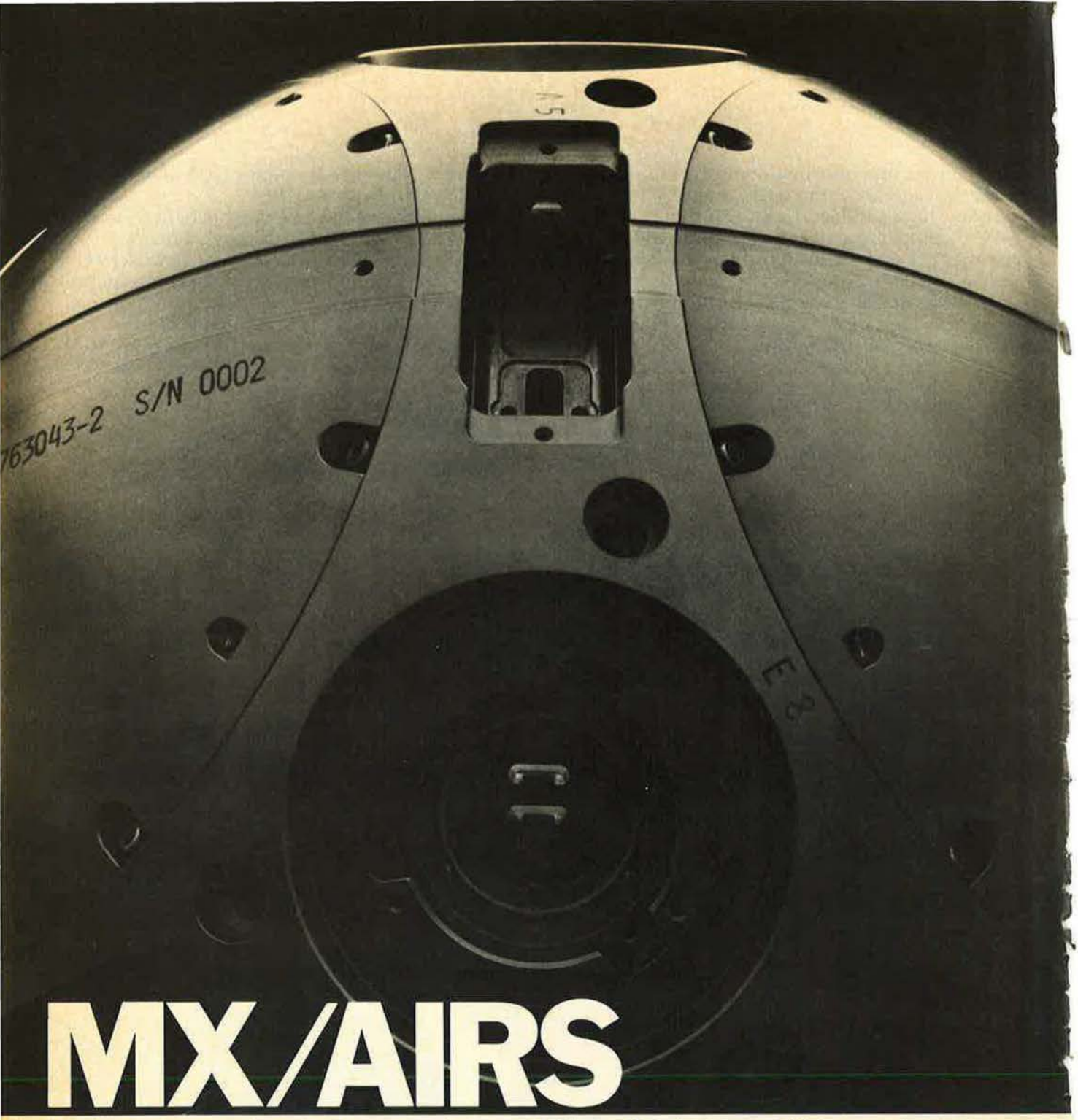


3. 2 June: Balloon corps commander J.M.J. Coutelle ascends in 18,000-cubic-foot *L'Entreprenant*. Engineer officer with him observes details of enemy movements—history's first aerial reconnaissance mission.

4. Austrians resent surveillance. On 5th ascent they fire 17-pounder over and under balloon, grazing car. Coutelle defiantly shouts "Vive la République" but also signals crew to pay out cable until out of range.

This ad is one of a series
Historical facts verified by
Historical Evaluation and Research Organization



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AIR FORCE MAGAZINE
PUBLISHED BY THE AIR FORCE ASSOCIATION

JANUARY 1980
VOLUME 63, NUMBER 1

This Month

ABOUT THE COVER

Lockheed-Georgia Co. has begun delivery of the stretched C-141B Star-Lifter to Military Airlift Command, thereby significantly increasing airlift capability. The C-141B, a longer version of the C-141A, also received an aerial refueling system that will lessen dependence on foreign support bases and increase its operational flexibility.

Departments

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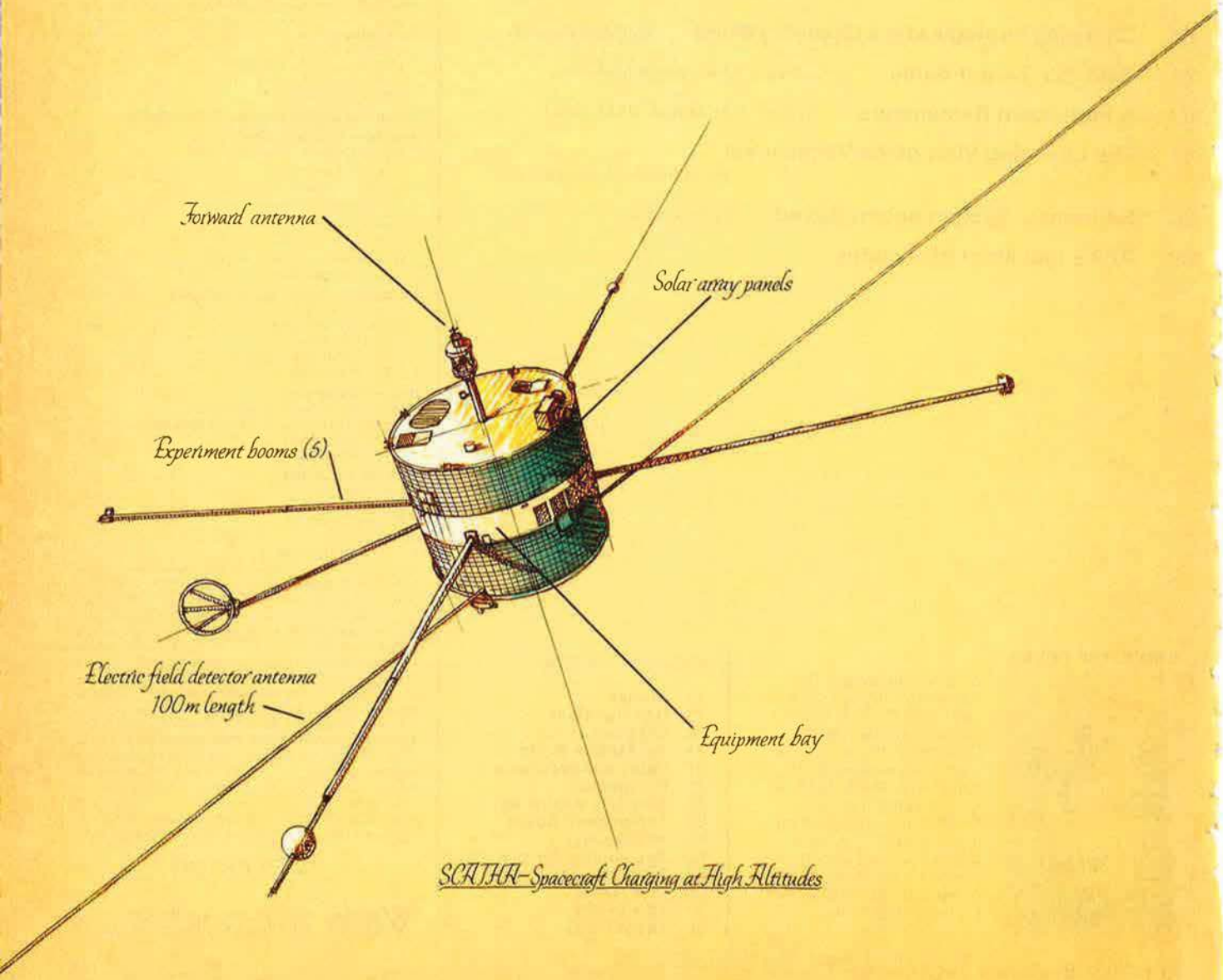
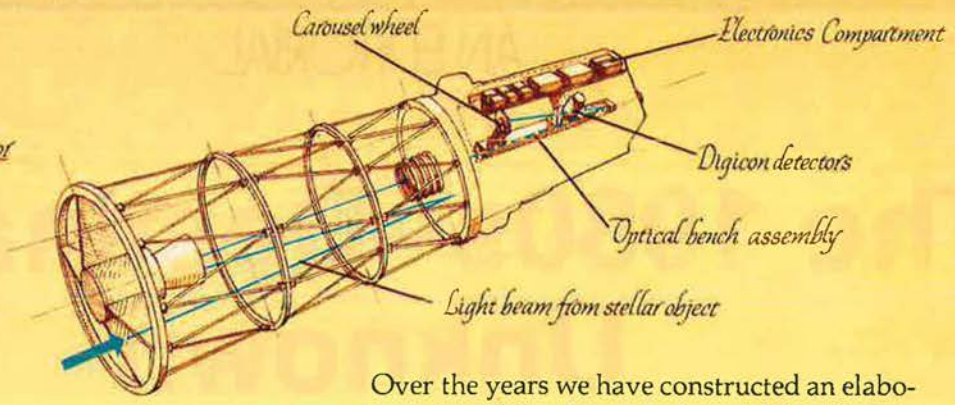
What is required for future space exploration?

Successful experience.



SCATHA–Spacecraft Charging at High Altitudes



Space Telescope
Faint Object Spectrograph Sensor

Satellites in orbit, men in space, scientific laboratories on Mars, voyages to Venus, Jupiter and Saturn: in three decades man's exploration of space rivals the 16th century's exploration of Earth.

From the outset, Martin Marietta has played a growing part in the development of this new frontier. Beginning with our first launch of the Vanguard in 1958, our role continues today in spacecraft, their instruments and experiments.

Millions of miles in space our experiments are taking the measure of Mars, examining and analyzing the atmosphere, cloud structure and radio emissions of Jupiter, and studying the variation of the sun's energy on the environment of Venus.

Closer to Earth, another instrument, an integral part of Space Telescope, is designed to provide unprecedented spectral data on stars, galaxies and quasars 50 to 100 times fainter than observable from ground telescopes.

One of our satellites, SCATHA, built for the Air Force, carries 12 experiments to explore the little understood phenomenon of destructive electrical charge buildup on orbiting spacecraft.

A concept under development for use by future Space Shuttle crews is a small remotely controlled spacecraft to deploy, retrieve, survey and even repair other spacecraft.

An important advance in navigation is our autonomous space sextant. Using the moon and stars for reference, it establishes the satellite position almost instantaneously, allowing the craft to operate independently of signals from Earth.

Over the years we have constructed an elaborate variety of simulators and special chambers to help in the conquest of space. Prior to flight, single instruments and complete craft face the rigors of vibration, noise, heat, cold, radiation and vacuum to be encountered in space.

With our knowledge, advanced technologies, facilities and success, we are prepared to assist in developing the new systems our country needs for exploration of space during the next decade and beyond.

MARTIN MARIETTA

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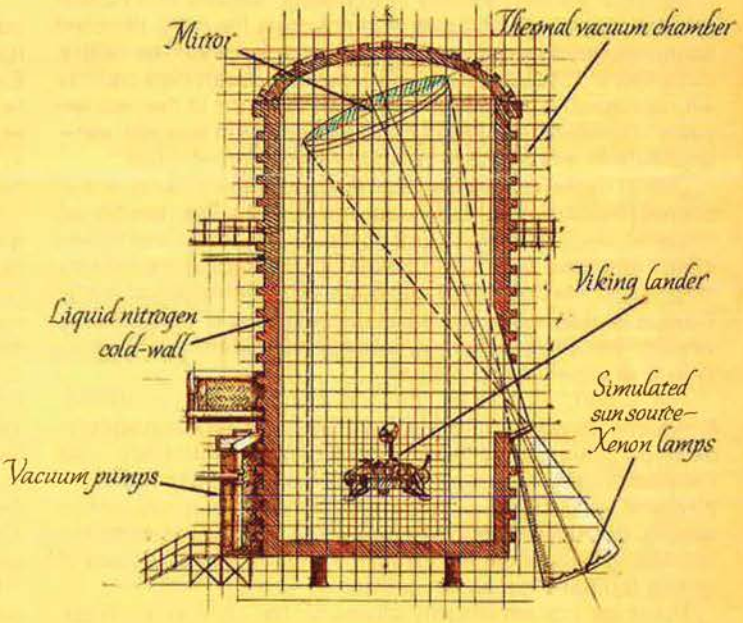
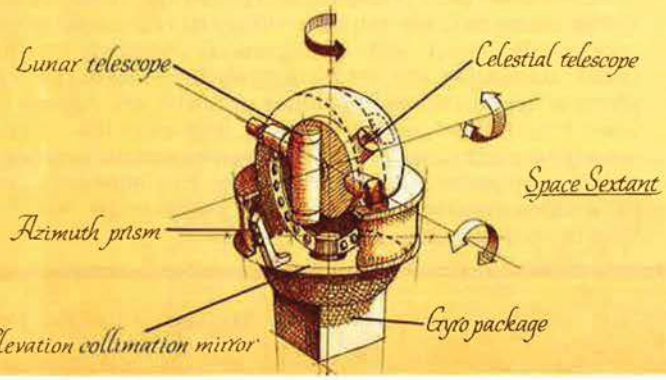


Space & Solar Simulation



Space Sextant

AN EDITORIAL

The 1980s—Destination Unknown

LAST month we observed that the 1980s will lead to an unknown destination along a path that can be seen only dimly at best. There are, nevertheless, a few landmarks that loom through the fog. Forecasting what they portend is quite another matter.

The frailty of human foresight is illustrated in a year-long study of the oil situation completed by a Cabinet-level task force just ten years ago. Those experts judged that oil would stay at about $2.50 a barrel, the oil-producing countries would lack the know-how to form a workable cartel, supplies would be adequate to meet world demand, and the US would have no energy problem until at least 1980.

So much for the fallibility of forecasts. Society and human motivations are so complex that not even the most honored economist, sociologist, political scientist, or other "-ist" with a company of computers and a regiment of researchers can say with surety what lies ahead next year, let alone in the next ten years. Therefore, we intend to do no more than suggest some possibilities without attempting to assign probabilities.

One of the few things that can be said with certainty is that Leonid Brezhnev will not live out this decade. The new Soviet leadership will come from among those who administer Soviet affairs and have been instrumental in developing the military engine that has driven Russian adventurism on a global scale. There is no reason to believe that the objectives of the past sixty years or the newly won means of attaining them will change. Who is to argue with success?

The USSR, of course, has its own internal problems. Economic growth has slowed. Brezhnev's $500 billion agricultural programs have fallen short of self-sufficiency. The peoples of Eastern Europe are scarcely a happy band of fellow travelers, and there is some evidence of incipient unrest among the USSR's minorities, to say nothing of endemic grumbling throughout the Kremlin's empire over shortages of quality food and consumer goods.

These are not necessarily pluses for the US and the West. Among absolutist governments, the time-honored antidote for internal problems is to focus on real or concocted external threats—or point to foreign-policy triumphs, of which the USSR has had more than a few in the last five years.

Now there is another tempting plum hanging just outside the Kremlin's window. As we have pointed out before, the USSR will soon become an importer of oil (by 1982, according to a recent CIA report), but without hard currency for *buying* foreign oil. The CIA also estimates that OPEC countries will have no excess oil capacity after about 1983, and sometime in the '80s will not be able to meet world demand at any price. The competition for a dwindling oil supply is likely to become explosive.

If present military spending trends in the USSR and the US continue, the Soviet Union, which already has a geographical advantage over the US in relation to the Mideast, will also have a credible capability to intervene in that area. With the guns and the will to use them, the USSR could end up deciding who gets a share of Mideast oil, how large the share, and how high the price—not necessarily in dollars, pounds, or francs. Thus might the Kremlin realize a quarter-century-old goal of destroying NATO if we—and our NATO allies as well—allow the military balance to continue tilting against us.

This is only one, though the most serious, in a panoply of potential threats confronting the US in the 1980s. The dissolution of NATO followed by Soviet domination of Western Europe, and coupled to their control of the Middle East, would be a disaster of unparalleled proportion. Hardly less serious would be a change in China's leadership, likely to take place in the '80s, that could result in renewed friendly relations with the USSR.

Potential developments of lesser but still serious consequences lie at every point of the compass: a North Korean invasion of the Republic of Korea, a Chinese attack on Taiwan, unchecked Communist subversion in Latin America and Africa, unbridled spread throughout the Moslem world of Khomeini's "holy war" against the United States.

Most of these threats are not new, but we think a new trend in the world balance is discernible. After two decades of movement toward a multipolar world, there seems to be a slow drift back toward a sort of bipolarism as the superpower balance shifts in favor of the USSR. This time, however, the lineup on the Soviet side may well be longer than on our side. Worse yet, it could include most of the suppliers of raw materials that keep the wheels of our economy turning.

Nevertheless, we are optimistic that the decline of US influence can be reversed. In looking at worst-case scenarios, we sometimes have forgotten what the US has going for it: a still unequaled base of science and technology; plant capacity that allows us to turn out both military and consumer goods concurrently, hence with an expansion capability that the USSR lacks; allies who, in the aggregate, possess massive physical and economic resources and who will support us when it is in their interest to do so; and an ability, unique among the major powers, to feed ourselves and still produce a gigantic exportable surplus of foodstuffs. This latter is a potential weapon that Americans have been loath to use, but may have to consider in the future.

During our recovery from the Vietnam syndrome, some elementary lessons in international relations have been driven home to the American people. One is that the veneer of civilization is tissue-thin in much of the world. Large segments of the world community do not respond to Western moral imperatives, and every country—save in rare instances—tailors its objectives to its own interests. This should inject into US policies a note of realism that has been lacking of late.

Whoever is elected President this year—and, remember, he may be in office for eighty percent of the decade—can hardly avoid responding to general dissatisfaction with the dilatory way our foreign and defense policies have been conducted. Events of the past few months have showed that the majority of Americans, young and old, do care about national honor, national prestige, and national interests. Painful and humiliating though it is, the Iranian situation and its reflection in other parts of the Moslem world have glued this country together in a way unmatched since World War II. And none too soon. The machinery of government has been getting progressively more unwieldy and splintered by special interest groups.

In any event, all but a few extremists have, for now at least, accepted the fact that only strength (in the final analysis military strength) will restore an acceptable position of security and leadership. But make no mistake about it, there can be no return to the easier days of the '50s and '60s, when US economic and military stature were unchallenged.

Rebuilding US military strength is going to call for very difficult choices. Inevitably inflation will continue as oil prices go up. Given our late start, alternative sources of energy can't fill the gap between the demand for oil and domestic production during the decade. Essential, and probably growing, social expenditures will compete with the requirements of national security. Americans can no longer count on a constantly rising standard of living, if they are indeed determined that this nation is to remain alive and well.

The years of greatest peril lie between 1982 and 1986. In those years, US ICBMs will be highly vulnerable to a Soviet first strike and the oil crunch probably will have locked down with a vengeance, but the modernization of US strategic forces will not have begun to pay off. Our military capabilities will still be great, though likely not equal to those of the USSR. We will have to bridge the gap between US and Soviet strategic power with something that lately has been lacking—a credible national will to defend US interests, even at high cost. We had better hope that the Iranian glue mentioned earlier holds firm long after the glue pot is empty.

It does little good, except as a reminder of the costs of indecision and misplaced confidence, to mourn what might have been. There is, nevertheless, a lesson in a recent speech by former Air Force Secretary Thomas Reed, who recalled that if FY '77 programs had been carried out, ALCM and SLCM would go operational this month, two wings of B-1s would have been in the inventory by 1982, and MX could have reached initial operational capability in 1982 or 1983.

Under present projections, the Air Force, to take an example, will have no new major weapon systems coming into the inventory during the 1980s, other than the cruise missile and MX, the latter with an IOC of 1986. For that, there is enough blame to go around. The Air Force itself must accept most of the responsibility for a glacially slow process of reaching consensus on the systems it needs and what their operational capabilities ought to be. There also has been a tendency to wait for technological advances that lie just over the horizon. To these impediments we might add the throttling effects of micromanagement on the Hill, in the White House, and in the Office of the Secretary of Defense, plus the vitiating impact of interservice horse-trading, logrolling, and cutthroat competition. The military, no less than the general public, must forswear special interests in deference to the national interest.

There will, of course, be improvement in Air Force combat capabilities—and those of the other services—during the decade as current modernization programs move along and as new munitions, sensors, ECM/ECCM, and space-based support systems come on line. But we can't count on subsystems to match the steady flow of new fighters, bombers, and missiles from Soviet production lines.

There are, it seems to us, two less-apparent dangers that can be countered best at the grass roots, where AFA members can be particularly effective. One is the possibility that frustration with foot-dragging allies and unresponsive recipients of past US support could turn the country toward isolationism. The other is the tendency of an impatient, technically oriented, and generally optimistic people to look for quick fixes and to lose sight of long-term perils and goals whenever Moscow smiles.

The Soviet challenge will not abate. The decade of the '80s may decide its outcome. To quote from AFA's Statement of Policy for 1979–80: ". . . restoring self-confidence and unity of purpose must be America's highest priority. . . . The nation must be willing to pay the price for the military capabilities needed to support its global and national security objectives . . . and [to] resume its role as the responsible and resolute leader of the free world."

—JOHN L. FRISBEE, EDITOR

Airmail

Mackay Trophy Winners

I see by the Lockheed ad in your November issue that the 436th MAW is the first wing to win two Mackay Trophies in a row. Not so. I know you're not responsible for advertising copy, but I was hoping you could pass along to the Lockheed people the straight word, since they didn't include an address.

The 43d Bomb Wing, SAC, did it in 1961 and 1962, flying the B-58 Hustler to seven world speed and payload records and also winning the Thompson, Bendix, and Blériot Trophies in the period from January 12, 1961, to March 5, 1962. The 1961 Mackay Trophy was awarded for the nonstop flight from Carswell AFB, Tex., to Paris via Washington and New York in five hours, forty-five minutes on May 26, 1961. The 1962 Mackay was for a nonstop Los Angeles to New York and return flight. Eastbound average speed was 1,214.65 mph, and westbound the B-58 beat the sun, while averaging 1,081.80 mph. This flight occurred on March 5, 1962, and was also the flight that won the Bendix Trophy.

Thank you for helping me get this information to Lockheed, a fine company, but unfortunately not the builder of an outstanding bomber, the ahead-of-its-time B-58.

James F. Nash
Sunnyvale, Calif.

• *Mr. Nash is correct, but we feel that Lockheed wins on a technicality. The 1961 and 1962 Mackay Trophies were not awarded to the 43d Bomb Wing, but rather to the B-58 crews: Lt. Col. W. R. Payne, Maj. W. L. Polhemus, and Maj. R. R. Wagener in 1961, and Maj. R. G. Sowers, Capt. Robert McDonald, and Capt. J. T. Walton in 1962. Careful reading of the magazine—and of the ads—by knowledgeable people like Mr. Nash keeps us all on our toes. We appreciate it.—THE EDITORS*

MRW Red Tape

Your policy paper, "Defense Manpower Issues," adopted at AFA's Annual National Convention and reported in the November issue of AIR FORCE Magazine, is comprehensive and deserves serious consideration and support. I would like to add a personal observation about one of the specific benefits mentioned—morale, recreation, and welfare (MRW) activities.

Although the AFA paper calls for increased government support for these important activities, my experience with an Air Force aero club at a Southern US base indicates that we are perhaps our own worst enemies. The aero club and other MRW activities paid a proportionate share of the expenses of running the MRW division administrative staff. While many of the services provided by the division were worthwhile, the cost was staggering. Nearly $5 per flying hour went to cover monthly billing and a proportionate share of the base MRW overhead.

The high administrative cost eliminated much of the benefit associated with the aero club in comparison with rental rates at local airports. As a result many young airmen and junior officers were unable to participate. A familiar spiral of decreased membership and flying activity, increased overhead cost per hour of flying, further decrease in membership, etc., was established.

During my two years as a member of the board of governors of that aero club, we sought to reduce these costs. Although MRW officials tried, the bottom line always seemed to be that costs were high because of the myriad directives that had to be complied with. Many of these directives can be traced to the club scandals of Southeast Asia. The cost of compliance by small recreation activities can be devastating.

I believe American taxpayers agree that Air Force support of MRW activities by providing unused buildings and hangar space is appropriate. On the other hand, burdensome administrative procedures, which unnecessarily add to the cost of MRW activities for service members, should be eliminated before we seek more dollars from other sources.

Maj. Michael R. Gallagher, USAF
McGuire AFB, N. J.

C-130 Exodus from Iran

In Bonner Day's article "Exodus from Iran" in the June 1979 issue, why didn't you give any credit to the MAC C-130Es that actively participated in the evacuation? On page 75, you quoted the C-141 and C-5 airlift statistics, but no C-130 data. Your magazine is supposed to inform AFA members about the activities of other organizations through stories such as this.

I hope you didn't forget about the "Air Force *team*." Well, C-130s are part of the MAC team. I was in the 40th Tactical Airlift Squadron (C-130s), of the 317th TAW, Pope AFB, N. C., on rotation to RAF Mildenhall, UK, when we were ordered to send several C-130s to fly evacuation shuttles between Tehran and Athens. For proof, just look at your article's first page (p. 72) photograph. It's a C-130!

Robert "Pete" Hayden
Euless, Tex.

The Voice of Angels

Please accept my congratulations and thanks for the excellent article regarding the Arnold Air Society and Angel Flight contained in the October 1979 issue.

The excellence of your reporting on defense doctrine and hardware seems to be widely recognized and unquestionably form an important part of my growth of knowledge in these matters. However, your "people" reporting in this instance was especially rewarding.

The article on Angel Flight was the first time I have had Angel Flight placed in such clear perspective and I am a former member. I strongly support your observations that (1) Angel Flight is a college organization of young civilian leaders; (2) that some Angels join the Air Force as a result of experience as an Angel; and (3) most Angels will continue their interest in the Air Force if a way can be found to keep them informed and involved. I respectively follow your observations with one of my own: Angels have proven that they are joiners.

It has taken a long time for someone to recognize the postgraduate void, and it is my hope that the Air Force Association accepts the challenge of reemploying former Angels for the benefit of the AFA and the Air Force.

1st Lt. Barbara Hunter Shippy, USAF
Reese AFB, Tex.

Air Defense to the Air Force

In today's military, we are having a difficult time recruiting people for our missions. The Air Force is maintaining most of its recruiting goals, how-

ever. But even though our main mission is control of the air, we leave ground-to-air defense up to the Army.

The Army is finding it hard to fill its combat arms role. They have increased the bonus for these slots to try to recruit more men. It is even coming to the point where women might fill these roles. Instead, money could be saved in the future by giving air defense totally to the Air Force. For the slots left open by men training into air defense, the Air Force could recruit more women to fill them.

This would allow the Army to fill critically undermanned combat roles, such as armor, infantry, and the artillery. If something is not done soon, we will be left with support troops with nothing to support.

A1C Ronald R. Landers, USAF
Lowry AFB, Colo.

Luftwaffe B-17 Pilot

In your March 1, 1979, "Airmail" (p.15), you published a letter from Mr. Petersen, Denmark, titled "B-17 Down in Denmark." There is mentioned that the name of the German test pilot who flew this plane to the German Test Center at Rechlin was "Lerche."

A copy of this magazine was sent to me by an American friend. Maybe you are interested to hear that I was the one who flew back this plane.

I have evaluated the foreign fighters and bombers in Rechlin. In 1976, I was elected honorary fellow by the Society of Experimental Test Pilots. The translation of my book, *Testpilot auf Beuteflugzeugen* (Test Pilot on Captured Aircraft) is said to be available in English by the end of the next year.

Hans-Werner Lerche
Munich, West Germany

Return to Clark

On last August 31, I had the opportunity to return to Clark Air Base in the Philippines to visit the home of the Thirteenth Air Force. I would like to inform any interested former airmen who might have served there following World War II that several changes have occurred.

First, this is a modern permanent installation that servicemen can be proud of. Gone are those temporary enlisted men's quarters (*sawales*) so many of those who were stationed there can remember. In their place can be found modern three-story concrete dormitories. Instead of one Quonset building for a theater, there are now three theaters. In addition, there is a well-equipped gymnasium and bowling center. Also, the old Silver Wing recreation center has been greatly expanded.

Second, the grounds of Clark are beautifully landscaped and cared for. This has happened despite the growth of the base. The asphalt highways and streets have replaced the dust and potholes of yesteryear.

Although the base is now modern, it still retains with dignity evidences of the past. The parade ground along with the white headquarters buildings still remains peacefully in the shadows of the mountains in the west.

Thirty-three years ago in the February issue of AIR FORCE Magazine, I was critical of the conditions at Clark Field. I can now happily report that all of this has changed!

Harry Stokes
Rolling Meadows, Ill.

Wrecked P-47 in New Guinea

I thought you would be interested to know that a party of British explorers in New Guinea has just located the well-preserved wreck of a P-47D lost on April 29, 1944.

They have asked if via your "Airmail" column it might be possible to trace this aircraft's assigned pilot, who was not flying the machine when it vanished. They have recovered parts of the plane and taken pictures they would like him to have. The pilot's name was J. W. Harris, who, I assume, must have been with one of the fighter groups in Kenney's Fifth Air Force.

On the day it crashed, the Thunderbolt was being flown on test from Nadzab by 1st Lt. Marion C. Lutes of the 312th Bomb Group.

The people who found the wreck—they were guided to it by a local tribesman—said that it was relatively undamaged. There was no sign of the pilot, and it was thought he probably escaped the crash but failed to make it back to civilization through the dense mountain rain forests.

The aircraft's serial number was AC 42-22687 and the names of the service crew—TSgt. W. E. White and Corporal Screws—were clearly visible on the bodywork, as were four Japanese "kills" stenciled under the cockpit.

The mountainside where it was found rises to 11,000 feet, and the plane was at 8,200. The airspeed indicator showed 250 knots. Opinion was that the pilot, who had said he was going out toward Faita to test the guns, ran into treacherous weather among the peaks and was trying to pull up and out when he hit.

If any readers know anything about Pilot J. W. Harris, if he survived the war, and if he is still alive anywhere, I would be very pleased to hear from them with the possibility of sending some pictures of his ship plus one or two cockpit souvenirs.

Jeff Edwards
Evening News
Carmelite House
London EC4Y 0JA, England

18th TFS Unit History

I am the Unit Historian for the 18th Tactical Fighter Squadron and am trying to compile and write a comprehensive history of the 18th. I would like to request aid in this endeavor.

I am aware of the large circulation of AIR FORCE Magazine and have noticed the section concerning unit reunions and other personal/unit affairs and would like to try that route in obtaining photographs, articles, and other memorabilia of the 18th.

I would like to retain the items sent to the 18th and include them in the history, but, if that is not possible, will copy them and return the item to the sender.

Any aid would be greatly appreciated.

Capt. Marvin D. Cox, USAF
Unit Historian
18th TFS (AAC)
Elmendorf AFB, Alaska 99506

POMO Patches

I am very interested in obtaining present and past POMO organizational patches. I have only been collecting a short period of time so any contributions would be greatly appreciated.

With the Air Force having so many changes in uniform and organization, I hope to preserve for others to see a part of how the Air Force organizations show individuality.

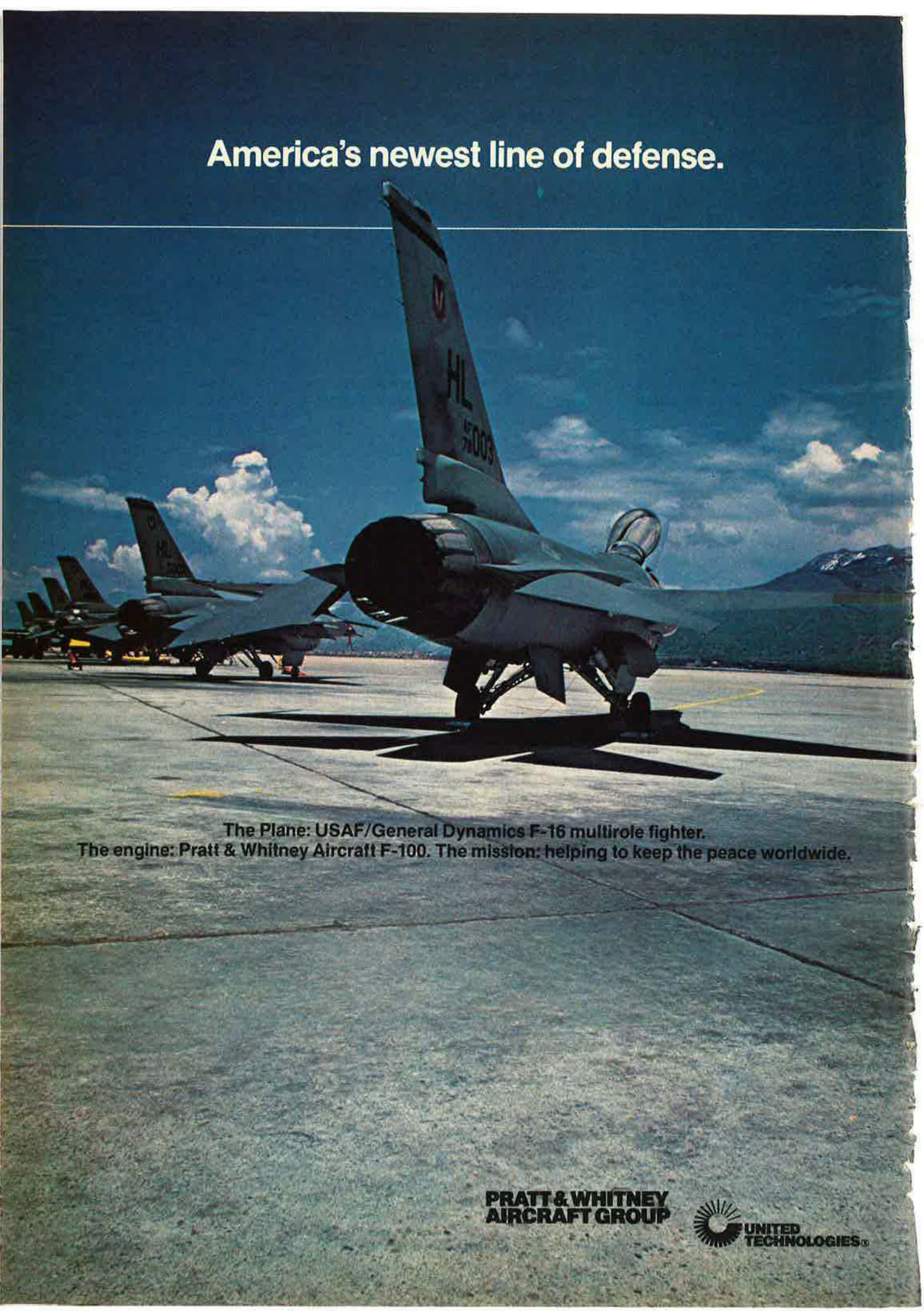
TSgt. James C. Hironimus, USAF
707 E. 91st St.
Tacoma, Wash. 98445

512th TFS History Update

The 512th Tactical Fighter Squadron, Ramstein Air Base, Germany, is currently updating its unit history. To date, we have been successful in contacting many of the original squadron members, and we have been able to obtain copies of the WW II unit history. We are still very interested in any pictures of the unit, the personnel, or the aircraft flown.

We have not been able to contact any of the personnel assigned to the squadron during the 1950s. During this period, the squadron was based at Manston and Bentwaters, England; Camp New Amsterdam, the Nether-

America's newest line of defense.



The Plane: USAF/General Dynamics F-16 multirole fighter.
The engine: Pratt & Whitney Aircraft F-100. The mission: helping to keep the peace worldwide.

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lands; and finally Sembach, Germany, before it was once again deactivated. Anyone who can provide historical data, photographs, or even war stories is asked to contact:

Maj. Kenneth F. Schanke, USAF
Executive Officer
PSC Box 189
APO New York 09009

528th History

We are currently compiling a history of the 528th Bombardment Squadron, 380th Bombardment Wing, and would greatly appreciate any information—anecdotes, pictures, or memorabilia—from previous members of the squadron.

Capt. William R. Craig, USAF
Squadron Historian
528th Bombardment Squadron
Plattsburgh AFB, N. Y. 12903

Eighth AF Bibliography

The Eighth Air Force Memorial Museum Foundation has commissioned Kenneth P. Werrell, Associate Professor of History, Radford University, for the production of a bibliography of the US Eighth Air Force. The Air Force Historical Foundation will oversee and publish the project. Dr. Robin Higham, Kansas State University, will act as project officer for this bibliography.

The bibliography, "A Guide to the History of the Eighth Air Force," will have two parts. The first will be a bibliographic essay. . . . The second will be a bibliographic listing. In addition to articles and books, manuscript sources will be covered by this project.

The project plans to list Eighth Air Force unit histories, addresses of Eighth Air Force unit historical associations, works in progress on the Eighth or its operations, and museums and displays related to the Eighth.

K. Werrell
Dept. of History
Radford University
Radford, Va. 24142

WW II Nose Art

I am presently writing an article on World War II nose art and would like to hear from anyone who has information. I'm especially interested in those who selected it, those who drew it, and those who fought to preserve it from censorship.

However, any details—anecdotes, memories, or opinions—would be greatly appreciated. Please feel free to write as little or as much as you want; any material used will be properly attributed. I'd also like to see any preliminary sketches of nose art or personal photos. Safe return is guaranteed.

L. B. Chollet
138 W. Englewood Ave., Apt. 5B
Teaneck, N. J. 07666

Vietnam Air War

I am an Air Force JROTC cadet of the NY-773 program and am interested in the air war over Vietnam.

Since I am doing a report on that topic, I would like to have eyewitness accounts from actual pilots and flight crews during missions such as: fighter combat, interdiction, rescue of downed aircrews, B-52 missions, and close support. Also, if you can, write and tell me how present-day military aircraft could have helped in these missions.

Please be sure to give me your rank during that mission, your position today, date of mission, number of missions and kills, your name and address and any other information you can spare so I can give you credit, and, of course, my thanks. Also, if you have any old newspaper articles of air war in Vietnam, spare photographs (color or B&W), aircraft specifications, or anything else you can spare.

I would appreciate as many pages as you have time to write. Remember, I need factual information only and would really appreciate your aid. I will send copies of the report to anyone who helps me and I will also dedicate it (report) to the survivors and especially to the men who died in the Vietnam War. Send all information to:

Edward Bensen
15 Jewel St.
Brentwood, N. Y. 11717

OX5 Pioneers

The OX5 Aviation Pioneers is a nationwide, nonprofit organization established to perpetuate the memory of pilots, mechanics, and others who contributed in the development of civil and military aviation. Men and women are qualified for membership if: they flew as student or pilot, owned, or participated in the design, repair, maintenance, overhaul, construction, or operation of Curtiss OX5-powered aircraft prior to December 31, 1940. Annual membership dues are $10, which includes both local Wing and National publications. California residents who are interested and qualified should write for an application to OX5 Pioneer Membership, 6848 Murietta Ave., Van Nuys, Calif. 91405. All others should write to:

Secretary, National Hq.
OX5 Aviation Pioneers
10405 W. 32d Ave.
Wheat Ridge, Colo. 80033

Robert Huber, W. F. Wagner

I am trying to locate two men; Robert J. Huber, serial number 33763821, whose name appears on a name tag on an A-2 flying jacket, and W. F. Wagner. On the collar of the A-2 jacket is an AOPA badge and on the other side an AFA badge. This jacket appears to have had a CBI shoulder patch on it at one time.

Would they please contact me?
John Sutay
Historian, 57th Bomb Wing Assn.
1975 Huntington
Trumbull, Conn. 06611

14th Service Squadron

Would like to hear from anyone who was stationed at Camp Meeks, Iceland, 14th Service Squadron, during 1943–44.

J. C. Walters
53 Glen Ridge Rd., Apt. 3-A
Glen Burnie, Md. 21061

UNIT REUNIONS

Night Fighters, WW II

May 23–25, 1980, Arlington Hotel, Hot Springs, Ark. **Contact:** Roy Atwell, 26220 N. Bravo Lane, Rio Verde, Ariz. 85255.

Hq. V Fighter Command

June 1980, Bellevue, Neb. (Offutt AFB). All WW II members who served in Seattle, Wash.; Townsville, Australia; Port Moresby, Nadzab, Hollandia, New Guinea; Owi-Biak; Leyte, Mindoro, Clark Field, P. I.; or Okinawa. **Contact:** John Liebentritt, VFC Reunion Association, 103 Caldor Dr., Bellevue, Neb. 68005.

38th Bomb Group

June 13–15, 1980, Royal Orleans Hotel, Vieux Carre, New Orleans, La. 70130. For additional information send stamped, self-addressed envelope. **Contact:** Carlos E. Giron, 2727 Chestnut St., New Orleans, La. 70130.

P-47 Thunderbolt Pilots Association

May 16–18, 1980, Sheraton Chateau Charles, Lake Charles, La. **Contact:** Bud Deaton, P. O. Box 5213, 1615 Enterprise Blvd., Lake Charles, La. 70601.

461st and 484th BGs, 15th AF

Based at Torretto, Italy, 1944–45. Redondo Beach, Calif., summer 1980. **Contact:** Bud Markel, 1122 Ysabel St., Redondo Beach, Calif. 90277.

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(C) HAVE IN

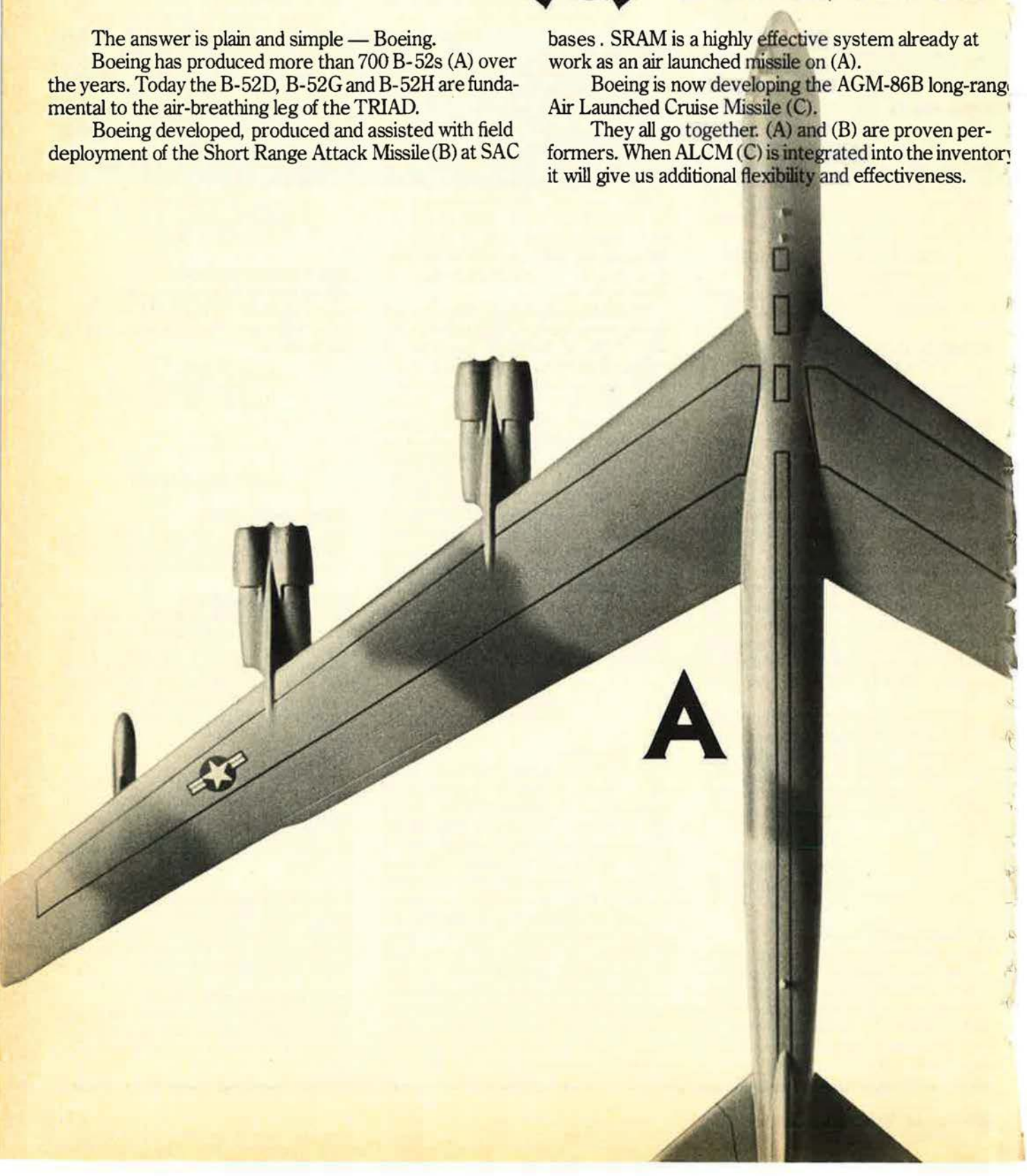
The answer is plain and simple — Boeing.

Boeing has produced more than 700 B-52s (A) over the years. Today the B-52D, B-52G and B-52H are fundamental to the air-breathing leg of the TRIAD.

Boeing developed, produced and assisted with field deployment of the Short Range Attack Missile (B) at SAC bases. SRAM is a highly effective system already at work as an air launched missile on (A).

Boeing is now developing the AGM-86B long-rang Air Launched Cruise Missile (C).

They all go together. (A) and (B) are proven performers. When ALCM (C) is integrated into the inventor it will give us additional flexibility and effectiveness.



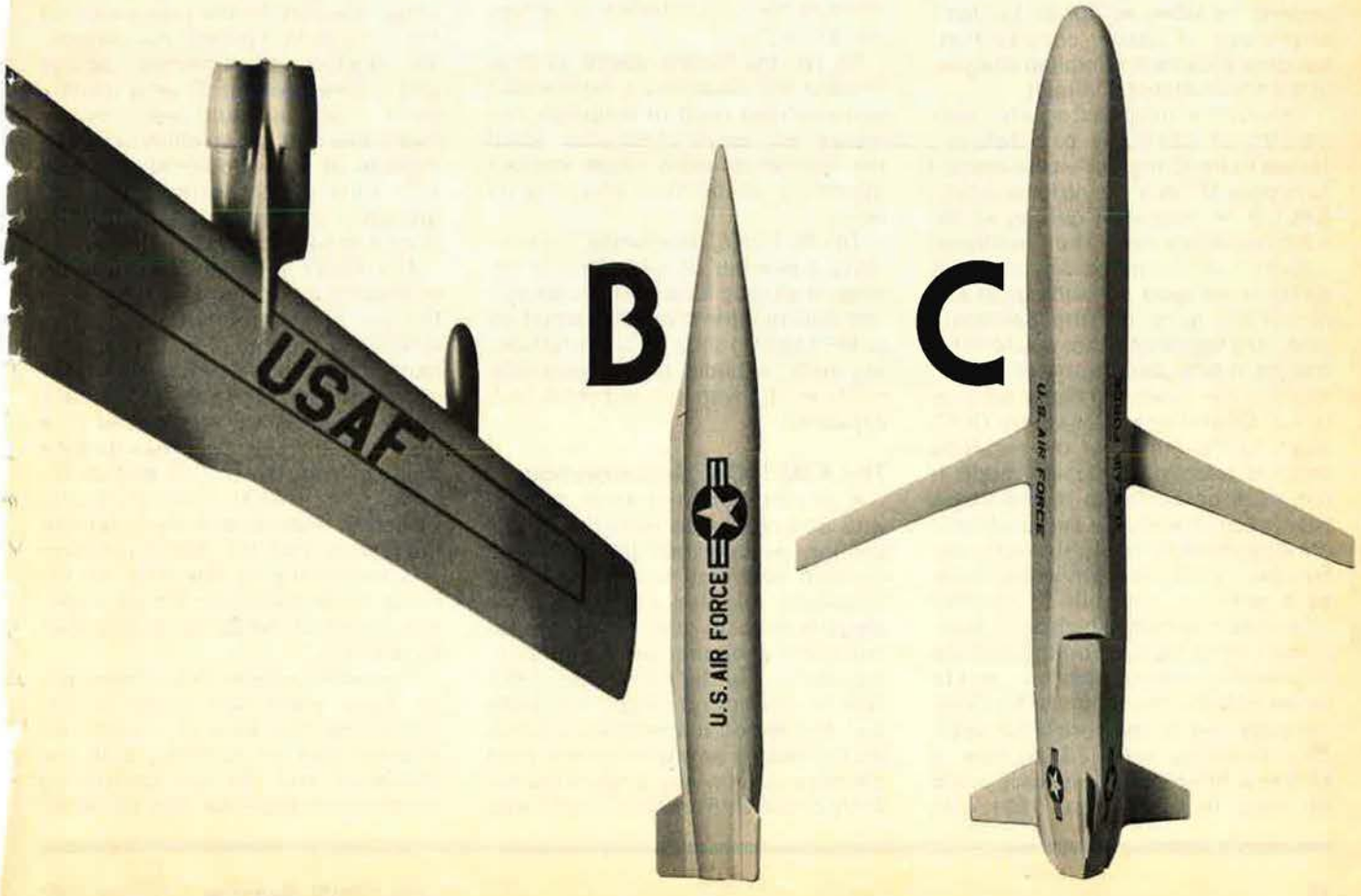
WHAT (A), (B) AND COMMON?

ALCM is more than an air launched missile that flies to target with pinpoint accuracy. It's a system of aircraft, support equipment, people, technical data and, of course, missile, designed to help B-52s destroy a wide variety of targets. All this has been tested in flights of the shorter-range ALCM-A during the ALCM advanced development program.

Result: The specifications were met or bettered.

The experienced Boeing team now at work on the ALCM program is an unparalleled resource in the development and fabrication of air launched strategic missiles.

One thing for sure, if anybody is going to put it together right, (A), (B) and (C), it's Boeing.



In Focus...

BY EDGAR ULSAMER, SENIOR EDITOR

Washington, D. C., Nov. 28

OSD Flexible on MX Basing

Defense Secretary Harold Brown, in a November 8, 1979, letter to Senate Armed Services Committee Chairman John C. Stennis, made clear that DoD and Air Force selection of the so-called "horizontal-dash" or racetrack MX basing mode does not preclude its modification or even a shift to another land-based technique during full-scale engineering development (FSED).

Asserting that his Office and the Air Force agreed that the "horizontal-dash MX basing mode best serves . . . the problem of future ICBM survivability," Dr. Brown disclosed that of the $230 million of FY '80 funds requested for FSED of the missile system's basing—in the main, shelter design, transporter/erector/launcher (TEL) vehicles, and command and control—"only $55 million is uniquely dedicated to the horizontal-dash basing mode." The request includes no funds for land acquisition or basing construction, but does provide for detailed analysis of the environmental impact.

Obviously addressing the odd liaison of normally pro-defense forces in the Congress—who elected to oppose MX as a means for scuttling SALT II or otherwise getting at the Administration—and the traditional "doves" who oppose any new US strategic weapon on ideological and moralistic grounds, the Secretary said "any legislation that would delay basing-mode development by restricting the funds will cause a slip in Initial Operational Capability (IOC) equal to the length of the resulting delay in selecting of basing mode. If our work on basing is delayed by a year [as proposed in a defeated Senate amendment], this irretrievably delays deployment in a survivable mode by a year. . . . A shift to another land-based system because of technical or other factors during full-scale engineering development . . . would cause only the loss of the $55 million uniquely tied to the horizontal dash. By proceeding with [FSED] now, a shift to a different basing mode could be made in Fiscal Year 1981 with minimum impact on both cost and schedule."

The Air Force's present MX schedule is predicated on achieving IOC, consisting of ten missiles and an "appropriate number of protective structures by July of 1986." Overall, the FY '80 budget includes about $733 million for FSED and construction of MX flight-test facilities.

Challenging the contention of several prominent Senate conservatives that the dash-on-warning feature was motivated by SALT II, Dr. Brown asserted that this capability "was added to provide increased survivability . . . through the capacity to rapidly move the missiles . . . should the Soviets obtain the capability to locate the missiles in their shelters. The added cost for SALT-related features is about $1 billion, primarily for SALT verification ports and associated equipment." (Sen. Larry Pressler [R-S. D.], in contrast, claimed that features required for SALT II compatibility amounted to between $7 billion and $12 billion.)

So far, the Senate seems to have heeded the Secretary's admonition and confined itself to language that merely expresses skepticism about the horizontal-dash mode without impeding associated engineering work.

The Air Force, meanwhile, is examining a number of other basing options, including a vertical shelter system (the multiple protective structure or MPS approach), a "horizontal loading dock" scheme, and a less-costly modular TEL with no horizontal-dash capability.

The AMST–C-X Metamorphosis

A senior Administration official who declined to be named told this column recently that the Air Force concept definition for the new C-X strategic airlifter program drew plaudits from all quarters except for one point: a requirement for intratheater delivery of the Army's new XM-1 tank to runways no longer than 3,500 feet. He termed it a mistake to focus the C-X design on anything other than optimization for very long-range delivery of outsized and oversized cargo in support of the Rapid Deployment Force (RDF). Pointing at what he termed the almost unanimous opinion among pertinent government agencies that the C-X program should be started *now*, he said it would be a mistake to "prolong the agony" of Boeing and McDonnell Douglas by giving the impression that the AMST (YC-14 and YC-15) intratheater STOL program is still alive under the guise of C-X. The White House's view of the requirement, he asserted, centers on a highly fuel-efficient follow-on to the C-5 and the C-141. Further, advocates of C-X optimized for long-range strategic airlift have the "political clout" in the executive branch and in Congress, and the supporters of intratheater lift don't, the official claimed.

For the time being, the Air Force tends to take a wait-and-see attitude on C-X, especially in light of a recently completed BDM study suggesting that improved intratheater airlift could help make a NATO-Warsaw Pact war winnable. Without such enhancements, the West's defeat appears to be preordained, according to this study and related research by the US Army.

The Air Force also is drawn toward a C-X design capable of performing both strategic and intratheater airlift without significant compromise of either mission, by the possibility—at this time neither proven nor disproven—of a C-5 with shortened fuselage and lowered weight. From a military point of view, it would seem obvious that if this sort of versatility could be realized at low additional cost and with only minor performance degradation of the strategic mission, such a design should be chosen.

The AMST program involving development by Boeing and McDonnell Douglas of two prototypes each of an Advanced Medium STOL predominantly designed for tactical airlift was short-lived. Initiated in January 1972, the program was placed in a hold status when Congress deleted funding from the FY '79 budget request. Somewhat incongruously, Congress nevertheless kept alive the impression that the AMST program was continuing by directing the Air Force to proceed with source selection, for which the Congress provided $5 million.

Tentative Defense Department and Air Force plans now center on terminating the source selection charade and so notifying both the Congress and the two competing contractors. Basis for this proposed

action are fundamental changes in US mobility requirements that necessitate corresponding adjustments in airlift modernization and the increased emphasis on strategic airlift for the Rapid Deployment Force. Special emphasis is to be placed on the long-range requirements attending Middle East contingency operations.

The C-X program, if the Air Force has its way, will be tantamount to restructuring the AMST program into C-X. Emphasis is to be on strategic airlift but an "adequate level" of tactical performance is to be retained. Initial operational capability of the C-X airlifter is to be attained in FY '87 and it must be, like the C-5A, capable of accommodating such "outsize cargo" as tanks.

A study group comprised of Air Staff, Army Staff, MAC, and AFSC personnel—headed by Air Force Maj. Gen. Emil N. Block—has been set up, working in close coordination with the Joint Chiefs of Staff and the Office of the Secretary of Defense. This group is expected to agree on the mission and performance requirements for C-X by mid-January 1980, and to submit a mission element needs statement (MENS) to the Secretary of Defense by March of this year.

C-X source selection is expected to get under way with the release in April of a new Request for Proposals (RFP) that will be open to all qualified aircraft contractors and won't exclude derivatives of the now moribund AMST designs.

Stepped-up Soviet Propaganda

Soviet forgery of US government documents for purposes of disinforming third-world countries is increasing, according to Sen. Gordon J. Humphrey (R-N. H.). "Between 1957 and 1965, there were fifty cases of significant Soviet forgeries of American documents [including diplomatic cables, military manuals, and letters and speeches by US officials]. Between 1965 and 1972, Soviet activity declined slightly. At the height of the spirit of détente, between the years 1972 and 1976, no significant Soviet forgeries were detected. However, since then there have been as many as half a dozen significant forgeries per year. Clearly, the Soviets are up to their old tricks again," Senator Humphrey reported to his Senate colleagues in November 1979.

Further, he disclosed, "the Soviets have for the first time begun to forge documents related to the offices of the President and Vice President of the United States. Evidently, no longer worried about disrupting détente and perhaps convinced the US is a helpless giant, the Soviet forgers have begun operating in an entirely new league."

Senator Humphrey called attention to two flagrant acts of Soviet disinformation, in the first case a speech purportedly delivered by President Carter on the subject of NATO's southern flank. The forged interview was a Machiavellian fabrication to create discord between the US and Greece. The second instance involved a fake interview with Vice President Walter Mondale "intended to insult both Israel and Egypt and to disrupt the rapprochement between these nations," Senator Humphrey reported.

He added that the US government "has strong evidence that these forgeries were the products of the Soviet KGB, and they were . . . authorized by the Soviet Politburo. President Brezhnev almost certainly was aware of and approved of the forgeries. In any case, they were authorized by Soviet officials at the highest levels."

For reasons that are not clear, the United States has never protested the Soviet forgery campaign, Senator Humphrey added. The disclosure of these forgeries comes on the heels of evidence that the Soviet propaganda machine skillfully inflamed the tense situation in Iran and other Moslem countries to promote anti-Americanism.

Soviet Ethnic Pluralism's Impact Minimal

A detailed DIA projection of the impact of ethnic pluralism on the reliability and efficacy of the Soviet armed forces concludes that while nationality problems will continue to trouble Moscow's policymakers, they will not adversely affect that nation's military power. The DIA document predicted a gradual increase in the non-Russian and non-Slavic elements of the population throughout the 1980s because of the relatively high birthrates among the Turkic-Muslims of Central Asia who already account for an estimated 40,000,000 to 45,000,000 of the Soviet Union's 262,000,000 citizens. While the Soviet population is dominated numerically and politically by three Slavic groups—the Russians, the Belorussians, and the Ukrainians *(see October '79 issue, pp. 62–66)*—Moscow's pragmatic approach to the nationality problem in the past few decades has eliminated serious minority resistance. The Kremlin's formula, in the main, hinges on eliminating socioeconomic disadvantages of the less-modernized nationalities, according to DIA. Moscow tends to intertwine concessions with encouragement, but exerts little overt coercion, to hew to the general Soviet line.

The DIA document finds that the Soviet approach also highlights gradual erosion in ethnic differences in education. Further, non-Russian minorities are making strides in Communist Party membership—the USSR's principal ticket to upward economic mobility. Not only have several of the major non-Russian groups higher per capita rates of Party membership than the Russian population but there is evidence of the Central Committee's commitment to promoting minority group participation in the political process and of these groups' willingness and ability to exploit such opportunities to the hilt.

Even the vexing language problem appears to be no insurmountable obstacle, with fluency in the Russian language becoming the rule rather than the exception among younger members of the minority groups.

Putting a damper on the frequently aired notion that ethnically based dissidence over the long haul is bound to trigger antiregime activities in the Soviet Union, the DIA instead finds that the Soviet Union's redundant networks of control and internal security—including the KGB, MVD, and border guards—all but rule out focused and organized resistance. Cautioning against the tendency to overstate the language problem among draft-age Soviet youths, the DIA report found that "an estimated 80–85 percent of the current draft pool can speak Russian with some fluency; most of the remainder can speak it haltingly. Many conscript billets in the Soviet military can be filled with draftees who are not fluent in Russian; the projected supply of draft-age males with fluent command of Russian far exceeds the estimated military requirements for Russian-fluent conscripts."

The DIA concludes that "the problems associated with an increased [share] of non-Russians in the armed forces are expected to remain within manageable proportions. Since the political officer bears the direct responsibility of maintaining good unit relations [and] ensuring political reliability, more intensive efforts may be

InFocus...

made in the coming decade to recruit additional non-Russian political officers to deal with the large number of ethnic minority recruits."

Ethnic pluralism, the DIA study concludes, therefore remains a potential source of spontaneous unrest, but not a significant threat to Soviet military capabilities or to the political cohesion of the Soviet state.

Washington Observations

★ The Senate Armed Services Committee dealt a startling setback to its Chairman, Sen. John C. Stennis (D-Miss.), and the Administration when it voted informally in favor of a committee report urging that SALT II be amended in substantive form. The amendments, if supported by the full Senate, would require renegotiation of the accord with the Soviet Union.

Meanwhile, middle-of-the-road critics of SALT II and several uncommitted senators, headed by Sen. John W. Warner (R-Va.), believe that the treaty would be defeated in a straight up or down vote, if brought to the floor of the Senate in the near future. Their recommendation, therefore, is that the Senate vote to "recommit," that is, return the treaty to the Administration in order to defer final Senate review until after the November 1980 election. In the interim, the Senate would carry out an orderly, comprehensive review of the nation's defense requirements that could establish preconditions for SALT II approval next year. The motion to recommit requires a majority vote. The prospect of an outright defeat of the treaty in an up-or-down vote might cause some of its supporters to vote in favor of such a motion, the Warner camp believes, especially since both signatories could abide by the terms of the accord during the period of deferral.

★ The Soviet lead in all long-range theater nuclear delivery vehicles provides the Warsaw Pact with a five-to-one margin over NATO, according to a recently completed Pentagon study. Released at a time of intense Soviet political and military coercion of NATO to prevent the alliance from modernizing its own limited theater nuclear forces, the Defense Department document brought out the cynicism of President Leonid Brezhnev's offer to not accelerate Soviet deployment of new theater nuclear weapons as long as NATO abstained from modernizing its obsolescent arsenal at all.

★ The Commander of AFSC's Aeronautical Systems Division, Lt. Gen. Lawrence A. Skantze, told the Engineering Society of Detroit that innovative approaches to strategic offensive requirements of the coming decade may range from a new "standoff multirole cruise missile carrier and convertible airborne tanker to a stealthy delta planform penetrating bomber. We are also looking at a simple skewed-wing configuration [with both designs] using provocative new engines and fuel technologies." In the strategic airlift area, he said, a new generation of outsize cargo aircraft is becoming feasible. The fact that by 1986 twelve out of the sixteen active Army divisions will be mechanized or armored—and thus dependent on heavy mechanized equipment—makes the case for such an aircraft imperative, General Skantze said.

★ Deputy Under Secretary of Defense for Research and Engineering (in charge of strategic and space systems) Dr. S. L. Zeiberg recently disclosed that annual funding of space-related defense activities has risen from $2.4 billion in FY '77 to about $4.0 billion at present, with further increases projected for the immediate future. Dr. Zeiberg also reported full agreement between the Defense Department and the Air Force concerning the need for a new Defense Department Consolidated Satellite Operations Center (CSOC), incorporating a dedicated DoD Shuttle Operations and Planning Center. Other steps aimed at boosting survivability of the Space Shuttle, according to Dr. Zeiberg, include command link encryption and command authentication.

★ Sen. Richard (Dick) Stone (D-Fla.), the Senate Foreign Relations Committee's foremost expert on Cuban affairs, recently refuted Administration claims that this country can determine whether the Soviet MiG-23s now stationed in Cuba are nuclear-capable or not. He confirmed—as reported in this space previously—that modifications associated with nuclear weapons carriage by these aircraft are not discernible through "photographic or other means available to US intelligence in Cuba" at this time. He added that US acceptance of these aircraft in Cuba as a *fait accompli*, "as we have not only of those MiGs but of the Soviet pilots on . . . several occasions, is a very unhappy precedent." He also reported that the Administration, "after first denying that the Soviet Golf II submarine, which visited both Havana and Cienfuegos . . ., was nuclear armed, . . . did say finally that it was indeed nuclear armed." The Administration's docile acceptance of the continued presence of a Soviet combat brigade in Cuba, he charged, represents a reneging by this country of the Monroe Doctrine and a violation of last year's Presidential commitment to oppose any "direct or indirect effort by the Soviet Union to establish a military base in this hemisphere."

★ The Senate's Select Committee on Intelligence, in a recent study, concluded that "although our national reconnaissance system is complex and comprehensive, some of its components are fragile. In order for the reconnaissance system to be effective, sufficient backup and redundancy must be provided during the period of SALT II." Further, the Committee concluded that "continued improvement and investment will be required during this period to ensure that United States monitoring systems keep pace with the monitoring tasks they must perform. Arbitrary resource constraints must not curtail these needed improvements and investments."

★ A senior Administration official informed this writer that none of the six options for a revised Five-Year Defense Plan under consideration by President Carter provides for either development and deployment of the FB-111B/C upgraded, "quick fix" strategic bomber or for reengining the fleet of KC-135 tankers, both rated as high-priority programs by SAC. The Administration official predicted that the Navy would be authorized to build up to eighty new ships under the new Five-Year Defense Plan. He also asserted that in the view of the Carter Administration, linkage of military and civil service pay should be severed. He predicted that such a step would boost the chances that the President eventually will recommend a selective pay increase for military personnel centered on correcting inadequacies confronting the lower enlisted ranks and officers in the eight- to twelve-year group, "rather than an across-the-board pay boost." ■

SCIENCE/SCOPE

As the newest aircraft to have Maverick missile capability, the U.S. Air Force F-16 fighter has launched more than 20 of the Hughes air-to-ground weapons in tests at China Lake, CA. The aircraft has carried as many as six missiles on a single flight. Tests have involved TV-guided versions only, although the missile also is designed with laser and imaging infrared seekers. Other aircraft that carry the Maverick are the F-4, F-5, A-7, A-10, and F-111. Maverick has scored direct hits on targets in more than 88 percent of all firings to date.

Air defense systems around the world track targets more easily with an advanced data-processing unit built by Hughes. The RADEX radar data extractor works in conjunction with surveillance radars at local or remote sites. It filters out radar clutter to improve video displays and provide target reports for use in tracking. Because the equipment is much more efficient than the average human operator, it can either supplement or replace operator positions at the control center or at the radar head. RADEX is operating in Norwegian and Danish NADGE (NATO Air Defense Ground Environment) sites and in Spain's Combat Grande system.

Major developments toward an optical filter that can be tuned electronically to specific wavelengths of light have been reported by Hughes scientists. The device is tuned by a microprocessor that varies the electric field distribution onto an electro-optic crystal. One filter with a lithium-tantalate crystal has been operated across the visible light spectrum from deep blue to deep red. Another has been tuned into infrared wavelengths. The device promises to find important uses in pollution monitoring, multispectral imaging, and monitoring color consistency in commercial products, including paints and dyed fabrics.

Remotely piloted vehicles using a new video processing technique could relay TV pictures with less chance of being detected or jammed by an enemy. The method, developed by Hughes for the U.S. Army, first separates potential targets from background clutter. Background areas are then converted into a white-on-gray outline picture that's updated every second. A window containing the prime target is allowed a fuller range of tones and is updated at a rate of 7-1/2 frames per second. Other targets receive lower resolution or are converted to symbols, and are updated every second. Though standard TV is sharper because it uses twice the line resolution and is transmitted at 30 frames per second, this compression technique transmits all vital data with one-thousandth the bandwidth.

Exemplifying international teamwork in the defense industry, British Aerospace Dynamics Group is producing U.S.-designed TOW missile systems for the United Kingdom's Lynx helicopters. The British firm is licensed by Hughes to build TOW (Tube-launched, Optically-tracked, Wire-guided) equipment for the British Ministry of Defense. The system will enable Lynx helicopters to knock out enemy tanks. To launch a missile, the gunner locates a target in the sight, fixes the crosshair on the target, and fires. He then holds the crosshair on the target and the missile is guided automatically to impact, receiving steering signals through two wires it unreels in flight. The pilot may fly at any speed, fly a zigzag course, or make sharp turns without affecting the missile's flight.

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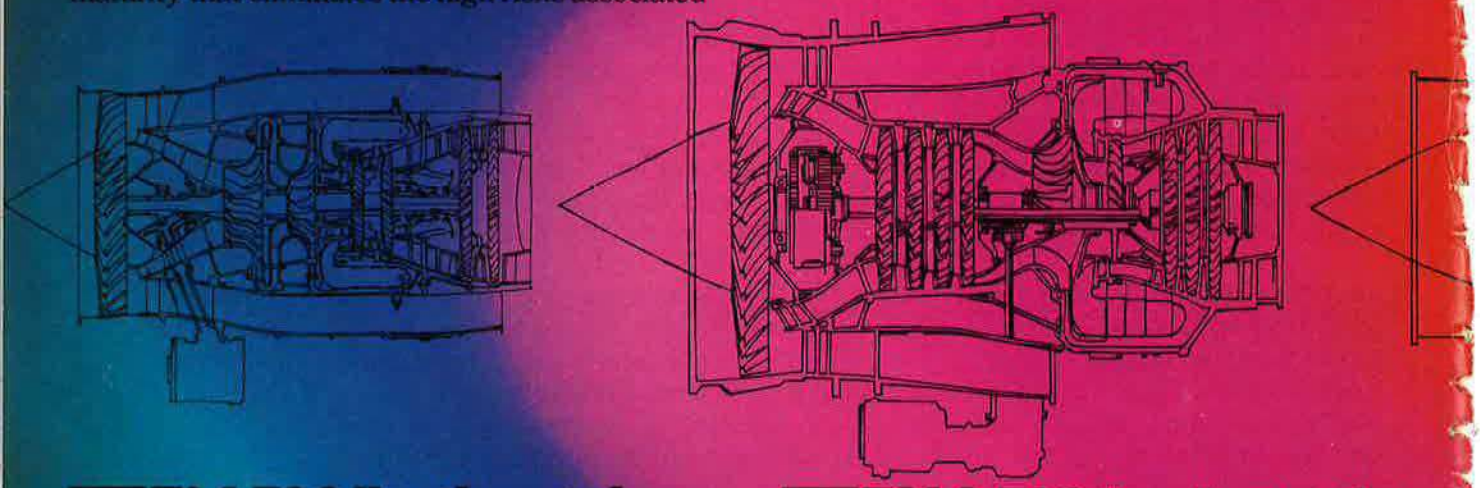

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- Based on the core section of Garrett's phenomenally successful T76 and TPE 331 turboprop engine.
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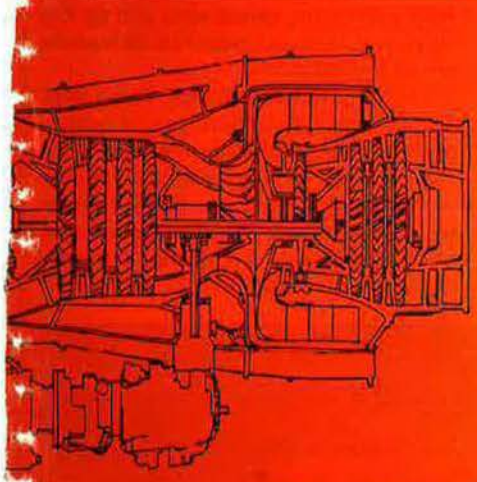

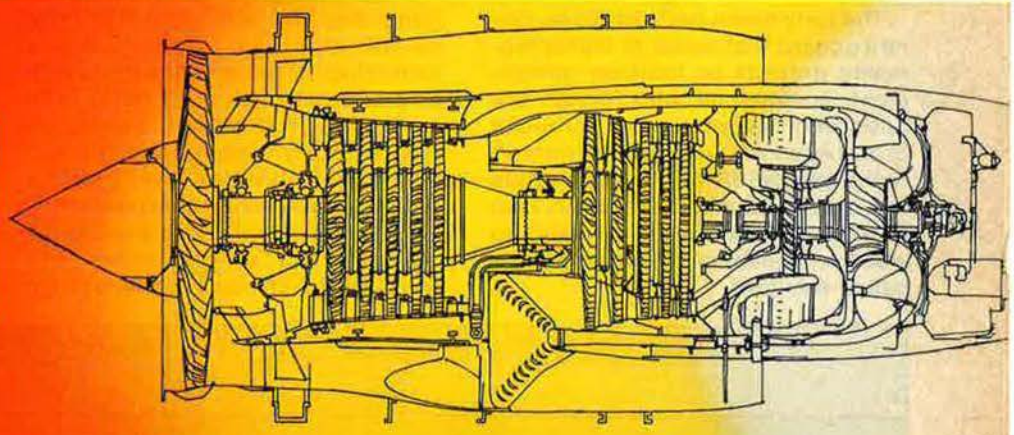

TFE1042 4,500 lbs. thrust class

- Low bypass, high performance turbofan.
- Fully militarized version of the commercial TFE 731, under development with Volvo Flygmotor.
- Version available at 3,600 lbs. thrust to meet a variety of aircraft and mission requirements, and provide longer life with low operating costs.
- Testing is now underway at Volvo Flygmotor.

ATF3 5,500 lbs. thrust class

- Medium bypass with extremely low IR and noise signatures.
- Selected for the Mystere 20 Gardian, the Falcon 20H business jet and used on U.S. Coast Guard HU-25A surveillance aircraft.
- The only turbofan engine in its class that has been flight-tested above 55,000 feet.
- Early version set turbofan altitude and endurance records on USAF/Ryan "Compass Cope" RPV.

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Aerospace World News, Views & Comments

By William P. Schlitz, ASSISTANT MANAGING EDITOR

Washington, D. C., Dec. 4

★ Despite development problems, NASA has firm payload commitments for the first thirty-seven operational Space Shuttle flights expected to begin in 1981, officials said. Thus, the Shuttle schedule is almost completely booked through 1984.

The forty-seven payloads to be carried aboard that series of flights represent projects by fourteen government, commercial, and foreign entities, and range from the European Space Agency's Spacelab (being built in Europe; NASA will be responsible for operation and integration into Shuttle activities after delivery) to weather, communications, and navigation satellites.

NASA payloads are expected to account for thirty-two percent of the Shuttle cargoes, DoD about fifteen percent, and all other users about fifty-three percent.

While Shuttle payloads are being assigned to flights on a first-come, first-served basis, those involving national security will receive priority, as will significant scientific and technological projects and those with time-critical launch windows. With an eye to costs, NASA plans to give preference to payloads for which it will be fully reimbursed over routine scientific/technological experiments.

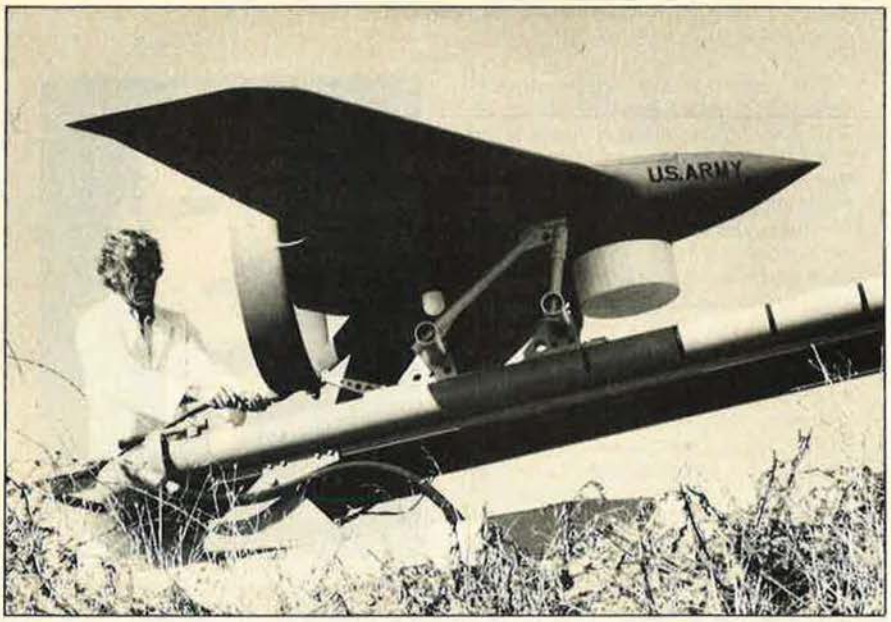
If this last sounds as if the Shuttle will be used for "space business," in a way it will. NASA plans to offer a range of services. Standard services, uniform for all nongovernment users, will include a basic launch for a one-day operation with a standard orbital altitude and inclination, three-person crew, and support services. Optional services will be available at extra cost on request and could include special hardware, analysis and testing, use of Kennedy Space Center facilities and services, and such special orbital operations as extravehicular activity and longer-duration missions.

In addition to the large payloads, more than 200 organizations and persons have reserved passage for some 200 small self-contained payloads called "Getaway Specials," which must be of a research-and-development nature. The charge, to universities, researchers, and companies, ranges from $3,000 to $10,000.

★ A unique new aerial combat simulator is under development to help in training pilots who will fly the Navy and Marine Corps F/A-18 Hornet strike fighter.

The simulator's cockpit, fitted with a full set of F/A-18 controls, displays, and pilot-support equipment, is to be situated inside a forty-foot dome on which computer-generated images will be projected. The effect inside the cockpit will be of a wrap-around view of earth and sky. In the simulated

A comparison of the "stretched" C-141B transport, foreground, and the original "A" version. The first modified StarLifter, to be stationed at Charleston AFB, S. C., was delivered to the Military Airlift Command in December. When the program to modify the entire fleet of 217 C-141s is concluded in 1982, MAC will have gained cargo capacity equivalent to an additional ninety of the jet transports. Another significant airlift advantage will be the aircrafts' aerial-refueling capability. With a payload capacity of forty tons, the stretched C-141 will serve as MAC's airlift workhorse in the 1980s.



The Army's new Remotely Piloted Vehicle for target acquisition and reconnaissance is currently in full-scale engineering development. See adjacent item.

"sky" will also appear maneuvering aircraft (friend, foe, and combinations) as well as missiles and gunfire.

The combat training device will also simulate sensations of centrifugal force, including optical grayout and blackout as experienced in an air-combat situation; all this will be accompanied by the appropriate sounds.

An instructor, manning his console, will be able to formulate a tactical problem, and monitor and evaluate the trainee's performance. The instructor will have the option of either controlling the action directly or assigning the task to the computer, programmed to conduct a complete problem.

With the F/A-18 aerodynamic and control characteristics provided in full, including normal and degraded flight operations, pilots can be trained in realistic air-to-air tactics, instrument procedures, airframe system and engine control, and emergency procedures.

The first of the simulators should be ready for use by October 1982. Called a "Weapons Tactics Trainer," it is being built by Hughes Aircraft Co.'s Support Systems Organization.

★ The Army has under full-scale engineering development a new Remotely Piloted Vehicle system designed for aerial target acquisition, designation, and reconnaissance missions.

The RPV program, under a $101 million contract, stems from the successful Aquila RPV system technology demonstration conducted for the Army by Lockheed in recent years. The Army Training and Doctrine Command's Field Artillery Center and School, Ft. Sill, Okla., will receive the equipment.

Plans call for the acquisition of twenty-two air vehicles (AVs), four ground control stations, three launchers, three recovery units, three maintenance shelters, and training simulators and manuals.

Primary mission of the RPV will be to locate targets for engagement by artillery, including the General Support Rocket System. Through use of its on-board laser and TV camera, the system will provide very accurate target location, artillery adjustment, and designation for precision-guided munitions, officials said. The system will also provide high-quality, real-time reconnaissance imagery of targets far beyond the normal range of the ground observer and deep into enemy territory, they added.

According to Lockheed, the system can be carried in seven standard Army truck/trailer combinations and can be transported in one C-5. Truck mounted and operated by a crew of thirteen, the system can be set up for launch in less than an hour and stowed and ready for transport in thirty minutes.

The RPV will have a twenty-four horsepower engine providing a top speed in excess of 110 mph and a mission duration of more than three hours. System missions can be either preprogrammed or adjusted manually while in flight.

★ NASA is sponsoring a flight research program featuring one of the world's most unusual aircraft—the human-powered Gossamer Albatross. (Actually, Gossamer Albatross No. 2; it was No. 1 that made history in the summer of 1978 when it became first to cross the English Channel under human power.)

NASA scientists are interested in Albatross because they think some of her design characteristics may have possible application to future aircraft capable of flight at extreme altitudes.

The two-month program is being funded jointly by NASA's Dryden Flight Center, Edwards AFB, Calif., and NASA Langley Research Center, Hampton, Va., and will take place at NASA Dryden.

Special emphasis, officials said, will be on utilizing a lightweight data system to measure aircraft stability, control, and performance. Albatross will be flown under human power, towed propellerless in flight, and be modified with a small electric motor to study steady-state conditions under powered flight, NASA said.

★ NASA's Lewis Research Center, Cleveland, Ohio, has been assigned prime responsibility to develop an advanced communications satellite for launch in 1985 or 1986.

The major objective of the five-year program is to strengthen US leader-

The first KC-10A Advanced Tanker Cargo Aircraft is undergoing assembly at the McDonnell Douglas plant in Long Beach, Calif. Delivery of the aircraft to the Air Force is expected by year's end.

Aerospace World

ship in satellite communication R&D. The project calls for scientists at Lewis to work closely with private industry, DoD, and other NASA centers to develop a satellite featuring the most up-to-date technology.

One aim is to spur more effective use of the radio frequency spectrum at the geostationary orbit level, about 22,300 miles (35,900 km) above the earth. Another goal is to try to cut communications satellite use costs while also creating new and innovative public services, like high-speed electronic mail delivery.

Studies already under way at Lewis are focusing on the feasibility of high-technology satellites employing multibeam antennas, on-board signal processing and switching, high-power transmitters using both solid state and traveling wave tube amplifiers, and solid state low-noise amplifiers, Lewis officials said.

The studies are intended to lead to the development of a space communications system with the capability of, among other things, beaming transmissions to almost any spot in the country regardless of population size or electronic sophistication.

Because of budget pressures and strong capabilities in the private sector, NASA had pretty much phased down its satellite communications research in recent years. The new program at Lewis should serve to bolster and enhance work being done in the field of space communications, officials said.

★ Lacking the international hullabaloo created by last July's fiery reentry of Skylab, a Pegasus-2 satellite weighing considerably less broke up on reentry in early November and fell into the Atlantic near the equator somewhere northwest of Ascension Island.

Pegasus-2, launched in May 1965, gathered micrometeoroid data for use in designing spacecraft. Named for the winged horse of Greek mythology, the satellite in operation had wing-like panels ninety-six feet wide containing 2,300 square feet of sensors. Pegasus-2 thus followed two other such satellites back into the at-

LAURENCE S. KUTER—1905–1979

Ten years ago, this magazine published an editorial titled "We Will Not See Their Like Again." It was a tribute to the pioneers who, in the years before World War II, developed fundamental ideas on the employment of airpower, planned the air strategy of the war, and later raised our postwar Air Force from the ashes of demobilization. Standing tall among that small group was Laurence Sherman Kuter, one of this country's most talented strategists, planners, and commanders, who died at Naples, Fla., on November 30 at the age of seventy-four.

General Kuter graduated from West Point in 1927, served for two years in the Field Artillery, and completed training as a bomber pilot in 1930. He completed the Air Corps Tactical School in 1934 and immediately became an instructor in bombardment aviation and employment of airpower at a time when the school was a focal point in the evolution of air doctrine.

Four years later, he was assigned to the War Department General Staff, where he was one of the four principal authors of the airpower plan for World War II. In 1942, at the age of thirty-six, he became the youngest general officer since William T. Sherman.

During the war, General Kuter commanded an Eighth Air Force bombardment division, served as Deputy Commander of Allied Air Forces in North Africa, and was General Arnold's chief planner. He represented General Arnold at the Yalta and Malta Conferences and at war's end was Deputy Commander of Army Air Forces in the Pacific.

In the postwar years, General Kuter was US representative to the International Civil Aviation Organization (ICAO) and subsequently commanded MATS (now MAC), the Air University, Far East Air Forces, Pacific Air Forces, and the North American Air Defense Command. He retired in 1962 and was Executive Vice President of Pan American World Airways until his second retirement in 1970.

General Kuter was a frequent contributor to this magazine and to other military journals. He served as a member of AFA's Policy Committee and, from 1966–72, on the Board of Directors of the Aerospace Education Foundation. He is survived by his widow, Ethel, a daughter, Roxanne Williamson, and three grandchildren.

Memorial services were held in Naples on December 4, followed by interment at the Air Force Academy.

Nautilus, *the US's first nuclear submarine, has retired from active duty and is to serve as a national monument in the nation's capital. See opposite page. Here, triumph in New York Harbor following historic first cruise under the North Pole.*

mosphere and destruction. One came down over Africa in 1978 and the other fell into the Pacific in 1969; no debris was recovered from either.

★ In 1980, USAF will expand substantially the opportunity for women to enter pilot and navigator training programs.

The move was announced recently by Under Secretary of the Air Force Antonia Handler Chayes during her testimony on "Women in the Military" before the House Armed Services Committee's subcommittee on military personnel.

Specifically, the Air Force will offer 122 women the chance to enter Undergraduate Pilot Training (UPT) during FY '80, a fivefold increase over the twenty-three trained in FY '79. Also, twenty-nine women will enter Undergraduate Navigator Training (UNT) in FY '80, up from eight the previous year. At present, USAF has thirty-one women pilots and twelve women navigators serving in units around the world.

Noting that Air Force women are performing with no significant overall quality differences from their male colleagues, Ms. Chayes called for the repeal of the law forbidding women from serving in combat. "In any future war, I have no doubt women will face more severe risks of injury, just as United States civilians will," Ms. Chayes said. "What is needed now is flexibility for the services to address the utilization of women in specific detail, free from artificial or stereotyped constraints," she added.

★ The *Nautilus*, the world's first atomic submarine, will join other specimens of the nation's technological heritage when she is retired to Washington, D. C., probably sometime in 1980.

Other localities made strong bids for *Nautilus:* Groton, Conn., where the boat was launched in 1954 and which was home port for her twenty-five years of service; and the Naval Academy, among others. But Washington won out because of "the national character of the ship," said Navy Secretary Edward Hidalgo.

If Congress approves the funding, *Nautilus* will be refurbished and then opened to the public as a national monument. She'll be moored at the Navy Yard in Southwest Washington.

The prototype for the US's fleet of atomic subs, *Nautilus* conducted a class act to the end with many "firsts." In 1958, she was first under the North Pole.

MAC's Air Evac Mission to Japan

The young American Marines had been confined to their dormitory at Camp Fuji in eastern Honshu by a typhoon, which had struck Japan with a vengeance. Unknown to the Marines, the storm had ruptured a nearby gasoline storage tank.

The escaping gasoline flooded under the dorm and when ignited engulfed the building in flames. Many of the Marines able to scramble to safety were severely burned. One died in the blaze.

Word of the disaster reached the MAC Command Center at Scott AFB, Ill., in the early morning of October 19, along with orders to air evac, in conjunction with Army medical personnel, the seriously burned men to Brooke Army Burn Center at San Antonio, Tex.

Two MAC C-141s capable of being converted to medical use were assigned the mission. One from Clark AB in the Philippines carried medical supplies and crews from the 9th Aeromedical Evacuation Squadron stationed there to Japan. Another from Norton AFB, Calif., flew to Kelly AFB, Tex., to pick up the Army burn team, and then on to Elmendorf AFB, Alaska, for more supplies.

The supplies were essential, and included electrical converters so that the respirators required in caring for burn victims could operate off the aircraft internal power systems. This meant that MAC had to quickly shift back-up equipment from as far away as McGuire AFB on the East Coast.

Meanwhile, the burn victims were flown by helicopter from Camp Fuji to Yokota, ninety miles to the northeast. There, Army, Air Force, and Navy personnel made the stricken Marines as comfortable as possible. When the C-141s landed in Yokota, the patients had been prepared for the nine-hour-plus flight back to the States.

The first C-141 took off from Yokota carrying seventeen of the most severely burned; the second followed an hour later with twenty-one of the injured. At a refueling stop at Travis AFB, Calif., the planes were readied in record time for the last leg of the journey to Kelly, near San Antonio and the burn center. All the patients were offloaded at Kelly and on their way to the burn center by 7:10 p.m. October 21.

Of the more than seventy Marines who received burns in the fire, twelve have died. "The toll certainly would have been much higher," said one Army doctor, "had the men not been in top physical condition and young and healthy. Another factor was that we got them to first-class treatment so rapidly. The burn team left San Antonio and was back with the patients in a little over twenty-four hours. The Air Force really did its job."

Air Force Flight Nurse Capt. Deanna Cox pauses a moment to wipe away perspiration while tending a seriously burned Marine during the evacuation flight to rush the injured to the Brooke Army Burn Center near San Antonio, Tex.

Aerospace World

★ The Alabama Space and Rocket Center, the "largest rocket and space museum in the world" that has on hand more than 1,500 items of hardware valued at more than $30 million, is planning a major expansion.

The Center, which is also an important repository of the National Air and Space Museum, is adjacent to the Redstone Arsenal at Huntsville, Ala. Now occupying thirty-five acres, the Center plans to expand onto some 380 acres now part of the Arsenal.

Among its new displays would be a Space Shuttle in launch configuration with its two solid-rocket boosters and related hardware. The ASRC also plans to create a youth science camp, set up an energy information center, and add a planetarium, Saturn service tower, and a multitude of recreational facilities.

Self-sustaining since it opened in 1970, the Center is appealing to the public, industry, and local and state governments to raise more than $11 million for expansion over an eight-year period.

Based on current visitor figures, the Center estimates that its planned expansion would boost attendance to 500,000 annually by the mid-1980s and 750,000 by the end of the decade, generating $25 million for the Center, $60 million for the local economy, and $5 million in local taxes.

★ NASA is conducting flight demonstrations of an experimental Automated Pilot Advisory System that might have a use at small, general aviation airports that now lack air traffic control capability. It is at these high-density, "uncontrolled" airports that more than half of the midair collisions occur.

The system is designed to broadcast airport wind, barometric pressure, and temperature information, as well as air traffic and active-runway advisories.

Principal elements of the system, which uses a computer-generated

SAMUEL M. HECHT—1908–1979

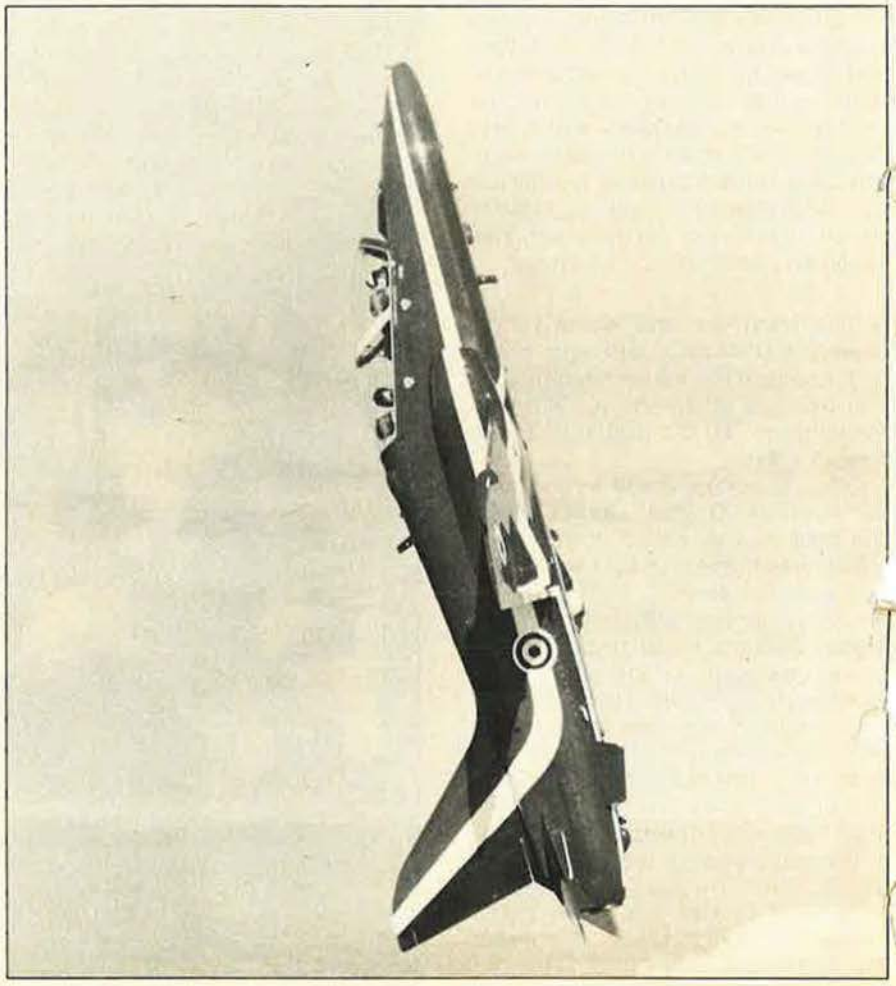
Samuel M. Hecht, an Air Force Association pioneer who served as AFA National Treasurer 1953–56, died in Owings Mills, Md., on November 30 following a long illness. He was seventy-one.

Mr. Hecht, a Baltimore civic leader and retired chairman of the board of the Hecht Co. department store chain, entered the Army Air Forces in 1942 and served as a pilot in the European, North African, and CBI theaters. His decorations included the Distinguished Flying Cross with cluster and Air Medal with cluster.

On discharge from the service, Mr. Hecht rejoined the family business and in 1947 became president of the company. He served as chairman from 1955 to 1959, when Hecht Co. merged with St. Louis-based May Department Store Co. He was a member of the May Co. board of directors until his retirement last year.

Mr. Hecht also served on the boards of Loyola College of Baltimore, the city's Provident Hospital, the Macke Corp., and was director of Associated Jewish Charities.

He is survived by his wife, Ruth; a daughter, Margery K. Peyton of Baltimore; a sister, Mary B. Hecht of Miami, Fla.; and three grandchildren.



RAF's aerial demonstration team, the Red Arrows, have transitioned from the Gnat to the Hawk attack/trainer aircraft built by British Aerospace. The Arrows will be in intensive training in the aircraft for their 1980 season debut in the spring.

The 41st Aerospace Rescue and Recovery Squadron, McClellan AFB, Calif., fielded the best pararescue medical team in this year's SAREX exercise at Prince Edward Island, Canada, to win the Sullivan Trophy. (Not in the photo, navigator Maj. Thomas E. Reiter.)

voice technique, are a radar, mini- and micro-computer, weather sensors, and a very high frequency transmitter. NASA is cooperating to ensure system compatibility with the Automated Terminal Service system being developed by FAA.

★ The 41st Aerospace Rescue and Recovery Squadron, McClellan AFB, Calif., was awarded the Sullivan Trophy as the best pararescue medical team in this year's joint US/Canadian Search and Rescue Exercise held at Prince Edward Island, Canada. In fact—and without crowing—this is the fifth year in a row that a team from the US has led the pack; further, in this year's competition US teams garnered all five trophies in contention.

In peacetime, men in the Aerospace Rescue and Recovery Service hone their skills in training and in performing humanitarian missions. In the annual exercise—dubbed SAREX—US and Canadian rescue people are given a chance to shine in a simulated combat environment.

The two Rescue Specialists representing the 41st ARRS were SSgt. Daniel J. Byrd and A1C Edward B. Lundberg. Besides being able to render advanced emergency medical care, the two are trained parachutists, scuba divers, and mountain climbers.

(For a story on USAF's Aerospace Rescue and Recovery Service, see October 1978 issue, p. 84.) In SAREX the twelve competing teams are judged on how quickly they can diagnose the general extent of a victim's injuries and which to treat first.

Other members of the 41st team (all of whom, incidentally, are AFA members): Capts. David G. Roeber and James M. Kearney, aircraft commander/pilot and copilot respectively; Maj. Thomas E. Reiter, navigator; MSgts. David B. Kuykendall and Rosco Williams, flight engineer and radio operator; and TSgt. Donovan L. Wilder, loadmaster.

CORRECTION

On p. 82 of the November 1979 issue listing the Aerospace Education Foundation's Jimmy Doolittle Fellows, AFA's Southeast Region was incorrectly listed as sponsor of one of the fellowships named posthumously in honor of Donald W. Steele. The correct sponsor is South Central Region.

★ **NEWS NOTES—The Air Force Communications Service,** headquartered at Scott AFB, Ill., has been redesignated **Air Force Communications Command,** "to more accurately denote the role the command plays in providing communications, air traffic control, and data automation support" for USAF. With the deactivation of ADCOM, AFCC is now responsible for about 1,800 personnel and more than fifty worldwide sites that had been ADCOM resources.

In early November, **Evelyn Johnson of Morristown, Tenn.,** was presented **FAA's Flight Instructor of the Year** award in ceremonies in Washington. The sixty-nine-year-old grandmother has taught about 3,000 people to fly in some 25,000 hours of instructional flying and has logged more than 35,000 hours of flight time. "I fly five to seven hours a day, seven days a week. I intend to keep it up just as long as I can pass my physical every year—and I certainly don't have any trouble with that," the Indomitable One said.

Died: Col. William W. Westlake, USAF (Ret.), of cancer at Andrews AFB, Md., in mid-November. He was eighty-one. During his Air Force career, the long-time AFA member served Gen. H. H. "Hap" Arnold, Commander of the Army Air Forces, as senior public affairs officer. ■

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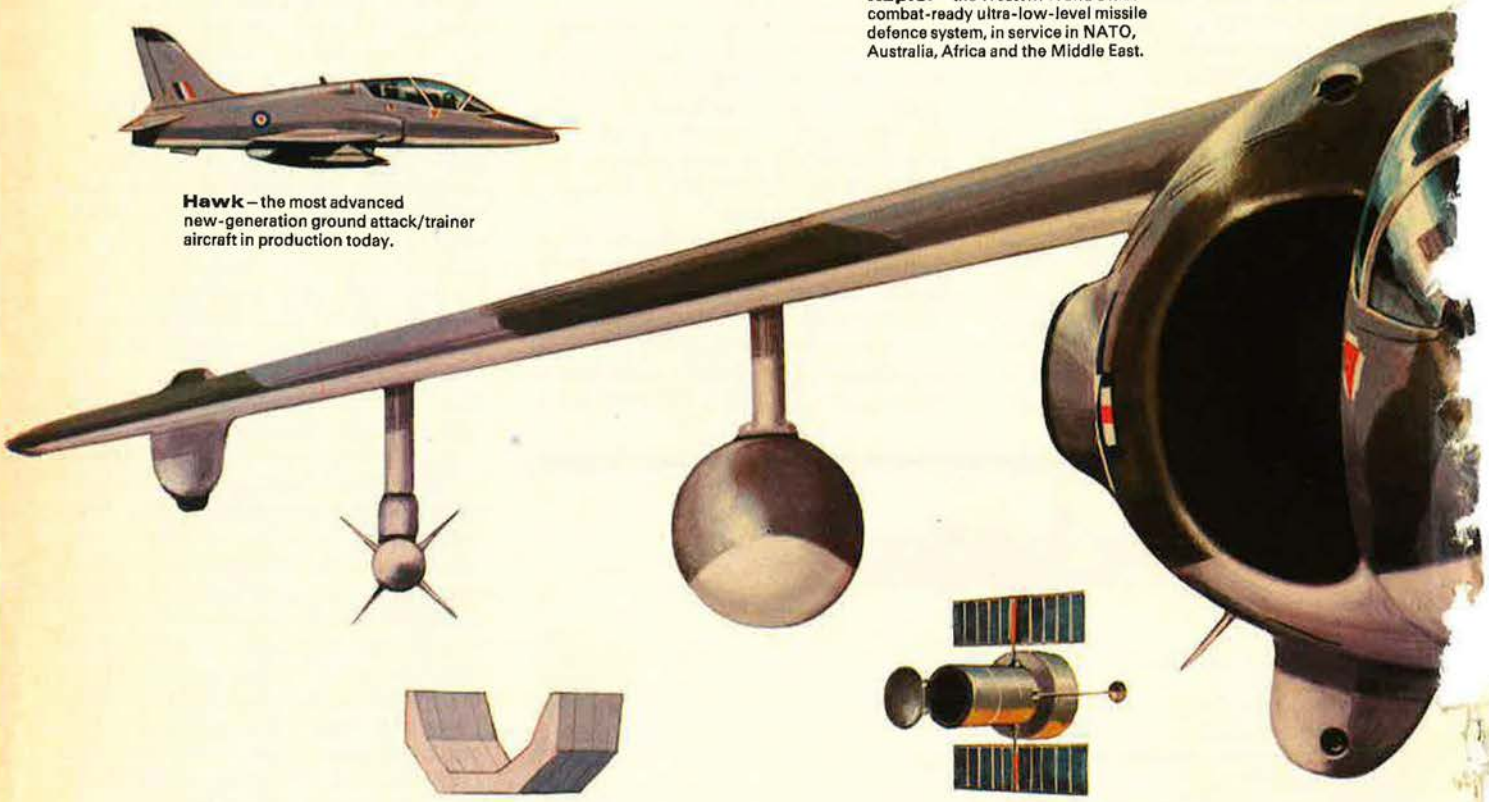
Rapier – the Western World's first combat-ready ultra-low-level missile defence system, in service in NATO, Australia, Africa and the Middle East.



Spacelab Pallets – designed and built by British Aerospace as a member of the 9-nation European Spacelab consortium.

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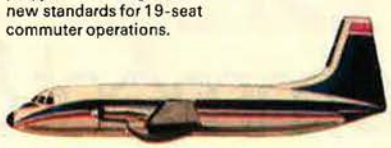

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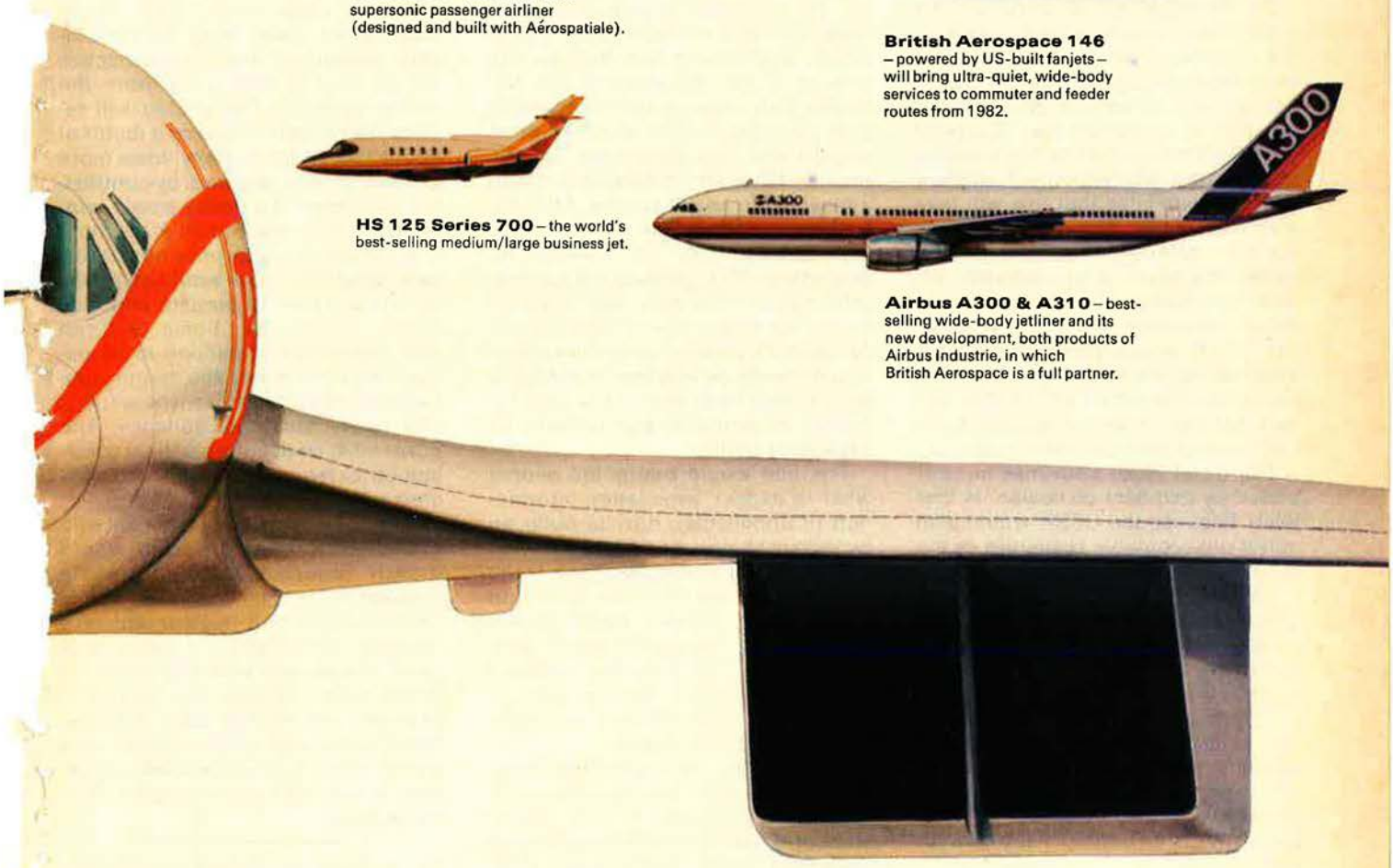
British Aerospace 146 – powered by US-built fanjets – will bring ultra-quiet, wide-body services to commuter and feeder routes from 1982.

HS 125 Series 700 – the world's best-selling medium/large business jet.

Airbus A300 & A310 – best-selling wide-body jetliner and its new development, both products of Airbus Industrie, in which British Aerospace is a full partner.



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Perspective
Comment & Opinion

By William Olsen, Earl Conrad, and Robert Denington

A Civil Defense for Today

Years ago, when the US had overwhelming nuclear capability, it could be argued that an effective civil defense wasn't really needed. But today our nuclear capability has eroded to an "equal balance." This major deterioration and the lack of an effective civil defense will soon—if it hasn't already—adversely affect the balance of power and possibly our national survival.

To illustrate, let us consider the most likely nuclear attack scenario, the "nuclear confrontation." It is the most likely, simply because the USSR can achieve its aims without getting involved in a nuclear war. Suppose the USSR evacuates her city dwellers to prepared and expedient shelters (the CIA estimates that this will take less than a week). Because the US has no civil defense, it cannot do the same; therefore, a subsequent nuclear exchange would cause very heavy casualties in the US, whereas the USSR would suffer acceptably small casualties. After evacuation, the Soviet leaders would be virtually certain that the US would not attack, no matter what they demand or do.

The worst case, a surprise nuclear attack by accident or design, is less likely because the USSR would also suffer unacceptable casualties as the result of inadequate time to evacuate.

An effective civil defense would greatly reduce US casualties in any nuclear war. But most importantly it would be a significant deterrent to nuclear war and nuclear blackmail.

In spite of this obvious need, the US has no civil defense. Furthermore, it appears that the proposed evacuation plan of the Federal Emergency Management Agency (FEMA) will probably not be funded in the near future.

We can't wait for this plan; our national survival demands some kind of interim civil defense right now. The authors offer the following austere civil defense program. It is so simple, versatile, and free of bureaucracy that it is likely to work. This program involves an expedient shelter and a CD plan that are implemented, when the danger becomes obvious, with simple TV instructions. Improvements, including the FEMA evacuation plan, can be phased in as funds and the public interest permit.

Austere Civil Defense Plan. The plan is best described by the following scenario. The President appears on TV (probably prerecorded) in order to make it clear that a nuclear attack is imminent and that we can survive if his instructions are followed. This message (often repeated) and peoples' innate survival drive should end any significant apathy, provided they are immediately shown a reasonable way to survive. After the President's message a short local Civil Defense (CD) film is shown repeatedly on TV to provide this survival information. The film was selected from a few locally stored films tailored for each TV viewing area. Film selection depends on whether or not there would likely be at least a few days for people to evacuate and prepare an expedient shelter.

The film would briefly tell people what to expect, evacuation information (if applicable), how to build an expedient shelter, and how to survive during and following the attack. It will also indicate the essential tools and supplies (*e.g.*, shovel, plastic sheet, water, food, transistor radio, batteries, etc.). The transistor radio is used for postattack survival instructions from a small CD staff, at a radio station in the fallout area.

Given a few days warning, there would be enough time to carry out a wholesale evacuation from major cities and other probable target areas to fallout areas. Once there, they would dig their expedient shelter. Food and other essential supply stores, gas stations, utilities, and other essential services would be ordered in the film to stay in minimal operation until the last day; public transportation would be ordered rerouted to evacuate those without transportation. If there is no evacuation, then city people would build their expedient shelters near their homes.

Expedient Shelter. The expedient shelter is basically a covered slit trench (narrow and about four feet deep). It can be constructed rapidly from simple instructions given in the CD film shown on TV by using a shovel and materials found around the house. It can shelter its inhabitants from the radiation hazard in the fallout areas very well, and also do a relatively good job in the target areas where there are more severe and numerous hazards. The cover for the trench shelter and its operation are different, depending upon whether you evacuate or build the shelter near home.

Evacuees to fallout areas would dig a narrow trench and cover it with a smooth sheet (a plastic tablecloth or a painter's drop cloth). This easily transported cover must be periodically shaken so that the radioactive fallout dust is kept away from the trench opening. This shelter will reduce the radiation dose by a factor of about 150, which is many times more protection than required; by contrast, the basement of a house would generally provide inadequate protection.

In the less likely surprise nuclear attack situations, there would generally be enough time to prepare an initial trench shelter near home that can give significant protection to its occupants from all of the target area hazards, except in close where lungs and heavy buildings collapse. The cover must be opaque and light (overlapped exterior doors or a rug covered with less than a foot of dirt).

This austere civil defense plan and expedient shelter program would greatly reduce casualties, but its greatest value is that it would reduce the likelihood of a nuclear war or a nuclear confrontation. It would be a good interim measure that could be implemented rapidly with very little expense, civil defense staff, or preparation on the part of the population or government. A more detailed discussion is available upon request from the authors.

The authors are research engineers at NASA's Lewis Research Center, Cleveland, Ohio 44135. Their involvement with civil defense is on an unofficial basis.

AIR FORCE MAGAZINE PROUDLY PRESENTS THE

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WW I Fokker Dr.1 Triplane
Loening Amphibian
F-16
T-6 Texan trainer
B-47 Stratojet
Navy F-8 Crusader

Keith Ferris, son of an Air Force career officer, grew up around airplanes. He has been painting them for more than 25 years and is one of the best known aviation artists. He is a member of the Union-Morris (New Jersey) Chapter of the Air Force Association.

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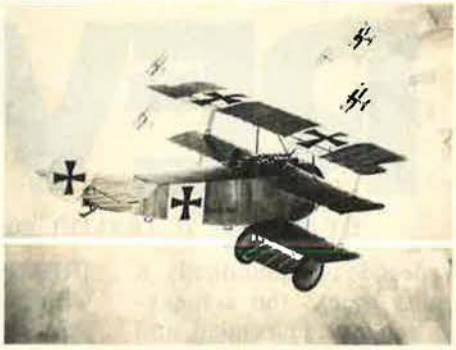

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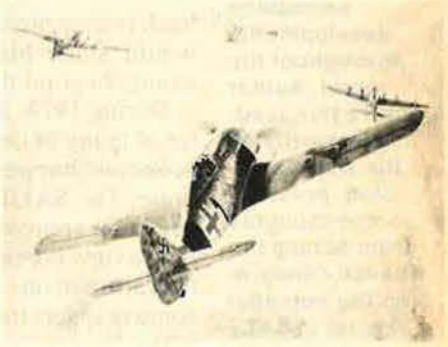

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JANE'S AEROSPACE REVIEW

BY JOHN W. R. TAYLOR, EDITOR, JANE'S ALL THE WORLD'S AIRCRAFT

AIR FORCE Magazine begins the new year, as we have since 1972, with a review of aerospace developments throughout the world. Author John Taylor, leading authority on the world's aircraft, presents some thoughts from across the Atlantic concerning the potential impact of SALT on aerospace developments, the qualitative and quantitative airpower balance between NATO and the Warsaw Pact, and the virtues of intergovernment collaboration in commercial as well as military aircraft production.

THE start of a new decade is, traditionally, a time when pundits assess the achievements of the ten years that have just ended, and predict what is likely to happen during the next ten. In our aerospace business, the pace of events is so rapid that it is sufficient to look back twelve months, and only a very brave man would stake his fortune on any forecast of events beyond the mid-eighties.

During 1979, aerospace has been at the center of many of the major political, military, and economic happenings, and this is likely to continue. The SALT II agreement, although it has yet to be approved or rejected by Congress as this review is being written, may hold the key to the future of our civilization, East and West. In some respects its contents are hypocritical; but in the view of this writer, it is better to have the superpowers talking to one another than simply snarling on opposite sides of a fence across Europe.

SALT II applies only to the USA and USSR. It provides for no limitation of weapons that might annihilate the European allies of either of the superpowers in the event of major war, being concerned only with strategic arms and interpreting "strategic" as something able to hit the USA from the Soviet Union, or vice versa. The Soviet SS-20 nuclear missiles and Backfire bombers targeted against countries like Britain, West Germany, the Netherlands, and Norway are not regarded as strategic in this context; but how do the allies and friends of the superpowers "in the middle" feel about this?

The moment of truth might come when efforts are made to persuade people in the UK that USAF ground-launched cruise missiles based in East Anglia would provide an effective counterforce against Soviet SS-20 nuclear IRBMs and Backfire bombers. Older Britons, with memories going back to 1944, might see this as being akin to equating Hitler's V-1 flying bombs, which they swatted like flies, with V-2 rockets, against which there was no defense. To make large areas of England prime targets, in exchange for such a deal, could offer little attraction.

The reported inability of US early warning satellites to distinguish between a meteorite, a nuclear explosion, or some other occurrence over the sea south of Africa was followed all too quickly last November by a computer hiccup that put NORAD combat aircraft into the air and SAC's bombers and ICBMs at alert readiness for dispatch. Such incidents remind everyone of the dangers inherent in the current nervous state of world military preparedness. This is true not only in terms of massive ICBM exchanges, but of what might erupt from a small-scale dispute of the kind that occurs periodically on the border between the Soviet Union and China.

When forces are balanced, such incidents are unlikely to get out of hand. When they are not, the stronger contestant might well be tempted to capitalize on initial gains, leading to a breakthrough that would provoke retaliation by nuclear weapons on a rapidly increasing scale.

The Imbalance in Europe

The forces now on opposite sides of the border across Europe are far from balanced. Britain's last *Statement on the Defence Estimates* included a diagram suggesting that the Warsaw Pact nations outnumber NATO in central Europe by 2.2 to 1 in fixed-wing tactical aircraft, 2.8 to 1 in main battle tanks, and 2.7 to 1 in artillery. They are known to deploy immense

The author cites engine problems of the F-16 (above), with the single-seat "A" at left and the two-seat "B" at right, as illustrative of "the dangers inherent in trying to develop every part of a new weapon system concurrently." At left, the two-seat night and adverse weather version of the A-10.

numbers of antiaircraft missiles and guns of high quality, are acknowledged to be dominant in chemical and electronic warfare, and have demonstrated a round-the-clock competence by comparison with which far too many of NATO's first-line aircraft are fair-weather types, lacking the equipment or weapons necessary for all-weather operation.

In frequent exercises, and through writings in journals like *Red Star* and *Soviet Military Review,* the Warsaw Pact forces offer ample evidence of how they would exploit their numbers and equipment in actual combat.

Tactical air forces facing NATO's Central Region include the northern group of Soviet Frontal Aviation air armies in East Germany, Poland, and Czechoslovakia, others in the western military district of the USSR, and indigenous air armies in Poland and Czechoslovakia—an estimated total of more than 4,000 fixed-wing combat aircraft. Directly opposite the Central Region are combat assault regiments with more than 2,000 helicopters, of which two-thirds are gunships with extremely heavy armament and recently proven capability in Afghanistan and the Ogaden region of Ethiopia.

If every fixed-wing aircraft in the 16th Air Army alone flew a single sortie against NATO forward areas from East Germany, the effect would be equivalent to 360 field guns firing for one hour. The helicopters are intended to follow up, flying at low altitude, to drop assault troops, vehicles, guns, and equipment at strategic points, under a cover of gunship helicopters that would clear a path through the defenses, dealing particularly with surface-to-air missile and gun sites, and any NATO helicopters encountered on the way.

Air-to-air combat between helicopters might be a new and surprising concept in Western circles, but it is routine for crews of Soviet gunships. An article by Col. M. Belov entitled "How to Fight Helicopters," in the September 1979 issue of *Soviet Military Review,* reported that: "According to the estimates of umpires at an exercise, helicopters of the Orange forces 'destroyed' 200 tanks, six fire-support helicopters, two tactical fighters, several multipurpose and reconnaissance helicopters, and a great number of trucks of the Blue forces. During the same four and a half days of combat operations, the Orange forces 'lost' only four helicopters. Thus, helicopters have proved most effective as versatile fire systems, highly superior to

other combat vehicles as regards observation, maneuverability, and choice of time and place for delivering a blow. Plans for designing future combat helicopters envisage further enhancement of their fighting power, survivability, and ability to operate in any weather."

This represents an entirely new concept of frontal attack. By comparison, the strength and potential of the Warsaw Pact ground forces are well understood, but no less formidable for that reason. The DoD's Assault Breaker antiarmor study states that in the event of an outbreak of hostilities, a primary commitment for NATO would be "to engage the command tanks of six Soviet and Warsaw Pact armored divisions attacking along an 18-km front—some 2,400 targets—and try to keep them from becoming a dominant part of the battle, at least for a couple of days and hopefully for longer than that."

This must be put in context with a program shown on British television some months ago, which suggested that resistance to such an onslaught, through the Fulda Gap on the Central Front, would have to be provided by fewer than fifty HueyCobra gunship helicopters of the US Army. That kind of report does no good for anyone. The US Army alone has added 47,000 antitank guided missiles to its NATO inventory in two years. The USAF rotates units of A-10 Thunderbolt II attack aircraft from UK bases to forward operating locations in Germany, and anyone who has seen the mighty 30-mm gun of this aircraft in action will appreciate its fearsome destructive power.

A fundamental weakness is that the A-10, like the RAF's Jaguar and Harrier, is not a true all-weather aircraft. It would take extreme conditions to ground the dedicated and highly skilled pilots of the Allied air forces at a time of desperate need, but such conditions are far from uncommon in Europe. There are in NATO service all-weather aircraft like the F-111, and the Tornado will be ready to contribute mightily to Western combat capability within a few years; but more is needed now, and it could be provided without excessive expense and effort.

Some Sensible Solutions

Fairchild Republic has built and tested a two-seat night and adverse-weather version of the A-10. All A-10s should be uprated to this standard, which would increase greatly the availability of this "1980s Sturmovik" tank-buster in Europe. The Soviet defense planners have shown their respect for the A-10 by developing a counterpart to it—though one must admit that they invented the Sturmovik concept, with the wartime Il-2, which Stalin described as being "as essential to the Red Army as air and bread."

If the USAF needs a replacement for the F-111, in time to be ready when its deterrent power will be most needed, it could forget for once its conviction that there is no substitute for products of the US industry and standardize on the Tornado with its European allies. The DoD is already working with the UK to produce a low-altitude airfield attack system that can be carried by aircraft like the Tornado, to close enemy air bases during the critical early stages of a NATO land/air battle. It would make sense to step up international production of the Tornado to meet US requirements, and offset this by supplying the RAF with McDonnell Douglas AV-8B Advanced Harriers built in the USA, rather than the still-untried "Big Wing" Harrier proposed by British Aerospace as a replacement for the standard version now operational.

The time has come for every NATO air force to equip with the best available aircraft, wherever they are developed and built, in order to improve overall effectiveness and standardization, lack of which has always been one of the West's gravest weaknesses compared with the Warsaw Pact forces.

Another persistent weakness has been the tendency to reject good airplanes already available in prototype form in favor of the promise of something better in the future. Tomorrow's product will always be better so long as technology continues to advance. Unfortunately, as the old adage reminds us, tomorrow never comes. It is why the USAF flys B-52s instead of B-1s, and yet can still feel there is merit in revealing that "Preliminary work on an advanced strategic manned penetrator for the 1990s has just started. It is now at a very low funding level, and mostly in the form of studies." A handful of studies offers scant comfort to NATO combat commanders at a period when the Soviet Union admits to having three large bombers under development.

As a stopgap, after developing and flight-testing the B-1 at enormous cost, there is a proposal to produce a cut-price penetrator by modifying this superb aircraft to "aluminum, fixed-wing, with reduced power and bomb-bays replaced by a missile launcher." One might as well have saved millions of pounds sterling and francs on Concorde by making it man-powered.

There is no way to save money on defense and be secure, except by ending the possibility of war. There is no way to do this without beginning with a total and clearly visible balance of power, strategic and tactical, and then starting a genuine, balanced reduction on both sides. This should not be impossible in a world in which nations are becoming increasingly dependent on one another. There would be no "butter mountain" for the Soviet Union to buy from a devastated Europe, and no wheat to feed its people, millions of tons at a time, from American prairies scorched and blighted for generations by nuclear radiation.

In the same way, any threat of war, by East

or West, to secure sources of Middle East oil would most likely lead to the wells being set on fire and lost forever, which would make the whole world poorer. That is why one cannot envy politicians who must cope with increasing Soviet presence in Afghanistan and the results of revolution in Iran, which sits astride routes to places where the oil flows.

Red Star Rising

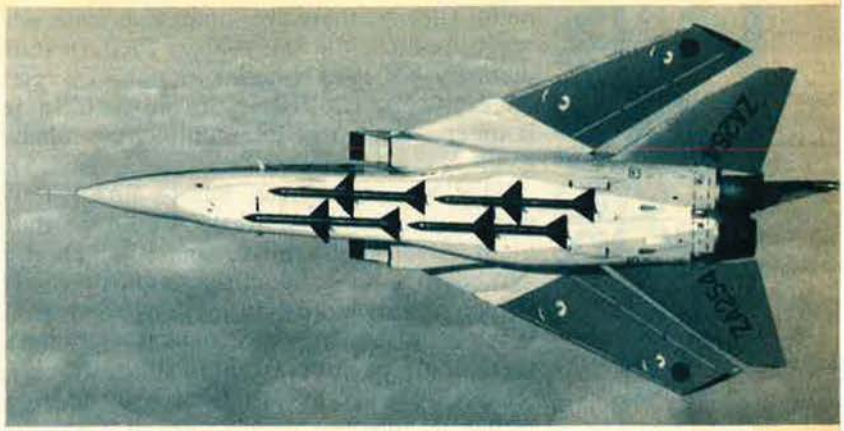
How well prepared are the world's aerospace industries to meet the demands and challenges of the eighties? Again, most of the best cards seem to be held in the East, where air forces and airlines usually get precisely what they need, in adequate numbers and at the right time. Often the aircraft received are not so good as the best that the West is capable of building; the difference is that they *are* built, in thousands.

At this moment, one can do no more than hint at types under development or entering production in the Soviet Union. There are still no good photographs of Sukhoi's counterpart to the Tornado and F-111, known to NATO as Fencer, although it has been in squadron service for nearly six years. The 1979–80 *Jane's* contains a highly provisional three-view drawing of a new fighter in the class of America's F-18 Hornet, which is said to have been monitored by US reconnaissance satellites. There are known to be prototypes of a variable-geometry bomber in the class of the B-1, a huge heavy-lift helicopter known to NATO as Halo, and the counterpart of the A-10 already mentioned. Expected soon are a new naval ASW helicopter and a true V/STOL combat aircraft to supersede the first-generation VTOL Yak-36 Forger.

By the end of this year, a flood of information on such types, even photographs of formations of some of them, may be spreading gloom and frustration among Western air forces still flying vintage combat aircraft, or new ones that prefer to fly when the sun shines.

It is easy to forget that Soviet designers have problems, too. They must contend with powerplants that have specific fuel consumptions higher than those of the West, and times between overhauls that would create serviceability problems rapidly in anything but a short, sharp conflict. The avionics and munitions available for their aircraft do not approach Western effectiveness. Nor do servicing standards, and the number of flying hours logged annually by any but elite pilots is inadequate to create and maintain high combat ability.

Shortcomings of this kind do encourage the ingenuity and competence of designers, and the USSR has been well served by the men whose names are symbolized by designations like MiG, Su, Yak, Mi, and An, and their successors such as Novozhilov of the Ilyushin bureau, Tishchenko of Mil, Mikhéev of Kamov, and the second-generation Alexei Tupolev and Sergei Yakovlev.



The prototype of the RAF's Tornado F. Mk 2 interceptor (above) went supersonic on its first flight in October. The Soviets are likely soon to introduce a true V/STOL successor to the Yak-36, at left, seen taking off from the cruiser/carrier Kiev.

This has been well demonstrated by the history of the Tu-144 supersonic airliner. Twelve months ago it was out of service, after only six months of operation over the short Moscow-Alma Ata route. It seemed a sad end for Concorde's only rival, and a setback for those who believe that commercial flying must continue to advance in speed as well as safety and scope.

No Tu-144 appeared at the 1979 Paris Air Show; then, on June 23, came news that the Soviet SST had completed a proving flight over the long Moscow-Khabarovsk route for which it was originally intended. Anyone with a pocket calculator and the right kind of know-how could prove to his own satisfaction that such a nonstop journey, with a reasonable payload, was possible only for a reengined Tu-144—a conclusion that was confirmed by the USSR's Deputy Minister of Civil Aviation.

This could have considerable significance for NATO, as the Tupolev bomber known as Backfire is thought to have the same basic type of engine as that fitted in the Tu-144. AIR FORCE Magazine was first to suggest the existence of an alternative engine for the Tu-144, following a tour of the Soviet aircraft industry by Senior Editor Edgar Ulsamer as long ago as 1973. As readers will know, *Jane's* has always regarded Backfire as being strategic, and has been criticized at the highest levels in the USA for insisting on the common sense of its assess-

ment. Clearly, there are some Americans who agree, because the *US Military Posture* statement for FY 1980 contains on page 7 a reference to "BACKFIRE, the newest Soviet bomber, which has intercontinental capability."

That was, of course, before SALT II. A component part of the treaty is a Soviet statement covering Backfire, under which it is agreed to limit production to thirty a year (which is thirty more than anything comparable in the West), and to ensure that it is restricted to tactical or peripheral roles (like attacking America's NATO allies in Europe) by declining to use its inherent flight-refueling capability. So, Backfire has been photographed in flight minus its flight-refueling probe, which is presumably safely in store back at its base.

This should not imply that the Soviet Union *intends* to break its promise. But treaty terms like this can hardly be taken seriously in the context of pressures likely to be exerted on any great nation in time of a war for its survival.

One of the SALT II clauses concerning the USA is equally quaint. Described as a Protocol, it bars operational deployment of ground-launched and sea-launched cruise missiles with ranges greater than 600 km through 1981, but permits unimpeded testing and development of such vehicles of any range. As none of America's GLCMs and SLCMs could now be made ready for deployment by the end of next year, its effect on the limitation of armaments and guarantee of peace is unlikely to be decisive.

Meanwhile, there are no limitations on the deployment of nonstrategic aircraft. For six years, Soviet fighter production has been maintained at a rate of 1,000 a year, compared with the sixty F-15s, 175 F-16s, twenty-four F-14s, and fifteen F-18s requested originally under the DoD's FY '80 budget. Only a minority of the 274 US fighters are true all-weather types.

It is equally thought-provoking to study the types of helicopters that make up the Soviet Frontal Aviation assault forces described earlier. The primary transport is a version of the Mi-8, known in the West as Hip-E and described by the DoD as the most heavily-armed helicopter in the world. Its cabin can accommodate twenty-eight troops. To each side are outriggers able to carry up to 192 rockets in six packs and four of the infrared homing antitank guided missiles known to NATO as Swatter. There is a machine gun in the nose and, to prevent boredom, the troops inside can fire their personal weapons through fittings in the cabin windows to keep down the heads of opposition in the drop zone.

The Mi-24 helicopter known as Hind-E is also impressive. It can carry a squad of eight heavily armed assault troops inside a heavily armored cabin, but is operated normally in an attack role. For this it can carry up to 128 rockets, or bombs, under its stub-wings, plus four of the new "Spiral" laser-guided antitank missiles, *and* a four-barrel Gatling-type gun under its nose. Undernose turrets house radar and low-light-level TV. Its performance capability is indicated by the fact that a slightly cleaned-up example of an earlier model of Hind, with engines uprated to 2,200 shp instead of the normal 1,500 shp, holds the absolute speed record for helicopters at 368.4 km/h (228.9 mph).

The Thin Line of New US Combat Planes

The roll call of new US combat aircraft seems thin by comparison with what is anticipated from the land of its fellow SALT II signatory. The F-4 has passed out of production after twenty-one years, in favor of the F-18. The A-4, too, has gone after twenty-five years. Nobody is sure whether the Navy will want, or can afford, the AV-8B. Meanwhile, some more A-7Es which were not requested are being built to keep things going in Texas.

It seems that the AH-64 helicopter has slipped a year; but there are active studies to evaluate the possibility of updating 155 FB- and F-111s into FB-111B/Cs to plug the manned penetrator gap through the eighties.

Such cynical comments do less than justice to the US aerospace industry, which retains its leadership despite problems, seldom of its own making.

One lesson that does seem to have been learned by those who control the pursestrings is the danger inherent in trying to develop every part of a new weapon system concurrently. This was emphasized by Under Secretary of Defense for Research and Engineering Dr. William J. Perry. Discussing the F-16 fighter, he said it provided "an excellent example of a program where we took a risk." Stressing that the F100 engine had caused most concern, he added: "We did not know when we made the decision [to go into production] that we were about to enter a whole series of problems on the F100 engine in the F-15."

Dr. Perry reckoned that up to two years had been saved in getting the F-16 into service by using the same basic engine as that in the F-15. . . . "But if we don't get our engine problem solved and have to introduce a different engine, it will have proven a very, very poor decision."

Pratt & Whitney seems to be justifying his trust. The company has announced that it knows the reason for the stall stagnations that have been encountered usually when afterburning has been selected on the F-15 at high altitude and low speed, and is remedying the problem. By last autumn it had succeeded in reducing the incidence of such stalls from three or four per 1,000 engine hours to 1.38, and hopes eventually to attain a rate of 0.15 per 1,000 hours.

A second problem—turbine blade failures, of which there had been fifty-four in operational use by late November—has been caused by excessive temperature during stall stagnation and by uneven distribution of heat in the combustor. Newer technology materials are now being used in turbine vanes, and engineering work is under way to correct combustor temperature distribution.

An alternative engine program was launched, taking the core of the B-1 bomber's General Electric F101 engine as the basis for a new powerplant for both the F-16 and F-14. The cost through FY 1978–80 was a relatively modest $57 million, but the eventual cost of reengining F-14s alone was estimated at well over a billion dollars. Even if it will not, now, be necessary, it is startling to learn that improvement programs on eight current US engines had cost a total of $676 million by October 1979, and were expected to absorb a further $1.2 billion by the mid-1980s.

In an effort to prevent future key programs from being plagued by problems of this kind, the Air Force and Navy have selected four engine companies to begin studies for a new

18,000-pound static thrust fighter engine with a thrust-to-weight ratio of 11.3:1. On the basis that it usually takes twelve to fourteen years and 1,000,000 flying hours to mature advanced fighter engines, whereas airframes can be developed in four to six years, the new engine is required to be at the preproduction flight test stage by 1990–91.

The kind of aircraft it might power was displayed by Rockwell International, in the form of a full-scale mockup, at the 1979 Paris Air Show. As exciting in concept as the F-16, it was one of three competitive designs by Rockwell, Grumman, and General Dynamics to meet a DARPA specification for a Forward Swept Wing technology demonstrator. One of the three is likely to be built for flight testing in 1982–83, and DARPA expects it to provide five major advantages compared with sweptback wings: high maximum lift at all angles of attack, because the tips remain effective as angle of attack increases; better distribution of internal volume; lower supersonic drag; improved flutter characteristics; and enhanced wing bending moment relief.

The Rockwell design is based on a forty-five degree forward-swept aeroelastic wing made of composites, and a single General Electric F404 engine. Weight is calculated at only 5,900 kg (13,000 lb), complete with one M61 Vulcan gun, two air-to-air missiles, and the APG-65 radar developed for the F-18. Cost is estimated at $6 million per aircraft.

US Lead in Transports

With Boeing turning out every month twelve 727s, eight and a half 737s, and seven 747s, plus a 707 every two months, there is little likelihood of America's losing its place as the num-

The MiG-23 Flogger-B interceptor (above) has demonstrated lookdown, snapdown capability against low-flying targets. At left, Rockwell International's mockup of a forward sweptwing fighter concept.

ber-one supplier of transport aircraft to the world. McDonnell Douglas had a less happy year in 1979, but the accident to a DC-10 at Chicago O'Hare in May must be kept in perspective. However great the advances made in every aspect of air safety, there will always be accidents. In the thirty-one days of August, more than 4,600,000 people traveled in the 283 DC-10s in worldwide service with forty-one airlines. By then, these aircraft had carried more than 233,000,000 passengers in eight years. New orders placed in September brought the total to close on 400, including fifty-three conditional orders and options. No further comment should be needed.

News from Lockheed in September was that orders and options for the TriStar had passed the 300 mark. The company's engineers also came forward with a scheme that would enable the potential of liquid-hydrogen fuel to be assessed realistically on a scheduled freight service, using aircraft that would be almost indistinguishable externally from their kerosene-fueled counterparts.

The idea is to install in a conventional but lengthened TriStar two large tanks holding a total of 22,710 kg (50,070 lb) of liquid-hydrogen fuel, fore and aft of the cargo hold. Such an aircraft would be capable of hauling 48,230 kg (106,330 lb) of freight for a distance of 3,500 nm (6,480 km; 4,025 miles), and the proposal is to

use it on services from the USA across the Atlantic to Western Europe and then down to the Gulf States. Lockheed believes that cargo operations could begin by 1987 if work on the project started now.

The urgent need for such practical research, in preparation for the depletion of hydrocarbon fuels, was highlighted in *Jane's* as long ago as 1974–75. We are now five years nearer the time when the tanks will run dry, and are more conscious than ever of the other advantages offered by liquid hydrogen. It is not only the cleanest burning of all fuels, but might offer solutions to both airport noise and in-flight sonic boom problems when allied to advanced design.

The Virtues of Collaboration

Just twelve months ago, it seemed that Britain's recently nationalized aerospace industry might be able to face the future with more confidence than at any time for more than twenty years. The euphoria did not last. A new government, seemingly anxious to have immediate money rather than long-term prosperity, soon disturbed the calm with plans to sell back British Aerospace (BAe) shares to the private ownership under which the industry had declined before nationalization. Even worse, the work force caught the malaise that had been slowly throttling Britain's car and shipbuilding industries, by joining in strikes that reduced each "working week" to only three days and persuaded Rolls-Royce to close completely until its employees' yearning for industrial suicide had passed.

The consequences have still to be reckoned. With the RB.211-535 engine program eight weeks behind schedule, Eastern Air Lines is known to have studied actively the possibility of fitting General Electric CF6-32s in its new fleet of Boeing 757s—first-ever US airliners for which British turbofans have been chosen as launch engines. Rolls-Royce's Aero Engine Division Managing Director told his staff that "Boeing would never let the poor performance of a supplier stand in the way of their success," and that the potential sale of RB.211s for 2,000 airliners during the 1980s was in the balance.

In some British Aerospace factories, once-thriving workshops are already empty. Production of the superb Hawk, Harrier, and Sea Harrier military aircraft is continuing, and the HS 125 twin-turbofan business aircraft continues to do well in the export market. Nimrods are being updated, and converted for an AWACS role. Ex-airline VC10s are being modified into flight refueling tankers for the RAF. HS 748 and One-Eleven airliners are still being built; but there are persistent rumors of the imminent demise of the BAe 146, which represents the sole almost-new product to be given the go-ahead since nationalization.

Last April in the US, the Mauro Solar Riser was the first solar-powered aircraft to fly successfully—perhaps a harbinger of still another solution to the energy problem.

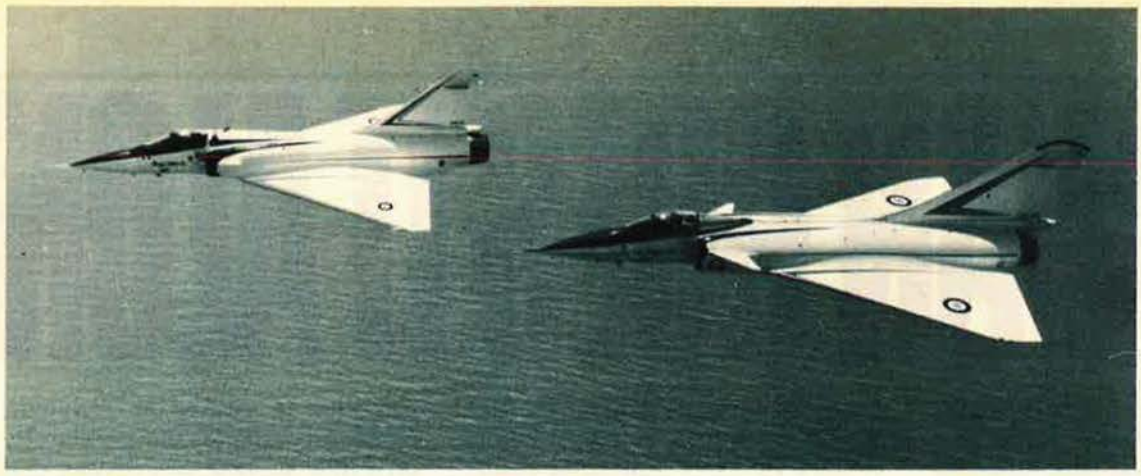
Outside the BAe conglomerate, Shorts and Westland continue to attract new orders, but Britten-Norman has become a subsidiary of Pilatus of Switzerland. Clearly, time is running out for evidence of long-term plans for the industry at government level, and common sense will to survive on the shop floor.

The best hope for the future must lie in the extent to which Europe's aerospace industries are learning to work together. The only large airliners now manufactured in Western Europe are the products of Airbus Industrie, drawing on the capabilities of French, West German, Dutch, Spanish, and British manufacturers, with Belgium coming in on the A310. Britain, France, Sweden, and Italy continue to produce military aircraft to meet their own special needs and those of export customers; but here, too, there is growing emphasis on collaboration, evident in the programs for the Tornado, Jaguar, Alpha Jet, and new armed helicopters.

The cost of collaboration is not always as low as one might wish, which is hardly surprising when one sees Airbus wings and fuselage sections being airfreighted from Chester and Hamburg to Toulouse, and counts the cost of personnel commuting from one country to another. Nevertheless, the advantages are well proved—not least that Europe would probably be out of the big transport aircraft league entirely without such a venture. As it is, sales of the A300 and A310 had reached the highly respectable total of 390 (250 firm orders and 140 options) by November.

Nor should it be imagined that any of the "big three" US manufacturers does the job on its own. This was emphasized when Boeing placed $1 billion worth of 757 subcontracts in a single day in October—covering delivery of 200 shipsets of components from companies in the USA, as a follow-up to earlier contracts placed in the UK and Australia, and leaving Boeing responsible for manufacturing little but the wings and nose section. Such widespread collaboration is not unusual. With the Concorde program now terminated, there are many who would like to see a second-generation SST take shape as a three-nation venture drawing in McDonnell Douglas.

Reports coming into the *Jane's* office bring mind-boggling figures, which mean less year by year as they grow ever larger. Who can imagine, for example, the size of an army of more



At left, Dassault's stars of the 1979 Paris Air Show—the single-engine Mirage 2000 and the twin-engine Super Mirage 4000. Below, Messerschmitt-Bölkow-Blohm concept for a tactical fighter of the '90s.

than 100,000,000 people—the number of passengers carried by just one airline, Aeroflot, in 1978? The figure of 92,000,000 hectares of agricultural land treated by Aeroflot fixed-wing aircraft and helicopters that year becomes only a little more comprehensible when worked out as seven times the area of England, one-tenth of the entire USA.

The Industry's Expanding World

There are nearly 35,000 military helicopters in service throughout the world, proclaims another piece of paper. It becomes believable when one receives data on the vast range of helicopters, of all shapes and sizes, now marketed successfully by companies like Aérospatiale of France, Agusta of Italy, and Westland of the UK, as well as Bell, Hughes, and Sikorsky.

Dassault-Breguet of France delivered 150 military and civil aircraft during 1978 and provided two of the glittering stars of the 1979 Paris Air Show, in the shape of its new Mirage 2000 and Super Mirage 4000 combat deltas. Dornier of Germany is flight testing an advanced-technology wing which promises to extend that company's share of the light transport market into the twenty-first century; and MBB's helicopter business continues to expand, with assembly lines now active in Indonesia and the Philippines. Both of these manufacturers, and VFW, are competing for contracts to develop much-needed harassment RPVs, and are likely to collaborate with the UK and French industries in developing a tactical support aircraft for the late eighties and nineties.

EMBRAER of Brazil, CASA of Spain, Canadair and de Havilland of Canada, Government Aircraft Factories of Australia, Israel Aircraft Industries, and manufacturers everywhere from Argentina to Japan and Yugoslavia now produce good, sometimes unique, aircraft that find customers in every continent. This is as it should be, for not even the biggest nation has a monopoly of genius and craftsmanship. The one with the largest population, China, is building up its aerospace industry at a truly remarkable rate. During the past year, it has revealed a range of aircraft of its own design. Most bear traces of early Soviet influence; the F-6bis fighter, for example, is based on the MiG-19 airframe. Soon we may see photographs of the F-12, benefiting from technology embodied in the variable-geometry MiG-23s presented to China by Egypt, and probably powered by license-built Rolls-Royce Spey turbofans. Also eagerly awaited is a first glimpse of the 140-passenger, three-turbofan C-10 airliner developed at Shanghai.

In a year when the Pioneer-11 spacecraft sent back the first close-up photographs of Saturn's rings—and when the Soviet Union interrupted signals from key missile early-warning satellites to avoid jamming Pioneer's transmissions—it might have been expected that the frontispiece to the 1979–80 *Jane's All the World's Aircraft* would be a photograph sent back from this robot explorer, hundreds of millions of miles from earth. In fact, the frontispiece shows a young American named Bryan Allen pedaling the man-powered Gossamer Albatross a few feet above the waters of the English Channel, midway between Dover and Cap Gris Nez. So, seventy years after Louis Blériot made the first crossing of this stretch of water in an airplane—in the year when *Jane's* itself was first published—we see a man as both pilot and driving force, still, when the making of aviation history demands very special qualities. ■

John W. R. Taylor has been editor of *Jane's All the World's Aircraft* since 1959. His "Jane's Supplement" appears regularly in this magazine, and he compiles or edits the galleries of aerospace weapons for both our USAF and Soviet Almanac issues. He is a Fellow of the Royal Historical Society and of the Society of Licensed Aircraft Engineers and Technologists, and an Associate Fellow of the Royal Aeronautical Society. Mr. Taylor is the author of nearly 200 books and countless articles on aviation subjects.

Abandoned by the United States, but with rising prosperity, strong military forces, and a national determination to survive . . .

TAIWAN GOES IT ALONE

THIS year, as it has been for all the years since the Nationalist Army of Chiang Kai-shek straggled ashore in 1949, Double Ten Day was celebrated in Taipei. October 10, 1911, marked the date of Sun Yat-sen's overthrow of the Manchu (or Ch'ing) Dynasty, and so Double Ten Day this year was, in theory at least, the sixty-eighth anniversary of the Republic of China. The fact that the Republic of China controls only the islands of Taiwan, Quemoy, Matsu, and their 17,000,000 inhabitants is viewed by the government in Taipei as just one of those things that, with the infinite patience of the Chinese, time will remedy.

Another anniversary of sorts was not celebrated this year, though it certainly did not go unremarked. For the first time in the history of the Chinese Republic, whether in Peiping—as the Nationalists insist Peking, or now Beijing, be called so long as it is not their capital—or Taipei, the United States has no official diplomatic relations with the Republic of China. And so, naturally, we had no official representatives at the Double Ten Day celebrations. There were all sorts of unofficial Americans present: politicians, journalists, businessmen, tourists, a sprinkling of retired military types, a large delegation of prosperous Chinese-Americans, but no one representing the United States government. It was a curious feeling to spot a general or an admiral in full regalia only to discover he was not ours but South American. The limousines and military honors are now reserved for someone from Colombia or Uruguay.

The diplomatic defections to the Communist regime have been growing over the years until now there are only twenty-three nations that recognize the government in Taipei, among them Saudi Arabia, the Republic of South Africa, and a number of Latin American countries. There is, admittedly, something reassuring about Saudi Arabia's intransigent stand against communism. Whatever the denomination—Leninism, Maoism, or any other persuasion—they stay away from it. Saudi recognition is a blessing for Taiwan in its almost total dependence on imported oil. It is also a disconcerting reflection of the fact that only the oil-rich nations these days seem to be able to choose their friends without hypocrisy.

Anyway, Taiwan, despite the absence of the usual drove of ambassadors found nowadays in even the most potholed little national capitals of the world, is prospering. The new Chiang Kai-shek International Airport was opened last January, and it makes the San Francisco or Chicago international terminals resemble, by comparison, something out of the underdeveloped third world. Nor has diplomatic nonrecognition seemed to have inhibited the world's airlines. Chiang Kai-shek is located at Taoyuan, about forty minutes south of the city on a new six-lane expressway that runs the length of the island. For one who always somehow expected to die in an Asian car driven by an inscrutable fatalist with a heavy foot, the speed limit of fifty-five came as a pleasant surprise. Gasoline, at two dollars a gallon, is the motivation for this new serenity behind the wheel.

The Grand Hotel on its hill overlooking the old Taipei airport—now used only for domestic and military flights—remains one of the world's great hotels. It is also one of the world's busiest, judging from the endless traffic streaming up to the entrance of that towering red pagoda. At the end of the magnificent lobby a majestic staircase leads to the old hotel, still preserved as old-timers will remember it. But whether in the new or old wings, there are few hotels in the world that can match the elegance and the service of the Grand.

There are, however, a lot of them trying, right there in Taipei—no

The elegant Grand Hotel from its hilltop location surveys the Taipei scene and dispenses unmatched service.

A SITUATION REPORT ON INDEPENDENT TAIWAN AT AGE THIRTY

BY GEN. T. R. MILTON, USAF (RET.)

longer a dusty subtropical Asian town, but a modern and bustling metropolis. The pedicabs have been banished as a dangerous anachronism in heavy city traffic. That traffic itself is a measure of the prosperity on Taiwan. Ford builds cars there, and General Motors is about to go into truck production on the island. The Chinese build a version of the Datsun, and they make their own buses. And while an automobile is still a luxury for the average citizen, it is by no means out of reach in a country that has attained one of the highest standards of living in Asia. Motor bikes are clearly within everyone's reach.

As we have all found out when checking where things are made, whether television sets, stereos, clothing, golf gloves, or whatever, a lot of manufacturing is going on in Taiwan, and a good many American and European companies are well entrenched there. The two biggest trading partners are the United States and Japan. Taiwan has become, as well, a favorite weekend excursion destination for the golf-loving Japanese, who also can find a few other diversions when the golfing day is done. As a measure of Taiwan's affluence, incidentally, the initiation fee at Tamsui Golf Club, a place well known to veterans of the bygone days when we had a large military contingent in Taipei, is $15,000—US dollars. There is a five-year waiting list besides.

And so, not to make too much of the fact, Taiwan is a prosperous and booming place. The US diplomatic withdrawal cast a momentary pall over the island, but it was only momentary. The Chinese are far too practical to let something like that interfere with the business of life. Admittedly, there is a lingering disappointment in our behavior, but it takes the form more of sorrow than anger. We are still treated as close friends whose leaders have simply gone astray.

We have, like the Japanese, made some arrangements to compensate for the lack of an embassy in Taipei. The American Institute performs most of the practical functions of an embassy, but it is not the same thing as an embassy. The Institute, obviously, does not speak for the United States on political matters, and the head of the Institute, a retired diplomat, is a long way down the protocol list. Still, it is a good deal better than nothing, and it does lend some sort of dignity to the continued association of two old friends.

This American Institute is the last official representation we have on Taiwan. The Military Assistance Group, the Taiwan Defense Command, and all the detachments and various other organizations departed with our last ambassador. So far, this exodus has had no visible effect on the Chinese armed forces. Over the years we did our advisory work well, and the Republic of China's military give every evidence of being first-rate. By and large, they are patterned after our own forces, without, it is fair to say, some of the problems our forces are facing these days.

VACRES—A Unique Institution

Aside from the fact that conscrip-

Taipei, October 10, 1979—Troops march in Taipei to mark Double Ten Day, the anniversary of Sun Yat-sen's overthrow of the Manchu Dynasty in 1911.

tion takes care of the numbers required, there is a real incentive for ambitious young men to join the regular forces and make a career of it. Quite apart from the generally satisfactory pay and allowances provided for the active-duty military, there is a most remarkable veterans organization waiting for them on retirement. And since retirement for the regular military often comes, as it does in our own case, at a relatively early age, the veterans organization provides those who are interested the chance of a second career. It also takes care of what once seemed to be a major problem of the Republic of China—what to do with a sizable, and growing, retired military population.

The Vocational Assistance Commission for Retired Servicemen, to give this veterans' bureau its official name, is like nothing anywhere else. Nothing, at any rate, that I have ever encountered. VACRES, to use the official acronym—doubtless a reflection of our influence—is in reality a large conglomerate exploiting the talents of retired servicemen. There is a training establishment that teaches skills both to veterans and their dependents.

But beyond that, VACRES actually operates logging companies, farms, engineering firms, and construction consortiums. It manufactures buses and refines all the oil on Taiwan, even exporting some to Japan. A veterans group built family housing for United States forces on Guam and did some of the work on Diego Garcia, our new outpost in the Indian Ocean. The VACRES companies quarry marble and build highways. Even the Taiwan Little League team that shellacked our entries in the midget world series came out of VACRES schools. Veterans affairs are, in short, on a paying basis. It is hard to judge just how much interference this scheme causes with the otherwise free-enterprise system on Taiwan, but the general impression is that there is enough business to go around.

Air Superiority—Key to Survival

The active-duty military is still very much in business as well. At this point it is too early in our relationship to detect any change in the Chinese military forces that might have come from our abandonment. Well, perhaps it is not quite an abandonment since we are still committed to selling equipment to the ROC, but it is the nearest thing to it when we look back to our former close ties. At any rate, what one can see of the Republic of China's military forces is reassuring evidence that the government on Taiwan is serious about defense. There is little talk any longer of invading the mainland. That return is now pictured as a logical eventuality following the collapse of the Communist regime. Instead, the forces on Taiwan are concerned with standing off any forays, large or small, from the mainland. The key to the Republic of China's strategy lies in maintaining air superiority over the Taiwan Strait, that eternally rough hundred-mile-wide channel separating the two Chinas. And so even Chinese admirals place their highest priority on a superior air force.

Presently, the ROC Air Force is equipped with a mixed bag of airplanes: F-104s, F-5As and -Es, and about ninety ancient F-100As with a few two-seater F-100Fs. The airlift squadrons have a vintage assortment of C-47s, C-119s, and a few C-123s. The last C-46s, survivors, doubtless, of the Hump operation of thirty-five years ago, were only recently retired. Airlift, then, is a matter the Chinese are worried about, for even if a mainland invasion no longer seems imminent or even probable, the ROC wants an airlift capability to move troops and supplies quickly around the island.

However, it is their fighter inventory that worries them more. The F-100s are clearly ready to be retired, and so will be the F-104s in a few more years. As a replacement, the military chiefs in Taipei speak hopefully, almost wistfully, of F-16s

Prototype tandem two-seat, twin-engine XAT-3 trainer designed by Taiwan's Aero Industry Development Center.

or F-18s. They are, on the other hand, realistic men, and so the fact that the F-5E is already being produced on Taiwan encourages them to believe there will be at least some continuation of that effort. The F-5E is, in fact, a better airplane than anything it is likely to face over the Taiwan Strait, not to mention the superior training and skill of the ROC pilots compared to their Communist counterparts.

As a hedge, perhaps, against the day when American airplanes might be denied them—however unlikely that may be—the ROC has established an aeronautical research and design center at Taoyuan, on the far side of the former USAF Chingchuan Kang, or CCK, Air Base. At the Aeronautical Industry Development Center, or AIDC, they have designed and built a transport prototype, a primary trainer now in production, and an advanced jet trainer that will fly next year. The AIDC production line on F-5Es turns out, in conjunction with Northrop, two airplanes a month. The quality of workmanship is clearly of the highest standard. Since the Republic of China already produces its own small arms, ammunition, and naval gunboats, perhaps it could, in a pinch, turn out its own airframes. Anyone who has seen the overhauls they did for us at Tainan during the Vietnam War can have no doubt as to the Chinese ability to perform complicated and exacting work.

Gen. T. R. Milton's articles appear regularly in AIR FORCE *Magazine. He graduated from West Point in 1940 and commanded bombing units in Europe during World War II* (see also p. 80). *Later service included Command of 41st Air Division and of Thirteenth Air Force. He was also Chief of Staff, Tactical Air Command, Comptroller of the Air Force, and just prior to his 1974 retirement was US Representative to the NATO Military Committee. Besides his writing for* AIR FORCE, *General Milton's work appears in* NATO's Fifteen Nations *(he is a member of its Editorial Board) and other international defense-related magazines. This article resulted from a trip to Taiwan in October.*

Well, that is the positive side of things on that controversial island lying off the coast of China. The fact that a Republic of China exists thirty years after the Nationalists had been written off is, in itself, positive, for the Pentagon and the Department of State, in 1949, gave Chiang Kai-shek and his followers a year or so at most. If we had not intervened on the side of the Nationalists on Taiwan, maybe the doomsayers would have been right. Not necessarily exactly right, for Chiang Kai-shek would surely have lasted more than a year no matter what, but right enough. It was our military support, air and naval, that gave the Republic of China a chance to consolidate its resources, organize Taiwan, and, finally, to prosper. Now, President Carter has announced the termination, on New Year's Day 1980, of our Mutual Defense Treaty. Barring a successful challenge by Sen. Barry Goldwater and others of unilateral presidential authority to terminate a treaty, the Republic of China will face a lonely future, one for the first time without a powerful protector.

Statue of Chiang Kai-shek dominates the entrance to Taiwan's Aeronautical Research Laboratory, nucleus of its aircraft industry.

Taiwan's Strategic Significance

In discussing the future of Taiwan, the question of a new status for that island invariably comes up. Why not an independent Republic of Taiwan? Surely, few others of the new postwar nations have as legitimate a claim to sovereignty and recognition as does this prosperous land with a high standard of living, a growing GNP, and a government that has been in control since 1945, the year Chiang Kai-shek first established his authority over what had been a Japanese colony.

The trouble with that proposition is that it goes right against the One-China principle subscribed to by both Peking and Taipei. And while the idea of a separate Taiwan seems, at superficial first glance, an easy way out of this endless Chinese confrontation, it would need the wholly unlikely agreement of the Communist regime to have any chance of succeeding. Even, that is, if the Nationalists were ever to adopt the notion of independence, and that is equally unlikely.

Thus, Taiwan's future appears slightly cloudy, at least with regard to diplomatic recognition and world acceptance. The fact remains that Taiwan occupies a strategic spot in the Western Pacific, and the people running that island are not going to come along quietly in a rapprochement with the Communists.

Gen. Chiang Wei-kuo, or Wego, as he is called, son of the late Generalissimo and half-brother to President Chiang Ching-kuo, is head of the Armed Forces University and a man who spends a lot of time pondering Taiwan's strategic

President Chiang Ching-kuo of Taiwan speaks at Double Ten Day ceremonies. He is the son of the late Generalissimo Chiang Kai-shek. His half-brother, Gen. Chiang Wei-kuo, is head of Taiwan's Armed Forces University.

position in this unsettled world. There is, understandably enough, a certain bias in his views, but they are very much worth listening to. For, whether or not you buy his argument that the People's Republic of China is far more likely to end up in the Soviet camp than become a partner of the free world, his views on the strategic importance of Taiwan are persuasive.

Briefly, Wego sees the line from Singapore to Japan as America's western front line of defense. Taiwan is essential to Japan's security, just as it was in World War II. Beyond that, Taiwan holds the key to naval superiority in the South China Sea and the Indian Ocean. The Soviet fleet, to Wego's way of thinking, is not going to be much of a threat in the South China Sea if the Americans are operating out of Taiwan.

The trouble is that we are not, and on our present course we are not likely to deploy forces there again. Taiwan has become a curious sort of never-never land in our Pacific strategy, such as that is. Our statesmen and politicians beat a steady path these days to Peking, meanwhile making clear our determination to avoid any military association with the Communist regime. Presumably, one of the attractions we have for the People's Republic, and they for us, is our mutual distrust of the USSR. And, also presumably, our military power is a very important part of our attractiveness to the Red Chinese, since their own military capability is so limited. At this point, then, it might be worth wondering why we cannot assert a continued interest in the military importance of Taiwan as a keystone in our Pacific strategy and thus in the best interests of everyone who is worried about the Soviets.

The Short and the Long Run

It is difficult to come away from Taiwan, in these days of the Chinese Republic's diplomatic limbo, with any clear vision of the island's future. For the most part, Taiwan is run by the Nationalists who came over from the mainland thirty years ago. The military is still dominated, in the senior ranks, by mainlanders, although there is now one rising army general who is native Taiwanese. The fact remains that of the 17,000,000 ethnic Chinese on Taiwan, plus the 200,000 or so Taiwan aborigines, only 2,000,000 are mainlanders. Given the inexorable facts of death and birth, the mainlanders are a fast shrinking minority. In a decade or so, Taiwan will be populated once again by people who have never seen mainland China, barring the occasional refugee from communism.

True enough, the government of Chiang Kai-shek and now of Chiang Ching-kuo has done a great deal to-

Taiwan-designed and -built trainer, the turboprop T-CH-1.

ward bringing the Taiwanese closer to mainland China. For one thing, and it is a very big thing in a China where the variety of spoken dialects has traditionally been the bar to communication, the Republic of China has made Mandarin the single language taught in the schools. Just, in fact, as the People's Republic has done on the mainland.

The government in Taiwan has gone to great lengths to preserve Chinese culture and traditions, again a significant move toward closer ties with the mainland Chinese. It is interesting to contrast this with the Taiwan the Japanese ruled for more than forty years, a period that left a discernible mark on Taiwan in the form of public buildings that are unmistakably Japanese. During that occupation, a high percentage of Taiwan's population was literate in the Japanese language. These past thirty years have seen most of this Japanese influence erased, but it is worth remembering that it has been only thirty years or so since the Chinese side of things has come to the fore.

Still, the people on Taiwan are Chinese, no matter how long ago their ancestors left the mainland. The seventeenth century hero, Koxinga, a sort of Chinese Alexander the Great who died, like Alexander, at an early age, drove out the Dutch and declared the island a part of China. A great many Taiwanese families can trace their family origins to Koxinga's time, an observation that raises an interesting parallel in our own history and a question as well. When did our British ancestors cease to think of themselves as British?

In the short run, there seems to be no reason to worry about either the security or the prosperity of Taiwan. These people have a discipline and a desire for the better things in life that seem to assure them of success in a world grown increasingly lazy and noncompetitive.

By and large, the people seem as happy as people anywhere, and more satisfied with their government than, say, we ourselves are with our own. True enough, the government of Chiang Ching-kuo is an autocracy with democratic trimmings, but it is a benevolent autocracy, and President Chiang Ching-kuo appears to be both genuinely popular and unobtrusively protected as he mingles with the populace. The whole business of security on Taiwan is extremely low-key and discreet. The young people are as uninhibited in criticism of their elders as are the young anywhere else in the world. There is, admittedly, considerably more discretion shown in the press.

All of which leads us nowhere in predicting the future of that beautiful island. Sooner or later, there will have to be a change. If, as Koxinga decreed and both Chinese governments now proclaim, Taiwan is a province of China, then that, presumably, must be its future. Then again, considering the tenuous connections the vast majority of Taiwanese have with mainland China, maybe not. It is just one of those things that time, and Chinese wisdom, will have to work out.

Meanwhile, we have some shorter-term matters to ponder—matters that have to do with our position in the western Pacific in the face of a crumbling Southeast Asia, a worrisome situation in Korea, and an ever-more aggressive Soviet Union as it asserts itself in the Kuriles, Vietnam, and throughout the area. Taiwan, whatever its long-term future, would seem to have an essential part to play right now in keeping our side in the game. Somehow it does not make sense to think of those splendid air and naval bases on Taiwan shunned by the United States, especially when we remember that the people of the Republic of China remain, no matter how we have recently behaved, among our best and truest old friends. ■

The XC-2 twin turboprop transport prototype is powered by Lycoming T-53 engines, which are also used in the T-CH-1 trainer.

At Otis AFB in Massachusetts, this phased array radar—as tall as a ten-story building—looks out 3,000 miles over the Atlantic Ocean. A second, identical radar will soon be operational at Beale AFB in California. Together, they comprise the Pave Paws early warning system.

Designed and constructed by Raytheon for the U.S. Air Force's Electronic Systems Division, Pave Paws will provide rapid detection and characterization of a submarine-launched ballistic missile attack on the U.S. mainland. The two dual-faced radars—employing the most advanced solid-state, phased array technology—also monitor satellites in orbit.

On Shemya Island in the Aleutians, another large phased array radar, Cobra Dane, collects data on Soviet missile development flights. Cobra Dane, also designed and constructed by Raytheon for the Electronic Systems Division, performs early warning and satellite tracking as well.

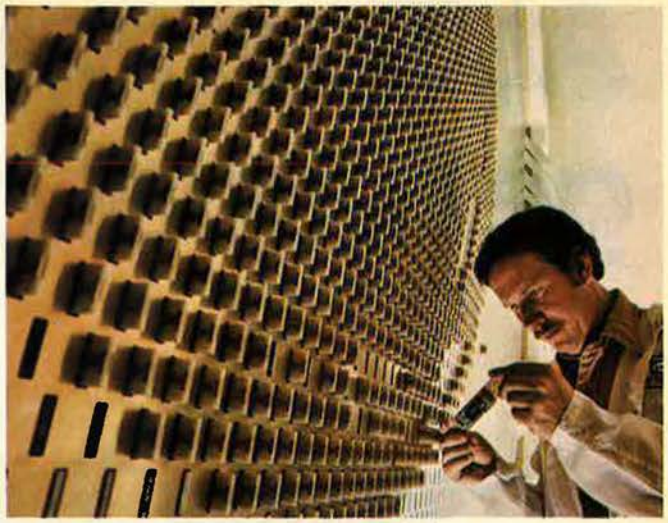
In Puerto Rico, the Raytheon-developed Wide Area Active Surveillance radar (WAAS) will handle mission control, event reconstruction, and range safety at the Atlantic Fleet Weapons Training Facility. And, as shown in the smaller photograph, Raytheon is designing a multiple target instrumentation radar (MIR) for test, evaluation, and training. Capable of tracking up to 16 targets simultaneously, MIR will provide

Pave Paws: a new long-range lookout for early

a new range instrumentation capability for the U.S. Naval Air Systems Command.

Early warning, intelligence gathering, range instrumentation, long-range surveillance and tracking... prime examples of Raytheon's continuing leadership in phased array radar technology. For more details, please write on your letterhead to Raytheon Company, Government Marketing, 141 Spring Street, Lexington, Massachusetts 02173.

RAYTHEON



warning.

At Sperry, older aircraf
get equal billing with th

For the B-52 . . . Sperry's controls and displays subsystem (CDS) will be the major control center for the offensive avionics system. The system, part of a B-52G and H updating, consists of two 10-inch cathode ray tube displays, a display electronics unit, digital scan converter, video recorder and two integrated control keyboards.

The display electronics unit is used for control and supervision of weapon delivery and navigation display processing and presentation. The two keyboards, located at the radar navigation and navigator stations will control the system in conjunction with the navigator's management and presentation panels.

Boeing B-52

the F-102 . . . like the B-52, is also getting a new lease on life, thanks to Sperry Flight Systems. At our modification center near Phoenix we're changing the role of the fighter interceptor to that of a target drone — the PQM-102 (shown above). The Air Force contracted for the conversion of 145 aircraft, including options.

Capable of up to 8g maneuvers and operation through the full performance range of the F-102, the PQM-102 is a realistic afterburning target used in Air Force weapons system training.

Sperry has a long history of drone conversion work, from B-17s and B-47s to F-104s and T-33s.

the AH-64 . . . Hughes' advanced attack helicopter also counts on Sperry Flight Systems technology. We're providing the digital automatic stabilization system, including the digital backup fly-by-wire control system, a digital symbology generator for cockpit displays, and the entire multiplex data bus system, which integrates the TADS/PNVS with the aircraft fire control system.

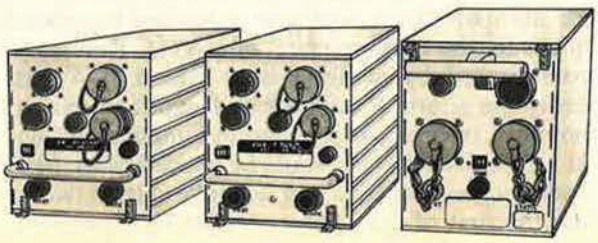
ike the B-52 and F-102 newer F-15 and AH-64.

If you'd like to join our military marketing or engineering team, write to Professional Employment (MS), Sperry Flight Systems, Box 21111, Phoenix, AZ 85036.

McDonnell Douglas F-15

the F-15 . . . is equipped with three major Sperry systems, including the attitude and heading reference system, an air navigation multiple indicator and digital air data computer.

the F-16 and F-18 . . . are also equipped with Sperry's digital air data computers. And for the F-18, Sperry builds the magnetic memory disc for the Hughes radar system.



F-15, F-16, and F-18 Digital Air Data Computers

the KC-10A . . . will have an advanced digital fly-by-wire refueling boom control system designed and built by Sperry. The system, proven in more than 1,400 hookups between a KC-135 and a variety of aircraft, allows the boom operator to "fly" the boom into optimum position for aerial refueling.

and for several fighters . . . Sperry is producing a three-inch threat warning indicator, incorporating a three-inch cathode ray tube display. It's one of three CRT systems in production for the military at Sperry.

It's easy to see why the military services and airframe companies alike turn to Sperry for avionics systems. We're attuned to the needs of the defense industry because *we understand how important it is to listen.* We're Sperry Flight Systems of Phoenix, Arizona, a division of Sperry Rand Corporation.

SPERRY
FLIGHT SYSTEMS

Armor troops from Fort Hood, Tex., disembark at Ramstein AB, Germany.

JOINT DEPLOYMENT AGENCY GOES TO WORK

Drawing on Readiness Command's years of experience, and drawing space and people from it, a new agency focuses the planning for deployment of US forces and continued support once they arrive.

BY ALLAN R. SCHOLIN

A NEW military organization has been formed at MacDill AFB, Fla., to improve procedures for rapid reinforcement of US overseas commands in exercises or an emergency. It's called the Joint Deployment Agency (JDA) and operates as a component of the Joint Chiefs of Staff.

JDA is located in the headquarters building of the United States Readiness Command (USREDCOM) at MacDill. It draws on REDCOM's command personnel to augment its staff. Basing and administrative support are shared with REDCOM.

The new agency also benefits from USREDCOM's long experience—dating back to 1961 when its predecessor, the US Strike Command, was created—in planning for deployment of CONUS-based Army and Air Force general-purpose combat forces.

JDA not only has assumed responsibility for that function, but also coordinates deployment planning with Navy and Marine Corps forces.

Army Gen. Volney F. Warner, USREDCOM Commander in Chief, is also Director of JDA. His Vice Director is USAF Lt. Gen. Charles C. Pattillo, who had been General Warner's Deputy CINC at USREDCOM and made the switch to his new job merely by changing the title on his door.

(General Pattillo was succeeded in his USREDCOM job by his twin brother, Maj. Gen. Cuthbert A. Pattillo, who had been Deputy for Plans, J-5, at USREDCOM. To distinguish the brothers, JDA and USREDCOM staff members refer to them, unofficially, as 3-P and 2-P, for the number of stars each wears.)

JDA's Chief of Staff is Rear Adm. Karl J. Christoph, Jr., the first Navy flag officer at MacDill since USREDCOM replaced the Strike Command in January 1972.

A total of 126 officers and enlisted members of all services are being transferred to MacDill to serve in JDA, about eighty percent of whom are to be on board by January 1. USREDCOM has shifted ten people to full-time duty with JDA. Another 110 USREDCOM personnel are, like General Warner, "dual-hatted," serving JDA as well as USREDCOM.

USAF Gen. David C. Jones, Chairman of the Joint Chiefs of Staff, has indicated that the decision to create JDA grew out of lessons learned in the JCS worldwide command post exercise, Nifty Nugget, late in 1978. That exercise included all elements of the Defense Department and other federal agencies having a significant role in a national mobilization.

"The Nifty Nugget results," General Jones reported to Congress in his Fiscal Year 1980 Military Posture statement, "have confirmed my judgment that we have a great deal of work to do in order to update our near-term capability to mobilize, deploy, and sustain our combat forces."

JDA is directly involved in the latter two capabilities—planning the deployment of combat forces and assuring their continued support.

General Jones visited General Warner at MacDill last fall to check on progress in forming the agency, and JDA has set up a liaison office, to be headed by a Navy captain, in the JCS.

Needed: More Air- and Sealift

Before being assigned to USREDCOM and JDA, General Warner commanded the Army's XVIII Corps at Fort Bragg, N. C., where he was in charge of molding elements of the 82d Airborne Division to team, as necessary, with Air Force, Navy, and Marine Corps units in forming a rapid-reaction force to cope with contingencies outside the NATO area.

At JDA, he assumed responsibility for coordinating the planning of all services in deploying and sustaining this rapid-reaction force. The events of recent weeks in the Middle East and elsewhere have kept the lights burning late at JDA Headquarters.

But turbulent and tragic as these events may be, the major share of JDA's workload is devoted to coordinating plans for the reinforcement of NATO. That planning is complicated by a factor over which JDA has no control—the shortfall in airlift and sealift to match the numbers of troops and tonnage of supplies and equipment NATO leaders feel would be needed from the US.

Under present schedules, it will take at least two years before the first of the Military Airlift Command's C-5s

Gen. Volney F. Warner, USA, CINC USREDCOM and also Director, JDA.

Lt. Gen. Charles C. Pattillo, USAF, Vice Director, Joint Deployment Agency.

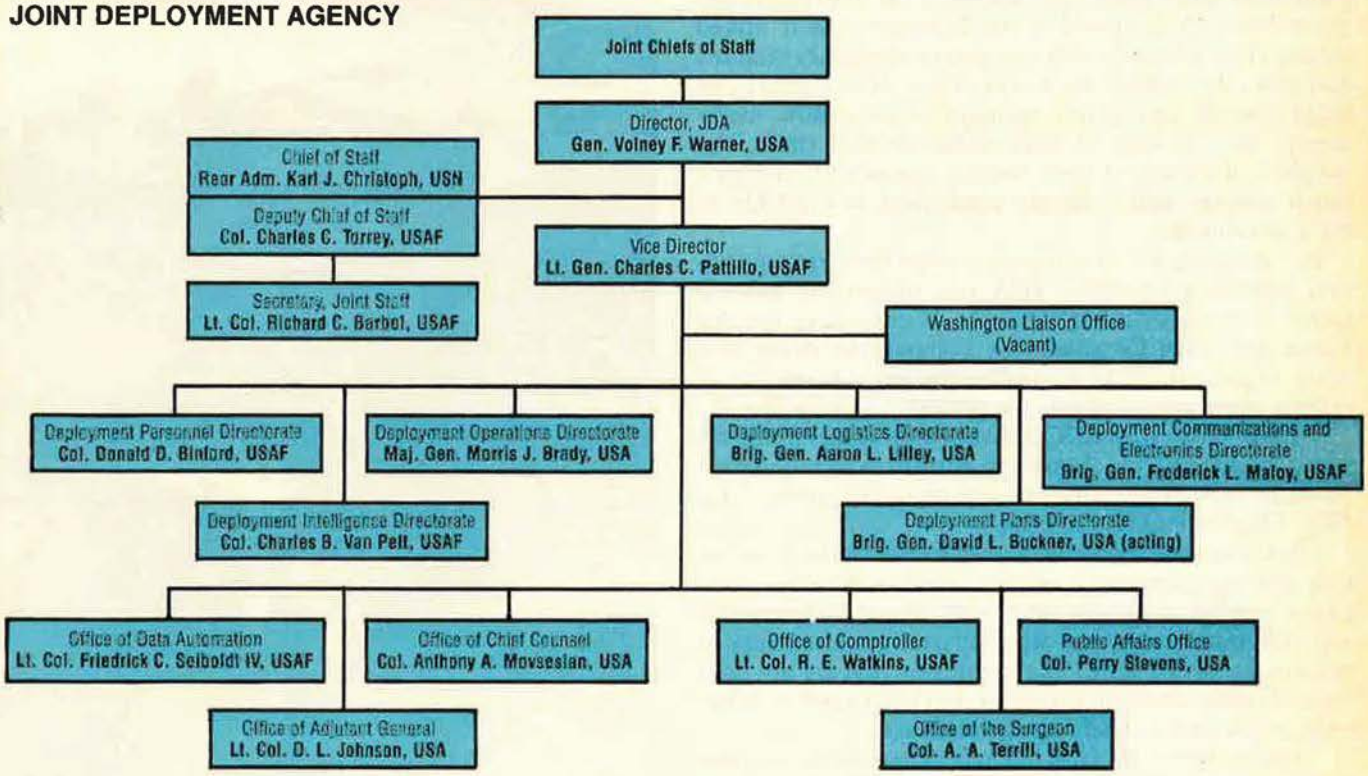
Rear Adm. Karl J. Christoph, Jr., USN, Chief of Staff, JDA.

can be fitted with new wings to carry their full design payload and extend their service life to 30,000 hours from 8,000 hours at present. Meanwhile, C-141s are being shuttled through Lockheed's Marietta, Ga., plant, which is stretching fuselages to provide thirty percent more cargo space and adding an in-flight refueling capability. The first "stretched" C-141 was delivered to MAC in December.

These C-141Bs will provide a much-needed increase in airlift. However, sealift shortages are of even greater concern, because more than ninety percent of combat equipment and supplies for deployed forces will have to move by ship. A JCS summary of airlift and sealift resources appears on p. 54.

Besides adding Navy and Marine Corps deployment planning to its responsibilities, JDA works closely with the Transportation Operating Agencies—MAC, the Navy's Military Sealift Command, and the Army's Mili-

JOINT DEPLOYMENT AGENCY



As of October 10, 1979

In the unwieldy headings for JDA's major directorates, the second word in the title is the key to its function. Thus, the directorates are comparable to the J-1 through J-6 directorates in most unified commands, while the other staff offices are self-explanatory. Of those shown in this chart, only the Vice Director, Chief of Staff, Deputy Chief of Staff, and the JCS Liaison Officer are directly assigned to JDA. All others are dual-hatted, serving in the same capacity with both USREDCOM and JDA.

Allan R. Scholin writes widely on aviation subjects. He served more than thirty-one years on active and reserve status in the Air Force before retiring as a colonel in 1973. He was an Associate Editor of this magazine from 1962 to 1968, then served as special assistant to the Public Affairs Officer at US Readiness Command, MacDill AFB, Fla., until 1977. Now retired from government service, he lives in—and writes from—Tampa, Fla.

tary Traffic Management Command. Senior officers from each are assigned to JDA to provide first-hand knowledge and liaison with their parent organizations.

Keeping Current Electronically

The master computer at USREDCOM headquarters, now used jointly by JDA, already contains detailed plans developed by USREDCOM with overseas commanders and JCS for deployment of Army and Air Force units, including the forces required, logistic support, routes to and from the target area, and resupply and reinforcement.

Under USREDCOM those plans were normally reviewed, or "massaged," every two years, or whenever it was necessary to update them for participation of CONUS-based forces in contingency operations or joint/combined exercises overseas.

JDA, however, intends to maintain constant surveillance over each deployment plan. That includes frequent review of designated force structures and availability of transport covering at least the first fifteen days of each planned operation.

The computer is tied in with the World-Wide Military Command and Control System (WWMCCS) Intercomputer Network centered in the Pentagon and is linked through that network with computers at military stations and posts throughout the world. Thus, JDA staffers can determine at any given moment exactly how many people are on duty in deployable combat units, the weight and cubage of their combat equipment, and how much support and resupply equipment is available in their warehouses.

By "plugging in" to computers at the three transportation operating agencies, JDA can obtain the current status of transportation available. It can query the Air Force Logistics Command or comparable Army and Navy organizations to determine the exact inventory of critical spare parts and other supplies on hand or due in.

"In the past, USREDCOM relied on force status reports supplied by the Army and Air Force to requisition airlift or other transportation for deploying units," Lt. Gen. Charles Pattillo explained.

"But when the transport planes arrived to pick up the unit and its equipment, it often turned out that the anticipated number of people or the equipment to be moved was different because of other mission requirements or inaccurate supply data. The result was that we not only wasted transportation resources, but had to call on other units elsewhere to make up the shortage.

"Today, however, JDA has access to reliable information that enables us to tailor our transportation requirements exactly to the seats and cargo space we need."

Such data is essential to JDA in developing deployment and reinforcement plans with the staffs of overseas commanders in chief.

JCS charges those CINCs to start the planning cycle by preparing, or updating, specific operations plans. A key element of each plan designates what kind of combat units are deemed essential to augment the plan, and when and where those units should arrive—known in JCS parlance as Time-Phased Force Deployment Data.

At JDA, the detailed and specific analysis of forces, resupply, and transportation needs is conducted primarily by the Deployment Plans Directorate, assisted by the Deployment Logistics Directorate and other staff agencies. They coordinate directly with the supported CINC. If, because of other commitments or shortages of equipment or transport, the forces requested by the supported CINC are not available in the required strength, JDA consults with the overseas commander to work out an alternate solution that meets with the latter's full approval.

When the JCS also approve, the plan is published, copies sent to all concerned, and data fed into the JDA computer. Whenever anything happens to change the plan—for example, a designated unit leaves its home station for a training exercise, or MAC diverts a C-5 to the factory for overhaul, or a ship earmarked for a resupply mission is transferred to another run—JDA immediately consults with the supported CINC to come up with a suitable substitution.

The project officer who handled most of the spadework

At left, troops of 1st Bn., 66th Armor, from Fort Hood, Tex., watch their duffel bags unload at Ramstein AB, Germany. The unit flew there on a no-notice exercise carrying only their personal equipment and individual weapons and wearing standard combat clothing. They then drew their major combat equipment and vehicles from storage. Photo above shows the unit with its M-60 tanks en route via rail and motor convoy to a training site, where it functioned for thirty days.

in drawing up the JDA organization is USAF Col. Charles C. Torrey, now the agency's Deputy Chief of Staff. We asked Colonel Torrey what would happen if JDA's omniscient computer should be put out of action, perhaps by sabotage or a bomb.

"Everything that's stored in our computer is available somewhere else," he replied. "If ours should go out for any reason—or if something in its memory should be inadvertently erased—we can readily reassemble the information. Meanwhile, there are alternate sources available—at WWMCCS, in the transportation operating agencies, and at major military command headquarters—that give us adequate backup."

Three Stages of Deployment

Colonel Torrey is also the action officer on the Joint Deployment Systems Users Group, chaired by General Pattillo and composed of representatives of the JCS, unified and specified commands, each of the services, transportation operating agencies, and designated DoD departments. The group will meet about twice a year, Colonel Torrey said, to iron out differences in terminology and procedures and to develop recommendations for improving deployment planning.

Last month, JDA and USREDCOM conducted a shakedown command post exercise (CPX Brisk Ride), to test their respective roles in staging a joint readiness

exercise. Because almost half of the JDA staff also works for USREDCOM in their dual-hat status, a major purpose of the CPX was intended to identify and resolve any confusion in this relationship.

"We don't want any unnecessary overlap in our respective responsibilities," Colonel Torrey said. "But we don't want anything to fall through the crack, either."

General Pattillo noted that JDA's procedures will soon be tested in other JCS-directed exercises in CONUS as well as overseas, including Reforger/Crested Cap NATO reinforcement exercises and combined maneuvers in the Republic of Korea.

"Ideally, I suppose one could say JDA's goal should be to plan to deploy just what's needed to attain a military objective—no more, no less," he observed. "Unfortunately, in combat or not, there are too many unknowns and unforeseens to enable us to plan as accurately as that. Our objective really is to plan deployments so that the forces and their equipment arrive on time, with confidence that their support and resupply needs will be met.

"As we see it," he added, "deployment of forces to NATO really falls into several stages. First, it's not too difficult when you know what you've got and where it's going. TAC fighter squadrons, including those of the Air Guard and Reserve, are prepared to move. They've already staked out their bases in Europe. Similarly, the first two Army divisions earmarked for NATO will be flown over and will draw equipment that's prepositioned in Europe."

The second stage, he said, presents a few more problems in moving tanks and heavy weapons from Stateside posts to the ports and rounding up ships to cross the Atlantic.

"The problems are probably more complex at the other end—unloading the ships as fast as they come in, marrying up troops with their equipment, and clearing the roads and rails to move them into position."

In Southeast Asia, he recalled, it was far more difficult to get ships unloaded than it was to load them at US West Coast ports.

"Some of those ships waited a month or more to get into Saigon or Cam Ranh Bay," he said. "In Europe, port facilities are far more efficient than in Southeast Asia, but the military must share those facilities with goods going into the civilian economy.

"Of course, if we get into the third phase—planning and carrying out deployment operations after war erupts and with a full-scale mobilization and industrial buildup here at home—that's when our people will need all the skills, teamwork, and ingenuity we've assembled in this deployment team.

"But if we can do the job right in the first two phases, and make an aggressor think twice before launching an attack, we pray we won't ever have to face the third." ■

WHAT THE JOINT CHIEFS SAY ABOUT MOBILITY FORCES

United States Airlift Forces

The military strategic airlift force comprises 304 long-range aircraft. In addition, the U.S. civil airline industry has committed 113 long-range cargo and 96 long-range passenger aircraft to meet defense needs during an emergency. These commercial aircraft are managed through the Civil Reserve Air Fleet (CRAF) program.

Several recent mobility analyses indicate that the number of passenger aircraft currently committed to the CRAF program will not meet rapid reinforcement requirements. The Department of Defense is currently working with the Department of Transportation and the commercial airline industry to obtain additional CRAF aircraft to meet deployment requirements. . . . JCS staff studies have also identified that the current strategic airlift force does not provide sufficient cargo capability to meet deployment needs.

To reduce cargo delivery shortfalls several airlift improvement programs have been initiated, including stretching the C-141 fuselage and adding an inflight refueling capability. . . . Stretching the fuselage by some 24 feet equates to approximately 90 more C-141 aircraft without an increase in aircrews, airplanes, or operating costs, and will increase each C-141's ability to carry oversize cargo by approximately 30 percent. . . .

A new [C-5] wing has been engineered and is undergoing testing to increase its useful life from 8,000 to 30,000 hours. This wing modification program will provide U.S. forces with a continuing capability to deploy complete fighting forces to distant areas.

Inclusion of cargo convertibility in new widebody commercial passenger aircraft to accommodate the movement of oversize cargo further enhances capabilities to deploy combat forces, and is a cost-effective way of increasing oversize airlift capability without acquiring new aircraft. . . .

In addition to the long-range aircraft of the strategic mobility force, there are also 594 medium- and short-range military tactical aircraft which are used primarily to move forces within a combat theater.

This tactical airlift force has performed well, but the vast majority of this fleet is rapidly aging and will reach the end of its economic service life in the early 1980s. In addition, the current tactical airlift assets can carry only about one-third of the basic combat equipment items found in the Army division. . . .

Sealift

Military Sealift Command (MSC) resources include Department of Defense-owned ships and ships under charter. This fleet consists of six cargo ships and 21 tankers under direct ownership, and 27 cargo ships and six tankers under charter by the MSC. . . .

As in the case of airlift, the Department of Defense relies heavily on commercial sealift assets to augment government controlled resources in times of need. The privately owned ocean-going U.S. merchant fleet consists of 268 tankers and 303 cargo carriers. Of the 303 dry cargo carriers, 284 are considered suitable for carrying military equipment and supplies.

The Department of Defense, supported by the Maritime Administration . . . has developed a Sealift Readiness Program by which privately owned U.S. shipping companies contractually commit selected vessels to meet defense transportation requirements. Currently, 54 breakbulk, 46 container, and five Lighter Aboard Ship vessels are included in the program. As a result of a recent public law, ships receiving certain construction or operating subsidies must be offered for enrollment in the Sealift Readiness Program. Thus, an additional 85 dry cargo and 76 tanker ships were offered to the program in FY 1979. Twenty percent of these ships can be made available within 10 days of notification, an additional 30 percent between 11 and 30 days, and the remainder within 60 days.

In addition, Maritime Administration maintains the National Defense Reserve Fleet. Based at selected East, Gulf, and West Coast ports, this element of sealift consists, in large part, of 149 dry cargo breakbulk ships. These ships are mainly of World War II vintage, have no assigned crews and are in various conditions of serviceability. . . .

The biggest potential augmentation to U.S. sealift capabilities in the event of a NATO-oriented emergency would come from the other NATO countries. At the May 1978 Washington meeting of NATO heads of state, a pledge was made by the allies to provide 600 NATO flag ships to carry cargo from U.S. ports in support of the NATO defense. . . .

—Excerpted from Appendix B, United States Military Posture for FY 1980, prepared by the organization of the Joint Chiefs of Staff.

While our NATO allies remain aloof, they and the US are increasingly dependent on oil from an area of expanding Soviet influence.

The Threat From NATO's Blind Side

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

WHAT has been fairly clear for some time has, by now, become painfully clear. The Mideast is, for us, the most essential and most vulnerable part of the globe. We cannot live without the Mideast lifeline, at least not in our accustomed manner—nor can we do much about it when things go wrong there. We are singularly without the kind of influence a great power is supposed to have: Diplomacy without military strength is, as it has always been, an exercise in futility. It is no secret to anyone that we have precious little military strength in the troubled Middle East.

That is not to imply that we should have used force to deal with the rabble in Tehran. Once the mob came through the embassy gate, there was nothing to do but negotiate and hope. But since our evident weakness seems to have been a factor in this Iranian caper, as well as the ones in Pakistan and Afghanistan, we had better begin thinking about the future. Since our military is pretty much in hock to NATO, any discussion of the future disposition of our forces must take into account the Alliance.

Understandably enough, our European allies live in terror of an oil embargo, a fact that accounts for their low profile whenever any sort of Mideast trouble crops up. Hence, it is convenient for them that NATO's southern boundary is the Tropic of Cancer, a line that ends these days, so far as NATO is concerned, at Africa's west coast. A while back, when Portugal was trying to hang on in Angola and Mozambique, the Tropic of Cancer became a happy excuse for NATO to avoid entanglement in her Portuguese ally's colonial wars.

Well, the colonial wars are long since over, and now NATO faces new and grave peril in a region south of its declared area of responsibility. On the other hand, the Warsaw Pact, uninhibited by NATO's need for prolonged debate and consultation, has made South Yemen, an impoverished land, its newest member in fact, if not in name. South Yemen, now ruled by a Marxist authoritarian government, has little going for it except geography, but in this case that is quite enough.

Weapons far beyond the technical capability of the South Yemenis are beginning to pour into that backward country. Aden, a British stronghold in the great days of the Empire, is now a Soviet naval and air base. There is another major Soviet air base under construction to the northeast and within striking distance of the Saudi Arabian oil fields. The Warsaw Pact, in short, has arrived at the most critical and vulnerable point in the world while NATO continues to be preoccupied with the defense of Central Europe.

The humiliation we have suffered in Iran is, judging by the brief but similar affair in Pakistan, just the beginning of a new and troubled era for the United States and hence for its allies. And if we are in trouble, then they—like it or not—are also in trouble. There can be no credible military alliance, at least not one designed to deter the Soviets, without United States participation and leadership.

We have seen how difficult it is for us to react to a Mideast crisis. Subic Bay in the Philippines, our nearest naval base, is a week's steaming away from the Arabian Sea, even assuming a carrier is available. Carriers are, like all our weapon systems these days, in short supply and overcommitted. And while tanker-supported, land-based air forces can deploy far more rapidly than carriers—the spectacular two-day shifts from places like North Carolina to Thailand demonstrated that clearly enough during Vietnam—the problem lies in where to put those forces when they get there and, for that matter, where to set down along the way. It is a problem that has always been rightfully brought out by seapower disciples as a justification for carriers. So long as the discussion centers on transitory situations, it is hard to counter that argument for the carrier.

The Mideast situation, however, is nothing transitory. We are going to be facing the threat to our oil supplies from now on. With the effective move of the Warsaw Pact to South Yemen, the threat is now just as real—as formal, if you will—as the threat to the North German Plain or to Norway. The inference seems clear. We, the NATO nations, need a legitimate tie to the Middle East, one that would allow for the orderly, fast deployment of forces through the Mediterranean into friendly, and preferably allied, bases. ■

Although some difficulties lie ahead, officials describe current Air Force maintenance readiness as "excellent," and are confident that it will remain so into the foreseeable future . . .

AIR FORCE MAINTENANCE— Issues and Challenges for the Eighties

BY MAJ. GENE E. TOWNSEND, USAF, CONTRIBUTING EDITOR

MORE than three centuries ago, George Herbert, the author of *Outlandish Proverbs,* set down an aphorism that is no less applicable to military affairs now than it was in 1640:

> For want of a nail the shoe is lost; for want of a shoe the horse is lost; for want of a horse the rider is lost; for want of a rider the battle is lost; for want of a battle the kingdom is lost.

Today, if the Air Force were called on to defend US national interests in a major war, it probably would enter battle outnumbered, thousands of miles from its home bases, and in the midst of a modernization program that leaves it with a mix of new and old systems. It can't afford to have any of its "winged horses" out of the battle for want of maintenance, since maintenance, along with operations and logistics, forms the triad of combat capability.

The current state of maintenance readiness is excellent, according to Brig. Gen. Waymond C. Nutt, Director of Air Force Maintenance and Supply, Hq. USAF. "Few people in the Air Force work harder or under greater demands than maintenance people. Their ability to get the job done has been demonstrated repeatedly during simulated combat exercises, deployments, and periods of national emergency."

However, ensuring that Air Force maintenance readiness stays high is presenting difficult challenges for those responsible for this effort. Recent discussions with people in the Directorate of Maintenance and Supply underscored some reasons why this is so.

The span of control in keeping the vast array of systems in a good state of repair is awesome. Scattered across more than 100 Air Force installations at home and abroad is a weapon system inventory of some 9,200 aircraft, 40,000 engines, 1,054 strategic missiles, thousands of conventional and nuclear munitions, and a wide assortment of electronic, avionic, and communications equipment. The global nature of the mission plus the unique responsibilities in fielding a combat capability require that the Air Force support two broad and complex categories of maintenance: base, which is done at operational installations throughout the world; and depot maintenance, performed at five Air Logistics Centers, the Aerospace Guidance and Metrology Center, and by more than 700 contractors in the US and overseas. The total cost is between $5 billion and $7 billion annually.

Recently, the Air Force radically altered maintenance procedures for the tactical air forces. Until about three years ago, Air Force base-level maintenance, supporting all weapon systems, was grouped under a common philosophy called "centralized" maintenance. How-

Maintenance personnel prepare an A-10 to test an imaging infrared tracking system over the Baumholder Range in Germany.

ever, some studies done under the Maintenance Posture Improvement Program by the Tactical Air Command concluded that centralized maintenance wasn't the most effective method for the tactical air forces. Consequently, the Air Force decided to implement a decentralized maintenance concept for those forces; hence, USAF currently uses two maintenance management systems—centralized and decentralized.

Maintenance and other support costs are initially high for a new weapon system. When the system matures, these costs stabilize. However, as a system ages and begins to experience wearout, reliability decreases and maintenance and other costs begin to increase. In the near term, most Air Force systems are going to fall either in the "high-cost, front-end" area—the F-15, F-16, or Air-Launched Cruise Missile, for example—or, like the B-52, in the "high-cost, tail-end" category. Systems used beyond their intended service lives must undergo modifications and additional repairs to ensure reliability and safety. These two factors—modification and modernization—are putting the Air Force in a serious budget squeeze.

Technology needed to maintain the multitude of weapon systems in the Air Force inventory ranges from the vacuum-tube type representative of the late forties and early fifties, to the microcircuitry common today. As one Air Staff official put it, "This means that maintenance personnel must train and work in two different worlds." In addition, rapidly changing technology is causing some programs to be developed and put into the field with incomplete or "blue-line" technical data. This results in increased repair actions and maintenance man-hours.

Currently, there is a sizable shortage of experienced maintenance officers in the grades of captain through lieutenant colonel. The Air Force is also finding it difficult to retain high-quality experienced personnel in the enlisted ranks. This problem is expected to continue for the next several years.

Despite these challenges, General Nutt remains optimistic. "Air Force maintenance is good—I cannot think of a better way of expressing it," he says. But what of the future? Maintenance policy is a cooperative effort with inputs coming from the Air Staff, the major commands, and field units. General Nutt doesn't believe there will be many changes in maintenance policy in the immediate future; rather, he thinks it is time to review the progress already made. "We are looking for a period of stability to allow us to consolidate initiatives of the past several years. Future changes will be incremental rather than radical departures from the present way of doing business," he said. One of the "radical departures" was, of course, the recent switch of the tactical air forces from a centralized to a decentralized maintenance philosophy.

History of Air Force Maintenance Concepts

Air Force officials point out that, regardless of the weapon system, type of munition, or piece of electronic-communications equipment, Air Force maintenance generally falls into the categories of base level or depot; and centralized or decentralized.

The primary objective of Air Force maintenance has always been to ensure maximum self-sufficiency at base level. The majority of all equipment failures are repaired at the base, where maintenance is done primarily by military people to support the operational mission of the wing. Flight-line crews inspect components, service aircraft, munitions, and electronics, and adjust or replace damaged parts. Repairs requiring more specialized equipment; or those that may be more difficult, such as modifying damaged or unserviceable parts, engine inspec-

tion and repair, or corrosion prevention and control, are sent to the shop for "intermediate" maintenance.

Work requiring still more extensive shop facilities and equipment, or personnel with greater technical skills than normally found on a base, is performed at an Air Force Logistics Command depot or contracted out to an industrial facility. Depot maintenance normally consists of major modification or inspection of equipment, modernization or conversion of systems, or overhaul of engines and components.

Centralized Maintenance

While Air Force officials agree that these maintenance practices, established in the early 1950s, have withstood well the test of time, the organizational structure and philosophy upon which they were based has not. After trying a variety of procedures over the years, in 1970 the Air Force attempted to standardize all base-level maintenance under a program called "Rivet Rally." The objective was to produce an organizational arrangement, and develop procedures that would apply across the board for aircraft, engines, avionics, strategic and tactical missiles, munitions, and communications-electronic systems. Rivet Rally was later extended into the centralized maintenance procedures described in Air Force Manual 66-1, and implemented throughout the Air Force.

Under this concept, base-level maintenance is consolidated under deputy commanders for maintenance for each major operational mission area. In other words, depending on the wing/base mission, there is a deputy commander for maintenance of aircraft, communications-electronics, and ICBMs, as required. Basically, this provides for a centrally controlled dispatch system and consolidates the decision-making authority. Until about three years ago, the entire Air Force was organized under this centralized system. Today, the major

Because of the different missions of the various commands, some Air Force officials began to question in the mid-1970s if centralized maintenance procedures were best for the entire force....

commands using it include the Strategic Air Command (SAC), Military Airlift Command (MAC), Air Training Command (ATC), and Air Force Systems Command (AFSC).

Decentralized Maintenance (POMO)

Because of the different missions of the various commands, some Air Force officials began to question in the mid-1970s if centralized maintenance procedures were best for the entire force, particularly the tactical air forces. These forces have two unique requirements: They must be able to deploy quickly, and rapidly generate a high sortie rate. In 1974, the Air Staff tasked the Tactical Air Command to review its maintenance procedures in light of these requirements. TAC concluded that centralized control, scheduling, and direction of maintenance yielded neither the best potential for high sortie generation, nor quick deployment. The result was that TAC developed and tested a new maintenance concept called POMO—"production-oriented maintenance organization."

During 1975 and 1976, POMO was tested by the F-4 wing at MacDill AFB, Fla., and on F-15s at Luke AFB, Ariz. Following the tests, TAC recommended that POMO be adopted. The Air Staff agreed. It also was tested by and approved for the Pacific Air Forces (PACAF), the Aerospace Defense Command (ADCOM), the Alaskan Air Command (AAC), and recently for US Air Forces in Europe (USAFE). PACAF finished implementing POMO in January, AAC in April, ADCOM in June, and TAC in October 1978. It is expected that USAFE will finish implementing POMO in August 1980. *(For related information, see* AIR FORCE *Magazine, January 1979, "POMO and POST: Keystones of TAC's Readiness.")*

In contrast to a wing organized under centralized procedures with four aircraft maintenance squadrons, a wing using POMO has three. The aircraft generation squadron has maintenance specialists to perform the "on equipment" work necessary for producing sorties. The component repair squadron does the "off equipment," or shop maintenance, on avionics and engines. The equipment maintenance squadron maintains aerospace ground equipment and performs major aircraft inspections. It also builds up and stores munitions and does "off equipment" repair of guns and pylons brought into the shop. So far, Air Force officials are pleased with POMO's results. Its three main advantages are:

- It increases sortie production largely because of new procedures that train technicians to work in more than one specialty and perform common crew-chief duty such as launching, recovering, and towing aircraft.
- It simplifies the complex specialist dispatch system used in centralized maintenance by assigning specialists near or on the flight line. Now, those responsible for maintaining the aircraft work in close proximity to each other and the aircraft for which they are responsible.
- It decentralizes the decision-making authority under the deputy commander for maintenance, putting increased responsibility in the maintenance squadrons. Important decisions are now made by the squadron officers and noncommissioned officers responsible for sortie production.

Depot Maintenance

Complementing the base-level efforts is a massive depot maintenance program, managed by the Air Force Logistics Command, at five Air Logistics Centers (ALCs) and the Aerospace Guidance and Metrology Center. The ALCs are located in Ogden, Utah; Oklahoma City, Okla.; Sacramento, Calif.; San Antonio, Tex.; and Warner Robins, Ga. The Guidance and Metrology Center is at Newark, Ohio. Each year, these depots repair more than 3,000,000 items valued at nearly $6 billion. In general, Air Force officials estimate that an item can be repaired and returned to service by a depot for about fifteen percent of the repurchase cost. They also estimate that of all annual equipment failures, about twenty-six percent are repaired at a depot, and sixty-six percent in the field. The remaining eight percent are listed as nonrepairables.

Depot maintenance usually covers the large dollar items such as major repair and modification of aircraft, strategic and tactical missiles, engines, guidance systems, and other components requiring more capability than normally is found at a base. This work is done either at an AFLC facility, contracted out to private industry, performed at a depot of another service, or by special teams deployed to an operational site.

For example, using "man-hours of effort," Air Force officials estimate that in Fiscal Year 1980, about sixty percent of Air Force depot maintenance will be done at an AFLC facility, thirty-six percent contracted out, and four percent done in a depot of another service. Normally, depot maintenance at an AFLC facility is performed for Air Force mission-essential programs. Contract depot maintenance augments the mission essential workload, and also assists with the more routine, nonmission-essential work. In short, the objective is to attain the best possible combination of depot, contract, and interservice maintenance to ensure the readiness posture of the Air Force.

The Air Force Logistics Command *Depot Maintenance Annual Report* for FY '78 notes that the annual depot workload runs into the millions of man-hours, with thousands of aircraft, missiles, engines, munitions, and other components and equipment being repaired. A few of the major on-going or recently completed programs include:

- The Minuteman motor refurbishment program, replacing rocket propellant and linings that have deteriorated with age;

• The C-141 stretch program, increasing cargo capacity by extending the fuselage;

• The B-52G and -H Egress program, providing the capability for safe ejection at low speeds and altitude; and,

• The C-5 forward and aft ramp modification program, to prevent accidental opening of the ramps.

Last year, aircraft repairs, including inspections, modifications, major overhauls, and technical assistance, accounted for about thirty percent of the total depot work. Repair of components, avionics, ground communications and electronic systems, guidance and control systems, and other items accounted for about fifty percent. In all, the Air Force is spending more than $1.5 billion in Fiscal Year 1980 on depot maintenance, with the figure expected to rise due to inflation and the increased requirements for modifying and modernizing the force.

The Air Force Logistics Command is upgrading its facilities and equipment and through its Quality Assurance Division provides a central point to monitor maintenance trends. However, some initiatives are simply a return to basics. For example, turbine vanes for jet engines formerly were discarded when cracks and erosion caused tolerances to be exceeded. The cracks are now filled and vanes are reshaped and heat-treated—all for about twenty-five percent of the cost of a new part.

Personnel/Training

The maintenance career area is one of the largest and most diversified in the Air Force with maintenance people assigned to installations throughout the world, many in remote locations. It takes about 4,000 officers, 160,000 enlisted people, and 50,000 civilians to maintain all the aircraft, missiles, munitions, and electronic systems. Although most of the civilians work at the AFLC depots, about 14,000 are employed in the field. Based on USAF's estimated Fiscal Year 1979 end strength of about 811,000 military and civilians, almost twenty-eight percent of the work force was doing maintenance on Air Force systems.

In addition, the military and civilian manpower documents show dozens of specialty shredouts. A few examples show the size and complexity of the personnel force dedicated to Air Force maintenance. In the largest grouping of enlisted specialists and technicians, the Air Force needs about:

• 43,000 for Aircraft Maintenance.

• 38,000 for Aircraft Systems Maintenance.

• 24,000 for Avionic Systems Maintenance.

• 24,000 for Wire Communications-Electronic Systems.

• 20,000 for Munitions and Weapons Maintenance.

• 3,400 for Maintenance Management Systems.

• 2,500 for Training Devices.

• 2,100 for Strategic Missile Maintenance.

Meeting these requirements is a tough challenge for Air Force recruiting and technical training programs. Air Force officials expect that the experience level for both officer and enlisted maintenance specialists will continue to drop in the years ahead. For example, about thirty percent of Air Force maintenance officers currently are lieutenants. That figure is expected to reach about forty percent in a few years.

On the enlisted side, the percentage of first-term airmen is expected to continue at about sixty percent—far from an ideal situation. The maintenance career field in general is, however, adequately manned if low in experience. General Nutt believes that the major problem is the grade imbalance created by the shortage of experienced personnel. "We would be better off to have a better mix of grade and experience, but we have to do the job with what we have and I am confident that we can," he said. He notes that Air Force recruiting and training programs are working well to minimize the problem.

General Nutt points out another complicating factor—the subtle shift in the backgrounds of young recruits. "In 1960, most of the force came from so-called 'blue-collar,' mechanically oriented backgrounds. Today, it is estimated to be only about fifty percent. We are starting with a young man or woman with less mechanical background than before," he said. Increased specialization requirements are also impacting on recruiting and training programs. "We have forty-two different entry level specialists for aircraft maintenance, all of which must be trained differently."

General Nutt notes that working under two maintenance philosophies, coupled with the variety of weapon systems and mission differences among the command creates a complex training and working environment for maintenance technicians. Therefore, the Air Force is trying to standardize job requirements by skill and weapon system. "This will be the foundation on which our formal and base training programs will be structured. It should improve relevancy, interface among systems, and minimize retraining. The major commands are also putting considerable effort into base-level on-the-job training programs, emphasizing task training on actual hardware, in a real world environment. It is costly, both in terms of personnel and equipment, but it is a cost we must accept," he said.

Current Initiatives

There are no current maintenance innovations as sweeping in scope as the recent switch by several major commands to POMO. However, a few initiatives being worked in conjunction with the Air Staff, major commands, and field units include:

• Pacer Dot—the relocation of F-4 depot maintenance facilities from Taiwan to Kimhae, Korea;

• Reduction of paperwork—to lessen the documentation burden on

"Few support areas in the Air Force contribute more to the operational mission—and more directly—than maintenance. The people are good at their jobs."

—Brig. Gen. Waymond C. Nutt, USAF

technicians;

- Rapid Aircraft Battle Damage Repair—a program to have teams ready for quick deployment upon warning, or after outbreak of hostilities, to repair battle-damaged aircraft;
- Diagnostic Systems Approach to Troubleshooting—a program using a master computer along with a diagnostic test set to systematically consider all possible faults of a unit, and help reduce human error;
- Agile Aerie Mobile F-15 Avionics Shelter—a system to deploy with the aircraft, providing proper electrical power and environmental control for F-15 avionics maintenance equipment;
- Dedicated Crew Chief—designed to prepare a select group of individuals for a stabilized, long-term career as a crew chief, wedded to a particular aircraft, and to serve as a single point of contact for maintenance of that aircraft; and,
- Air Force Specialty Code Consolidation—an attempt to redress the balance of training between first termers and the rest of the career force and consolidate maintenance skills wherever feasible.

The record backs General Nutt's judgment that Air Force maintenance is "good." Late in calendar year 1979 Air Force accident rates attributable to maintenance causes were substantially lower than a year ago, and lower than originally projected. "We are looking hard for trends in the maintenance and material areas to even further reduce these accident rates," he said.

"Few support areas in the Air Force contribute more to the operational mission—and more directly—than maintenance. The people are good at their jobs. There's no area in the Air Force that requires its people to work longer hours or under more difficult circumstances. Remember, when relaxing at dinner tonight, or going to bed, there are thousands of maintenance people around the world working on aircraft flight lines, or in maintenance shops to ensure that the Air Force is ready," General Nutt stressed. ■

Officers returning voluntarily to USAF active-duty cite their missing the "Air Force way of life" and job satisfaction as important factors in the decision to return. Their important contribution to offsetting the loss of rated and scientific officers is . . .

THE OTHER SIDE OF RETENTION: THOSE WHO RETURN

BY ED GATES, CONTRIBUTING EDITOR

GREAT numbers of Air Force pilots, navigators, and engineers have shed their uniforms during the past two years. The reasons range from what some viewed as "Mickey Mouse" practices to lures of high-paying civilian jobs.

Many of them may regret their decision to depart. At least, that's the experience of hundreds of former active-duty officers who left USAF, mostly during the mid-1970s. They want back in, and the Air Force is accommodating some of them. As of two months ago, 478 had returned, and more were en route. Those being accepted, after careful screening, are stepping back into rated and other jobs vacated by more recent departees and, according to their responses in official and nonofficial surveys, are liking it just fine. Here are some examples:

- "Approximately three months after I separated, I began to regret my decision," a 1975 departee declared recently, shortly after USAF okayed his recall bid and returned him to active duty.
- "I have been homesick for it [USAF] ever since I left," said another. "No matter where in the USAF I went, I was never a stranger. Besides the sense of belonging, the Air Force gave me pride and a sense of purpose," he added.
- "My wife and I both missed the Air Force way of life, the camaraderie, and working with others toward a common goal," reported a third.

Line Officer Critical Skill Losses

Type	FY '78			FY '79		
	Pilot	Nav	S&E*	Pilot	Nav	S&E*
Separations	1,439	330		2,012	530	
Retirements	728	473		837	565	
Deaths, Disability, etc.	137	55		89	35	
	2,304	858	836	2,938	1,130	875
	Total '78: 3,998			Total '79: 4,943		

*Losses not categorized

These responses are typical of scores received by the Air Force Military Manpower and Personnel Center (AFMMPC), Randolph AFB, Tex.

The returnees, most of whom say they intend to make the Air Force a career, are definitely needed. In FY '78, the service lost nearly 4,000 pilots, navigators, and scientists and engineers (S&Es), mostly to separation and retirement. Last year, the exits jumped to 5,000, a figure that included about 3,000 pilots *(see accompanying chart for details)*.

Going into FY '79, the Air Force still enjoyed a pilot surplus. But the large losses together with a reduced annual training rate of only 1,050 new pilots resulted in a shortage of nearly 1,400 pilots by the end of September 1979. Navigator and S&E manning remained in serious trouble also.

Officer recalls were almost nonexistent until two years ago. "Once out, forever out" (except for mobilization) is the way the services "closed personnel system" has worked. Hardly a flexible one, critics have noted.

A huge recall, voluntary and involuntary, did occur during the big buildup of the Korean War period, and limited recall openings remained for some years thereafter as USAF personnel strength held close to the 900,000-mark. But th manpower drawdown got rolling 1969 and continued through mid-1970s.

Far from asking former officers tc return, the Air Force was bulging with excess people, particularly pilots, and swamped with AFROTC graduates. The response was a series of "early release" programs and heavy pressure on retirement eligibles to check out.

In the late 1970s, however, the signals changed. Pilots began leaving in far larger numbers than had been expected, many heading for the airlines. Air Force navigator retention also skidded, and S&E requirements rose sharply.

All this triggered USAF's FY '79

recall program. The service flashed the word to former officers, mainly captains in their late twenties and early thirties, and convened five separate recall boards. More than 1,460 applications poured in, of which 782 were approved. Of these, 478—mostly pilots and S&E types, but including more than 150 nonrated officers in various support skills—accepted the invitation, and 304 declined.

For FY '80, now under way, two more recall boards have met and two more will convene soon. Of the first 139 selected, ninety agreed to return and only nine declined. Responses from the others were due in shortly. For the entire year, the Air Force expects to pick up 237 recallees and at least 120 more in FY '81. So the opportunity to step forward still remains for other separatees of recent years, who deep down inside want to return.

The need for pilots is likely to remain critical for some time. The latest pilot loss rate, according to end-September 1979 figures from Hq. USAF, show that for every 100 pilots now in their sixth year of service, only twenty-six are expected to be around by their eleventh year. That's worse than just six months earlier when the projection called for thirty to still be in uniform.

The recent decline in airline hiring may ease the bind just a bit, Hq. USAF officials say, and they also report that new applications for separation and retirement have slowed. But overall, "the retention outlook in FY '80 is a continuation of the FY '79 trends," they said.

New pilot production, meanwhile, is rising to 1,575 this year and will continue upward each year until FY '85, when 1,890 new pilots are projected to enter the inventory.

Numbers, of course, don't tell the whole story. What really hurts is the drop in the experience level throughout the officer corps. The Air Force Military Manpower and Personnel Center puts it this way: "Withdrawals of middle management, experienced rated officers from support skills to fill rated shortages will cause the Air Force to man these skills with new lieutenants, most of whom are inexperienced (some do have enlisted experience). In fact, by end-FY '80, we expect thirty-six percent of the manning in support skills to be lieutenants with less than four years of experience as officers." These lieutenants-to-be are being recruited in near record numbers, including 10,800 this year and next for Officer Training School alone.

Why They Come Back

What about the quality of the recallees? Do they measure up to USAF's traditionally high standards? Or are they marginal types who can't make up their minds? Are they returning only because of the job security? Or because they can't hack it outside?

"We're pleased with the caliber of our recallees," one Hq. USAF personnel planner told AIR FORCE Magazine. Another, noting that the latest group of seventy-one returnees includes just twenty-eight pilots, said, "We could use more pilots." Of the recallees in general, he said, "They look good."

Backing up this feeling is data gleaned from a heretofore unpublished survey. The AFMMPC at Randolph recently contacted the FY '79 recallees, asking their reasons for separating, their experiences in civilian life, reasons for wanting to return to the Air Force, and the influence their wives and children exercised on the decision process.

The typical respondent, the survey found, was a thirty-one-year-old captain, a 1970 OTS or ROTC graduate, married, who separated in 1975. About half hold bachelor's degrees only, the rest master's, except for ten who have earned doctorates.

The most frequently cited factors prompting their original separation were lack of control in the assign-

What Makes a Career Pilot?

While the service continues to lose far too many pilots, most of those who consider themselves true careerists have a positive, pro-Air Force attitude, according to a special study of 2,150 pilots from one unidentified "flying command." As a group, Hq. USAF reports, career pilots:

- Have greater job satisfaction than noncareer pilots, have a stronger feeling of accomplishment, and are less attracted to airline job opportunities (half as many career pilots as noncareer flyers).
- Have families who strongly support their decision to make USAF a career (four times as often as other families) and express more pride in their spouse's career.
- Have a stronger feeling of accomplishment from their Air Force jobs and feel more secure about their future (twice as many career pilots as noncareer ones).
- Are more confident that the OER system is administered fairly and equitably and attach less significance to the belief that additional duties more strongly influence their OERs than do flying duties.
- Are satisfied with weapon systems they have flown. More than twice as many career pilots as noncareer pilots would accept a return to their previous assignment.

ment process and the perceived attractiveness of civilian employment. The latter, the survey revealed, included job opportunities, geographic stability, freedom in decision-making, and higher pay. For rated personnel, "little flying time and the inability to fly one's entire career" were also cited.

Air Force and civilian work experience were contrasted, the survey reporting that the former came out far ahead. The level of job satisfaction experience in the Air Force was noticeably higher than in civilian employment. "Level of responsibility, upper management leadership and supervision, and working relations" were also rated as better in the Air Force.

What specifically motivated their bids for return to active duty? The survey revealed that for pilots the most frequently mentioned was "an opportunity to return to flying duties," followed by "the attractiveness of the Air Force 'way of life.' " Other factors prominently mentioned were career and educational opportunities, pay and financial security, and a good assignment offer. Travel opportunities, the retirement program, and Air Force benefits also were cited.

Interesting results surfaced with regard to the families' role in the decisions to leave and return. The majority, the Air Force reported, were agreeable in both instances. Fifty-two percent said their families supported the decision to separate, thirty-seven percent were neutral, and only eleven percent were opposed. On the other hand, sixty-five percent supported the decision to return, five percent opposed it, and the remainder were neutral. These findings, Air Force officials said, "confirm the important role played by family members in the decision process."

The average recallee reported that his civilian salary was in the $15,000–$20,000 range, though some made much more. And a handful were unemployed. Nearly one of every five reported holding a management job, ranging from running a restaurant to personnel manager for a major railroad to president of a gas and oil company.

Thirteen percent of the survey respondents were in sales, real estate, insurance, purchasing, and comparable positions. One of every eight was an engineer, while nearly nine percent were closely connected with aviation—as airline, commuter, or charter pilots, air traffic controllers, flight instructors, or crop dusters. Still others were stockbrokers, bank tellers, loan officers, computer analysts, lawyers, policemen, dairymen, and so on. There was even a deputy sheriff.

The single most important factor cited for returning to the Air Force was "to fly." Money and pay, travel, retirement, and job satisfaction were high on the list of "other significant factors" prompting return *(see opposite page)*.

Some recallees expressed concern about winning a Regular commission (those who were Regular officers and left had to give up that status and take Reserve commissions). Not surprisingly, the recallees are intensely interested in winning their promotions. A handful said they would consider their readopted career with the Air Force "a success" only if they made a star or two, but most settled for "lieutenant colonel or higher."

The AIR FORCE Magazine Survey

AIR FORCE Magazine, meanwhile, conducted a small survey of its own, directed at fifty officers, rated and nonrated, mostly captains with around ten years of service. This was a random group, scattered throughout the service and including a few recent recallees. Most, however, had no break in service.

We asked the recallees, "Why did you return to the Air Force?"

We asked those who had remained in uniform, "Why, when many of your associates are leaving, are you staying in?" and "Do you plan to stay until retirement?"

For the recallees, the responses resembled those prominent in the official AFMMPC survey. Job satisfaction, importance of the mission,

He Came Back

"A little more than four years ago, while I was on active duty, a friend approached me with a civilian job offer which was . . . tempting. With nearly ten years of service and never having been dissatisfied with any aspect of Air Force life, the decision to leave or stay was an extremely difficult one.

"In the end, I decided to leave active duty. . . . It soon proved to be the worst decision I ever made. The 'big bucks' my friend offered did not last long for the corporation went into bankruptcy within a year. I then got a job in an aviation-related company with an excellent salary. I also joined the Air Force Reserve and the combined income far exceeded that of an active-duty captain on flying status.

"Yet, here I am back on active duty when money was the reason I chose to leave in the first place. Why? I missed the Air Force. I had become tired of working with people only interested in the quantity of work accomplished rather than quality.

"If excellence, pride, self-esteem, and dedication are present, job satisfaction will most assuredly follow. These attributes are present in the Air Force, and they make it a great way of life for me."

—Capt. Robert L. Brooks
35th Flying Tng. Sqdn.
Reese AFB, Tex.

the Air Force way of life, and greater concern for the welfare of its people than in the civilian sector were typical reasons. The retirement system was also cited.

Some concern was also expressed. A thirty-one-year-old engineer, who separated in mid-1976 and thus had only four and one-half years of service at recall time, said, "I am concerned about how my break in service will affect my new career. I intend to structure my Air Force service so I will have experience applicable to a civilian job rather than experience applicable only to Air Force staff jobs."

Twenty-six officers—two lieutenants and twenty-four captains without a break in service—responded to AIR FORCE Magazine's questions on "Why I stayed in." Most said they have considered outside employment, but decided to stay with the Air Force because they like the jobs they've held, their associates, the different places Air Force life takes them, the mission challenge, and the security. Here are some typical responses:

- An operations officer, age thirty, and an OTS product: "I'm staying in because of three things: (1) job satisfaction, which allows a person to go home at night with a sense of accomplishment; (2) close association with the finest people in our society; and (3) the retirement system."
- A pilot with eight years of service, holding an MS in systems management and assigned to the Pentagon under the ASTRA (Air Staff Training) program: "I considered going to the airlines because the money looked great. However, I do not like the type of flying the airlines perform and am not extremely concerned about the extensive free time their pilots get, though these factors have been significant for many of my friends."
- A female, nonrated computer specialist, just twenty-six: "My initial commitment is not up, but I am seriously considering making the Air Force a career. The major factors for staying in are security, appreciation of my work by others, and reasonable promotion opportunity."
- An eleven-year service senior pilot: "There is no comparison in flying jobs. Flying low-level, high-speed, practice bombing missions in the FB-111A is considerably more exciting and challenging than monitoring the airliner's autopilot at 35,000 feet."
- An AFROTC distinguished graduate, a navigator about to complete his doctorate in math: "I plan a full career because I enjoy what I'm doing and feel I'm making a positive contribution." He, like several others, added that should pay and benefits become inadequate, he will review the situation.
- A seven-year service public-affairs officer in Alaska, nonrated, an MA holder: "I like what I'm doing and feel I'm performing a needed function."

Several officers in the magazine survey, though leaning strongly toward a full USAF career, conditioned their statements, saying they could change their minds if pay and benefits suffer more inroads. One ten-year service engineer said a worsening financial picture probably would send him packing. A pilot at Plattsburgh AFB, N. Y., warned against any tampering with the retirement system.

Such sentiments, of course, were to be expected. What may not have been expected is the large turnout of former officers who want their old jobs back. They and the sizable corps of talented officers who like what they're doing give the Air Force a couple of pluses in what otherwise has been a discouraging officer manning picture. ■

Career Motivators

For airmen, the "retirement system" remains the single most important factor influencing them to make the service a career. For officers, "my Air Force job" currently holds first place, followed by the "retirement system." These are among the findings of the latest Air Force-wide survey conducted in August 1979. Respondents listed many different first choices, including travel, opportunity to serve country, fringe benefits, Air Force policies, housing, and the promotion system. However, the top eight and the percentage of respondents who named them are as follows:

Enlisted		*Officer*	
Retirement system	16%	My Air Force job	29%
Pay/allowances	14%	Retirement system	17%
Opportunity for training/ education	11%	Pay/allowances	11%
My Air Force job	8%	Promotion opportunity	7%
Security of Air Force life	7%	Opportunity for training/ education	6%
A voice in future assignments	6%	Security of Air Force life	5%
Travel/new experiences	5%	A voice in future assignments	5%
Fringe benefits	5%	Travel/new experiences	5%

Innovative thinking on a host of Air Force concerns spanning the gamut from space defense to the latest trends in forward air control characterized a recent Air Force Association Symposium . . .

Changing Strategies for a Changing World

BY EDGAR ULSAMER, SENIOR EDITOR

STRATEGIC deterrence based on the survivability of the strategic forces is apt to fall prey to technological advance before the end of this century and may be superseded by deterrence gained through "vigilance and knowledge." This drastic revision of strategic thinking was forecast by Air Force Secretary Hans M. Mark, keynoter of the Air Force Association's national symposium "New Defense Horizons: Changing Strategies for a Changing World," held in Los Angeles, Calif., October 25–26, 1979.

Over the long term, Dr. Mark suggested, the "technology to find things will become better, more rapid than the technology to hide things, and, therefore, the notion that stability comes from a strategic force which is structured to accept a strike may have to be abandoned." Citing as an example the hypothetical deployment by the Soviet Union of SS-16 ICBMs on the mobile SS-20 launchers—an eventuality "we fear"—Dr. Mark said that "right now there is no way for us" to cope with such a weapon in a timely fashion. But the technology "is clearly on the horizon" to track mobile systems on a real-time basis with the help of sensors permanently on station in geosynchronous orbit.

Another long-term adjustment in strategic doctrine may be necessitated by advances in antiballistic missile technology, which "has come a long way" since the SALT I ABM treaty was concluded in 1972. "There may come the time when we might want to reexamine the treaty and . . . our attitude toward . . . shooting down RVs [warheads] as they come in, either with directed energy weapons or with very actively guided projectiles of one kind or another," Secretary Mark said. From the premise that the development of technology is a continuing process, Dr. Mark argued that arms control also must be treated as an adjustable entity: "No agreement should ever be considered as permanent, just as no weapon system is ever permanent."

His tentative espousal, over the long term, of a strategic posture anchored in vigilance and knowledge notwithstanding, Secretary Mark rejected over the short term the widely propounded notion of launching the ICBM force "on warning." In the context of a strategic exchange, such a policy would fall outside the "realm of rational thinking" because of inadequate US attack assessment and other command and control deficiencies. The nation's current warning systems were never designed for this role, he stressed. The position of Defense Secretary Harold Brown on the issue of launch on warning is that "we want to get into a posture where we plant the seed of doubt in the minds of the Russians" about this country's willingness to launch its ICBMs on the basis of unambiguous information about an impending strike against them rather than lose the force to a Soviet preemptive attack. The ability to do so rationally can be acquired over the long term, Dr. Mark suggested, and "needs to be debated in public as a major issue of national policy."

Modernizing the strategic forces is not only the Air Force's but also the Defense Department's "first priority," Dr. Mark said, adding that the MX's basing mode "I hope will turn out to be salable and survivable."

Although management of the Space Shuttle program will "remain with NASA," operation of the system will involve the Air Force to an increasing extent, Dr. Mark predicted. Use of the Shuttle for such military objectives as reconnaissance "will evolve as a matter of course." Another space activity of growing importance to the Air Force is verification of arms-control agreements. "I want the Air Force to do [this], not somebody else," Secretary Mark stressed. He expressed regret that Congress and the public often do not appreciate fully the extent of USAF's involvement in verification.

Air Force Secretary Dr. Hans Mark stressed that modernization of the strategic forces is not only the Air Force's but also the Defense Department's first priority.

The Strategic Imperatives

The recent decision to go forward with the MX system was an "event of historical importance to the country [that] embodies a national commitment to maintain an unambiguously strong deterrent force, whatever the challenge. It meets the Soviet counterforce threat in a direct, head-on, and offsetting manner, without itself being destabilizing," Dr. S. L. Zeiberg, Deputy Under Secretary of Defense for Research and Engineering (Strategic and Space Systems), told the AFA symposium.

Pointing out that reaching a government-wide consensus on the MX system concept proved difficult, he said that varied and sometimes disparate viewpoints had to be accommodated: "Since many system design features were in conflict with some policy-oriented considerations, it is evident that we couldn't select the lowest-price technical solution while feeling confidence in its acceptability. Some argue we didn't select the best, but I submit we selected the optimum."

Dr. Zeiberg focused attention on what he termed "the seeds of a potentially divisive battle" that have been planted within the defense community over the MX basing concept. "We have," he asserted, "a sound conceptual design which is workable. What is needed is a fully coordinated industrial-government team effort to make it better and to lower its cost. We do not need hand-wringing, sour-grapes pronouncements, holier-than-thou and gratuitous statements, intellectual posturing, and so forth. All that can do is help opponents of the principle of an MX program [to] 'divide and conquer.' "

Dr. Zeiberg strongly contested claims by congressional critics that the MX "racetrack" basing mode could make the system unduly vulnerable to SLBM attacks. The MX system's "dash-on-warning" feature—the ability to move the weapon on its integral transporter/erector/launcher (TEL) rapidly from any one of the twenty-three shelters on the racetrack to any other—these critics claim could be used by the Soviets to trick the US into flushing the TELs. SLBMs launched from submarines standing offshore would then intercept the missiles while they are out in the open.

Except for one "extreme scenario, in which war starts with a bolt-out-of-the-blue attack, and our tactical warning systems tell us that there are 200 RVs targeted at the MX deployment area—rather than 5,000—" the dash-on-warning would not be used, according to Dr. Zeiberg. (An attack by 200 Soviet RVs against the MX system comprised of 200 ICBMs would indicate that the Russians had breached the security of the system and knew which shelters housed missiles and which were empty. Hence the need to move the missiles to different shelters.) But as Dr. Zeiberg pointed out, the US warning system also would warn of an overlapping, synchronized attack by SLBMs, which makes it possible to "stop on warning," that is, to dash into another shelter before the warheads of the SLBMs detonate. The eventuality of the Soviets pinpointing the 200 TELs within their 200 "racetracks," each consisting of twenty-three shelters, is so remote as to strain credulity, Dr. Zeiberg suggested, especially since in cases of crisis or doubt about "whether we can maintain position uncertainty of our missiles we would be moving them around at a far more frequent rate [than under normal conditions] until we fix the problem."

Dr. Zeiberg pointed out that even though MX could not reach full operational status before 1986, the "cost tradeoff" between the Soviets eventually acquiring the additional warheads need to put at risk all or most of the system's horizontal shelters and the US building additional shelters to thwart Soviet RV proliferation, favors MX. Once the MX program is in full swing late in the 1980s, "we will be in a position to build a large number of shelters quickly, perhaps about 2,000 per year." Also, by that time the US probably will have developed prototypes of mobile ballistic missile defense [BMD] systems that can accompany and protect MX, thus adding significantly to its intrinsic, high survivability. "I am confident we can keep the MX system viable over the long term," he declared.

The synergism of combining the mobile ICBM system with a mobile BMD weapon, according to Dr. Zeiberg, is not attainable through a marriage of the silo-based Minuteman force and missile defense. The tradeoff between the two approaches he said, has been "done, redone, and overdone." Only MX realizes the compounded benefits of multiple shelter basing and an overlay of mobile BMD weapons, he said.

The Defense Department official refuted, with equal conviction, claims that the Soviets might have or be close to developing a space-based ballistic missile defense system that could destroy the post-boost vehicle (also called the "bus") of MX before its ten warheads have been released. "I am not losing any sleep over the imminence of [such postulated] laser or particle-beam [weapons in] space. This is not something we need to worry about for a long time. The proponents of this technology are far more optimistic" than available scientific and engineering data justify, he said.

In a general sense, Soviet directed-energy weapons programs—in the main, lasers and particle-beam weapons—appear to be no further advanced than comparable US efforts. It takes a "great deal of creativity" to put the Soviets ahead of the US in directed-energy research and development, Dr. Zeiberg remarked. The evidence puts

Secretary Mark argued that arms control, like weapons technology, should be treated as an adjustable entity.

Dr. S. L. Zeiberg warned against infighting within the defense community that could jeopardize the MX program.

in serious doubt the potential of these technologies for strategic weapons use "by either side," Dr. Zeiberg reported. "There are concepts for using lasers for local defense—in the range of kilometers rather than hundreds of kilometers," but while such weapons might become feasible eventually, they still face a formidable hurdle: "It is still cheaper—even when allowing for projected improvements—to shoot .50-caliber machine-gun bullets than electron beams."

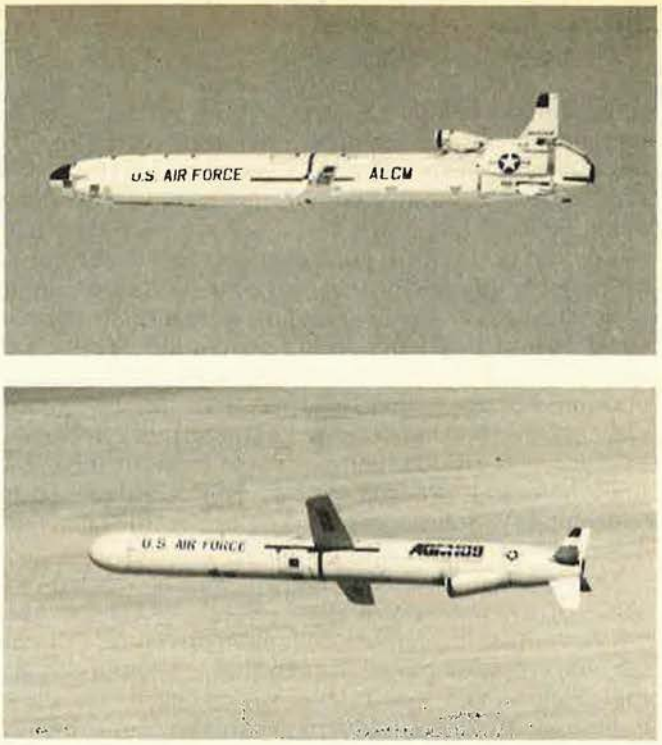
The Defense Department is satisfied with "technical progress of great significance" in regard to both the cruise missile and the Trident SLBM program, Dr. Zeiberg told the AFA symposium. "The Trident I missile, commonly called C-4, has completed what probably is the most successful test program we have ever had for a missile and is about to be deployed operationally in one of our SSBNs. We also launched the first Trident submarine earlier this year. This ship, the *Ohio,* will be commissioned about a year from now and will deploy on its initial operational patrol in the summer of 1981. The Soviets will have immense ASW [antisubmarine warfare] problems coping with these systems."

The cruise missile program, Dr. Zeiberg stressed, also "has been very successful, and we are on track leading to a late 1982 deployment on B-52s, a late 1983 deployment in a ground mobile mode in Europe, and a comparable IOC [initial operational capability] for sea-based versions. These deployments will markedly enhance our force posture. Our tests of the effectiveness of these cruise missiles lead me to believe that they make the Soviet air defense obsolete."

Dr. Zeiberg was less sanguine about the status of this nation's command control and communications (C^3) capabilities. " . . . We haven't moved out with a robust program to strengthen our strategic C^3 capabilities. We all are to blame here. The survivability and performance improvements we need dictate a departure from conventional thinking and proposals based on tweaking of existing systems. Novel schemes are needed—improved satellite survivability, survivable land lines, reconstitutable sensors and relays, dispersed and mobile critical nodes, to name a few."

Dr. Zeiberg, as well as other symposium speakers, expressed concern over Congress's refusal to fund USAF's proposed survivable strategic satellite (SSS) system, meant to operate at altitudes of about 110,000 miles (five times higher than geosynchronous orbits), and using two-way transponders. In part, the reason for Congress denying the Pentagon's funding requests for SSS may have been inadequate advocacy by the Defense Department and the Air Force, he suggested.

Among the most pressing concerns in the C^3 arena are space-based tactical warning and assessment systems, including "formulation and start of a program focused on replacement of the DSP [Defense Support Program, also called the Early Warning Satellite] system with one of far greater capability." Such an up-grading of DSP, he said, will pivot on mosaic infrared sensor arrays that stare rather than scan and, thus, like the human eye, can cover a panorama rather than scanning individual points on the earth's surface in the fashion of a searchlight. But Dr. Zeiberg also warned that—at least until the advent of the Space Shuttle—space will remain "an expensive place to do business [in], and in some areas we have jumped a little too soon." He cited specifically the DARPA-sponsored Teal Ruby mosaic infrared sensor program that is meant to detect the signature of aircraft and missiles from space. Teal Ruby, he said, is "an example of overly optimistic views of what we can do and [represents] a premature commitment" to building a space system without adequate background information.



Several speakers pointed out that the Soviets, at this time, would have great difficulty coping with either the Boeing (top) or the General Dynamics (below) version of ALCM.

There are "good ideas" around on how to deal with the so-called threat window that is expected to open wide when the Soviet Union, by about 1981 or 1982, will acquire an unambiguous first-strike capability against this country's ICBM force, Dr. Zeiberg acknowledged. "For example, stretching the FB-111s, if we have an extra five or six billion dollars; or backfitting our Polaris submarines—in process of being retired—with long-range C-4 missiles, again if we had an extra five billion dollars. There are other examples, but their price tags make it unlikely we will be able to swallow them without delaying more valuable programs for the longer term. Our inclination is to depend on the viability of the bomber and SLBM [components] of the triad during the expected difficult years of the early 1980s when Minuteman is in jeopardy, the reason being that we do not foresee threats to these legs during that period. However, in later years of the 1980s, we might see threats to them, so we had better get on with MX as fast as we can in order to preclude a situation wherein more than one leg of the triad is in trouble."

So far, important questions about the future of the triad's air-breathing leg have resisted solution, Dr. Zeiberg said. Some progress is being made on the issue of what constitutes an appropriate cruise missile carrier. By the time commercial derivatives are "modified to have the desired characteristics in the presence of the kinds of

threats we worry about, they offer no cost or performance advantage over a dedicated military aircraft. Variants of military cargo aircraft might be interesting, but the analysis is not yet convincing, and more work needs to be completed before we decide this point. Derivatives of the B-1 technology base have the desired features; however, there the questions tend to be cost-related."

Open questions remain also in regard to the nature and performance of a follow-on penetrating bomber, according to Dr. Zeiberg: "If I could trade five to six billion dollars of late 1980s money for near-term application, I'd weigh in for the FB-111 stretch. If I could round up more money, I would switch to derivatives of the B-1 technology, with suitable updating, since it offers better performance and can serve a dual role—bomber and cruise missile carrier. . . . We will be looking for a firm plan to evaluate B-52 life extension while developing prototypes for the shelf as backup, should the B-52 not be viable through the 1980s."

Yet another major concern in the area of strategic deterrence is caused by budget constraints that have prevented developing the large Trident II—also called the D-5—SLBM for the new Trident-class strategic submarines (SSBNs). The economics of the Trident SSBN, because of its very large launch tubes and over-all dimensions, depend on its carrying large SLBMs, Dr. Zeiberg said. Yet initially at least, Trident will have to be deployed with smaller C-4 SLBMs, "which by all standards is not the right thing to do." Complicating the situation, he explained, is the fact that "various exercises are going on to reassess the detailed design of the Trident sub and to see if there are significantly different alternative designs that would be more appropriate for us to pursue." While he said that the Pentagon is not likely to scale down Trident, in terms of overall size and size of its launch tubes, Dr. Zeiberg supported deferral of the D-5 program for another year, in light of present design uncertainties about the new submarine and present budget constraints.

CINC SAC Gen. Richard H. Ellis pointed at the need to "board up" the threat window of the 1980s.

CINC USAFE Gen. John W. Pauly called for improved all-weather and night capabilities for tactical airpower.

Provided that requisite funding were available, derivatives of the B-1 technology are the most promising candidates for a follow-on bomber, according to Dr. Zeiberg.

The Strategic Air Command's Requirements

The Soviets now surpass the US in a number of military capabilities and are generally equivalent in others because "we have simply been improving the old rather than discovering the new, and our once highly acclaimed lead in technology has all but disappeared in several key areas," SAC's Commander in Chief, Gen. Richard H. Ellis, told the symposium. Concerning the threat window of the early and mid-1980s, he suggested that "Congress—while recognizing the problem—is looking to the Administration for action and recommendations. I don't believe the situation has been defined precisely by the Administration—and if indeed it exists, as we believe it does—no recommendations have been [made] as to what to do about it."

General Ellis said that "the bomber is an established symbol of national resolve and can range the entire spectrum of conflict in every potential trouble spot in today's world and, more importantly, tomorrow's—such as the Persian Gulf, the African subcontinent, and the Indian Ocean. There are no sets of coordinates that a manned penetrator cannot reach. . . . Because there is a man in the loop, the unique advantages of the bomber over other systems are central to escalation control and keeping the threshold of nuclear war high."

General Ellis pointed out to the more than 400 industry executives, representing some 100 companies, attending the AFA symposium, that "if we are to retain the advantages of this weapon system, I believe there exists an urgent requirement for US aerospace industries to expand their horizons and give us the tools needed to fix the problems of the future. We need radical new advancements in aircraft design, composites, ECM [electronic countermeasures], and propulsion to keep the bomber economically and technically competitive." So far, he said, US industries "have not been motivated to pick up the gauntlet thrown by their counterparts in the Soviet design bureaus."

SAC, General Ellis said, sees a clear-cut need to redress near-term strategic deficiencies in order to "board up" the threat window of the early 1980s. The Command has recommended three programs "as offering the most cost-effective approach in the shortest number of years to offset this serious threat.

"The first is to modify 155 FB-111s and F-111Ds into

General Ellis reported that the Strategic Air Command has recommended that the E-4 Advanced Airborne Command Post program be expanded and accelerated to provide improved command control and communications support of the strategic forces.

more effective, stretched, and reengined FB-111B/C aircraft. In terms of available weapons, this modified bomber could add a retaliatory capability equal to about half of the entire Soviet SS-18 ICBM arsenal. After a thorough evaluation, the Air Force also has recommended the FB-111B/C as the most cost-effective near-term fix available."

SAC's second recommendation "is to reengine the KC-135 with modern, efficient turbofan engines. This would be equivalent to adding nearly 300 tankers to our inventory . . . a much-needed capability to support not only future strategic bomber mating, but also to meet growing requirements to support rapid, worldwide tactical deployments. These new engines will meet FAA noise and pollution standards as well as save large quantities of costly jet fuel," according to General Ellis.

SAC's third proposal "is to expand and accelerate the E-4 [Advanced Airborne Command Post] procurement program and related equipment. Such an action will provide the redundant and assured two-way communications, reliable warning and strike assessment intelligence, and automatic data processing that [are] needed for effective force management and escalation control before and after hostilities are initiated."

Acknowledging that the money for these programs must come from additional funds, he said that "the increase in defense spending called for by members of Congress and other prominent national leaders must be directed to those strategic efforts that will correct the serious imbalance that will confront us in the 1980s."

The importance of survivable command control and communications (C^3) to strategic deterrence is on a par with acquiring a new ICBM and a follow-on bomber: "If we can't execute these forces, new [strategic weapon systems] won't do any good. Submarines deployed off our coast . . . reduce our decision [time] to very critical levels. Our ability to classify an attack; to transmit that classification to proper authority; to receive a decision; to execute that decision; and to get that decision down to the forces takes time." Because a number of scenarios can be posited under which the US could not execute its strategic forces, SAC puts the development of survivable C^3 "at the top of our priorities," General Ellis said.

Although he agreed with Dr. Zeiberg that the Soviet air defense "of today would have great difficulty" in coping with the air-launched cruise missiles, he also suggested that by the time this force is fielded in operational numbers in the mid- and late-1980s, the Soviets "will be able to make a run on it."

USAFE's Many Challenges

Over the past year, the "Soviets have rolled nearly 100 modern fighter and reconnaissance aircraft off their production lines each month—that totals almost 1,200 aircraft in one year. . . . If we matched their recent efforts, I would be able to replace my entire USAFE combat force with brand-new aircraft every seven months," Gen. John W. Pauly, Commander of Allied Air Forces Central Europe and Commander in Chief of USAFE, told the AFA meeting. The number of MiG-23 Flogger units in Eastern Europe alone has increased by sixty percent, with most of these advanced swingwing aircraft going to the air forces of Warsaw Pact nations other than the Soviet Union, he added.

Over the past twelve months the Soviets also have increased the number of attack helicopter regiments in the forward area by about fifty percent: "Concurrent with these deployments, they have continued to upgrade their attack helicopters with improved weapons and other capabilities. By assigning them to the close air support mission, they can now free more of their fixed-wing aircraft to attack deep into NATO's rear areas," General Pauly said.

Advances in ground-based Warsaw Pact air defense are of special concern to USAFE: "Not counting hand-held SA-7s, there are nearly four SAMs in East Germany, Czechoslovakia, and Poland for every fighter and reconnaissance aircraft in [NATO's] Central region," according to General Pauly.

Soviet theater nuclear forces (TNFs) also are being

modernized and increased. All older generation TNFs are being replaced with new nuclear artillery and new surface-to-surface missiles. More than 100 mobile and reloadable SS-20 launchers—whose missiles deliver MIRVed payloads to ranges in excess of 3,000 kilometers—are in the field now and more are on their way, USAFE's CINC said. By combining these systems with nuclear-capable tactical aircraft and the Backfire bomber—which is coming into the inventory at a rate of about thirty per year—"the Soviets easily can reach all of Western Europe's rear-area targets."

Over the past year the Soviets also "have refined what is the largest and best-trained and -equipped chemical warfare force in the world. Warsaw Pact troops train regularly to wage chemical warfare—in many cases with awesome realism under toxic conditions. A variety of modern agents, multiple delivery systems, and a clear tactical doctrine for their use have been developed. While we are not certain when the Soviets would initiate chemical warfare or under what conditions, their ability to do so is undeniable," General Pauly said.

Rounding out the Soviet modernization drive are waves upon waves of new electronic warfare equipment, thus adding to the "overwhelming capability already possessed by the Warsaw Pact. Their concept of . . . 'radioelectronic combat' combines electronic warfare and reconnaissance resources with firepower to limit, delay, or neutralize our use of command and control systems. They already enjoy an overwhelming advantage in the number of airborne standoff platforms and ground-based jammers. In the latter case, the ratio is thirteen to one in their favor, and it is getting worse," according to General Pauly. The Soviet Union's "all-out production effort across the board" permits but one conclusion: "In spite of our efforts, the relative strength of the Warsaw Pact vis-à-vis NATO is increasing. While some still argue that the quality of Allied Air Forces provides an adequate balance to the Warsaw Pact's numerical superiority, I feel that the improvements they have accomplished place this premise in question," he said.

As a result of the Soviet buildup—compounded by US/NATO responses curtailed by economic and political factors—it is necessary that "we rethink some of the basic assumptions that guide the structuring of our defense capabilities. Our objective in Europe remains to be able to fight as far forward as possible, but we could not expect, at least in the near term, to overwhelm the enemy with materiel as we have in the past. There would be no time to mobilize our [production] resources once we were faced with a major conflict. Instead we must be able to rely on forces in being and seek alternative means to increase their effectiveness. . . . One of the most promising approaches is through the intelligent application of airpower—getting the most out of the resources we have," according to General Pauly.

A fundamental element of applying airpower intelligently is the ability to locate key targets under all-weather conditions and at night. He warned that "our ability to provide rapid detection, precise location, and sufficient coverage of targets under dynamic battlefield conditions is limited. With the exception of a relatively small number of U-2s and TEREC and SLAR systems, USAFE, and the rest of NATO, is restricted to nondata-linked photographic reconnaissance products. This builds in a time delay that can be very costly . . . in a fluid situation. Compounding the problem is the fact that only a limited number of our reconnaissance aircraft are capable of night operations." Hence the need is for more TEREC and SLAR systems over the short term while over the long term "the Precision Location Strike System (PLSS) and the TR-1 [an electronically sophisticated follow-on to the U-2] have the greatest potential to improve our capability."

Serious weaknesses also exist in the command control and communications area with the need for secure, survivable communications clearly one of USAFE's highest priorities, according to General Pauly. In light of the Warsaw Pact's vast arsenal of SAMs it becomes imperative to disrupt the enemy's radar net. Key here is acquisition of the EF-111 tactical support jamming system for both standoff and escort missions. An airborne communications jamming system to disrupt the enemy's command and control "is another badly needed improvement," General Pauly pointed out. Other related needs include more and better radar warning receivers and jammers for Allied aircraft and upgraded suppression capabilities, including improved antiradiation missiles and a real-time emitter and strike locator system to neutralize enemy defenses.

The ultimate measure of merit of airpower, General Pauly pointed out, is the ability to deliver proper weapons accurately and massively against the enemy regardless of weather conditions. "Work should begin now to upgrade our present capabilities to . . . attack enemy second echelon units, airfields, and other priority targets. . . . At present, our principal strength in this area is provided by the F-111, but there aren't very many of them. The scheduled addition of 'Pave Tack' F-4s in the near term and Tornadoes later on will help some, but won't solve the problem. We need more aircraft capable of attacking fixed targets, and we must develop the capability to identify and attack mobile targets." There also are deficiencies in the munitions needed to put the assigned targets out of business.

The extensive sheltering of Pact aircraft "has rendered them almost immune from conventional attack," according to the CINC USAFE. Consequently, he explained, "I have come to question the merits of directly attacking aircraft in shelters—the payoff just isn't there. What we must be able to do is deny the use of vulnerable runways."

Another principal munitions requirement hinges on current problems in USAF's ability to attack massed armor formations: "Obviously taking on tanks one at a time produces a situation in which the risks greatly exceed potential rewards."

A paramount, capping requirement "if we are to be able to pursue the battle to a successful conclusion is survival. Both our aircraft and critical sortie generation resources must remain intact. The high probability that our main operating bases would be attacked by a spectrum of weapons—including chemicals—argues strongly for increased emphasis" on enhanced survivability, General Pauly argued. USAFE is dealing with this challenge through an integrated program that melds "construction of shelters for our aircraft, the hardening of critical sortie generation resources, and rapid runway repair." While these measures will help, he said, there re-

mains a basic need to improve ground-based NATO air defenses including the expeditious introduction into the inventory of the US Army's Patriot surface-to-air weapon system. Ultimately, he added, "we must move away from the concept of dependence upon large bases with vast expanses of runways. Rather, we must complicate the enemy's targeting problem by dispersing our forces over wide areas. Achievement of this goal will require new STOL or V/STOL aircraft that can operate from battle-damaged runways and contingency strips."

An effective means for improving USAFE's capabilities is through augmentation by Strategic Air Command forces, including the latter's unique reconnaissance systems, General Pauly acknowledged. Similarly, SAC's tankers provide vital range extension for USAFE's fighters while the B-52s, which are "folded into our command and control systems and procedures," enhance the command's firepower significantly.

USAFE's Commander in Chief expressed concern over the long-term threat of SU-AWACS, the Soviet equivalent of USAF's E-3A AWACS, to this country's ground-launched cruise missile (GLCM) force. The Soviets are working hard on the SU-AWACS program and probably will begin fielding these systems within two or three years, he predicted. While it is unlikely that the Soviet systems, at the outset, will have the same high degree of look-down capability as the E-3As, he believes that over the long term their impact on GLCM would prove major.

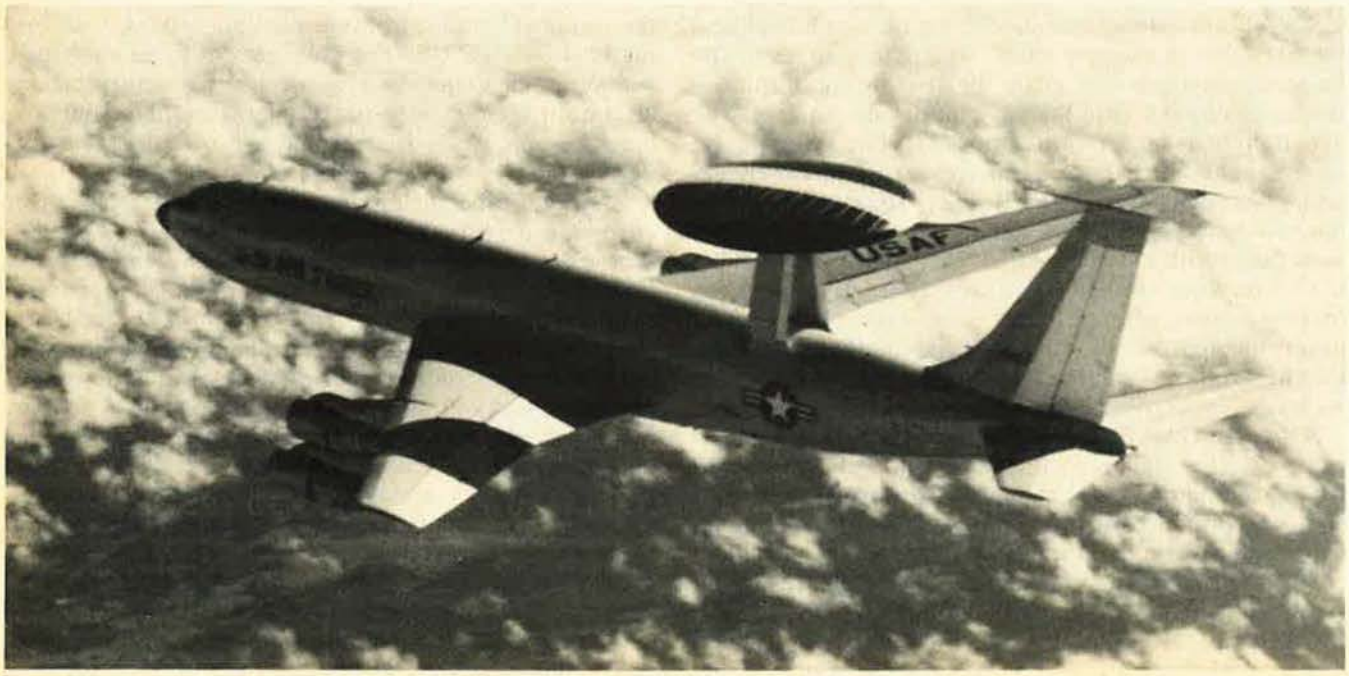
Studies and analyses carried out jointly by the Army and Air Force suggest that revisions in forward air control (FAC) doctrine are overdue, General Pauly told the AFA symposium. In the future, the airborne FAC is likely to be in a helicopter, while such traditional FAC aircraft as the OV-10 are likely to be reassigned to the role of radio relay and battle management. In what he termed an impending marriage of the A-10, Cobra, Huey, and OV-10, the latter becomes crucial because of the EW threat to ground-to-air and air-to-ground data links between the FAC and attack aircraft in the forward areas. Because of the Warsaw Pact's increasing ability to "jam us close to the FEBA" it becomes necessary to relay command and control information from ground sites situated safely in the rear of the battle area to the OV-10s, which then transmit these instructions to the attack aircraft.

One of USAF's pressing problems—ground defense of air bases—may be nearing a solution, General Pauly said. Providing base defense in Europe with USAF personnel would require about 10,000 troops and has been written off as too expensive. Agreements between this country and various NATO host countries appear to be near and hinge on some USAF-supplied base defense forces and mobilization of reserve forces and their assignment to this task by host countries, he predicted. In Britain, he added, a related requirement includes SAM defense of US air bases. Talks are in progress that could lead to assignment of the Rapier SAM system to this task, he said.

Birth of an Air Force Budget

The intricate ritual that takes USAF's budget from its inception to final approval by Congress was outlined by Lt. Gen. Hans H. Driessnack, the Air Force's Comptroller, for the AFA symposium.

The Air Force Board structure is the organization primarily responsible for developing USAF's budget. The initial impetus comes from twelve panels of Air Staff specialists that mate present and foreseeable threats to specific requirements, and affix priorities. Each panel is responsible for and staffed by experts in a particular area—such as strategic or tactical warfare, airlift, and so on—and reports to one or more special Air Staff committees. These three committees are the Force Structure Committee, the Operating Budget Review Committee, and the Program Review Committee. These committees, in turn, funnel their findings and recommendations to the Air Staff Board. The latter organization—chaired by the Director of Programs and comprised of the principal directors in all functional areas—serves as the primary ve-



hicle for developing the Air Force program and for setting the necessary priorities. The Board's recommendations are forwarded to the Secretary and the Chief of Staff of the Air Force.

The budget formulation process follows the procedures prescribed by a Pentagon-wide standard known as the Planning Programming Budget System, or PPBS, and involves iterative or back-and-forth patterns of recommendations and revisions. All planning exercises are preceded by action at the Joint Chiefs of Staff level, and are predicated on detailed threat analyses and joint intelligence estimates. The result of these joint studies is a series of planning documents for the development of forces and capabilities to deal with the threat forecasts. At this inchoate state, the force planning documents generally are not fiscally constrained.

The individual services use these documents in formulating their specific plans which are kept in phase with the Five-Year Defense Plan (FYDP) and shaped—in an iterative tradeoff process—by the Consolidated Guidance. The latter is being developed between the services and OSD's functional staffs and ultimately reaches the services as a formal document that is fiscally constrained and spells out how specific mission areas are to be dealt with. The next step is an internal programming process involving the Air Staff Board structure, during which the panels deliberate, the committees review, and the Air Staff makes decisions and sets priorities that lead to issuance of the Program Objectives Memorandum (POM).

The POM subsequently is subjected to back-and-forth reviews involving the functional staffs, the Secretary of the Air Force, and the Secretary of Defense. Culmination of this PPBS phase is issuance of an amended POM, which provides a definitive basis for the ensuing Air Force program, which is then priced out and represents the Air Force's "best estimate" for its budget submission. This document usually is submitted to OSD in September of each year and subsequently subjected to series of budget reviews by various elements of the Defense Department and the White House Office of Management and Budget. The product of this process is then submitted to Congress.

USAF's Comptroller, Lt. Gen. H. H. Driessnack.

left: Sophisticated sensor systems, such the E-3A AWACS, and eventually the -AWACS, represent a long-term threat to und-launched cruise missiles.

Revisions in USAF's and the US Army's forward air control doctrine are overdue, according to General Pauly, and probably will assign the role of a command and control relay system to the OV-10, currently used as a FAC aircraft.

Complicating budget formulation is the fact that usually the services are instructed to develop and submit several program levels—such as minimum, basic, and enhanced—which in turn are subdivided into several bands of program "prioritization." OSD—beginning this year in the form of a new organization, the Defense Resource Board, made up of the Deputy and Assistant Secretaries of Defense as well as JCS representatives—uses these "bands" provided by the services to come up with similar bands on a Defense-wide basis.

Running the Committee Gauntlet on the Hill

On Capitol Hill, the Air Force budget, as part of the Defense budget, goes before six committees, which probe, amend, and occasionally "micromanage" its line items. The Budget Committees of the House and Senate are the only congressional organizations that deal in outlays by setting caps on the outlays of the federal budget, and thus of the Defense budget. As a corollary, the other committees deal with budget authorities, but must constrain their programs within the outlay figures provided by the Budget Committees.

The Budget Committees provide a first and a second concurrent budget resolution. The first concurrent resolution is a guide under which the House and Senate Armed Services Committees and the Appropriation Committees operate. The second concurrent resolution has the authority of law and takes into account revenues and expenditures. The two Armed Services Committees generally concern themselves with procurement and R&D and normally are viewed as "friendly" by the Pentagon.

The Defense Subcommittees of the Appropriation Committees, usually seen as "neutral," concentrate on O&M (operations and maintenance). The tendency to "micromanage," especially of the House subcommittee concerned with Defense appropriations, is growing. This year that subcommittee cut 679 line items of the Defense budget while making 125 add-ons, according to General Driessnack. ■

(This report on the AFA symposium will be concluded in the February issue of AIR FORCE *Magazine.)*

When it was over and the sun set that late winter day over North Germany, the losses inflicted by the Luftwaffe on the raiding bombers could not offset the realization on both sides that the war had turned another important corner. Hitler's capital was now subject to around-the-clock bombing, and it began with . . .

Raid 250: Target Berlin

BY JEFFREY L. ETHELL AND ALFRED PRICE

MARCH 1944: After four and a half years of war, Germany was still master of most of Europe. Its control ranged from Lorient in the west to Minsk in the east, from the tip of Norway in the north to Monte Cassino in the south. Since the beginning of 1943, the US Eighth Air Force had been striking progressively deeper at targets in Germany, most recently with P-38, P-47, and P-51 escort fighters covering the bombers along their entire route. Yet still unhit by day was the most heavily defended target of all: Berlin, capital of the Reich, which lay more than 450 miles from the nearest Eighth Air Force base.

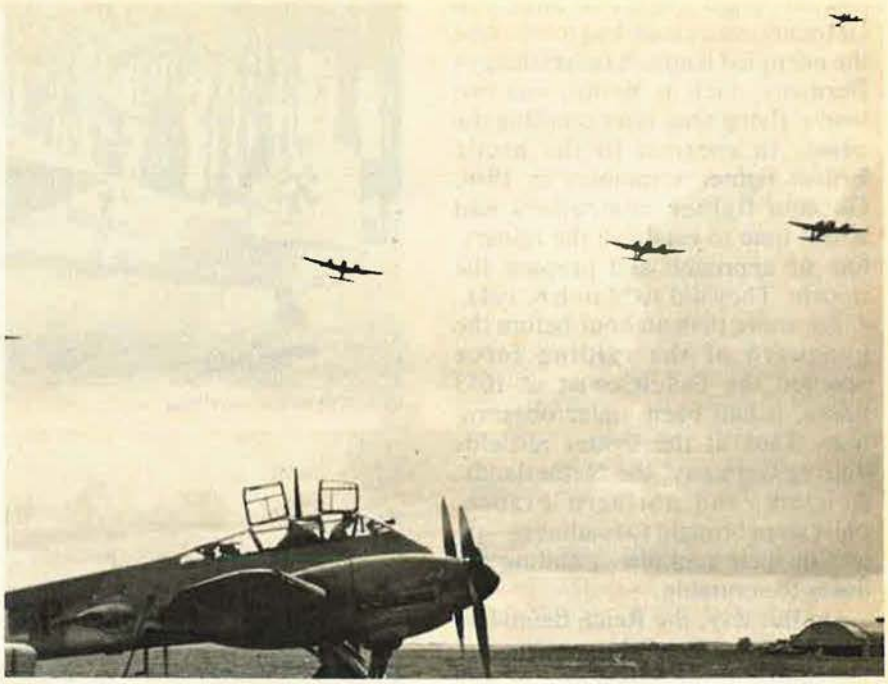
USAAF bombers set out on the first daylight mission to Berlin on March 3. But as the leading aircraft reached the northern coast of Germany, high cloud extending to 30,000 feet forced them to turn back. On the following day it was a similar story, but one combat wing of twenty-nine B-17s failed to receive the recall signal. It pressed on to the target with part of the fighter escort, losing five B-17s and twenty-three escorting P-51 fighters, but showed that a small force could get through to hit the German capital. It remained to demonstrate that the same thing could be done in strength.

The Tactical Plan

The opportunity came two days later, on the morning of March 6. With a forecast of reasonable weather along the route and over Berlin, Eighth Air Force planners had ordered another maximum-effort attack on targets in and around the city.

Three target complexes were assigned. Five combat wings of the 1st Bomb Division, with 301 B-17s, were to attack the V.K.F. ball-bearing factory at Erkner in the southeastern corner of Berlin. It ranked third in productive capacity, after the plants at Schweinfurt and Bad Cannstatt, near Stuttgart.

B-17s of the 303d, 379th, and 384th Bomb Groups, comprising the 41st Combat Wing, photographed at about 1:22 p.m. on March 6 as they flew north along the eastern side of Berlin after releasing their bombs on the Köpenik district. The shell bursts are from 8.8, 10.5, and 12.8-cm guns belonging to Flakregiment 172.



Messerschmitt 410s of II/ZG 26 forming up for a sortie. The 410 was built to replace its aging predecessor, the 110, as a "destroyer," but the aircraft did not live up to expectations on March 6. The presence of numerous American escort fighters was more than the German pilots could handle.

Three combat wings of the 2d Bomb Division, with 249 B-24s, were to bomb the Daimler-Benz works at Genshagen twenty miles south of Berlin. This was the most important aero-engine plant in Germany, producing more than a thousand engines each month.

The Robert Bosch works was the target of the 3d Bomb Division. Its six combat wings totaled 262 B-17s. They were to strike Bosch's factory at Kleinmachnow, a southwestern suburb of Berlin, which manufactured electrical equipment for aircraft and military vehicles.

Fighter cover was planned by relays of fifteen groups of P-38s, P-47s, and P-51s of the Eighth Air Force, four groups of P-47s and P-51s of the Ninth Air Force, and three squadrons of P-51 Mustangs of the Royal Air Force—a total of 691 fighters. The 132 P-47s covering the first part of the penetration were to land, refuel, and fly second missions to assist in covering the withdrawal of the bombers.

By 0750 hours, Eighth Air Force bomber bases across East Anglia were alive with the sound of engines, as the first aircraft—B-17s of the 92d Bomb Group—began taking off from Podington. Soon they were followed by bombers from the other units. Bomb groups formed up and assembled into wings; wings came together to form divisions. At 1001 hours, the leading B-17s of the 1st Bomb Division crossed the English coast at Cromer; twelve minutes later those of the 3d Bomb Division set course from Orford Ness; twelve minutes still later the first B-24s of the 2d Bomb Division, forming the rear of the bomber stream, also left Cromer.

The Defenders Prepare

German radar operators watched the assembly of the bombers over East Anglia and their flight across the North Sea. Their reports flashed back to the main fighter control centers responsible for the defense of the Reich—the 1st Fighter Division at Döberitz near Berlin; the 2d Fighter Division at Stade, near Hamburg, and the 3d Fighter Division near Arnhem, the Netherlands.

The air battle over Germany in 1944 has been likened to the Battle of Britain in 1940. Both were major air actions in which numerically inferior defenders strove to protect their homeland against devastating attacks, but the differences were greater than the similarities. In 1940, the Luftwaffe could strike Britain from occupied territory across short reaches of the Channel and North Sea. In 1944, the Allies

had far longer flights to targets in Germany, since they had to traverse the occupied lands. A target deep in Germany, such as Berlin, was two hours' flying time after crossing the coast. In contrast to the hectic British fighter scrambles in 1940, German fighter controllers had ample time to establish the raiders' line of approach and prepare the riposte. They did so March 6, 1944.

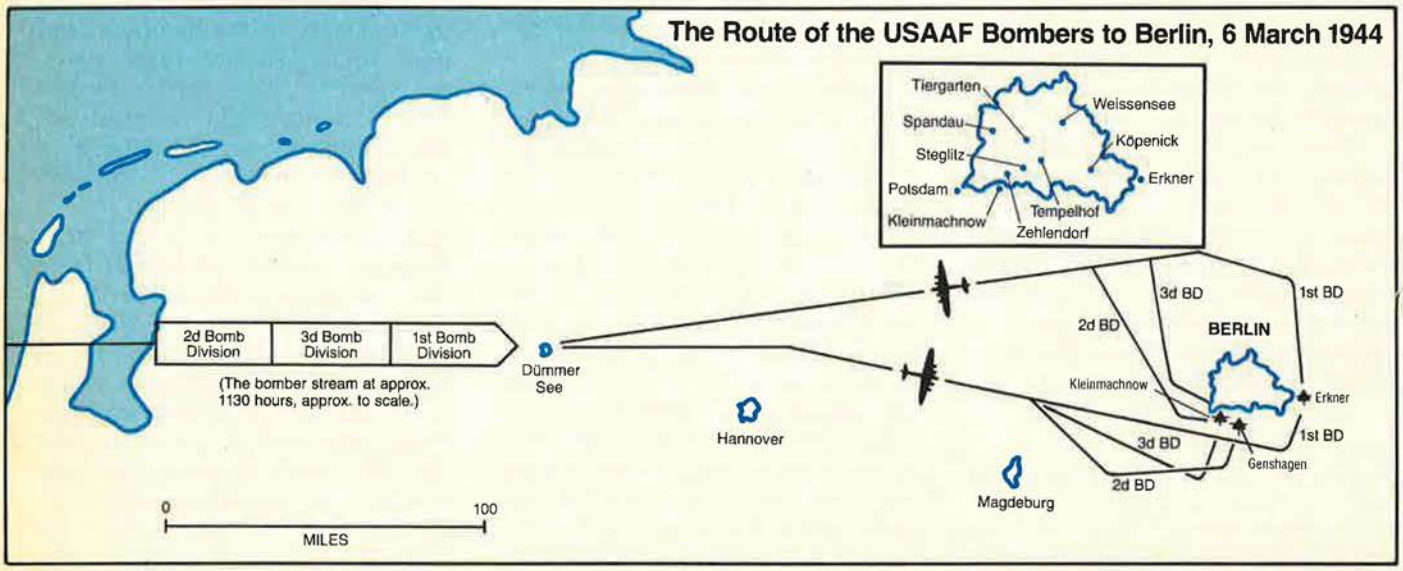
For more than an hour before the vanguard of the raiding force reached the Dutch coast at 1053 hours, it had been under observation. Thus at the fighter airfields dotting Germany, the Netherlands, Belgium, and northern France, units were brought to readiness—pilots in their cockpits, awaiting the order to scramble.

On this day, the Reich defenders could call on 911 fighters. The single-engine force consisted of 599 Me-109s and FW-190s. Twin-engine bomber destroyers—the Me-110 and -410—totaled eighty-one. Each was armed with cannon and launchers for four 21-cm rockets. Finally, a small number of the 231 night fighters could take part in daylight battles. They were Me-110s and Ju-88s fitted with radar, but some were based too far south to engage the bombers.

As the raiders continued due east across the Netherlands with the 91st Bomb Group in the lead, it became clear to the defenders that their target was somewhere in northern Germany. From the direction of the approach, it could be another attempt to strike at Berlin itself. The first German fighters were launched at 1100 hours—twenty-four Me-110s of Destroyer Geschwader (Wing) 76, based at Ansbach in Bavaria, ordered to head north for the Magdeburg area.

Soon after 1100 hours the single-engine fighter units in the Nether-

TOP: The heavily armored and heavily armed FW-190A-8s of the Sturm units that were formed specifically to down American bombers saw action on March 6. They were equipped with 30-mm cannon just outboard of the landing gear, plus a great deal of additional armor. Note the 30-mm bulletproof glass on each side of the sliding canopy. ABOVE: Messerschmitt 109Gs of Fighter Geschwader 27, standing at readiness at Wiesbaden-Erbenheim.



The route of US bombers to Berlin on March 6. The bomber stream passed over Dümmer See and near Hannover and Magdeburg on its approach. The 1st Bomb Division was to attack the V.K.F. ball-bearing plant at Erkner, the 2d Bomb Division's target was the Daimler-Benz aero-engine plant at Genshagen, and the 3d Bomb Division was to strike the Bosch works at Kleinmachnow.

lands and northern Germany were scrambled: Fighter Geschwader 1, with Gruppen (groups) at Twente and Rheine; Fighter Geschwader 11, with Gruppen at the Lower Saxony cities of Rotenburg, Wunstorf, and Oldenburg; and Fighter Geschwader 54, with one Gruppe at Lüneburg.

Within minutes, more than a hundred Me-109s and FW-190s were airborne, and assembling in Gruppe formations of fifteen to twenty fighters. Then Gruppen linked up to form two great battle formations *(Gefechtsverbände)* each of about fifty aircraft. (In the Atlantic, the German Navy had learned that the best way to strike at an escorted convoy of shipping was to concentrate the U-boats into a "wolf pack," then launch a massed attack. For the first time similar wolf-pack tactics were to be used against an enemy bomber stream.)

By 1150 hours, the leading bombers had reached a point just north of Hannover. Since eighty-two bombers had aborted for various reasons, the force now numbered 730 B-17s and B-24s in a bomber stream 107 miles long. Droning eastward at just over three miles a minute true airspeed, it took more than thirty-five minutes to pass over any point along its path. Covering the force were 140 P-47s drawn from the 56th, 78th, and 353d Fighter Groups. These fighters had to protect the long bomber stream. With about half the fighters around the leading air division, the escort was weak elsewhere.

—Photo courtesy 78th Fighter Group Assn.

TOP: A P-51B Mustang of the 354th Fighter Group just after liftoff at Boxted, UK. This Ninth Air Force unit, attached to the Eighth Air Force, provided "Target Support" over Berlin on March 6 with the only other Mustang units then in England, the 357th and 4th Fighter Groups. ABOVE: Drop tank in place, a P-47 of the 78th Fighter Group stands at Duxford ready for an escort mission. On March 6, this unit was heavily engaged against German fighters trying to attack bombers in the Dümmer See area.

Clash at Dümmer See

At 1155, Hauptmann Rolf Hermichen, leading one of the wolf packs, caught sight of the 1st Division bomber stream near Dümmer See (Lake). By chance, his ground controller had directed him against the stream almost exactly halfway along its length, where the escort was at its weakest. Hermichen led his fighters into the gap between two boxes of bombers, then swung to the right for a head-on attack on the next combat wing.

1st Lt. Robert Johnson was flying a P-47 of the 56th Fighter Group. He later reported how the German wolf packs looked from his vantage point: "I was on the left side of the bombers and going 180° to them when I noticed a large box of planes coming at us at the same level at two o'clock to us and seven o'clock to the bombers. There were about forty or fifty to a box, and I saw two boxes at our level and one box at 27,000 or 28,000 feet. I called in to watch them, and then that they were FW-190s. There were only eight of us. . . ."

Johnson led his P-47s in an attempt to disrupt the enemy attack, but most of the Messerschmitts and Focke-Wulfs simply ignored the P-47s as they streaked in toward the bombers at closing speeds of more than 500 mph. Oberfeldwebel Hermann Reinthaler, flying an Me-109 of Fighter Geschwader 11, fired a brief burst at one of the B-17s before breaking away, and saw his rounds hitting the bomber's number-two engine. Feldwebel Friedrich Ungar, in an Me-109 of Fighter Geschwader 54, hit another of the bombers and emerged from the rear of the formation with tracer rounds flashing all around him from the tail gunners.

After hitting the 1st Division, the Luftwaffe then concentrated its attack on the 3d Division. The recipients of the attacks were the 13A and 13B Combat Wings. They were flying almost parallel to each other at the center of the bomber stream. The 13A Wing was comprised of thirty-four B-17s of the 95th and 390th Bomb Groups; the 13B, thirty-five B-17s of the 100th and 390th Bomb Groups. The 100th Bomb Group report on the action stated:

> Definite assessment of losses is made difficult because of the intensity of enemy attacks. It is believed that a great majority of aircraft lost by this Group may be charged directly or indirectly to the enemy attacks between 1200 and 1245 hours. During this period of attacks, both B-17s and enemy aircraft were going down on all sides. It appears that at least six of our aircraft and about ten from other Groups were knocked down in this attack. Large gaps were knocked in formations, and

B-17G of the 96th Bomb Group based at Snetterton Heath. This unit sent twenty-one bombers to Berlin on March 6, and on this day, when the Eighth Air Force lost more heavy bombers than on any other, the 96th distinguished itself by having not a single aircraft destroyed or damaged.

during the latter stages of the battle, it appeared that many aircraft were fighting out of formation.

Following the initial massed attack, the German fighters split up into smaller formations for reattacks on the two combat wings. Some made head-on attacks, some came in from the rear of the bombers, still others picked off damaged B-17s straggling behind their formations. The attacks lasted about three-quarters of an hour and extended more than 120 miles eastward from Dümmer See.

The action around the 3d Bomb Division tailed off at about 1245 hours, but by then the second German massed attack was almost ready to begin. The fighter controller of the Luftwaffe 1st Fighter Division had assembled in front of Berlin almost everything he had in order to block the attack: forty-two heavily armed Me-110s and -410s of Destroyer Geschwader 26 and 76, seventy Me-109 and FW-190 single-seaters, and fourteen Me-110s of Night Fighter Geschwader 5. This huge force hurled itself at the two leading bomb divisions, but this time the escort—eighty P-51s of the 4th and 354th Fighter Groups—was in the right place at the right time. 1st Lt. Nicholas Megura of the 4th Fighter Group later described the Germans' approach:

> Twelve-plus smoke-trails were seen coming from twelve o'clock and high, thirty miles ahead. "Upper" positioned the Group up sun, below condensation height, and waited. Trails finally positioned themselves at nine o'clock to bombers and started to close. Six thousand feet below the trails were twenty-plus single-engine fighters line abreast, sweeping area for twenty-plus twin-engine rocket-carrying aircraft. "Upper" led Group head-on into front wave of enemy aircraft.

The counterattack by the P-51s deflected part of the blow, but several of the twin-engine German fighters got into position to launch their salvoes of rockets head-on into the bombers, and then followed up with cannon attacks. Their victim was the 1st Combat Wing at the head of the bomber stream, with fifty-one B-17s drawn from the 91st and 381st Bomb Groups. During the next few minutes seven bombers were knocked out of the formation.

While this was happening, however, the P-51s continued to break up other attacks and pounced on the twin-engine Me-110s as they came out the back of the bomber formation. Helpless against the nimble P-51s, fourteen of the big Messerschmitts were knocked down, one after the other.

Cloud Cover

The air battle around the bombers still raged as shortly after 1300 hours the three bomb divisions split up and each made for its own target. Now, however, the weather in the Berlin area was to protect the bombers' primary targets more effectively than the German defenses could. At first it seemed that the bombardiers would be able to hit their targets through breaks in the clouds. But again and again, too lat for the lead crews to revert to radar bomb runs, the drifting cloud obscured aiming points at the critical moment and the bomb groups were forced to hit secondary targets in and around the city. The flak was heavier than anything they had previously encountered.

The capital's antiaircraft defenses were the responsibility of Generalmajor Max Schaller's 1st Flak Division, whose flak regiments 22, 53, 126, and 172 operated seventy-eight batteries with more than 400 88-mm, 105-mm, and 128-mm heavy guns. Capt. E. Curry, a bombardier with the 401st Bomb Group trying to hit the ball-bearing factory at Erkner, later recalled: "I'd been to Oschersleben and the Ruhr, but I'd never seen flak as heavy as that they had over Berlin. It wasn't just the odd black puff, it was completely dense; no just at one altitude, but high and low. There was a saying that you see the smoke only after the explosion but that day we actually saw the re

of the explosions. One shell burst near us, and we had chunks of shell tear through the radio room and the bomb bay."

The vicious flak barrage knocked down four bombers, damaged others so severely that they were forced out of the protective envelope of the formations, and inflicted lesser damage to nearly half of the bombers that reached the Berlin area. Few German fighters pursued the raiders into the flak zone; the majority preferred to wait till their prey emerged on the far side of the gun-defended area.

As a result of the patchy cloud cover, no 1st Bomb Division B-17s were able to hit their targets at Erkner. Instead, they attacked parts of Berlin itself, mainly the Köpenick and Weissensee districts. It was a similar story for the 3d Bomb Division, whose groups laid most of their bombs in the Steglitz and Zehlendorf districts. Only the B-24s of the 2d Bomb Division, the last to attack, succeeded in getting some bombs on their primary target, the Daimler-Benz aero-engine works at Genshagen; the rest fell on secondary targets in and around the capital.

On their way to the rallying point northwest of Berlin, the bombers again came under fighter attack. Fourteen Me-110s of Night Fighter Geschwader 5 tried to sneak into the formations in ones and twos, but with their radar antennas and other night-fighting equipment slowing them down, they fell easy prey to the escorting P-51s. Ten of the night fighters were shot down within a space of a few minutes, most of them falling close together near Berlin. Destroyer Geschwader 26 also suffered heavy losses from P-51s while the bombers were approaching and leaving the target: Of the eighteen Me-110s and -410s put up, eleven were destroyed and one damaged.

After reaching the rally point, there was a lull in the fighting. During it the P-51s that had fought near Berlin were relieved by other fighter units and headed for home. Near Bremen a section of P-51s of the 357th Fighter Group caught a lone Me-109, and 1st Lts. Howell and Carder shot it down. The German pilot, Oberleutnant Gerhard Loos of Fighter Geschwader 54, a leading ace credited with ninety-two victories, lost his life.

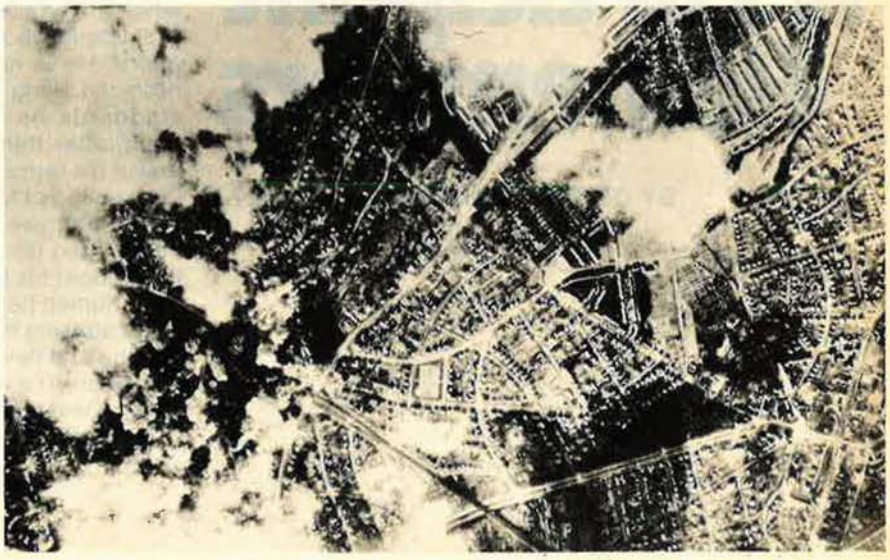
During the return flight, there were several brisk skirmishes with Me-109s and FW-190s. Some of these fighters were from units that had taken part in the noon action near Dümmer See. Others belonged to Fighter Geschwader 2 and 26 based in France and Belgium. One of the most devastating attacks fell on the 45A Combat Wing, at the rear of the 3d Bomb Division, as it passed Dümmer See on the way home. Waves of fighters attacked from head-on, and the 388th Bomb Group lost six B-17s in rapid succession. Another bomber was lost when one of the B-17s, abandoned by its crew, ran into it. Both went down.

The skirmishing continued most of the way across the Netherlands. During one such action an FW-190 was shot down after engaging several bombers. Its pilot, Hauptmann Hugo Frey of Fighter Geschwader 11, one of the German pilots most successful against heavy bombers with twenty-six to his credit, was

Jeffrey L. Ethell is the son of an Air Force career officer. He has been writing about aviation since 1967. His first piloting experience was at the age of eight, when his father put him behind the controls of a Piper Tri-Pacer. He soloed at eighteen. He is a certified flight instructor, holds a commercial pilot multiengine rating, and owns a World War II AT-6. He lives in Richmond, Va.

Alfred Price served as an aircrew officer in the RAF and, in a flying career spanning fifteen years, logged some 4,000 hours in more than forty types of aircraft. During that time he specialized in electronic warfare and aircraft weapons, and also taught tactics to bomber crews. He now works full time as an author, with many books to his credit, and is a regular guest lecturer at the RAF College, Cranwell. In 1974 he was elected to a fellowship of the Royal Historical Society and was historical advisor to the BBC television series, "The Secret War."

Bombs from a B-24 of the 2d Bomb Division shortly after release . . .



. . . and exploding on the Zehlendorf district of Berlin, at about 1:30 p.m. on March 6, 1944.

killed. Frey's was one of the last aircraft destroyed during the battle.

The Balance Sheet

During the attack on March 6, 1944, 812 B-17s and B-24s set out from their bases in England and 672 reported attacking primary or secondary targets. Sixty-nine B-17s and B-24s failed to return to England. Four landed in Sweden, where the aircraft and crews were interned. Two returning bombers were damaged beyond repair, fifty-eight had severe damage, and 336 suffered lesser amounts of damage. Eleven of the 691 escorting fighters were lost and eight more returned with severe damage.

B-17 and B-24 gunners claimed ninety-three enemy fighters destroyed and forty-four probably destroyed; the escorts claimed a further eighty-two enemy fighters destroyed and nine probables. Later, these claims were found to be almost triple the actual toll inflicted on the German fighters.

On the German side, 463 fighter sorties were launched against the raiders, with 332 making contact. Sixty-four German fighters were destroyed or damaged beyond repair and eleven damaged; forty-four German pilots were killed and twenty-three wounded. Initial claims by the Luftwaffe fighter force were 100 heavy bombers and eleven fighters destroyed; ground gunners claimed eight bombers and five fighters.

On the ground in Germany, afternoon of March 6, 1944. God Bless Our Ship, *a B-24 of the 445th Bomb Group that went down during the attack, is inspected by German officers.*

The bombers inflicted little damage on military targets. The production complexes at Erkner and Kleinmachnow were untouched; that at Genshagen received only minor damage. Throughout the German capital there was wide-

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General Milton, Deputy Commander of the 91st Bomb Group and leader of the March 6, 1944, raid on Berlin, looks back on one of the greatest air battles of the war . . .

A Participant Remembers

BY GEN. T. R. MILTON, USAF (RET.)

The briefing for the maximum effort against Berlin really came as no surprise. A Berlin mission had been launched a few days earlier, but the weather turned it back, although a small force did reach the outskirts of the city. Still, surprise or no surprise, there were some audible sighs in the room when the curtains were pulled back from the map.

I had not thought of that mission for a long time until a letter arrived a few days ago. It was from a former pilot of the 91st Group who had led my high squadron on the March 6 attack. He is now, it appears, a successful retired businessman living comfortably on his Texas ranch. By most standards he should be content. Nonetheless, one thing, after thirty-five years, still bothers him. Why did I praise his formation flying, as we gathered around the bar the evening of March 6, then criticize him—he used a more colorful phrase—at the critique on March 7? He has evidently used my Jekyll-Hyde transformation as a reminder throughout his business career, of the essential unreliability of human behavior. Well, I can't remember either praising or abusing him. It will have to remain his story. I do recall that the 91st flew, in our vulnerable lead position, very good formation. The man in Texas will just have to accept a belated repeat of the praise and forget the rest.

The Luftwaffe did its best to take our formation apart as

spread damage to housing, public utilities, and the transport system. Altogether, 345 civilians were killed in the attack or declared missing afterwards, and 363 people were wounded. But for intermittent cloud cover at the critical time, however, there is little doubt that the bombers would have devastated their assigned targets. The German war machine could not depend on such cooperative weather in the future.

As is often the case in warfare, a few units on each side took the bulk of the casualties. The hardest hit USAAF unit was the 100th Bomb Group, which lost fifteen B-17s out of thirty-six, most of them during the initial clash at Dümmer See, where eight B-17s of the 95th Bomb Group also went down and where the 388th lost seven on the homeward flight. During the massed Luftwaffe attack just west of Berlin, six 91st Bomb Group B-17s were shot down. These four groups suffered just over half of the bomber casualties. The remaining thirty-three bomber losses were spread more or less evenly among the other twenty-five groups involved.

On the German side, the twin-engine fighter units took the worst beating. Night Fighter Geschwader 5 lost ten Me-110s of fourteen committed. Eleven of eighteen Me-110s and -410s put up by Destroyer Geschwader 26 were downed. In both cases, the losses were to P-51s of the 4th, 354th, and 357th Fighter Groups, which fought a brilliant covering action in the Berlin area.

By throwing in almost every day fighter that could hope to reach the bombers' route, the Luftwaffe had knocked down more B-17s and B-24s on March 6 than on any day before—or any that followed. But it was not enough. By March 1944, the Eighth Air Force could absorb such a loss—about five percent of the bombers and fighters committed—almost in stride. And to prove it, two attacks in similar strength were launched against Berlin during the three days that followed.

That week was the turning point in the US bomber offensive against Germany. From then on, no target in Germany, no matter how far from the bases in England or how strong its defenses, was immune from daylight precision attack. ■

Where Were You on March 6, 1944?

Anyone who took part in Raid 250 over Berlin on March 6, 1944, is encouraged to contact the authors, who are preparing a book on this raid. Jeff Ethell can be reached at 2403 Sunnybrook Road, Richmond, Va. 23229. Alfred Price's address is 19 Bayley Close, Uppingham, Rutland LE15 9TG, England.

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we slogged in across Germany at 25,000 feet or so, indicating a precise 150 miles per hour. Our fighter escort put on a splendid show, but there was just no way to keep the enemy fighters away. We lost six B-17s to the FW-190s and Me-109s, meanwhile claiming our usual inflated number of enemy fighters destroyed. Each enemy fighter shot down by the bombers was inevitably claimed by several gunners, all of whom were sure they had hit it. Our after-action reports thus bore an innocent resemblance to Cook County election returns in the twenties.

The London newspapers treated the March 6 attack as headline news. We had finally gone to Berlin, a place the RAF had been hammering by night for years. It is hard to realize now the symbolic importance the British attached to any strike against Germany's capital. That was the place where the evil devils—Hitler, Himmler, Goebbels, and the rest—lived and plotted. A Berlin raid represented revenge for the British for all the things London had suffered and was, in fact, suffering again that spring of 1944. The Luftwaffe had launched a new blitz against London, the so-called "little blitz," and it was causing some nasty damage. Thus, the fact that our air force, fighters as well as bombers, could venture over Berlin in broad daylight captured the British imagination. It was giving the Germans one back, at a time when British morale badly needed a boost.

From a political and morale-building standpoint, then, the mission was a great success. Viewed militarily, it was a great air battle with mixed results. We could not pick out our primary targets through the low broken layer of fair weather cumulus, and so we ended up just bombing the city. Turning away from Berlin, we in the lead airplanes could look back through the ugly black antiaircraft bursts at a bomber stream literally stretching to the horizon. It was Tennyson's vision come to pass.

A few years later I was back in Berlin, this time in a more constructive enterprise called the Berlin Airlift. It was then that I discovered what truly courageous and indomitable people the Berliners are. It was one of the ironies of World War II that Londoners and Berliners shared the same traits of courage and humor that made life bearable in unbearable circumstances. It is understandable, then, if it was not exactly forthright, that I never mentioned to Berliners my part in the March 6 expedition.

Looking back through the distance of thirty-five years, it is a little easier to get a perspective on that first daylight mission to the heart of Hitler's Third Reich. What we really accomplished, indifferent bombing results aside, was a massive demonstration of Allied power. The condensation trails, viewed from the Tiergarten, or the Reichschancellery itself, must have been a sight to behold and a convincing omen of the Third Reich's—The Reich of a Thousand Years—impending doom. ■

Airman's Bookshelf

Third Reich Cloak-and-Dagger

Canaris: Hitler's Master Spy, by Heinz Höhne. Translated by J. Maxwell Brownjohn. Doubleday & Co., Garden City, N. Y., 1979. 703 pages with notes, glossary, bibliography, index, and photographs. $15.95.

Canaris—the name had been synonymous with masterful espionage and linked to the anti-Nazi German resistance since before the Allied armies smashed into Germany. Adm. Wilhelm Canaris enjoyed a wide reputation both in the German military and political establishment and among Allied intelligence circles as Nazi Germany's supreme spy. His Abwehr paved the way for many of Hitler's lightning expansions of the Third Reich, often with Abwehr commando teams and intelligence groups far in advance of the Wehrmacht's war machine.

Admiral Canaris also gained fame, particularly among postwar Germans, as the spiritual father and behind-the-scenes manipulator of the German resistance to the Nazi regime. In the wake of the July 20, 1944, attempt on Hitler's life by Count Claus Schenk von Stauffenberg, Canaris was executed at Flossenbürg for his complicity in plans to overthrow Hitler dating as far back as 1938.

Heinz Höhne has attempted to come to grips with the contradictory and oblique character of the German militiary intelligence chief in this revisionist and not wholly flattering biography. Höhne states explicitly in his foreword his motivation: "I have unearthed fresh documentary evidence and new information which reveal my elusive subject in an unaccustomed light."

This "unaccustomed light," while not completely demolishing the Canaris legend, certainly reveals flaws in the picture of a man who had been respected in his profession and admired for his subversion of the Nazi reign. Höhne presents Canaris as a man of many facets—a man almost schizophrenic in his attitude toward Hitler, a mysterious loner delighting boyishly in intrigue, a morose fatalist and a master manipulator and negotiator, an impassioned animal lover and friend of Heydrich and Himmler.

Canaris was a creature of his time. Reared in Imperial Germany, he embodied the Christian conservative officer chained to tradition who harbored dreams of the resurgence of German might from the humiliation of Versailles. With the coming of the Nazis, he at first welcomed the discipline of the "National Socialist revolution" and the promise of a powerful Germany.

As time went on, Canaris became deeply disturbed by Hitler's reckless foreign policy and the excesses of the Nazi rule. He privately prophesied "the end of Germany." However, at the same time, he carried out brilliant operations with the Abwehr that made Hitler's daring conquests possible.

The Abwehr had become a shadowy world of resisters under Canaris, as he alternately encouraged and restricted plans for a coup. As the war wore on, the efficiency of the Abwehr suffered, and Canaris was relieved of command. Although not at first under direct suspicion of treason, the accidental discovery of his personal diaries sealed his fate with the gallows.

Höhne documents thoroughly the labyrinthine twists and turns in the professional career of Canaris. However, he shortchanges the reader on information concerning Canaris's early years and personal life that might have provided more clues to the nature of a man who led the Abwehr under the Nazis, and yet became a symbol of the German resistance to Hitler.

Regardless of this shortcoming, Höhne's book is a frightening and fascinating look at the intelligence and espionage apparatus of one of the world's foremost police states, and the complex and intriguing Admiral Canaris.

—Reviewed by Hugh Winkler, Editorial Assistant.

Art and History at NASM

The National Air and Space Museum, by C. D. B. Bryan, author; David Larkin, art director. Photography by Michael Freeman, Robert Golden, and Dennis Rolfe. Harry N. Abrams, Inc., New York, N. Y., 1979. 504 pages with photographs, index, technical appendix, and bibliography. $50.

Many people reading this book will already have visited the National Air and Space Museum, and most will be pleasantly surprised how well the writer-art director team has captured the vastness, variety, and magnificence of their subject. For here text, photography, and layout are combined to give the reader an experience second only to being there, and it is a close second at that.

Most who have seen the exhibits up close can appreciate the photographers' challenge of trying to record the Museum on film. Larkin states in the book, "It was necessary, for instance, for one of the photographers to spend a week photographing the huge murals that dominate the main entrance to the Museum. To do this he had to perch in a cage 50 feet above the ground, holding his breath and taking pictures with a 45-second exposure, patiently guessing that he would miss the tremor caused by the new Metro under the Museum. . . ."

Whatever the challenges, they were overcome, resulting in page after page of glossy, full-color photographs, faithfully recording the most complete collection of air-and-space artifacts in the world. In addition to the hundreds of full-color pages, several color foldouts are sprinkled throughout the book, including Keith Ferris's "Fortresses Under Fire," Eric Sloane's "Earthflight Environment," and Robert McCall's "Space Mural—A Cosmic View." These foldouts realistically depict the huge murals found on walls throughout the Museum.

Often with books of this type, if the photography is strong, the text lacks depth—or vice versa. That is not true

for this work. Bryan, the author, also wrote the bestseller *Friendly Fire*, about a young soldier from Iowa killed in Vietnam. Bryan's versatility is proven by the enthusiasm and sensitivity with which he treats his new book. He not only describes the Museum's detailed collection, but he also reveals the historical significance of the items being discussed.

"Stand in the center of the vast Milestones of Flight Gallery and look again at that fragile, austere, antique Wright Flyer skimming overhead, then look down at the sweep-second hand on your wristwatch and count off twelve seconds—twelve engine-popping, chain-rattling seconds of uneven darting flight and that is all the time Wilbur and Orville Wright needed to change the destinies of man," he writes.

The book is divided into twenty major divisions, describing subjects basically as they are arranged in the Museum. Bryan details everything from hot-air balloons, the first powered flight, the *Spirit of St. Louis*, commercial aviation, aircraft used in warfare, Mercury and Apollo, the Space Shuttle, planetary exploration, and wraps it all up with a section entitled "Science, Technology, and the Arts."

The Aerospace Chronology and Technical Appendix will be useful to those doing research since they provide additional details of aviation history and factual information on the major aircraft and spacecraft appearing in the book.

The price might put some off, but for those who purchase the book, it will provide hours of enjoyment, and, like the Museum it depicts, will be returned to by many again and again.

—Reviewed by Maj. Gene E. Townsend, USAF, Contributing Editor.

Aerospace *True Grit*

The Right Stuff, by Tom Wolfe. Farrar, Straus, Giroux, New York, N. Y., 1979. 436 pages. $12.95.

The dictionary defines "Ziggurat" as "an ancient Babylonian temple tower having the form of a terraced pyramid." Ziggurat is a word that crops up regularly in *The Right Stuff.* According to Tom Wolfe, the most righteous possessor of the "right stuff" will reach the top of the ziggurat. The "right stuff," of which an uncritical acceptance of danger is a prime ingredient, appears in increasing amounts in pilots, fighter pilots, combat fighter pilots, test pilots, and research test pilots.

Those with enough of the "right stuff" to become test pilots like to demonstrate their ability to fly right to the edge of an aircraft's performance. When another pilot is killed, no matter how difficult the problem that killed him, those with the "right stuff" always feel that they could have handled it. They never pray for a safe flight, but merely one in which they don't "foul up," and thus lose their reputation for having the "right stuff."

Wolfe is, rightly, very impressed with Chuck Yeager, who spent many years at the top of the ziggurat. The chapters on Edwards AFB and Yeager are very well done.

The rest of the book covers the early days of the space program through the Mercury flights. The descriptions of the selection process for the first seven astronauts are hilarious and do not reflect well on the physicians and psychologists who did the testing. Another very funny section describes the first suborbital and orbital Mercury flights from the points of view of the "pilots," the chimpanzees Ham and Enos. Not a technical book, it describes in some detail the astronauts' life at the Cape and their personal interactions with each other, their wives, and the media.

Wolfe takes a very cynical view of the instant deification of the seven astronauts by the media, before they had accomplished their missions in space. This deification was baffling to the rocket test pilots at Edwards, who were really flying rockets, not just relieving a monkey for active duty.

The book is uneven in spots, and Wolfe's generalizations and whizbang style of writing get a little wearing at times, but *The Right Stuff* is well worth reading as an incisive and entertaining look at the space program.

—Reviewed by Donald S. Lopez, Assistant Director for Aeronautics, National Air and Space Museum.

New Books in Brief

The American Flying Boat, by Capt. Richard C. Knott, USN. More than a catalog of records and significant aviation firsts, this volume includes descriptions, rare photographs, and line drawings of every major American flying boat type produced, including extensive material on the more obscure models like the Sperry Amphibian, the never-completed Navy Giant Boat of 1920–21, the Tandem Fighter, and Fairchild's Jungle Clipper. Naval Institute Press, Annapolis, Md., 1979. 262 pages. $29.95.

Bomber Command: The Myths and the Realities of the Strategic Bombing Offensive, 1939–1945, by Max Hastings. An award-winning British journalist details the story of Britain's bombing effort in WW II which, contrary to propaganda and official histories, failed to achieve its major objectives, according to the author. Albert Speer has called the book "an exceptionally interesting insight into the events of the second world war." It explores the myths and controversies that have surrounded the bomber offensive since 1945. Photos, appendices, index. Dial Press, New York, N. Y., 1979. 399 pages. $12.95.

2194 Days of War, compiled by Cesare Salmaggi and Alfredo Pallavisini. Here is a massive, illustrated day-by-day account of the six years of WW II. Text is based on war communiqués, government documents, and the personal memoirs and diaries of those involved. Includes 620 illustrations, eighty-four maps. Mayflower Books, Inc., New York, N. Y., 1977. 754 pages. $29.95.

Infantry Weapons of the World, by Christopher F. Foss and T. J. Gander. This second edition includes new photos of infantry weapons in use around the world and under development. Not included are mortars above 60-mm as they are detailed in a companion reference, *Artillery of the World.* Weapons are grouped by country and are described by specification, text, and photos. Index. Charles Scribner's Sons, New York, N. Y., 1979. 136 pages. $12.50.

Pacific Aircraft Wrecks . . . and Where to Find Them, by Charles Darby. The author inspected 2,000 aircraft wrecks and crash sites over fifteen years to offer this guide for the enthusiast. For years, he says, the large number of "fairly intact" aircraft which survived the war in remote battlegrounds in the Pacific has been the subject of misleading stories and hearsay. Here, documented in color and black-and-white photos, is evidence of the air war over the Pacific in WW II. Kookaburra Technical Publications, 214 Kenmark Rd., Newark, Del. 19713, 1979. 80 pages. $20.45.

—Reviewed by Robin Whittle

The Bulletin Board

By James A. McDonnell, Jr., MILITARY RELATIONS EDITOR

Retirees Face Jobless Pay Problem

Starting April 1, many persons receiving retired pay or pensions, and who become unemployed, may be denied unemployment compensation if their pensions or retired pay is larger than the unemployment benefit. Accordingly, some military retirees could lose a bundle.

If the pension should be less than the jobless pay that a particular state authorizes, the jobless person could receive only the difference between the two. Thus, a military retiree drawing $550 per month in military retired pay in a state paying $650 in unemployment benefits would receive just $100.

That's the way present law reads. But there's considerable opposition to it, particularly from military associations like AFA. They endorse a bill, recently passed by the House Ways and Means Committee, which would ease the penalties. The measure, H.R. 5507, would also delay the starting date of the law until January 1, 1982.

H.R. 5507 would still require reductions in jobless pay when military retirees claim such pay based on their military service. However, retirees who come off active duty and work in a civilian job long enough to qualify for a state's jobless benefits (they vary by state) could claim them.

The present threat to retired pay is complicated by the fact that the states, which actually operate the unemployment pay program, have widely varying policies. Some require a reduction in benefits based on pensions. Some don't. Others have special rules.

Some military groups consider the law scheduled for April 1 implementation a grossly unfair torpedoing of an earned pension. Whether the Ways and Means Committee measure prevails is highly uncertain. It passed the committee October 17, but at press time had not come up for a House vote.

Unemployment compensation carries on for twenty-six weeks, but continues for thirty-nine weeks in high unemployment areas.

Bothering many patriotic Americans is the fact that tens of thousands of service members enlist, serve a minimum of ninety days, manage to get discharged, and then stick the taxpayers with millions of dollars in unemployment compensation. Rep. Robin Beard (R-Tenn.) claims that over the past five years 206,000 ex-service members have received $256 million in federal unemployment compensation. He wants it stopped.

Ways and Means recently conducted hearings on H.R. 5533, which, with certain exceptions, would deny unemployment benefits to persons who fail to complete their enlistments. The committee took no immediate action on the bill.

"Dependent" Out, "Spouse" In

"We probably lose more good people from the Air Force than we ever realize simply because spouses either aren't fully aware of the importance of their husband's or wife's work, or because they are excluded from association with the unit."

So said Gen. Bennie L. Davis, Commander of Air Training Command, in a recent speech reflecting USAF's new emphasis on "enriching the quality of Air Force family life." An Air Force Family and Retention Working Group has been searching for ways to get wives and children more involved, to give them "a feeling of belonging, of being valued." Get them more involved and they'll convince more husbands and fathers to remain in uniform, officials feel.

An important first step in this direction, Hq. USAF says, is to eliminate the degrading word "dependent" where possible, and substitute "spouse" or "family member." It won't be easy, for "dependent" has become perhaps the single most overworked term in the Air Force lexicon. Previous feeble efforts to shelve the word got nowhere. The new drive, quarterbacked by the Hq. USAF Director of Personnel Plans, Maj. Gen. William R. Usher, calls on Air Force "members, writers, speakers, and commissary and BX personnel . . . to use the terms 'family member' and 'spouse,' instead of 'dependent' wherever use of the term is not required legally." The Working Group advanced seventeen other "initiatives" aimed at motivating families.

Authorities cautioned, however, that "changes to improve the quality of family life should not be made at the expense of single members."

AECP Grads Pay Off

"These are the kind of people we really need. They are a known quality, dedicated, career-oriented, know the ropes, and are anxious to become officers. . . . We ought to be allowed more than the 300 or so we get each year. . . ."

The speaker, a Hq. USAF personnel official, was referring to the 163 airmen recently selected for entry into the Airman Education and Commissioning Program this fiscal year (FY '80). Another 130 will be chosen February 26 from the 229 not selected by the recent board and from new contenders. Those chosen will eventually attend Officer Training School.

All told, USAF expects about 2,200 airmen will be commissioned through OTS this year, mostly airmen who earned their degrees via off-duty study. Some will enter the critical scientific and engineering field, but most will perform in other areas. The AECPers go to college for S&E-type degrees under Air Force sponsorship, then attend OTS.

In a related development strongly backed by AFA, the Senate has voted to give USAF the full 6,500 AFROTC scholarships it sought for this year. 740 more than were granted last year. All the additional pacts will be earmarked for potential S&E officers. That figure could be trimmed slightly in an expected House-Senate compromise. The ROTC stipends cove. just about all of a student's college expenses.

Some 5,700 persons—AECP grads and others—are programmed to graduate from OTS this fiscal year. The schedule calls for 2,607 of them to serve in nonrated nontechnical skills; 2,206 to be nonrated technical

officers (S&E); 496 to attend undergraduate pilot training; and 391 to attend undergraduate navigator training.

Pay Raise Vote Revealing

In a little-publicized action in late 1979, the Senate turned down an amendment to the military appropriations bill that would have raised the October 1, 1979, seven percent military pay raise to 10.41 percent, retroactive to that date. But it was close, and the recorded vote and debate are revealing. Items:

- Sens. William Armstrong (R-Colo.) and Spark M. Matsunaga (D-Hawaii) sponsored the proposal. They noted that the President's Pay Agent had certified the 10.41 percent figure as required to meet the comparability standards prescribed by law. Both lawmakers declared the erosion of military pay-benefits must stop or the All-Volunteer Force will crumble and the draft will be inevitable.
- Twenty-three other senators cosponsored the amendment. Sen. Gary Hart (D-Colo.) said, "Without this measure [the 10.41 percent], our service personnel will suffer their third real pay cut in six years." Sen. John Warner (R-Va.) said, "Simple equity demands that we ask for this pay relief." Sen. William Cohen (R-Me.) said, "We have a choice here: We can provide a decent wage scale for the people who serve this country, or we can say that we are not going to and go back to a draft system." Others who spoke for the raise were Sens. Henry Bellmon (R-Okla.), Harrison J. Schmitt (R-N. M.), David Durenberger (R-Minn.), Robert Dole (R-Kan.), William Proxmire (D-Wis.), and Gordon Humphrey (R-N. H.).
- Sens. Milton R. Young (R-N. D.), John C. Stennis (D-Miss.), Edmund S. Muskie (D-Me.), and Sam Nunn (D-Ga.) strongly opposed the raise proposal. Young, calling it "inopportune," said educational benefits, free medical care, noncontributory retirement, and early retirement programs are already provided. Senator Muskie said the amendment would be a "budget buster," leading to demands for an equal raise for federal civilian employees.

Senator Nunn said the amendment represented a philosophy that "we can bail out the problems of the All-Volunteer Force by increasing military pay across the board." Senator Stennis called the amendment "a classic case of recognizing a problem and then attempting to solve the problem by throwing money at it."

The amendment, which was ruled not germane to the appropriations bill, was defeated 44 to 40.

Meanwhile, the Defense Department has approved some $650 million worth of special pay recommendations advanced by a joint-service pay study group. However, opposition was reported within the President's Office of Management and Budget. And, since congressional approval is also required before any of the increases can take hold, a lengthy wait for positive action seems likely.

The pay study group, as reported

AFA Believes . . .

The Changing View of the Vietnam Vet

The Veterans Administration, in late November, produced support for the intuitive feeling of many observers that the nation is changing its perception of the Vietnam veteran in a positive way. The VA released some preliminary findings from a comprehensive survey by Louis Harris and Associates, Inc., commissionod to determine the general public's attitudes toward Vietnam-era veterans.

This report is an advance look at the survey and is based on a smaller sampling than the complete survey (due in the spring of 1980) will include. There is no reason to believe that subsequent findings will differ significantly.

The purposes of this survey were: to define public perception of Vietnam-era veterans; to determine if there are problems to which these veterans are believed to be particularly susceptible; to evaluate what effect the war experience may have had on those problems; and to find what the public believes is the country's obligation to Vietnam vets.

AFA believes that this study, abbreviated though it may be, is nonetheless of interest since it highlights some trends we think are significant. It documents encouraging changes in the public attitude toward Vietnam vets since a similar Harris survey was conducted in 1971.

In summary, some of the findings are:

- Public attitudes toward Vietnam veterans are shaped more strongly by the public's attitude toward the entire Vietnam War generation (roughly those now between the ages of twenty-five and thirty-five) than by its attitude toward the war itself.
- While the public is convinced that the Vietnam vet faces a number of serious problems, it views combat experience as more likely to have caused psychological or emotional problems than to have any direct relationship to such problems as unemployment.
- A key finding of the study is that the public now separates its attitudes toward the war from its attitudes toward those who fought in it. Sympathy for the Vietnam vet has increased dramatically since the 1971 survey (particularly for those who face the most serious problems, such as combat-related disability), while the public as a whole disapproves of the nation's involvement in the war. The margin for such a finding was more than three to one.

Using the 1971 study as a base, it also is clear that public opinion is no more favorable toward those who evaded military service than it was eight years ago. This judgment contrasts sharply with an increase (from forty-nine percent in 1971 to sixty-three percent now) in the proportion of respondents who view the veteran with respect.

AFA believes that this survey is an encouraging and accurate reflection of the feeling of the American people, and we look forward to completion of the full report. While the many ramifications of the Vietnam conflict continue to unfold—in some cases restoring credibility to those who were considered "dishonored prophets" while the conflict raged—AFA has never doubted that the American people would eventually recognize and appreciate the sacrifices of those who served.

In the June 1975 issue of AIR FORCE Magazine, we quoted then-Secretary of Defense James R. Schlesinger in a message that we said at the time deserved attention. In part, he said:

> As the last withdrawal of Americans from Vietnam takes place, it is my special responsibility to address to you, the men and women of our armed forces, a few words of appreciation on behalf of the American people. . . . In this hour of pain and reflection you may feel that your efforts and sacrifices have gone for naught.
>
> That is not the case. When the passions have muted and the history is written, Americans will recall that their armed forces served them well. . . . Beyond any question you are entitled to the nation's respect, admiration, and gratitude.

As we begin the decade of the 1980s, AFA remains convinced that Secretary Schlesinger accurately portrayed the future status of the Vietnam veteran. We are encouraged by the solid evidence in the Harris survey. Certainly, the time for this change is overdue.

—BY JAMES A. McDONNELL, JR.

The Bulletin Board

here last month, advanced an early $815 million sweetener in per diem, housing allowances, temporary lodging allowance, and selected basic pay boosts. The Air Force urged increases worth $1.5 billion, but Defense came out for $650 million. The Joint Chiefs of Staff and other high service leaders say that is not enough to begin to restore pay equity and solve military personnel problems.

The Defense Department late in the year also endorsed a flight pay increase providing a fifty percent boost in flight pay for officers, enlisted members, and warrant officers, and a bonus worth up to four months of basic pay a year. The bonus would be payable from the sixth through the eighteenth year of service. This proposal also could take a long time clearing OMB and Congress.

USAF Wins Round in WO Battle

The Senate has come down hard on a House-passed scheme to cram warrant officers down USAF's throat. The action follows the House Appropriations Committee's attempts to make the Air Force give warrant officer status, rather than commissioned status, to its physician assistants and some of its future new pilots and navigators.

The Air Force, of course, started phasing out its several thousand WOs twenty-one years ago, and the job has now been completed. Purpose: Eliminate an unnecessary layer of supervision between officers and enlisted members.

The Senate, in the FY '80 military appropriations bill, has vetoed the House position. A mixed force of PAs within a single service would create "significant morale problems," the Senate said. On the pilot issue, the senators said that appointing some new pilots as warrant officers would not help the services meet their aviator requirements, improve aviation officer management, or result in any cost savings.

"Such a system," they continued, "could increase the problems of retaining qualified aviators . . . [while] the lower pay . . . for warrant officers . . . would create significan. morale problems" and make them ripe for leaving the service for the airlines as soon as possible. These are the same things Air Force officials have been saying for some time.

In buying USAF's argument to deep-six the PA-pilot WO ploy, the Senate said it "strongly disagrees" with the House action and rejected it.

Vets Win Pension Rights

Raymond E. Davis, a retired power company employee, felt his thirty months of military service in World War II should have been included in figuring his company pension benefits.

Airline mechanic Ben R. Kidder thought his union contract entitled him to holiday pay for Memorial Day, even though he was on leave that day for training with his National Guard unit. But the company refused to pay.

Jerry W. Earle, another veteran, thought his seniority as a journeyman boilermaker should be assigned from the date he would have completed his apprenticeship.

All three went to court, and each man won. The Davis case went to the Supreme Court, which ruled in his

Ed Gates . . . Speaking of People

Retirement System Seems Saved

As recently as 1977, this column and most other close observers of the military personnel scene were just about certain that the military retirement system, particularly its twenty-year pension proviso, was in for drastic alterations. And soon, too.

Critical statements about rapidly rising military retirement costs mounted on Capitol Hill. The executive branch talked of economies. A presidential pay commission was gearing up for what was perceived as adverse action. The press cranked out editorials denouncing the military pension program as too generous. All the signals suggested that the service community's most cherished fringe benefit—by far the number-one factor influencing favorable career decisions—was in trouble, that Uncle Sam was preparing to lower the boom.

AIR FORCE Magazine, in its June '77 issue, declared that unfavorable changes "within the next two years appear inevitable."

Well, they haven't happened. Nor do they seem likely to occur during the next two, or four, or perhaps more years. Today the rumblings of the recent past are muted. Rep. Les Aspin (D-Wis.), long the most prominent and vocal critic of the military retirement program, does keep hammering away. He wants military pensions scaled back drastically, so that payments don't start until age fifty-five to sixty-five, something more nearly akin to private-sector programs. Otherwise, public outcries for pension "reform" have been missing.

This is a favorable development, of course. In a related matter, we also note that Congress, in the recent military appropriation bill, routinely approved, with little discussion, $11,415 million for retired pay in FY '80. That is the exact amount the Pentagon requested and is an increase of $1,183 million over what Congress actually approved the previous year. The increase will cover retired pay raises and additional annuitants. The average number o retirees this year is put at 1,300,000, a net increase of about 38,00 over FY '79. The accompanying chart expands on the increase and categories of annuitants.

A decade ago a one-year retired pay increase of $1 billion-plus would have touched off a mighty howl from the public and renewed demands for reform. No more. Inflation and sharply increased spending, of course, have helped make billion-dollar figures commonplace.

But more is involved. The services have made a major production of the importance of retaining the twenty-year retirement plan untouched. Air Force studies take sharp issue with the findings of the President's pay commission two years ago. Those recommendations, in part, were incorporated into the Uniformed Services Retirement Benefits Act (USRBA). That legislation, long gathering dust in the Armed Services Committees of Congress, would provide modest retirement benefits after only ten years of service, though overall rewards would be reduced considerably below current levels.

To play fair with active-duty members at the time the USRB might become law, the Pentagon inserted a grandfather clause the Air Force demanded that it be included. It would give active-duty members a choice of electing the USRBA or staying with the twenty-year system.

Even though the language in the USRBA is clear—there's no doubt the option is genuine—a surprising number of military members apparently fear that once Congress takes up the legislation, the lawmakers will weaken the grandfather provision.

The Air Force has gone to unusual lengths to assure the troops that grandfather is real as the proposal now stands and that the

favor in what the Labor Department calls a "landmark, affecting perhaps hundreds of thousands of veterans." Labor administers the federal veterans' reemployment rights law, which is designed to ensure that veterans don't lose any job or other employment benefits because of military service. Basically, it protects seniority, status, and the rate of pay they would have attained with reasonable certainty if they had not gone into the military. Reservists are similarly protected.

Veterans with reemployment, pension, or related problems should contact the Office of Veterans' Reemployment Rights, LMSA, US Department of Labor, Washington, D. C. 20216. OVRR investigates veterans' complaints and helps resolve them. If the vet isn't satisfied, the government may take legal action in his behalf and provide legal assistance free of charge. With many World War II veterans reaching retirement age, cases revolving around pension credit for the veterans' time in military service have increased. The Davis case was the first to reach the Supreme Court.

In related developments the Veterans Administration is opening job centers in thirty-five major cities. The move follows what VA says were successful tests in the Washington, D. C., and San Diego VA regional offices. The job centers aim to show Vietnam era veterans that they have marketable skills and help them compete. The centers will be equipped with audiovisual training aids, such as videotape recordings of mock job interviews. The new centers, VA said, will supplement existing counseling and rehabilitation services provided by VA regional offices.

The first new center opened in the Newark, N. J., regional office in late November. Others are to follow shortly in Atlanta, New York, Buffalo, Philadelphia, Pittsburgh, Baltimore, Roanoke, Columbia, S. C., Boston, San Juan, and Providence.

Also, Hartford, Winston-Salem, St. Petersburg, Huntington, W. Va., Chicago, Detroit, New Orleans, Little Rock, Jackson, St. Paul, Los Angeles, Denver, Phoenix, Seattle, San Francisco, Milwaukee, Portland, Ore., Louisville, St. Louis, Indianapolis, Cleveland, Nashville, and Montgomery.

The VA said it hired 12,487 more

Former Surgeon General of the Navy Vice Adm. Donald L. Custis (Ret.), became Chief Medical Director of the Veterans Administration the second of this month. Dr. Custis, sixty-two, succeeds Dr. James Crutcher as head of the VA hospital system, the country's largest. Earlier he commanded the Naval Hospital in Danang, Vietnam, and the Bethesda, Md., Naval Hospital. He was the Navy medical chief from 1973 until his retirement in July 1976.

service will fight any attempt, from any source, to tamper adversely with it. Chief of Staff Gen. Lew Allen, Jr., and his top aides have flashed that promise Air Force-wide in messages to major commands, in speeches, and in internal news reports. Nothing quite like it—where the top executive vows publicly, if it becomes necessary, to put his prestige on the line against powerful elements of the government—has occurred in recent years.

These efforts have convinced many—but not all—doubters. For example, a captain at Tyndall AFB, Fla., sent this message to AIR FORCE Magazine: "I put absolutely no stock in the retirement system. Despite all the protestations to the contrary by Air Force leaders, I expect to see all my retirement benefits chopped away to the point that there is no reason to count on them as significant factors in my decision to stay in or separate."

His worries, while groundless, point up the tremendous emotion generated by the mere mention of the retirement issue. The USRBA may never see the light of day, and even if it does, grandfathering is a sure thing, military authorities feel. There is no reason to suppose the Administration would withdraw its support.

The Air Force, throughout the years of controversy over retirement costs, has advanced a strong case for continuing the twenty-year system, for present-day members as well as future ones. While critics faulted the extended pensions that early military retirement provides, USAF leaders were underscoring the positive features: that it is a tremendous retention aid; that it helps maintain a youthful and vigorous force; and that it prevents stagnation and keeps promotions flowing.

Another reason the steadily rising costs of military retirement don't draw the fire of earlier years is that private sector and other federal retirement plans also are galloping upward in cost. Federal agency budgets generally are mounting.

One change affecting military retired pay may surface in the near future. This would adjust CPI raises once, instead of twice, a year. Supporters of this change, which they say would save the government $250 million annually, note that Social Security annuitants receive only one adjustment a year, so why shouldn't the military? They have a point.

In any event, the earlier forecasts of almost-certain adverse doctoring of military retirement pay are down the drain. Present-day active-duty members should stow their fears.

RETIRED PAY, DEFENSE

(Dollars in thousands)

	Fiscal year 1978 actual		Fiscal year 1979 estimate		Fiscal year 1980 request	
	Average number	Funding	Average number	Funding	Average number	Funding
Retirement category:						
Nondisability	921,395	$7,362,993	959,795	$8,343,474	991,269	$9,311,081
Temporary disability	12,426	61,861	12,306	64,131	12,167	68,851
Permanent disability	140,354	963,342	140,834	1,070,505	140,229	1,107,572
Fleet Reserve	98,165	637,166	94,947	672,031	96,115	731,885
Survivors' benefits	47,514	147,802	54,031	198,359	60,230	232,111
Total	1,219,854	$9,173,164	1,261,913	$10,348,500	1,300,010	$11,451,500

The Bulletin Board

Vietnam-era veterans during FY '79, nearly half of whom came in under a special hiring program that exempts certain persons from going through the regular civil service competitive appointment process.

VA said 39,000 Vietnam-era veterans are now on its payroll, seventeen percent of its work force. The government-wide rate is ten percent.

ABA: Make Legal Aid Permanent

Most military members probably don't realize it, but the legal assistance they receive free from their services is provided on the basis of directives and regulations. Statutory authority does not exist for legal aid for wills, tax advice, divorce proceedings, adoption, landlord-tenant matters, consumer protection problems, personal real estate transactions, small claims, and other matters.

The American Bar Association, through its Committee for Legal Assistance for Military Personnel, has been trying to change that shortcoming for nearly a decade. The ABA doesn't exactly suggest that legal help for service people might, under the present set-up, suddenly be curtailed or withdrawn. But the Committee notes that without statutory underpinnings, the services can't budget specifically for legal assistance matters and therefore can't provide as much help as they might wish.

Free legal assistance for the military community is an important fringe benefit, the ABA says, and it wants to make sure it remains that way. Bills to provide the statutory basis for in-house legal aid include S. 1130, sponsored by lawmakers normally miles apart on the political spectrum, such as Sen. Strom Thurmond (R-S. C.) and Sen. George McGovern (D-S. D.).

Judge Advocates General of each service serve on the ABA Committee. USAF is represented by Col. Keith E. Nelson and Maj. Bryan G. Hawley.

Short Bursts

The Air Force Military Manpower and Personnel Center, Randolph AFB, Tex., is looking for **nonrated lieutenant colonels wanting to become site and base commanders.** The best qualified of the applicants presumably will be chosen. The only hitch: the openings are at Thule, Greenland; Johnston Atoll; various frosty places in Alaska; and other **remote locations** around the world. Most are twelve-month tours.

The deadline for **discharge review application**—for veterans separated before 1965 with an undesirable discharge—has just ended (such discharges are now called "discharges under other than honorable conditions"). The Pentagon, the Veterans Administration, military bases, and veterans organizations widely publicized the opportunity for a cleansed discharge. But two months before the January 1, 1980, application deadline only 2,750 of the estimated one million-plus eligible ex-service members had applied for upgrading. Of those, 1,508 received an upgrading; 893 of them were ex-Air Force.

When transferring, military members can ship **professional books, papers, and equipment** (PBP&E) over and above their normal personal property weight allowances. But what exactly is included? The Air Force says the list covers flight clothing, life-support gear, speech files, technical reports, individual personnel records, and MARS equipment. Not included in PBP&E: sports equipment, uniforms, file cabinets, study desks, bookcases (even though related to use of professional books), papers, wall plaques, aircraft models, and certificates. If in doubt, contact local transportation offices "before the move is made," Headquarters says.

Pentagon corridor walls are covered with pictures of former chiefs of staff, Presidents, and other dignitaries, so why not the Air National Guard in Texas? Here, Capt. Charles Amos of the ANG's 147th Fighter Interceptor Gp., Ellington AFB, Tex., checks a new art display of National Guardsmen who became President. The pictures help "dress up" the 147th's recently remodeled headquarters.

Loring AFB, Me., will remain an active SAC installation, not be reduced to a "forward operating base" as previously planned. It was on the Air Force "hit list" for years. In its stay-open announcement, which ties the turnaround to its "continuing assessment of evolving strategic requirements," the Air Force indicated it would try to get more housing for Loringites. Repairs to existing housing are reportedly urgently needed.

An important new bill for the service community is H.R. 5704, sponsored by **Rep. Joseph Fisher** (D-Va.). It would **continue military and federal civilian employee** pay even though appropriations bills and continuing resolutions were delayed, as they have been in recent months. Pay raises tied up in the confusion would be held in abeyance until the regular appropriations bills were passed. Then the raises would be paid retroactively.

Rep. Jerry Lewis (R-Calif.) recently lauded **USAF Lts. James, John, and Thomas Hunt,** along with their parents, **Philip and Eleanor Hunt,** who, Lewis said "had the unique experience of having all three of their sons graduate from the Air Force Academy." James is stationed at Elmendorf AFB, Alaska; John at Moody AFB, Ga.; and Thomas at Wright-Patterson AFB, Ohio. "They are truly outstanding Americans," Lewis declared in the *Congressional Record.*

Like it or not, 1,000 of what the Army calls its "best soldiers" are being involuntarily assigned to recruiting duty. That service has about 5,300 "production recruiter" billets, but it has fired several hundred for recruiting hanky-panky. Air Force continues to use volunteers to fill its 2,300 recruiter slots.

Senior Staff Changes

PROMOTIONS: To be ANG **Major General:** Irvin G. **Ray;** Bobby E. **Walls.**

To be ANG **Brigadier General:** William J. **Davis;** Charles K. **Evers;** Richard C. **Freeman;** Ray P. **Greenwood;** William E. **Haymes;** Raymond E. **Hebrank;** Frank L. **Hettlinger;** Edward J. **Power;** Hugh A. **Ward.**

CHANGES: M/G James D. Isaacks, Jr., from Mob. Asst. to Cmdr., AFLC, Wright-Patterson AFB, Ohio, to Mob. Asst. to DCS/L&E, Hq. USAF, Washington, D. C., replacing M/G Bruce M Davidson . . . **M/G Jasper A. Welch Jr.,** from ACS/Studies & Analyses, Hq USAF, Washington, D. C., to National Security Council Staff, Washington, D. C. ■

Industrial Associates of the Air Force Association

"Partners in Aerospace Power"

Listed below are the Industrial Associates of the Air Force Association. Through this affiliation, these companies support the objectives of AFA as they relate to the responsible use of aerospace technology for the betterment of society, and the maintenance of adequate aerospace power as a requisite of national security and international amity.

Aeritalia, S.p.A.
Aerojet ElectroSystems Co.
Aerojet-General Corp.
Aerojet Services Co.
Aerospace Corp.
Allegheny Ludlum Industries, Inc.
*American Electronic Laboratories, Inc.
American Telephone & Telegraph Co.
AT&T Long Lines Department
Analytic Services Inc. (ANSER)
Applied Technology, Div. of Itek Corp.
Armed Forces Relief & Benefit Assn.
AVCO Corp.
Battelle Memorial Institute
BDM Corp., The
Beech Aircraft Corp.
Bell Aerospace Textron
Bell Helicopter Textron
Bell & Howell Co.
Bendix Corp.
Benham-Blair & Affiliates, Inc.
Boeing Co.
British Aerospace, Inc.
Brunswick Corp., Defense Div.
Brush Wellman, Inc.
Burroughs Corp.
CAI, A Division of Recon/Optical, Inc.
Calspan Corporation, Advanced Technology Center
*Canadair Inc.
Canadian Marconi Co.
Cessna Aircraft Co.
Chamberlain Manufacturing Corp.
Cincinnati Electronics Corp.
Clearprint Paper Co., Inc.
Collins Divisions, Rockwell Int'l
Colt Industries, Inc.
Computer Sciences Corp.
Conrac Corp.
Control Data Corp.
Cubic Corp.
Decca Navigator System, Inc.
Decisions and Designs, Inc.
Dynalectron Corp.
E-A Industrial Corp.
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ECI Div., E-Systems, Inc.
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Emerson Electric Co.
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Ex-Cell-O Corp.—Aerospace
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Fairchild Industries, Inc.
*Falcon Jet Corp.
Federal Electric Corp., ITT
Ford Aerospace & Communications Corp.
GAF Corp.
Garrett Corp.
Gates Learjet Corp.
General Dynamics Corp.
General Dynamics, Electronics Div.
General Dynamics, Fort Worth Div.
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Gulfstream American Corp.
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Howell Instruments, Inc.
Hudson Tool & Die Co., Inc.
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ITT Defense Communications Group
ITT Telecommunications and Electronics Group—North America
Kelsey-Hayes Co.
Kentron International, Inc.
Lear Siegler, Inc.
Leigh Instruments, Ltd.
Lewis Engineering Co., The
Litton Aero Products Div.
Litton Industries
Litton Industries Guidance & Control Systems Div.
Lockheed Corp.
Lockheed Aircraft Service Co.
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Lockheed Georgia Co.
Lockheed Missiles & Space Co.
Logicon, Inc.
Loral Corp.
Magnavox Government & Industrial Electronics Co.
Marquardt Co., The
Martin Marietta Aerospace
Martin Marietta, Denver Div.
Martin Marietta, Orlando Div.
McDonnell Douglas Corp.
Menasco Manufacturing Co., Div. of Colt Industries, Inc.
Military Publishers, Inc.
MITRE Corp.
Moog, Inc.
Motorola Government Electronics Div.
Northrop Corp.
OEA, Inc.
O. Miller Associates
Pan American World Airways, Inc.
Perkin-Elmer Corp., Computer Systems Div.
PRC Information Sciences Co.
Products Research & Chemical Corp.
Rand Corp.
Raytheon Co.
RCA, Government Systems Div.
Redifon Flight Simulation Ltd.
Rockwell International
Rockwell Int'l, Electronic Operations Group
Rockwell Int'l, North American Aerospace Operations
Rohr Industries, Inc.
Rolls-Royce, Inc.
Rosemount Inc.
Sanders Associates, Inc.
Satellite Business Systems
Science Applications, Inc.
Singer Co.
Sperry Rand Corp.
*SRI International
Standard Manufacturing Co., Inc.
Sundstrand Corp.
Sverdrup & Parcel & Associates, Inc.
System Development Corp.
Talley Industries, Inc.
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UTC, Sikorsky Aircraft Div.
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Western Gear Corp.
Western Union Telegraph Co., Government Systems Div.
Westinghouse Electric Corp.
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Wyman-Gordon Co.
Xerox Corp.

*New affiliation

AFA News

By Vic Powell, AFA AFFAIRS EDITOR

Harry J. Gray, Chairman of the Board of United Technologies Corp. and a member of AFA's Iron Gate Chapter, left, receives a desk pen set from New England Region Vice President Joseph Falcone in appreciation of Mr. Gray's strong support of the Connecticut State AFA. The presentation was made during ceremonies observing Veterans Day. Mr. Gray served as an Army captain in World War II.

During the recent Texas State AFA Convention, Jack Coker of Waco, Tex., left, receive the AFA Presidential Citation for Veterans Affairs. Frank Manupelli, who presented th Citation to Mr. Coker, was also elected for a second term as State President at the Convention.

Vincent F. O'Connor, Chairman of the New York State AFA Executive Committee, left, presented a plaque to Dan McGrath, President of the Eastern Long Island Retired Officers Club, recognizing the Club's longstanding support of the Northport Veterans Hospital. The award was presented at a recent meeting of the Retired Officers Club.

Cadet Lt. Col. Merri Sanchez, a member of AFJROTC at Montezuma Cortez High School in Colorado, has received the Colorado State AFA Aerospace Education Award for the second consecutive year. A plaque and a check for $100 were presented to Cadet Sanchez by Noel A. Bullock, Director of Aerospace Education for the Colorado State AFA.

COMING EVENTS

AFA Board of Directors Meeting, Fort Walton Beach, Fla., March 1, 1980 . . . **AFA Midwest Symposium,** "The Crisis of the '80s . . . A Time For Decision," O'Hare Inn, Park Ridge, Ill., March 1, 1980 . . . Iron Gate Chapter's **17th National Air Force Salute,** Sheraton Center, New York, N. Y., March 22, 1980 . . . **AFA Golf and Tennis Tournaments,** The Broadmoor, Colorado Springs, Colo., May 23, 1980 . . . **AFA Nominating Committee and Board of Directors Meetings,** The Broadmoor, Colorado Springs, Colo., May 24, 1980 . . . Twenty-first Annual Dinner Honoring the **Air Force Academy's Outstanding Squadron,** The Broadmoor's International Center, Colorado Springs, Colo., May 24, 1980.

chapter and state photo gallery

At the recent New York State AFA Convention, former State President Kenneth C. Thayer presented Mrs. Audrey S. Balchen an AFA Life Membership pin. Mrs. Balchen is the widow of retired Air Force Col. Bernt Balchen, the internationally famous Arctic explorer and aviator who died in 1973.

Gen. Robert E. Huyser, Commander in Chief, MAC, unveiled a model of a 1917 Wright biplane at ceremonies marking the fourth annual observance of Corporal Frank Scott Day at Scott AFB, Ill. The six-foot copper and brass biplane was donated by AFA's Scott Memorial Chapter, represented by President Robert D. Eisenhart, in memory of Corporal Scott. Scott, the first enlisted man to lose his life in an air accident and the only enlisted man to have an Air Force installation named for him, died in a crash at College Park, Md., in 1912.

Martin H. Harris, Chairman of AFA's Constitution Committee and a former National Secretary of the Association, presented the AFA Medal of Merit to Irene E. Robertson at a recent ceremony in Air Force Systems Command headquarters at Andrews AFB, Md. The medal was in recognition of Mrs. Robertson's volunteer work for AFA at the National Conventions.

AFA's Los Angeles Air Power Chapter sponsored a "Salute to SAMSO" luncheon on August 3, 1979, attended by more than 800. Following the luncheon, a monument donated by the California State AFA to mark SAMSO's Silver Anniversary was dedicated. Present at the dedication ceremonies were, from left, SAMSO Commander Lt. Gen. Richard C. Henry; Ed Stearn, California State AFA President; Secretary of the Air Force Hans M. Mark; and Gen. Alton Slay, AFSC commander.

This Is AFA

The Air Force Association is an independent, nonprofit, aerospace organization serving no personal, political, or commercial interests; established January 26, 1946; incorporated February 4, 1946.

The Association provides an organization through which free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principle of freedom and equal rights for all mankind.

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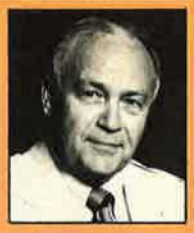

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VICE PRESIDENTS

Information regarding AFA activity within a particular state may be obtained from the Vice President of the Region in which the state is located.

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Northeast Region
New York, New Jersey, Pennsylvania

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Grand Forks, N. D. 58201
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Midwest Region
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Farmington, Utah 84025
(801) 867-2566
Rocky Mountain Region
Colorado, Wyoming, Utah

AFA News photo gallery

Thomas E. Correll, second from right, a member of the AFA Central Indiana Chapter, recently presented a "Partners in Aerospace Power" certificate to Edward B. Colby, second from left, Indianapolis Operations Manager of Detroit Diesel Allison Div. of General Motors Corp. Present for the ceremonies were Lt. Col. Jerry E. Knotts, USAF, Commander, Defense Contract Administration Service Plant Representative Office; and Roy P. Whitton, far right, President of the Indiana State AFA.

New officers elected at a recent meeting of AFA's Curtis E. LeMay-Orange County Chapter, Calif., are: President David Graham, left, Secretary Lois Hermann, and Vice President T. R. "Ted" Gillenwaters, right. Retiring President Tom Scott, center, presents featured speaker Charles E. Phelps of the Rand Corp. to the new officers. Dr. Phelps discussed governmental regulations as a major factor in the present energy shortage.

The Civil Air Patrol was well represented at a recent meeting of the Iron Gate Chapter held at the "21" Club in New York City. Guest speaker at the Iron Gate Chapter AFA anniversary luncheon was Under Secretary of the Air Force Antonia Handler Chayes, second from left. Lt. Col. Ruth Leibold, CAP, New York Wing, far left, was a luncheon guest. CAPers who are members of the Iron Gate Chapter also attending the luncheon are, from right, Lt. Col. Sid Birns, New Jersey Wing; Lt. Col. Dorothy Welker, National Headquarters Squadron, and Secretary of the Iron Gate Chapter; Col. Fred Bamberger, Jr., North East Region; and Col. Roy Arroll, Commander, New York Wing.

20% Dividend Paid for 1978 Reduces Net Cost to All-Time Low

Three Low-Cost, High Benefit Plans to Choose From

NOW AVAILABLE TO

CURRENT BENEFIT TABLES

Insured's Attained Age	STANDARD PREMIUM: $10 per month Basic Benefit*	HIGH OPTION PREMIUM: $15 per month Basic Benefit*	HIGH OPTION PLUS PREMIUM: $20 per month Basic Benefit*
20-29	$85,000	$127,500	$170,000
30-34	65,000	97,500	130,000
35-39	50,000	75,000	100,000
40-44	35,000	52,500	70,000
45-49	20,000	30,000	40,000
50-54	12,500	18,750	25,000
55-59	10,000	15,000	20,000
60-64	7,500	11,250	15,000
65-69	4,000	6,000	8,000
70-74	2,500	3,750	5,000
Aviation Death Benefit*			
Non-war related	$25,000	$37,500	$50,000
War related	$15,000	$22,500	$30,000
Extra Accidental Death Benefit*	$12,500*	$15,000*	$17,500*

*The Extra Accidental Death Benefit is payable in addition to the basic benefit 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.

OTHER 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 in all but three years (during the Vietnam War) since the program was initiated in 1961, and basic coverage has been increased on six 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 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 members of the Air Force Association are eligible to apply for this coverage provided they are under age 60 at the time application for coverage is made.

*Because of certain restrictions on the issuance of group insurance coverage, applications for coverage under the group program cannot be accepted from non-active duty personnel residing in either New York or Ohio. Non-active duty members residing in Ohio, however, may request special application forms from AFA for individual policies which provide coverage quite similar to the group program.

OPTIONAL FAMILY COVERAGE

(may be added to any of the above Plans)
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.

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 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.

ALL AFA MEMBERS (under age 60)

APPLICATION FOR
AFA GROUP LIFE INSURANCE

United of Omaha

Group Policy GLG-2625
United Benefit Life Insurance Company
Home Office Omaha Nebraska

Full name of member _____
Rank Last First Middle

Address _____
Number and Street City State ZIP Code

Date of birth (Mo. / Day / Yr.)	Height	Weight	Social Security Number

This insurance is available only to AFA members

☐ I enclose $13 for annual AFA membership dues (includes subscription ($9) to AIR FORCE Magazine). Please send membership application.

☐ I am an AFA member.

Name and relationship of primary beneficiary

Name and relationship of contingent beneficiary

Please indicate below the Mode of Payment and the Plan you elect:

Mode of Payment	Plan of Insurance: Standard Plan		High Option Plan		High Option PLUS Plan	
	Member Only	Member And Dependents	Member Only	Member And Dependents	Member Only	Member And Dependents
Monthly government allotment (only for military personnel). I enclose 2 month's premium to cover the necessary period for my allotment (payable to Air Force Association) to be established.	☐ $ 10.00	☐ $ 12.50	☐ $ 15.00	☐ $ 17.50	☐ $ 20.00	☐ $ 22.50
Quarterly. I enclose amount checked.	☐ $ 30.00	☐ $ 37.50	☐ $ 45.00	☐ $ 52.50	☐ $ 60.00	☐ $ 67.50
Semi-Annually. I enclose amount checked.	☐ $ 60.00	☐ $ 75.00	☐ $ 90.00	☐ $105.00	☐ $120.00	☐ $135.00
Annually. I enclose amount checked.	☐ $120.00	☐ $150.00	☐ $180.00	☐ $210.00	☐ $240.00	☐ $270.00

Names of Dependents To Be Insured	Relationship to Member	Dates of Birth Mo. Day Yr.	Height	Weight

Have you or any dependents for whom you are requesting insurance ever had or received advice or treatment for: kidney disease, cancer, diabetes, respiratory disease, epilepsy, arteriosclerosis, high blood pressure, heart disease or disorder, stroke, venereal disease or tuberculosis? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance been confined to any hospital, sanatorium, asylum or similar institution in the past 5 years? Yes ☐ No ☐

Have you or any dependents for whom you are requesting insurance received medical attention or surgical advice or treatment in the past 5 years or are now under treatment or using medications for any disease or disorder? Yes ☐ No ☐

If YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, EXPLAIN FULLY including date, name, degree of recovery and name and address of doctor. (Use additional sheet of paper if necessary.)

I apply to United Benefit Life Insurance Company for insurance under the group plan issued to the First National Bank of Minneapolis as Trustee of the Air Force Association Group Insurance Trust. Information in this application, a copy of which shall be attached to and made a part of my certificate when issued, is given to obtain the plan requested and is true and complete to the best of my knowledge and belief. I agree that no insurance will be effective until a certificate has been issued and the initial premium paid.

I hereby authorize any licensed physician, medical practitioner, hospital, clinic or other medical or medically related facility, insurance company, the Medical Information Bureau or other organization, institution or person, that has any records or knowledge of me or my health, to give to the United Benefit Life Insurance Company any such information. A photographic copy of this authorization shall be as valid as the original. I hereby acknowledge that I have a copy of the Medical Information Bureau's prenotification information.

Date _____, 19 ____ _____
Member's Signature

FORM 3676GL App REV. 10-79

Application must be accompanied by a check or money order. Send remittance to:
Insurance Division, AFA, 1750 Pennsylvania Avenue, NW, Washington, D.C. 20006

1/80

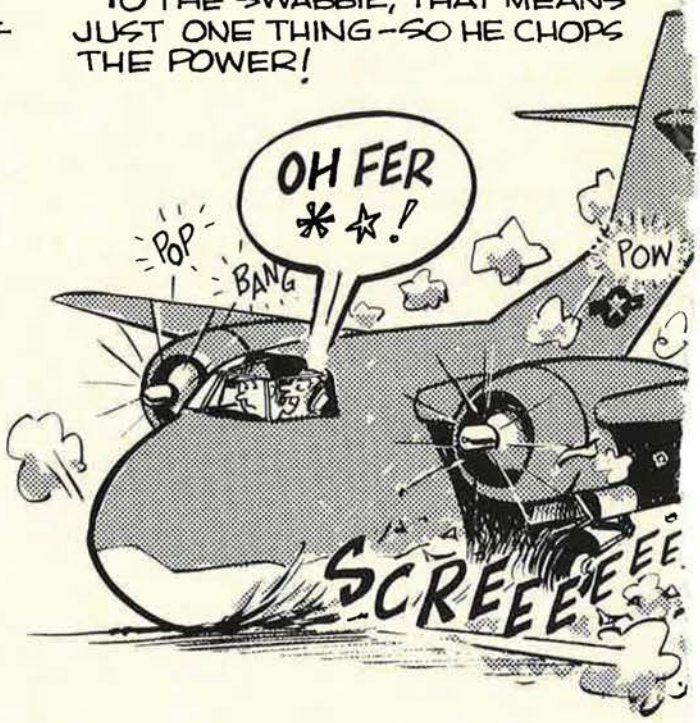
Bob Stevens'

"There I was..."

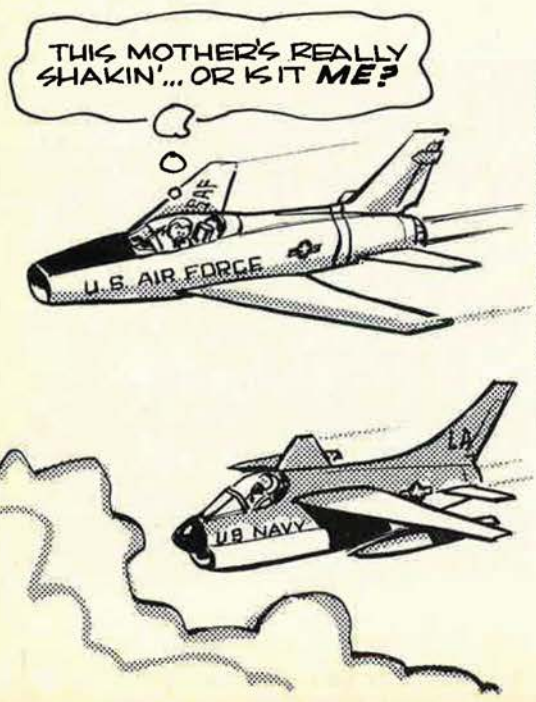
HERE WE GO AGAIN WITH COMMUNICATIONS – and THE LACK THEREOF. WE HAVE ENOUGH TROUBLE UNDERSTANDING EACH OTHER IN THE SAME BRANCH OF THE SERVICE – MIX A COUPLE OF BRANCHES and YOU'VE GOT ***REAL*** TROUBLE...

A NAVY "EXCHANGE" TYPE AVIATOR IS RIDIN' RIGHT SEAT TO A BLUE SUITER ABOUT TO LIFT OFF IN A C-7...

TO THE SWABBIE, THAT MEANS JUST ONE THING – SO HE CHOPS THE POWER!



ANOTHER CLASSIC FOUL-UP: A SUPER-SABRE'S COMIN' OFF A STRIKE IN 'NAM. A RATTLED PILOT THINKS HE'S HIT & CALLS ON GUARD (EMERGENCY) FOR SOMEONE TO LOOK HIM OVER–



MAINTAINING RADIO SILENCE, THE NAVY SEES NO SERIOUS DAMAGE and GIVES THE OL' "THUMBS UP"

Bob Stevens

The New Shape of Air Power

In each generation, one combat aircraft incorporates the full technology of the time and is known as the "fighter pilot's fighter." The Spitfire. The Mustang. The Sabre. The Phantom. Each delivered spectacular performance and each dominated the skies of its era.

Today, that fighter pilot's fighter is the F-16, with its unparalleled maneuverability, advanced avionics and multiple weapons payloads . . . a true multirole fighter with unmatched capability in air-to-air and air-to-ground missions.

The F-16 is operational with the Air Forces of Belgium, The Netherlands and the United States, and is now joining the Air Forces of Denmark, Norway and Israel. Like the pace-setting fighters of other generations, the F-16 will set the standard of multirole combat performance for years to come.

GENERAL DYNAMICS

Fort Worth Division, Fort Worth, Texas 76101

Remember when he was President?

If you do, then you probably remember when the F-106 was the "hottest new interceptor" in the U.S. defense arsenal. The aircraft for Air Defense. Well, much has changed since then, but one thing hasn't —we still have to depend on the F-106 for continental defense. But can we?

Right now we are trying to protect the United States of the 1980's with aircraft of the 1950's. Quite frankly, they are not the best choice. The aircraft are old, slower than newer models, radar-limited, armament-limited and expensive to maintain. They haven't the range required for adequate protection against the foreign bomber threat.

Then what's the answer to strategic defense? The McDonnell Douglas F-15 Eagle. America's air superiority ace. It can outfly and outfight anything else in the air. The F-15 is an all-weather aircraft ideally suited to strategic defense.

Advanced radar provides superior tracking and coverage of huge blocks of airspace. Versatile armament gives pilots the all-weather capability they need to get the job done. The F-15 Eagle. It's the best interceptor in the sky. It's in the inventory today doing the important tactical air superiority job.

Now the Air Force needs more F-15s for the vital task of strategic defense. And it needs them soon.

logical choice

The F-15 Eagle

MCDONNELL DOUGLAS