MAY 1974 / $2

AIR FORCE

PUBLISHED BY THE AIR FORCE ASSOCIATION

MAGAZINE

AIR FORCE ALMANAC

NUMBER 1

SPERRY

Avionics Report

ORBITER ELECTRONICS—Sperry has been selected by Rockwell International to supply Multiplexer-Demultiplexer units for the Space Shuttle Orbiter. The MDM units will work in conjunction with the Orbiter's general purpose computer to convert data from spacecraft systems into a format useable by the computer. The MDMs will also make computer signals useable by Orbiter subsystems. In addition, Sperry will supply five automatic test equipment sets. Under a previously awarded contract by Rockwell, Sperry is aiding in the design and development of the Orbiter's autoland capability.

SPACE SHUTTLE TRAINER—Under contract to Grumman Aerospace Corp., Sperry will provide avionics and services to modify two Gulfstream II jets for use as Orbiter training aircraft. When flown from the left side of the cockpit, the jets will have the handling characteristics of the Orbiter, which will be approximately four times heavier.

CERTIFICATION—Sperry has certified its STARS autopilot with a flight director system in the first of three Falcon 20 jets purchased by Japan Air Lines for training. Sperry has also certified the new autopilot in the Beech E-90, Cessna 421B, Mitsubishi MU-2J and Rockwell 690A.

VARIG Brasilian Airlines is the 10th major air carrier to select Sperry's automatic test equipment. The Rio de Janeiro-based airline will use the ATE for support of its DC-10, 737, 727 and 707 fleet avionics, analog and digital. The Sperry system will be installed at the airline's Porto Alegre facility.

SHORT NOTES: Sperry has been selected by Hawker Siddeley to provide the instruments for the new HS-146... Sperry is looking for electrical engineers with digital avionics experience... Sperry pulled the wraps off a new series of four-inch panel mounted gyro horizons at the SAE Business Aircraft Show in Wichita. Another addition to the STARS line of general aviation avionics.

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We've delivered 850 F-5's so far. On time. On cost. Now we're building the new International Fighter—the F-5E Tiger II. And the F-5F tactical trainer. Tigers with even more bite. To date we have orders and program commitments for more than 500 aircraft.

These, together with the new YF-17 to be used by the U.S. Air Force to demonstrate advanced technology, comprise the Northrop family of fighters—pound for pound, the best lightweight fighters in the world.

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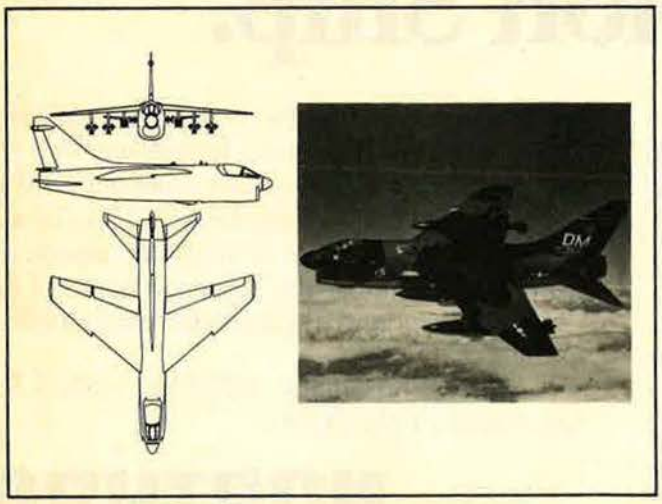
NORTHROP

"The A-7 is the most accurate and effective tactical air weapon system in the air today. And this is the humble opinion of the Forward Air Controllers who've seen 'em all."

...QUOTE FROM OPERATIONAL REPOR



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

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

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

VOUGHT SYSTEMS DIVISION
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AIR FORCE MAGAZINE
PUBLISHED BY THE AIR FORCE ASSOCIATION

VOLUME 57, NUMBER 5

MAY 1974

ANNUAL AIR FORCE ALMANAC ISSUE

REPORTS FROM THE MAJOR AIR COMMANDS AND SEPARATE OPERATING AGENCIES

GALLERY OF USAF WEAPONS

BY S. H. H. YOUNG

AN AIR FORCE ALMANAC

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With the Lockheed C-5A MAC can implemen

Today the C-5A is the world's biggest and most advanced airlifter. It has proven the concept which led to its development in both Asian and Middle East operations.

It began in the 1960s. A plane was needed to help this country follow a policy of remote presence, a plane big enough, strong enough, and with enough range to let this country make that presence a real one thousands of miles away. In hours.

It had to be able to carry equipment which, up to that time, could only be transported slowly on ocean-going ships. Equipment such as enormous bridge launchers, 50 ton M-60 tanks, 5-ton trucks and Super Jolly Green Giant helicopters. Plus their crews.

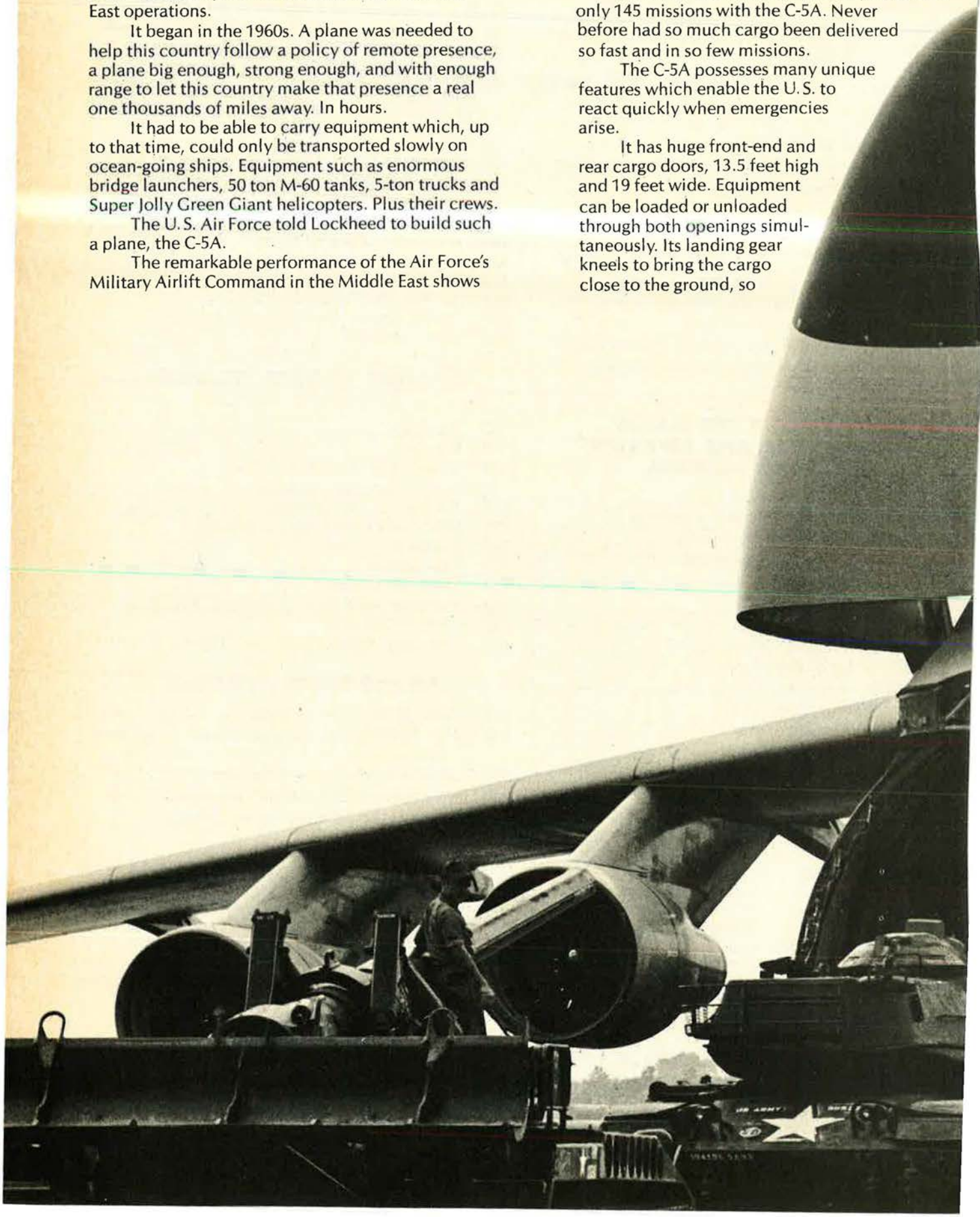
The U.S. Air Force told Lockheed to build such a plane, the C-5A.

The remarkable performance of the Air Force's Military Airlift Command in the Middle East shows how the C-5A has proven that concept of remote presence.

Skilled MAC crews delivered 10,800 tons in only 145 missions with the C-5A. Never before had so much cargo been delivered so fast and in so few missions.

The C-5A possesses many unique features which enable the U.S. to react quickly when emergencies arise.

It has huge front-end and rear cargo doors, 13.5 feet high and 19 feet wide. Equipment can be loaded or unloaded through both openings simultaneously. Its landing gear kneels to bring the cargo close to the ground, so



U.S. policy anywhere in the world in hours.

vehicles can drive on and off over C-5A ramps without any ground-handling equipment.

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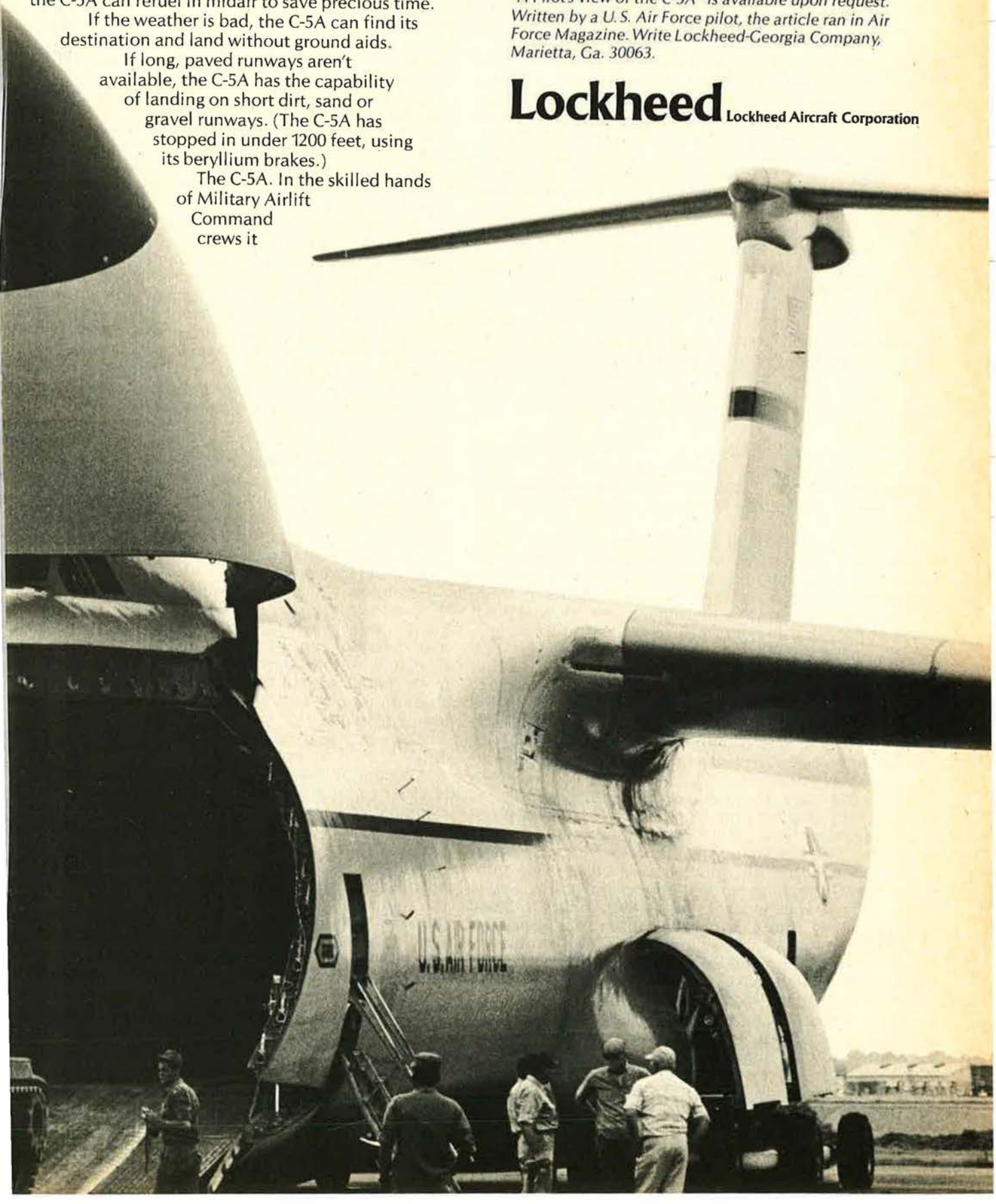
If long, paved runways aren't available, the C-5A has the capability of landing on short dirt, sand or gravel runways. (The C-5A has stopped in under 1200 feet, using its beryllium brakes.)

The C-5A. In the skilled hands of Military Airlift Command crews it has proven that airlift can implement U.S. policy.

The C-5A, built by Lockheed. It's the world's most advanced airlifter. And will be for many years.

If you want more information about the C-5A, "A Pilot's view of the C-5A" is available upon request. Written by a U.S. Air Force pilot, the article ran in Air Force Magazine. Write Lockheed-Georgia Company, Marietta, Ga. 30063.

Lockheed Lockheed Aircraft Corporation



AN EDITORIAL

YOU CAN'T MOTHBALL PEOPLE

BY JOHN F. LOOSBROCK

EDITOR, AIR FORCE MAGAZINE

Six thousand warplanes stand waiting at Davis-Monthan Air Force Base in Arizona, preserved in the same benevolent desert air that Indians used centuries ago to dry their meat for future times when kills would be scarce. The aircraft stand there, in the Air Force Logistics Command's Military Aircraft Storage and Disposition Center, with the mindless patience of inanimate things, waiting to fulfill a purpose that for most of them will never come.

Many of their predecessors got their second chance. During the Korean War, P-51s, B-26s, and B-29s of World War II vintage were stripped of their protective cocoons, refurbished, and sent halfway around the world to fly and fight again. In the early years of Vietnam, B-66s, B-57s, A-1s, even venerable Gooney Birds were rousted from their resting places and put to uses their designers never dreamed of. Over all these years, these great old birds of the American desert have been a rich source for critical, long lead-time components—engines, struts, and dozens of important bits and pieces.

There they stand, ready to be used, cannibalized, or cut up for scrap as the needs and desires of their masters may dictate. You can mothball airplanes and know they'll be there—when, as, or if they may be needed.

But you can't mothball people—and if you try, don't expect them to be there when the crunch comes. People—at least the kind of people the Air Force needs—have to have a sense of purpose, the stimulus of activity, the excitement of achievement, the challenge of doing better what they have been trained to do well.

Every military commander worth his salt knows that. The greatest enemy of morale, esprit, and combat effectiveness is idleness—idleness of mind, idleness of body, idleness of spirit. Occasional relief through the vicarious exercise of military skills only exacerbates the situation. This is why command in peacetime traditionally has been no less demanding of imaginative leadership than it has been in war.

During the ten years of queasy peace between Korea and Vietnam, the Air Force had not to face this problem. They were years not truly of peace but of cold war, quite unlike anything the world had known before. In that decade, the Air Force built a bulwark of aerospace power against a continuously growing Soviet threat. There was more than enough work to keep everyone busy. More important, there was sense of purpose. And there was public support. When Lebanon, the Offshore Islands, the Berlin Wall, the Cuban Missile crisis came along, the Air Force was ready—instantly—its machines and its people.

For a different picture, let us look at another period of peace. In the 1920s and '30s, the country was seized by antimilitary sentiment as an aftermath of World War I. Isolationism was in the saddle. Came the Great Depression. Military budgets were cut to the bone. Fifty hours of flying time a year was about par for our airmen, and a lot of good men who figured their professional skills were being mothballed turned in their su and sought their challenges elsewhere.

Fortunately for several hundred million people he and abroad, a handful of the most capable stayed They invented missions that would keep the rust their skills—like Hap Arnold's forest-fire patrol a border patrol. They accepted missions they were r equipped to carry out—like flying the air mail in ricke planes. They stunted, devised records to be broke so that airpower, feeble as it was, would occupy son small place in the public eye. And they became the leaders of World War II. Fortunately, geography a the efforts of our allies gave them time to recruit, tra and equip the two million airmen without whom t greatest war in history could not have been won.

Neither the peacetime environment of forty years a nor that of the years between Korea and Vietnam a likely to repeat themselves. But the years ahead m combine elements of both, and there are lessons fro both that need to be remembered.

Soviet military power is not going to decline, mu less disappear. There is a general, although amo phous, recognition that the US must maintain stro military forces, but remarkably little concern over t seriousness of the Soviet threat, no matter how p suasively it is described by knowledgeable expe Inevitably, public disinterest in and lack of understa ing of defense affairs will create enormous pressures reduce defense spending.

Personnel costs are irreducible, short of a dras reduction in the size of the Air Force. Obsolete equ ment has to be replaced. This leaves the operati and maintenance area as the only option for fund flexibility. At the same time, the Air Force, as the larg user of fuel among the services, will have to bear share in energy conservation while paying more for fuel it does use.

When one remembers that it costs, at today's pri about $1,500 an hour to fly a B-52H, $2,100 for a or $900 for an F-4, the net result of all the above fac is likely to be public and congressional pressure to operational readiness flying, probably below a minimum, and to eliminate virtually all other flying in the 1920s and 1930s.

If this happens—and odds are it will, barring pu enlightenment as to the dangers of such a cours the effects on morale, retention of highly trained p ple, and combat readiness are predictably disastr Air Force leaders understand the implications and concerned. But there are few indications that the d gers to national security are understood by the pu or by many in Congress.

The energy crisis provides a case in point. warnings of the knowledgeable few that a serious sh age was at hand went unheeded. But the burden of predicted results was shared by all.

The Air Force mission, as the saying goes, is t and to fight. The flying must come first.

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Airmail

Point of View Clash

Gentlemen: The article, "A Military Force for the Twentieth Century," was outstanding. Colonel Rosser has put together a provocative and challenging thesis that seems not only workable but desirable. It is obvious that a lot of thought went into his paper and I appreciate it.

Defense, as a whole organization, needs a whale of a lot of internal challenge; it is already getting a lot of external challenge. American citizens are no longer willing to accept some individual's "This is the way it's got to be" without question, and that form of internal challenge represented by Rosser is vital and very necessary. Many things required in military units are based to large degree on custom, habit, and tradition, which further emphasizes Rosser's point that American armed forces are not of the twentieth century; at least not this part of that century. We have effective capability, it seems, but efficiency is highly suspect, and particularly suspect if that efficiency means a challenge to what has been. We have traveled our rut so long we are likely blinded to what else might be. . . .

Jerome G. Peppers, Jr.
Fairborn, Ohio

Gentlemen: . . . The changes [Colonel Rosser] suggests would create a military force about as effective as the chorus from a comic operetta. How in the world the military can be made more effective by dismantling the officer and NCO corps is beyond me.

Using an unfortunate selection of definitions, the author states we have a two-class system of which one is the "lower" class. Men of all ranks in the services whom I know see no class distinction just as they see no color distinction. Pride, respect, and affection are commonplace in the relations between the Air Force commissioned and noncommissioned. . . .

Basically, the author's hypotheses are unsound if we limit the discussion to the Air Force. When he talks about the problems of recruitment, retention, job satisfaction, etc., he lapses into the term "military." Rightfully so, because none of these problems has in the past or will in the future deter the Air Force accomplishing any mission it is given.

Military men know most of the problems cited by the author really pertain to the Army. Right now, the Air Force has a problem of getting rid of people rather than figuring out how to keep them. Peace and prosperity might make this forever so, who knows?

In a word, the Air Force in the twentieth century can be a volunteer force. Adequate budgetary support will result from considerations completely unrelated to personnel structuring as the author suggests. Foreign-policy objectives will dictate the money levels for military use, not how happy, well-fed, well-organized, etc., the services are. . . .

Shedding the "combat standard" as "the touchstone of military professionalism" would be like removing the Bibles from all the churches, although some in our changing society opt for that, too. It wouldn't be too long before people in the services would forget what they were put there for. All kinds of superwaste and supermanagement would prevail, empire building would know no bounds. . . .

. . . [Colonel Rosser] states "informal systems" now exist for selection of "generalists." This is hardly the case. When a man makes general or colonel there are twenty to twenty-five years of formal reports on his performance and potential. His other remark that selection process favors young officers with "good connections" sounds like sour grapes. If you are not in the "clique" you can get in real easy by working like hell, learning your job, being dependable, being cooperative, lead others to superior achievements, etc. . . .

As for weekend warriors manning the missile sites and cockpits—careful! The actual time spent in the cockpit or site is significant, but is shared with all the other requirements to keep the person in a high state of professional readiness and competence. There is a constant stream of study, evaluation, testing, etc., which monopolize huge portions of an individual crew member's time. The practicality of this suggestion defies historical experience.

The author cleverly avoided the racial-integration aspect of the military in our changing society. Perhaps because the military has been a leader in giving all minorities the rights they deserve as citizens of this country. . . .

Calling the base-housing and family-support structure "self-contained military ghettos" is a distortion of fact. Post exchanges provide a profit that in turn funds recreational outlets for military personnel. The other services are there because current strategic and tactical forces must be maintained in constant readiness. Having sufficient numbers of supervisors, crews, and support personnel housed on base enhances the ability for forces to react quickly.

The military are a "unique separate group with society." Americans want it that way. Citizens do not want the military coming downtown and telling them how to run things. What they want of the military is assurance that, if called upon, the military can do the job it is paid to do—fight. The military is going to become damn "suspect" if it starts neglecting its own job and becomes a pervasive if not dominating force in the communities. If the military is to spend its time integrating into the community then the time has come to question its need of large numbers or funds.

As for the "tendency to treat members of the military as adolescents when off duty"—hogwash! The only requirement placed on off-duty behavior is to conform to the laws of the land, no more or no less than any citizen. There are no paternal limitations placed on people who live on or off base.

People who choose a military career like the life style it offers. They accept the rigid standards of discipline, training, and morale because they recognize the need for it. Without it, even the neophyte airman recognizes we would have a "banana republic" Air Force. The Air Force isn't a social agency created to be in the forefront of changes to the American way of life. Nor does it have to administrate changes to reflect societal changes. That will happen on its own and in good time.

The Air Force needs a deep and

abiding respect by the civilian community for its (the military) ability to be able to do its job, rather than their affection. To lessen the burden of preparedness for combat of the Air Force will only cripple the military force for the twentieth century, whatever the popular dialogue of today might be.

Col. Gerold E. Bickley,
USAF (Ret.)
Spokane, Wash.

Gentlemen: Being of the younger generation of Air Force officers, and highly motivated toward the continued successful accomplishment of our military objectives, I enjoyed immensely "A Military Force for the Twentieth Century," written by the retired Col. Richard F. Rosser. I completely agree with the ideas expressed by Colonel Rosser and would like to believe the great majority of my contemporaries, as well as my superiors, are in concurrence.

If we are to maintain our position as the dominant military force in the world, it is imperative we collectively exert ourselves in the pursuit of sociological as well as technological advancement. The technical expertise and intellectual level of the young men and women in our Air Force today is of an extraordinary high level. The effective utilization and retention of this talent is to become a most imposing managerial problem with regard to the fact that ever decreasing manpower authorizations and monetary allocations create problems conducive to a most frustrating work environment.

This problem of retention and motivation can only be overcome if problems such as the ones presented in this article are to be recognized and attacked, not in the coffee bars of every organization on every Air Force installation but in the offices of our leaders who possess the capacity to initiate necessary change within our force structure.

Capt. Bernie Hale
Ellsworth AFB, S. D.

Gentlemen: May no one who was fortunate enough to skip it when going through your March issue now read "A Military Force for the Twentieth Century." I must say that in addition to the usual disclaimer it should have been identified as printed for provocation only. It certainly does not represent the views of the editorial staff or of the Air Force Association, as I understand them].

If Dr. (of philosophy) Rosser wrote it as an academic, it would have been well for him to seek the advice of his colleagues in sociology and psychology, as it is unsound as it relates to both those fields. If Colonel (USAF, Ret.) Rosser wrote it as a military man, he may well have produced better copy by tape recording the conversation at a military bar toward the end of a happy-hour session.

Rosser's academic and military careers make it embarrassing for you to devote eight pages to such nondirectional drivel, although he may defend himself on your having shortened the original published form. If it could be dignified by the term "criticism," then it would still be destructive toward the achievement of all the necessary elements of an adequate national defense. It has only one redeeming feature—it refers to a century that is now almost three-quarters behind us. Only clearer thinking and writing will contribute to the quality of the military forces needed to preserve freedom in the remaining quarter of this century.

Col. Joseph L. Hodges,
USAFR (Ret.)
National Director, AFA
South Boston, Va.

Counterforce Alternative

Gentlemen: I would like to see responsible discussion within the membership of the Air Force Association of alternatives to the Counterforce strategy advocated by AIR FORCE Magazine and by Executive Editor John L. Frisbee's editorial in the February issue.

There is a conscientious view which holds that any form of nuclear war borders upon madness. Proponents of this view would argue that any effort to distinguish among targets in a full-scale, or even a limited, nuclear exchange—directing warheads, for example, toward an adversary's hardened missile sites rather than his population centers—makes a distinction without substance.

The Soviet Union, in particular, has a reputation for favoring high-yield, dirty warheads that are less than discriminate in dispersing harm, and I find it difficult to believe that an SS-9 targeted against SAC headquarters would spare many of the ordinary citizens of Omaha. Even a relatively clean, half-megaton warhead thrown against, say, the Soviet Long Range Air Fleet installation at Andyr would kill tens of thousands of civilians. This damage to the general civil populace might, admittedly, be less than damage wreaked by application of the McNamara concept of Assured Destruction, but it would also be decidedly less surgical than the Counterforce doctrine suggests.

I have doubts about any strategy aimed at neutralizing an adversary's capability to conduct either an initial, or a follow-up, strike against the practitioner of that strategy. It has never worked in any form of warfare in the past. There will always be some weapon system that will survive the Counterforce effort and remain available for a further exchange. Furthermore, the more effective Counterforce is—so long as it is less than one hundred percent—the more likely it is to generate the desperation that would result in surviving systems being targeted against population centers.

There are alternatives. Both superpowers have gains to be reaped from staying with an Assured Destruction approach, or from a further step in the direction of arms control and reduction. Neither will seek these gains if the other is willing to exhaust its effort and treasure on a First Strike or Counterforce capability.

I don't fully understand AFA's apparent hostility toward arms control and reduction and would welcome any exposition you might wish to offer.

Robert F. Dorr
Fukuoka, Japan

• *We are not opposed to arms control or reductions* per se. *At the same time, we feel entitled to voice concern about agreements or policy decisions in these areas that are likely to leave the United States at a disadvantage vis-à-vis the USSR, or any other potential enemy.*

Arms-control measures and force reductions that are mutual, and that are balanced in a way that permits the United States to protect its people and its legitimate international interests are one thing. Arrangements that fail to meet those criteria are quite another. Our criteria may seem severe to Reader Dorr, but we consider them both reasonable and realistic.—THE EDITORS

Address Correction

Gentlemen: The "Airmen's Bookshelf" column in your March 1974 issue carried a report that *D-Day: The Normandy Invasion in Retrospect* is still in print. This is true, and we are very grateful for the publicity.

However, our address is listed as Wichita, Kan. Although we repre-

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Airmail

sent the three state universities, including Wichita State University, our offices are located in Lawrence. Orders sent to Wichita may be delayed for several weeks or may eventually be returned to the sender. Our correct address is: The University Press of Kansas, 366 Watson Library, Lawrence, Kan. 66045.

Susan Schott, Promotion Mgr.
University Press of Kansas
Lawrence, Kan.

UNIT REUNIONS

Disabled Officers Association
The national convention of the Disabled Officers Association will be held July 4–6, at the Waldorf-Astoria Hotel, New York, N. Y. Write or call

Walter J. Reilly
Disabled Officers Assn.
1612 K St., N. W.
Washington, D. C. 20006
Phone: (202) 347-3401

Eagle Squadron
The 8th annual Eagle Squadron reunion will be held at the Kona Kai Club, San Diego, Calif., June 12–23. For information write

James A. Gray
Eagle Squadron Assn.
7283 Kolb Pl.
Dublin, Calif. 94566

Flying Tigers
The Flying Tigers of the 14th Air Force Association will hold its 31st annual convention at Albuquerque, N. M., at the Hilton Inn, July 24–28. Anyone with service in the China Theater of Operations during WW II, in the American Volunteer Group, China Air Task Force, and the 14th Air Force, assigned or attached thereto as military personnel, Red Cross, tech rep, or US Civil Service can attend. For information write

George T. Koran
5555 Montgomery N. E., Suite 1
Albuquerque, N. M. 87109

91st Bomb Group (H)
Known as "Wray's Ragged Irregulars," the 91st Bomb Group (H) and its supporting units, Sta. 121, Bassingbourn, England, 1942–45, will return "one more time" June 7–21, 1974. The scheduled national reunion will be held June 22–27 at Valley Forge, Pa., upon return of the Group from Europe. Further details from

Paul Chryst
1494 N. Adams St.
Pottstown, Pa. 19464

86th Air Service Sqdn.
The 86th Air Service Squadron, stationed at Jorhat, India, Myitkyina, Burma, and other parts of the CBI from 1943 to 1946 will hold its 4th reunion at the Marriott Inn, Minneapolis, Minn., July 12–14. Contact

Clyde C. Gillespie
1899 Selby Ave.
St. Paul, Minn. 55104
Phone: 647-0005
or
Harold Weiss
3110 East 65th St.
Inver Grove Heights, Minn. 55075
Phone: 455-5842

379th Bomb Group (H)
All former members of the 379th Bomb Group (H) are invited to a reunion at the Omaha Hilton, Omaha, Neb., July 7–11. Contact

Bart Cobey
379th BG Association
574 S. E. Canal Lane
Palm Bay, Fla. 32905
Phone: (305) 723-5711

384th Bomb Group
The 4th reunion of the 384th Bomb Group, Inc. (8th Air Force), will be held in New Orleans July 26–28. For further information write

384th Bomb Group, Inc.
P. O. Box 766
Wall Street Station
New York, N. Y. 10005

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Concentric reel and dual capstan design means lighter, more compact recorders.

Our MARS series features "basic dual capstan design and concentric reel mechanism". That's a longwinded way of saying "slimmer and trimmer". The dual capstans are driven at different speeds and hence develop constant dynamic tension within the closed loop of tape across the magnetic heads. A tape wrap angle of more than 226 degrees around the capstans develops the necessary forces to transmit positive drive power from the capstans to the tape. The large wrap angle effectively clamps the tape to the capstans and isolates the reels from the capstan drive without need for pinch rollers, thus doing away with a primary source of dynamic skew and flutter when operating in severe environments. The reels are mounted in a concentric arrangement, one on top of the other, to conserve space and ensure minimum size and weight.

Talk about rugged. These MARS series airborne modular recorder systems operate in the severest of environments: ±10G Vibration, 15G shock, with 30G crash safety; −55°C. at +55°C. temperature range. Sea level to 75,000 feet altitude. They fly where the flying is rough.

Take our svelte MARS 1400. It's the smallest and lightest multi-speed, lowest power consumption, 14-inch wideband 1 MHz airborne recorder in the field. But our MARS 1000 is slimmer and trimmer still! Both operate at 6 electrically-switchable tape speeds (1⅞ through 60 ips); 14-28 channels with 1 MHz at 60 ips wideband direct recording capability; or 42 tracks with 250 kHz at 60 ips. Digital and FM capability are also available.

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

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

Our M-14E and M-14G: light in pounds. Heavy in performan

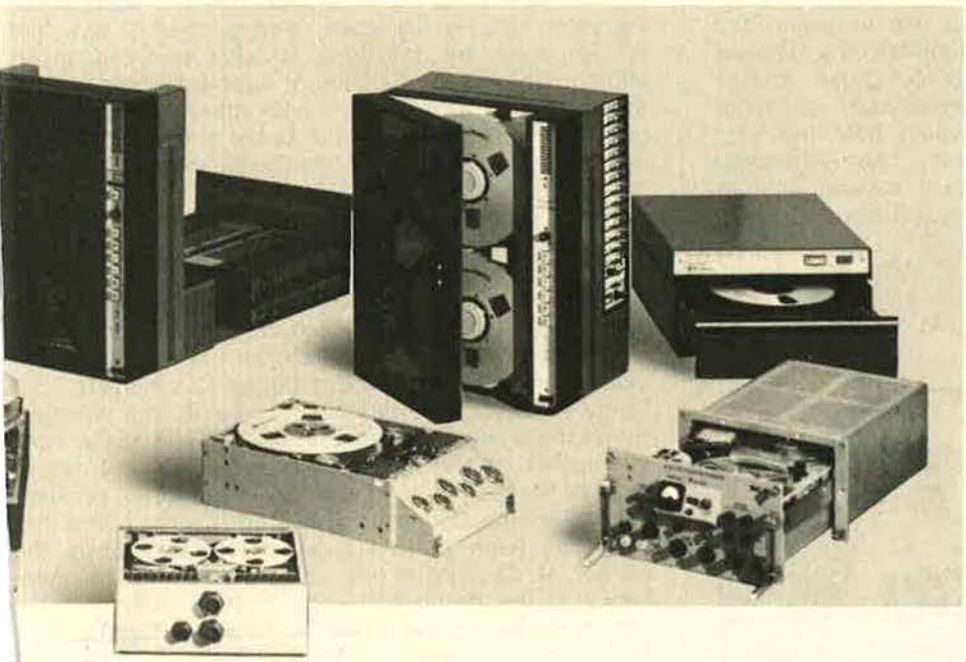
The M-14E is something special. For use in aircraft,

oard ships, on field vans or other hostile environments, the smallest and lightest wideband 2 MHz system avail-le which handles 1-inch tape on 14-inch NAB reels. It is htweight, state-of-the-art, compact, reliable and easy maintain.

Its reliable kin, our M-14G, is a wideband 2 MHz rtable recorder/reproducer designed for tight spots. Its ck-mountable field enclosure includes all local controls d record-reproduce functions for total performance. The G offers full 14-channel, 6-speed reproduce capability data analysis in Direct or FM modes of operation. Designed to military specifications, the M-14G provides l front accessibility and modularity to permit complete vice and maintenance without removing the unit from rack.

Our CPR-4010 and 4040 bring the lab into the field.

The rough and ready



-4010 provides laboratory-caliber performance in ield. This reliable unit has up to 7 channels on ½-inch . Up to 14 on 1-inch tape! Seven speeds ranging from 16 to 60 ips are standard. It's a standout in ease of ntenance and repair, offering a hinged back panel for plete accessibility of all components and plug-in ules which can easily be changed.

ur newest entry into the wideband recorder field is the -4040. It's a winner in the cost-to-performance ratio. co-planar, portable reel-to-reel gem has 7 electrically-chable bi-directional tape speeds ranging from 15/16) ips. *Plus* direct signal electronics which provide onse to 1 MHz at 60 ips. And the same ease of mainte-e and repair as the CPR-4010.

The VR-3700B gives you more channels to choose from.

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BELL & HOWELL

Airpower in the News

By Claude Witze
SENIOR EDITOR, AIR FORCE MAGAZINE

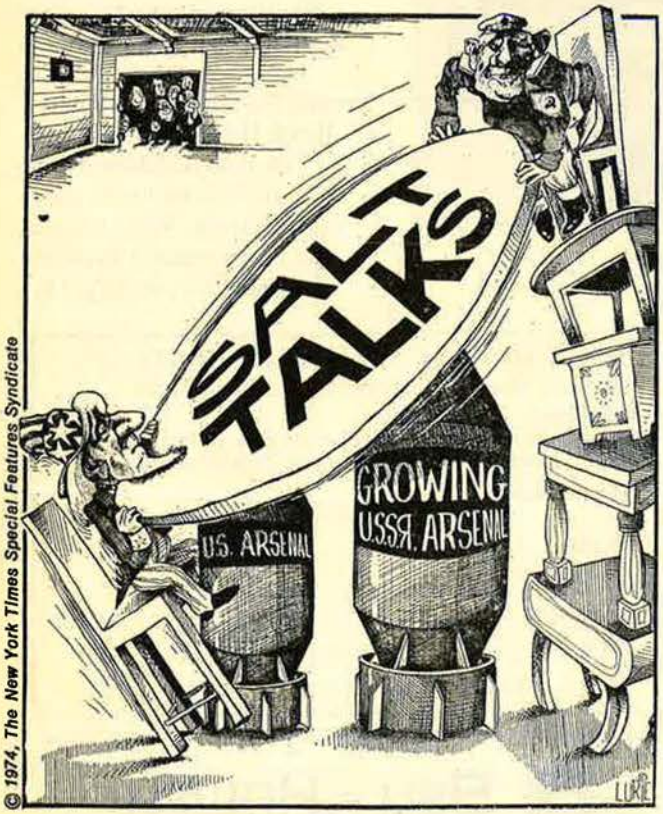
Who Said Happy Birthday?

Washington, D. C., April 4

The North Atlantic Treaty Organization is twenty-five years old today. Another way of putting it is that Soviet Russia now has spent twenty-five years in its efforts to defang NATO and put it out of business. A third way to put it is that NATO has kept the peace in Europe for twenty-five years. Your definition will depend on your viewpoint.

There is no evidence that this birthday is a happy one for the alliance. C. L. Sulzberger is in Brussels looking for a celebration and finds only that NATO has produced a territorial status quo. He writes in the New York *Times* that, as costs mount, NATO's "military strength diminishes vis-à-vis the Soviet Union. And as relaxation becomes a habit and memories of confrontation fade, the cement of fear which held the pact together flakes off into almost nothing." Mr. Sulzberger finds it hard to believe NATO will survive another quarter of a century. The Russians will have achieved their goal, which is to destroy NATO.

It seems that too many people, at home and abroad, have forgotten the origins of the Cold War. They were reviewed recently by Dean Rusk, in a discussion he had with William Buckley on the revisionist historians and how careless they are with facts these days. Lyndon Johnson's much-abused Secretary of State pointed first to how the US disarmed after World War II until, by 1946, we did not have a division or an air group ready for combat. We took the Baruch proposal, to share our nuclear secrets with others for peaceful purposes, to the United Nations, and invited the Soviet Union to join the Marshall Plan. Russia was not interested, and it was Russia that started the Cold War.



Now we have people, at home and abroad, who think the Cold War is over. Yet, Israel's Defense Minister, Moshe Dayan, was in Washington this week seeking arms aid. He disclosed, among other things, that the Russians are delivering MiG-23s to Syria, in an effort to change the balance of airpower in the Middle East. The Minister said the Soviet antiaircraft weaponry given to the Arabs is superior to the arms he gets from us. Also in Syria, according to Dayan, there is a Cuban, yes *Cuban,* brigade at the front.

It may surprise some Americans to learn it, but those Cubans are in Syria because Russia wants them there. One of the responses in Washington is the introduction of a resolution by Sen. Claiborne Pell of Rhode Island that would repeal the Cuban Resolution signed by President Kennedy in 1962. That one expressed our determination to prevent the Cuban Communists from using force or the threat of force in the Western Hemisphere. Nothing was said about Syria at the time, but that is where the threat is today. Mr. Pell would remove the restriction in our part of the world, presumably to let the Cuban brigade work nearer home.

Getting back to NATO, which already knows the history of Czechoslovakia and Poland and the indecency of the Berlin Wall, one of its concerns is the use of force, or the threat of force, in Europe. The twenty-fifth anniversary was marked on Capitol Hill with a hearing at which James R. Schlesinger, the Secretary of Defense, explained why NATO needs its own Triad. This one is composed of strategic forces, tactical nuclear forces, and conventional forces. The US contribution, which is considerable, is being examined by two subcommittees of the Senate Foreign Relations Committee, one on US Security Agreements and Commitments Abroad and the other on Arms Control, International Law and Organization. The chairmen are Senators Stuart Symington of Missouri and Edmund S. Muskie of Maine. Both were present.

Mr. Symington said at the outset that he is specifically interested in our deployment of tactical nuclear weapons in Europe. It should be pointed out, in this connection, that the Senator, who was the first Secretary of the Air Force, also is a member of the Armed Services Committee and the Joint Committee on Atomic Energy. He is in the habit of making frequent reference to this, always adding that it is his position

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on Foreign Relations, not the other two committees, that makes it possible for him to ask nitty-gritty questions about atomic bombs in open session.

On March 14, the Symington subcommittee on Foreign Relations held a hearing on our strategy in Europe, at which the witnesses were Alain C. Enthoven and Paul C. Warnke, who spoke as members of a sort of Defense Department Administration in Exile. Enthoven was Assistant Secretary of Defense for Systems Analysis, and Warnke Assistant Secretary of Defense for International Security Affairs, both in the Johnson Administration. Both witnesses deplored the size of our nuclear arsenal in Europe as well as the nature of it, with growing emphasis on tactical weaponry.

Senator Symington says we have accumulated "in a somewhat mindless manner, some 7,000 tactical nuclear weapons, adding system on top of system." And, he declared, "we seem to be more nervous about the reactions of our allies—and our adversaries—to the possible withdrawal of the weapons than we are about what should worry us far more, namely, the fact these weapons are deployed in ways which make them either vulnerable to attack or likely to be used in the early hours after the outbreak of any hostilities—inadvertent or otherwise—in Europe."

Secretary Schlesinger's response to this is that a good tactical nuclear capability will make NATO's deterrent believable, once the doctrine for their use is worked out and made clear to the potential enemy. The doctrine, he says, cannot be "mindless," but must aim to control escalation once the nukes are used.

"We should strive to reduce the vulnerability of the systems already deployed," the witness said, "and, if NATO can deal with these problems, the Alliance should consider whether, in the future, there are serious possibilities of replacing the existing stockpile with nuclear weapons and systems more appropriate to the environment of Eastern and Western Europe. Steps of this order should ensure that the tactical nuclear forces will serve both as a direct deterrent to a nuclear attack by the [Warsaw] Pact and as a serious hedge against any major breakdown in our conventional forces." He added that flexibility is essential, and that we do not rule out the use of nuclear weapons "if necessary to contain and halt major conventional aggression."

Senator Muskie is alarmed by the prospect. He says the Schlesinger proposal for a change in targeting doctrine—the Secretary is disturbed by the simple use of "retargeting" to describe his suggestion—and reliance on more accurate weapons may provoke more than it deters. Mr. Symington says, more bluntly, Mr. Schlesinger would lower the nuclear threshold, increasing the chances of war. The witness does not agree. He says it will improve our deterrent power:

"We want to keep recourse to nuclear weapons as far away as possible. Our objective in all of these matters is, if conflict were to come, to keep that conflict at as low a level of violence as possible. We are using the strategic forces, as it were, to establish a framework within which conflict, if it comes, would be fought at a low level, in terms of the violence of the weapons involved. It is our judgment that this change in targeting doctrine shores up deterrence."

Secretary of Defense James R. Schlesinger helped mark NATO's twenty-fifth birthday by explaining, on Capitol Hill, why NATO needs its own "Triad" of strategic, tactical nuclear, and conventional forces.

—Wide World Photos

Of course, the major motivation for examining the doctrine and proposing that Soviet missile sites be the prime target comes out of the immense surge in Russian missile capability. Mr. Schlesinger presented charts to illustrate this. The USSR's throw-weight capability is impressive. And it must be balanced against the factor of accuracy. One Schlesinger chart sets down these principles:

1. No nation will ever know prospective accuracy under operating conditions against a real world target system.
2. Each nation will know its own throw weight.
3. Throw weight can compensate in limited but adequate degree for accuracy degradation to be expected in a real world exchange.

The inference from this is that the US must not tolerate in the long run the present four-to-one throw-weight advantage held by the USSR.

These facts were laid out in the hearings of both subcommittees on different dates. Mr. Symington still wanted to know why the Russians, told their silos are a prime target, would not conclude the US is building up a first-strike capability. The answer is that neither side can be fully confident of first-strike capability because there is genuine skepticism about accuracy. If accuracy is degraded, Secretary Schlesinger said, "American counterforce capability goes to the dogs very rapidly." He added:

"We know that and the Soviets should know it, and that is one of the reasons that I can publicly state that neither side can acquire a high-confidence first-strike capability. I want the President of the United States to know that for all future years, and I want the Soviet leadership to know that for all future years. If the Soviet planners sit down and make exactly the same calculations, they will see that, even after a US first strike, their ICBM force would have sufficient ability to strike back and destroy the industrial base of the United States."

The Secretary added that he is not urging the US to acquire a major counterforce capability, "but there is built into the Soviet program, given the recent R&D activity, the potential net throw weight for a major counterforce capability. If they move in that direction, I think we simply cannot allow that marked superiority to develop. I stress again I am not advocating that for either side."

There seems little doubt that this year will see a growing debate about the direction to be taken in our defense planning. The matter is critical to both the US and to NATO, as it starts its twenty-sixth year. Much of what is said will be based on speculation about the nature of a war in Europe if we are so unfortunate as to see one by the 1980s.

The peril in Washington is that there are people who do not accept Mr. Schlesinger's expertise and demand, in Senator Muskie's words, that we get on the "downescalator." Such action, taken unilaterally, could be fatal. Soviet conduct, from its weapons development to its current intervention in the Middle East, is not designed to reassure NATO. ■

The Wayward Press

Now that they don't have Spiro Agnew to blame anymore, it begins to appear that spokesmen for the press will have to blame Congress for what they call the "chilling effect" of criticism. Members of both the House and Senate are becoming more outspoken on the subject since the Vice President was knocked off the podium by a tax rap.

Recent issues of the *Congressional Record,* a publication that enjoys even more privileges than those bestowed by the First Amendment, are heavy with examples. Congressman O. C. Fisher, of Texas, has inserted a couple of letters to the editor of the New York *Times,* both criticizing that paper. Sen. John G. Tower, also of Texas, has contended that Morton Mintz, a reporter for the Washington *Post,* is biased and willing "to undertake unjustifiable personal attacks on those with whom he disagrees," in the Senator's language.

In a lengthy insertion, one that ran more than seven pages, Sen. Jesse A. Helms of North Carolina has reprinted a New York *Times* dispatch from Saigon under the byline of David K. Shipler. Alongside the newspaper story, marching down the pages paragraph by paragraph, he has inserted a point-by-point rebuttal from Graham Martin, the US Ambassador to South Vietnam. According to Mr. Helms, the Shipler article is "a specific instance of obvious misrepresentation of the facts." There is no room here to review the dispute, which involves US aid to the Saigon government, but the Senator minces no words. He says "such obvious irresponsibility [by the *Times*] could not be accidental. Indeed, it so often seems carefully calculated. Many of the major media appear to be determined to make and shape the news instead of reporting the news as it is. They seem to care not whose reputations they trample, or how badly they distort or misrepresent the truth."

Incidentally, the Shipler piece from Saigon also is being investigated by the National News Council in New York, which is reported to have received its complaint from another member of Congress, Rep. John Ashbrook of Ohio. In addition, the council is looking into a complaint charging that a New York *Times* report on the effects of defoliation in Vietnam, by John Finney, its Pentagon reporter, was "misleading and inaccurate."

These are not the only manifestations of congressional discontent with the media. In late February, the Joint Committee on Congressional Operations held two days of hearings billed as an investigation of Congress and Mass Communications. Senators and congressmen testified; so did a handful of executives from the television networks. There was enough nonsense put in the record to give everybody a generous share.

The leadoff witness was Sen. Edmund S. Muskie, of Maine, who actually said he can conceive of Congress setting up its own television network. He has no idea how much this would cost or how the Democrats and the Republicans would divvy up the time, which means that, like the networks, they might need a fairness doctrine. And, he added, much as an afterthought, that there is a question about the audience that would be reached with daytime broadcasts of the proceedings on Capitol Hill. None of the TV experts was asked to give an estimate on this, and you can't get a Neilson rating until you go on the air. Cameras, of course, are not now permitted in the House or Senate. A study by the committee staff shows that in one year, July 1971 to June 1972, the regular broadcasters provided live coverage of about two dozen Capitol Hill hearings and 182 hours of air time for their proceedings.

Rep. Lionel Van Deerlin of California told the hearing Congress could write laws requiring the media to make space or time available to politicians, but he would not advise it. Better, he said, to "give the press free access, and then lay off." He added: "Instead of telling the media what they should do, we should make it easier for them to do what they want to do." That would mean opening the doors to the cameramen and then, Mr. Van Deerlin said, the communications problems of Congress will take care of themselves.

The chairman of the Joint Committee, Sen. Lee Metcalf of Montana, fears that Congress is inaudible; it is not coming through loud and clear. At the same time, Americans, who know little about Congress, say they are not satisfied with its performance. If we get right down to the nitty-gritty of the complaint, it is that the White House can command prime TV time and Congress cannot.

The TV executives, who had their day at the hearing, had a simple case. Open the doors and we will cover your proceedings, they said. What they did not discuss was the simple fact that what the Congress wants may not be what the public wants and will look at. There is a vast gap between Mr. Muskie's lament that the press reports too little, that it concentrates "more on the exchange of insults than the exchange of ideas," and what TV networks need from the Neilson ratings. What is known in the trade as "box office" cuts more mustard than what a Senator points to as productive work.

In addition to the hearings, the Joint Committee has published an eighty-one page study on the subject by the Library of Congress. Interesting, yes. Important no. Like the hearings themselves, it is not basically important because it almost ignores the printed press. Both the study and the investigation, if it can be called that, are centered on the infatuation with television, which is part of show business, not journalism.

For this, the newspapers have themselves to blame. According to Mr. Muskie, some forty-one percent of Americans have confidence in TV news and only thirty percent have confidence in the written press. There is nothing to brag about in either figure, but high standards of professionalism in the nation's newsrooms is what it is all about. Even Spiro Agnew knew that.

"The United States has no objections if this independent policy becomes hostile to the United States."—Henry Kissinger quoted by the Associated Press in the Baltimore *Sun,* March 12, 1974.

"The United States has no objection whatever to an independent European policy. It does have an objection when independence takes the form of basic hostility to the United States."—Henry Kissinger, quoted by Murray Marder in the Washington *Post,* March 12, 1974.

Which newspaper did ya' read on March 12, 1974?

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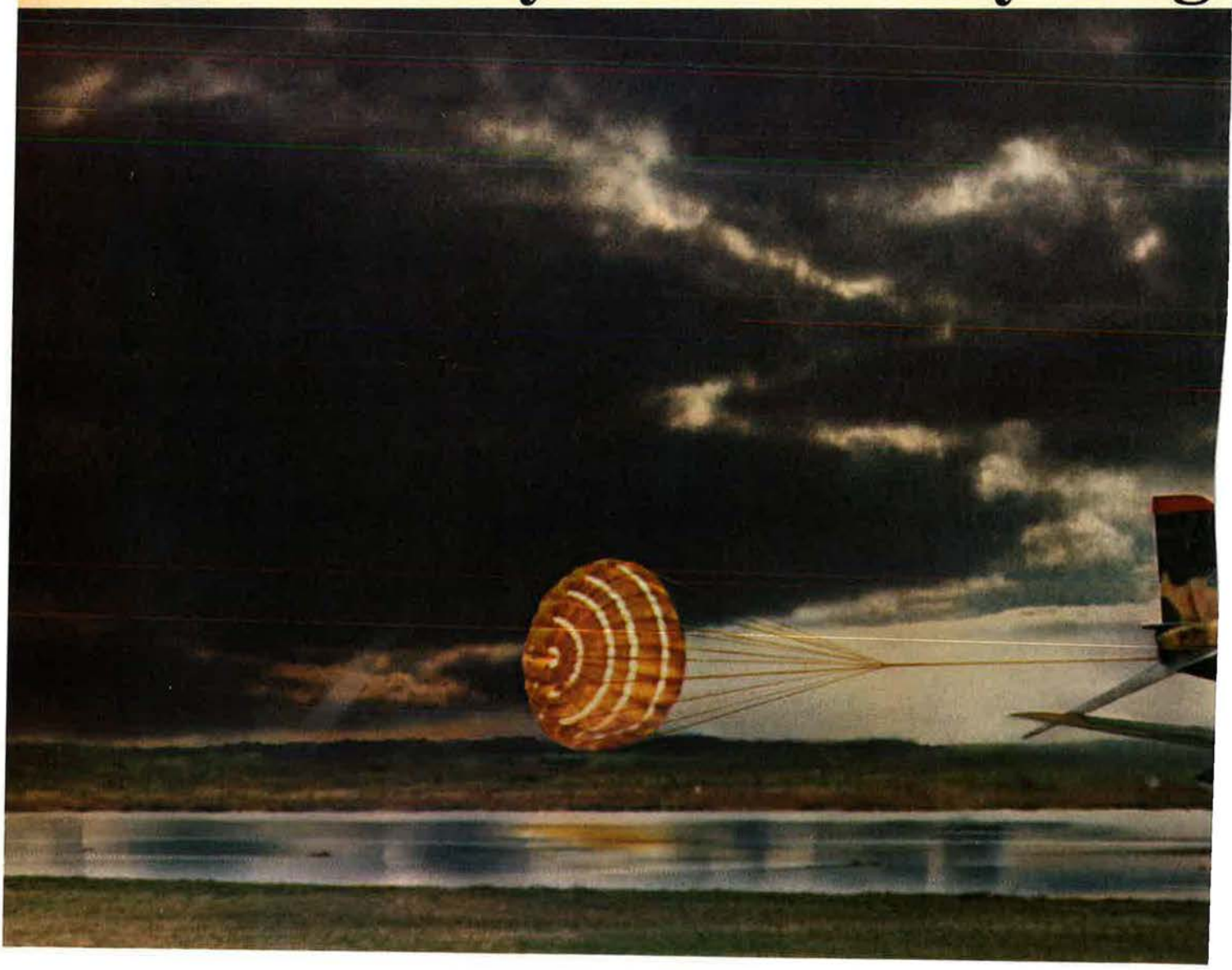

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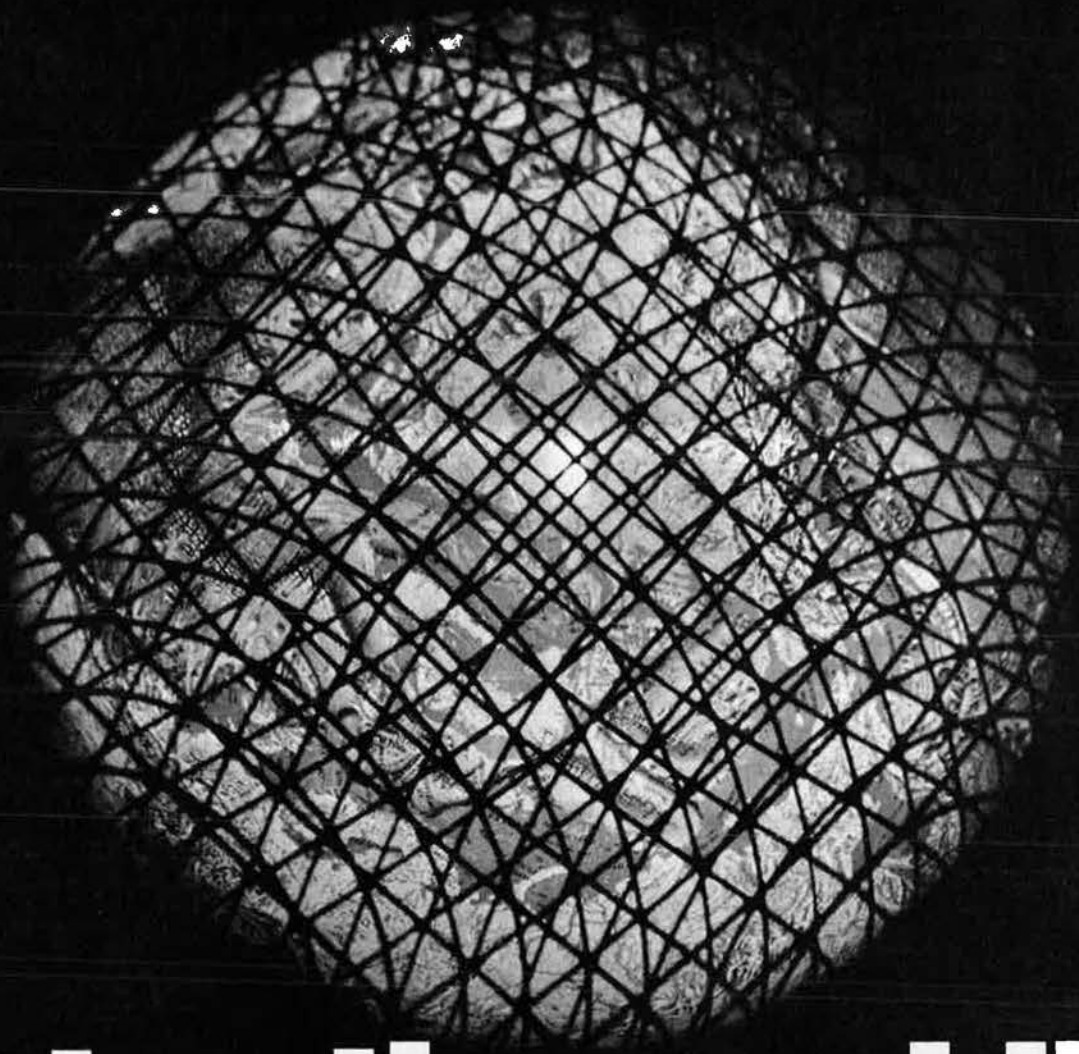

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Aerospace World

News, Views & Comments

By William P. Schlitz

ASSISTANT MANAGING EDITOR, AIR FORCE MAGAZINE

WASHINGTON, D. C., APRIL 8

The YF-17, Northrop Corp.'s contender in the Lightweight Fighter Prototype competition, made its debut April 4 with roll-out at Hawthorne, Calif. Keynote speaker at the unveiling ceremony was Air Force Secretary John L. McLucas.

The new fighter's key features, according to the company, are technological firsts in aerodynamics, propulsion, advanced composite materials, and improved environment for the pilot. (*For a detailed description of the YF-17, see October '73 issue, pp. 64–67.)*

Powering the YF-17 are twin GE YJ101 engines, each rated at 15,000 pounds of thrust. This punch will enable the aircraft "to fly at supersonic speeds without afterburner, a first for any US-built aircraft," Northrop said.

Another characteristic of the fighter is the extensive use of graphite composite materials in its construction. About 900 pounds, or roughly ten percent of the airframe, is made up of the tough and light materials, more than in any other aircraft now built, Northrop said.

Northrop noted that the YF-17 design means that the "airplane is being given back to the pilot, since he can now perform air combat maneuvering in an environment never before possible in a high-performance fighter." Among specific considerations are the tilted pilot's seat and a bubble canopy affording unrestricted vision, the company said.

The YF-17 is to make its maiden flight this spring at Edwards AFB, Calif. A second Northrop prototype is completing assembly. Both will compete in USAF's Lightweight Fighter Program against two YF-16 prototypes built by General Dynamics Corp. (*See January '74 issue and also this issue, p. 114.)*

☆

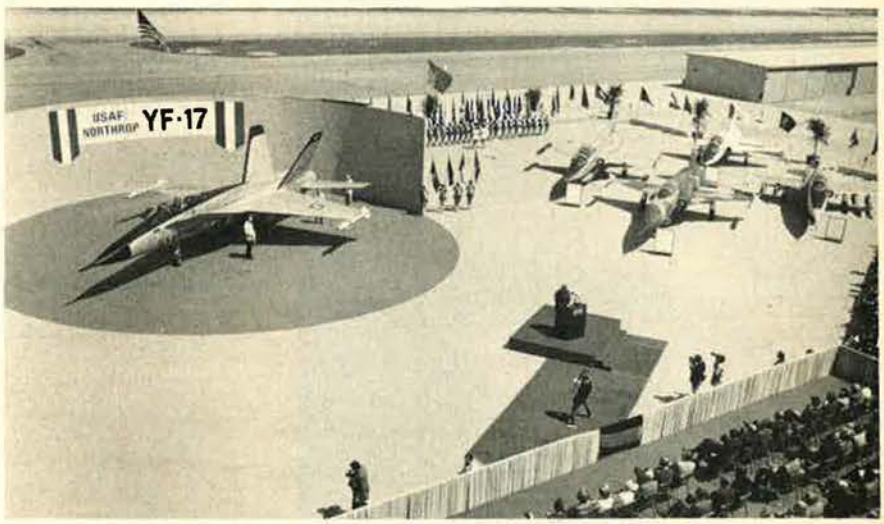
A memorial park has been dedicated on the island of Guam to the men who flew and supported the eight-year "Arc Light" SAC operation in Southeast Asia.

Focal point of the park is a pedestal-mounted B-52 Stratofortress—number 0100 and fondly known as "Old 100"—an aircraft that participated in four of the precedent-breaking Linebacker II missions of December 1972. (It was the Linebacker II air campaign against military installations and stores in Hanoi that has been largely credited with North Vietnam's decision to finally sign the Paris accords and release US prisoners.) More than 200 SAC B-52s participated in Arc Light, with the combat loss of fifteen during Linebacker II.

Arc Light Memorial Park was formally dedicated in February by SAC Commander in Chief Gen. John C. Meyer, fittingly enough on the first anniversary of the return of the American POWs.

☆

Beginning in July, SAC will ex-



On April 4, Northrop Corp.'s entry in the Lightweight Fighter Prototype competition was rolled out at Hawthorne, Calif. Close-up at left shows the extremely clean lines of the YF-17, a Mach 2.0 fighter in the 23,000-lb.-weight class. Above, at the roll-out ceremony, the YF-17 is shown with Northrop's T-38 (rear), and, from left, the F-5B, F-5E, and F-5A.

Aerospace World

pand its B-52 Combat Crew Training School (CCTS) to include training in the B-52D version at Carswell AFB, Tex.

Previously, all CCTS operations were conducted at Castle AFB, Calif., and consisted of training in B-52F series aircraft exclusively. After graduation, aircrews were then required to fly a number of "difference training" flights in D, G, or H models to bring them up to combat-ready status in the aircraft model they'd fly at their permanent duty stations.

Henceforth, training in the G and H series Stratoforts will take place at Castle. SAC has yet to determine final disposition of Castle's F versions being phased out.

In addition to the B-52D CCTS, moving to Carswell will be the Central Flight Instructor's School and the Replacement Training Unit.

The aircraft to be used at Castle are to be supplied by G and H series wings, one aircraft each.

☆

Following an exhaustive study, USAF has canceled development of the 25-mm GAU-7/A cannon and the caseless ammunition for it.

The aerial gun system was to arm the F-15 Eagle and perhaps other future aircraft but was stymied by such technical difficulties as "excessive variation of muzzle velocity, system overweight, short component life, and problems with the ammunition," Air Force said.

It was quickly pointed out, however, that operational capability of the F-15 will in no way be affected, since the aircraft "was initially designed to carry the conventional M-61 Vulcan 20-mm cannon used successfully in combat in the F-4 and which is now qualified in the F-15 as meeting its gun requirement."

Under contract to build the GAU-7/A was Philco-Ford Corp., while McDonnell Douglas was to perform ground and flight testing. Subcontractor Brunswick Corp. was to produce the caseless ammunition.

☆

The Air Force is pondering the details of a proposed new production-model C-5 Galaxy transport that would double as an aerial tanker capable of refueling Military Airlift Command C-5As and C-141s and presumably SAC's bombers.

Secretary of Defense James R. Schlesinger has requested funds to study this and other approaches to USAF's future tanker requirements.

The recent airlift to the Mideast demonstrated a solid requirement for a big-load tanker to serve on extended-range flights or in global areas where land refueling is out of the question.

The C-5B, as it would be known, would be able to offload three times the amount of fuel as a KC-135, currently USAF's basic tanker. The B version itself would be capable of being refueled while airborne.

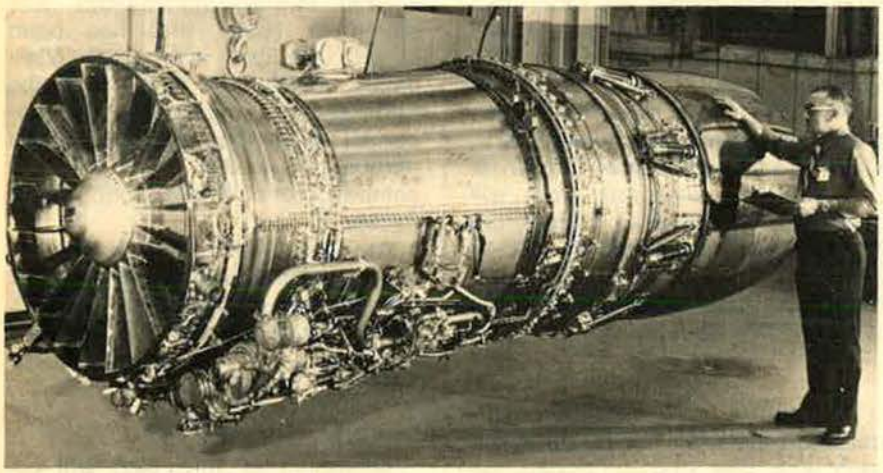
The transport/tanker would be configured to pass fuel from cells beneath its heavy-duty floor through "a flying tail boom hinged above and beyond its aft cargo loading door," manufacturer Lockheed-Georgia said.

Additionally, equipped with a removable fuel pod beneath each wing, the C-5B would be able to refuel three TAC fighters simultaneously, the company said.

USAF is checking out other alternatives to the C-5B as well.

☆

Spokesmen for Great Britain's



At top, the first General Electric YF101 turbofan engine for the Air Force B-1 strategic bomber is readied for shipment to Rockwell International's facility at Palmdale, Calif. At that facility, the final major step in building the first flight-test B-1 was recently completed when the crew compartment/escape capsule was installed (left).

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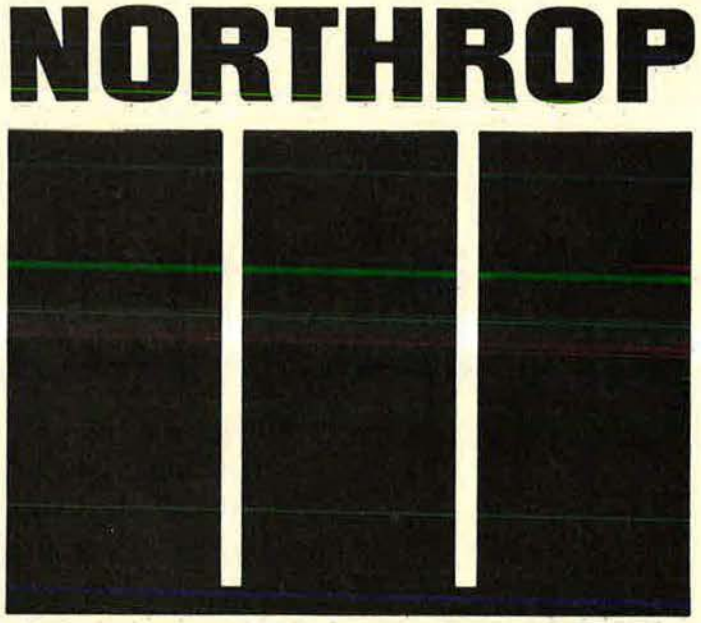

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A model of the Yak-42 transport, developed for Aeroflot, the Soviet airline. The Yak-42 can be configured to carry 120 passengers and has a range of more than a thousand kilometers at a cruising speed of 820–870 km. per hour.

new Labor government have notified the US that the controversial plan to expand American air and naval facilities on the strategically important island of Diego Garcia will be reexamined. This does not necessarily mean the expansion will be blocked.

The island, in the Indian Ocean and proximate to Southeast Asia and the oil-rich Persian Gulf area, is owned by Great Britain.

It is estimated that the US has already invested $75 million in island facilities with an additional $29 million proposed. Congressional critics of the undertaking have called for talks between the US and USSR to limit military forces in the Indian Ocean. Key US military leaders—including Chief of Naval Operations Adm. Elmo R. Zumwalt—view the upgraded island facilities as an "essential element" of US influence in the area.

Australia, among other nations in the region, has been particularly outspoken in deploring the buildup of forces there and the extension of US facilities on Diego Garcia.

The Northrop Corp. F-5E International Fighter is shown here in the final assembly of the company's Palmdale, Calif., plant. Northrop has orders and commitments for more than 500 F-5Es for use by eight foreign air forces.

☆

A new point of interest—known as the Air Force Armament Museum—opened this spring at Eglin AFB, Fla.

The museum's purpose, according to officials, is to "preserve and portray the history of aircraft armament and development, as well as the history of Eglin AFB."

The museum has a standing request for such items as uniforms and flight clothing, guns, bombs, and rockets from both World Wars, and photos and hardware related to the development and use of unusual munitions.

Of particular interest to the museum would be items and information concerned with the Doolittle Tokyo Raid, whose participants received their initial training at Eglin. Other data involved in training activities at the base also would be welcome.

Send a description of items, accompanied by photos if possible, to

Sikorsky Aircraft's three-engine YCH-53E—the largest and most powerful helicopter in the Western world—made its first flight on March 1 at the company's Stratford, Conn., plant, a month ahead of schedule.

Aerospace World

3201st Air Base Group/AM, Eglin AFB, Fla. 32542.

☆

The three Skylab crews and NASA Skylab Program Director William C. Schneider will be awarded the 1973 Collier Trophy in June.

The recipients were selected on the basis of "their individual accomplishments in not only making Skylab the outstanding aerospace event of 1973, but also dramatically demonstrating that man can live and work effectively in space," the National Aeronautics Association, which administers the trophy, said.

The Skylab crewmen: Charles Conrad, Jr., Dr. Joseph P. Kerwin, and Paul J. Weitz—first mission; Alan L. Bean, Dr. Owen K. Garriott, and Jack R. Lousma—second mission; and Gerald P. Carr, Dr. Edward G. Gibson, and William R. Pogue—third mission.

During their total 2,400 orbits of earth, the astronauts returned more than 40,000 photos of the planet, plus 175,000 feet of magnetic tape on earth resources, among other things.

The trophy was established in 1912 by publisher and pioneer aviation enthusiast Robert J. Collier.

In another matter, Dr. Frederick B. Tuttle, NASA's Director for Educational Programs, was named 1973 recipient of the Brewer Trophy, awarded annually for contributions to aerospace education for the nation's young people. This trophy is also administered by NAA.

With a JB-2, US-built version of the German World War II V-1 "buzz bomb," is Lt. Col. William R. Lounsbery, Director of the new Armament Museum, Eglin AFB, Fla.

A Grumman A-6E Intruder TRAM aircraft made its first flight this spring. TRAM, for Target Recognition Attack Multisensor, will provide "lower hemispheric coverage for laser-guided weapon delivery." Supplied by Hughes Aircraft Co., TRAM consists of a turreted electro-optical sensor package that contains both infrared and laser equipment integrated with Intruder systems.

Six recently restored P-47 Thunderbolts of the Confederate Air Force take to the air over Harlingen, Tex. Of the 15,684 Thunderbolts built during World War II, all but two had been destroyed or exported by 1961. The planes shown here were acquired for the Confederate Air Force collection from Nicaragua and Peru. All bear the colors of famous Jug units.

At this writing, the fate of Thomas L. Gatch remains undetermined. Gatch, a DoD employee and the son of a naval hero of World War II, disappeared during an attempt to cross the Atlantic in a balloon.

He had been hoping to be first to reach Europe this way when he launched on February 18, but adverse winds took him well off course, and he was last sighted on February 21 by the crew of a Liberian freighter about 1,000 miles west of Africa's Spanish Sahara. His balloon was equipped with a life raft and food for ten days.

Under the assumption that Gatch had gone down at sea, the US military conducted an extensive but unsuccessful search that was terminated on March 6.

☆

Inactive Wendover AFB, Utah has been renamed in honor of the


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We have the APUs to match, today.
When the order of the day is low-cost design with high performance, it's time to buy Garrett Auxiliary Power Units.
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Why? Because your primary attitude indicator or flight director system will be inoperative in the event of an electrical system failure or malfunction. And if your attitude indicator is out, you can't fly a jet in IFR conditions for very long.

Crew safety, not to mention the investment in aircraft, is too important to ignore that possibility. And if you've been reading maintenance bulletins or "incident" reports lately, you've probably noticed that total electrical system failures, although infrequent, happen often enough to cause concern.

Include occasional problems with primary attitude systems, from intermittent anomalies to induced failure, and the need for a reliable stand-by indicator becomes even more important.

What to do? Equip your aircraft with a J.E.T. Stand-by Attitude Indicator. It's a unique, totally case-contained electric gyro which is always on. In the event of loss of electrical input, for any reason, it continues to present usable attitude information for over 9 minutes by specification.

Valuable time . . . to fix what's wrong, re-establish electrical power, return to base, fly to VFR conditions . . . or establish a safe flight attitude and consider alternate courses of action.

Why J.E.T.? Ask the man who flies with one — and had to use it. He'll tell you how well it works and about the high degree of reliability. Various configurations of these instruments are in the military inventory now and we have installed over 5,000 in high-performance military and business aircraft. It's the reason some of those aircraft, and their pilots, are still flying.

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- Over 9 minutes of usable attitude information after loss of electrical input.
- Attitude reference through 360° of roll and pitch.
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- Over 2,000 hour MTBF.
- MIL-I-81454, MIL-I-81606.

Design Options

J.E.T. has manufactured a wide variety of these indicators in numerous configurations and presentations including those shown. In addition to the basic two-axis attitude indicator they have incorporated in a single unit an inclinometer, rate-of-turn indicator, direction indicator, flight director needles with self-test, and synchro pickoffs to provide outputs for radar stabilization, autopilots, etc.

The large (5″) presentation shown is an ideal primary system for light weight aircraft and rotary-wing aircraft due to its' compactness and light weight. Of course it still includes 9 minutes of stand-by attitude information.

For further information write or call Jerry Snider or Don Vetter at: Jet Electronics & Technology Inc., 5353 52nd Street, S.E., Grand Rapids, Michigan 49508, (616) 949-6600. Or call Bill Howard, J.E.T./Dayton, Ohio at (513) 299-3424.

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Dynamic Mr. Decker is the first living person to have an airfield in the US named for him.

Wendover once was home to a military community of more than 20,000 people during World War II that serviced B-24s and the B-29 Superforts used to train the crews participating in the Hiroshima and Nagasaki missions.

Since, the sprawling complex has lain dormant, except for an occasional training mission. Mr. Decker changed all that.

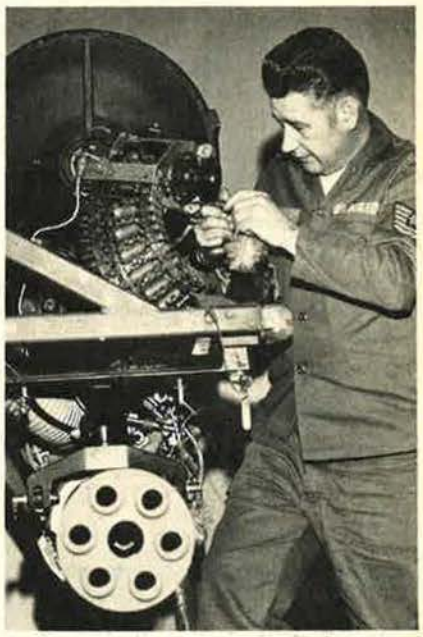
With Wendover's potential as an alternate to Salt Lake City's sometimes fog-bound International Airport and proximity to the famed Bonneville Salt Flats as stimuli, Decker, now thirty-four, cut through the bureaucratic tape and got Wendover declared surplus and turned over to civil control.

☆

In another in a series of force reductions, USAF will inactivate one of two ADC airborne early warning and control squadrons at McClellan AFB, Calif.

Six EC-121T aircraft from the unit —the 964th AEWCS—will be used to modernize an AFRES unit—the 79th AEWCS—at Homestead AFB, Fla., replacing the older EC-121D. The 964th's other aircraft will be retired.

By spring of 1975, the remaining early warning squadron at McClellan—the 963d—will be reduced to six aircraft from its current strength of eighteen.



TSgt. Giles C. Rose of the 406th TFW, Zaragoza AB, Spain, has been chosen as USAFE Maintenance Man of the Year for 1973. Sergeant Rose is a twenty-year veteran of the USAF.

These actions are expected to result in the reduction of 1,007 military and 121 civilian spaces at McClellan and an increase of 149 Reserve slots at Homestead.

ADC also announced plans to inactivate the 661st Radar Squadron at Selfridge ANG Base, Mich., with the resulting loss of 130 spaces, including nineteen civilians.

☆

US Army is looking into the feasibility of using an unmanned, tethered, rotary-wing, aerial platform for battlefield surveillance and target acquisition.

Under contract to do the study, Kaman Aerospace Corp. has advanced the concept of such a drone

Index to Advertisers

Aerospace World

launched and retrieved from a large truck. A command and control vehicle would operate and monitor the drone, which would be equipped with various sensing devices.

And, funded by the state of Arizona and the Department of Justice, Goodyear Aerospace Corp. recently completed a study on the viability of using two-man blimps as silent police patrol craft over cities.

After a six-month test for the Arizona city of Tempe, Goodyear said that "the airship offers distinct advantages over a helicopter or a STOL aircraft. These include long endurance, low speed, low fuel consumption, quietness, and safety, and it could fly as low as 500 feet."

The proposed airship would be somewhat smaller than the famous Goodyear blimp—about 141 feet long. It could carry a pilot and observer, camera, spotlight, radio, loudspeaker, siren, and firearms.

Sgt. Paul J. Gillette, historian of the 307th Strategic Wing (SAC), has been named Air Force Wing Historian of the Year. Gen. John C. Meyer, SAC Commander (left), accepts a plaque in Sergeant Gillette's name from Gen. Richard H. Ellis, USAF Vice Chief of Staff, and retired Brig. Gen. Monro MacCloskey (right) as Air Force Secretary John L. McLucas looks on.

☆

Air Force Systems Command's Electronic Systems Division is developing a tactical navigation aid that can be conveniently transported and assembled to give aircrews or ground troops their exact position.

The system, to be built by Sperry Gyroscope, will consist of three easily assembled towers and electronic equipment that will transmit signals to be picked up by conventional LORAN (long-range navigation) receivers. Locations are determined by interpreting the time differences between pulses beamed from each of the three stations.

Key characteristics of the new system will be its transportability and ease of assembly. LORAN systems have been in use for decades, but, heretofore, for the most part, the sending units required extensive and permanent ground facilities.

☆

NASA is a worldbeater at creating big and complex hardware that works—witness the recent Mariner-10 flyby of the planet Mercury that determined that the smallest planet in our solar system is one of the densest. It seems Mercury is made mostly of iron.

But the space agency's R&D often extends to products of direct usefulness to the civilian world. Several examples:

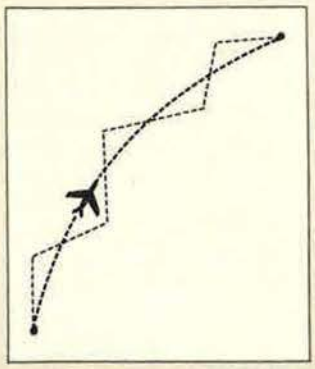
- NASA technology has produced a battery-powered, hand-held spotlight that can generate a peak *one million candlepower*—fifty times brighter than an auto's high beams. Called "Stream Lite-1 Million," the seven-pound light should benefit police and fire departments and prove helpful during general emergencies.
- In a bid to produce quieter jet engines, NASA has successfully tested a modified JT8D, a Pratt & Whitney engine that now powers a major part of the nation's commercial aircraft fleet. By "refanning," essentially replacing the present two-stage fan with a larger single stage, the engine "could reduce the noise footprint areas by seventy-five percent or more," NASA said.
- Also in the works is NASA research into the design of windmills that would produce electricity enough to efficiently power small cities.

☆

NEWS NOTES—SSgt. Paul J. Harrington, USAF, has been named **1973 Military Photographer of the Year.** He's chief photographer for *Pacific Stars and Stripes.* National Press Photographers Association sponsors the prestigious award.

Roger E. Shields, previously DoD's expert on MIA/POW matters, has been named to the new post of Deputy Assistant Secretary of Defense (International Economic Af-

Now you can create and fly your own air route.



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And perhaps the best news is that the Hoffman tactical area navigation system is not expensive.

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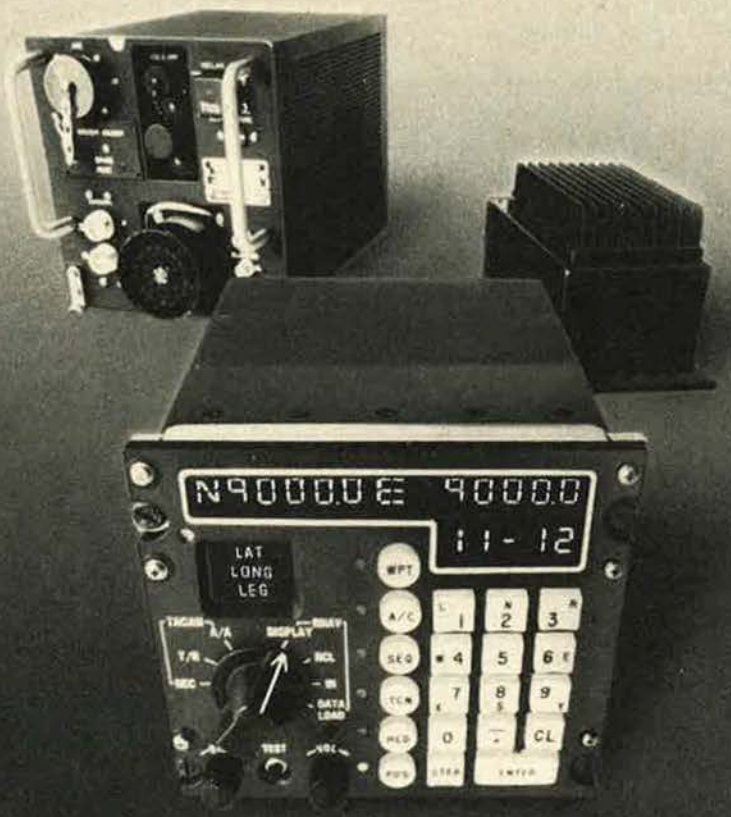

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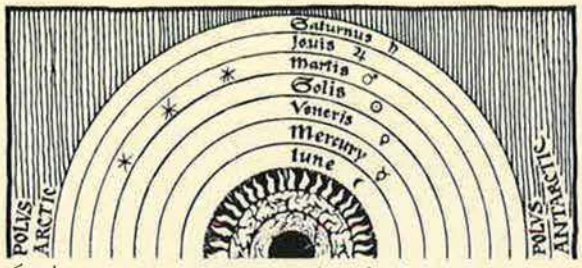
Conversation Pieces

Technically intriguing items from TRW, guaranteed to add luster to your conversation and amaze your friends.

How the Days Got Their Names — On Thursday, March 2, 1972 our Pioneer 10 spacecraft left for Jupiter, the first of the outermost planets. Although Pioneer travels so fast it swept past the Moon's orbit in a mere 11 hours, the voyage to distant Jupiter (a half a billion miles away) took two years.

Pioneer 10's departure took place on a peculiarly appropriate day. Thursday, it happens, is named after Jupiter. In fact, if we look back through astronomical history, we find that every day of the week is associated with an object in our solar system.

Early astronomers named the planets after gods and goddesses, and believed that each planet "ruled" or had primary influence on one day of the week. Jupiter, they held, ruled Thursday and so named the day Jove's day, or *jeudi* in the French*. Our Anglo-Saxon forebears replaced the Roman Jove with their equivalent deity, Thor. Hence we know it as Thor's day or Thursday.



THE NAMES OF THE DAYS COME FROM THE PTOLEMAIC SYSTEM.

Here, for your information, is the complete planetary week. Women's lib advocates will be pleased to note that we should thank a goddess it's Friday.

Day	*Ruling Planet/ Divinity*	*Anglo-Saxon Equivalent*
Monday	Moon	—
Tuesday	Mars	Tiw
Wednesday	Mercury	Woden
Thursday	Jupiter	Thor
Friday	Venus	Freya
Saturday	Saturn	—
Sunday	Sun	—

*Those of you familiar with the French will see the planet's names clearly in *lundi, mardi, mercredi, jeudi, vendredi, and samedi.*

Burn Coal (But Not Throats)! Must a high standard of living and low quality of life always go hand-in-hand? The argument for the case is as follows. A high standard of living requires the consumption of large amounts of energy (e.g., lights, air conditioners, cars, home appliances). In producing and using this energy, however, we pollute our environment. If the air you breathe is toxic or the water you drink causes you to retch, be happy; your discomfort is proof positive you have a high standard of living.

To add to this dilemma, our so-called clean sources of energy are dwindling fast. A logical replacement is coal, the Earth's most abundant fossil fuel. Yet coal is a major polluter. When burned, it produces sulfur dioxide, a gas noxious to lungs, eyes, and throats. In 1970, for example, the U.S. pumped around 28 million tons of sulfur dioxide into the air.

How can we burn the coal and make the electricity and light the lights and run the air conditioners without befouling our atmosphere? At TRW, our answer is to remove the sulfur from the coal ***before*** burning it. The result: clean coal and a clean environment.

Until we came upon the method, it was considered formidable to remove the sulfur content. Strong acids have little or no effect on the sulfur, most of which is locked up tightly in the iron pyrites or fool's gold molecule. Strong oxidizers dissolve the pyrites but also oxidize the coal, making it useless. Our method removes the sulfur without altering the coal matrix, and increases the heat content of the coal by cutting down on the ash content. As an added attraction, our oxidizing agent can be regenerated and recycled.

Right now, we're happy to report, the Environmental Protection Agency is supporting the development of the process to determine its effectiveness and assess its economic merit. If it lives up to specs, we'll all breathe easier.

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Maj. Gen. Benjamin N. Bellis, former F-15 System Program Director, became commander of AFSC's Electronic Systems Division, Laurence G. Hanscom Field, Mass., on April 1.

fairs), in the Office of Assistant Secretary of Defense (International Security Affairs).

Motto of May 18 observance of **Armed Forces Day:** "American Forces—Vigilant, Vital, Volunteer."

USAF Recruiting Service has a priority call out for a total of 200 **engineers, scientists,** and **mathematicians** for commissioning in FY '75.

AF Systems Command junior officers now have a direct channel to the top with establishment of a **Junior Officer Adviser** to AFSC Commander, following ADC's lead in setting up such a post; **Capt. Lee F. Aldridge** will man it.

In mid-March, the **YF-16 Lightweight Fighter** Prototype hit Mach 2 for the first time, according to builder General Dynamics.

Two C-141 StarLifter squadrons —the **15th MAS,** Norton AFB, Calif., and **30th MAS,** McGuire AFB, N. J. —each received MAC awards for 200,000 accident-free flying hours.

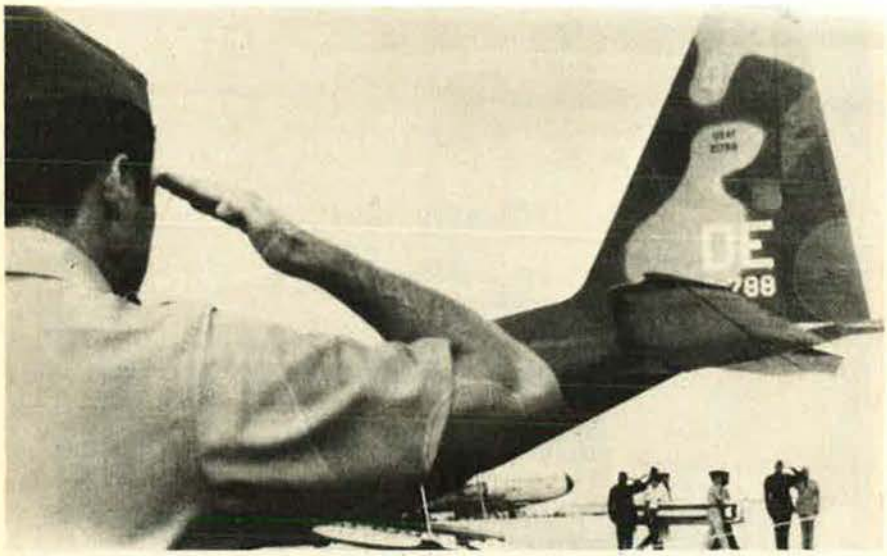
"Women in the Air Force celebrate their silver anniversary June 12, and it will be their last. Since women have always been an integral part of the Air Force, it's time to stop celebrating separately," said **Col. Billie M. Bobbitt,** WAF Director. ■

MIA/POW Action Report

Return of the Fallen POWs

Reversing a heretofore hard-nose policy on the matter, the North Vietnamese in March allowed the recovery from Hanoi of the remains of twenty-three American POWs said to have died in captivity.

Of the twenty-three, sixteen were reported to be Air Force and seven Navy. The bodies were escorted by members of a military reception team to the special forensic laboratory in Thailand, where positive identification was to be undertaken. (North Vietnam was known to have retained possession of the body of a B-52 crewman found in the wreckage of his aircraft. His return was being arranged.)



—WIDE WORLD PHOTOS

A salute for the fallen, as the bodies of twenty-three Americans who died in North Vietnamese captivity are repatriated. Of these men, sixteen were reported to be Air Force. The bodies were escorted first to a special lab in Thailand for positive identification (see above).

Kathy Shinn, Commander of Iowa State University's Arnold Air Society Chapter, presents a plaque commemorating the state's Southeast Asia MIA/POWs to Ames Mayor William Pelz, as USAF Maj. John B. Shiffert, faculty adviser, looks on. Presented at recent ceremonies, the plaque will mark a "freedom forest" planted in Ames's Stuart Smith Park this spring.

Hanoi's motivation in turning over the bodies of the US servicemen is unclear at this point. One possibility is that the North Vietnamese are attempting to soften relations with the United States, with the ultimate objective of securing some sort of US assistance in the reconstruction of North Vietnam. In view of the continuing discussions between US officials—specifically Secretary of State Dr. Henry Kissinger—and their North Vietnamese counterparts, action of this nature may be at least under discussion. Closely related to that issue, of course, is the question of the recent buildup of North Vietnamese troops and materiel in the South, in violation of the cease-fire agreement.

In any event, Hanoi's change in attitude brings renewed optimism that US search teams will be permitted to extend the scope of their operations in SEA to hunt for other US missing, a mission frustrated in the interval since the release of the US POWs (*see January '74 Issue, p. 45*).

Still pending is a hoped-for decision by the Viet Cong in South Vietnam to return the remains of the thirty-two Americans said to have died in captivity there.

Status-Change Limbo

A New York City court action has put into limbo the status of the several thousand US servicemen still carried officially as MIA in Southeast Asia. Unresolved also will remain important legal, financial, and other concerns of their next of kin.

In March, a special panel of three federal judges handed down a decree that declared unconstitutional Sections 555 and 556 of the US Code's Title 37. Over the last several decades, these statutes have provided the service Secretaries

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

with procedures to change the status of US personnel listed missing in action to presumed killed. (Anticipating what might prove to be a tricky legal tangle, DoD had ceased status reviews on February 14.)

The court decision is the result of a class-action suit brought by a number of MIA family members who contended that massive changes in status were in the works (*see January '74 issue, p. 45*).

While they won a round with the court's decision on the constitutionality of Sections 555 and 556, lawyers for the MIA families in the case were far from satisfied. They argued that, while the constitutional question had been decided, the decree as a whole was ambiguous in that it went on to set guidelines under which status changes could be made. In effect, a *legislative* action, the lawyers said. They'll appeal the entire matter to the Supreme Court.

Without attempting to sort out the legal technicalities of the case, suffice it to say that a Supreme Court decision might require a congressional overhaul of the legal machinery governing status changes.

There is no assessing how long the legal proceedings can be expected to drag on.

Mideast POWs

While sporadic outbreaks of fighting continued around the Golan Heights in the wake of October's Mideast war, the situation concerning those Israeli POWs in Syrian hands (*see February '74 issue, p. 21*) eased somewhat.

First, Secretary of State Henry Kissinger, in the area to try to help damp down the conflict, was able to procure a list of Israeli captives, previously refused by Syrian officials. (Sixty-five of more than 100 listed MIAs had survived.)

Syria also allowed the Red Cross to visit the POW camp where captured Israeli soldiers were being held and a hospital where several Israeli wounded were confined.

For their part, the Israelis had handed over lists of Arab prisoners soon after the cease-fire ended the major fighting. Red Cross visits followed thereafter.

It has been reported that the Israelis permitted a number of Arab POWs to appear before TV cameras and even identify themselves as a means of reassurance to their families. It is ironic that the Mideast combatants live in such close proximity that they can tune in each other's television broadcasts. ■

On March 15, Alabama AFA's Mobile Chapter played host to 250 guests at ceremonies in honor of America's Southeast Asia dead and MIA/POWs. Returned POW Brig. Gen. (Maj. Gen. selectee) John P. Flynn was guest speaker. Here, from left, Lt. Col. William R. Sifford, USAF (Ret.), Chapter President; Brig. Gen. John R. Dyas, USAF (Ret.), of Montgomery; Mrs. Irene Denton, mother of returned POW Rear Adm. Jeremiah Denton; General Flynn; and E. M. Steiner, Alabama AFA State Vice President.

As family and friends look on, James F. Graham is assisted by his granddaughter, Nicole, in dedicating a Freedom Tree in honor of his son, Air Force Capt. Allen U. Graham, missing in action in SEA. The event also took place on March 15, and was sponsored jointly by the Mobile Chapter of AFA and the Alumni Association of the University of South Alabama, Captain Graham's alma mater. General Flynn also spoke at the tree dedication. Captain Graham's wife, Susan, is at left; holding the plaque is his brother Mike.

AIR FORCE
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Strategic attack assessment capabilities, always of great importance, become even more crucial as national strategic policy shifts toward a limited counterforce stance. For this and other reasons, the North American Air Defense Command is in the process of upgrading its systems for detecting and tracking enemy ICBMs and sea-launched ballistic missiles. While reducing its air defense forces, NORAD will continue to maintain basic capabilities in this field in order to retain an option for full-scale deployment if that becomes necessary in the future.

STRATEGIC WARNING, CORNERSTONE OF DETERRENCE

BY EDGAR ULSAMER
SENIOR EDITOR, AIR FORCE MAGAZINE

THE North American Air Defense Command (NORAD) and its Air Force component, the Aerospace Defense Command (ADC), are shifting their primary concerns from air to space, and from defense to surveillance, warning, and attack assessment. While NORAD continues to guard the North American airspace, its Commander in Chief, USAF Gen. Lucius D. Clay, Jr., emphasizes that changes in the potential Soviet threat and in US defense policy have elevated the Command's other mission—that of providing warning and assessment of aerospace attacks—to a position of "obvious primacy."

Referring to recent cuts in the Command's air defense forces (the phasing out of forty-eight Nike-Hercules batteries and the reduction in the US air defense interceptor strength from 486 to 336 aircraft), General Clay, who also serves as Commander in Chief of the Continental Air Defense Command (CONAD) and as ADC Commander, said, "NORAD is in the throes of a major realignment. While we have been instructed to retain basic defense capabilities against manned bomber forces, our primary defense mission is surveillance and warning" regarding ballistic missiles.

Gen. Lucius D. Clay, Jr., recently became Commander in Chief, North American Air Defense Command (NORAD).

This new tilt, he said, "is perhaps less glamourous than manned air combat, but it is expensive, complex, sophisticated, and crucial to our ability to deter nuclear war." The drop in air defense forces is balanced out by boosts in ICBM warning and surveillance systems, and thereby NORAD's annual budget has stayed at a "reasonably steady level of about $2.7 billion over the past few years. We are now spending more on warning systems, in terms of R&D and procurement, than on manned systems," General Clay told AIR FORCE Magazine.

INSTANT, UNAMBIGUOUS WARNING

In the uncertain world of nuclear strategy, where perception may be

more decisive than fact, one requirement is certain and central: The need to know with electronic instancy and mathematical precision what a potential aggressor is doing. The tool is real-time warning and surveillance. This requirement becomes acute when the potential adversaries agree to limit their antimissile defenses (ABM) to token levels, as specified by the treaty portion of the SALT I accord. Knowing that the US would be almost instantly aware that it is being attacked, and by whom and in what manner, and that it is, therefore, capable of launching any part of its own strategic forces before they might be damaged or destroyed, will deter any rational aggressor, at least as much as the actual might of the US strategic forces. NORAD's array of interlinked warning systems has clearly demonstrated that "we can give meaningful warning, under all circumstances, to the National Command Authorities in time to take whatever steps are deemed necessary prior to the arrival of the attacking force," according to General Clay.

NORAD relies on four separate but fully interlinked systems to keep track of Soviet missile launches; one of these systems is optimized for the detection of submarine-launched ballistic missiles. The systems augment each other in terms of speed, range, and the type of information that they produce through "multiphenomenology." The latter term denotes that each system looks for different phenomena associated with a missile launch and operates in different ranges of the frequency spectrum. The result is greater reliability of the warning mechanism. Spurious signals that might deceive one system are likely to be filtered out by the others. Also, the enemy's countermeasures are likely to blind or deceive only one or two but not all the US systems. (Recent MIRV testing of Soviet ICBMs can be expected to enhance their ECM capabilities and provide them with options to deploy decoys in the future.)

SATELLITE-BASED EARLY WARNING SYSTEM

The newest and most rapid means for ballistic missile launch detection and warning is NORAD's satellite surveillance system, including Early Warning Satellites and the Surveillance and Warning System.

At this time, it consists of at least three satellites operating in a synchronous orbit. These provide coverage of much of the earth's surface. Improvements of the system are planned and presumably will involve an increase in the number of satellites fully dedicated to the early warning role.

So far as ICBM launches are concerned, the Early Warning Satellite System "can be expected to provide unambiguous warning in the envelope of weapons that we see in the Soviet inventory at present," according to General Clay. The satellite surveillance and warning system operates in the infrared (IR) range and measures the energy content of the plume of a missile's rocket engine.

The surveillance and warning system is capable of detecting nuclear explosions in "all current areas of potential interest," according to Air Force Systems Command spokesmen. While the system, as presently constituted, provides reliable warning against missiles fired from Soviet territory, it does not furnish precise impact assessment.

"We have been trying to get improved capability for impact assessment into the inventory, but the program was dropped by congressional action. The objective was to develop a capability to correlate surveillance information from diverse systems and improve the quality of assessments on the nature and extent of an attack. This would allow the National Command Authorities to determine in advance whether an impending attack is directed against military targets, population centers, or a combination of both," General Clay told AIR FORCE Magazine.

Funds requested for the Attack Assessment System in the FY '74 budget were reduced, however, and associated industrial contracts terminated, he added. In the interim, the Air Force was directed to conduct in-house studies and research on means for developing attack-assessment capabilities, according to General Clay. The need for such a system would appear to be especially pronounced in light of Soviet MIRVing.

The effectiveness of NORAD's surveillance and warning system could be degraded but not negated by the introduction of mobile ICBM systems into the Soviet inventory, according to General Clay. "Right now we know, of course, where the Soviet missile fields are and, as a result, can tell automatically that we are dealing with an ICBM launch because it involves the right spot. A mobile system, on the other hand, would introduce some ambiguity, especially if it were launched from a point close to an international border," he said. (Development of a mobile Soviet ICBM system appears to be in progress, according to Defense Secretary James R. Schlesinger's Annual Report.)

Maj. Gen. Otis C. Moore, Commander of the Fourteenth Aerospace Defense Force.

Maj. Gen. Otis C. Moore, Commander of the Fourteenth Aerospace Defense Force, ADC, told AIR FORCE Magazine that while the capacity of the satellite warning and surveillance system is "not infinite, it is not limited in a practical sense." The number of individual launches the system can keep track of before it becomes saturated is sufficiently high to indicate that the United States is under full-scale attack, and anything beyond this point becomes, of course, academic, General Moore said.

The surveillance and warning system is optimized to deal with ICBMs, but "has considerable capability regarding SLBM launches. Its coverage is, however, not complete" for information about sea-launched ballistic missiles, according to General Clay. (Also, because of the limited number of satellites used by the system, predictable blind spots occur when the sun, moon, and earth are aligned in a certain way and affect offshore locations likely to be used by enemy submarines. This condition prevails infrequently, but in a practical sense is sufficiently severe to require supplementary coverage by other means.)

Department of Defense spokesmen have disclosed also that "there are certain geographic gaps, essentially in the northern regions, of potential attack that are not covered by the satellites from their synchronous orbits." Other problems, according to DoD, are caused by the sun's rays hitting the tops of clouds, causing a "signal that will look to the satellite as if it were an IR reading from a missile plume."

In terms of the technological state of the art, the Air Force's surveillance and warning system "represents the best that is available. We know of no emerging technique that could do a better or faster job," General Moore told this magazine.

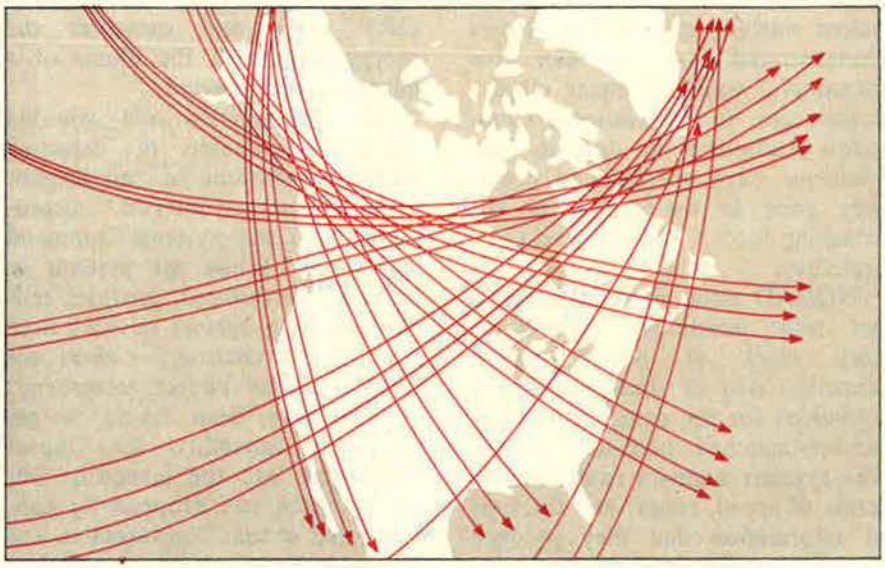
THE SATELLITE SURVIVABILITY QUESTION

"Technically, it is not too difficult to attack a satellite if a nuclear kill mechanism is available for the task. The treaty banning the use of nuclear weapons in space, of course, precludes the legal use of such a system," General Clay said. Explaining that many military satellite systems are in fixed orbits, he pointed out that Soviet space-rendezvous capabilities appear to be sufficiently sophisticated to perform a successful intercept, "although the practical merits of such an attack may well turn out to be highly dubious." Since an attack on the US military satellite systems is likely to be construed—whether intended as such or not—as a precursor of a nuclear attack, such an action would "be extremely risky from the attacker's point of view and signal his punches."

(A surprise attack on satellites in synchronous orbit is difficult to mount since the interceptor, if fired from the ground, requires several hours to reach geosynchronous altitude. It is possible, however, to place spacecraft with either a nuclear or conventional kill capability in high-altitude orbits and keep them there in a dormant state until they are directed to attack. There is evidence that the Soviets have tested systems employing nonnuclear kill mechanisms successfully.)

(Air Force Secretary John L. McLucas told AIR FORCE Magazine that USAF started development of a nuclear-armed antisatellite system, known as Program 437, on orders from former Defense Secretary Robert S. McNamara almost ten years ago. Theoretically, this capability is still in existence, but is not usable in a practical sense because the US is a signatory of the treaty barring use of nuclear weapons in space.)

General Clay commented that "in a military sense it is always necessary to maintain capabilities that can cope with each element of the enemy's threat."



Soviet satellites in orbit above the United States are closely monitored in NORAD's Cheyenne Mountain complex.

Because of the risks inherent in any attack on the US early warning system, it is more likely that attacks on military satellite systems will be directed selectively against nonvital systems outside of the command and control area. "A potential aggressor might go after systems that, once destroyed, would deprive us of capabilities he does not want us to have. In the process, the attacker would produce a low-level crisis, which may serve his political end, yet he would avoid a situation that would be interpreted automatically as a precursor of a nuclear attack on the United States," General Moore said.

OVER-THE-HORIZON WARNING SYSTEM

The most effective means for assuring the survivability of the US ICBM warning system is through redundancy. Even in the unlikely event of a successful attack on US satellite warning systems, the nation's warning mechanism would be curtailed only slightly. The reason for this is the Warning System 440L, a forward-scatter, over-the-horizon system that detects missile launches from the northern tier of the Eurasian land mass.

The system relies on signal reflections between the ionosphere and the ground, meaning that sig-

nals from the transmitters are bounced back and forth between the ground and the ionosphere until they reach the receiving stations.

The 440L system, General Clay explained, serves as a vital augmentation of the other components of NORAD's ICBM warning apparatus. The ionosphere extends to altitudes between ninety and 150 miles, depending on weather conditions.

The 440L system has two weaknesses, according to General Moore: "It provides only an approximation of what is happening, and it can't track. Also, because it depends on both transmitter and receiver sites on foreign territory, it is subjected to the vagaries of international relations. While it is our long-term objective to come up with a system that eliminates these vulnerabilities, we are years away from reaching that goal."

BMEWS: THE MOST PRECISE WARNING SYSTEM

NORAD's oldest ICBM warning system is BMEWS, for Ballistic Missile Early Warning System, which consists of a series of radars covering the northern approaches to the continental US. BMEWS provides fifteen to twenty-five minutes of warning of an impending ICBM attack and can predict impact areas through very precise radar tracking. BMEWS is also used to warn of IRBM (intermediate-range ballistic missile) attacks against Great Britain and to keep track of satellites in low orbit. (High-orbit satellites are outside the range of ground-based radars.) The system uses three sites —one in Alaska, another in Greenland, and a third in England.

The BMEWS warning net uses two types of radar—detection radar (DR) and tracking radar (TR). The first is a pulsed system that emits two beams of different but fixed elevation, scanned in azimuth in the manner of fans. The "fans" are arranged one on top of the other so that any penetrating missile has to go through both of them. The tracking radar is a mechanically scanned pulse radar that tracks individual missiles, after they have been detected by the DR fans. BMEWS detection range extends out to distances of 3,000 miles from each site.

BMEWS computers, collocated with the radars, process the sensor signals to establish trajectory information about objects within the system's range and to determine whether or not they are in fact enemy ICBMs. The data-processing system issues warnings to NORAD's Combat Operations Center on the second floor of the hardened Cheyenne Mountain complex in Colorado.

BMEWS dates back to the early 1960s and, according to General Clay, "is still a highly effective system." In order to increase US attack assessment capabilities, the Air Force is, however, exploring means for modifying BMEWS. "We want to be able to get more accurate information about the missiles as they pass through the fans—in the main, by extracting larger data samples. We are examining specific means for achieving this goal," according to General Moore.

SLBM WARNING SYSTEMS

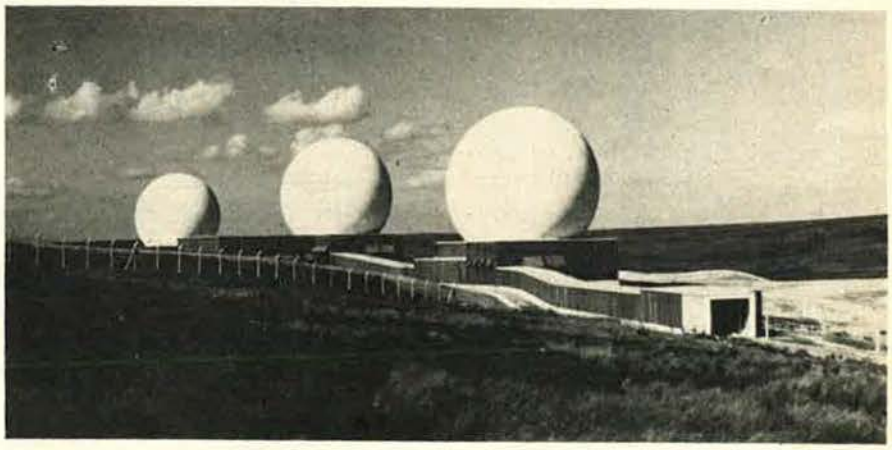
Because they probably will be launched from positions close to the US shoreline and because of their trajectories, SLBMs require a specialized warning system, in addition to the Early Warning Satellite System. For the time being, SLBM warning is provided by seven converted height-finder radars of the FSS-7 type. This system is augmented by a more advanced FPS-49 tracking radar installation in New Jersey and a sophisticated phased-array radar system of the AN/FPS-85 type at Eglin AFB, Fla., the principal mission of which is satellite detection and tracking.

These radars search out sectors of space just above the ocean horizon and can provide trajectory measurements. The warning times this system can provide depend on the location of the launching submarine. This system, in the view of Generals Clay and Moore, is antiquated and should be replaced, an assessment concurred in by Secretary Schlesinger.

In his current Posture Statement, the Defense Secretary has urged development of a "more effective and reliable" SLBM warning radar system. Dr. Schlesinger disclosed that the present SLBM warning system has "limitations against Soviet SLBMs, particularly the new longer-range [4,200 nautical mile] SS-N-8, [because] it does not fully encompass all of the areas from which the SS-N-8 could be launched."

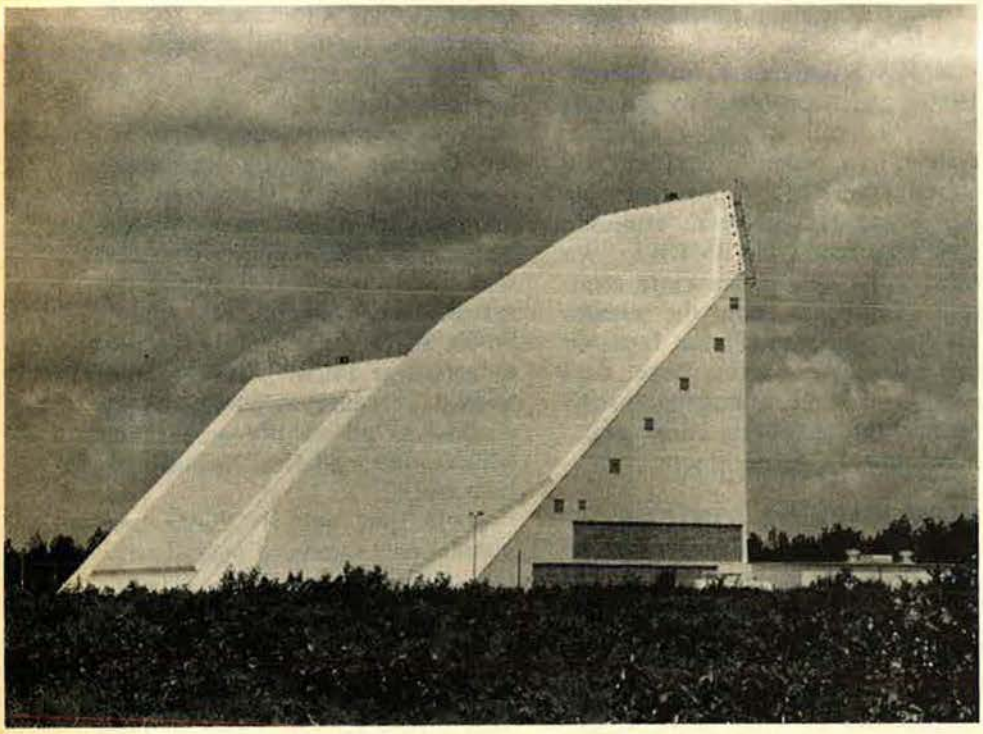
Some time ago, NORAD proposed a new system of phased-array radars to replace the FSS-7s; Congress denied funding in FY '74 for that program. DoD has reinstated this program in the FY '75 budget request by asking for $50 million —of a total estimated cost of $100 million—for acquisition of two phased-array radars, one each for the east and west coasts.

Dr. Schlesinger informed the



This Ballistic Missile Early Warning System (BMEWS) station in England is one of three that provide ICBM warning to NORAD.

Congress that a phased-array SLBM system, operating in conjunction with the two satellites of the surveillance and warning system positioned above the Western Hemisphere, "would provide highly credible warning of a Soviet SLBM launch against the US. First warning of such an attack would come from the satellites, and, within a very short interval, which increases with the distance of the launching submarine from our coast, verification of the attack would come from the SLBM phased-array radars."



A phased-array radar SLBM system supplemented by two synchronous orbiting warning satellites would provide a highly credible warning of a Soviet SLBM launch against the United States.

The radars, Dr. Schlesinger explained, "would not only verify the signals received from the satellites, but would also fill in any gaps that may occur in the satellite coverage as a result of solar reflections."

Phased-array radars differ from conventional systems in that their solid-state systems steer search beams electronically rather than mechanically; they don't use either the familiar moving dish antennas or the large bubble-shaped domes of older systems. The AN/FPS-85 installation at Eglin AFB can track nearly simultaneously about 200 objects over extended ranges. The radar transmitters and receivers are built into the face of a building that is a city block long and thirteen stories high. The more than 5,000 radar transmitters of the AN/FPS-85 are controlled by a computer, and the direction of their scanning beams can be changed in a fraction of a second. Radar-beam steering is accomplished by varying the way energy is fed to the antennas of a phased-array radar system.

General Clay rated deployment of such a system "one of the most pressing NORAD requirements."

THE NEED FOR ATTACK ASSESSMENT

The information derived from the four components of USAF's ballistic missile warning and surveillance apparatus, while undergoing a filtering process as it passes from one system to the next and correlated by the command and control computers at NORAD's Combat Operations Center, is at this time not sufficiently organized to provide what the Air Force calls "attack assessment." Development of such an Attack Assessment System (AAS) began on a tentative basis in FY '72 when the Air Staff instructed the Air Force Systems Command to examine this new requirement. According to General Moore, development of an Attack Assessment System "must be viewed as one of the most pressing present requirements."

In May of last year, AAS was launched officially by issuance of an Air Force program management directive. Recent changes in national policy concerning strategic deterrence, which emphasize the need for limited, selective counterforce capabilities, make the need for attack assessment categoric. Without precise knowledge of the origin, scope, and nature of an impending missile attack on the United States, the application of counterforce is not likely to be effective.

AAS's basic purpose is to take the information from individual sensor systems and combine it "to form a comprehensive picture of the conflict in progress," according to Col. Douglas W. Carmichael, AFSC's Director of Attack Assessment. DoD's FY '75 budget contains a request of $3.9 million for initial development of AAS. The key functions of AAS were agreed upon at a recent meeting of representatives from the strategic operating commands and include evaluation of attack origin, preferably down to identification of individual silos; secondly, detailed and precise information about timing, such as when the warheads will reenter the atmosphere and when they will impact.

Other points to be assessed are precise, near-real-time information about the number of missiles and, if MIRVed, number of RVs about to attack the US, as well as analyses of what kind of ICBMs are involved and what their payload is. Finally, AAS must be able to provide precise information about attack patterns, including type and distribution of targets under attack and "classes of targets under attack [retaliatory forces, cities, urban/in-

dustrial areas, or mix], the target complex [missile farm] or large target [city] involved, or the exact installation [silo, airfield, command center] targeted," according to Colonel Carmichael.

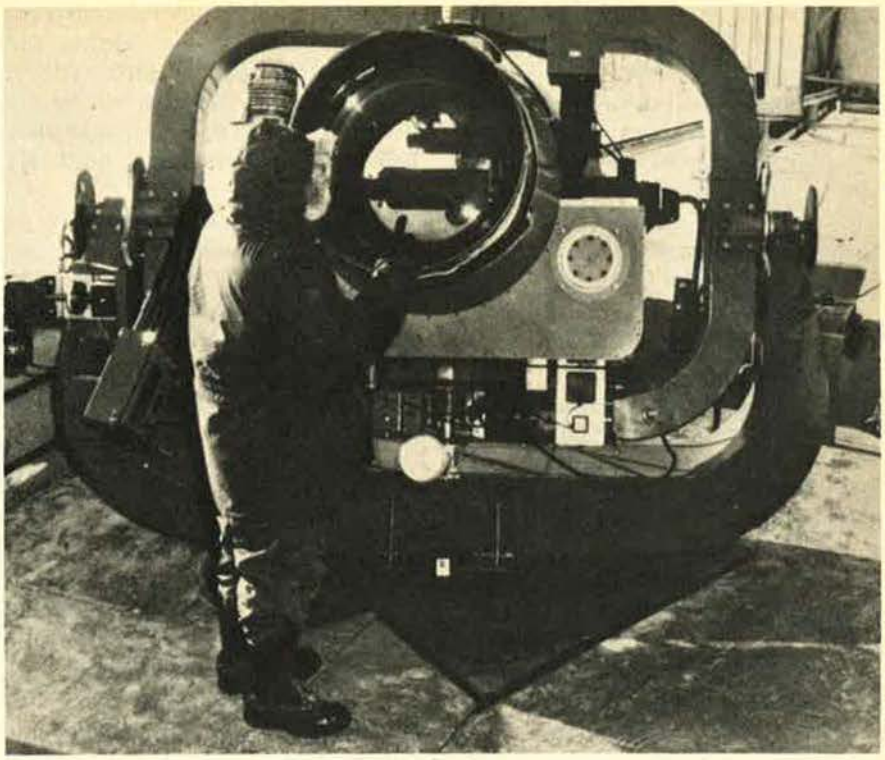
AAS is to do its job through sophisticated data-processing and display techniques, beyond those already existing or projected for the Worldwide Military Command and Control System (WWMCCS). "While the quality and quantity of the information is not yet present to completely achieve the goals set out for the future missile attack assessment system, there is opportunity to integrate the data at the command centers" to provide significantly improved information to the decision-makers, Colonel Carmichael said.

The AAS program is divided into three parts, or "tasks." Task I, the development of common data displays at the Pentagon's National Military Command Center, SAC's Command Post, and NORAD's Cheyenne Mountain complex, is currently in progress. Tasks II and III will involve specifying additional information needs and translating them into systems hardware.

THE SAFEGUARD ABM SYSTEM

At this time, the Soviet Union operates the world's only antiballistic missile defense system. This ABM system protects the Soviet national command authority and the city of Moscow with sixty-four interceptors and associated radar systems. (The number of launchers can be expected to increase to 100, the limit set by SALT I.) By April 1975, the US is scheduled to place its ABM system, the US Army's SAFEGUARD, into operation near Grand Forks AFB, N. D., to protect Minuteman missile farms in that area. The SAFEGUARD site at Grand Forks will consist of 100 Sprint and Spartan missiles as well as missile site and perimeter acquisition radar installations. The system will be controlled from CONAD's Cheyenne Mountain underground complex, where the necessary command and control computers are currently being installed.

Asked about the effectiveness of SAFEGUARD in defending a limited number of Minuteman silos, General Clay told AIR FORCE Magazine: "All tests indicate that this is an effective system. Obviously, our experience to date has been obtained in a test environment. It must be recognized that we have designed our tests against something other than MIRVs, which, of course, complicates the problem appreciably. Nevertheless, the evidence so far suggests that SAFEGUARD can be a good system, although limited numerically by SALT." (Department of Defense officials announced recently that the SAFEGUARD radars at Grand Forks are tracking satellites successfully as part of the present test cycle and that, of the forty-nine test firings of Sprint and Spartan interceptors from the Kwajalein test facility, forty-two were successful and two "partially successful."



The Baker-Nunn camera can photograph light reflected from an object the size of a basketball out to 20,000 miles in space. This one is operated by NORAD's Canadian Forces.

NORAD'S SPACE DETECTION AND TRACKING SYSTEM

NORAD's surveillance and warning mission includes the job of detecting, assessing, and keeping track of space satellites. This is the task of the Command's Space Defense Center, which is operated by ADC's Fourteenth Aerospace Defense Force. The Center's computers process information from NORAD's Space Detection and Tracking System (SPADATS), the principal component of which is ADC's Spacetrack System, also operated by the Fourteenth Aerospace Force.

"We attempt to track everything that goes into space and then, through SOI [space object identification], establish the nature and purpose of the object as soon as possible," according to General Moore.

At the time of this writing, SPADATS was tracking 3,137 space objects, including 352 US and 233 Soviet active satellites. Identification is performed by analyzing radar returns from a space object to deduce its size, shape, and type of motion. The information resembles an electrocardiogram and provides precise clues about the object under examination. (During the initial troubles of NASA's Skylab space station, SPADATS rapidly estab-

lished that a solar panel had failed to deploy.) The system also acts as an air traffic controller in space by predicting conflicting orbits as well as projecting decaying orbits, reentry of space objects into the atmosphere, and forecasts of where they will fall to earth (important because it reduces the chance of false ICBM-launch alarms).

Spacetrack's radar network is augmented by Baker-Nunn ten-foot-high telescopic cameras, located at five sites, which can photograph light reflected from an object the size of a basketball out to about 20,000 miles in space, a distance well beyond the limits of radar coverage.

In its FY '75 budget request, DoD provides for improved SPADATS capability. Dr. Malcolm R. Currie, the Director of Defense Research and Engineering, told the US Senate, "We are now working on detectors, target discrimination techniques, data processing, and other critical components in both the visual optical and radar portions of the spectrum, with the goal of demonstrating the feasibility of a near-real-time, ground-based capability to detect, track, and identify all objects. We are also developing technology to determine whether a space-based surveillance system would be cost-effective."

CUTS IN AIR DEFENSE

Early this year, DoD cut NORAD's air defense capabilities by phasing out forty-eight of fifty-two Nike-Hercules SAM batteries and by reducing the number of air defense interceptors by 150.

The Chairman of the Joint Chiefs of Staff, Adm. Thomas H. Moorer, summarized the reductions in congressional testimony:

"Our current projections of the US air defense force have declined, while the USSR air defense forces are essentially the same as . . . last year. As a result of budget decisions, primary emphasis is being placed on airspace surveillance and peacetime control and warning of a bomber attack. AWACS development funding has been transferred to General Purpose Forces, although the AWACS still will be required to fulfill strategic, as well as tactical, missions. All existing CONUS strategic air defense surface-to-air missiles (SAMs) will be phased out of operation by the end of FY '74, although deactivation will not be completed until FY '75.

"All F-102 interceptors will be phased out by mid-1976, but 242 F-106s and 124 F-101s will be retained at least through mid-1976. Pending a review on the retention of the F-101s, this force could be maintained at about that level through the 1970s. . . . In crisis situations, general-purpose fighters and SAMs could augment CONUS defenses; but, of course, these are the same forces that frequently are deployed elsewhere in a crisis. Thus, the Soviet Union's commanding lead over the United States in numbers of air defense radar sites, command and control facilities, surface-to-air missile launchers, and interceptor aircraft is expected to increase."

Defense Secretary Schlesinger justified the cuts in his annual report to the Congress by stating that because of the "interdependency of antiballistic missile and antibomber defenses," and the ABM Treaty's prohibition against even thin nationwide ABM defenses, "we cannot in good conscience postpone any longer the basic adjustments in our air defense program made necessary by the changing world situation."

In assessing curtailed US air defense capabilities for AIR FORCE Magazine, General Clay stressed that "the Air Force believes strongly that there is an air defense requirement, and that this role calls for some dedicated force as well as a particular type of expertise combined with a meaningful command and control capability to integrate air defense so that it can be applied effectively when needed. In my judgment, we have now reached the absolute minimum. If we go any lower, we would destroy, or at least significantly reduce, our air defense know-how and our understanding of the associated command and control techniques."

He added that "the Soviets have increased their capabilities in the very areas that we are cutting back, not just in terms of fighters but in air-to-air munitions. They have some 9,800 SAMs and about 2,600 air defense interceptors."

Under the recently promulgated realignment, the Aerospace Defense Command will operate six squadrons of F-106 aircraft and the Air National Guard another six squadrons of F-106s as well as six squadrons of F-101s and two squadrons of F-102s. Referring to this arrangement, General Clay commented, "Obviously, I would prefer, for reasons of effectiveness, to be in command of the entire force. On the other hand, the Guard is a good force with dedicated crews and maintenance teams that do a superb job. But, we have to remember that not all Guard units have reached the same level of training as the regular force. This is not being said critically, but to state a fact of life that is only proper."

The severe cuts in the nation's air defense forces are buffered to some extent by greater reliance on augmentation. "Secretary Schlesinger has instructed us to plan on augmentation of our forces [by calling on general-purpose forces during periods of need]. This is a realistic approach, because there are tremendous resources in fighters available in the Air Force as well as in the Navy. In a surprise situation, we would use these forces for the defense of the United States. This is not to say that all of them will be available for this purpose at the time, but it is our job to provide for all contingencies and to assure the integration of the augmenting and main forces," under such conditions, General Clay said.

Dr. Schlesinger, in a similar vein, told the Congress that "we will have the option to deploy a new interceptor [*e.g.*, F-15 or F-14] and a new SAM system [*e.g.*, SAM-D, a mobile system currently under development by the US Army] for CONUS defense, since those programs are being pursued in any event for the general-purpose forces."

General Clay pointed out that the realignment of air defense forces is based on "retaining the fundamental elements of an inte-

grated air defense environment sufficient to build up from in the fields of command and control, interceptors, and detection and warning, if it turns out that we have guessed wrong," and larger forces than presently envisioned are needed.

POTENTIAL TECHNICAL IMPROVEMENTS

In the mid-1960s, the Air Force developed a three-pronged program to boost the nation's air defense capabilities—an airborne warning and control system, an improved radar, and a new interceptor known as IMI.

"The F-106 still looks very good, and we believe it will be able to perform its job until the mid-1980s with the help of a better radar and improved missiles," General Clay told AIR FORCE Magazine.

Brig. Gen. Timothy I. Ahern believes the F-106 may get a new look-down radar system.

ADC's Deputy Chief of Staff for Programs and Requirements, Brig. Gen. Timothy I. Ahern, explained that "fortuitously, we have some small, highly capable radars coming into the Air Force inventory that look very attractive for the F-106. The F-15's system, for instance, would give us a much needed look-down capability. In turn, this can be coupled with a commensurate kill capability—that is, a missile with a look-down, shoot-down capability, such as an improved AIM-4, of which we have a large inventory. What we would need is an improved seeker and a warhead with a proximity fuze and fragmentation capability to increase the kill probability. The improvements that we are looking at are of modest cost."

Eventually, in the opinion of General Clay, it will become necessary to replace the F-106 with a new system. "Both the F-14 and the F-15 have the speed and inherent range—and that could be boosted relatively easily—to make them effective long-range interceptors." Although the F-14 and its sophisticated Phoenix missile and fire-control system—derived from the F-12 project—are optimized for the intercept mission, Air Force studies find the F-15 somewhat more cost-effective because of its significantly lower price.

While the F-14 can track and fire at six targets simultaneously, "this is a capability that is important to the Navy fleet-defense," General Ahern pointed out. "The F-15 needs some modifications for the air defense mission, but they are modest in cost and seem to pose no problems," General Clay said.

The second step to upgrade US air defenses hinges on installation of OTH-B, a modern over-the-horizon backscatter radar that can provide coverage from sea level to the ionosphere. Present radars provide adequate coverage at altitudes above 20,000 feet, become less effective down to 2,000 feet, and are extremely limited from 2,000 feet to surface levels. The OTH-B program, General Clay said, is "moving along well. We are conducting tests with a system in the Canadian Arctic in conjunction with the Canadian Resources Board. While there are still some technical problems to be solved, it looks like we can overcome them. Even if we can't, OTH-B is already far superior to the existing system."

In addition, ADC and the FAA are in the process of consolidating military and civilian radars and control centers in the CONUS into a joint-use system. Nine common-use surveillance radars are currently in operation, and, by FY '78, all military surveillance radars are to be replaced by joint-use systems in the continental US. By FY '79, thirteen USAF/FAA joint-use control centers will replace the six regional control centers of the SAGE system.

The third element of the current effort to modernize air defenses is the E-3A AWACS, now assigned to the General Purpose Forces and classified by DoD as a tactical system that "could be used to augment the strategic air defense in a crisis." General Clay commented that, "while from a parochial view, I would prefer to have AWACS assigned to ADC, the aircraft doesn't care. It is configured to perform the air defense role, and that is what really matters."

TAC has been designated as AWACS system single manager and will operate the thirty-four aircraft programmed to enter the inventory late in the 1970s as part of a general-purpose pool for use in both strategic defense and tactical missions.

NUMBERS DOWN, MORALE UP

NORAD's force reductions have been severe and, in General Clay's view, may involve yet another cut of between ten and twelve percent. "We have gone from 250,000 people to fewer than 70,000 in just ten years. It would be understandable if our people developed a 'nobody-loves-me' attitude. But this is not the case. The *esprit de corps* and morale are amazingly high, and we are going to keep it that way.

"This is still the only command where a relatively junior man has a good chance of command; for example, a young major running a radar site all by himself, and being fully in charge in all aspects. The opportunities are still tremendous and so are the responsibilities. I believe that this is the reason why our morale continues to be excellent." Even a brief visit to NORAD confirms that here is a command that, as General Clay puts it, "isn't going to cry in its beer." ■

In the months since Air Force participation in Southeast Asia combat operations ended, emphasis has shifted to maintaining effective forces in peacetime. The Secretary of the Air Force reviews a year of solid accomplishment in personnel and equipment programs as USAF has moved . . .

From Combat to Peacetime Readiness

BY THE HON. JOHN L. McLUCAS
SECRETARY OF THE AIR FORCE

IT WAS just over a year ago—the end of March 1973—that the last group of our prisoners of war was released. Thus ended our involvement in the longest and perhaps most difficult conflict in American history. I believe, and I think most Americans believe, that in the final analysis it was a worthwhile effort. I know that the men and women of our armed forces performed in a way of which we can all be proud.

But as we turned to seeking a more durable peace and to strengthening détente, we faced a whole new set of challenges. However, within the Department of Defense, the key responsibility came down to maintaining effective forces in peacetime. It so happened that this transition, in the main, coincided with a number of leadership changes in the Office of the Secretary of Defense and the services. There has been a continuing dedication to excellence on the part of those responsible for our nation's defense policies, but as a new team comes aboard there are new techniques and initiatives. I'm sure

THE SECRETARIES OF THE AIR FORCE

Stuart Symington	Sept. 18, 1947	Apr. 24, 1950
Thomas K. Finletter	Apr. 24, 1950	Jan. 20, 1953
Harold E. Talbott	Feb. 4, 1953	Aug. 13, 1955
Donald A. Quarles	Aug. 15, 1955	Apr. 30, 1957
James H. Douglas, Jr.	May 1, 1957	Dec. 10, 1959
Dudley C. Sharp	Dec. 11, 1959	Jan. 20, 1961
Eugene M. Zuckert	Jan. 24, 1961	Sept. 30, 1965
Harold Brown	Oct. 1, 1965	Feb. 15, 1969
Robert C. Seamans, Jr.	Feb. 15, 1969	May 14, 1973
John L. McLucas	July 18, 1973	

that under the leadership of Secretary of Defense Dr. James R. Schlesinger the emphasis upon innovation will continue.

Certainly, we are encouraging Air Force people to accomplish their tasks imaginatively, whether they deal with recruiting goals or improving the management of weapons procurement. I might add that with James W. Plummer aboard as our Under Secretary, virtually all senior Air Force positions are filled. And, working with Gen. George S. Brown as Chief of Staff, we are confident that we can do the job ahead of us.

Of course, not all of our challenges are new, and I think that we have dealt with our main responsibilities just long enough so that it would be valuable to examine where we stand. A particularly useful way of "taking stock" of where we have come during the last nine to twelve months is to think in terms of people, readiness, and modernization.

MANNING THE FORCE

To meet the challenges of maintaining technological progress, modernizing our forces, and keeping them in a high state of readiness, we need to attract competent and dedicated people to the Air Force. A few years ago, we began to work toward the goal of doing this through an all-volunteer force. The authority for the draft ended in June 1973, although no men were drafted after January of that year. I am happy to report that, thus far, we have been able to operate successfully without the draft incentive, and the Air Force is very pleased with the results.

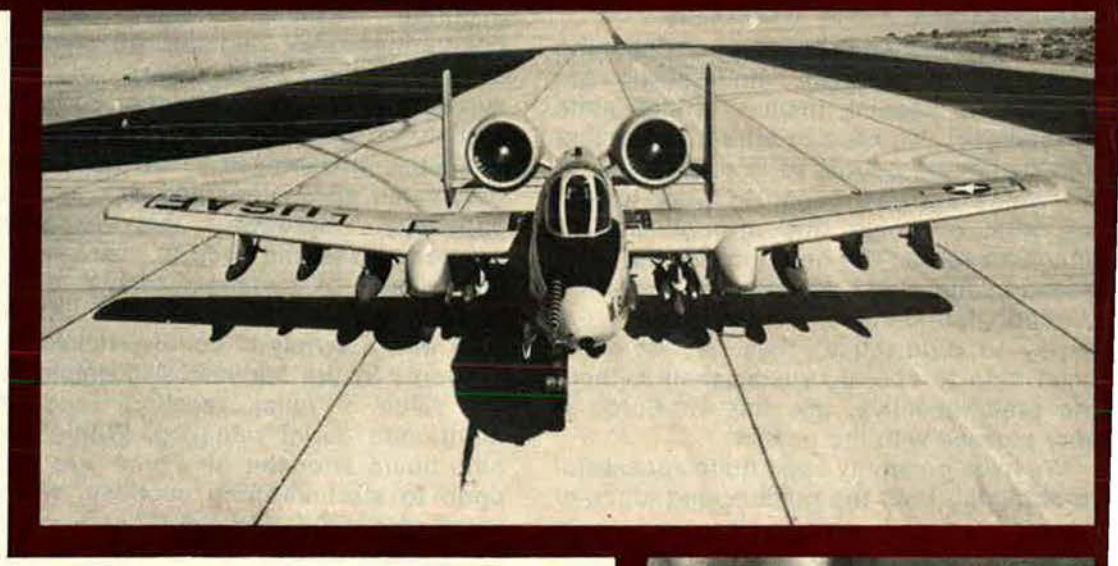
We have generally been quite successful in obtaining both the number and kinds of people we need. As a matter of fact, in terms of mental ability and the percentage of high school graduates, our new airmen compare favorably with those of the draft years. It is a tough task, but we believe the outlook for continued success is good. Some problems remain. For example, we have difficulty in attracting people for the Reserve Forces and in finding enough physicians and dentists. But, through our continued effort in these areas, and with the help of Congress, we hope to meet these needs. And through job satisfaction enhanced by education and training, as well as successful equal opportunity programs, we can help to make the Air Force an even more attractive place to live, work, and learn.

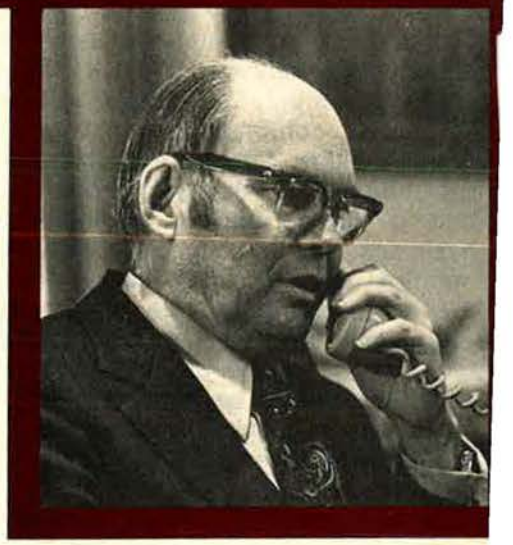
Before leaving the subject of personnel and the all-volunteer force, I want to emphasize that the Reserve Forces will constitute the primary source of augmentation for the active-duty personnel, should this need arise. Thus, they must be fully effective and ready both in peacetime and in contingency situations. Despite the number of conversions taking place in both the Air National Guard and the Air Force Reserve units, their readiness status has improved markedly during the last year. And that's what it's all about.

READINESS ACROSS THE BOARD

I believe events in Southeast Asia and the Middle East have clearly demonstrated the need for continually updating our tactical air capability and having sufficient war reserve materials to support combat forces as long as necessary until wartime supply lines can be established. Combat experience in both these areas reinforces the need for such conventional capabilities as accurate weapons, in-being electronic countermeasures, and aircraft sheltering. Similarly, the effectiveness of air-to-surface missiles against armor under conditions of good visibility highlights the additional advantages to be gained from getting an all-weather and day and night capability. Moreover, this experience points up to us the need to maintain good intelligence of various systems: aircraft, antiaircraft, and others, to enable us to deal with a variety of contingencies.

Events in the Mideast also emphasized the value of quick reaction, long-range airlift, and aerial refueling. Within about nine hours after the Air Force was called upon to start airlifting supplies, we had some of our C-5 and C-141 jet transports on the way. Within three days, we were moving approximately a thousand tons of material per day, including equipment such as fifty-ton tanks and CH-53 helicopters. Incidentally, this equipment could not have been airlifted until we got the C-5—and the Mideast persuaded us that we had indeed moved in the right direction in developing this transport. Notwithstanding this performance, we realize that if we extrapolate the requirements created by the Middle East to the more general kind of conflict that might take place in Europe, we would need an improved airlift capability. So we have been looking the past several months at different ways to do that. These measures include enhancing the cargo capability of the Civilian Reserve Air





Secretary John L. McLucas (right) has announced that one means under consideration for increasing USAF's airlift capacity is to lengthen the fuselage of the C-141 (top). The A-10 (center) close-support-aircraft program and its associated engine and gun developments are on or ahead of schedule.

Fleet, lengthening the C-141 fuselage, modifying the C-5 wing, and developing an advanced cargo-tanker aircraft.

I suggested that our goal is to maintain a force that is ready to act when called upon. I think the importance of that goal is the major lesson that was reconfirmed by events in the Middle East. I believe the Air Force demonstrated that we were in a good state of readiness, but as I have pointed out, we did find certain areas that need improvement, and many of our efforts during the last six months have been devoted to overcoming those deficiencies.

One of these problems, of course, is fuel, and we in the Air Force are trying hard to conserve this scarce resource. Beginning in the summer of 1973, we foresaw the need to move toward austere fuel consumption, and we created an Energy Conservation Task Group to implement such a policy. In October, with the Arab-Israeli crisis, the oil shortage became critical. In November and December, we cut our aviation fuel usage by about one-third. If we had continued such large cuts, they might have affected our combat readiness. Now we have reduced aviation fuel consumption by at least fifteen percent below FY '73 levels. While this is a hardship, we recognize that we must share in the national conservation effort, while maintaining adequate flight training and combat readiness.

PROGRESS IN MODERNIZATION

But a highly ready force cannot remain static. Modernization is required if we are to preserve an overall military balance in a world of rapid technological change. I would like now to turn to the task of modernization and review some of the progress we have made during the last year in producing and developing our major systems.

One of our most important needs is an air-superiority fighter second to none, and for this purpose we developed the F-15, which went into production in 1973 and now has had more than 1,500 flights. The Pratt & Whitney F100 engine completed its endurance qualification test, and production-configured engines are now being flown on the flight-test aircraft. The fire-control radar has already demonstrated capability beyond design requirements. The F-15 has exceeded its maximum design performance in both altitude and airspeed. It has the power, maneuvering ability, and weapons that will enable it to defeat the best aircraft we expect the Soviets to have in the 1970s and early 1980s. I have flown in this aircraft and am convinced that it will live up to its potential as one of the most significant aircraft developments in our history.

For better support of ground troops, we are developing the A-10 close-air-support aircraft, which has been specifically designed for that role. This simple and rugged aircraft can operate from forward areas. It will be able to carry heavy payloads and will also be maneuverable enough to work under low clouds, even over rough terrain.

A contract was awarded to Fairchild Industries in March 1973 for a Development Test and Evaluation program of ten of these aircraft. Six are already funded, and the remaining four are being requested in the present budget. This program, as well as engine and gun development, is proceeding on or ahead of schedule. We hope to have a production decision by July of this year.

We are also developing an Airborne Warning and Control System—a 707 jet transport modified to carry a radar with a unique look-down capability and associated data-processing and communications equipment—which will be a tremendous jump in our ability to control forces in a tactical battle area covering thousands of square miles. An AWACS prototype was tested in April 1973 in Europe with results that were well received by the NATO countries.

A production decision on AWACS is scheduled for December of this year. The program has proceeded within cost and on schedule. In fact, when the contract was let in July 1970, we predicted a first production flight on March 23, 1974. It actually occurred on March 16 of this year.

THE STRATEGIC AREA

While we must maintain adequate tactical capability, strategic deterrence remains of paramount importance. I am convinced that the mutual interest of the United States and the Soviet Union, and indeed of all nations, in avoiding nuclear war depends heavily upon the nuclear deterrent strength of the United States. And to help ensure that we maintain full equality in the face of Soviet strategic force improvements, we have continued to modernize our own ICBM force through deployment of Minuteman III, further improved prelaunch survivability, and more effective command and control.

Also, we are developing the B-1 bomber

Dr. John L. McLucas became the tenth Secretary of the Air Force on July 18, 1973. Prior to that, he had been Under Secretary of the Air Force for more than four years. Dr. McLucas has had long experience in defense affairs as Deputy Director of Defense Research and Engineering, NATO's Assistant Secretary General for Scientific Affairs, and President of the MITRE Corp. He also has served as a member of the Air Force Scientific Advisory Board. Dr. McLucas is a graduate of Davidson College and holds a doctorate in physics from Pennsylvania State University.

to replace the B-52. The Air Force has long considered alternatives to the aging B-52, and by 1970 we felt we could specify fairly accurately what characteristics we wanted in a new bomber. The Air Force and the Department of Defense decided we should proceed with an orderly development program and defer production release until after successful flight demonstration.

After competitive selection of a contractor, we further refined the development program to get three flight aircraft and two structural test models. The first aircraft is now in final assembly in Palmdale, Calif., and is scheduled for roll-out very shortly. All major assemblies of air vehicle No. 1 have been mated, including the crew module. Manufacture and assembly of air vehicle No. 2 is under way and is taking fewer man-hours than planned. Progress is also evident at General Electric, where the F101 engine preliminary flight-rating test was recently completed.

While there have been some delays in design and assembly, we feel that considering the complexity of the job, this is not unexpected. However, when I found last summer that we were not going to be able to meet projected dates for completion of the first aircraft, General Brown and I initiated certain steps to keep development progressing in an orderly fashion. One of these was to ask Dr. Raymond Bisplinghoff of the National Science Foundation to chair a special committee to review technical and management aspects of the program.

Upon completion of their study, the committee reported that we had not made adequate provision for the transition from development to production. They recommended that we manufacture a few preproduction aircraft to help ease this transition. They also felt that the program had been funded too austerely and that our prime contractor had not fully manned all key areas as rapidly as he should have. I believe that management changes have generally overcome these deficiencies.

The Bisplinghoff team believes that the B-1 will meet all essential objectives, and they found no major technical problems that would preclude the successful development and production of this new aircraft.

We agree with the main conclusion of the Bisplinghoff group, namely, that the program should be structured to provide better transition to production. I have recommended in Congress that it act favorably on our request for funding to carry out B-1 development, specifically, to begin work on air vehicle No. 4 this year and possibly a fifth aircraft in FY '76. We also urge that Congress continue support for the important programs that I mentioned earlier.

BUILDING ON A FIRM FOUNDATION

On balance, we are pleased with the progress made in each of our major programs in the past twelve months.

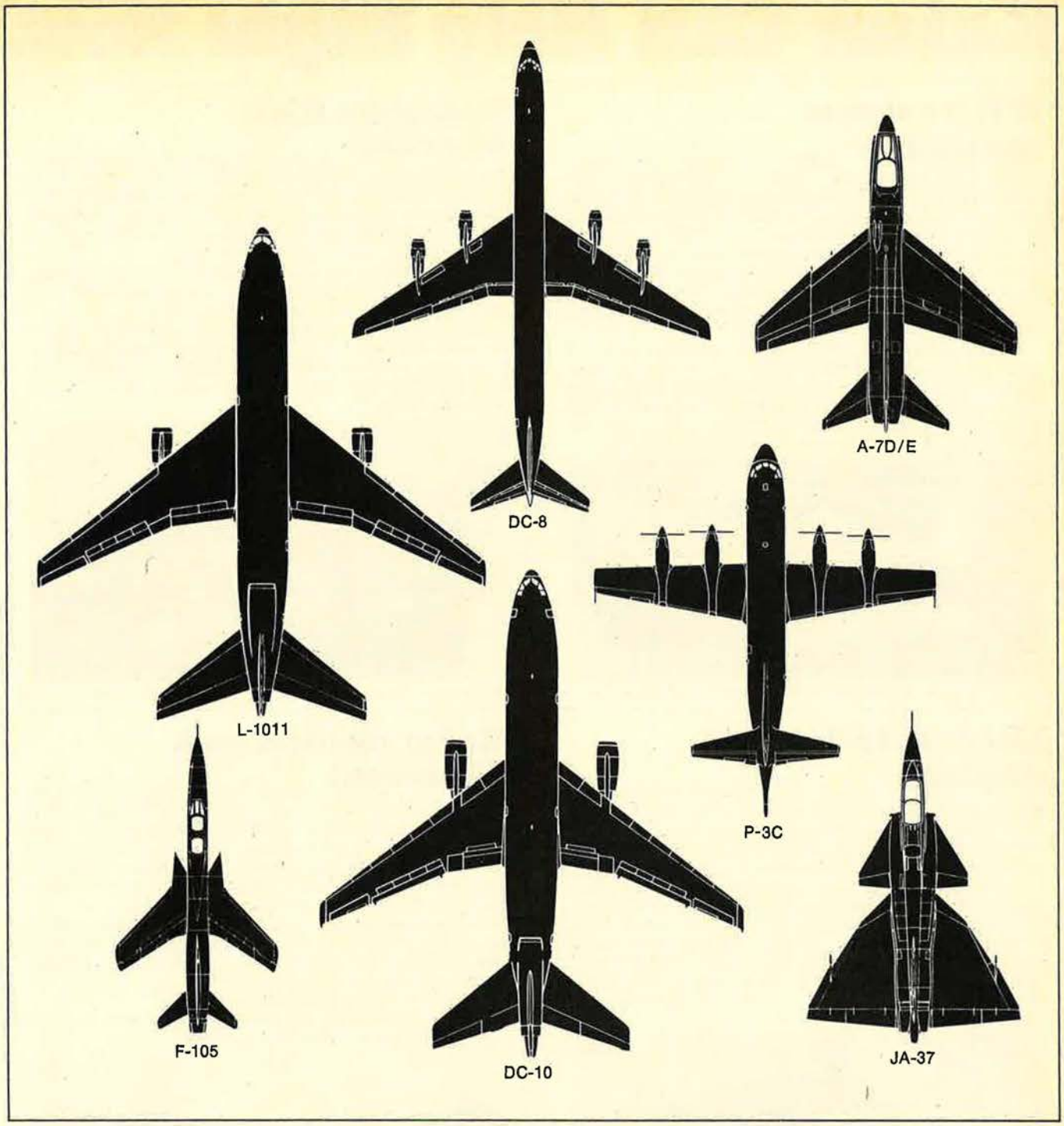
The reduction of our involvement in Southeast Asia has muted antimilitary sentiment and the recent Mideast conflict demonstrates the need for military strength. We now enjoy the support, I believe, of most of the American people.

We emerged from the Southeast Asia conflict with a number of newly developed and tested weapons and tactics and highly trained combat veterans, which put us in a stronger position with respect to our ability to deal successfully with any future military conflicts. The morale of our forces is high. The acceptance of a military career is sufficiently high that we are getting all the forces needed to meet our strength objectives.

The Fiscal Year 1975 budget request, which has already been submitted, takes account of inflation over the last five years and would maintain essentially the same level of force as before. The Fiscal 1974 budget was supplemented to take account of lessons learned in the Middle East, particularly for suppression of surface-to-air missiles, as well as countermeasures for the same purpose, and funds for beginning the development of more capable airlift.

We know that Soviet resupply efforts to the Arab nations during the October crisis were very effective. And we also know that Soviet capabilities continue to be improved at an increasingly rapid rate. Moreover, they are willing to employ pressure tactics where our interests may be involved, if they believe that in any particular situation their military position is stronger than our own.

The major lesson that I draw from this assessment, or "taking stock," is that our military—our Air Force—must continue to attract and retain highly qualified people, who must be kept in a high state of readiness and who must be provided with modern equipment adequate to their tasks. The American people have a right to expect no less. ■



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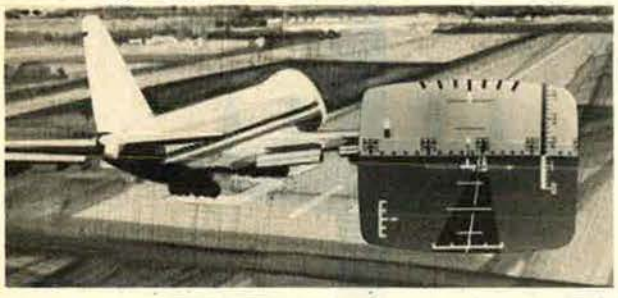

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The Chief of Staff believes "that the evidence of past conflicts indicates the need for forces that can best deal with surprises." The versatility and flexibility with which airpower has met unforeseen situations in the past must be preserved in the new weapons and concepts with which . . .

USAF Prepares For the Future

BY GEN. GEORGE S. BROWN, USAF

CHIEF OF STAFF, UNITED STATES AIR FORCE

THE future of the Air Force reflects the future of our nation. Never clear, our outlook is clouded by the complexities of a rapidly changing world. However, certain things are obvious. We know, for example, that the Air Force, like our society as a whole, faces a multitude of problems with the environment, inflation, and our energy supply. These factors will necessarily influence our future.

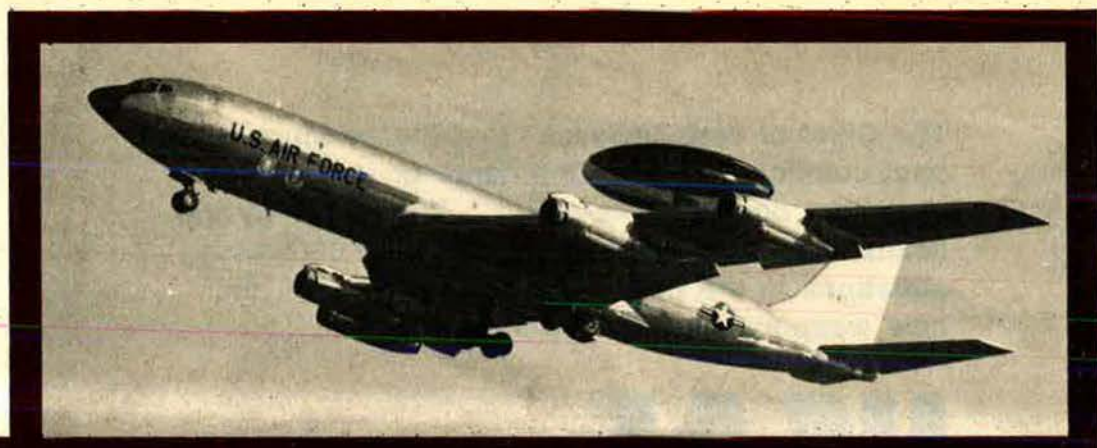
We know for sure that the future holds uncertainty and change. There is uncertainty as to what will occur internationally by way of threat to our security and economic health. There will be change, for that is the earmark of progress.

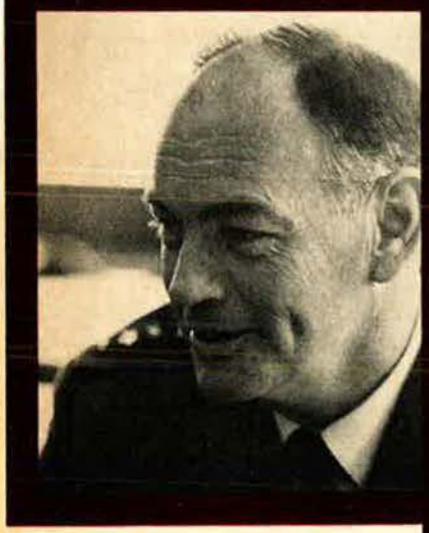
Expecting surprises should tell us something about how to prepare. I believe that the evidence of past conflicts indicates the need for forces that can best deal with surprises. That is, forces that possess inherent versatility and flexibility. Airpower offers these capabilities plus a unique potential for new and innovative solutions to security needs.

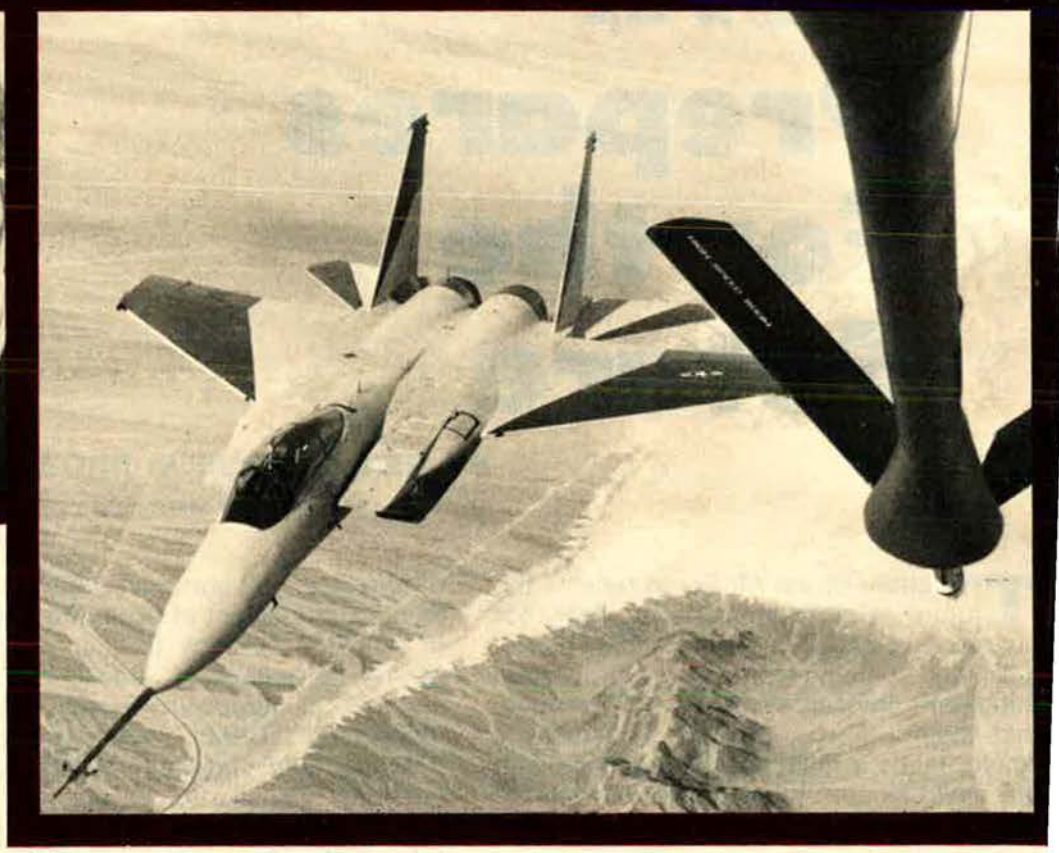
We recognize that many factors contribute to the national defense, but the role of *airpower* is pervasive. Airpower is a significant element of each of our services. In fact, the strategy for our national defense—deterrence of attack—is based on a Triad of *airpower* weapon systems—land-based ICBMs, submarine-launched missiles, and strategic bombers. These strategic offensive forces are neither rigid nor stagnant. Rather, they are versatile instruments that can contend with the surprises of a changing threat. Although the world environment may alter and our adversaries may confront us with a new or increasing threat, our strategic forces are capable of accommodating changes.

THE UNITED STATES AIR FORCE CHIEFS OF STAFF

Gen. Carl A. Spaatz	Sept. 26, 1947	Apr. 29, 1948
Gen. Hoyt S. Vandenberg	Apr. 30, 1948	June 29, 1953
Gen. Nathan F. Twining	June 30, 1953	June 30, 1957
Gen. Thomas D. White	July 1, 1957	June 30, 1961
Gen. Curtis E. LeMay	June 30, 1961	Jan. 31, 1965
Gen. John P. McConnell	Feb. 1, 1965	July 31, 1969
Gen. John D. Ryan	Aug. 1, 1969	July 31, 1973
Gen. George S. Brown	Aug. 1, 1973	







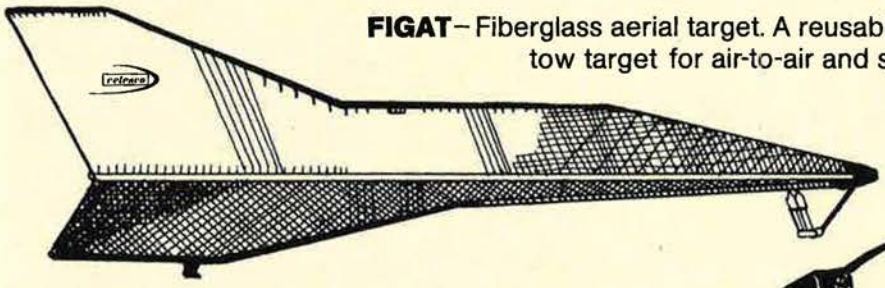
Gen. George S. Brown (above) believes that new weapon systems must be adaptable and flexible. The AWACS (top) and F-15 both have capabilities that cover a wide range of operations and the potential for meeting unforeseen requirements.

The B-52 is a case in point. Since it was first introduced twenty years ago, the B-52 has adapted to a wide variety of needs. It has not only supplied strategic nuclear strike capability but filled tactical roles in Southeast Asia, interdicting enemy supply routes and supporting troops with discrete but massive firepower. It has been configured with weapons ranging from nuclear bombs and standoff missiles to iron bombs and mines. It was repeatedly modified and improved to adapt to new and changing missions and challenges.

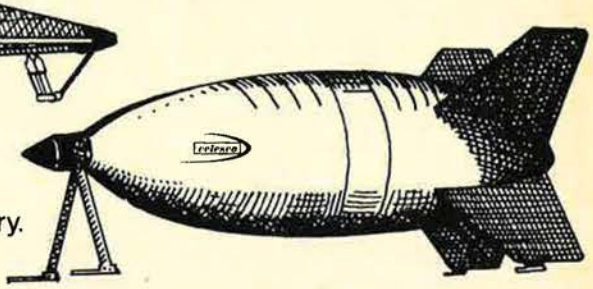
But like anything mechanical, the B-52 has structural limitations. We cannot expect it to last indefinitely. That is why we are developing the B-1 for the next decade. We believe the manned-bomber element provides maximum versatility in the Triad. Thus, we will continue our efforts to ensure that the characteristics and capabilities our strategy requires will be met in the B-1.

When I say our forces must be those best able to deal with surprises, I do not necessarily mean greater forces or even more complex forces. Rather, we must build into each program and each weapon system the characteristics that can best prepare us for the future. If our forces are

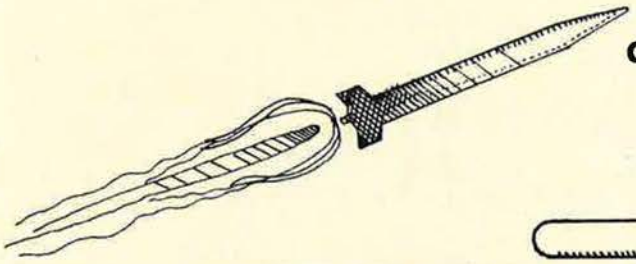
Celesco is building a new vocabulary in targets and simulation systems.



FIGAT– Fiberglass aerial target. A reusable, realistic large scale tow target for air-to-air and surface-to-air gunnery.



LOFAT– Low flying aerial target. A large diameter tow target for point defense gunnery.



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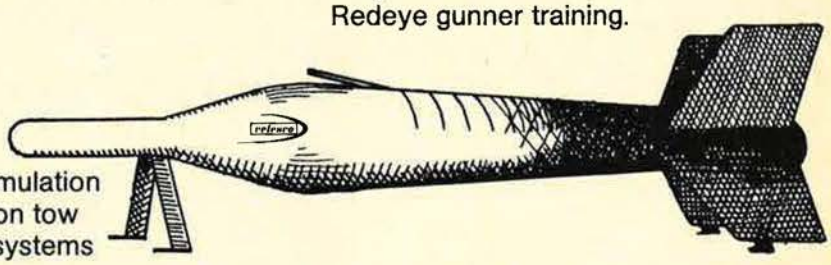

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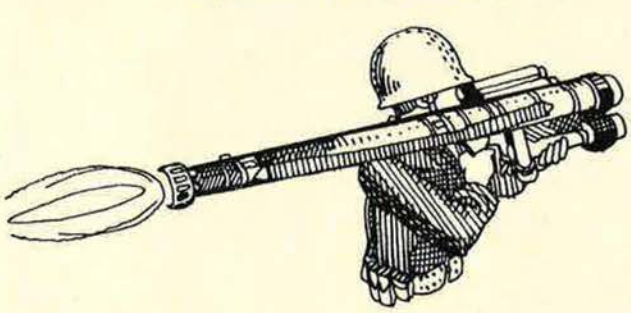

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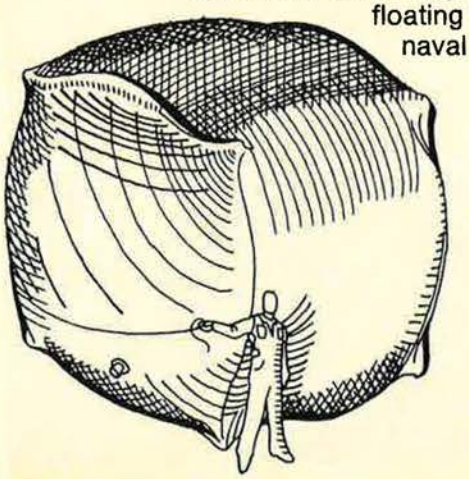

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to be usable and effective, they must be readily adaptable.

For example, our experiences in North Vietnam and our analysis of the recent Middle East conflict clearly pointed to the need for an improved capability to suppress enemy defenses. An effective ECM capability is essential to success. To this end, we are developing the EF-111. The EF-111 is an F-111A modified to carry the ALQ-99 jamming subsystem. The EF-111 will provide an ECM system capable of accompanying the strike force and reducing losses during operations in heavily defended territory. It will also be capable of jamming enemy radar coverage of friendly airspace and enemy mobile surface defense missile sites operating in support of their frontline forces. When combined with various other electronic warfare systems, the EF-111 will greatly improve the combat capability of our tactical forces.

In addition to providing better systems to meet a more complex threat, we have a duty to provide effective defense at least cost. We recognize the enormous cost of acquiring weapon systems and retaining quality personnel to operate and maintain them. We are taking steps to promote better management and more efficiency. That is a continuing, never-ending task. At the same time, we recognize our national need for economic stability and a justifiable national concern with domestic issues. These may predict continuing austerity for defense forces. I, too, support an austere force—but it must be a force that assures national security.

I do not mean to imply that our budget is declining or is insufficient for an adequate national defense. In fact, I am encouraged that the President's FY '75 budget shows an increase in the real purchasing power of the defense dollar. This is the first such increase in more than five years. These additional funds are needed and will help to offset the rising cost of fuel and of the recruitment and retention of high-quality people. They will also cut the sting of inflation and, most importantly, help to support a much needed force modernization program.

The weapon systems that we now operate were shaped in the 1950s, and they cannot be expected to do the job in the decade ahead. Our major programs that are designed to counter future surprises include the F-15 air-superiority fighter, the A-10 close-support aircraft, the B-1 strategic bomber, the airborne command post, and AWACS. However, congressional decisions are necessary on all of these programs.

Force modernization is not just an idea we promote in order to continue changing and gaining new forces. There are very real needs for each system. Look at several examples.

The A-10 will satisfy very real requirements. It will help to offset the massive numerical armor advantage of the Warsaw Pact compared to NATO. Long endurance, high survivability, and great firepower characterize the A-10 and are the attributes needed for close air support in a conventional conflict.

The F-15 air-superiority fighter will provide the air-to-air protection that will permit the A-10 to work most effectively. We need the F-15 to keep up with Soviet advances in air-to-air capability. Our present F-4 is a very capable system but is only an even match with the MiG-21—unless our pilots can maneuver the fight into their own best environment. The Soviets' more advanced fighters could cause greater difficulties, but not for the F-15.

So when I talk of a period of modernization, I am really calling for systems to meet real requirements. Some critics contend that we can't afford it, but I insist we cannot afford to forego the modernization any longer.

The same thing is essentially true for Air Force personnel programs. We are "modernizing" many facets of these programs because in the final analysis the success of all our forces, plans, and policies will depend on the men and women who are our Air Force. They are special people whose dedication and talents are more critical than ever. We will continue to examine the "what," "how," and "why" of each personnel action we take to ensure it contributes to the mission. Difficulties and occasional hardships will still exist for some of us, but each must pass the critical test of being mission essential. We simply can't afford the costs of counterproductive irritants.

I have noted a few factors that will help to shape the Air Force's future. We face uncertainty and will encounter surprises. The view ahead is certainly one of change —but not one of gloom. On the contrary, I am convinced that the outlook is bright. It is made brighter by the certain knowledge that our airmen will meet the future with the same dedication and professionalism that have provided our nation the security and peace we now enjoy. ■

Gen. George S. Brown became the eighth Chief of Staff of the United States Air Force on August 1, 1973. A West Point graduate, General Brown was a bomb group commander in World War II and has held command assignments in TAC, ADC, MAC, and ATC. He has served as military assistant to both the Secretary and the Deputy Secretary of Defense and as Assistant to the Chairman, JCS. A former Seventh Air Force Commander and Deputy Commander for Air Operations, MACV, General Brown was Commander of Air Force Systems Command prior to his present assignment.

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AIR FORCE MAGAZINE'S ANNUAL ALMANAC ISSUE

DEDICATION

For the first time in more than a decade, this annual Almanac Issue of AIR FORCE Magazine—the twenty-fourth such issue—reports on an Air Force whose people are nowhere engaged in combat. That the United States is at peace is a tribute to the professionalism and dedication of the men and women of the Air Force and to the airmen of our sister services. An honorable termination of US participation in the Vietnam War was achieved largely through the proper use of airpower during the last nine months of that war.

In the past year, the Air Force has made the difficult transition from a decade of war to an era of peace. The challenges of that transition, and of preserving peace in the years ahead, are different from those of war, but in their own way no less demanding.

Today, the Air Force, smaller in numbers than it has been since early 1950, faces an array of Soviet missiles and operational aircraft larger, and in some respects more powerful, than any aerospace force that has existed before in peacetime.

Long-delayed replacement of Air Force equipment with new weapon systems that will be capable of deterring both nuclear and conventional war is made difficult by inflation and by a lack of public interest in defense affairs.

Against these adverse circumstances is balanced a pronounced decline in the anti-military feeling that existed in this country during the latter years of the Vietnam War. And the Air Force, which all evidence indicates has earned the confidence of the American people, is manned by volunteers who are better educated, better trained, more stable in tenure, and with a breadth and depth of combat experience unparalleled at any time in its history.

It is to these men and women of the Air Force, whose professionalism and perseverance are a cornerstone of this nation's future, that the 1974 Almanac Issue is dedicated.

Our faith in their continued devotion to the security of this nation is equaled only by our pride in their past accomplishments.

—THE EDITORS

A MAJOR AIR COMMAND

AEROSPACE DEFENSE COMMAND

The Aerospace Defense Command (ADC), headquartered at Ent AFB, Colo., is future-oriented. It has been in a continuing state of change almost from its beginning more than two decades ago—change to keep pace with an evolving threat.

Continuing modifications in the command's force levels as the Soviet threat shifted from bombers to ballistic missiles, coupled with recent national decisions on the US defense posture, have led to still more change and an altered role for ADC.

Presenting the Fiscal Year 1975 budget proposal to Congress, Secretary of Defense James R. Schlesinger charted a new direction for US air defense forces when he noted that "without an effective antimissile defense, precluded to both the US and USSR by the ABM treaty of 1972, a defense against Soviet bombers is of little practical value."

To implement that position, ADC's mission, as the major component of the North American Air Defense Command (NORAD), will emphasize warning and assessment of a missile attack. A secondary role will be limited bomber defense and control of US sovereign airspace. To carry out those assignments, ADC has more than 35,000 men and women stationed at some 250 locations in the US and throughout the world.

While ADC's mission has been directed away from active air defense and more toward surveillance, control of airspace, and warning of bomber attack, the responsibility for actually defending against a bomber intrusion has not been eliminated.

Today, a mixed force of seven ADC squadrons of F-106 Delta Dart interceptors and twenty squadrons of Air National Guard F-101 Voodoos, F-102 Delta Daggers, and F-106s is available to police and control airspace, as well as to provide the nucleus for a defensive force if one is required.

The fighter-interceptor force will be reduced within the next year to a total of twenty squadrons (six active and fourteen ANG) that will man a thin identification and interception line around the nation's periphery. This realignment of strategic defense priorities has placed an even greater dependence on the ADC/ANG partnership for air defense of the continental US.

ADC's aerospace surveillance and warning capabilities rest primarily on four systems: BMEWS, the Ballistic Missile Early Warning System; an early warning satellite system; a forward-scatter, over-the-horizon detection-and-warning system sited in Europe and Asia; and an eight-radar, submarine-launched missile detection and warning network covering the US coasts. ADC's worldwide Spacetrack net detects and tracks the more than 3,000 earth-orbiting satellites. The thirty-plus units of the Fourteenth Aerospace Force operate Spacetrack and form ADC's global space surveillance network.

The Combat Operations Center and the Space Defense Center, both located in NORAD's Cheyenne Mountain complex near Colorado Springs, Colo., are the nerve centers for this global network of space and ground-based optical and electronic sensors. Although there is no active defense at this time against a ballistic-missile attack, the surveillance and warning functions performed by ADC provide the National Command Authorities and strategic forces time to react to any attack. Surveillance and early warning are significant elements in the deterrent equation and posture of the US.

In an age when flight at twice the speed of sound is taken for granted and supersophisticated satellites orbit the earth, com-

Though ADC's primary mission is warning and assessment of missile attack, its air defense role has not been eliminated.

placency can lead to disaster. That is why ADC looks to the future. There are systems in development that promise to bring global radar coverage to a point not previously realized. Innovations in survivable command-and-control systems are also under development.

The new over-the-horizon, back-scatter radar, with an all-altitude capability to extended ranges, would provide long-range detection of aircraft that far exceeds today's system.

The command-and-control system under study to replace ADC's SAGE centers is one of combined Regional Operations Control Centers (ROCCs) and Airborne Warning and Control System (AWACS) jet aircraft. Four ROCCs are envisioned, encompassing the same area covered by today's six SAGE centers. They would receive inputs from military/FAA joint-use radars and would be adequate in peacetime to accomplish the air-sovereignty mission.

AWACS would provide the vital surveillance and command and control for the wartime mission. Flying in strategic orbits around the periphery of the US in periods of advanced alert, they would supply a command-and-control element that has its own radar detection system, plus a capability to control interceptor aircraft. This survivable airborne radar platform is a natural follow-on for ADC's aging force of prop-driven EC-121 Warning Stars.

A firm decision has not been made on an aircraft to replace ADC's fighter-interceptors, but the F-15 Eagle, being developed as an Air Force air-superiority fighter, could be adapted to the air defense role, as could the Navy's fleet-defense fighter, the F-14 Tomcat.

ADC and its mission have taken a new course, but both are still essential to the fundamental military objective of deterring war. The strategy for protecting the nation places new emphasis on global aerospace surveillance and warning. It is ADC's task to guarantee that our Triad of strategic forces will have time to react and survive any attack.

ADC anticipates that the future will bring the command a new family of modernized systems that will give the nation an improved surveillance and warning capability. Vigilance and excellence will continue to be trademarks of the Aerospace Defense Command. ■

ADC'S LEADERS THROUGH THE YEARS

Lt. Gen. George E. Stratemeyer	Mar. 21, 1946	Nov. 30, 1948
Maj. Gen. Gordon P. Saville	Dec. 1, 1948	Dec. 31, 1950
Lt. Gen. Ennis C. Whitehead	Jan. 1, 1951	Aug. 25, 1951
Gen. Benjamin W. Chidlaw	Aug. 25, 1951	May 31, 1955
Maj. Gen. Frederic H. Smith (acting)	May 31, 1955	July 19, 1955
Gen. Earle E. Partridge	July 20, 1955	Sept. 17, 1956
Lt. Gen. Joseph H. Atkinson	Sept. 17, 1956	Aug. 15, 1961
Lt. Gen. Robert M. Lee	Aug. 15, 1961	July 31, 1963
Lt. Gen. Herbert B. Thatcher	Aug. 1, 1963	July 31, 1967
Lt. Gen. Arthur C. Agan	Aug. 1, 1967	Feb. 28, 1970
Lt. Gen. Thomas K. McGehee	Mar. 1, 1970	July 1, 1973
Gen. Seth J. McKee	July 1, 1973	Oct. 1, 1973
Gen. Lucius D. Clay, Jr.	Oct. 1, 1973	

Formerly Air Defense Command.
Redesignated Aerospace Defense Command Jan. 1, 1968.

Gen. Lucius D. Clay, Jr., took command of ADC in October 1973. He also serves as CINC of NORAD/CONAD. He previously commanded PACAF and, earlier, Seventh Air Force. A WW II bomb group commander, General Clay later served in SAC and TAC in command and staff posts, on the Joint Staff, and as DCS/P&O, Hq. USAF.

AEROSPACE DEFENSE COMMAND

Headquarters, Ent AFB, Colo.

Commander
Gen. Lucius D. Clay, Jr.

14th Aerospace Force
Ent AFB, Colo.
Maj. Gen. James E. Paschall
Commander

Air Defense Weapons Center
Tyndall AFB, Fla.
Brig. Gen. Carl D. Peterson
Commander

20th Air Division
Ft. Lee AFS, Va.
Brig. Gen. James M. Fogle
Commander

21st Air Division
Hancock Field, N. Y.
Maj. Gen. Ray A. Robinson, Jr.
Commander

23d Air Division
Duluth IAP, Minn.
Brig. Gen. Louis G. Leiser
Commander

24th Air Division
Malmstrom AFB, Mont.
Maj. Gen. Lawrence J. Fleming
Commander

25th Air Division
McChord AFB, Wash.
Brig. Gen. (Maj. Gen. selectee)
James A. Young
Commander

26th Air Division
Luke AFB, Ariz.
Brig. Gen. (Maj. Gen. selectee)
Ranald T. Adams, Jr.
Commander

A MAJOR AIR COMMAND

AIR FORCE COMMUNICATIONS SERVICE

The Air Force Communications Service (AFCS) operates and maintains a worldwide system of long-haul and on-base communications, as well as air traffic control and navigational aid facilities and services at most Air Force bases. AFCS also engineers and installs communications - electronics - meteorological systems for the Air Force, Department of Defense, and foreign governments under the Security Assistance Program.

The command's mission includes the installation and maintenance of thousands of miles of communications cable, modernization of Air Force aircraft control towers, and management and installation of large, complex communications-electronics programs. Nearly 1,000 military and civilian engineers perform systems engineering and provide detailed plans to more than 5,000 skilled installation technicians. An annual budget of $87 million, plus an inventory of $56 million in supplies, equipment, and vehicles, is required to support this portion of the AFCS mission.

AFCS's nearly 50,000 people, including more than 40,000 enlisted personnel, 2,500 officers, and nearly 7,000 civilians, serve at more than 500 operating locations in forty-seven states and twenty-five foreign countries and island possessions.

The command's organizations vary from one-man operating locations to a 1,000-man group maintaining the full spectrum of AFCS services at a large Air Force base. AFCS has 5,700 people at seventy-six remote worldwide locations.

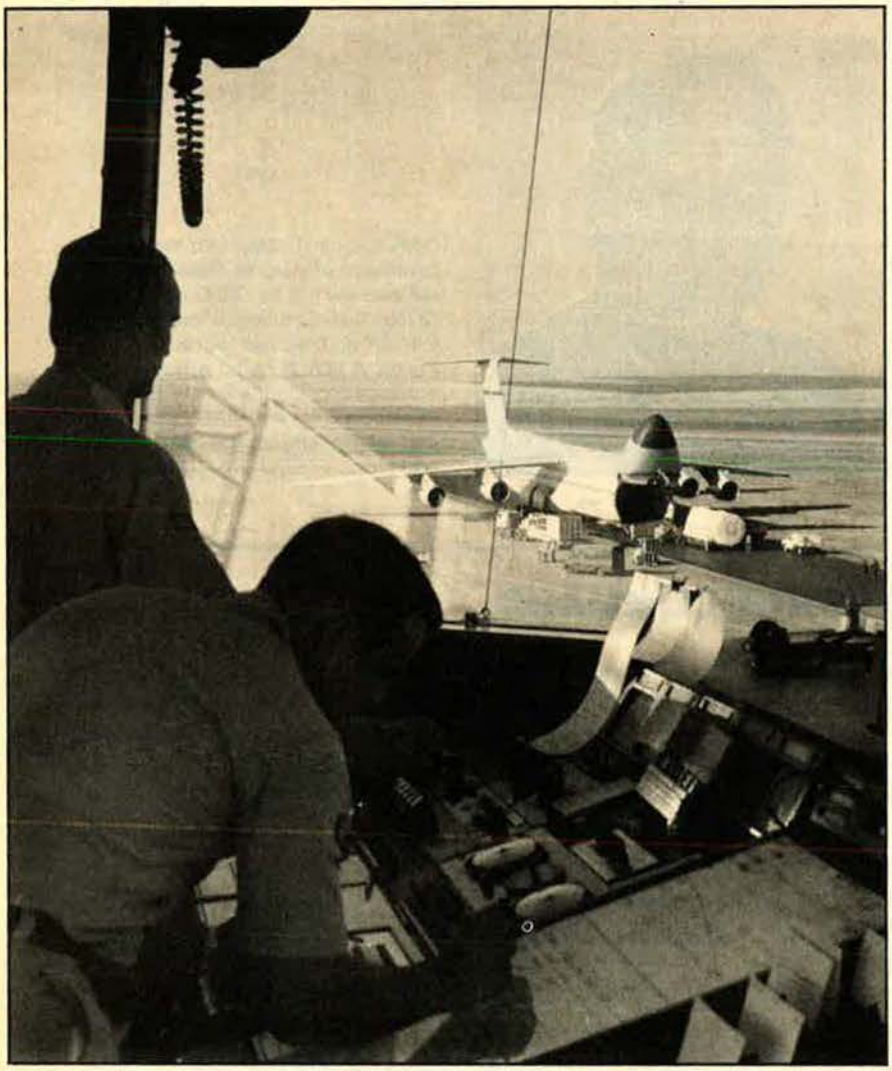
AFCS places great emphasis on noncommissioned officer (NCO) leadership and provides young officers and NCOs command experience early in their careers. More than 100 AFCS detachments are commanded by NCOs. Half of AFCS's unit commanders are captains or below.

AFCS supplements its active-duty force with Air National Guardsmen and Air Force Reservists (ANG/AFR). Included are 142 ANG and thirty-seven AFR units. The 15,000 ANG and Reserve personnel make up approximately thirty percent of the total AFCS strength.

AFCS's ANG/AFR units train with the same equipment and demands they would face on active duty. These forces are tested against actual operational requirements, rather than training exercises. AFCS will continue to rely on its ANG/AFR resources and will increase their utilization in the future.

Two recent major accomplishments in communications-electronics and air traffic control emphasize the importance of AFCS within the Department of Defense.

In 1971, AFCS established a Digital Systems Test Bed to study the applications of all-digital transmissions. "Digital transmissions" offer the most reliable command and control communications for the future. In 1973, this program gained great importance when the Department of Defense decided to apply digital technology in all future sys



One of AFCS's many functions is air traffic control. Its new TPN-19 deployable traffic control radar system brings greatly increased flexibility to control facilities in the field.

tems. The advantages inherent in digital systems will revolutionize future communications systems. They include greater channel capacity, resistance to interference, ease in providing secure transmissions, and increased computer capability to handle digital signals.

The TPN-19 air traffic control radar system is a reliable radar approach facility that can be deployed anywhere in the world. It can be operational within two hours of arrival. This system has demonstrated an improved ability over currently operational precision approach radar (PAR) systems to track aircraft in heavy rains.

The TPN-19 has twenty miles of PAR final approach coverage, allowing simultaneous landing control of six aircraft—each with three miles of separation. Also, airport surveillance radars can be located up to ten miles away from the operations shelter to provide optimum radar coverage.

AFCS uses ten facility-checking aircraft to ensure its navigational aids (NAVAIDS) and air traffic control facilities are providing safe and accurate service. These NAVAIDS include mobile tactical mission support equipment and terminal NAVAIDS that can be transported to any location. The command has five mobile communications groups strategically located around the world. These units, with more than 4,100 highly qualified people, maintain a constant readiness status to travel by air, ground, or sea to meet communications, navigational, and air traffic control requirements.

AFCS maintains instantaneous worldwide communications and air traffic control, permitting Air Force commanders to instantly command and control their globally dispersed forces. A vital member of the aerospace team, AFCS lives by its motto—"Providing the Reins of Command." ■

AFCS'S LEADERS THROUGH THE YEARS

Maj. Gen. Harold W. Grant	July 1, 1961	Feb. 15, 1962
Maj. Gen. Kenneth P. Bergquist	Feb. 16, 1962	June 30, 1965
Maj. Gen. J. Francis Taylor, Jr.	July 1, 1965	Oct. 31, 1965
Maj. Gen. Richard P. Klocko	Nov. 1, 1965	July 2, 1967
Maj. Gen. Robert W. Paulson	July 15, 1967	Aug. 1, 1969
Maj. Gen. Paul R. Stoney	Aug. 1, 1969	Oct. 31, 1973
Maj. Gen. (selectee) Donald L. Werbeck	Nov. 1, 1973	

Maj. Gen. (selectee) Donald L. Werbeck has commanded AFCS since November 1, 1973. Previously, he had served as AFCS Chief of Staff and then Vice Commander. Since WW II combat in Europe, General Werbeck's varied career has extended from satellite recovery to weapons development. He is a command pilot.

AIR FORCE COMMUNICATIONS SERVICE

Headquarters, Richards-Gebaur AFB, Mo.

Commander
Brig. Gen. (Maj. Gen. selectee) Donald L. Werbeck

PACIFIC COMMUNICATIONS AREA
Hq., Wheeler AFB, Hawaii
Brig. Gen. William R. Yost
Commander

1st Mobile Communications Group
Clark AB, Luzon, P. I.

1867th Facility Checking Squadron
(Service Evaluation)
Clark AB, Luzon, P. I.

TACTICAL COMMUNICATIONS AREA
Hq., Langley AFB, Va.
Col. John M. Bolger
Commander

4th Mobile Communications Group
Altus AFB, Okla.

5th Mobile Communications Group
Robins AFB, Ga.

EUROPEAN COMMUNICATIONS AREA
Hq., Lindsey AS, Germany
Brig. Gen. William W. Gilbert
Commander

1868th Facility Checking Squadron
(Service Evaluation)
Wiesbaden AB, Germany

2d Mobile Communications Group
Lindsey AS, Germany

NORTHERN COMMUNICATIONS AREA
Hq., Griffiss AFB, N. Y.
Brig. Gen. Kenneth P. Miles
Commander

1931st Communications Group
Hq., Elmendorf AFB, Alaska
Col. Marvin J. Anderson
Commander

SOUTHERN COMMUNICATIONS AREA
Hq., Oklahoma City AFS, Okla.
Brig. Gen. Rupert H. Burris
Commander

1840th Air Base Wing
Richards-Gebaur AFB, Mo.
Col. Hewitt E. Lovelace
Commander

3d Mobile Communications Group
Tinker AFB, Okla.
Col. Lowell F. Bohn
Commander

1978th Communications Group
Albrook AFB, Canal Zone
Lt. Col. Gerald B. Warton
Commander

1866th Facility Checking Squadron
(Service Evaluation)
Richards-Gebaur AFB, Mo.

A MAJOR AIR COMMAND

AIR FORCE LOGISTICS COMMAND

The best word to describe the Air Force Logistics Command (AFLC) is *support*—support to the Air Force's aerospace weapon systems in the form of procurement, supply, maintenance, and transportation. Support to the USAF combat commands, the Air Force Reserve, the Air National Guard, and the air forces of sixty foreign countries. And, support of national policy.

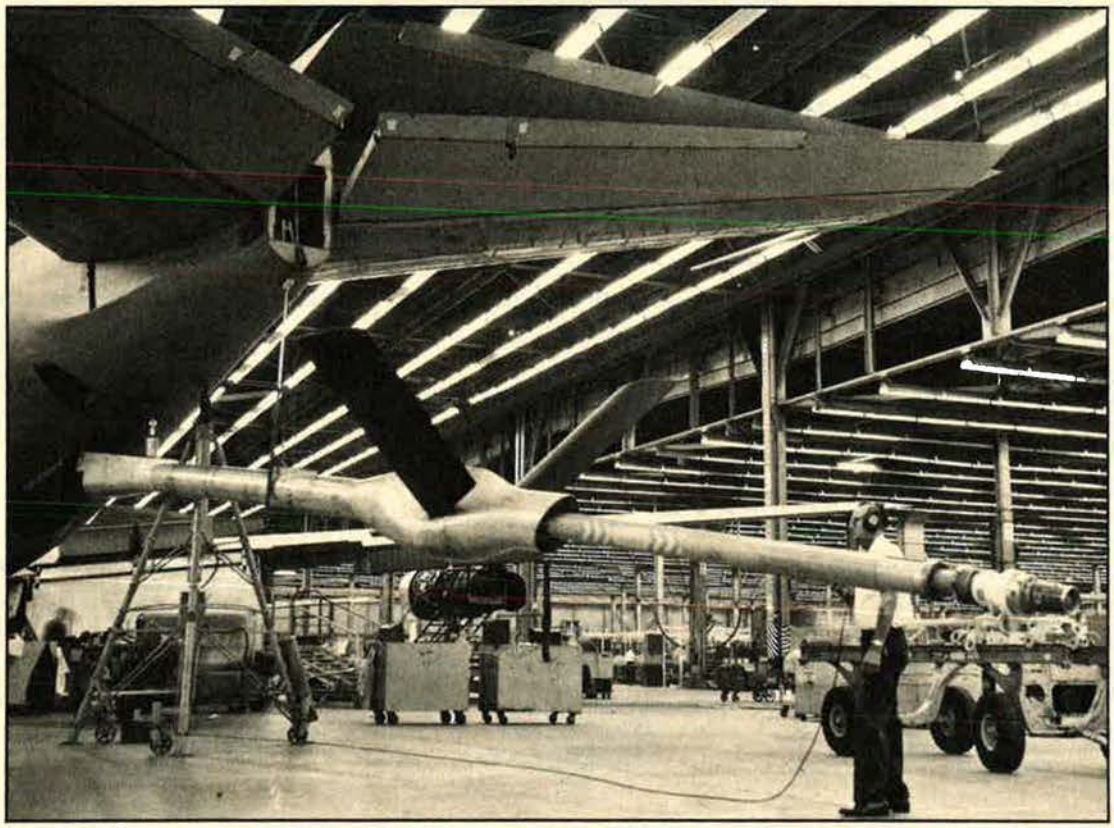
As the "Lifeline of the Aerospace Team," AFLC keeps the US Air Force ready to defend freedom and to support allies at a moment's notice. Thus, AFLC makes it possible for air forces to "fly and fight."

The Israeli resupply airlift of late 1973 was an excellent example of AFLC's effort on a large scale. During the thirty-eight days of airlift to Israel, AFLC helped assemble approximately 11,000 tons of materiel for shipment—all without hampering its worldwide support mission.

Also last year, the first phase of the command's Advanced Logistics System (ALS) went "on-line." Third-generation computers in this system will help provide AFLC with a feasible approach to large-scale management of logistics data. The savings to the Air Force over the next six years are expected to exceed $250 million.

AFLC's 10,000 military and 96,000 civilian personnel work with everything from aircraft rivets to the world's largest aircraft. In the coming years, they will continue to support all air commands to ensure that the commands have the technical support needed to maintain their aircraft, missiles, and equip-

Military Aircraft Storage and Disposition Center, Davis-Monthan AFB, Ariz.



AFLC has five main field organizations, now known as Air Logistics Centers. This KC-135, in overhaul at Warner Robins Air Logistics Center, Robins AFB, Ga., gets a new refueling boom.

ment at top efficiency. For instance, a modification of some B-52s is programmed to give the big bomber short-range missile capability and a new electro-optical viewing system. The latter will enable crews to assess strike target damage and to avoid low-level terrain features day or night.

AFLC's headquarters is at Wright-Patterson AFB, Ohio. Its five main organizations in the field—previously known as Air Materiel Areas—have been redesignated "Air Logistics Centers" to better reflect their increased worldwide logistics responsibilities.

The five centers are located at Robins AFB, Ga.; Kelly AFB, Tex.; Tinker AFB, Okla.; Hill AFB, Utah; and McClellan AFB, Calif. They supply and service particular Air Force weapon systems and are also responsible for assigned equipment and commodities on a global basis. For example, the San Antonio Air Logistics Center at Kelly AFB supports, overhauls, and modifies the C-5 Galaxy, backbone of the airlift fleet.

AFLC also has three specialized organizations. The Aerospace Guidance and Metrology Center at Newark AFS, Ohio, maintains and overhauls all inertial guidance systems used in Air Force aircraft and missiles. The Military Aircraft Storage and Disposition Center at Davis-Monthan AFB, Ariz., is the "boneyard" for all aircraft not currently needed by the Department of Defense and the Coast Guard. The Air Force Contract Maintenance Center, located at Wright-Patterson AFB, Ohio, administers hundreds of millions of dollars in contracts for maintenance work performed by commercial organizations around the world.

AFLC is big business, annually managing assets totaling more than $46 billion. AFLC's importance today is obvious each time an aircraft soars from a runway—AFLC *is* the Lifeline of the Aerospace Team. ■

AFLC'S LEADERS THROUGH THE YEARS

Gen. Joseph T. McNarney	Oct. 14, 1947	Aug. 31, 1949
Lt. Gen. Benjamin W. Chidlaw	Sept. 1, 1949	Aug. 20, 1951
Gen. Edwin W. Rawlings	Aug. 21, 1951	Feb. 28, 1959
Lt. Gen. William F. McKee	Mar. 1, 1959	Mar. 14, 1959
Gen. Samuel E. Anderson	Mar. 15, 1959	July 31, 1961
Gen. William F. McKee	Aug. 1, 1961	June 30, 1962
Gen. Mark E. Bradley, Jr.	July 1, 1962	July 31, 1965
Gen. Kenneth B. Hobson	Aug. 1, 1965	July 31, 1967
Gen. Thomas P. Gerrity	Aug. 1, 1967	Feb. 24, 1968
Lt. Gen. Lewis L. Mundell (acting)	Feb. 24, 1968	Mar. 28, 1968
Gen. Jack G. Merrell	Mar. 29, 1968	Sept. 11, 1972
Gen. Jack J. Catton	Sept. 12, 1972	

Formerly Air Materiel Command.
Redesignated as Air Force Logistics Command Apr. 1, 1961.

Gen. Jack J. Catton has headed AFLC since September 1972. He commanded MAC from 1969–72. General Catton flew the first B-29 across the Pacific in 1944 and took part in the first two Pacific nuclear-weapons tests. A former SAC bomb wing and division commander, General Catton has also commanded Fifteenth Air Force.

AIR FORCE LOGISTICS COMMAND

Headquarters, Wright-Patterson AFB, Ohio

Commander
Gen. Jack J. Catton

Ogden Air Logistics Center
Hill AFB, Utah
Maj. Gen. Bryce Poe II
Commander

Oklahoma City Air Logistics Center
Tinker AFB, Okla.
Brig. Gen. (Maj. Gen. selectee)
James G. Randolph
Commander

Sacramento Air Logistics Center
McClellan AFB, Calif.
Maj. Gen. George W. McLaughlin
Commander

San Antonio Air Logistics Center
Kelly AFB, Tex.
Maj. Gen. William A. Jack
Commander

Warner Robins Air Logistics Center
Robins AFB, Ga.
Maj. Gen. Robert E. Hails
Commander

Air Force Contract Maintenance Center
Wright-Patterson AFB, Ohio
Col. Richard G. Schulz
Commander

Military Aircraft Storage and Disposition Center
Davis-Monthan AFB, Ariz.
Col. Harry L. Gronewald
Commander

Aerospace Guidance and Metrology Center
Newark AFS, Ohio
Col. Albert R. Neville, Jr.
Commander

USAF Medical Center
Wright-Patterson AFB, Ohio
Col. Joseph E. Wesp
Commander

2750th Air Base Wing
Wright-Patterson AFB, Ohio
Brig. Gen. Irby B. Jarvis, Jr.
Commander

A MAJOR AIR COMMAND

AIR FORCE SYSTEMS COMMAND

Air Force Systems Command (AFSC) continues to seek to balance tomorrow's needs with the demands of current systems and to ensure the matching of man and machine. Either in-house or through contract with industry, AFSC accomplishes the research, design, development, test, evaluation, and procurement and production of Air Force missiles, aircraft, and related hardware.

In Fiscal Year 1974, the budget to support the command's programs and installations is $6.4 billion, or approximately twenty-five percent of the total Air Force budget. The command administers contracts having a total obligation of about $50 billion.

From AFSC headquarters at Andrews AFB, Md., Gen. Samuel C. Phillips, Commander, directs the operation of a number of divisions, development and test centers, ranges, and laboratories. The 200 installations operated by AFSC are valued at more than $2 billion. Command personnel strength numbers approximately 10,000 officers, 17,000 airmen, and 29,900 civilians. Ninety-nine percent of Systems Command scientific and technical officers hold college degrees. Fifty-one percent of these hold advanced degrees.

Effective management, as in the past, continues to have high priority in the command. Today, more than ever, the command is seeking ways to improve its management techniques in order to stretch available dollars to cover essential requirements.

In recent years, the command has effectively implemented the "fly-before-buy" concept, as the A-10, Lightweight Fighter, AWACS radar, and B-1 programs have demonstrated. Management procedures initiated to combat rising costs and improve efficiency include:

- An intensive evaluation program designated Project ACE (Acquisition Cost Evaluation). The purpose of the project was to determine reductions in weapon-system acquisition and ownership costs. As a result, a series of problems was identified and recommendations made for their solution.
- A requirements evaluation program under which this command evaluates each Required Operational Capability forwarded to it by prospective using commands and, when appropriate, suggests alternatives to satisfy the requirement at less cost. Part of this program is the Joint Operational and Technical Review, which permits the AFSC commander and the commander of the Air Force Logistics Command to make a joint decision on trade-off proposals after hearing briefings on the need for the development program and its impact on costs and schedule.
- A "Blue-line" reporting system to avoid unnecessary layers of organization between program managers and higher-echelon officials. This system permits program directors to communicate directly with the AFSC Commander, Air Force Chief of Staff, or the Secretary of the Air Force when critical emergencies arise.
- A one-briefing-per-headquarters policy to prevent briefings from becoming a burden. When a program manager comes in from the field, he briefs the commander and all staff personnel simultaneously. Visits to the Pentagon entail a similar procedure.
- A reduction in paperwork by establishing a Procurement Evaluation Panel to improve the quality of Requests for Proposals (RFPs) before they are released. The panels, comprised of members who have no connection with the program in question, but who are familiar with the format and purpose of RFPs, have become known as "Murder Boards." These management and procurement experts from the product divisions of Hq. AFSC scrutinize each major RFP quickly but thoroughly between the time it is completed by the Program Office and the time it is sent out. They examine stated requirements with a very critical eye on essentiality and cost, and their experience and objectivity are helpful in correcting deficiencies.

During the past year, and into the early part of 1974, the command recorded a number of major milestones. Among them:

The final C-5A aircraft was delivered to MAC; the T-43 airborne navigational trainer was turned over to ATC; the F-15 received full production go-ahead and flew more than 1,200 test hours; the X-24B made its first powered flight; the B-1 strategic bomber was mated with its wings; General Dynamics YF-16 and Northrop YF-17 Lightweight Fighter prototypes were rolled out and the YF-16 has now flown; the 500th SRAM missile was delivered to SAC; the Boeing and Teledyne Ryan Compass Cope RPVs were rolled out; first Boeing 747 aircraft was accepted for the Advanced Airborne Command Post Program; Fairchild Industries' close-air-support A-10 aircraft was approved for full-scale development; the AN/TPN-19 air-traffic-control radar went into full-scale development; the Simulator for Electronic Warfare Training (SEWT) was turned over to ATC; construction of the Trestle electromagnetic pulse (EMP) simulator started; GAU-8/A-10 compatibility test firing was conducted; A-10/A-7D close-air-support evaluation was initiated.

In our laboratories, a day-to-day research and development program continues to advance our weapon-systems technology and at the same time improve the operational environment for man. Significant advances made in the past year include: a new tilt-back cockpit seat that will help pilots to perform better under high G-forces; a new technique to more accurately measure the burn rate of solid rocket propellants; continued, successful "fly-by-wire" electronic flight-control system testing; conversion of the F-102 into PQM-102A target drones for test and evaluation of present and future aircraft air-to-air armament systems; utilization of Remotely Piloted Vehicles (RPVs) as data links; development of a

portable infrared analyzer that can detect contaminated oxygen in an aircraft.

Ahead in the coming months:

Roll-out and first flight of the B-1, turnover of the first operational F-15 to TAC, delivery of the 1,000th SRAM missile to SAC, and delivery and first flight of the first DT&E A-10.

AFSC has also directed its efforts to find solutions to the nation's energy and ecology problems. The largest US magnetohydrodynamics (MHD) generator is being used in research to improve efficiency in coal-burning power plants. At the same time, a new filter is being tested in a city sewer treatment facility to determine how well it cleans water discharged from the facility.

AFSC planners, scientists, and engineers are aware that they must look at least twenty years ahead to keep abreast and survive in a swiftly changing world of technology. These innovations take them into some different technical domains, all intended to lead the way into new and imaginative technologies for future aerospace systems. ■

AFSC'S LEADERS THROUGH THE YEARS

Maj. Gen. David M. Schlatter	Feb. 1, 1950	June 24, 1951
Lt. Gen. Earle E. Partridge	June 24, 1951	June 20, 1953
Lt. Gen. Donald L. Putt	June 30, 1953	Apr. 14, 1954
Lt. Gen. Thomas S. Power	Apr. 15, 1954	June 30, 1957
Maj. Gen. John W. Sessums, Jr.	July 1, 1957	July 31, 1957
Lt. Gen. Samuel E. Anderson	Aug. 1, 1957	Mar. 9, 1959
Maj. Gen. John W. Sessums, Jr.	Mar. 10, 1959	Apr. 24, 1959
Gen. Bernard A. Schriever	Apr. 25, 1959	Aug. 31, 1966
Gen. James Ferguson	Sept. 1, 1966	Aug. 30, 1970
Gen. George S. Brown	Sept. 1, 1970	July 31, 1973
Gen. Samuel C. Phillips	Aug. 1, 1973	

Formerly Air Research and Development Command (ARDC).
Redesignated as Air Force Systems Command Apr. 1, 1961.

Gen. Samuel C. Phillips has been Commander, AFSC, since August 1973. His previous post was as Director, NSA/Chief, Central Security Service. General Phillips has also headed SAMSO and served as Apollo Program Director, 1964–69. He was a fighter pilot in Europe during WW II.

AIR FORCE SYSTEMS COMMAND

Headquarters, Andrews AFB, Md.

Commander
Gen. Samuel C. Phillips

Aeronautical Systems Division
Wright-Patterson AFB, Ohio
Lt. Gen. James T. Stewart
Commander

Electronic Systems Division
L. G. Hanscom Field, Mass.
Maj. Gen. Benjamin N. Bellis
Commander

Space and Missile Systems Organization
Los Angeles AFS, Calif.
Lt. Gen. Kenneth W. Schultz
Commander

Aerospace Medical Division
Brooks AFB, Tex.
Brig. Gen. (Maj. Gen. selectee) George E. Schafer
Commander

Air Force Flight Test Center
Edwards AFB, Calif.
Brig. Gen. Robert A. Rushworth
Commander

Air Force Contract Management Division
Kirtland AFB, N. M.
Maj. Gen. Donald G. Nunn
Commander

Space and Missile Test Center
Vandenberg AFB, Calif.
Maj. Gen. Herbert A. Lyon
Commander

Foreign Technology Division
Wright-Patterson AFB, Ohio
Col. George R. Weinbrenner
Commander

Air Force Eastern Test Range
Patrick AFB, Fla.
Maj. Gen. Kenneth R. Chapman
Commander

Arnold Engineering Development Center
Arnold AFS, Tenn.
Col. Webster L. English, Jr.
Commander

Armament Development and Test Center
Eglin AFB, Fla.
Maj. Gen. Henry B. Kucheman, Jr.
Commander

Air Force Civil Engineering Center
Tyndall AFB, Fla.
Col. William E. Rains
Commander

Air Force Special Weapons Center
Kirtland AFB, N. M.
Maj. Gen. Thomas W. Morgan
Commander

A MAJOR AIR COMMAND

AIR TRAINING COMMAND

Recruiting, basic military training, technical training, and flying training remain as the fourfold primary mission of Air Training Command (ATC), headquartered at Randolph AFB, Tex.

ATC's vital role is evidenced by its billion-dollar-plus budget in an era of monetary austerity. Its assets are valued at more than $2.8 billion. ATC operates fifteen bases located in nine states (Laredo AFB, Tex., was closed during 1973) and more than seventy field training detachments deployed throughout the world.

With a military and civilian population of 118,000, an inventory of more than 1,900 aircraft—including 767 T-37s, 903 T-38s, and 131 T-41s—and more than a million programmed flying hours annually, ATC trains all new Air Force pilots and navigators and is single manager for all Air Force survival training. The command's cumulative flying accident rate of 1.3 per 1,000 flying hours at the end of the year was one of the lowest in the Air Force.

Undergraduate pilot training at eight ATC bases produced about 3,000 pilots last year. The flight screening program, using the prop-driven Cessna T-41, was consolidated at Hondo, Tex., Municipal Airport last May to screen prospective pilots prior to starting jet flying training in the T-37.

Undergraduate navigator training at Mather AFB, Calif., produced approximately 1,400 navigators in 1973. Five T-43s, a medium-range jet navigation trainer, were delivered there last year. A fleet of nineteen T-43s will replace most of the twenty-two-year-old, prop-driven T-29s.

Education has accelerated in importance and scope since the Community College of the Air Force (CCAF) was established at Randolph AFB in April 1972. All of ATC's major Air Force technical training schools have been accredited by the Southern Association of Colleges and Schools (SACS) or the North Central Association of Colleges and Secondary Schools. CCAF itself was fully accredited by SACS on December 12, 1973.

The US Air Force Recruiting Service, an ATC staff agency, met or exceeded its goals in all personnel procurement programs during 1973.

Efforts to update and modernize teaching methodology and technology continued throughout ATC, with the principles of Instructional System Development being applied to well over 100 of the command's resident courses. Computer-assisted instruction featuring self-paced, individualized instruction was further developed, and computer-assisted simulation training is also under development.

During FY '73, more than $30 million in Security Assistance Training was provided to 4,947 foreign military students.

Steady progress was made in the planning, design, and evaluation of the maintenance and avionics training required to support the F-15 Eagle fighter and the developing B-1 bomber.

ATC continued its support of the Interservice Training Review Program, which has avoided costs of more than $300,000 by consolidating training courses.

The ATC NCO Academy was dedicated at Lackland AFB, Tex., on November 14, 1973.

ATC recognizes and meets the many challenging human concerns through its people-oriented programs. For those Air Force members who have had difficulties adjusting to military life, or who have been convicted for various infractions of the law, ATC operates special facilities at Lowry AFB, Colo., to rehabilitate and retrain those who are recommended for another try at succeeding in military society. ■

ATC'S LEADERS THROUGH THE YEARS

Lt. Gen. John K. Cannon	Apr. 15, 1946	Oct. 15, 1948
Lt. Gen. Robert W. Harper	Oct. 14, 1948	June 30, 1954
Maj. Gen. Glenn O. Barcus	July 1, 1954	July 25, 1954
Lt. Gen. Charles T. Myers	July 26, 1954	July 31, 1958
Lt. Gen. Frederic H. Smith, Jr.	Aug. 1, 1958	July 31, 1959
Lt. Gen. James E. Briggs	Aug. 1, 1959	July 31, 1963
Lt. Gen. Robert W. Burns	Aug. 1, 1963	Aug. 10, 1964
Lt. Gen. William W. Momyer	Aug. 11, 1964	June 30, 1966
Lt. Gen. Sam Maddux, Jr.	July 1, 1966	Aug. 30, 1970
Lt. Gen. George B. Simler	Sept. 1, 1970	Sept. 9, 1972
Lt. Gen. William V. McBride	Sept. 9, 1972	

Lt. Gen. William V. McBride has been ATC chief since September, 1972. Previously, he was Vice CINC, USAFE. A triple-rated officer, he was a WW II navigator-bombardier. He has held many MAC posts, including Chief of Staff. A National War College graduate, General McBride has been Military Assistant to the Secretary of the Air Force.

USAF RECRUITING SERVICE

The mission of the US Air Force Recruiting Service is to recruit, classify, and assign from civilian sources qualified young men and women to meet the manpower requirements of today's all-volunteer aerospace force. Emphasis is on persons with no prior military service—intelligent young people who can be trained to handle the complex duties demanded by a modern Air Force.

During 1973, Recruiting Service met or exceeded all recruiting goals, enlisting some 80,000 non-prior service personnel without lowering quality standards. In the first half of FY '74, ninety-three

percent of all recruits were high school graduates, and more than forty-five percent were classified in the top two DoD mental categories.

Another 2,203 college graduates enlisted for officer training, and 536 registered nurses were commissioned as officers.

Late in 1973, Air Force Recruiting Service acquired new responsibilities in three areas of recruiting —minority officers, health professionals, and women.

Seven Minority Officer Recruiting Teams were assigned to the recruiting groups across the nation, concentrating on recruiting minority college graduates in an effort to raise minority officer strength to 5.6 percent by 1980.

Twenty-three Medical Recruiting Teams were established and assigned to areas with a high density of medical schools.

On January 1, 1973, all noncombat career fields were opened to women and the classification of women into more technical areas was expanded.

The Air Force ended 1973 with more than 20,000 women on active duty and expects to increase this to 48,000 by 1978.

Recruiting Service, an ATC staff agency with headquarters at Randolph AFB, Tex., is made up of 3,700 people, both military and civilians. It is commanded by Brig. Gen. Conrad S. Allman. ■

AIR TRAINING COMMAND

Headquarters, Randolph AFB, Tex.

Commander
Lt. Gen. William V. McBride

Technical Training Center
Chanute AFB, Ill.

Training: Aircraft maintenance; missile; aircraft specialists; weapons systems support; weather.

Technical Training Center
Keesler AFB, Miss.

Training: Electronic principles; communications systems; communications and electronics officer; ground electronics; personnel and administration; avionics; computer systems.

Technical Training Center
Lowry AFB, Colo.

Training: Aerospace photography; logistics; avionics; aerospace munitions; special instruments; air intelligence.

3320th Retraining Group

3415th Special Training Group

Technical Training Center
Sheppard AFB, Tex.

Training: Aircraft maintenance; civil engineering; comptroller; communications/missiles; transportation; field training.

USAF School of Health Care Sciences

Air Force Military Training Center
Lackland AFB, Tex.

Training: Marksmanship; security police/law enforcement; cryptographic; recruiter and instructor; social actions.

Basic Military Training School

3700th Occupational Measurement Squadron

Undergraduate Pilot Training

Columbus AFB, Miss.
(14th Flying Training Wing)

Craig AFB, Ala.
(29th FTW)

Laughlin AFB, Tex.
(47th FTW)

Moody AFB, Ga.
(38th FTW)

Reese AFB, Tex.
(64th FTW)

Vance AFB, Okla.
(71st FTW)

Webb AFB, Tex.
(78th FTW)

Williams AFB, Ariz.
(82 d FTW)

Sheppard AFB, Tex.*
(80th FTW)

Navigator Training
Mather AFB, Calif.
(323d FTW)

Training: Undergraduate; advanced; electronic warfare.

12th Flying Training Wing
Randolph AFB, Tex.

Pilot Instructor Training Learning Center; USAF Instrument Flight Center.

3253d Flying Training Squadron*
US Air Force Academy, Colo.

Community College of the Air Force
Randolph AFB, Tex.

Officer Training School
Lackland AFB, Tex.

3636th Combat Crew Training Wing*
(Survival)

Fairchild AFB, Wash.*
(Albrook AFB, C. Z.)*
(Clark AB, Philippines)*
(Eielson AFB, Alaska)*
(Homestead AFB, Fla.)*

USAF Recruiting Service
Randolph AFB, Tex.

3500th Recruiting Operations Group

Recruiting Groups:
3501-Hanscom AFB, Mass.
3502-McGuire AFB, N. J.
3503-Robins AFB, Ga.
3504-Lackland AFB, Tex.
3505-Chanute AFB, Ill.
3506-Mather AFB, Calif.
3507-Lowry AFB, Colo.

Armed Forces Vocational Testing Group

*Tenants

A MAJOR AIR COMMAND

AIR UNIVERSITY

At the close of World War II, the Air Force recognized that continuing professional education would be as important to its future growth and effectiveness as its inventory of weapons. In 1946, Air Force planners established a professional education center and called it Air University (AU).

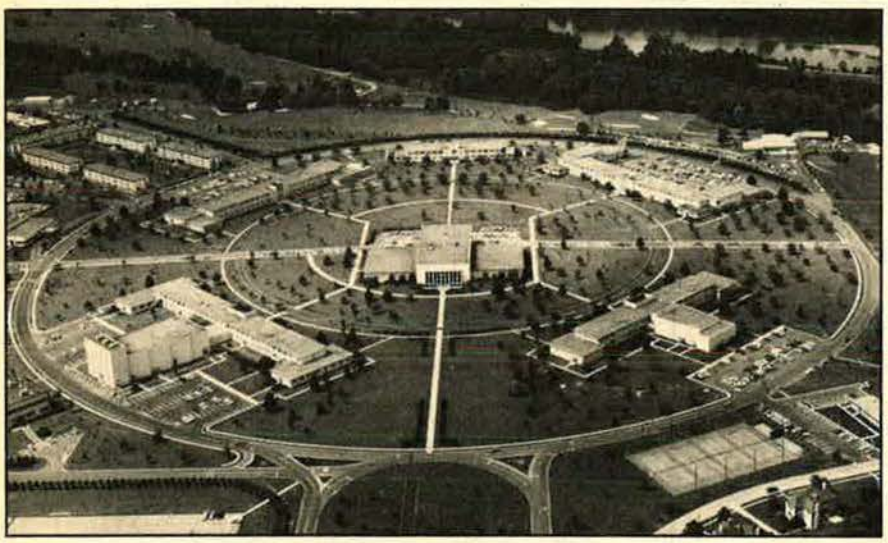
Today, Air University and its vast educational facilities stand as visible evidence of sound and practical planning by USAF educational pioneers like Gen. Muir S. Fairchild, AU's first commander, whose educational philosophy and concepts have guided Air University's growth over the past quarter century.

Lt. Gen. F. Michael Rogers, a long-time proponent of professional education, now commands AU. Its headquarters and most of its major activities are located near Montgomery, Ala., at Maxwell AFB, an installation rich in aerospace history.

AU's academic system encompasses four professional military education (PME) schools. Air War College, for senior officers; Air Command and Staff College for mid-career officers; and Squadron Officer School for junior officers are all located on the Academic Circle at Maxwell. The fourth PME, the USAF Senior Non-Commissioned Officer Academy, joined the AU system in 1972 and is located across town, at Gunter AFS.

The PME schools provide the continued professional education essential to progressively more responsible positions in both the enlisted and officer corps. These schools have graduated nearly 75,000 officers and a growing number of senior NCOs.

The Air University's specialized schools meet specific USAF educational requirements. The AU Institute for Professional Development operates personnel management, comptroller, judge advocate, chaplain, and electronic warfare



The Academic Circle at Maxwell AFB, Ala., is the hub of the Air University's comprehensive system of professional military education.

The Learning Center of the Academic Instructor Course, Academic Instructor and Allied Officer School, makes use of the latest educational technology.

courses, along with a seminar for USAF commanders.

Academic Instructor and Allied Officer School serves in two principal capacities. It conducts the USAF teachers' college for instructor personnel and prepares allied officers for attendance at USAF schools.

The Extension Course Institute administers approximately 375 courses in specialized and career development fields of learning. Enrolling some 300,000 students annually, the Institute has handled more than six million enrollments.

USAF requirements in scientific, technological, managerial, and other designated professional areas are met through the Air Force Institute of Technology, located on AU's northern campus at Wright-Patterson AFB, Ohio.

With its headquarters at Maxwell, Air Force ROTC, a major source of new USAF second lieutenants, operates detachments at colleges throughout the US and Puerto Rico. The Junior AFROTC program, started in 1966, is conducted at 275 high schools throughout the nation and in Europe and on Guam.

Supporting the academic complex is the Air University Library, with its vast resources that include bibliographic, documentary, and circulating facilities.

Throughout its existence, Air University has remained responsive to the changing pattern of Air Force educational requirements. For example, curricula at all PME schools now include some exposure to computer technology and contemporary problems. Flexibility and responsiveness were demonstrated during the past year, when Air University provided a Professional Update Program for the repatriated Vietnam prisoners of war. Although designed to bring the men abreast of developments within their profession, the two-week course also covered such areas as changed social, cultural, economic, and political conditions in this country.

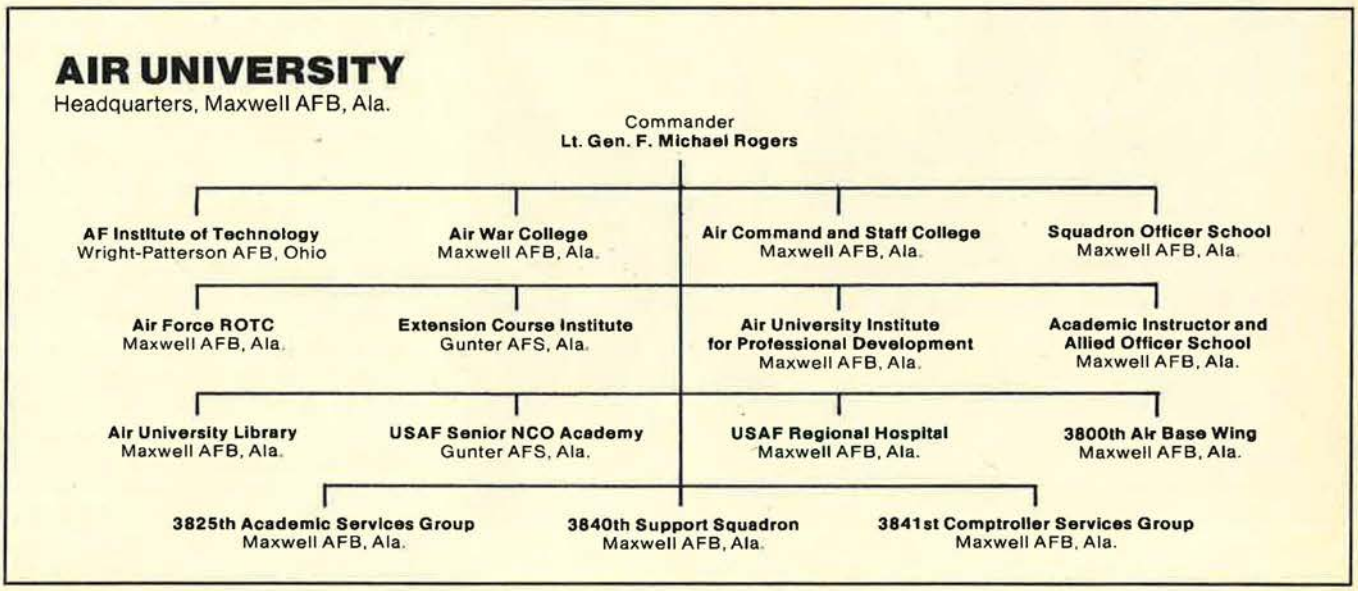
Facing the growing need to permit greater numbers of junior officers to attend the Squadron Officer School, that program has been redesigned to offer the course four times annually, with a reduction in class length from fourteen to eleven weeks. Nearly eighty-five percent of eligible junior officers will now be able to attend.

Air University will continue to provide an intellectual system to further enrich Air Force professionals. Aptly phrasing the command's progressive educational concept is its motto: *Proficimus More Irretenti* —"We Progress Unhindered by Tradition." ■

AU'S LEADERS THROUGH THE YEARS

Maj. Gen. Muir S. Fairchild	Mar. 15, 1946	May 17, 1948
Maj. Gen. Robert W. Harper	May 17, 1948	Oct. 15, 1948
Gen. George C. Kenney	Oct. 16, 1948	July 27, 1951
Lt. Gen. Idwal H. Edwards	July 28, 1951	Feb. 28, 1953
Lt. Gen. Laurence S. Kuter	Apr. 15, 1953	May 31, 1955
Lt. Gen. Dean C. Strother	June 1, 1955	June 30, 1958
Lt. Gen. Walter E. Todd	July 15, 1958	July 31, 1961
Lt. Gen. Troup Miller, Jr.	Aug. 1, 1961	Dec. 31, 1963
Lt. Gen. Ralph P. Swofford, Jr.	Jan. 1, 1964	July 31, 1965
Lt. Gen. John W. Carpenter III	Aug. 1, 1965	July 31, 1968
Lt. Gen. Albert P. Clark	Aug. 1, 1968	July 31, 1970
Lt. Gen. Alvan C. Gillem II	Aug. 1, 1970	Oct. 31, 1973
Lt. Gen. F. Michael Rogers	Nov. 1, 1973	

Lt. Gen. F. Michael Rogers became AU Commander on November 1, 1973, after serving as ATC Vice Commander. General Rogers has had a long career in intelligence and R&D, including development planning for the B-1, F-111, F-15, and C-5. A graduate of the National War College, he downed twelve enemy planes as a fighter pilot in WW II.



A MAJOR AIR COMMAND

ALASKAN AIR COMMAND

The Alaskan Air Command (AAC), one of the oldest of the United States Air Force's major air commands, is the air component of the unified Alaskan Command.

AAC plans, coordinates, conducts, and controls defensive and offensive air operations according to the tasks assigned by the Commander in Chief, Alaska (CINCAL). AAC is responsible to CINCAL for the defense of North America against aerospace attack and for providing tactical forces for employment within the CINCAL area of responsibility. When directed by CINCAL, the AAC commander will place those combat units having an air defense capability under the operational control of the commander of the Alaskan NORAD/CONAD Region.

Ski-equipped C-130s of AAC's 17th Tactical Airlift Squadron provide logistic support to Distant Early Warning radar sites on the Greenland ice cap.

An HH-3 helicopter of the 5040th Helicopter Squadron moves Army troops from Eielson AFB to the front lines in a recent winter exercise.

The command, under the direction of Maj. Gen. Jack K. Gamble, operates three air bases and fourteen stations throughout the state.

In addition, the command provides logistics, administrative, and services support to more than 15,000 military and Civil Service personnel in the area of its command, approximately 3,500 of whom are with tenant units assigned to other commands or Defense Department agencies.

Operating the command's main aerial arm is the responsibility of the 21st Composite Wing at Elmendorf AFB. The wing is comprised of four flying and nine support squadrons and an air base group. The flying squadrons are the 17th Tactical Airlift Squadron, equipped with C-130s; the 43d Tactical Fighter Squadron, with F-4E Phantoms; the 5040th Helicopter Squadron, with HH-3 helicopters; and the 5041st Tactical Operations Squadron, with T-33s, C-118s, EB-57s, C-124s, and a T-39.

The 5010th Combat Support Group at Eielson AFB is the only other unit in the command with aircraft assigned. The group's 25th Tactical Airlift Support Squadron is equipped with O-2s. Eielson's main tenant unit is SAC's 6th Strategic Wing, equipped with KC-135 Stratotankers.

The 5073d Air Base Squadron is the host unit for the smallest of the Alaskan Air Command installations with air base status—Shemya AFB. Tenant units include a surveillance squadron, communications squadron, security squadron, and a detachment of the 6th Strategic Wing.

To meet its air defense needs,

the command supports a network of thirteen aircraft control and warning squadrons and two air base squadrons in Alaska. These units are responsible for providing defense information to the Alaska NORAD Region and the North American Air Defense Command.

In the coming year, the command will upgrade some of its remote installations by replacing World War II-type buildings with new facilities.

The command is directly involved in several joint-service training exercises that take place in the state each year. These exercises employ mass airlifts of troops and equipment, daily resupply, and tactical air support of troops in the field.

EMBER DAWN V, in August 1973, was the first exercise in recent years in Alaska to have a completely separate aggressor air force. The exercise also marked the first time that airmobile troops have been used in the state in an infantry-delaying action. Participating in the exercise were units from the US Readiness Command; Alaskan Air Command; Canadian Mobile Command; and Air Force Reserve and Air National Guard units from Ohio, Mississippi, New York, New Mexico, North Carolina, Oklahoma, Tennessee, Texas, Virginia, and Washington.

In 1973, the command's Rescue Coordination Center directed Air Force, Army, Air National Guard, and Civil Air Patrol aircraft to the rescue of 420 military and civilians in the forty-ninth state. The Center was responsible for saving 152 lives through coordinating 2,574 emergency evacuation and search and rescue sorties. The total number of lives saved in Alaska since the Center began operations now stands at 2,682.

Its mission makes the Alaskan Air Command one of the most unusual in the Air Force. Whether it be saving a native Alaskan life with a command helicopter or the resupply of communications relay stations on the Greenland ice cap, the men of the command stand ready to provide "Top Cover for America." ■

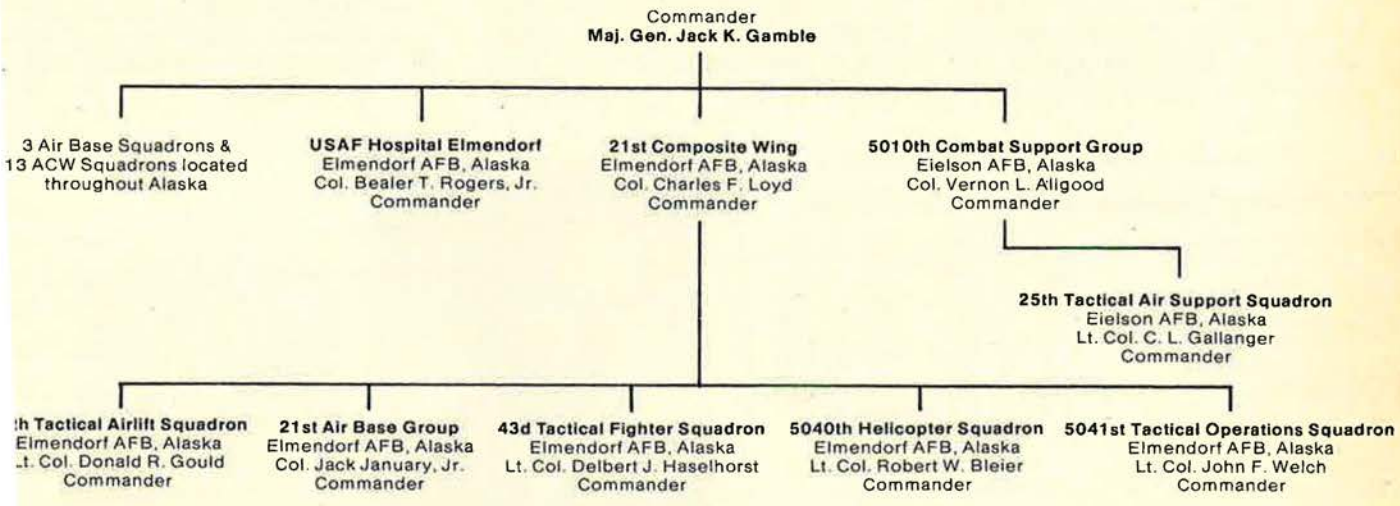
AAC'S LEADERS THROUGH THE YEARS

Brig. Gen. Edmund C. Lynch	Dec. 21, 1945	Oct. 1, 1946
Brig. Gen. Joseph H. Atkinson	Oct. 1, 1946	Feb. 26, 1949
Brig. Gen. Frank A. Armstrong, Jr.	Feb. 26, 1949	Dec. 27, 1950
Maj. Gen. William D. Old	Dec. 27, 1950	Oct. 14, 1952
Brig. Gen. W. R. Agee	Oct. 14, 1952	Feb. 26, 1953
Maj. Gen. George R. Acheson	Feb. 26, 1953	Feb. 1, 1956
Lt. Gen. Joseph H. Atkinson	Feb. 24, 1956	July 16, 1956
Maj. Gen. Frank A. Armstrong, Jr.	July 17, 1956	Oct. 24, 1956
Maj. Gen. James H. Davies	Oct. 24, 1956	June 27, 1957
Maj. Gen. Frank A. Armstrong, Jr.	June 27, 1957	Aug. 19, 1957
Brig. Gen. Kenneth H. Gibson	Aug. 19, 1957	Aug. 14, 1958
Maj. Gen. C. F. Necrason	Aug. 14, 1958	July 26, 1961
Maj. Gen. Wendell W. Bowman	July 26, 1961	Aug. 15, 1963
Maj. Gen. James C. Jensen	Aug. 15, 1963	Nov. 14, 1966
Maj. Gen. Thomas E. Moore	Nov. 14, 1966	July 31, 1969
Maj. Gen. Joseph A. Cunningham	July 31, 1969	Aug. 1, 1972
Maj. Gen. Donavon F. Smith	Aug. 1, 1972	June 6, 1973
Maj. Gen. Charles W. Carson, Jr.	June 18, 1973	Mar. 3, 1974
Maj. Gen. Jack K. Gamble	Mar. 18, 1974	

Maj. Gen. Jack K. Gamble took command of AAC in March 1974. He previously commanded the 25th NORAD/CONAD Region and the 25th Air Division. General Gamble has extensive experience in tactical and air defense fighter operations. A command pilot, he flew night fighters during WW II in Europe.

ALASKAN AIR COMMAND

Headquarters, Elmendorf AFB, Alaska



A MAJOR AIR COMMAND

HEADQUARTERS COMMAND

Headquarters Command, USAF (HQ COMD USAF), supports certain Air Force personnel in the Washington area, in designated separate operating agencies, joint and unified commands, international activities, and other government agencies here and abroad.

In carrying out its worldwide responsibilities, the command's approximately 25,000 people, nearly one-third of them overseas, are assigned to more than 800 locations. Collectively, they represent the greatest variety of job specialties in the Air Force.

Organizationally, units of HQ COMD USAF are categorized as either "operational" or "special-activities" units.

Among the former are the 1100th Air Base Wing and 1st Composite Wing, which operate and maintain Bolling AFB, Washington, D. C., and Andrews AFB, Md., respectively. These units provide much of the support required by Headquarters USAF and Air Force personnel assigned to other agencies in Washington and the surrounding area. They also provide limited base-level support to people assigned to special-activities units.

Other operational units of the command include the USAF Postal and Courier Service, located in Virginia; Civil Air Patrol-USAF at Maxwell AFB, Ala.; and the Malcolm Grow USAF Medical Center at Andrews AFB.

HQ COMD USAF special-activities units provide administrative and limited logistical support for Air Force people on duty with joint and unified commands, international activities, and other specified government agencies around the world. Some are Supreme Headquarters Allied Powers Europe, NATO, Pacific Command, US Readiness Command, FAA, and NASA.

The complexities of functions required to fulfill the HQ COMD USAF mission are many and varied. To cite a few examples, the 1st Composite Wing hosts more than 8,000 distinguished visitors from around the world who arrive at Andrews AFB each year. The wing also provides administrative airlift for USAF headquarters and other personnel designated by the Air Force Chief of Staff. It operates a national airborne command post for the Joint Chiefs of Staff and a quick-response airlift emergency evacuation capability in the Washington area.

The wing hosts more than twenty Air Force, Navy, and Marine Corps tenant organizations.

The Malcolm Grow USAF Medical Center serves the medical needs of the Air Force in this area. With clinics at both Bolling AFB and the Pentagon, the Center provides a full range of medical service to military personnel and dependents. It is also one of the major instructional hospitals in the Air Force, conducting both residency and internship programs.

The USAF Postal and Courier Service is responsible to the command for the operation of post offices and courier stations around the globe. Its personnel operate some 490 functional activities that provide services to military personnel in sixty-two countries.

The Civil Air Patrol (CAP), the all-volunteer civilian auxiliary of the Air Force, consists of eight geographical regions, fifty-two wings, and a membership of more than 60,000. CAP pilots, operating under the supervision of Aerospace Rescue and Recovery Service (ARRS), have flown more than 155,000 rescue sorties, saved more than 1,250 lives, and assisted some 16,000 Americans threatened by danger during natural disasters. CAP also operates a comprehensive aerospace education and youth motivation program for its 25,000 teenage cadet members.

The 1139th Comptroller Services Squadron at Bolling AFB provides major command and base-level data automation, accounting and finance, and graphic-arts support for Air Force people in the Washington area.

The central agency in the local area for ordering commercial supplies and services for the Air Force is the 1138th Procurement Squadron at Andrews AFB.

Perhaps the command functions most visible to the public are those performed by two other Bolling AFB units: The USAF Band serves as the Air Force musical goodwill ambassador around the world, and the USAF Honor Guard is the official USAF representative at public ceremonial events.

The HQ COMD USAF NCO Academy is diversified in much the same way as the command. It provides professional military education to all command NCOs, including those performing duties with such other agencies as NATO and the Air Reserve. The diverse backgrounds of the students add an important dimension to the professional military education gained at this Academy.

HQ COMD USAF, one of the most complex organizations in the Air Force, is commanded by Maj. Gen. M. R. Reilly. ■

HQ COMD USAF LEADERS THROUGH THE YEARS

Brig. Gen. Burton M. Hovey	Jan. 3, 1946	Dec. 13, 1948
Brig. Gen. Sydney D. Grubbs	Dec. 14, 1948	Oct. 1, 1950
Brig. Gen. Morris J. Lee	Oct. 2, 1950	June 13, 1952
Brig. Gen. Stoyte O. Ross	June 14, 1952	July 4, 1956
Maj. Gen. Reuben C. Hood, Jr.	Aug. 1, 1956	June 30, 1959
Maj. Gen. Brooke A. Allen	Aug. 3, 1959	Dec. 31, 1965
Maj. Gen. Rollen H. Anthis	Jan. 10, 1966	Nov. 30, 1967
Maj. Gen. Milton B. Adams	Dec. 1, 1967	June 30, 1968
Maj. Gen. Nils O. Ohman	July 5, 1968	Apr. 30, 1972
Maj. Gen. John L. Locke	May 1, 1972	Feb. 25, 1974
Maj. Gen. M. R. Reilly	Feb. 26, 1974	

Formerly Bolling Field Command.
Redesignated as Headquarters Command, USAF, Mar. 17, 1948.

Maj. Gen. M. R. Reilly has commanded Headquarters Command, USAF, since February 1974. Previously, he was Director of Civil Engineering, Hq. USAF. A graduate of the Air Command and Staff College and the Air War College, General Reilly flew B-24s and B-29s in the Pacific in WW II.

A MAJOR AIR COMMAND

MILITARY AIRLIFT COMMAND

A large part of the world was touched by the operations of Military Airlift Command (MAC) during 1973.

From the return of former American prisoners of war through the airlift resupply of Israel, the men and women of MAC flew missions into many countries, including Russia and China, to gain the admiration and respect of millions.

Beyond its primary responsibility for providing the nation's strategic airlift, MAC is assigned several other missions: aeromedical evacuation; aerial search, rescue, and recovery; weather sampling, forecasting, and dissemination; training aircrew and special ground personnel for all transport units; providing air transportation for top government officials, including the President; documentary photography and audiovisual service; and contracting commercial airlift as executive agent for the Department of Defense. All but the last named are conducted by MAC's Technical Services and specialized wings.

The command is assigned some 70,000 people, including 8,945 officers, 45,862 airmen, and 15,758 civilians.

During January, the cease-fire agreement went into effect in Vietnam, and a continuing flow of MAC C-5 Galaxys and C-141 StarLifters airlifted 7,000 tons of equipment and 21,000 personnel out of Vietnam during the sixty-day withdrawal period. The same week that the cease-fire became effective, MAC provided the airlift for the deployment of four US-based F-4 Phantom fighter squadrons to Germany to participate in Exercise Crested Cap IV—a mission in support of NATO.

While this exercise was in progress, Operation Homecoming, the return of former American prisoners of war, began. During Homecoming, MAC flew 118 missions, all of them on time. When the men had been returned to the US, the C-9 Nightingales of MAC's 375th Aeromedical Airlift Wing flew them to hospitals around the country. During the seven-week Homecoming operation, 566 American military men and twenty-five US civilians, along with nine third-country nationals, were returned to freedom.

In April, the C-5 Galaxys flew twenty-one missions and the StarLifters 212 missions in deploying men and equipment from twenty bases throughout the US to exercise areas in Texas for Gallant Hand '73, the largest joint training exercise to be staged in the US since 1965.

Concurrent with its support of exercises and operations around the world, MAC responded to many humanitarian situations. When a flood in Pakistan left more than 400 persons dead and thousands homeless, MAC flew relief equipment and supplies into that country. There was a C-141 mercy flight from Germany across Russia to Siberia to pick up a seriously ill American and transport him to medical facilities in Japan, and the rescue of the survivor of a plane crash in the mountains of central Guyana. Thirty-three seriously ill hospital patients were evacuated from the volcano-devastated Westman Island near Iceland by two Aerospace Rescue and Recovery Service (ARRS) HH-3 Jolly Green Giant helicopters. In all, the aircrews of ARRS were credited with saving 519 lives all over the world during 1973, upholding their motto, "That Others May Live."

The climax to an historic year came in the thirty-three-day-long (October 13 to November 14) MAC airlift to Israel, involving 421 C-141 and 145 C-5 missions that airlifted more than 22,000 tons of urgently needed combat and combat support equipment and supplies. This

MAC's 1973 activities included airlifting US forces, equipment, and POWs out of Vietnam, humanitarian missions, exercises, and the Israeli airlift.

airlift was dramatized by the huge cargoes of battle tanks, helicopters, and cannons carried by the C-5, which proved its worth to the world during this airlift.

Without fanfare, MAC observed its Silver Anniversary on June 1, 1973, flying its present force of 276 C-141 StarLifters and seventy-seven C-5 Galaxys and providing a strategic mobility capability unparalleled by any other nation.

While MAC's strategic airlift and Aerospace Rescue and Recovery Service operations were in progress, the Air Weather Service, operating high-flying WB-57s, RC- and WC-130s, and C-135s, provided round-the-clock weather support to Air Force and Army units throughout the world. The Aerospace Audio-Visual Service directed more than 1,500 military and civilian technicians from thirty-four locations around the globe. In addition to combat and historical photo documentation, AAVS provides the Air Force with an average of 200 films in a typical year, as well as a variety of other audiovisual services.

MAC's 443d Military Airlift Wing at Altus AFB, Okla., conducted formal training for aircrews and special ground personnel of MAC and other Air Force units using transport aircraft. During 1973, C-5 and C-141 training courses graduated 640 pilots, 234 flight engineers, 247 navigators, and 236 loadmasters.

The 375th Aeromedical Airlift Wing, flying twelve C-9 Nightingale "flying hospitals," airlifted an average of nearly 6,000 patients and attendants each month to medical facilities within the US.

The 89th Military Airlift Wing, whose variety of aircraft includes the Presidential aircraft, "The Spirit of '76," continued its remarkable record as it passed 475,000 flying hours and twenty-five years of operations without an aircraft accident.

It's a big mission—the one of Military Airlift Command—and it has been a big year. The command is now expanding energy-conservation efforts throughout its global operations while maintaining its readiness to perform the airlift mission—whatever the need and whenever it arises. ■

MAC'S LEADERS THROUGH THE YEARS

Lt. Gen. Laurence S. Kuter	June 1, 1948	Oct. 28, 1951
Lt. Gen. Joseph Smith	Nov. 15, 1951	June 30, 1958
Lt. Gen. William H. Tunner	July 1, 1958	May 31, 1960
Gen. Joe W. Kelly, Jr.	June 1, 1960	July 18, 1964
Gen. Howell M. Estes, Jr.	July 19, 1964	July 31, 1969
Gen. Jack J. Catton	Aug. 1, 1969	Sept. 12, 1972
Gen. Paul K. Carlton	Sept. 20, 1972	

Formerly Military Air Transport Service (MATS).
Redesignated as Military Airlift Command Jan. 1, 1966.

Gen. Paul K. Carlton took command of MAC in September 1972, after serving as Commander of SAC's Fifteenth Air Force. During his career, General Carlton has held many SAC command and staff posts, including DCS/Ops, Hq. SAC. A graduate of the National War College, he was a WW II B-29 pilot in the Pacific.

MILITARY AIRLIFT COMMAND

Headquarters, Scott AFB, Ill.

Commander
Gen. Paul K. Carlton

21st Air Force
Hq., McGuire AFB, N. J.
Maj. Gen. Lester T. Kearney, Jr.
Commander

22d Air Force
Hq., Travis AFB, Calif.
Maj. Gen. John F. Gonge
Commander

Aerospace Rescue & Recovery Service (ARRS)
Hq., Scott AFB, Ill.
Brig. Gen. Glenn R. Sullivan
Commander

Air Weather Service (AWS)
Hq., Scott AFB, Ill.
Col. (Brig. Gen. selectee)
John W. Collens, III
Commander

Aerospace Audio-Visual Service (AAVS)
Hq., Norton AFB, Calif.
Col. James P. Warndorf
Commander

89th Military Airlift Wing
Andrews AFB, Md.
Col. Jay R. Wallace
Commander

443d Military Airlift Wing
Altus AFB, Okla.
Brig. Gen. Tedd L. Bishop
Commander

375th Aeromedical Airlift Wing
Scott AFB, Ill.
Col. Frank W. Contestable
Commander

A MAJOR AIR COMMAND

PACIFIC AIR FORCES

Next month, Pacific Air Forces (PACAF) will observe its thirtieth anniversary. On June 15, 1944, PACAF's forerunner, the Far East Air Forces (FEAF) was formed as a provisional unit. Less than two months later, the provisional title was dropped. To FEAF's two assigned air forces, Fifth and Thirteenth, a third, Seventh Air Force, was added on July 14, 1945. Before the end of World War II, FEAF pilots had flown nearly half a million combat sorties against the Japanese.

FEAF entered the Korean War in June 1950, and, during the ensuing years of the conflict, FEAF fighter pilots destroyed Communist fighters at a ratio of 7.2 to 1.

FEAF was redesignated Pacific Air Forces on July 1, 1957, with headquarters at Hickam AFB, Hawaii. The new headquarters was established to serve as the Air Force component of the unified Pacific Command (PACOM).

Largest of the US unified commands, the PACOM area covers more than forty percent of the earth's surface; that area contains approximately two billion people under thirty-six different flags. The PACOM eastern boundary is just off the coast of South America, and its western boundary lies in the Indian Ocean. In the north, the PACOM area of responsibility reaches into the Arctic Ocean, the Bering Sea, and most of the Aleutian chain.

From the Hickam-based headquarters, PACAF's Commander in Chief, Gen. John W. Vogt, and his staff are charged with planning, conducting, controlling, and coor-

This 347th TFW F-111 flew the last mission over Cambodia on August 15, 1973.

A CH-3E from Clark AB delivers food, clothing, and medical supplies to victims of flooding in the Philippines.

Capt. Paul W. Young conducts the 746th USAF Band, Fuchu AS, Japan, in a concert for residents of a home for the elderly.

dinating US air operations in the PACOM area. The command has some 49,000 military personnel and more than 18,000 civilians.

PACAF's responsibilities include providing ready, mobile, tactical strike forces to meet any emergency; performing aerial reconnaissance; assisting air forces of friendly nations; providing intra-theater airlift and support for all services and friendly nations; conducting US air defense operations; supporting the air aspects of the US Security Assistance Program in allied nations; and supporting US military and civilian space programs.

A total of forty-five squadrons of aircraft are assigned to PACAF units. These include such tactical fighter and attack aircraft as the versatile F-4 Phantom, F-102s of the Hawaiian Air National Guard, F-105 Thunderchiefs, F-111s, and A-7s. Photo-reconnaissance requirements are fulfilled by RF-4Cs. C-130s handle the bulk of PACAF's airlift requirements outside of that furnished by the Military Airlift Command. A small contingent of C-9s is maintained at Clark AB, Republic of the Philippines, for aeromedical evacuation purposes.

The major units in PACAF are:

Fifth Air Force, which is headquartered at Fuchu AS, Japan, with an area of responsibility including Japan and Korea. Under the Kanto Plain Consolidation Plan, Fifth's presence in Japan will be mostly consolidated at Yokota Air Base. By 1976, the estimated completion date of the consolidation plan, Yokota will be the only major USAF installation in the Kanto Plain. Fifth Headquarters is scheduled to relocate from Fuchu AS to Yokota within the next year. Fifth's tactical aircraft are all assigned to units at Okinawa and Korea, under the 313th and 314th Air Divisions.

Seventh Air Force, which moved its headquarters from Tan Son Nhut AB near Saigon when the US withdrew from South Vietnam, is now collocated at Nakhon Phanom RTAFB with the joint service command, US Support Activities Group (USSAG). The USSAG was established, concurrent with the Vietnam withdrawal, to control supporting air activities as required and also to provide operational control and maximum support for the Joint Casualty Resolution Center (JCRC), whose mission is to locate or otherwise resolve the status of US personnel missing in Southeast Asia. The CINCPAC exercises operational command of the JCRC through the Commander, USSAG, who is also Commander of Seventh Air Force.

Thirteenth Air Force, at Clark AB, is responsible for PACAF activities in the Philippines, Taiwan, and Thailand. The 327th Air Division represents the Thirteenth on Taiwan. In Thailand, the Thirteenth Air Force Advanced Echelon (ADVON), at Udorn RTAFB, is responsible for administration, logistics, and training for PACAF forces in Thailand.

PACAF's Hawaii-based units are the 326th Air Division and 15th Air Base Wing. The 326th commander exercises control of the Hawaiian Air National Guard Fighter Inter-

THE MAJOR OPERATIONAL UNITS OF PACIFIC AIR FORCES (PACAF)

UNIT	LOCATION	AIRCRAFT
15th Air Base Wing	Hickam AFB, Hawaii	EC-135, O-2
326th Air Division	Wheeler AFB, Hawaii	F-102 (Hawaii Air National Guard)
FIFTH AIR FORCE, HQ. FUCHU AS, JAPAN		
3d Tac Fighter Wing	Kunsan AB, Korea	F-4
18th Tac Fighter Wing	Kadena AB, Okinawa	F-4
51st Air Base Wing	Osan AB, Korea	
313th Air Division	Kadena AB, Okinawa	
314th Air Division	Osan AB, Korea	
475th Air Base Wing	Yokota AB, Japan	
THIRTEENTH AIR FORCE, HQ. CLARK AB, P. I.		
8th Tac Fighter Wing	Ubon RTAFB, Thailand	F-4, AC-130
56th Special Ops Wing	Nakhon Phanom RTAFB, Thailand	CH-53, OV-10
327th Air Division	Taipei AS, Taiwan	
347th Tac Fighter Wing	Takhli RTAFB, Thailand	F-111
354th Tac Fighter Wing *	Korat RTAFB, Thailand	A-7
374th Tac Airlift Wing	Clark AB, P. I./Kadena AB, Okinawa	C-130
388th Tac Fighter Wing	Korat RTAFB, Thailand	F-4, F-105, A-7, C-130
405th Fighter Wing	Clark AB, P. I.	F-4, C-9
432d Tac Recon Wing	Udorn RTAFB, Thailand	RF-4, F-4
635th Combat Support Group	U-Tapao Royal Thai Afld, Thailand	
6214th Air Base Group	Tainan ROCAB, Taiwan	

* Unit deployed temporarily from Tactical Air Command (TAC) under PACAF operational control.

ceptor Group, two aircraft control and warning squadrons, and any US Navy and Marine Corps forces made available for air defense in his area of responsibility. The 15th Air Base Wing provides administrative and logistic support to Hq. PACAF and more than 150 PACAF central Pacific activities. Its commander reports directly to the PACAF commander in chief.

One year ago, PACAF's combat role was concentrated in Cambodia, following cease-fires in Vietnam and Laos in January and February, respectively. As Communist activities increased in Cambodia, so did retaliation by US airpower. PACAF aircraft, augmented by F-4s, F-111s, and A-7s from Tactical Air Command (TAC), were flying as many as 200 tactical air sorties a day until the bombing halt took effect August 15, 1973. For the first time in nine years (since the Gulf of Tonkin incident in 1964), PACAF forces were no longer engaged in combat operations.

As a result of the bombing cessation in Southeast Asia, many of Strategic Air Command's B-52s and KC-135s and TAC's fighter aircraft have redeployed from PACAF bases to their home stations in the United States. However, a creditable presence of airpower is currently maintained in Thailand and the Western Pacific.

The winding down of US involvement in Southeast Asia hostilities brought about the transfer of PACAF's 374th Tactical Airlift Wing from Taiwan. During November, the wing's headquarters and two of its assigned squadrons were shifted to Clark AB. A third squadron was relocated at Kadena AB. Equipped with C-130 aircraft, the 374th provides tactical airlift support throughout the western Pacific.

As additional decreases in force structure occur, the PACAF of the future will take shape around a highly capable force, augmented when required by deployed forces from the continental United States, to accomplish military goals in support of national policy and treaty commitments to our allies. ■

PACAF'S LEADERS THROUGH THE YEARS

Gen. George C. Kenney	June 15, 1944	Dec. 29, 1945
Lt. Gen. Ennis C. Whitehead	Dec. 30, 1945	Apr. 25, 1949
Lt. Gen. George E. Stratemeyer	Apr. 26, 1949	May 20, 1951
Lt. Gen. Earle E. Partridge (acting)	May 21, 1951	June 9, 1951
Gen. O. P. Weyland	June 10, 1951	Mar. 25, 1954
Gen. Earle E. Partridge	Mar. 26, 1954	May 31, 1955
Gen. Laurence S. Kuter	June 1, 1955	July 31, 1959
Gen. Emmett O'Donnell, Jr.	Aug. 1, 1959	July 31, 1963
Gen. Jacob E. Smart	Aug. 1, 1963	July 31, 1964
Gen. Hunter Harris, Jr.	Aug. 1, 1964	Jan. 31, 1967
Gen. John D. Ryan	Feb. 1, 1967	July 31, 1968
Gen. Joseph J. Nazzaro	Aug. 1, 1968	July 31, 1971
Gen. Lucius D. Clay, Jr.	Aug. 1, 1971	Sept. 30, 1973
Gen. John W. Vogt	Oct. 1, 1973	

Formerly Far East Air Forces (FEAF).
Redesignated as Pacific Air Forces July 1, 1957.

Gen. John W. Vogt has been CINC, PACAF, since October 1973. He formerly was Commander, US Support Activities Group, Nakhon Phanom RTAFB, Thailand; prior to that, he commanded Seventh Air Force. General Vogt has held many key posts on JCS and Air Force staffs. A command pilot, he was a WW II fighter ace in Europe.

PACIFIC AIR FORCES

Headquarters, Hickam AFB, Hawaii

Commander in Chief
Gen. John W. Vogt

5th Air Force
Hq., Fuchu AS, Japan
Maj. Gen. Edward P. McNeff
Acting Commander

7th Air Force
Hq., Nakhon Phanom RTAFB, Thailand
Gen. Timothy F. O'Keefe
Commander

13th Air Force
Hq., Clark AB, Luzon, P. I.
Maj. Gen. Leroy J. Manor
Commander

313th Air Division
Hq., Kadena AB, Okinawa
Brig. Gen. Clyde F. McClain
Commander

314th Air Division
Hq., Osan AB, Korea
Brig. Gen. Winfield W. Scott, Jr.
Commander

327th Air Division
Hq., Taipei, Taiwan
Brig. Gen. Lynwood E. Clark
Commander

15th Air Base Wing
Hq., Hickam AFB, Hawaii
Col. Wilmot E. Y. Paxton
Commander

326th Air Division
Hq., Wheeler AFB, Hawaii
Col. Robert A. Preciado
Commander

Attached Units
Weather Wing (MAC)
Photo Squadron Detachment (MAC)
Hq., Pacific Communications Area (AFCS)
USAF Pacific Postal & Courier Region
Pacific Air Rescue Center (MAC)

A MAJOR AIR COMMAND

STRATEGIC AIR COMMAND

The mission of the Strategic Air Command (SAC) is to deter attacks on the United States and its allies. Deterrence is accomplished by maintaining the capability to destroy any target designated by the National Command Authorities.

To do this, SAC operates all US manned bombers and intercontinental ballistic missiles (ICBMs) as well as SR-71 strategic reconnaissance aircraft. As the Air Force's single manager for air-refueling operations, SAC also operates a fleet of KC-135 tanker aircraft.

The SAC force is comprised of:

- 1,000 Minuteman and fifty-four Titan II ICBMs, housed in hardened underground silos.
- Approximately 350 B-52s and seventy FB-111s.
- More than 600 KC-135 tankers.
- Reconnaissance aircraft and airborne command posts.
- More than 160,000 military and civilian people.

SAC's role in Southeast Asia came to an end August 15, 1973, when three B-52Gs from Andersen AFB, Guam, flew the last B-52 combat mission against a truck park and storage area ninety miles northeast of Phnom Penh.

Redeployment of the B-52 force stationed in the Pacific began September 19, 1973, with the return of fifteen B-52s to Blytheville AFB, Ark. By March 1, 1974, there were approximately seventy-five B-52 bombers remaining on Guam and in Thailand.

Operational testing of the Short Range Attack Missile (SRAM) reached a milestone late in July 1973 with the completion of the B-52 launch portion of the program. Sixteen missiles were successfully fired at the White Sands Missile Range, N. M., from B-52s based at Loring AFB, Me. SRAM, designed to penetrate ground defenses from both high and low altitudes, is being phased into B-52G and H and FB-111 units. It can also be carried aboard the B-1 bomber.

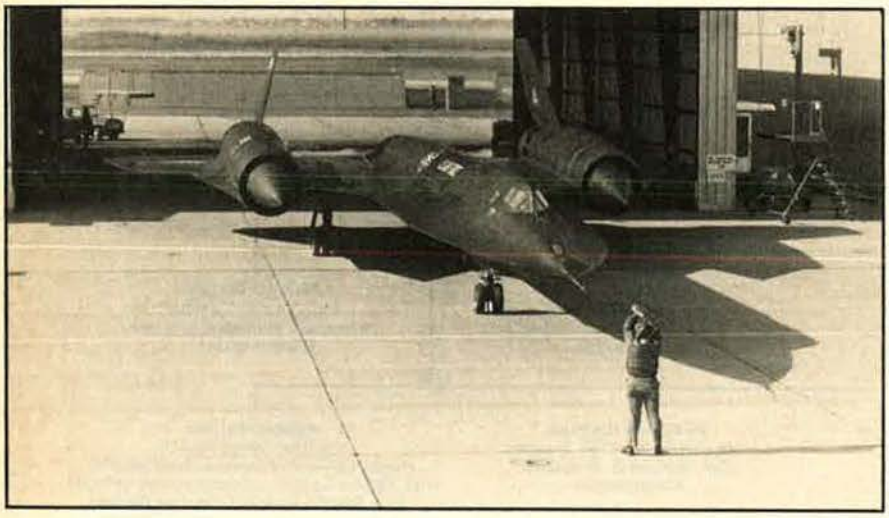
The Minuteman III conversion program also continued during the year, running ahead of schedule and at nearly $2.4 million less than original estimates. A second wing of the newer, more versatile missiles was completed in March 1973, and work on a third was begun. When the command's conversion program is completed by the mid-1970s, SAC will have approximately 450 Minuteman IIs and 550 of the multiple independently targeted reentry vehicle (MIRV) capable Minuteman IIIs.

A relatively new innovation to improve and update the effectiveness

Gen. John C. Meyer has been CINC, SAC, since May 1972, following service as Vice Chief of Staff, Hq. USAF. He has had command assignments in ADC, SAC, and TAC and was Director of Operations, JCS. General Meyer is one of USAF's leading aces, with 37½ victories in the air or on the ground in WW II and two more in Korea.

SAC'S LEADERS THROUGH THE YEARS

Gen. George C. Kenney	Mar. 21, 1946	Oct. 15, 1948
Gen. Curtis E. LeMay	Oct. 16, 1948	June 30, 1957
Gen. Thomas S. Power	July 1, 1957	Nov. 30, 1964
Gen. John D. Ryan	Dec. 1, 1964	Jan. 31, 1967
Gen. Joseph J. Nazzaro	Feb. 1, 1967	July 31, 1968
Gen. Bruce K. Holloway	Aug. 1, 1968	Apr. 30, 1972
Gen. John C. Meyer	May 1, 1972	



The Strategic Air Command's long-range, Mach 3 SR-71 is the world's most advanced strategic reconnaissance aircraft.

and efficiency of SAC's current weapon systems is Command Data Buffer (CDB), which will allow rapid targeting changes beyond those prestored in the guidance systems of Minuteman III missiles. CDB allows retargeting data to be transferred electrically to the missile from the launch control center. Prior to CDB, retargeting required inserting a new targeting tape by hand into each missile.

Last December, the Department of Defense announced the decision to plan for a series of eight demonstration launches of Minuteman missiles without warheads from operational silos, during the winters of 1974–75 and 1975–76. Past launches from Vandenberg AFB, Calif., have provided high confidence in the missile, but conditions there do not exactly duplicate those at operational bases. The planned launch next winter of four Minuteman missiles from Montana across the northwest to a Pacific Ocean target will demonstrate performance of the missiles, associated ground equipment, and launch pro-

STRATEGIC AIR COMMAND

Headquarters, Offutt AFB, Neb.

Commander in Chief
Gen. John C. Meyer

2d Air Force
Hq., Barksdale AFB, La.
Lt. Gen. Richard M. Hoban
Commander

19th Air Division
45th Air Division
40th Air Division
42d Air Division

8th Air Force
Hq., Andersen AFB, Guam
Lt. Gen. George H. McKee
Commander

17th Air Division

15th Air Force
Hq., March AFB, Calif.
Lt. Gen. William F. Pitts
Commander

12th Air Division
14th Air Division
47th Air Division
4th Air Division

1st Strategic Aerospace Division
Hq., Vanderberg AFB, Calif.
Maj. Gen. John W. Pauly
Commander

- 1st Combat Evaluation Group
  Barksdale AFB, La.
- 544th Aerospace Reconnaissance
  Technical Wing
  Offutt AFB, Neb.
- 98th Strategic Wing*
  Torrejon AB, Spain
- 3902d Air Base Wing
  Offutt AFB, Neb.

*Tenant Unit

SECOND AIR FORCE (SAC)

Headquarters, Barksdale AFB, La.

Commander
Lt. Gen. Richard M. Hoban

19th Air Division
Carswell AFB, Tex.
Brig. Gen. Thomas P. Conlin
Commander

11th Air Refueling Squadron*
Altus AFB, Okla.
(KC-135)

2d Bomb Wing
Barksdale AFB, La.
(B-52/KC-135)

7th Bomb Wing
Carswell AFB, Tex.
(B-52/KC-135)

381st Strategic Missile Wing
McConnell AFB, Kan.
(Titan II)

384th Air Refueling Wing
McConnell AFB, Kan.
(KC-135)

45th Air Division
Pease AFB, N. H.
Brig. Gen. Richard M. Baughn
Commander

95th Strategic Wing*
Goose AB, Labrador
(KC-135)

416th Bomb Wing
Griffiss AFB, N. Y.
(B-52/KC-135)

380th Bomb Wing
Plattsburgh AFB, N. Y.
(FB-111/KC-135)

509th Bomb Wing (M)
Pease AFB, N. H.
(FB-111/KC-135)

42d Bomb Wing
Loring AFB, Me.
(B-52/KC-135)

40th Air Division
Wurtsmith AFB, Mich.
Brig. Gen. Donald M. Davis
Commander

301st Air Refueling Wing
Lockbourne AFB, Ohio
(KC-135)

379th Bomb Wing
Wurtsmith AFB, Mich.
(B-52/KC-135)

410th Bomb Wing
K. I. Sawyer AFB, Mich.
(B-52/KC-135)

305th Air Refueling Wing
Grissom AFB, Ind.
(KC-135)

449th Bomb Wing
Kincheloe AFB, Mich.
(B-52/KC-135)

351st Strategic Missile Wing
Whiteman AFB, Mo.
(Minuteman)

42d Air Division
McCoy AFB, Fla.
Brig. Gen. John J. Murphy
Commander

19th Bomb Wing*
Robins AFB, Ga.
(B-52/KC-135)

68th Bomb Wing*
Seymour Johnson AFB, N. C.
(B-52/KC-135)

308th Strategic Missile Wing*
Little Rock AFB, Ark.
(Titan II)

17th Bomb Wing*
Wright-Patterson AFB, Ohio
(B-52/KC-135)

97th Bomb Wing
Blytheville AFB, Ark.
(B-52/KC-135)

*Tenant Unit

cedures and their reliability following extended periods of strategic alert. The program has been designed to provide maximum operational realism and safety.

The manned bomber is a unique and proven element of the strategic deterrent force. Introduction of the B-1 into SAC will ensure that the strategic bomber force maintains into the 1980s its present high prelaunch survivability against enemy offensive forces and its ability to penetrate projected improvements in enemy air defenses. Construction of the first B-1 is nearing completion, with first flight scheduled later this year.

SAC, as it has since its inception, stands ready in its role as the major element of the United States nuclear deterrent. With continued force improvements and its sustained high degree of professionalism, SAC is assured of becoming an even greater force for peace in the years ahead. ■

EIGHTH AIR FORCE (SAC)

Headquarters, Andersen AFB, Guam

Commander
Lt. Gen. George H. McKee

43d Strategic Wing
Andersen AFB, Guam
(B-52/KC-135)

17th Air Division
(Provisional)
U-Tapao Airfield, Thailand
Brig. Gen. (Maj. Gen. selectee)
James S. Murphy
Commander

307th Strategic Wing
U-Tapao Airfield, Thailand
(B-52/KC-135)

310th Strategic Wing
(Provisional)
U-Tapao Airfield, Thailand
(B-52/KC-135)

340th Consolidated Aircraft Maintenance Wing (Provisional)
U-Tapao Airfield, Thailand

FIFTEENTH AIR FORCE (SAC)

Headquarters, March AFB, Calif.

Commander
Lt. Gen. William F. Pitts

12th Air Division
Davis-Monthan AFB, Ariz.
Brig. Gen. Raymond L. Haupt
Commander

100th Strategic Reconnaissance Wing
Davis-Monthan AFB, Ariz.
(U-2, DC-130)

390th Strategic Missile Wing
Davis-Monthan AFB, Ariz.
(Titan II)

22d Bomb Wing
March AFB, Calif.
(B-52/KC-135)

96th Bomb Wing
Dyess AFB, Tex.
(B-52/KC-135)

14th Air Division
Beale AFB, Calif.
Brig. Gen. Don D. Pittman
Commander

6th Strategic Wing*
Eielson AFB, Alaska
(RC-135)

9th Strategic Reconnaissance Wing
Beale AFB, Calif.
(SR-71)

456th Bomb Wing
Beale AFB, Calif.
(B-52/KC-135)

55th Strategic Reconnaissance Wing
Offutt AFB, Neb.
(RC/EC-135)

916th Air Refueling Squadron*
Travis AFB, Calif.
(KC-135)

320th Bomb Wing*
Mather AFB, Calif.
(B-52/KC-135)

47th Air Division
Fairchild AFB, Wash.
Col. (Brig. Gen. selectee)
Martin C. Fulcher
Commander

92d Bomb Wing
Fairchild AFB, Wash.
(B-52/KC-135)

341st Strategic Missile Wing
Malmstrom AFB, Mont.
(Minuteman)

5th Bomb Wing
Minot AFB, N. D.
(B-52/KC-135)

91st Strategic Missile Wing
Minot AFB, N. D.
(Minuteman)

4th Air Division
F. E. Warren AFB, Wyo.
Brig. Gen. Gerald G. Fall
Commander

28th Bomb Wing
Ellsworth AFB, S. D.
(B-52/KC-135)

44th Strategic Missile Wing
Ellsworth AFB, S. D.
(Minuteman)

90th Strategic Missile Wing
F. E. Warren AFB, Wyo.
(Minuteman)

319th Bomb Wing
Grand Forks AFB, N. D.
(B-52/KC-135)

321st Strategic Missile Wing
Grand Forks AFB, N. D.
(Minuteman)

Direct Reporting Unit
93d Bomb Wing
Castle AFB, Calif.
(B-52/KC-135)

*Tenant Unit

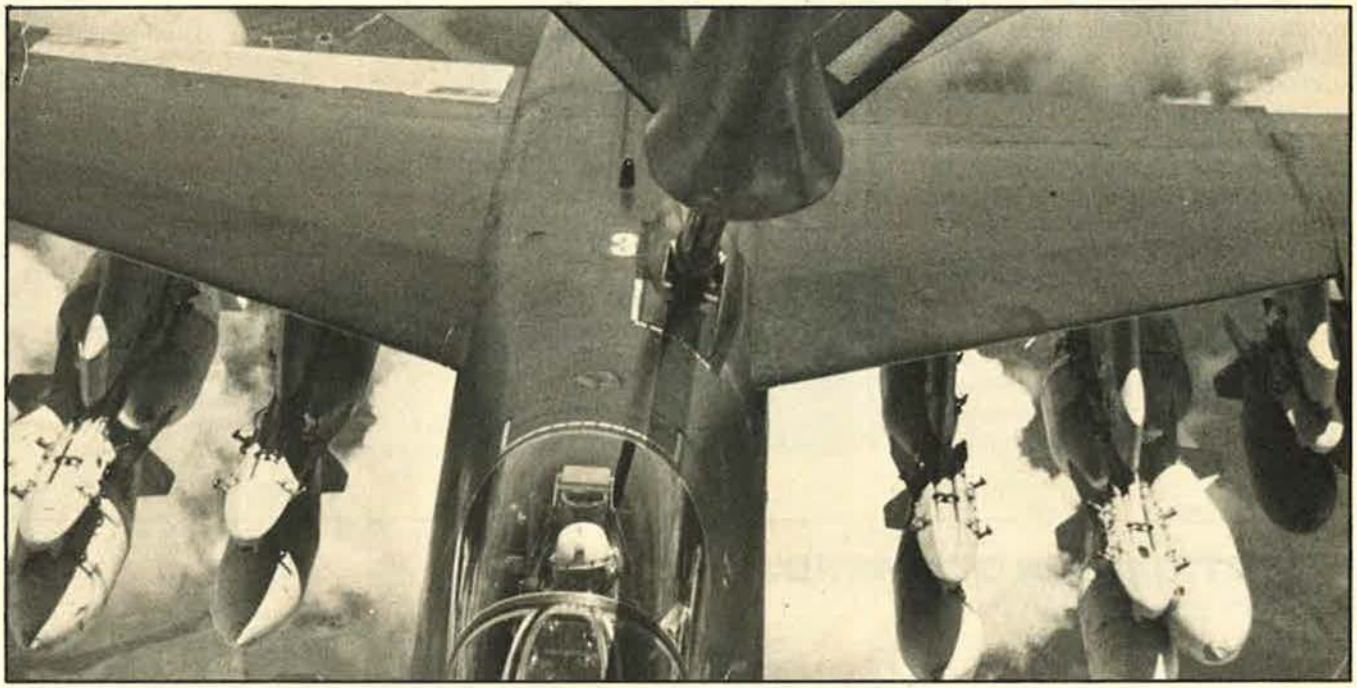
A MAJOR AIR COMMAND

TACTICAL AIR COMMAND

While responding to the crises and emergencies of the present, Tactical Air Command (TAC) continues to prepare for the future as the Air Force's quick-reaction force, ready to deploy on short notice to any place in the world with fighter, reconnaissance, airlift, and special operations forces.

TAC's responsiveness was again proved this past fall in the Middle East crisis. TAC responded just sixteen hours after the United States resolved to assist the Israelis on October 13, 1973. Under the command of Gen. Robert J. Dixon, who had become the TAC Commander two weeks earlier, TAC ferried F-4 Phantom fighters and C-130 Hercules transports to the Middle East as part of America's effort to reestablish the military balance that was being threatened by substantial Soviet air and sea resupply activities in support of the Arab states.

Only eleven hours and eighteen minutes after takeoff, TAC delivered the first eight F-4 Phantoms. Similarly, the first C-130 Hercules was transferred to the Israelis within forty-one hours of being alerted.



One of TAC's A-7Ds, loaded with more than 12,000 pounds of bombs, refuels from a KC-135 en route to a target range.

TAC C-130s deliver grain to a drought-stricken part of Africa.

TAC airlift also moved supplies destined for Israel to Military Airlift Command (MAC) terminals within the United States and assisted MAC in accomplishing its mission.

Major and minor humanitarian efforts saw TAC forces responding to emergencies throughout the world. The two biggest efforts were in the climate extremes of Iceland and Africa.

On Heimaey Island, Iceland's chief fishing port, Vestmannaeyjar, was threatened with destruction by lava and ash from volcanic eruptions. TAC C-130 airlift and aerial port members, in conjunction with members of the Icelandic Defense Force, fought the battle of man against nature. In the face of gale-force Arctic winds, poisonous gases, and showers of volcanic ash, the men and machines of TAC airlifted from the island 680 tons of hospital and fishery equipment and processed fish.

In West Africa, crops and millions of cattle in the sub-Saharan nations were destroyed in the worst drought of the century. The United Nations predicted that up to six million Africans might die of starvation. Many nations, including the United States, offered food to the stricken nations; however, in areas of Mali, Chad, and Mauritania, the normal transportation system could not deliver the food quickly enough.

TAC provided a literal lifeline to people in the remote regions of the three nations. C-130s, operating as part of the US Readiness Command, airlifted more than 9,200 tons of food and medicine to the beleaguered people during a six-month period.

In the United States, TAC and the US Forest Service combined efforts to use a newly developed modular airborne fire-fighting system (MAFFS) to combat forest fires. The MAFFS quickly converts a C-130 Hercules aircraft into a flying tanker that can dispense a stream of fire retardant eighty feet wide and a quarter of a mile long. The fire-fighting Hercules was used successfully last year against blazes in Idaho, Montana, and California. Plans call for the Forest Service to purchase a number of the MAFFS and store them near areas where major forest fires are likely to occur. Tactical Air Command C-130s can quickly respond when civilian fire-fighting resources

TAC'S LEADERS THROUGH THE YEARS

Lt. Gen. E. R. Quesada	Mar. 21, 1946	Nov. 23, 1948
Maj. Gen. Robert M. Lee	Dec. 24, 1948	June 20, 1950
Maj. Gen. Glenn O. Barcus	July 17, 1950	Jan. 25, 1951
Gen. John K. Cannon	Jan. 25, 1951	Mar. 31, 1954
Gen. O. P. Weyland	Apr. 1, 1954	July 31, 1959
Gen. Frank F. Everest	Aug. 1, 1959	Sept. 30, 1961
Gen. Walter C. Sweeney, Jr.	Oct. 1, 1961	July 31, 1965
Gen. Gabriel P. Disosway	Aug. 1, 1965	July 31, 1968
Gen. William W. Momyer	Aug. 1, 1968	Sept. 30, 1973
Gen. Robert J. Dixon	Oct. 1, 1973	

Gen. Robert J. Dixon took command of TAC in October 1973. Earlier, he served as DCS/Personnel, Hq. USAF, and as Commander of the Military Personnel Center. He has held several assignments as an Air Staff planner, commanded both TAC and SAC operational units, and flown combat missions in three wars.

TACTICAL AIR COMMAND

Headquarters, Langley AFB, Va.

Commander
Gen. Robert J. Dixon

9th Air Force
Hq., Shaw AFB, S. C.
Maj. Gen. James D. Hughes
Commander

12th Air Force
Hq., Bergstrom AFB, Tex.
Maj. Gen. Charles W. Carson, Jr.
Commander

Langley AFB, Va.
4500th Air Base Wing
1st Aerial Port Gp.
2d Aircraft Delivery Gp.
480th Recon Technical Gp.

Pope AFB, N. C.
1st Aeromedical Evacuation Gp.

Nellis AFB, Nev.
USAF Tactical Fighter Weapons Center
57th Fighter Weapons Wing
F-4, F-111A/E, F-105, A-7, T-38
USAF Aerial Demonstration Sqdn.

Eglin AAF, No. 9, Fla.
(Hurlburt Field)
USAF Air-Ground Operations School

Eglin AFB, Fla.
*USAF Special Operations Force

Eglin AFB, Fla.
*USAF Tactical Air Warfare Center

Eglin AAF, No. 9, Fla.
(Hurlburt Field)
1st Special Operations Wing
O-2, OV-10, UH-1, C-123, C-130, AC-130
USAF Special Operations School

*Tenant Unit

are exhausted or deemed inadequate.

As 1974 began, TAC had more than 99,000 military and civilian personnel supporting and operating approximately 1,850 aircraft in eighty-one flying squadrons. Major aircraft in the command's diversified inventory include the O-2, OV-10, A-7, A-37, C-130, F/RF-4, F-105, and F-111.

For the future, the caliber of TAC's fighting force will be significantly enhanced as the F-15 Eagle joins the command's inventory later this year at Luke AFB, Ariz.

"There can be no doubt that this aircraft will give us a distinct edge. There is no air-superiority fighter in existence that can match its combat capability, and air superiority over the battle zone is the key to effective tactical airpower and air/ground combat operations," said General Dixon, after he flew the F-15 at Edwards AFB, Calif.

The introduction of the F-15, continued development and testing of the A-10 close-air-support fighter, the airborne warning and control system (AWACS), and other weapon systems, munitions, and equipment now under development will enhance TAC's ability to perform its mission in support of national objectives. ■

NINTH AIR FORCE (TAC)

Headquarters, Shaw AFB, S. C.

Commander
Maj. Gen. James D. Hughes

Pope AFB, N. C.
839th Air Div.
317th Tactical Airlift Wing (839th AD)
C-130E

MacDill AFB, Fla.
1st Tactical Fighter Wing
F-4E

Shaw AFB, S. C.
363d Tactical Recon Wing
RF-4C, EB-66C/E
507th Tactical Control Gp.
68th Tactical Air Support Gp.
O-2A, CH-3E

Seymour Johnson AFB, N. C.
4th Tactical Fighter Wing
F-4E

Homestead AFB, Fla.
31st Tactical Fighter Wing
F-4E

Myrtle Beach AFB, S. C.
354th Tactical Fighter Wing
A-7D

England AFB, La.
23d Tactical Fighter Wing
A-7D

Langley AFB, Va.
*316th Tactical Airlift Wing (839th AD)
C-130E

Eglin AFB, Fla.
*33d Tactical Fighter Wing
F-4E

Eglin AAF, No. 9, Fla.
(Hurlburt Field)
823d Civil Engineering Sqdn.

*Tenant Unit

TWELFTH AIR FORCE (TAC)

Headquarters, Bergstrom AFB, Tex.

Commander
Maj. Gen. Charles W. Carson, Jr.

George AFB, Calif.
35th Tactical Fighter Wing
F-4C/D/E, F-105G

Cannon AFB, N. M.
832d Air Div.
27th Tactical Fighter Wing (832d AD)
F-111D

Bergstrom AFB, Tex.
67th Tactical Recon Wing
RF-4C
602d Tactical Control Gp.
71st Tactical Air Support Gp.
O-2A, CH-53

Nellis AFB, Nev.
474th Tactical Fighter Wing
F-111A
820th Civil Engineering Sqdn.

Little Rock AFB, Ark.
834th Air Div.
314th Tactical Airlift Wing (834th AD)
C-130E

Luke AFB, Ariz.
58th Tactical Fighter Training Wing
F-4C, F-104G

Williams AFB, Ariz.
*425th Tactical Fighter Training Sqdn.
F-5A/B/E

Dyess AFB, Tex. (SAC)
*463d Tactical Airlift Wing
(834th AD)
C-130E

Mountain Home AFB, Idaho
366th Tactical Fighter Wing
F-111F

Davis-Monthan AFB, Ariz. (SAC)
*355th Tactical Fighter Wing
A-7D, DC-130A, CH-3

Holloman AFB, N. M.
49th Tactical Fighter Wing
F-4D,T-38

*Tenant Unit

A MAJOR AIR COMMAND

UNITED STATES AIR FORCES IN EUROPE

This year marks the twenty-fifth anniversary of the North Atlantic Treaty Organization (NATO) and of USAFE's support of US commitments to NATO.

Although USAFE's activation in 1945 predates the establishment of NATO by four years, the command has always been dedicated to the security of Western Europe. In peacetime, USAFE trains and equips US Air Force units pledged to NATO. Under wartime conditions, the command's airpower—its tactical fighters, its fighter-bombers, and its reconnaissance aircraft—would come under NATO's operational control.

Most of USAFE's 300 operational sites and twenty-eight squadrons are concentrated in Western Europe. Major USAFE units are maintained in the Netherlands, England, Spain, Germany, Greece, Italy, and Turkey. The command operates approximately 400 F-4 Phantoms, seventy F-111 fighter-bombers, ninety RF-4C reconnaissance aircraft, and thirty C-130 tactical airlift aircraft. About 69,000 USAF military personnel are assigned to the European area.

A streamlined command structure for Air Force activities in Europe, reductions in overhead manpower, and increased integration of Air Force staffs with their NATO counterparts are hallmarks of USAFE management actions to achieve an operationally economical and efficient posture.

During the past five years, headquarters overhead of Air Force activities in the European theater has been reduced by fifty-three percent while at the same time improving management of combat resources committed to NATO.

An F-4 crew chief of a dual-based squadron readies his aircraft at a base in Germany. These squadrons remain under EUCOM control when in the US.

One of USAFE's four C-9 Nightingale aircraft boarding patients at a European base for aeromedical evacuation to a central medical facility.

A USAFE F-4 crew runs to its aircraft during a practice alert.

Much of this reduction was achieved through reconfiguration and realignment of USAFE's numbered air forces. Third Air Force was relocated to an active flying base in England, and its former support base in metropolitan London was closed. Effectiveness of the command's tactical air force organization in the Mediterranean was increased by assigning the commander of NATO's Allied Air Forces Southern Europe—an Air Force general — dual responsibility as commander of Sixteenth Air Force.

At the same time, USAFE consolidated all principal tactical communications, ground control, and tactical air support elements at Wiesbaden AB, Germany.

The most recent reorganization was completed last year with the relocation of Hq. USAFE from Wiesbaden to the active flying base at Ramstein, alongside NATO's Fourth Allied Tactical Air Force headquarters. Collocation of the two headquarters aids USAFE's incorporation into NATO's operational structure during times of emergency.

These moves produced significant additional savings by eliminating city-based units that support headquarters.

Additionally this year, the Hq. USAFE staff is being reduced twenty percent and realigned for maximum efficiency. Less essential activities are being eliminated, and staffs are being merged for maximum economy of headquarters operation.

With less than half the headquarters overhead of five years ago, USAFE now has more than ninety-seven percent of its personnel assigned to field units.

Aircraft modernization programs have reduced 1965's mix of seven types of tactical fighters to only two basic models today—the F-4 Phantom series and the F-111. RF-4s are the primary all-weather, day and night reconnaissance aircraft of NATO.

In future months, USAFE will continue to improve its combat capability. All F-4Es in USAFE are being modified with a leading edge slat to improve their maneuverability.

OV-10 forward control aircraft are expected to be added to the USAFE aircraft inventory this year, and an Airborne Warning and Control System (AWACS) aircraft was tested in Europe last year.

USAFE'S LEADERS THROUGH THE YEARS

Lt. Gen. John K. Cannon	Aug. 16, 1945	Mar. 2, 1946
Maj. Gen. Idwal H. Edwards	Mar. 2, 1946	Aug. 14, 1947
Brig. Gen. John F. McBlain	Aug. 15, 1947	Oct. 20, 1947
Lt. Gen. Curtis E. LeMay	Oct. 20, 1947	Oct. 15, 1948
Lt. Gen. John K. Cannon	Oct. 16, 1948	Jan. 20, 1951
Gen. Lauris Norstad	Jan. 21, 1951	July 26, 1953
Lt. Gen. William H. Tunner	July 27, 1953	June 30, 1957
Gen. Frank F. Everest	July 1, 1957	July 31, 1959
Gen. Frederic H. Smith, Jr.	Aug. 1, 1959	June 30, 1961
Gen. Truman H. Landon	July 1, 1961	July 31, 1963
Gen. Gabriel P. Disosway	Aug. 1, 1963	July 31, 1965
Gen. Bruce K. Holloway	Aug. 1, 1965	July 31, 1966
Gen. Maurice A. Preston	Aug. 1, 1966	July 31, 1968
Gen. Horace M. Wade	Aug. 1, 1968	Jan. 31, 1969
Gen. Joseph R. Holzapple	Feb. 1, 1969	Aug. 31, 1971
Gen. David C. Jones	Sept. 1, 1971	

THE MAJOR OPERATIONAL UNITS OF USAFE

UNIT	LOCATION	AIRCRAFT/MISSION
10th Tac Recon Wing	RAF Alconbury, England	RF-4C
48th Tac Fighter Wing	RAF Lakenheath, England	F-4D
20th Tac Fighter Wing	RAF Upper Heyford, England	F-111E
81st Tac Fighter Wing	RAF Bentwaters/Woodbridge, England	F-4D, MAC Rescue HC-130, HH-53
513th Tac Airlift Wing	RAF Mildenhall, England	TAC Rotational C-130, SAC Rotational KC-135
401st Tac Fighter Wing	Torrejon AB, Spain	F-4C, SAC Rotational KC-135
406th Tac Fighter Training Wing	Zaragoza AB, Spain	Tactical Range Support, Weapons Training School
40th Tac Air Control Group	Aviano AB, Italy	Rotational USAFE Aircraft, Command and Control
TUSLOG Detachment 10	Incirlik CDI, Turkey	Rotational USAFE Aircraft
601st Tac Control Wing	Wiesbaden AB, Germany	Communications, Command and Control
7400th Air Base Group	Sembach AB, Germany	Command and Control
7206th Air Base Group	Athenai Airport, Greece	Support and Communications
7350th Air Base Group	Tempelhof Airport, Berlin	Support and Communications
86th Tac Fighter Wing	Ramstein AB, Germany	F-4E
322d Tac Airlift Wing	Rhein-Main AB, Germany	C-9, TAC Rotational C-130, ANG Rotational KC-97
26th Tac Recon Wing	Zweibrucken AB, Germany	RF-4C
36th Tac Fighter Wing	Bitburg AB, Germany	F-4E
50th Tac Fighter Wing	Hahn AB, Germany	F-4E, F-4D
32d Tac Fighter Squadron	Camp New Amsterdam, Netherlands	F-4E
52d Tac Fighter Wing	Spangdahlem AB, Germany	F-4C, F-4D

When the F-15 becomes operational, USAFE officials believe that this air-superiority fighter will be suitable for the European operating environment. Also being considered as a follow-on to the F-4 in a ground-support role are such improved close-air-support aircraft as the A-7 or A-10.

With a streamlined command structure and modernized forces, USAFE—in this twenty-fifth anniversary year of NATO—remains a viable force in the defense of Western Europe. ■

Gen. David C. Jones has been CINC, USAFE, since September 1971. In this post, he also commands the Fourth Allied Tactical Air Force. General Jones has had long experience in USAFE key posts. He also has served as DCS/ Operations and Vice Commander, Seventh Air Force, and Commander, Second Air Force.

UNITED STATES AIR FORCES IN EUROPE

Headquarters, Ramstein AB, Germany

US European Command (USEUCOM) — **US Air Force (USAF)**

Headquarters
United States Air Forces in Europe (USAFE)
Hq., Ramstein AB, Germany
Gen. David C. Jones, Commander in Chief

3d Air Force
Hq., RAF Mildenhall, England
Maj. Gen. Evan W. Rosencrans
Commander

16th Air Force
Hq., Torrejon AB, Spain
Lt. Gen. Joseph G. Wilson*
Commander

17th Air Force
Hq., Sembach AB, Germany
Maj. Gen. John C. Giraudo
Commander

*Lt. Gen. Joseph G. Wilson, USAF, is dual-hatted as Commander of both AIRSOUTH and 16th Air Force. Maj. Gen. Salvador E. Felices, 16th Air Force Vice Commander, directs daily operations of 16th Air Force from the headquarters at Torrejon AB, Spain.

Relationship of Major USAFE Units to NATO Chain of Command for Air

Supreme Headquarters Allied Powers Europe (SHAPE)
Gen. Andrew J. Goodpaster, USA
Supreme Allied Commander, Europe (SACEUR)

Allied Forces Central Europe (AFCENT)
Gen. Ernst Ferber, GA
Commander in Chief

4th Allied Tactical Air Force (4ATAF)
Gen. David C. Jones, USAF
Commander

3d Air Force (USAFE)
Maj. Gen. Evan W. Rosencrans
Commander

17th Air Force (USAFE)
Maj. Gen. John C. Giraudo
Commander

32d Army Air Defense Command
Maj. Gen. T. E. Fitzpatrick, USA
Commander

1st Canadian Air Group
Brig. Gen. Gerard C. E. Theriault
Commander

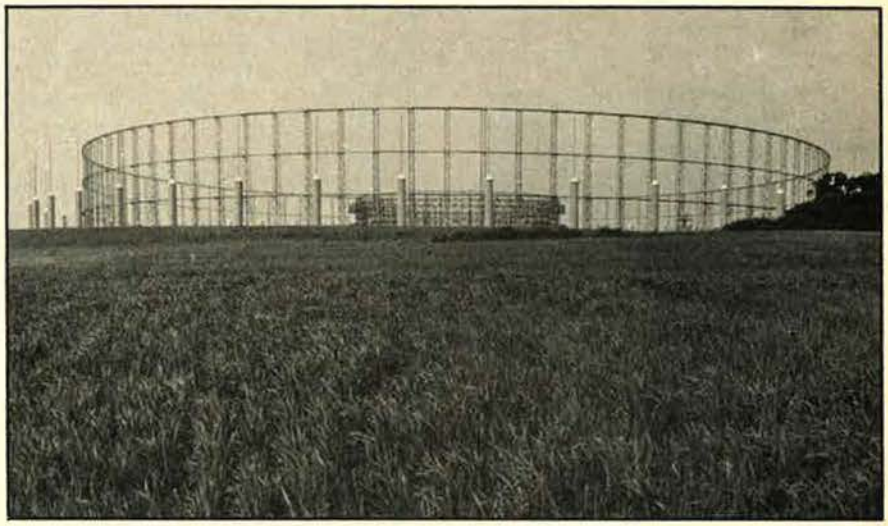
1st German Air Force Division
Maj. Gen. C. H. Greve
Commander

2d German Air Force Division
Brig. Gen. Werner Schmitz
Commander

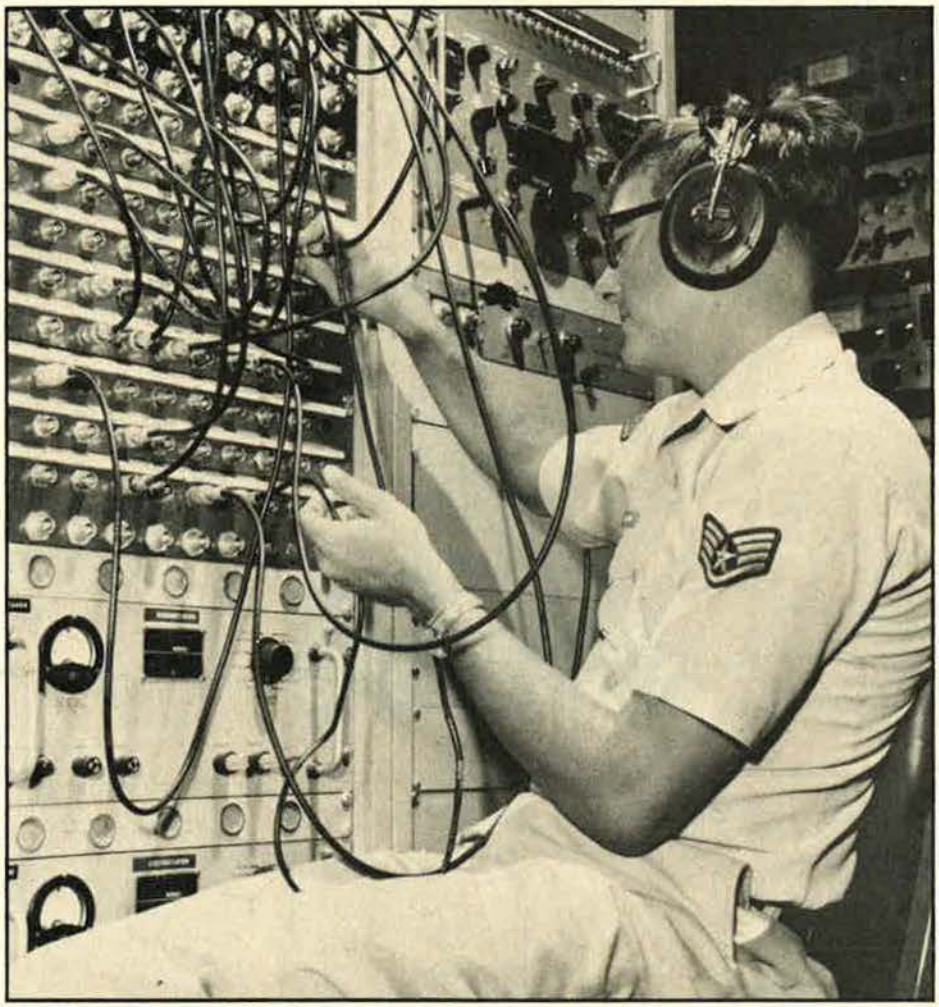
A MAJOR AIR COMMAND
USAF SECURITY SERVICE

The United States Air Force Security Service (USAFSS) recently concluded its twenty-fifth year of service as a major air command of the US Air Force.

When activated on October 20, 1948, the command was tasked with a cryptologic mission and to provide communications security (COMSEC) for the Air Force. Since then, USAFSS has grown from a small cadre of eleven officers and a handful of enlisted men on loan from the Army to a full-fledged



This AN/FLR-9 circular antenna covers thirty-five acres.



As a security measure, USAFSS technicians monitor unsecure USAF communications systems and networks. This communications operations specialist mans an antenna switching console.

force of more than 19,000 people.

In the spring of 1949, the headquarters staff and supporting elements moved from the Washington, D. C., area to Brooks AFB, Tex. Four years later, the USAFSS organization moved to Kelly AFB, Tex., where today it directs the activities of seventy-eight units at forty-seven geographical locations throughout the world.

USAFSS has undergone an extensive organizational and operational change within the past three years. It now functions as a major command within the policy constraints required by triservice relationships. It is the Air Force component of the Central Security Service (CSS), which also includes the Army Security Agency and Naval Security Group.

Beside its cryptologic mission, the command provides communications security (COMSEC) services for USAF commanders, and maintains data and an analytic center for Air Force electronic warfare planning and operations. In addition to its fixed sites, USAFSS also maintains a mobile emergency reaction capability for deployment in support of tactical exercises.

To perform its COMSEC mission, the Security Service provides other commands with materials and services necessary to safeguard information of intelligence value that is transmitted electrically. The object of COMSEC is to provide surveillance and evaluation of all vulnerable communications systems used by Air Force units. This function is necessary to detect and correct improper transmission procedures and faulty equipment and to determine if classified information is being transmitted over unsecure communications systems.

The surveillance aspect of this function is performed by COMSEC surveillance units located in each major theater of Air Force operations. Specially equipped mobile teams often fly on aircraft of other Air Force commands to spot-check air-to-air and air-to-ground communications and provide on-the-spot technical assistance. The evaluation of monitored communications is performed by communications analysts.

Current USAFSS missions dictate the use of the most sophisticated electronic and cryptographic equipment available. The antenna is the trademark of USAFSS operational sites around the world. The need for a particular type of antenna is dictated by the unit's mission, the specific tasks assigned, the type of operational equipment installed, and the unit's location. Some of the command's antennas cover acres of land and extend more than 100 feet into the sky.

These antennas are connected to some of the most complex electronic equipment in the Air Force inventory. Some items were designed and built especially for USAFSS. The command also uses many types of standard equipment items such as receivers, transmitters, recorders, typewriters, teletypewriters, computers, and radarscopes.

Because of various types of equipment used and the deployment pattern required to spot-check Air Force air-to-air and air-to-ground communications for security evaluation, USAFSS units also perform direction finding and range estimation functions in support of search-and-rescue operations.

From its inception, the command has trained its personnel to perform the functions and tasks peculiar to the USAFSS mission. USAFSS established its own training programs, arranged with the Air Training Command to conduct special courses or modify existing ones to fit command needs, contracted with civilian educational institutions to provide specialized training, and eventually established its own school of cryptologic sciences at Goodfellow AFB, Tex.

Since 1948, USAFSS organizations have earned more than ninety Air Force Outstanding Unit Awards, two Presidential Unit Citations, the Navy Meritorious Unit Commendation, and three special awards for outstanding contributions to the national cryptologic effort.

Maj. Gen. Walter T. Galligan assumed command of USAFSS in 1973, the eleventh man to head the globally dispersed organization. ■

Maj. Gen. Walter T. Galligan has commanded USAF Security Service since February 1973, following a tour as Air Force Academy Commandant of Cadets. He has served in the Office of the Secretary of the Air Force, as USAFE Director of Operations, and as Seventh AF Director of Combat Ops, as well as commanding fighter wings in Europe and Vietnam. General Galligan has been nominated for three-star rank and command of PACAF's Fifth Air Force, but the change had not taken effect when this issue went to press, nor had a replacement Commander been named for USAFSS.

USAFSS'S LEADERS THROUGH THE YEARS

Col. Roy H. Lynn	Oct. 26, 1948	July 5, 1949
Col. Travis M. Hetherington	July 6, 1949	Feb. 21, 1951
Maj. Gen. Roy H. Lynn	Feb. 22, 1951	Feb. 13, 1953
Maj. Gen. Harold H. Bassett	Feb. 14, 1953	Jan. 3, 1957
Maj. Gen. Gordon L. Blake	Jan. 4, 1957	Aug. 5, 1959
Maj. Gen. John B. Ackerman	Aug. 6, 1959	Sept. 20, 1959
Maj. Gen. Millard Lewis	Sept. 21, 1959	Aug. 31, 1962
Maj. Gen. Richard P. Klocko	Sept. 1, 1962	Oct. 15, 1965
Maj. Gen. Louis E. Colra	Oct. 16, 1965	July 18, 1969
Maj. Gen. Carl W. Stapleton	July 19, 1969	Feb. 23, 1973
Maj. Gen. Walter T. Galligan	Feb. 24, 1973	

A MAJOR AIR COMMAND

UNITED STATES AIR FORCES SOUTHERN COMMAND

The US Air Forces Southern Command (USAFSO), with headquarters in the Canal Zone, is the USAF major command in Latin America and the air component of the unified US Southern Command.

Commanded by Maj. Gen. Arthur G. Salisbury, USAFSO operates two Air Force bases—Albrook and Howard—in the Canal Zone. In addition to its responsibility for providing the air element for defense of the Panama Canal, USAFSO furnishes advice, assistance, and training to Latin American air forces and logistic and other support for US military groups and their Air Force sections in fifteen of the twenty Latin American republics.

Headquarters of the command is at Albrook, along with the Inter-American Air Forces Academy, the 1978th Communications Group (AFCS), and the USAF Tropic Survival Training School (ATC). Air Force flying activity is conducted from Howard, headquarters for the command's 24th Composite Group, which in 1973 was redesignated from the 24th Special Operations Group. Also at Howard are Detachment 2, 39th Aerospace Rescue and Recovery Wing, and Detachment 25, 5th Weather Wing, both MAC units, and rotational aircraft detachments from Tactical Air Command and Air Force Reserve.

As of January 31, 1974, there were 2,129 military personnel and 791 DoD civilian employees assigned to USAFSO and tenant units in the Canal Zone.

Most of the training offered by the command to officers and airmen of the Latin American nations is conducted by the Inter-American Air Forces Academy. In 1973, the Academy trained 538 officers and airmen from thirteen countries in aerospace-related skills, bringing to 11,780 the number of students trained since the Academy opened in 1943.

The coming year will witness the beginning of apprentice-level courses and specialized training in A-37, T-37, C-130, and UH-1H aircraft. Academy courses are conducted in Spanish.

In addition to training at the Inter-American Air Forces Acad-

USAFSO'S LEADERS THROUGH THE YEARS

Maj. Gen. Willis H. Hale	Nov. 13, 1947	Oct. 19, 1949
Brig. Gen. Rosenham Beam	Oct. 20, 1949	Nov. 5, 1950
Brig. Gen. Emil C. Kiel	Nov. 6, 1950	June 10, 1953
Maj. Gen. Reuben C. Hood, Jr.	June 11, 1953	June 16, 1956
Maj. Gen. Truman H. Landon	June 20, 1956	June 1, 1959
Maj. Gen. Leland S. Stranathan	Aug. 3, 1959	Sept. 8, 1963
Maj. Gen. Robert A. Breitweiser	Sept. 11, 1963	July 9, 1966
Maj. Gen. Reginald J. Clizbe	Aug. 6, 1966	June 14, 1968
Maj. Gen. Kenneth O. Sanborn	June 14, 1968	Apr. 7, 1972
Maj. Gen. Arthur G. Salisbury	Apr. 7, 1972	

Formerly Caribbean Air Command.
Redesignated US Air Forces Southern Command July 8, 1963.

Maj. Gen. Arthur G. Salisbury has been USAFSO Commander since April 1972. The General has many years of air defense experience, having served in such key posts as Commander, New York NORAD Sector; J-3, NORAD/CONAD; DCS/Plans, Hq. ADC; and Chief of Staff, ADC. General Salisbury led a fighter group during WW II.

An AFRES C-123K, serving with USAFSO, sprays insecticide to reduce the Mediterranean fruit fly population. The command is involved in many training and humanitarian activities with Latin American countries.

emy, eighteen USAFSO Mobile Training Teams (MTT) traveled to ten Latin American countries to teach air force people aerospace-related skills. One MTT visited Argentina and Peru, where instructors trained 340 technicians in C-130 maintenance specialties.

USAFSO is also responsible for coordinating joint search and rescue operations of US air, sea, and ground forces in Latin America. During 1973, the USAFSO Rescue Coordination Center at Albrook directed a total of 100 search and rescue or emergency medical evacuation flights of assistance to 170 people.

Support of joint US Army–US Air Force training programs, civic action, humanitarian airlift, and disaster-relief activities are other important parts of the USAFSO mission. Among the other airlift missions, USAFSO personnel flew spray missions in Nicaragua to help rid that country of the Mediterranean fruit fly, a pest that had been devastating crops. Spray missions had also been flown in the Canal Zone to control the equine encephalitis-carrying mosquito.

The command also provided airlift of civic-action materials to Bolivia, Costa Rica, Honduras, Panama, and Paraguay. In February of this year, C-130s flew emergency supplies to Bolivia's flood-devastated Cochabamba and Santa Cruz areas. Last fall, command personnel supported the USAF Thunderbirds during a month-long tour of thirteen countries in Central and South America, where the precision flying team performed before more than seven million people.

USAFSO acts as executive agent for USAF's responsibilities in the System of Cooperation Among the Air Forces of the Americas. The system's primary objective is to promote and strengthen ties of friendship, cooperation, and fraternity among the air forces of the Western Hemisphere. The command also administers the Permanent Secretariat of the system.

The command has long been recognized as a major source of emergency relief and humanitarian service in Latin America. Last November, 24th Composite Group personnel were awarded an Oak Leaf Cluster to the Air Force Outstanding Unit Award for exceptionally meritorious service that included support for victims of the destructive 1972 Christmas season earthquake in Managua, Nicaragua.

Also in 1973, the command won the Secretary of the Air Force Safety Trophy for its flying safety program, the Recon and Suggestion Program Award for exceeding by four times its suggestion goal, and the Canal Zone Governor's Public Service Award for humanitarian service to the Canal Zone and Panama.

Detachment 25, 5th Weather Wing, at Howard won the MAC Maintenance Organization of the Year Award, the Air Weather Service Basset Award given for the most outstanding upper air observations, and the Air Weather Service's Observer Supervisor Award. ■

A SEPARATE OPERATING AGENCY

AIR FORCE ACCOUNTING AND FINANCE CENTER

The Air Force Accounting and Finance Center (AFAFC), paymaster for Air Force members and master accountant for Air Force budget monies, is a service organization.

These financial services are the responsibility and concern of the Center in Denver and its Commander—Brig. Gen. Larry M. Killpack, who also serves at Air Staff level as Assistant Comptroller of the Air Force for Accounting and Finance. This personal attention to pay and accounting matters by a staff of forty officers, 260 airmen, and 2,130 civilians has earned the Center a reputation for excellent customer service.

The Center's mission is to see that policies, procedures, and responsibilities are effectively carried out throughout the worldwide Air Force accounting and finance network. The Center normally develops the implementing instructions on established basic policy and procedures, conducts and evaluates system tests when required, and then supervises the implementation of the system in the field.

Accurate and timely payment of personnel, whose duty assignments may take them anywhere in the world, is the Center's first concern. To give the best possible pay service, AFAFC is consolidating on its computers the pay records of all Air Force personnel. The implementation of this centralized pay system, called the Joint Uniform Military Pay System (JUMPS), alone represents an annual payroll of $7 billion.

The full application of the Air Force JUMPS system is expected to provide significant benefits to the Air Force. It integrates in one record all pay, leave, allotment, and indebtedness data. Air Force members will receive responsive service, including up-to-date payments twice monthly, full explanation of pay computations at the end of the month, and prompt response to inquiries. At the same time, it provides the personnel appropriation fund manager with immediate access to detailed obligation and expenditure data.

AFAFC expects to have all member pay accounts centralized and to be exercising JUMPS requirements by June 30, 1974. An estimated 495,000 of these accounts will be in full JUMPS. The remaining accounts, approximately 121,000 in the AMPS 360 system, are scheduled for conversion to JUMPS by next October.

The Air Force Accounting and Finance Center accounts for all of the annual Air Force budget, currently more than $24 billion. It is a major task for the Center, especial-

Brig. Gen. (Maj. Gen. selectee) Larry M. Killpack has been Commander of the Air Force Accounting and Finance Center and Assistant Comptroller of the Air Force for Accounting and Finance since September 1971. Besides a number of AFSC posts, he has also commanded the 8th and 12th Tac Fighter Wings in Southeast Asia.

ly under the austere conditions and tight budgets associated with today's economy. Accounting and finance offices throughout the global network report accounting transactions directly to the Center over an automated communications network. The data from these reports is audited and consolidated to give a more meaningful financial status picture.

The results of these reports are forwarded to Hq. USAF in Washington, as well as to the Secretary of Defense, the Treasury Department, the Bureau of the Budget, and several other government agencies. The reports are critically important to the overall financial management of the government. For example, some are used by the Secretary of the Treasury in managing balance-of-payments and gold-flow problems. Still others are used to assist in determining when and to what extent the government must enter the open market to maintain a proper cash position.

Other centralized accounting functions carried out by the Center include deposit accounts on income tax withholding, Social Security deductions, and Servicemen's Group Life Insurance premiums. The Center monitors the accounting for payments and collections by country and category of transaction, in the International Balance of Payments Program. It also accounts, bills, collects, and reports on the Foreign Military Sales Program involving fifty-five participating countries.

The Center's financial mission is one of great magnitude. It maintains more than 2,000,000 accounts of one type or another and is now mailing out better than 9,000,000 checks a year. AFAFC pays the Air National Guard, the Air Force Reserve, and all retired members. All US Savings Bonds purchased by military members are issued from the Center.

To accomplish these tasks, the Center has two IBM 360-65 computers, each capable of storing internally nearly 3,000,000 characters of information. In addition, the computer system has the capability of storing externally, on line, another three billion characters, providing the Center with more than 5,000 hours of processing time each month.

Since money management is so important to Air Force members and to the global operations of the Air Force, the Center's continuing goal is to enhance its service mission in the disbursement of Air Force funds as well as in their accountability. ■

A SEPARATE OPERATING AGENCY

AIR FORCE AUDIT AGENCY

The Air Force Audit Agency (AFAA), a separate operating agency and a member of the Air Force Comptroller's organization, serves the internal audit needs of the Air Force. Its mission is to provide all levels of Air Force management with independent, objective, and constructive evaluations of the effectiveness and efficiency with which managerial responsibilities (including financial, operational, and support activities) are carried out.

This broad mission is delineated by public law, the General Accounting Office, the Department of Defense, and Air Force regulations. Under Title 10, USC 8014, the Air Force audit function is the responsibility of the Comptroller of the Air Force. This function is executed by the Air Force Audit Agency.

The Commander of the Air Force Audit Agency, Maj. Gen. Henry Simon, is also designated the USAF Auditor General. He reports directly to the Comptroller of the Air Force, and has direct lines of communication with the Assistant Secretary of the Air Force for Financial Management.

The Auditor General, his deputy —Trenton D. Boyd—and the Staff Directorates are located at Norton AFB, Calif. The Associate Auditor General—Orion Y. Row—and his staff represent and act for the Auditor General at Hq. USAF.

As of January 31, 1974, the AFAA had a total work force of 1,083 people (561 military and 522 civilian). This professional staff of 890 auditors and 193 clerical and support personnel is deployed at major USAF installations worldwide. By having auditors "where the action is," the AFAA maintains continual contact with all levels of Air Force management. This organizational posture permits instantaneous response to local management problems as well as conditions that are Air Force-wide in scope.

Air Force auditors examine policies, systems, and procedures related to the consumption of resources—men, money, and material. Their primary objective is to provide managers with increased visibility and additional alternatives for decision-making.

Operationally, the AFAA has three functional divisions and four geographic regions. The Acquisition Systems Division, headquartered at Andrews AFB, Md., serves the Air Force Systems Command (AFSC) and manages audit efforts at AFSC's buying divisions. The

Maj. Gen. Henry Simon assumed command of the Air Force Audit Agency in March 1973. He also has served as AFLC IG and Assistant DCS/Materiel Management, as well as in Defense Supply Agency and Hq. USAF materiel staff positions. General Simon was a pilot in the 1st Commando Group, CBI, during WW II.

Logistic Systems Division, Wright-Patterson AFB, Ohio, audits the functions and operations of the Air Force Logistics Command and supervises audits of the Air Logistics Centers. The Service-Wide Systems Division, collocated with AFAA Headquarters at Norton AFB, Calif., manages audits of standard automated Air Force-wide systems. This division manages audit offices at the Accounting and Finance Center, the Military Personnel Center, and the Data Systems Design Center.

The AFAA centrally directs multi-site integrated audits from its headquarters at Norton. These audits, managed by the functional divisions, are designed to evaluate programs and systems that are Air Force-wide in scope. Audit results are consolidated into Summary Reports of Audit for the highest levels of Air Force management and the Office of the Secretary of Defense.

Resident auditors use their knowledge of local programs and activities to provide increased management visibility to base-level managers. Results of their audits are also provided to major command level for use in trend analysis and management control.

The AFAA provides all commanders confidential, independent, and professional audit service through its Special Request Audits Program. The results of these commander-requested audits are reported only to the requester.

During Fiscal Year 1973, the AFAA issued forty-seven Summary Reports of Audit, 4,534 audit reports to major command and base-level managers, and 354 special request reports.

In Fiscal Year 1973, the AFAA implemented an audit resource management system that establishes priorities for the various elements of the audit work load. This system enables the Agency to identify and concentrate audit attention on those areas most vital to Air Force operations, including the Air Reserve forces.

AFAA plans for the ensuing year include a compressed planning cycle to ensure even greater responsiveness to changes in Air Force plans and programs. By continually refining its audit programs, the AFAA is meeting the challenge and providing real-time, action-oriented audit service to the managers of today's dynamic Air Force. ■

A SEPARATE OPERATING AGENCY

AIR FORCE DATA AUTOMATION AGENCY

The Air Force Data Automation Agency (AFDAA) was established as a separate operating agency on February 29, 1972, to provide centralized management and common organizational alignment of similarly engaged automatic data processing (ADP) activities. It is responsible for automatic data processing support to Hq. USAF, major commands, bases, Office of the Secretary of Defense (OSD), and other federal and separate operating agencies.

This agency, located at Gunter AFS, Ala., consists of a headquarters element and three subordinate centers: the Air Force Data Services Center (AFDSC), the Air Force Data Systems Design Center (AFDSDC), and the Federal Computer Performance Evaluation and Simulation Center (FEDSIM).

Maj. Gen. Jack B. Robbins, AFDAA Commander, is assigned to the Pentagon, where he serves in a dual capacity as the Air Force Director of Data Automation.

AFDAA, through its centers, participates in and performs ADP support, beginning with the conceptual stage of a system and extending through its operational life.

The operating philosophy of AFDAA assures a high degree of autonomy for the centers in carrying out their assigned missions. The organizational structure of AFDAA provides for proper management and grouping of data automation skills necessary to be responsive to major command requirements. Direct access to the centers by the activities served ensures prompt response to the users.

AFDAA's oldest organization is the Air Force Data Services Center. Formerly a field extension of the Air Staff, it is located in the Pentagon. It provides automatic data processing, computing, and management science services to Hq. USAF, OSD, and other agencies. It is also responsible for planning, designing, developing, and implementing computer-based management information systems in support of these agencies.

The largest organization under the AFDAA is the Air Force Data Systems Design Center (AFDSDC), established in 1967. It is responsible for designing, developing, and maintaining standard automated data systems assigned by Hq. USAF.

AFDSDC has a high degree of autonomy to conduct technical matters with the Air Staff and major commands. About 1,200 persons

Maj. Gen. Jack B. Robbins has been USAF's Director of Data Automation and Commander of AFDAA since September 1971. He also has served in AFOSI, the Electronics Systems Division of AFSC, and as Chief of Staff, AFCS. General Robbins is a former troop-carrier squadron commander.

are authorized. Major responsibilities of AFDSDC are to analyze, design, develop, program, test, initiate the use of, and maintain assigned automated data systems for standard management supporting systems; establish the use of common computer techniques approved by USAF for assigned automated data systems and recommend areas for additional applications; develop and maintain general-purpose software required by assigned systems.

AFDSDC also develops and recommends standards for programming languages; establishes documentation requirements for automated data systems according to Air Force policies; participates in the development of related standards for equipment; and acts as the Automatic Data Processing Systems Manager for base and major command Automated Data Processing Systems.

AFDAA's newest organization is the Federal Computer Performance Evaluation and Simulation Center (FEDSIM), which is unique in the government. Located in the Washington, D. C., area, it was established in February 1972 by the General Services Administration (GSA) to provide computer performance-evaluation services to all agencies of the federal government. Because of USAF's recognized expertise in this developing discipline, it was designated executive agent to operate this center for the GSA.

FEDSIM is financially underwritten by the GSA ADP fund to provide a source for advanced techniques of computer performance-evaluation services on a fully reimbursable basis. Projects include computer operations, analysis work for such agencies as the Internal Revenue Service and the Atomic Energy Commission, computer network and work-load analyses for the GSA, design of special-purpose computers for the Navy, and computer program analysis and improvement for numerous civil and military agencies.

FEDSIM has a full range of computer performance tools, including simulation languages and packages, hardware and software monitors, and analytical routines. New developments in the field are regularly applied to ensure that the center remains at the forefront of the state of the art in performance evaluation. ■

A SEPARATE OPERATING AGENCY

AIR FORCE INSPECTION AND SAFETY CENTER

"Strength through vigilance!"

This concise but far-reaching motto adorns the main entrance to a long, light green, attractively landscaped, single-story structure adjacent to the palm-lined parade grounds of Norton AFB, San Bernardino, Calif.

It is the home of the Air Force Inspection and Safety Center (AFISC), headquarters for more than 500 hand-picked men and women whose collective jobs are to provide the Chief of Staff, Gen. George S. Brown, with a continuous sampling of the overall effectiveness of the Air Force. So armed, he, his staff members, and his commanders around the world are able to make intelligent, day-to-day management decisions to assure the combat readiness of the Air Force in times of national emergency.

AFISC is a separate operating agency, and it and its predecessor organizations have been located at Norton since 1950. The AFISC commander, Maj. Gen. Ernest T. Cragg, also holds the Air Staff position of Deputy Inspector General for Inspection and Safety.

The Center has an authorized strength of 282 officers, fifty-six airmen, and 150 civilians, including fifty-two personnel stationed at Kirtland AFB, Albuquerque, N. M. An additional twenty-one persons are attached to the Center at Norton. These include exchange officers from Australia, Canada, and Germany, and safety engineering representatives from seven of America's major aerospace manufacturers.

AFISC is split into three primary mission directorates—Inspection, Aerospace Safety, and Nuclear Safety. It also has two support directorates—Management and Resources, and Data Automation—and the Office of Programs Control.

The Directorate of Inspection, headed by Brig. Gen. (Maj. Gen. selectee) Eugene E. Sterling, con-

Maj. Gen. Ernest T. Cragg has headed the Air Force Inspection and Safety Center since November 1973. He also is Deputy IG for Inspection and Safety, OIG, Hq. USAF. General Cragg is a former Vice Commander of SAC's Second Air Force. A command pilot, General Cragg flew P-38s and P-51s in Europe during WW II.

ducts worldwide inspections of Air Force commands, separate operating agencies, individual units, and contractor facilities.

Its specialty—and the backbone of the Air Force inspection program—is the "resource management inspection" (RMI). In this operation, a team of twelve to fifty specialists, frequently headed by a general officer, arrives unannounced at any Air Force base or facility on the globe. In five days, team members assess the effectiveness of selected activities at the base, summarize their observations, and prepare a written report for local, command, and Air Staff management. The results are generally immediate and positive.

The Directorate of Aerospace Safety, headed by Brig. Gen. Charles E. Yeager, has global responsibility for preventing and investigating USAF flight, ground, missile, space, and explosives accidents.

The Directorate publishes nearly 350,000 pieces of literature monthly. Included are the Air Force's *Driver* and *Aerospace Safety* magazines and the *Safety Officer's Study Kits. Driver* also is circulated to nearly 200,000 members of the Army, Navy, Marine Corps, and Coast Guard.

The Directorate monitors courses for officers of the Air Force in flight, missile, ground, systems, and command safety, which are taught at several of America's leading universities. Flight safety courses for personnel from forty-five allied nations also are monitored.

The Reporting and Documents Division is the nation's only repository for all USAF safety accident records; its microfilmed files date back to the first fatal military aircraft mishap in 1908.

The Directorate of Nuclear Safety is homogeneously located in the nuclear community at Kirtland AFB and is headed by Col. James H. Reddin. Its job is to develop and monitor Air Force policies, programs, and standards and procedures for preventing and investigating nuclear-related accidents and incidents. This mandate covers nuclear weapons, reactors, and propulsion systems.

Rounding out the Center's many capabilities at Norton is a third-generation computer complex, which provides immediate data from its numerous memory banks in response to official Air Force requests from around the world for inspection and safety information.

AFISC's people represent nearly every vocational specialty in the Air Force. Their jobs are tough, challenging, often frustrating, and sometimes unpopular. But the payoff is big savings in manpower, materiel, and money. ■

A SEPARATE OPERATING AGENCY

AIR FORCE TEST AND EVALUATION CENTER

Chief of Staff Gen. George S. Brown has directed that a separate Air Force operating agency be established to manage the Air Force operational test and evaluation (OT&E) program. This organization, the Air Force Test and Evaluation Center (AFTEC), is scheduled to become fully operational in September 1974. The two primary objectives for creating AFTEC are to:

- Strengthen the Air Force's capability to conduct realistic and independent OT&E.
- Satisfy recommendations in the Blue Ribbon Defense Panel Report, various GAO reports, and the Commission on Government Procurement Report that each military department establish an OT&E agency independent of both the developer and the user.

General Brown recently stated the importance of the AFTEC mission, to manage the Air Force OT&E program, when he told the Senate Armed Services Committee: "We acknowledge that an independent OT&E organization would improve objectivity in making procurement decisions for major weapon systems. We have, therefore, established the Air Force Test and Evaluation Center from available resources to conduct OT&E programs and report test results to me. Those test results and the AFTEC commander's recommendations will be a primary factor in decisions on future Air Force weapon systems."

AFTEC, located at Kirtland AFB, N. M., which will have 208 people assigned, is commanded by Maj. Gen. John J. Burns. As the Commander of AFTEC, General Burns is responsible for overseeing operational testing for the entire Air Force. This includes managing the operational tests of such Air Force aircraft as the A-10, B-1, F-15, and the Lightweight Fighter. AFTEC's specific functions are to design, plan, direct, analyze, evaluate and report independently on OT&E of major and designated nonmajor Air Force systems, and to develop

OT&E policy recommendations. AFTEC will strengthen the Air Force's capability to conduct realistic and independent OT&E and provide USAF with an OT&E agency independent of both the developer and the user. ■

Maj. Gen. John J. Burns was named the first Commander of the new Air Force Test and Evaluation Center in December 1973. Previously, he had served as Director of Operational Requirements and Development Plans, Hq. USAF, and commanded TAC's Twelfth Air Force. The General flew more than 100 fighter combat missions each in WW II, Korea, and SEA.

AFTEC, which will be fully operational in September, will manage operational testing of USAF systems, including the A-10 (above).

A SEPARATE OPERATING AGENCY

AIR FORCE MILITARY PERSONNEL CENTER

Whether you call it "MPC," "The PERS Center," or "The People Place," really doesn't matter. Every bluesuiter will know you're referring to the Air Force Military Personnel Center (AFMPC), located at Randolph AFB, Tex. They'll know, because the Center, the operating arm of the Air Force Deputy Chief of Staff/Personnel, is responsible for implementing all personnel actions for airmen and officers below the grade of colonel, and for the development and implementation of morale, welfare, and recreation programs.

Whether entering through the gates of Lackland AFB, pinning on their first stripes, traveling to a new duty assignment, or completing their retirement papers, Air Force men and women continually benefit from the improved "people" programs effected by the Air Force.

This "people" orientation is readily seen in such programs as: Consolidated Base Personnel Office (CBPO) Customer Service Centers; Officer Career Development Program; PALACE FLICKS; Weighted Airman Promotion System (WAPS); Join Spouse Program; and the PALACE TEAM concept of personnel management.

During 1973, the Center added new "people" emphasis with such efforts as expansion of the Airman Assignment Exchange Program to include airmen serving in overseas long-tour areas; establishment of the Air Force Retiree Council; revision of the overseas assignment

Maj. Gen. Travis R. McNeil has commanded the Air Force Military Personnel Center since June 1973. In this role, he also is Assistant DCS/Personnel for Military Personnel, Hq. USAF. He flew 154 missions in SEA as an F-4 pilot and has served as Commander, Air Forces Korea. He is a graduate of the National War College.

selection policy for career airmen with an approved retirement date or limited retainability under the TOP-CAP "high year of tenure" provisions to preclude forced retirement at a CONUS port; awarding short-tour credit and a new short-tour return date for 300 or more days overseas TDY within a fifteen-month period; extension of the personalized E-8 and E-9 assignment service to include E-7s and E-7 selectees; normalization of SEA assignments so that Thailand tours are now treated like any other overseas short tour; and a twenty-four-hour answering service for the Center's officer career development managers.

To implement Air Force Personnel Programs and Policies, the Personnel Center staff works through the MAJCOM/SOA Directors of Personnel and a worldwide network of 140 CBPOs and special services offices. These are the "action" offices for individual Air Force members—their personal personnel experts.

Although computers are used to expedite personnel actions, it's "personnel people working for people" who make the decisions at the Center. Maj. Gen. Travis R. McNeil, Air Force Assistant DCS/Personnel for Military Personnel and Center Commander, emphasized this recently when he said: "Our goal is to make this personnel business as 'personal' as possible. We're dealing with the Air Force's most valuable resource—people—and we're determined to do everything we can to help them."

Building 499 at Randolph may look like any other building on the base, but those words over the main entrance, "Air Force Military Personnel Center," speak for themselves. It's the "People Place." ■

A SEPARATE OPERATING AGENCY

AIR FORCE OFFICE OF SPECIAL INVESTIGATIONS

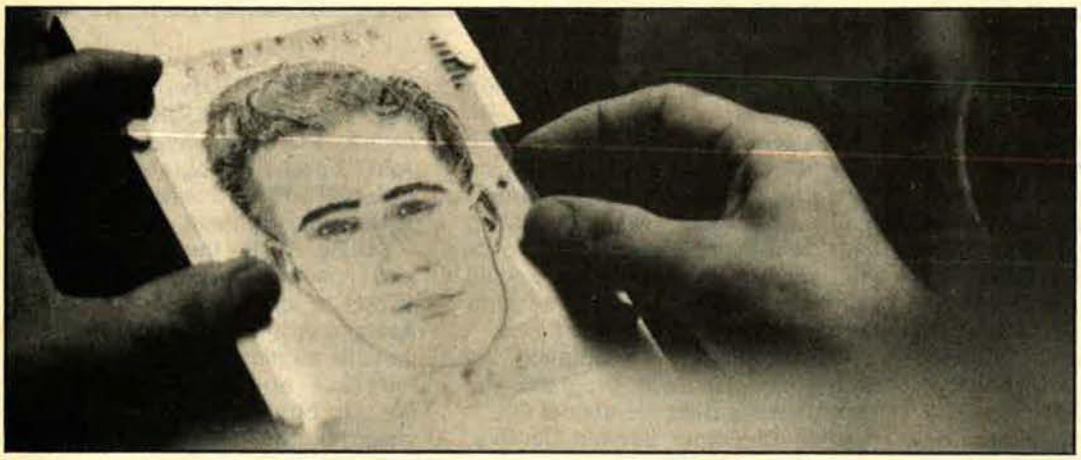
When any USAF commander needs assistance in dealing with criminal, fraud, or counterintelligence activities, he requests the help of the Air Force Office of Special Investigations (AFOSI).

AFOSI provides professional investigators to ferret out the facts and present them to the commander in detailed, objective reports of investigation. The commander, in turn, takes the action he deems appropriate.

While AFOSI's 1,859 special agents and administrative people provide services to commanders around the world, the organization itself is administered through its own centrally directed chain of command. Operational control is maintained from Headquarters AFOSI in Washington, D. C., over thirty-one districts and 135 detachments and operating locations worldwide.

To perform its mission, AFOSI divides its investigative task into three major categories and administers investigations through the Criminal, Fraud, and Special Operations directorates.

The Criminal Directorate investigates criminal offenses committed



Using an identi-kit, an AFOSI Special Agent builds a composite picture of a suspect, based on a description given by a witness. (USAF photo by Jim Thomas)

Brig. Gen. (Maj. Gen. selectee) William A. Temple has been Commander of the Air Force Office of Special Investigations since April 1972. Previously, he served as an Assistant Judge Advocate for Alaskan Air Command; in OSAF and OSD; and in Hq. SAC. Prior to joining OSI in 1971, he commanded a SAC bomb wing.

against persons, their property, or the Air Force. Generally, jurisdiction is limited to crimes committed on Air Force installations by persons subject to the Uniform Code of Military Justice. Included are offenses ranging from housebreaking to homicide. To aid in criminal fact finding, AFOSI directs the Air Force polygraph program, which recruits, trains, and uses polygraph examiners throughout the Air Force. The Criminal Directorate also operates the Air Force terminal to the FBI National Crime Information Center, and directs a criminal intelligence collection program geared to keep Air Force commanders apprised of patterns or trends in criminal activity.

The Fraud Directorate is responsible for the direction and staff supervision of criminal investigations and investigations of serious administrative irregularities and violations of public trust primarily involving Air Force procurement, disposal, nonappropriated fund activities, and finance matters. Additionally, this directorate is responsible for the supervision of OSI investigative surveys. Such surveys are in-depth probes or test checks to determine the existence, location, and extent of fraud, violations of public trust, and major administrative irregularities in Air Force operations or programs.

The Directorate also is charged with coordinating criminal investigative support to the Army and Air Force Exchange Service, AFOSI having been designated the Executive Agency for such support.

The Directorate of Special Operations is primarily concerned with countering threats to Air Force security posed by foreign intelligence services. This includes the investigation of all instances of espionage, sabotage, treason, sedition, terrorism, and major security violations. Related activities include the physical protection of senior Air Force and other designated US government officials.

Counterintelligence also involves the centrally directed collection, analysis, and dissemination of information on subversive activities directly affecting the security and discipline of Air Force commands.

Since many investigations extend beyond Air Force personnel or the boundaries of an Air Force base, AFOSI must maintain close liaison with other international, federal, state, and local investigative agencies in order to present complete investigative reports to Air Force commanders. Thus, AFOSI special agents coordinate their investigative efforts with the Army, Navy, FBI, the Secret Service, and such counterpart foreign agencies as the Royal Canadian Mounted Police Security Service, the Royal Thai OSI, and New Scotland Yard.

To accomplish its investigative task, AFOSI selects and trains its own special agents from among the most highly qualified Air Force officers, NCOs, and civilians. Selectees attend a mandatory ten week investigator's course at the Air Force Special Investigations School in Washington, D. C. The course includes some 350 hours of administrative, investigative, and military law work. At graduation, students are awarded badges and official credentials as special agents of AFOSI.

After a minimum of one year in the field, many agents return to school for advanced or specialized training to further enhance their investigative professionalism. ■

This plaster shoe impression, being made by an AFOSI Special Agent, can provide valuable information about the height and weight of a suspect. (USAF photo by Jim Thomas)

A SEPARATE OPERATING AGENCY

AIR FORCE RESERVE

Modernization of the Air Force Reserve under the Total Force Policy continues with conversions to newer weapon systems and establishment of a separate recruiting organization to meet personnel needs in the no-draft environment. As an important part of the total Air Force capability, the Air Force Reserve is poised to provide combat-ready units and trained individuals in time of war or national emergency, or in the event of increased world tensions.

The Air Force Reserve (AFRES) command is headquartered at Robins AFB, Ga., and administers a nationwide program ranging from civil engineering units to aeromedical evacuation organizations. Flying unit missions include military and tactical airlift, airborne early warning and control, aerospace rescue and recovery, special operations, and tactical fighter.

Aircraft flown include the C-130 Hercules transport, A-37 Dragonfly attack aircraft, F-105 Thunderchief fighter-bomber, C-123 Provider, C-7 Caribou, HC-130 Rescue Hercules, EC-121 Warning Star, and the HH-1H Iroquois and C/HH-3E Jolly Green Giant helicopters.

During 1973, AFRES units flew 6,316 missions in which productive airlift was provided as a by-product of training requirements. These missions included airlifting 65,350 passengers for 67,757,709 passenger miles and 5,831 tons of cargo for 5,592,391 cargo miles. In addition, 30,897 troops and 354 tons of cargo were airdropped.

Maj. Gen. Homer I. Lewis became Chief of the Air Force Reserve and Commander, Hq. Air Force Reserve, in April 1971 and March 1972, respectively. Prior to his active-duty post, he was Reserve Deputy to the Commander, Headquarters Command, USAF. Following a WW II stint with B-17 units In Europe, he held AFRES positions.

Reservists also fly and maintain MAC's first-line C-141 StarLifter, C-5 Galaxy, and C-9 Nightingale flying hospital aircraft under the Reserve's associate unit program. In these units, Reservists work with active-duty crews or form complete Reserve teams to perform MAC missions.

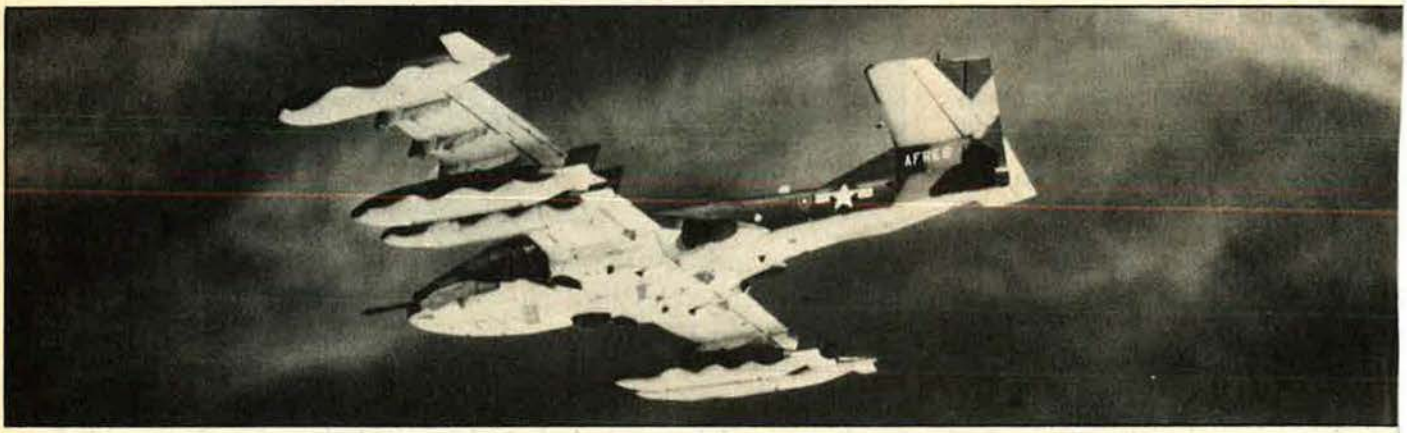
The Air Force Reserve regularly makes aeromedical evacuation flights, transporting patients to hospitals throughout the United States.

AFRES units also participate in a variety of domestic-action projects, ranging from spray operations to curb a disease epidemic in Central America to emergency construction following a natural disaster.

Nonflying organizations include all support elements of the flying units, in addition to medical service, aeromedical evacuation, civil engineering, mobile maintenance, and supply and aerial port units.

To provide top manning for Air Force Reserve units, Reserve recruiters are conducting a vigorous campaign to enlist personnel with prior military service as well as those with no previous duty. In 1973, 6,012 Reservists were recruited.

The ability of the Air Force Reserve to fulfill its mission has been demonstrated during the Korean, Berlin, Cuban, Dominican Republic, and *Pueblo* crises. In those instances, and in the Vietnam conflict, Reservists have performed outstandingly in support of the active Air Force. ■



In addition to flying and maintaining the full range of USAF airlift aircraft, AFRES units have AEW&C and air rescue and recovery missions, as well as operating F-105s and A-37s like this one.

AIR FORCE RESERVE FLYING WINGS AND ASSIGNED UNITS

AIR FORCE RESERVE REGION	WING HQ.	GROUP	SQUADRON	TYPE AIRCRAFT	LOCATION
			79th AEW&CS	C-121	Homestead AFB, Fla.
	94th TAW	918th TAG	700th TAS	C-7	Dobbins AFB, Ga.
		908th TAG	357th TAS	C-7	Maxwell AFB, Ala.
	302d TAW	906th TAG	355th TAS	C-123	Lockbourne AFB, Ohio
		907th TAG	356th TAS	C-123	Lockbourne AFB, Ohio
		911th TAG	758th TAS	C-123	Greater Pittsburgh AP, Pa.
	403d TAW	927th TAG	63d TAS	C-130	Selfridge ANG Base, Mich.
		913th TAG	327th TAS	C-130	Willow Grove NAS, Pa.
		914th TAG	328th TAS	C-130	Niagara Falls Int'l AP, N. Y.
Eastern Region (Hq., Dobbins AFB, Ga.)	439th TAW	901st TAG	731st TAS	C-123	Westover AFB, Mass.
		905th TAG	337th TAS	C-130	Westover AFB, Mass.
	459th TAW	909th TAG	756th TAS	C-130	Andrews AFB, Md.
		919th TAG	711th TAS	C-130	Eglin AFB, Fla. (Aux. 3)
		920th TAG	815th TAS	C-130	Keesler AFB, Miss.
	315th MAW (A)		300th MAS (Assoc)	C-141	Charleston AFB, S. C.
			701st MAS (Assoc)	C-141	Charleston AFB, S. C.
			707th MAS (Assoc)	C-141	Charleston AFB, S. C.
	512th MAW (A)		326th MAS (Assoc)	C-5A	Dover AFB, Del.
			709th MAS (Assoc)	C-5A	Dover AFB, Del.
	514th MAW (A)		335th MAS (Assoc)	C-141	McGuire AFB, N. J.
			702d MAS (Assoc)	C-141	McGuire AFB, N. J.
			732d MAS (Assoc)	C-141	McGuire AFB, N. J.
		932d AMAG (Assoc)	73d AMAS (Assoc)	C-9	Scott AFB, Ill.
	301st TFW		457th TFS	F-105	Carswell AFB, Tex.
			465th TFS	F-105	Tinker AFB, Okla.
			466th TFS	F-105	Hill AFB, Utah
	433d TAW	921st TAG	67th TAS	C-130	Kelly AFB, Tex.
		922d TAG	68th TAS	C-130	Kelly AFB, Tex.
		924th TAG	704th TAS	C-130	Ellington AFB, Tex.
			705th TATS		Ellington AFB, Tex.
Central Region (Hq., Ellington AFB, Tex.)	434th TFW	930th TFG	45th TFS	A-37	Grissom AFB, Ind.
		931st TFG	46th TFS	A-37	Grissom AFB, Ind.
		910th TFG	757th TFS	A-37	Youngstown Municipal AP, Ohio
		917th TFG	47th TFS	A-37	Barksdale AFB, La.
	440th TAW	933d TAG	95th TAS	C-130	Gen. Billy Mitchell Field, Wis.
		928th TAG	64th TAS	C-130	O'Hare Int'l AP, Ill.
		934th TAG	96th TAS	C-130	Minneapolis-St. Paul Int'l AP, Minn.
	442d TAW	935th TAG	303d TAS	C-130	Richards-Gebaur AFB, Mo.
		936th TAG	304th TAS	C-130	Richards-Gebaur AFB, Mo.
		926th TAG	706th TAS	C-130	New Orleans NAS, La.
			302d SOS	CH-3E	Luke AFB, Ariz.
	349th MAW (A)		301st MAS (Assoc)	C-5A	Travis AFB, Calif.
			312th MAS (Assoc)	C-5A	Travis AFB, Calif.
			708th MAS (Assoc)	C-141	Travis AFB, Calif.
			710th MAS (Assoc)	C-141	Travis AFB, Calif.
Western Region (Hq., Hamilton AFB, Calif.)	445th MAW (A)		728th MAS (Assoc)	C-141	Norton AFB, Calif.
			729th MAS (Assoc)	C-141	Norton AFB, Calif.
			730th MAS (Assoc)	C-141	Norton AFB, Calif.
	446th MAW (A)		97th MAS (Assoc)	C-141	McChord AFB, Wash.
			313th MAS (Assoc)	C-141	McChord AFB, Wash.
	452d TAW	904th TAG	336th TAS	C-130	Hamilton AFB, Calif.
		940th TAG	314th TAS	C-130	McClellan AFB, Calif.
			301st ARRS	HH-1H/HH-3E	Homestead AFB, Fla.
			303d ARRS	HC-130	March AFB, Calif.
			304th ARRS	HH-1H	Portland Int'l AP, Ore.
			305th ARRS	HC-130	Selfridge ANG Base, Mich.

AEW&CS	Airborne Early Warning & Control Squadron
AMAG (Assoc)	Aeromedical Airlift Group (Assoc)
ARRS	Aerospace Rescue & Recovery Squadron
MAW/S	Military Airlift Wing/Squadron
SO/S	Special Operations/Squadron
TATS	Tactical Airlift Training Squadron
TAW/G/S	Tactical Airlift Wing/Group/Squadron
TFW/G/S	Tactical Fighter Wing/Group/Squadron

VITAL ADJUNCT TO THE ACTIVE-DUTY FORCE

AIR NATIONAL GUARD

The primary mission of the Air National Guard is to train and to guarantee the immediate availability of combat-ready units as needed by the Air Force.

The Air National Guard also affords each of the fifty states an organized military body for its use. This feature of the ANG—a dual responsibility to the state and to the nation—is a requirement specified in the United States Constitution and Title 32, United States Code.

Under federal law, Air Guard units are organized, trained, and equipped in a nonmobilized, combat-ready status for immediate service as required. The Air National Guard is a primary source of added strength and equipment to help the US Air Force in times of war or national emergency, and its resources are devoted to training and performing meaningful missions for the Department of Defense.

In assisting the Air Force to fulfill its peacetime mission, the ANG provides a major portion of the air defense of the United States and Puerto Rico and the entire air defense of Hawaii.

With the end of US participation in the Vietnam War and the intensified emphasis placed on the Air Reserve Forces, the Air National Guard continues to modernize. Two units have already received the A-7D Corsair II with a third unit scheduled to convert to this aircraft in the near future. Two ANG units recently received the EB-57 and converted to a Defensive Systems Evaluation mission for the Aerospace Defense Command.

In its state mission, the Air Guard is invaluable in assisting local authorities during natural disasters and in a multitude of other daily emergencies. For example, its aircraft are used in airlifting to safety the victims of hurricanes, tornadoes, and floods, and in transporting vital supplies to stricken areas. Air Guardsmen have many times used their skills in providing vital communications to areas that have been isolated by disasters.

The transition from state to federal status may be accomplished in several ways. Air Guard units are available for federal service by call or order of the President, upon declaration of war by Congress, or when otherwise authorized by law.

All Air Guard units are assigned, for mobilization purposes, to active major Air Force air commands which, during peacetime, establish training standards, advise units on tactical standards, and inspect for compliance. Upon mobilization, Air Guard units take their place in the organizational structure of their respective gaining commands: TAC, ADC, MAC, AFCS, PACAF, and AAC. The Air Guard is involved in many Air Force mission areas, with prime emphasis placed on tactical, aerospace defense, and communications functions.

All Guardsmen, by statutory requirement, participate in forty-eight unit training assemblies per year and fifteen days of annual training—a minimum requirement to assure that units and individuals are trained and available for immediate active service. Pilots and aircrews receive up to thirty-six additional flying-training periods to maintain required readiness or proficiency.

The current Air Guard force structure includes twenty-four wings, ninety-two flying squadrons plus support units, and 295 specialized, nonflying, ground-support organizations. The flying squadrons operate twenty different types of mission aircraft and eight types of support aircraft.

The Air Guard maintains federal equipment and vehicles valued at $3.5 billion and has an annual federal appropriation of about $712 million. Each state provides substantial additional support in both funds and facilities.

Air Guard personnel total more than 90,000 men and women, serving in all fifty states, the District of Columbia, and Puerto Rico. ■

Maj. Gen. John J. Pesch became Director, ANG, on April 20, replacing retiring Maj. Gen. I. G. Brown. He previously served as Deputy Director. General Pesch's long ANG experience, in active-duty and other posts, dates back to 1947. During World War II, he flew a combat tour with Eighth Air Force in England.

Members of a Connecticut Air National Guard F-100 unit practice weapons loading as part of their readiness training.

THE AIR NATIONAL GUARD BY MAJOR COMMAND ASSIGNMENT

(As of end of FY '74)

TACTICAL AIR COMMAND

F-100 Super Sabre

103rd Tac Fighter Gp.	Windsor Locks, Conn.
104th Tac Fighter Gp.	Westfield, Mass.
114th Tac Fighter Gp.	Sioux Falls, S. D.
116th Tac Fighter Gp.	* Dobbins AFB, Ga.
122nd Tac Fighter Gp.	Fort Wayne, Ind.
127th Tac Fighter Gp.	*** Selfridge ANGB, Mich.
131st Tac Fighter Gp.	St. Louis, Mo.
132nd Tac Fighter Gp.	Des Moines, Iowa
138th Tac Fighter Gp.	Tulsa, Okla.
149th Tac Fighter Gp.	San Antonio, Tex.
159th Tac Fighter Gp.	** New Orleans, La.
178th Tac Fighter Gp.	Springfield, Ohio
179th Tac Fighter Gp.	Mansfield, Ohio
180th Tac Fighter Gp.	Toledo, Ohio
181st Tac Fighter Gp.	Terre Haute, Ind.
185th Tac Fighter Gp.	Sioux City, Iowa
188th Tac Fighter Gp.	Fort Smith, Ark.
162nd Tac Fighter Tng. Gp.	Tucson, Ariz.

RF-101 Voodoo

123rd Tac Recon Gp.	Louisville, Ky.
152nd Tac Recon Gp.	Reno, Nev.
186th Tac Recon Gp.	Meridian, Miss.
189th Tac Recon Gp.	* Little Rock AFB, Ark.

F-104 Starfighter

156th Tac Fighter Gp.	San Juan, P. R.

F-105 Thunderchief

108th Tac Fighter Gp.	* McGuire AFB, N. J.
113th Tac Fighter Gp.	* Andrews AFB, Md.
192nd Tac Fighter Gp.	Sandston, Va.
184th Tac Fighter Tng. Gp.	* McConnell AFB, Kan.

F-4 Phantom

183rd Tac Fighter Gp.	Springfield, Ill.

RF-4 Phantom

117th Tac Recon Gp.	Birmingham, Ala.
155th Tac Recon Gp.	Lincoln, Neb.
187th Tac Recon Gp.	Montgomery, Ala.

A-7D Corsair II

121st Tac Fighter Gp.	* Lockbourne AFB, Ohio
140th Tac Fighter Gp.	*** Denver, Colo. (Buckley ANGB)
150th Tac Fighter Gp.	* Kirtland AFB, N. M.

A-37B Dragonfly

174th Tac Fighter Gp.	Syracuse, N. Y.
175th Tac Fighter Gp.	Baltimore, Md.

KC-97L

126th Air Refueling Gp.	Chicago, Ill.
128th Air Refueling Gp.	Milwaukee, Wis.
134th Air Refueling Gp.	Knoxville, Tenn.
136th Air Refueling Gp.	** Dallas, Tex.
139th Air Refueling Gp.	St. Joseph, Mo.
151st Air Refueling Gp.	Salt Lake City, Utah
160th Air Refueling Gp.	* Lockbourne AFB, Ohio
161st Air Refueling Gp.	Phoenix, Ariz.
171st Air Refueling Gp.	Pittsburgh, Pa.

C-119 Flying Boxcar/U-10D Courier

129th Special Operations Gp.	Hayward, Calif.
130th Special Operations Gp.	Charleston, W. Va.
143rd Special Operations Gp.	Providence, R. I.

EC-121 Warning Star

193rd Tac Electronic Warfare Gp.	Olmsted, Pa.

C-123J Provider

176th Tac Airlift Gp.	Anchorage, Alaska

C-130 Hercules

109th Tac Airlift Gp.	Schenectady, N. Y.
118th Tac Airlift Gp.	Nashville, Tenn.
133rd Tac Airlift Gp.	St. Paul, Minn.
145th Tac Airlift Gp.	Charlotte, N. C.
146th Tac Airlift Gp.	Van Nuys, Calif.
153rd Tac Airlift Gp.	Cheyenne, Wyo.
157th Tac Airlift Gp.	* Pease AFB, N. H.
166th Tac Airlift Gp.	Wilmington, Del.
167th Tac Airlift Gp.	Martinsburg, W. Va.
172nd Tac Airlift Gp.	Jackson, Miss.
195th Tac Airlift Gp.	Van Nuys, Calif.

C-7 Caribou

170th Tac Airlift Gp.	* McGuire AFB, N. J.

O-2 Super Skymaster

105th Tac Air Support Gp.	White Plains, N. Y.
110th Tac Air Support Gp.	Battle Creek, Mich.
111th Tac Air Support Gp.	** Willow Grove, Pa.
135th Tac Air Support Gp.	Baltimore, Md.
182nd Tac Air Support Gp.	Peoria, Ill.

AEROSPACE DEFENSE COMMAND

F-101 Voodoo

101st F-I Gp.	Bangor, Me.
107th F-I Gp.	Niagara Falls, N. Y.
119th F-I Gp.	Fargo, N. D.
141st F-I Gp.	Spokane, Wash.
142nd F-I Gp.	Portland, Ore.
148th F-I Gp.	Duluth, Minn.

F-102 Delta Dagger

106th F-I Gp.	Suffolk County, N. Y.
112th F-I Gp.	Pittsburgh, Pa.
115th F-I Gp.	Madison, Wis.
124th F-I Gp.	Boise, Idaho
125th F-I Gp.	Jacksonville, Fla.
144th F-I Gp.	Fresno, Calif.
147th F-I Gp.	* Houston, Tex. (Ellington AFB)
154th F-I Gp.	* Hickam AFB, Hawaii
163rd F-I Gp.	Ontario, Calif.
169th F-I Gp.	*** McEntire ANGB, S. C.

F-106 Delta Dart

102nd F-I Gp.	*** Otis AFB, Mass.
120th F-I Gp.	Great Falls, Mont.
177th F-I Gp.	Atlantic City, N. J.
191st F-I Gp.	*** Selfridge ANGB, Mich.

EB-57

158th DSE Gp.	Burlington, Vt.
190th DSE Gp.	* Forbes AFB, Kan.

MILITARY AIRLIFT COMMAND

C-124C Globemaster II

137th Military Airlift Gp.	Oklahoma City, Okla.
164th Military Airlift Gp.	Memphis, Tenn.
165th Military Airlift Gp.	Savannah, Ga.

* Tenant unit on active Air Force base
** Tenant unit on Naval Air station
*** Operated by Air National Guard

Note: All other units collocated on state, county, or municipal airports.

A SEPARATE OPERATING AGENCY

AIR RESERVE PERSONNEL CENTER

The Air Reserve Personnel Center (ARPC) observed its twentieth anniversary on March 1 of this year. The occasion marked twenty years of outstanding service to the Air Force and individuals, highlighted by receipt of the Air Force Outstanding Unit Award.

The Center's primary mission is mobilization of Reserve forces. ARPC played a large role in mobilizations for the Berlin buildup in 1961, the Cuban crisis in 1962, and the *Pueblo* incident of 1968. Today, new techniques and modernization of equipment allow the Center to mobilize Reservists faster than ever before.

The Total Force Policy put into effect during 1973 has added a new dimension to the continuing efforts of the ARPC to improve management/administration of the Air Force Reserve. These efforts include establishing a Career Development Office, creating and expanding the ARPC Recruiting Command Post, improving the ARPC Air Force Reserve Policy Council as well as the ANG/AFR NCO Advisory Panel, assuming management of the Air Force Reserve Medical (MA) Program, establishing the new Reserve Supplement Officer (RSO) Program, planning for the change to the Air Force Advanced Personnel Data System (APDS), and many other internal improvements designed to help the Center better serve the Air Force.

ARPC's Career Development Office, which has been partially working for more than a year, will be in full operation in July. This function represents a "first" for the ARPC and will be similar to that of the active force.

The ARPC Recruiting Command Post has been providing service in many areas, including the successful "Palace Chase" program in which active-duty personnel switch to the Reserve and Guard in return for more service obligation time. Staffed by a mixture of Reservists, Guardsmen, and active-duty and civilian personnel, the Recruiting Command Post has responsibility for Central Vacancy Control and the ARPC "Action Line." Air Force Reservists with questions regarding their records or career can call the ARPC Action Line free from anywhere in the US (800-525-9984 outside Colorado; 800-332-9952 within Colorado).

Col. Benjamin S. Catlin III has commanded ARPC since February 1970. Previously, he was Executive to the Chief of the Air Force Reserve. In Vietnam, he headed Advisory Team No. 1 and flew 169 combat hours in three major campaigns. A WW II B-24 and B-29 pilot, Colonel Catlin later saw service with MATS.

The ARPC Air Force Reserve Policy Council and the ANG/AFR NCO Advisory Panel meet at the Center twice a year. They provide a direct line to the highest level of the Air Force for people who believe changes are needed. Council agenda items should be submitted to the Resident Secretary, ARPC Air Reserve Policy Council (CVR) and ANG/AFR NCO Advisory Panel (CVR), 3800 York St., Denver, Colo. 80205.

In June 1973, the ARPC's Surgeon's Office assumed management of the Air Force Reserve Medical (MA) Program. The Chaplain and Judge Advocate General (JAG) of the Center already function as single managers of their respective Reserve programs. The ARPC Office of Information manages the nationwide Air Reserve Information Squadron Program.

A completely new program established late last year at the Center was the RSO Program. Reserve Supplement Officers (RSOs) will replace rated active-duty officers when they are called back to the cockpit. RSO positions are available in the administration, personnel, intelligence, engineering, and procurement fields.

Like the rest of the Air Force, the Air Reserve Personnel Center has been preparing for the new Advanced Personnel Data System (APDS). Under the system, all computer output formerly produced at the ARPC will now be generated by the Air Force Military Personnel Center at San Antonio, Tex., with the ARPC satellited to the system via remote terminal.

With all its efforts to improve management techniques and equipment, the ARPC still emphasizes the personal touch in its relations with Reservists. The computer will never become a substitute for human relations.

In the future, the Center looks forward to a new building to be located at Lowry AFB in Denver. Funds have been approved for the $20 million facility that will also be the home of the Air Force Accounting and Finance Center. The move is scheduled to take place in late 1975 or early 1976. ■

The Air Reserve Personnel Center maintains thousands of master personnel records in its file bank.

A SEPARATE OPERATING AGENCY

UNITED STATES AIR FORCE ACADEMY

The mission of the Air Force Academy (USAFA) is to educate and train career officers for the United States Air Force. Under the leadership of Lt. Gen. A. P. Clark, Superintendent, this is accomplished by providing instruction and experience to each cadet so that he graduates with the knowledge and character essential to leadership and with the motivation to become a career officer.

The Academy marks its twentieth anniversary this year. President Dwight D. Eisenhower signed the legislation authorizing the establishment of the Academy on April 1, 1954. Operations began at interim facilities at Denver's Lowry AFB, and the Cadet Wing moved to the permanent site near Colorado Springs in 1958.

After completion of a four-year course in academics, military training, and physical education, each cadet graduates with a bachelor of science degree and a regular commission as a second lieutenant in the US Air Force. Social, religious, and extracurricular activities round out the program.

Brig. Gen. William T. Woodyard, Dean of the Faculty, administers academic instruction in the basic and engineering sciences, the humanities, and the social sciences.

The all-military faculty numbers almost 600. Each member holds a master's degree, and thirty percent have earned doctorates in the subjects they teach.

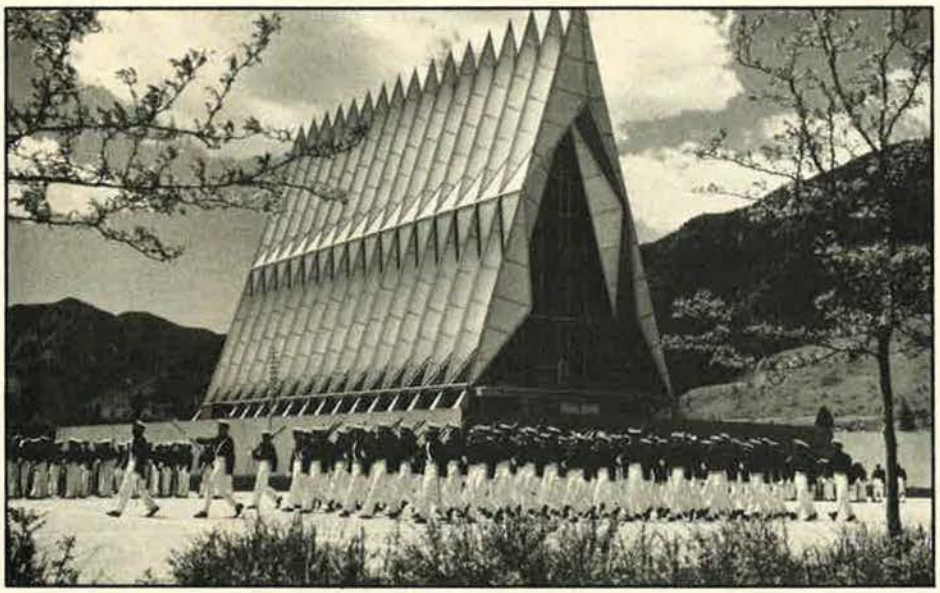
The Academy offers twenty-one academic majors, and each cadet must successfully complete one to graduate. All cadets are required to take at least 187 semester hours; approximately one fourth of the Cadet Wing participates in a special enrichment program, taking additional courses beyond those required.

Both the Academy and the Air Force identify the top fifteen percent of each graduating class so that they may be offered Air Force sponsorship for graduate education at a civilian institution in a field of their choice sometime between three and eight years after graduation. This sponsorship is contingent on their performance as officers and on a valid Air Force requirement for the graduate degree program they select.

Since its inception in 1955, the Academy has produced 7,789 graduates, including seventeen Rhodes scholars. About 816 cadets in the Class of 1974 will graduate on June 5.

The leadership and military training program is directed by Brig. Gen. Hoyt S. Vandenberg, Jr., Commandant of Cadets. Along with formal classes in professional military subjects, cadets gain leadership experience as cadet officers and noncommissioned officers at wing, group, squadron, and flight level.

The Cadet Wing, expected to reach its authorized strength of 4,442 next year, is divided into four groups of ten squadrons each. First classmen (seniors) hold cadet officer rank in command and staff positions. Underclassmen perform



A cadet squadron marches past the Air Force Academy Cadet Chapel. The Cadet Wing is expected to reach authorized strength of 4,442 next year.

progressively more responsible tasks in NCO positions.

Cadets spend the summer prior to their freshman year engaged in intensive military training and physical conditioning at the Academy. Succeeding summers are spent on field trips, leave, or back at the Academy serving in various upperclass leadership positions.

The cadets also participate in Operation Third Lieutenant, a three-week tour of duty with operational Air Force units at home and overseas.

Cadets receive airmanship training in several areas. All pilot-qualified first classmen learn to fly in the T-41, a 210-hp version of the Cessna 172. Many cadets volunteer to fly sailplanes, earning FAA private, commercial, and flight instructor glider ratings. Parachute training offers four advanced courses. Navigation courses, including flights in the T-29 aircraft, give cadets a basic understanding of navigation as a career specialty. Orientation flights in various aircraft introduce them to aerial operations.

Recent completion of parallel and crosswind runways, a control tower, and operations and maintenance buildings at the Academy's airstrip has vastly improved the facility.

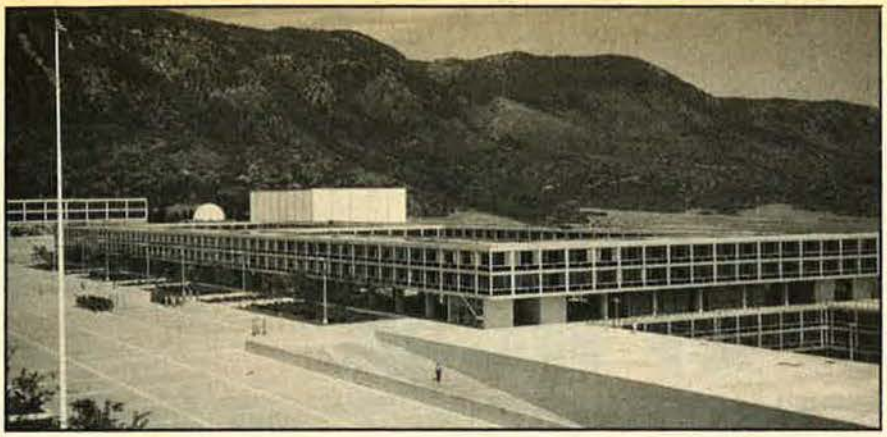
All cadets participate in physical education courses and varsity or intramural athletics. The Academy participates in eighteen different intercollegiate sports, playing teams

Pilot-qualified first classmen learn to fly the Cessna T-41. Many cadets also participate in the Academy's soaring and parachute training programs.

Lt. Gen. Albert P. Clark was appointed Superintendent of the Air Force Academy in August 1970. He previously had been Commander of Air University. General Clark has served with TAC, ADC, USAFE, and at Hq. USAF. A graduate of the National War College, he was a fighter pilot in Europe during WW II.

SUPERINTENDENTS OF THE AIR FORCE ACADEMY THROUGH THE YEARS

Lt. Gen. Hubert R. Harmon	July 27, 1954	July 27, 1956
Maj. Gen. James E. Briggs	July 28, 1956	Aug. 16, 1959
Maj. Gen. William S. Stone	Aug. 17, 1959	June 30, 1962
Maj. Gen. Robert H. Warren	July 1, 1962	June 30, 1965
Lt. Gen. Thomas S. Moorman	July 1, 1965	July 31, 1970
Lt. Gen. Albert P. Clark	Aug. 1, 1970	



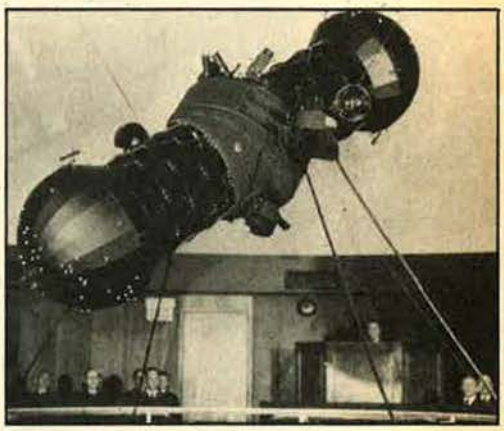
Vandenberg Hall is one of the cadet dormitories at the Academy. In the background are, from left, Harmon Hall, the administration building; the planetarium; and Arnold Hall, the cadet social center.

from all over the nation, including other service academies.

The falcon is the official mascot of the Cadet Wing, and the Academy's athletic teams are known as the Falcons. The Air Force Academy Athletic Association, a nonprofit, nongovernmental organization, gives financial support to all intercollegiate athletics.

The Air Force Academy Preparatory School is located on the Academy grounds. Here, selected Regular and Reserve Forces enlisted men spend a year of intensive study in math, English, and military training preparing for an Academy appointment. The schooling enables the cadet candidates to compete for high scores on the College Entrance Examination Board tests required for admission.

Academy admission requirements state that a young man must be at least seventeen years of age, and not yet twenty-two on July 1 of the year he is admitted. He must be a citizen of the United States, unmarried, of good moral character, and in good physical condition. He must show adequate academic preparation, demonstrated leadership potential, and have a desire to be a cadet and pursue a military career. Nominations to the Academy come through congressional or other authorized channels. ■

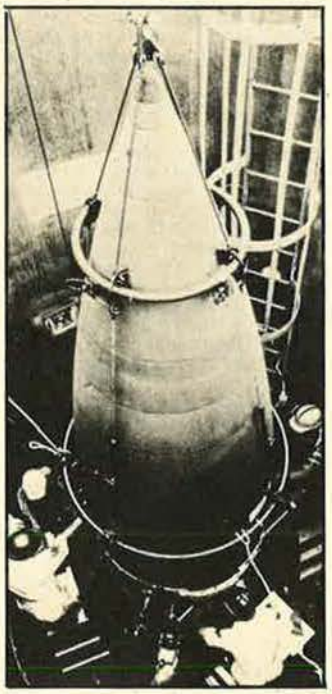


The Academy's planetarium is considered one of the finest in the country. Its projector is being used here by cadets in a navigation class.

President Eisenhower, after signing the Air Force Academy Act on April 1, 1954, shakes hands with then-Secretary of the Air Force Harold Talbott. Others, from left, include Rep. Carl Vinson; Gen. Nathan F. Twining, then USAF Chief of Staff; Rep. Dewey Short; Air Force Under Secretary James H. Douglas; and Lt. Gen. Hubert Harmon, who became the Academy's first superintendent.

UNITED STATES AIR FORCE AT WORK

These few pictures can do no more than suggest the diversity of people and jobs that make up the United States Air Force: 630,000 volunteers in uniform and 280,000 Air Force civilians managing a thousand missiles and eight thousand airplanes based round the globe and dedicated to the greatest of all causes—peace.



GALLERY OF USAF WEAPONS

By S. H. H. Young
ASSOCIATE COMPILER, JANE'S ALL THE WORLD'S AIRCRAFT
Edited by John W. R. Taylor
EDITOR, JANE'S ALL THE WORLD'S AIRCRAFT

Bombers

B-1 (composite)

B-52G landing at Guam

B-1

Development is continuing of this variable-geometry strategic bomber of blended wing/body configuration which, it is hoped, will eventually replace the B-52 force. The present development programme includes three aircraft which are in various stages of assembly, with the first B-1 approaching completion. Current plans call for beginning work on a fourth aircraft in November 1974, and possibly a fifth in Fiscal Year 1976. The B-1 is designed to cruise at least part of the way to its target at subsonic speed, then to attack at high subsonic speeds at low altitude or in an over-the-target supersonic dash at high altitude. A unique Low Altitude Ride Control system is incorporated to minimise the effects of turbulence likely in high-speed low-level operations. The four-man crew compartment will, in the event of emergency, function as an escape module. Among the weapons the B-1 can carry are the Short Range Attack Missile (SRAM) and the proposed Bomber Defence Missile (BDM), while protection is afforded by electronic jamming equipment, infra-red countermeasures, and other devices. First flight is scheduled for autumn 1974. USAF envisages production of 241 aircraft.

Contractor: Rockwell International Corporation, North American Aircraft Group.
Power Plant: four General Electric F101-GE-100 afterburning turbofan engines; each about 30,000 lb thrust.
Accommodation: four, in pairs.
Dimensions: span spread 137 ft 0 in, fully swept 78 ft 0 in, length overall 143 ft 0 in, height 34 ft 0 in.
Weight: gross 389,800 lb.
Performance (approx): max speed at 50,000 ft Mach 2.2, max range without refuelling 6,100 miles.
Armament: nuclear and conventional weapons; SRAMs on a rotary dispenser.

B-52 Stratofortress

Although the prototype XB-52 flew first more than 20 years ago, in October 1952, the SAC inventory continues to include about 450 of these eight-jet long-range bombers, most of them G and H models. A total of 744 production Stratofortresses were built between 1954 and 1962, with continual refinement and introduction of new equipment and more powerful engines resulting in a succession of variants. Those still operational are: **B-52D,** total of 170 built with J57-P-29W turbojet engines, with delivery from December 1956. **B-52F,** with uprated J57-P-43W engines, first flown in May 1958; 89 built; those remaining in inventory now used for training purposes. **B-52G,** introduced important changes including a redesigned wing containing integral fuel tankage, fixed underwing tanks, a new tail fin of reduced height and broader chord, a remotely controlled tail turret which allowed the gunner to be repositioned with the rest of the crew, and the ability to carry two AGM-28 Hound Dog air-to-surface missiles on missions of a round-trip range of more than 10,000 miles. Deliveries of the B-52G began in February 1959, and 193 were built. **B-52H,** the final version, switched to TF33 turbofan engines and had improved defensive armament, including a Vulcan multi-barrel tail gun and underwing pods of penetration rockets; 102 were built, with deliveries starting in May 1961. Under a major USAF programme initiated in 1971, the B-52Gs and Hs are being modified to carry 20 AGM-69A SRAM Short Range Attack Missiles, six under each wing and eight in the bomb-bay. (Data for B-52G.)

Contractor: The Boeing Aerospace Company.
Power Plant: eight Pratt & Whitney J57-P-43W turbojet engines; each 13,750 lb thrust.
Accommodation: two pilots, side-by-side, plus navigator, radar-navigator, ECM operator, and tail gunner.
Dimensions: span 185 ft 0 in, length 157 ft 7 in, height 40 ft 8 in.
Weight: gross 480,000 lb.
Performance (approx): max speed at 20,000 ft 660 mph, service ceiling 55,000 ft, range 10,000 miles.
Armament: four 0.50 calibre guns in tail turret; two AGM-28 Hound Dog air-to-surface missiles under wings; bombs and Quail diversionary missiles internally. Alternative provision for 20 SRAM missiles.

FB-111A

Two-seat medium-range strategic bomber version of the basic swing-wing F-111, de-

veloped originally to provide SAC with a replacement for some of its B-52C/F versions of the Stratofortress and the B-58A Hustler. The first production aircraft flew in July 1968, and the initial delivery was made in October 1969 to the 340th Bomb Group. Operational units equipped with the FB-111A are the 380th Strategic Aerospace Wing and the 509th Bomb Wing. Production of the 76 FB-111As ordered has been completed.

Contractor: General Dynamics Corporation.
Power Plant: two Pratt & Whitney TF30-P-7 turbofan engines; each 20,350 lb thrust with afterburning.
Accommodation: two, side-by-side.
Dimensions: span spread 70 ft 0 in, fully swept 33 ft 11 in, length 73 ft 6 in, height 17 ft 1.4 in.
Weight (approx): gross 100,000 lb.
Performance: max speed at 36,000 ft Mach 2.5, service ceiling more than 60,000 ft, range 4,100 miles with external fuel.
Armament: up to four AGM-69A SRAM air-to-surface missiles on external pylons, plus two in the weapons bay; provision for up to 31,500 lb of conventional bombs.

FB-111 carrying SRAM missiles

Fighters

F-4 Phantom II

Initially developed in the mid-1950s, several versions of this all-weather fighter have been supplied to USAF. The **F-4C** is a two-seat tactical fighter, developed from the basic F-4B naval version, with provision for a large external weapon load. Modifications included dual controls, an inertial navigation system, improved weapon aiming system, and boom flight refuelling, instead of drogue. First F-4C flew in May 1963. With deliveries completed by May 1966, the 583 aircraft ordered were deployed by TAC, PACAF, and USAFE for close-support, attack, and air-superiority duties. The **F-4D** was developed from the F-4C and replaced it in production. Major systems changes were introduced, including new weapon ranging and release computers to increase accuracy in air-to-air and air-to-surface weapon delivery. First F-4D flew in December 1965, with deliveries beginning in March 1966. A total of 825 aircraft was built, primarily for USAF, but 32 were supplied to Iran and 18 were transfered from USAF to the Republic of Korea. The **F-4E** is a multi-role fighter capable of performing air-superiority, close-support, and interdiction missions. A 20 mm Vulcan multi-barrel gun is fitted, together with an improved fire-control system in the nose, as a result of operational experience with earlier aircraft, some of which had been equipped with pod-mounted guns. An additional fuselage fuel tank extends the F-4E's radius of action. Leading-edge slats, as developed for the F-4F to improve manoeuvrability, are being retro-fitted to all the USAF's F-4Es. In addition, from early 1973, these models were being fitted with Northrop's target-identification system electro-optical (TISEO) as an aid to positive long-range visual identification of airborne or ground targets. Several hundred have been built for USAF. (Data for F-4E.)

Contractor: McDonnell Aircraft Company, Division of McDonnell Douglas Corporation.
Power Plant: two General Electric J79-GE-17 turbojets; each 17,900 lb thrust with afterburning.
Accommodation: pilot and weapons system operator in tandem.
Dimensions: span 38 ft 5 in, length 62 ft 10 in, height 16 ft 3 in.
Weights: empty 30,425 lb, gross 60,630 lb.
Performance: max speed at 40,000 ft Mach 2.27, range with typical tactical load 1,300 miles.
Armament: one 20 mm M-61A1 multi-barrel cannon; provision for up to four AIM-7E Sparrow and four AIM-9 Sidewinder air-to-air missiles, or up to 16,000 lb external stores.

F-4E Phantom

F-5E Tiger II

Although developed primarily to provide America's allies in Southeast Asia with an uncomplicated air-superiority tactical fighter, capable of relatively inexpensive maintenance and operation, foreign orders for this advanced version of the F-5 export aircraft have more than trebled the original estimated production figure of 325 aircraft. First flown in August 1972, the F-5E is basically a VFR day/night fighter with limited all-weather capability. The design emphasis is on manoeuvrability rather than high speed, notably with the incorporation of manoeuvring flaps. TAC, assisted by ATC, is training pilots and technicians of user countries. For this purpose, 20 F-5Es were supplied to USAF, beginning in April 1973 with the 425th TF Squadron, before the start of deliveries to foreign governments.

Contractor: Northrop Corporation, Aircraft Division.
Power Plant: two General Electric J85-GE-21 turbojet engines; each 5,000 lb thrust with afterburning.
Accommodation: pilot only.
Dimensions: span 26 ft 8 in, length 48 ft 3¾ in, height 13 ft 4½ in.
Weights: empty 9,588 lb, gross 24,080 lb.
Performance (at 13,220 lb): max level speed at 36,000 ft Mach 1.51, service ceiling 53,000 ft, ferry range with max fuel (with external tanks retained) 1,316 miles.
Armament: two AIM-9 Sidewinder missiles on wingtip launchers; two M-39A2 20 mm cannon in nose, with 280 rounds per gun; up to 7,000 lb of mixed ordnance can be carried on four underwing attachments and one under-fuselage station.

F-5E Tiger II

F-15 Eagle

Under the budget for FY 1974, authorisation has been given for the acquisition of another 62 F-15s, supplementing the initial 1973 funding for 30 aircraft for operational duties. First flown in July 1972, this single-seat fixed-wing all-weather fighter was designed specifically for an air-superiority role, but it also has an inherent air-to-surface attack capability. Specialised equipment includes a lightweight Hughes radar system for long-range detection and tracking of small high-speed objects operating at all heights down to treetop level, and for ensuring effective delivery of weapons, with a head-up display for close-in dog-fights; a Hazeltine interrogator for the IFF system to inform the pilot if an aircraft seen visually or on radar is friendly; and an inertial navigation system. By July 1973, seven F-15s were on flight status at Edwards AFB, Calif. The initial contract awarded in 1969, which had provided for 18 F-15s for development testing, also called for 2 **TF-15s:** basically a pilot training version, but which is being studied as a possible two-seat strike variant by USAF. The first TF-15 flew in July 1973.

Contractor: McDonnell Aircraft Company, Division of McDonnell Douglas Corporation.
Power Plant: two Pratt & Whitney F100-PW-100 turbofan engines; each 25,000 lb thrust.
Accommodation: pilot only.
Dimensions: span 42 ft 9¾ in, length 63 ft 9¾ in, height 18 ft 7¼ in.
Weight: gross about 40,000 lb.
Performance: max speed more than Mach 2, range more than 2,000 nautical miles.
Armament: one internally mounted M-61A1 20 mm multi-barrel gun; advanced model

F-15 Eagle

YF-16 Lightweight Fighter prototype

YF-17 Lightweight Fighter prototype

F-100 Super Sabre

F-101B Voodoo

F-102 Delta Daggers

Sidewinder and Sparrow air-to-air missiles carried externally. Provision for carrying electronic warfare pods on outboard wing stations.

Model 401 and P-600 (YF-16 and YF-17)

Each of these competing designs has been developed as a result of contracts awarded to General Dynamics Corporation and Northrop Corporation to build prototypes for evaluation under the USAF's Lightweight Fighter Prototype Program, aimed at determining the viability of developing a small lightweight low-cost air-superiority fighter.

YF-16 (Model 401)

Though of basically conservative configuration, the YF-16 incorporates advanced technological concepts, while particular emphasis has been necessarily placed on weight saving in order to achieve the requisite high performance from the single-engined design. Essential features include fly-by-wire control system; an inclined pilot's seat to improve g-force tolerance; provision of forebody strakes and automatically variable wing leading edges to maintain a high degree of lift during high angle of attack manoeuvres; and a blended wing/body. Provision for a great deal of flexibility in the prototype programme has been allowed for by a modular approach whereby advanced components can be flight-tested on the YF-16 with the minimum of structural disruption to the rest of the airframe. The two prototypes will carry minimal avionics to keep down weight and costs, but space for such equipment will be available. As much off-the-shelf equipment is being used as possible. The first YF-16 flew in February 1974.

Contractor: General Dynamics Corporation.
Power Plant: one Pratt & Whitney F100-PW-100 turbofan engine; about 25,000 lb thrust with afterburning.
Accommodation: pilot only.
Dimensions: span 30 ft 0 in, length 47 ft 0 in, height 16 ft 3 in.
Weight (approx): gross 20,000 lb.
Performance: max speed over Mach 2.0.
Armament (second prototype only): one M-61A1 20 mm multi-barrel cannon with 500 rounds, mounted in fuselage; provision for one infra-red missile mounted on each wingtip; under-wing attachments for other stores.

YF-17 (P-600)

Aerodynamic innovations embodied in this twin-engined Northrop design of mid-wing configuration include a "V" tail to improve directional stability; underwing engine intakes; automatically operated leading-edge and trailing-edge wing flaps (controlled by Mach number and angle of attack), used to vary the wing camber for maximum manoeuvrability; and large wing leading-edge extensions which enhance the airflow over the wing, significantly increasing lift, reducing drag, and improving handling characteristics. Outstanding visibility for the pilot is achieved by the shape and location of the canopy, with full aft vision at eye level and above. Two prototypes are being built.

Contractor: Northrop Corporation, Aircraft Division.
Power Plant: two General Electric YJ101 turbojet engines; each approximately 15,000 lb thrust with afterburning.
Accommodation: pilot only.
Dimensions: span 35 ft 0 in, length 55 ft 6 in, height 14 ft 6 in.
Weight (approx): gross 23,000 lb.
Performance: max speed more than Mach 2.0.
Armament: one M-61 multi-barrel 20 mm cannon; one infra-red Sidewinder missile mounted on each wingtip; underwing attachments for other stores.

F-100 Super Sabre

Around 400 of these aircraft remain operational with the ANG. Distinguished for being the first operational fighter capable of supersonic speed in level flight. Several versions of the F-100 were built following the initial flight of the first of two prototypes in May 1953. The **F-100A,** powered by a J57-P-7 or -39 engine, was the basic single-seat interceptor version. Two hundred and three were delivered, of which some were later converted to camera-carrying RF-100As. The **F-100C** introduced a strengthened wing with four attachments for up to 6,000 lb of bombs, other weapons, or drop tanks, and could be flight refuelled by normal probe-and-drogue or buddy techniques. Four hundred and seventy-six of this version were built, being superseded in production by another fighter-bomber, the **F-100D,** with bomb-load increased to 7,500 lb, a Minneapolis Honeywell supersonic autopilot, larger vertical tail surfaces and flaps, tail-warning radar, and other refinements; 1,274 were built. Final version was the **F-100F,** a two-seat variant for use as a fighter-bomber, air-superiority fighter, or trainer, first flown in March 1957. A total of 339 was built in 1957–59, with full operational equipment apart from having two instead of the standard four guns. Those aircraft which continue in service have been modified to include an All American lightweight spring tail hook for emergency use and provision for Sidewinder and Bullpup missiles. (Data for F-100D.)

Contractor: North American Aviation Inc.
Power Plant: one Pratt & Whitney J57-P-21A turbojet engine; 17,000 lb thrust with afterburning.
Accommodation: pilot only.
Dimensions: span 38 ft 9 in, length 47 ft 0 in, height 15 ft 0 in.
Weights: empty 21,000 lb; gross 34,832 lb.
Performance: max speed at 36,000 ft Mach 1.3, range, with two external tanks, 1,500 miles.
Armament: four 20 mm M-39E guns in fuselage; underwing pylons for six 1,000 lb bombs, two Sidewinder or Bullpup missiles, rockets, etc.

F-101B Voodoo

A development of the basic F-101 single-seat tactical fighter-bomber, the F-101B is a two-seat long-range all-weather interceptor, first flown in March 1957, and designed originally for service with the Air Defense Command (now Aerospace Defense Command—ADC). About 100 remain in service with the ANG, with others in Canadian Armed Forces under NORAD control. For reconnaissance versions, see page 117.

Contractor: McDonnell Aircraft Corporation.
Power Plant: two Pratt & Whitney J57-P-55 turbojet engines; each 14,990 lb thrust with afterburning.
Accommodation: pilot and radar operator in tandem.
Dimensions: span 39 ft 8 in, length 67 ft 4¾ in, height 18 ft 0 in.
Weight: gross 46,500 lb.
Performance: max speed at 40,000 ft Mach 1.85, service ceiling 51,000 ft, max range 1,550 miles.
Armament: two AIM-4D Falcon air-to-air missiles carried externally, and two AIR-2A Genie nuclear-warhead unguided rockets carried internally.

F-102 Delta Dagger

Of the 875 F-102As built originally for operation by ADC from mid-1956, many were transfered to the Greek and Turkish Air Forces in 1969–70, while those remaining in USAF service are deployed with the ANG. Similar to the YF-102A (area-ruled prototype), first flown in December 1954 and which overcame the deficiencies in high-speed performance shown in the earlier YF-102s, the production **F-102A** was designed as a supersonic all-weather delta-wing interceptor and was the first USAF operational fighter to be armed solely with guided missiles and unguided rockets. USAF also acquired 63 side-by-side two-seat **TF-102As** for use as combat trainers and has two versions which have been converted into target drones, the manned **QF-102A** and unmanned **PQM-102A** for use in the F-15A development programme. (Data for F-102A.)

Contractor: Convair Division of General Dynamics Corporation.
Power Plant: one Pratt & Whitney J57-P-23 or -25 turbojet engine; 17,000 lb thrust with afterburning.
Accommodation: pilot only.
Dimensions: span 38 ft 1½ in, length 68 ft 4½ in, height 21 ft 2½ in.
Weight: gross 28,000 lb (overload approx 32,000 lb).
Performance: max speed at 36,000 ft Mach 1.3, service ceiling 54,000 ft, max range 1,350 miles.
Armament: six AIM-4C/D Falcon and one AIM-26A/B air-to-air missiles; twelve 2.75 in rockets carried internally.

F-105 Thunderchief

To meet USAF's requirements for a supersonic single-seat fighter capable of delivering nuclear as well as conventional weapon loads at very high speeds over long ranges, development of the F-105 began in 1951. The first of two prototypes flew in October 1955, and several production versions followed until construction ended in 1965. However, subsequent contracts awarded by USAF for the modification and updating of existing aircraft have extended their operational effectiveness to the present. Current USAF versions are: **F-105D,** single-seat all-weather fighter-bomber, equipped with NASARR monopulse radar system, for use in both high- and low-level missions, and Doppler for night or bad weather operations. First F-105D flew in June 1959, and deliveries to the 4th Tactical Fighter Wing began in May 1960. More than 600 were built, of which about 30 have since been modified to carry the T-Stick II system to improve all-weather bombing capability, with additional avionics housed in a "saddle-back" fairing above the fuselage. **F-105F,** two-seat dual-purpose trainer/tactical fighter version of the F-105D with lengthened fuselage and higher tail fin. First flew in June 1963; 143 built. **F-105G,** all-weather "Wild Weasel" version of the two-seat F-105, intended for the suppression of surface-to-air missile sites, with an electronic countermeasures pod mounted on the under-fuselage. Typical armament load comprises four Shrike missiles or two Standard ARMs. (Data for F-105D.)

Contractor: Fairchild Republic Division of Fairchild Industries.
Power Plant: one Pratt & Whitney J75-P-19W turbojet engine; 26,500 lb thrust with afterburning and water injection.
Accommodation: pilot only.
Dimensions: span 34 ft 11¼ in, length 67 ft 0¼ in, height 19 ft 8 in.
Weights: empty 27,500 lb, gross 52,545 lb.
Performance: max speed at 38,000 ft Mach 2.1, service ceiling 52,000 ft, max range more than 1,600 nm.
Armament: one General Electric 20 mm Vulcan multi-barrel gun and more than 14,000 lb of stores under fuselage and wings.

F-106 Delta Dart

Constituting the largest single force of manned interceptors in service with USAF, the F-106 all-weather fighter was developed in the mid-1950s from the F-102 to accommodate the larger J75 engine. Constant updating has enabled the Aerospace Defense Command to deploy the aircraft throughout the '60s and into the '70s. The two production versions are: **F-106A,** single-seat interceptor with J75 engine, first flown in December 1956; 277 were built, with deliveries beginning in July 1959. **F-106B,** a tandem two-seat dual-purpose combat trainer, ordered into parallel production with the F-106A and first flown in April 1958; 63 were built. The F-106's MA-1 electronic guidance and fire-control system, which operates in conjunction with NORAD's SAGE defence system, has been updated periodically. Other modifications, including MEISR, which enhances the reliability of the on-board radar; supersonic drop tanks, which can be refuelled in flight; and the approval of a 20 mm cannon, which gives greater effectiveness against low altitude/ECM/manoeuvring targets, have improved the F-106's performance in such a way as to permit its operation in global roles as well as for continental US defence in conjunction with USAF E-3A AWACS aircraft. (Data for F-106A.)

Contractor: Convair Division of General Dynamics.
Power Plant: one Pratt & Whitney J75-P-17 turbojet engine; 24,500 lb thrust with afterburning.
Accommodation: pilot only.
Dimensions: span 38 ft 3½ in, length 70 ft 8¾ in, height 20 ft 3⅓ in.
Weights (approx): empty 23,650 lb, gross 35,500 lb.
Performance (approx): max speed at 40,000 ft Mach 2.3, service ceiling 57,000 ft, range 1,200 miles.
Armament: one AIR-2A Genie unguided nuclear-warhead rocket and four AIM-4F/G Falcon air-to-air missiles carried internally; 20 mm gun now under production.

F-111

The distinctive variable wing-sweep configuration of the F-111 was developed essentially to satisfy USAF's stringent specification for a tactical fighter with a maximum speed well above Mach 2 at high altitude; low-level supersonic dash; good take-off and landing performance on rough airfields in forward areas; and excellent handling characteristics throughout the speed range. An initial contract provided for 18 development F-111As for USAF, and, in January 1965, one month after its maiden flight, the aircraft gave its first demonstration of the full range of its wing sweep. Four versions are currently deployed with four USAF tactical fighter wings: **F-111A,** the initial aircraft of this type delivered for service with the 4480th TF Wing, a training unit, in July 1967 were development models. First operational wing was the 474th TFW, with deliveries beginning in October 1967. A total of 141 production F-111As was built, of which six served briefly in 1968 with the 428th TF Squadron, based in Thailand, three being lost. In 1972–73, F-111As used in SEA did exceptionally well. The "A" was superseded in production by the **F-111E,** a version with modified air intakes which improve engine performance above Mach 2.2. Ninety-four were built for service with the 20th TFW, based in the UK in support of NATO. The **F-111D** has more advanced avionics, offering improvements in navigation and in air-to-air weapon delivery. Ninety-six were built and equip the 27th TFW. The **F-111F,** of which 94 are currently on order for the 366th TFW with uprated turbofans, entered service initially with lower-rated TF30-P-9 engines, pending availability of the specified version. USAF is currently developing the **EF-111,** which uses a modified ALQ-99 jamming subsystem to suppress enemy defenses and provide other electronic warfare capabilities. SAC has a strategic bomber version of the same basic aircraft, designated **FB-111A** (see page 112). The Royal Australian Air Force has acquired 24 **F-111Cs** for strike duties.

Contractor: General Dynamics Corporation.
Power Plant: F-111A/E: two Pratt & Whitney TF30-P-3 turbofan engines; each 18,500 lb thrust with afterburning. F-111D: two TF30-P-9 turbofan engines. F-111F: two TF30-P-100 turbofan engines; each approx 25,000 lb thrust with afterburning.
Accommodation: crew of two, side-by-side in escape module.
Dimensions: (F-111A): span spread 63 ft 0 in, fully swept 31 ft 11.4 in, length 73 ft 6 in, height 17 ft 1.4 in.
Weights (F-111A): empty 46,172 lb, gross 91,500 lb.
Performance (F-111A): max speed at S/L Mach 1.2, max speed at altitude Mach 2.2, service ceiling more than 51,000 ft, range with max internal fuel more than 2,750 miles.
Armament: one 20 mm M-61A1 multi-barrel cannon or two 750 lb bombs in internal weapon bay; four swivelling and four fixed wing pylons carrying total external load of up to 25,000 lb of bombs, rockets, missiles, or fuel tanks.

F-105G "Wild Weasel" version

F-106 Delta Dart

F-111A at Nellis AFB, Nev.

Attack and Observation Aircraft

A-7D Corsair II

A-10A close-air-support aircraft

A-37 Dragonfly

AC-130 gunship version

OV-10A Bronco

A-7D Corsair II

Derived from the basic A-7 design, which was developed specifically for the USN, USAF's A-7D is a single-seat tactical fighter of outstanding target kill capacity as demonstrated by the 354th TFW in Southeast Asia. Its accuracy is achieved with the aid of a continuous-solution navigation and weapon-delivery system, including all-weather radar bomb delivery. The first of the initial two production aircraft, which were powered by a TF30-P-8 engine, flew in April 1968, followed five months later by the first flight of the TF41-engined model. Deliveries to USAF began in December of the same year, the 54th TFW being the first A-7D equipped unit. Current programmes call for 411 aircraft. In addition, several hundreds of the A-7A, B, and E versions are used by the USN, which made the first combat sorties from the USS *Ranger* in the Gulf of Tonkin on December 3, 1967.

Contractor: Vought Systems Division of LTV Aerospace Corporation.
Power Plant: one Allison TF41-A-1 non-afterburning turbofan engine; 14,250 lb thrust.
Accommodation: pilot only.
Dimensions: span 38 ft 9 in, length 46 ft 1½ in, height 16 ft 0 in.
Weights: empty 19,781 lb, gross 42,000 lb.
Performance: max speed at S/L 698 mph, ferry range with external tanks retained 2,820 miles.
Armament: one M-61A1 20 mm multi-barrel gun; up to 15,000 lb of air-to-air or air-to-ground missiles, bombs, rockets, or gun pods on 6 underwing and two fuselage attachments.

A-10A

Winner of the competitive fly-off with the Northrop A-9A. It is planned to build six R&D versions of this specialised close-air-support aircraft with funds requested in FY 1974. Funding for 26 production aircraft is requested in the FY 1975 budget. The first of two prototypes flew in May 1972, and a total of 328 flying hours was logged during the prototype phase, followed by 150 hours in continued testing. In July 1974, USAF intends to make a decision on acquisition of an initial 48 production aircraft. In October 1975, a decision will be made with regard to full production. Equipment includes a head-up display, laser seeker, penetration aids, 30 mm cannon, and Maverick missiles. Special emphasis was placed on designing the aircraft for survivability.

Contractor: Fairchild Republic Company, Division of Fairchild Industries.
Power Plant: two General Electric TF34-GE-100 turbofan engines; each approx 9,075 lb thrust.
Accommodation: pilot only.
Dimensions: span 55 ft 0 in, length 52 ft 7 in, height 15 ft 5 in.
Weights (estimated): operating weight empty 22,971 lb, gross 45,705 lb.
Performance: max speed 460 mph, range with 9,500 lb of weapons and 2 hour loiter 290 miles.
Armament: one 30 mm GAU-8 gun (20 mm M-61 on prototypes); ten underwing and one under-fuselage hard points for up to 16,000 lb of ordnance, including various types of free-fall or guided bombs, gun pods, or AGM-65 Maverick missiles.

A-37B Dragonfly

Intended for use in armed counter-insurgency missions (COIN) from short unimproved airstrips, the A-37 was evolved from the T-37 trainer; the A-37B, which first flew in September 1967, representing the main production version. More than 400 aircraft were delivered, mainly for service in Southeast Asia. Since 1970, USAF has been transferring the A-37Bs to the Air Force Reserve and to the Air National Guard.

Contractor: Cessna Aircraft Company.
Power Plant: two General Electric J85-GE-17A turbojet engines; each 2,850 lb thrust.
Accommodation: two, side-by-side.
Dimensions: span over tip-tanks 35 ft 10½ in, length 29 ft 3½ in, height 8 ft 10½ in.
Weights: empty 6,211 lb, gross 14,000 lb.
Performance: max level speed at 16,000 ft 507 mph, service ceiling 41,765 ft, range with max payload, including 4,100 lb ordnance, 460 miles.
Armament: one GAU-2B/A 7.62 mm Minigun installed in forward fuselage; four pylons under each wing able to carry various combinations of rockets and bombs.

AC-130A/H

Seven of these gunship conversions of the Hercules were initially ordered as a result of prototype trials at Wright-Patterson AFB, Ohio, in the summer of 1967 and were used subsequently, from 1970, in Vietnam. Each was fitted with four 20 mm Vulcan cannon, four 7.62 mm Miniguns, searchlight, and sensors, including forward-looking infra-red target-acquisition equipment and low-light-level TV and laser target designators. All the AC-130As are now equipped with two 40 mm cannons, two 20 mm cannons, and two 7.62 mm guns. In the AC-130H, one of the 40 mm cannons is replaced by a 105 mm howitzer.

Contractor: Greenville (Tex.) Division of E-Systems, Inc. Other data basically as for C-130 (page 119).

O-2A

Designated O-2A, this military version of the "push-and-pull" Cessna 337 Skymaster was originally selected by USAF to replace the Cessna O-1 in the forward air controller role in Vietnam in 1966. A total of 346 aircraft was ordered. Specialised equipment and electronics permit control of air strikes, visual reconnaissance, target identification and marking, ground-air co-ordination, and damage assessment. The O-2B version is no longer in operation.

Contractor: Cessna Aircraft Company.
Power Plant: two Continental IO-360-C/D piston engines; each 210 hp.
Accommodation: pilot and observer side-by-side; two passengers optional.
Dimensions: span 38 ft 2 in, length 29 ft 9 in, height 9 ft 2 in.
Weights: empty 2,848 lb, gross 5,400 lb.
Performance: max speed at S/L 199 mph, service ceiling 19,300 ft, range 1,060 miles.
Armament: four underwing pylons can carry light ordnance, including a 7.62 mm Minigun pack.

OV-10A Bronco

A two-seat counter-insurgency combat aircraft, first flown in August 1967, 157 of which were acquired by USAF for use in the forward air controller role and for limited quick-response ground support pending the arrival of tactical fighters. Production of the OV-10A for the US services ended in April 1969, but 15 aircraft have since been modified by E-Systems, Inc., under the USAF Pave Nail programme, with specialised equipment including a stabilised night periscopic sight, a combination laser rangefinder and target illuminator, a LORAN receiver, and a Lear Siegler LORAN co-ordinate converter, to permit their use in a night forward air control and strike designation role. Versions of the OV-10 are also in service with the USN and US Marine Corps.

Contractor: Rockwell International Corporation, North American Aerospace Group.
Power Plant: two AiResearch T76-G-410/411 turboprop engines; each 715 hp.
Accommodation: two in tandem.
Dimensions: span 40 ft 0 in, length 41 ft 7 in, height 15 ft 2 in.
Weights: empty 6,969 lb, overload gross weight 14,466 lb.
Performance: max speed at S/L, without

weapons, 281 mph; service ceiling 28,800 ft; combat radius with max weapon load, no loiter, 228 miles.
Armament: four fixed forward-firing M-60C 7.62 mm machine-guns; four external weapon attachment points under short sponsons, for up to 2,400 lb of rockets, bombs, etc; fifth point, capacity 1,200 lb, under centre fuselage. Provision for carrying one Sidewinder missile on each wing.

Reconnaissance Aircraft

SR-71A/C

Complex equipment carried internally enables this strategic reconnaissance aircraft to perform a broad range of world-wide, high-altitude reconnaissance duties, with simple battlefield surveillance systems to multiple-sensor high-performance systems capable of specialised surveillance of up to 60,000 sq miles of territory in one hour. Based on the Lockheed A-11 design, the **SR-71A** development began in February 1963; it flew for the first time in December 1964. Deliveries of operational aircraft to the 9th Strategic Reconnaissance Wing at Beale AFB, Calif., began in January 1966. The **SR-71C** is a tandem two-seat training version.

Contractor: Lockheed Aircraft Corporation.
Power Plant: two Pratt & Whitney JT11D-20B (J58) turbojet engines; each 32,500 lb thrust with afterburning.
Accommodation: crew of two in tandem.
Dimensions: span 55 ft 7 in, length 107 ft 5 in, height 18 ft 6 in.
Weight: gross (estimated) 170,000 lb.
Performance (estimated): range at Mach 3.0 (1,980 mph) at 78,740 ft 2,982 miles.
Armament: none.

U-2A/D

Original requirements for an aircraft capable of carrying out strategic reconnaissance for long periods at very high altitudes over Communist territory resulted in the design of the U-2, which is essentially a powered glider, with sailplane-like high aspect ratio wing and lightweight structure. Fifty-five aircraft are believed to have been built from 1954, including 2 prototypes, 48 single-seat **U-2A/B** versions, and 5 two-seat **U-2Ds.** The J57-P-37A turbojet of the U-2A was replaced by a more powerful J75-P-13, adapted to run on low-volatility fuel, in the U-2B. Several U-2s remain in service for special high-altitude reconnaissance and weather flights, with some of the weather reconnaissance aircraft redesignated **WU-2.** (Data for U-2A.)

Contractor: Lockheed Aircraft Corporation.
Power Plant: one Pratt & Whitney J57-P-37A turbojet engine; 11,200 lb thrust.
Accommodation: pilot only.
Dimensions: span 80 ft 0 in, length 49 ft 7 in, height 13 ft 0 in.
Weight: gross, with slipper tanks, 17,270 lb.
Performance: max speed at 40,000 ft 528 mph, operational ceiling about 80,000 ft, range about 4,000 miles.

RC-130A and WC-130E/H

Used by MAC's 1st Aerial Charting and Geodetic Squadron for aerial survey duties, the **RC-130A** is a photographic version of the C-130A. A contract for 16 aircraft, including the prototype, was completed in 1959; five remain in the inventory. In addition, 17 modified C-130Es, designated **WC-130E,** are used for weather reconnaissance. Data similar to C-130.

RF-101B/C

The Air National Guard has four operational squadrons of RF-101B/Cs. These aircraft, modified F-101s, perform a day tactical reconnaissance mission. During mobilisation or wartime, all ANG reconnaissance squadrons are assigned to TAC. Data similar to F-101B.

RF-4C

A multi-sensor reconnaissance version of the F-4C Phantom II, the RF-4C was developed to replace the RF-101 in USAF service. Radar and photographic systems are housed in a modified nose, increasing the overall length of the aircraft by 33 in. The three basic reconnaissance systems, operated from the rear seat, comprise side-looking radar, an infra-red sensor, and forward- and side-looking cameras. More than 300 RF-4Cs are currently in the USAF and ANG inventory. Data similar to F-4.

EB-66

Deployed in electronic countermeasures and reconnaissance roles over Europe, the **EB-66B/C** and **"E"s** represent the last remaining operational aircraft of the Destroyer series, developed from the A-3D, and are converted B-66Bs, RB-66Cs, and RB-66Bs, respectively, with rear turrets removed. Each version is equipped with different standards of avionics.

Contractor: Douglas Aircraft Company.
Power Plant: two Allison J71-A-13 turbojets; each 10,000 lb thrust.
Accommodation: crew EB-66C seven; EB-66E three.
Dimensions: span 72 ft 6 in, length 75 ft 2 in, height 23 ft 7 in.
Weight: gross, more than 70,000 lb.
Performance: max speed at 10,000 ft 620 mph.
Armament: none.

EC-121

Massive radomes above and below the fuselage readily distinguish this early warning, fighter control, and reconnaissance aircraft, derived from the C-121 (Super Constellation) transport. A few versions continue in service: the **EC-121D** is a development of the EC-121C, with added wingtip fuel tanks, first delivered in May 1954. Under subsequent modification programmes, some "D"s became **EC-121Hs,** with additional electronics to feed data into NORAD's SAGE defence system; others became **EC-121Ts,** which remain operational on radar picket duties covering the seas east of Iceland. (Data for EC-121D.)

Contractor: Lockheed Aircraft Corporation.
Power Plant: four Wright R-3350-91 piston engines; each 3,250 hp.
Dimensions: span 126 ft 2 in; length 116 ft 2 in, height 27 ft 0 in.
Weights: empty 80,611 lb, gross 143,600 lb.
Performance: max speed at 20,000 ft 321 mph, service ceiling 20,600 ft, range 4,600 miles.
Armament: none.

EC-135 etc.

In order to pursue specialised roles, several aircraft in the KC-135 Stratotanker series have received modification either during production or at a later date. The **EC-135C** (originally designated KC-135B) is basically similar to the KC-135A but with 18,000 lb st TF33 turbofans. Equipped as Flying Command Posts in support of SAC's airborne alert role, 17 were built, fitted with extensive communications equipment. As well as being able to refuel other aircraft in flight, EC-135Cs can themselves be refuelled by SAC tankers. Fourteen have been adapted to provide control of Minuteman ICBMs, and at least one aircraft is airborne at all times, accommodating a flight crew of 5, a general officer, and a staff of 18. Other models used as Flying Command Posts and communications relay stations are: 4 **EC-135Gs** and 3


SR-71 Mach 3 recon aircraft


U-2A


RF-4C


EB-66


EC-121

E-3A AWACS aircraft

E-4A Command Post aircraft

C-5A Galaxy

C-7A Caribou

C-9A Nightingale

EC-135Ls with J57 turbojets; 5 turbojet **EC-135Hs** used by USAFE; one **EC-135K** used by TAC, and 5 **EC-135Ps** used by PACAF, also with turbojets; and 3 **EC-135Js** which are modified "C"s with turbofan engines. Versions of the C-135 Stratolifter series used for reconnaissance include 12 turbofan **RC-135Vs,** equipped also for electronic reconnaissance with SAC; 2 **RC-135Bs** and 2 **RC-135Vs;** and 10 **WC-135Bs,** converted C-135Bs, are used by MAC for long-range weather reconnaissance missions. In addition, 8 **EC-135Ns** were equipped as airborne radio and telemetry stations for the Apollo programme. Data basically as C-135 (page 120).

EC-137D/E-3A

Further development of the E-3A AWACS (Airborne Warning And Control System) aircraft is in progress as a result of the successful completion of the initial phase of the development programme under a contract awarded to Boeing in 1970. Based on the Model 707-320 airframe, the design incorporates an extensive range of specialised operational equipment, including sensing, communications, display, and navigational systems. The first of the two prototypes, designated EC-137D, flew in February 1972. An advanced radar, housed in a 30 ft diameter rotating dorsal radome, provides all-altitude radar detection over both land and water and can discriminate between "clutter" and signals returned from moving targets. Additional subsystems are being installed in one of the EC-137D test aircraft to demonstrate the full capacity of the AWACS. The primary use of such an aircraft by ADC will be as a survivable early warning airborne command-and-control centre (AWACS) for the identification, surveillance, and tracking of airborne enemy forces, and for command and control of NORAD forces. Similar aircraft operated by TAC will be used as airborne command-and-control centres for quick-reaction deployment and tactical operations. Funding for one E-3A has been approved in the FY 1974 budget, and this, together with the EC-137Ds, both brought up to full E-3A configuration, will be used for development/operational test and evaluation purposes, with a decision on the production of 34 aircraft scheduled for December of this year.

Contractor: The Boeing Aerospace Company.
Power Plant (pre-production and production aircraft): four Pratt & Whitney TF33-P-7 turbofan engines; each 21,000 lb thrust.
Accommodation: operational crew of 17 in production version, which may be increased according to mission.

E-4A (AABNCP)

Intended to replace the EC-135s as Advanced Airborne National Command Posts, four modified Model 747Bs, designated E-4A, have now been provided for by Congress, although USAF hopes eventually to obtain approval for a further three. First delivery was scheduled for July, last year, so that an early assessment could be made of the aircraft's potential in this role. Equipment on the initial E-4As is essentially the same as that on the EC-135s, but the increased space permits early operation of the aircraft with an expanded battle staff, allowing a more flexible response capability. Measures are planned for a later stage to extend survivability and communications capacity.

Contractor: The Boeing Aerospace Company.
Power Plant: four Pratt & Whitney JT9D-7W turbofan engines; each 47,000 lb; present plans call for fitting the two Command Posts now in production with General Electric CF6-50E turbofan engines and subsequently retrofitting the two that were delivered last year.
Dimensions: span 195 ft 8 in, length 231 ft 4 in, height 63 ft 5 in.
Weight: gross 778,000 lb.

Transports and Tankers

C-5A Galaxy

Production contracts for this very heavy logistics transport aircraft have now been completed, with USAF having taken delivery of the last of the 81 aircraft ordered in May last year. Currently the largest aircraft in service anywhere in the world, with a lower-deck volume of 34,795 cu ft, the C-5A first flew in June 1968, after five years of design and development study. Delivery of the first operational aircraft was made to MAC in December 1969.

Contractor: Lockheed-Georgia Company.
Power Plant: four General Electric TF39-GE-1 turbofan engines; each 41,000 lb thrust.
Accommodation: basic crew of five; rest area for 16 (relief crew, etc); 75 troops and 36 standard 463L pallets or assorted vehicles, or additional 270 troops.
Dimensions: span 222 ft 9 in, length 247 ft 10 in, height 65 ft 1 in.
Weights: empty 323,000 lb, gross (for 2.25 g) 764,500 lb.
Performance: max speed at 25,000 ft 571 mph, service ceiling (at 615,000 lb) 34,000 ft, range (with 220,000 lb payload at 507 mph) 3,512 miles.

C-7A Caribou

A twin-engined STOL utility transport built in Canada, the prototype C-7A first flew in July 1958. The US Army was the principal customer and in January 1967 still had 134 aircraft in service, all of which were transfered to USAF. Their ability to operate from short, unprepared runways in all weather conditions led to the widespread use of the C-7As in Southeast Asia. All have now been transfered to the AFRES and ANG.

Contractor: de Havilland Aircraft of Canada Ltd.
Power Plant: two Pratt & Whitney R-2000-7M2 piston engines; each 1,450 hp.
Accommodation: crew of two or three; 32 troops, 26 paratroops, or 22 litters and 8 other persons.
Dimensions: span 95 ft 7½ in, length 72 ft 7 in, height 31 ft 9 in.
Weights: empty 16,795 lb, gross 26,000 lb.
Performance: max speed at 5,000 ft 216 mph, service ceiling 27,700 ft, range 200 to 1,400 miles.

C-9A Nightingale

The C-9A is essentially an off-the-shelf DC-9 Series 30 commercial transport, modified to include a special-care compartment with separate atmospheric and ventilation controls for USAF aeromedical evacuation operations. The first of 21 was delivered in August 1968 to MAC's 375th Aeromedical Airlift Wing. The Nightingale is also currently performing overseas theatre aeromedical evacuation missions with USAFE and PACAF. Orders are now completed.

Contractor: Douglas Aircraft Company, division of McDonnell Douglas Corporation.
Power Plant: two Pratt & Whitney JT8D-9 turbofan engines; each 14,500 lb thrust.
Accommodation: crew of two; 30 to 40 litter patients, more than 40 ambulatory patients, or a combination of both, plus five medical staff.
Dimensions: span 93 ft 5 in, length 119 ft 3½ in, height 27 ft 6 in.
Weight: gross 108,000 lb.
Performance: max cruising speed at 25,000 ft 565 mph.

KC-97L, C-97G and K

Since production was initiated in 1945, many versions of this transport development of the B-29 have seen service with

USAF. Those remaining in operational use are derived from the KC-97G, built between 1953 and 1956 and gradually replaced from 1957 by KC-135As. A total of 135 was converted to **C-97G** Stratofreighter cargo aircraft by the removal of the flight refuelling equipment; a further 26 became **C-97Ks,** in passenger configuration, for SAC mission support duties. A number were modified by the addition of J47-GE-25A jet pods for use by the ANG as tankers, for operation with TAC fighters, and were redesignated **KC-97L.** Another 28 were converted to **HC-97Gs** for air-sea search and rescue work, and now serve with the AF Reserve and ANG. (Data for KC-97G.)

Contractor: The Boeing Airplane Company.
Power Plant: four Pratt & Whitney R-4360-59 piston engines; each 3,500 hp.
Accommodation: crew of five; 96 combat troops or 69 litters.
Dimensions: span 141 ft 3 in, length 110 ft 4 in, height 38 ft 3 in.
Weights: empty 82,500 lb, gross 175,000 lb.
Performance: max speed at 25,000 ft 375 mph, service ceiling 35,000 ft, range at 297 mph 4,300 miles.

C-119 Flying Boxcar

First flown in October 1952, the **C-119G** was the final production version of the Flying Boxcar, with Aeroproducts propellers replacing the Hamilton Standards of the C-119F variant, of which all were eventually converted to "G" standard. In turn, 68 "F"s and "G"s were modified to **C-119J** standard with beaver-tail rear doors. All aircraft are now serving with the Air Force Reserve and ANG. (Data for C-119G.)

Contractor: The Fairchild Engine and Airplane Corporation.
Power Plant: two Wright R-3350-89A piston engines; each 3,500 hp.
Accommodation: crew of six; 62 troops or 26,000 lb of cargo.
Dimensions: span 109 ft 3 in, length 86 ft 6 in, height 27 ft 6 in.
Weights: empty 40,785 lb, gross 72,700 lb.
Performance: cruising speed 250 mph, range 2,280 miles.

C-123 Provider

Two modified versions of the basic **C-123B,** which entered service in 1955 as a troop and supply transport, are still in the USAF inventory. The **C-123J** has additional wingtip J44 turbojets and provision for wheel-ski landing gear; 10 were built for use as support aircraft for the DEW Line radar chain in Alaska. Some are still used by the ANG. The **C-123K,** flown initially in October 1966, features two underwing pylon mounted auxiliary turbojets, improved landing gear, and a new stall warning system. This version was widely used during the Vietnam War for transport and special duties. (Data for C-123K.)

Contractor: The Fairchild Engine and Airplane Corporation.
Power Plant: two Pratt & Whitney R-2800-99W piston engines; each 2,500 hp; and two General Electric J85-GE-17 turbojet engines; each 2,850 lb thrust.
Accommodation: crew of three; 60 troops, 50 litters, or 21,000 lb of cargo.
Dimensions: span 110 ft 0 in, length 76 ft 4 in, height 34 ft 6 in.
Weights: empty 35,366 lb, gross 60,000 lb.
Performance: max speed at 10,000 ft 228 mph, service ceiling above 25,000 ft, range with 15,000 lb payload 1,035 miles.

C-124C Globemaster II

Developed in the late 1940s from the earlier C-74 Globemaster I, the Globemaster II's design incorporated a much enlarged fuselage and nose-loading doors. In its final version, the **C-124C,** uprated engines were introduced together with combustion heaters in wingtip pods and nose-mounted APS-42 weather radar. Of the 243 "C"s built originally for operation by MAC and most operational USAF commands, those that remained in service in the '60s were gradually transferred to the AF Reserve and the ANG.

Contractor: Douglas Aircraft Company.
Power Plant: four Pratt & Whitney R-4360-63A piston engines; each 3,800 hp.
Accommodation: crew of eight; 200 troops, 127 litters, or 68,500 lb of cargo.
Dimensions: span 174 ft 2 in, length 130 ft 5 in, height 48 ft 4 in.
Weights: empty 101,165 lb, gross 194,500 lb.
Performance: max speed 304 mph, service ceiling 18,400 ft, range with 26,375 lb of cargo 4,030 miles.

C-130 Hercules

Many versions of the Hercules transport have entered USAF service, resulting from an original specification issued by TAC in 1951. The initial production model was the **C-130A,** first flown in April 1955, powered by 3,750 eshp Allison T56-A-11 or -7 turboprops; 219 ordered with deliveries beginning in December 1956. Two special variants, **GC-130As,** were built as drone launchers/directors for ARDC (now AFSC), carrying up to four drones on underwing pylons. All special equipment was removable, permitting the aircraft to be used as freighters, assault transports, or ambulances, as required. The **C-130B** was a developed version with improved range and higher weights, powered by 4,050 eshp Allison T56-A-7 turboprops; the first of 134 entered USAF service in April 1959. Twelve **C-130Ds** were modified C-130As for use in the Arctic, with wheel-ski landing gear, increased fuel capacity, and provision for JATO. The **C-130E** is an extended-range development of the C-130B, with larger underwing fuel tanks; 389 were ordered for MAC and TAC with deliveries beginning in March 1962. Basically similar to the "E", the **C-130H** has uprated T56-A-15 turboprop engines, a redesigned outer wing, and other minor improvements; initial delivery was scheduled for March this year. Variants include **HC-130H** for the Aerospace Rescue and Recovery Service, and the **AC-130A/H** and **WC-130E** described separately. (Data for C-130E.)

Contractor: Lockheed-Georgia Company.
Power Plant: four Allison T56-A-7A turboprop engines; each 4,050 eshp.
Accommodation: crew of five; up to 92 troops or 6 standard freight pallets, etc.
Dimensions: span 132 ft 7 in, length 97 ft 9 in, height 38 ft 6 in.
Weights: empty 72,892 lb, gross 175,000 lb.
Performance: max speed 374 mph, service ceiling at 155,000 lb AUW 23,000 ft, range with max payload 2,000 miles.

HC-130

An extended-range version of the C-130, the **HC-130H** was first ordered in 1963 for the Aerospace Rescue and Recovery Service. A total of 66 was built with 4,910 ehp (limited to 4,500 ehp) Allison T56-A-15 turboprop engines. Initial flight was made in December 1964. Crew comprises 10 to 12 members. The **HC-130N** is a further search and rescue version for the recovery of aircrew and retrieval of space capsules after re-entry, using advanced direction-finding equipment; 15 ordered in 1969. Twenty C-130E/Hs have been modified into **HC-130Ps** capable of refuelling helicopters in flight and of retrieving parachute-borne payloads in mid-air. Other data similar to C-130 above, except length, which is 98 ft 9 in with recovery system folded.

C-131 Samaritan

From the basic Convair 240/340/440 Series, several types of aircraft, including transports, were evolved for military use. Derived from the Model 240, 26 **C-131As** were delivered to MATS (now MAC) in 1954 for air-evacuation duties; each could accommodate 37 passengers, 27 litters, or a combination of both, in a pressurised cabin. For testing electronic equipment, USAF acquired 36 **C-131Bs,** based on the Model 340, which could, additionally, carry 48 passengers. Also developed from the Model 340 and the Model 440, with improved soundproofing, were the 44-passenger **C-131D** and **VC-131D,** 33 of which were delivered. In 1956–57, 15 **C-131Es** were built for use as

KC-97L of Illinois ANG

C-123B Provider

C-124 Globemaster II

C-130 Hercules

HC-130N

KC-135 Stratotanker

VC-137C "Air Force One"

C-140 JetStar

C-141 StarLifter

Boeing YC-14 (artist's concept)

ECM trainers by SAC, but 7 were later converted to RC-131s for use by MATS (now MAC). (Data for C-131B.)

Contractor: Convair Division of General Dynamics Corporation.
Power Plant: two Pratt & Whitney R-2800-99W piston engines; each 2,500 hp.
Accommodation: crew of four and 48 passengers.
Dimensions: span 105 ft 4 in, length 79 ft 2 in, height 28 ft 2 in.
Weights: empty 29,248 lb, gross 47,000 lb.
Performance: max speed 293 mph, service ceiling 24,500 ft, range 2,000 miles.

KC-135 Stratotanker

Developed from the Model 367-80 (prototype for the 707 series), the **KC-135A** can be used either as a standard flight refuelling tanker for SAC bombers, with high-speed and high-altitude capabilities, or as a long-range passenger and/or cargo transport; 732 were built, of which the first flew in August 1956. Variants include the **KC-135Q,** adapted to refuel Lockheed SR-71s; and **KC-135R** and **KC-135T** for special reconnaissance. (Data for KC-135A.)

Contractor: The Boeing Company.
Power Plant: four Pratt & Whitney J57-P-59W turbojet engines; each 13,750 lb thrust.
Accommodation: crew of four or five; up to 80 passengers.
Dimensions: span 130 ft 10 in, length 136 ft 3 in, height 38 ft 4 in.
Weights: empty 98,466 lb, gross 297,000 lb.
Performance: max speed at 30,000 ft 585 mph, service ceiling 50,000 ft, range with 120,000 lb of transfer fuel 1,150 miles, ferry mission 9,200 miles.

C-135 Stratolifter

Pending delivery of the C-141, MATS (now MAC) ordered the C-135 to serve as an interim jet passenger/cargo transport. Derived from the KC-135A, the Stratolifter version differed primarily in having had the tanker's refuelling equipment deleted; minor internal changes adapted the cabin for personnel transport, with other modifications to facilitate cargo handling. The first of three converted KC-135As, known as **C-135A** "Falsies", flew in May 1961. The 15 genuine production C-135As, with J57-P-59W turbojets, could be identified by their taller fin and rudder, as standardised for commercial 707s. Thirty **C-135Bs** followed, powered by Pratt & Whitney TF33-P-5 turbofans, and first flew in February 1962. Eleven "B"s were subsequently converted to **VC-135Bs** with revised interior for VIP transportation; others became **WC-135B** and **RC-135E/M.** Data similar to KC-135, except:

Dimensions: length 134 ft 6 in.
Weights (C-135B): operating weight empty 102,300 lb, gross 275,500 lb.
Accommodation: 126 troops; 44 litters and 54 sitting casualties; or 87,100 lb of cargo.
Performance (C-135B): max speed 600 mph, range with 54,000 lb payload 4,625 miles.

VC-137

Of the various modified Boeing 707 transports acquired by USAF for VIP duties, the best known is "Air Force One", a **VC-137C,** operated by MAC's 89th Military Airlift Wing from Andrews AFB, Md., for use by the President. It is basically a 707-320B with a special VIP interior for a crew of seven or eight and 49 passengers. Delivery has also been made of a second similar aircraft, ordered in 1972. Three of the smaller 707-120s, originally designated VC-137As but later modified to **VC-137B** standard by the installation of turbofan engines, are also in service with the 89th Wing.

Contractor: The Boeing Company.
Power Plant: four Pratt & Whitney JT3D-3 turbofan engines; each 18,000 lb thrust.
Dimensions: VC-137B span 130 ft 10 in, length 144 ft 6 in, height 42 ft 0 in; VC-137C span 145 ft 9 in, length 152 ft 11 in, height 42 ft 5 in.
Weights: VC-137B gross 258,000 lb; VC-137C gross 322,000 lb.
Performance (VC-137C): max speed 627 mph, service ceiling 42,000 ft, range about 7,000 miles.

C-140 JetStar

Used in inspecting world-wide military navigation aids, five **C-140As** have been delivered to the Air Force Communications Service, beginning from summer 1962. Eleven transport versions, **VC-140Bs,** are in service with the 89th Military Airlift Wing of MAC, operating from Andrews AFB, Md., the first being delivered in late 1961.

Contractor: Lockheed-Georgia Company.
Power Plant: four Pratt & Whitney J60 turbojet engines; each 3,000 lb thrust.
Accommodation: C-140A crew of five; VC-140B crew of three and 8 or 13 passengers.
Dimensions: span 54 ft 5 in, length 60 ft 5 in, height 20 ft 5 in.
Weight: gross 40,920 lb.
Performance: max cruising speed at 20,000 ft 550 mph, range with reserves 2,280 miles.

C-141A StarLifter

Initiated as the flying element of Logistics Support System 463L, with an all-weather landing system standard, the C-141A began squadron operations with MAC in April 1965 and was soon making virtually daily flights to Southeast Asia. A total of 284 aircraft was built, some of which were modified to carry Minuteman ICBMs, with local structure strengthening to accommodate this 86,207 lb load.

Contractor: Lockheed-Georgia Company.
Power Plant: four Pratt & Whitney TF33-P-7 turbofan engines; each 21,000 lb thrust.
Accommodation: crew of four; 154 troops; 123 paratroops; or 70,847 lb of freight.
Dimensions: Span 159 ft 11 in, length 145 ft 0 in, height 39 ft 3 in.
Weights: empty 136,000 lb, gross 325,000 lb.
Performance: max speed at 25,000 ft 571 mph, service ceiling 41,600 ft, range 4,080 miles.

AMST (YC-14 and YC-15)

Contracts were awarded to Boeing and McDonnell Douglas in November 1972 to develop their proposals for an advanced medium STOL transport (AMST), which might eventually replace the C-130 Hercules in USAF service, with each company building two prototypes to compete in a prototype fly-off competition.

Boeing YC-14

Basically the Boeing design uses a supercritical unswept high-wing T-tail airframe, with rear-loading ramp, and fuselage-side fairings to house the main-wheel bogies when retracted. The power plant installation will be highly unconventional. Two General Electric CF6-50D engines, each of 51,000 lb thrust, will be mounted close to the fuselage, above and forward of the wing. High lift will be provided by upper-surface blowing and use of slotless inboard Coanda flaps. The fuselage diameter will be considerably greater than that of the C-130 to accommodate most essential Army divisional combat equipment. The aircraft will be capable of airlifting 27,000 lb payloads into and out of 2,000 ft semi-prepared runways (S/L 103°F) at a 400 nautical mile radius. Operating at 2.5g the aircraft will transport more than 53,000 lb. Design gross weight (3.0g) at the mid-point is approx 160,000 lb. Max gross weight (2.5g) is estimated at 206,000 lb. Cruise speed is in the Mach 0.7 range. There is not yet any firm date for the first flight.

Dimensions: span 129 ft 0 in, length 131 ft 8 in, height 48 ft 4 in.

McDonnell Douglas YC-15

The McDonnell Douglas AMST is more conventional in configuration. It will have

a supercritical wing, leading-edge flaps and slats, spoilers, externally blown flaps, and a high T-tail. The aircraft will be powered by four JT8D turbofans, each having 15,500 lb thrust. Cargo compartment dimensions and performance capabilities will be similar to the Boeing AMST. Design gross weight (3.0g) at the mid-point will be approximately 150,000 lb. Maximum gross weight (2.25g) is estimated at 200,000 lb. There is no firm date for the first flight.

Dimensions: span 110 ft 4 in, length 123 ft 6 in, height 42 ft 10 in.

McDonnell Douglas YC-15 (artist's concept)

Utility and Experimental Aircraft

JC-130B

Delivery was made in 1961 of six modified C-130Bs to replace the C-119s of the 6593d Test Squadron at Hickam AFB, Hawaii. Designated **JC-130B,** these aircraft are equipped for air-snatch recovery of classified USAF satellites. Data similar to C-130.

U-3A/B

Popularly referred to as the "Blue Canoe", the Cessna 310 has been in USAF service since 1957, having won a competition for a light twin-engined administrative liaison and cargo aircraft. One hundred and sixty "off-the-shelf" models, designated **U-3A,** were initially ordered, followed by 35 **U-3Bs,** an all-weather version with swept fin, more cabin windows, and a longer nose delivered in 1960–61. (Data for U-3A.)

Contractor: Cessna Aircraft Company.
Power Plant: two Continental O-470-M piston engines; each 240 hp.
Accommodation: five persons.
Dimensions: span 36 ft 0 in, length 27 ft 1 in, height 10 ft 6 in.
Weight: gross 4,700 lb.
Performance: max speed 232 mph, range 850 miles.

X-24B

First flight of this lifting-body research aircraft took place on August 1, last year. The X-24B programme is aimed at developing manoeuvring manned re-entry vehicles able to perform as spacecraft in orbit, fly in earth's atmosphere like aircraft, and land at conventional airports. Evolved from the X-24A air-launched experimental aircraft, the X-24B is, as announced by NASA in July 1971, a rebuilt version with completely new external lines, incorporating a double-delta configuration, but retaining the power plant and systems of the "A".

Contractor: Martin Marietta Corporation.
Power Plant: one Thiokol XLR-11 turbo-rocket engine; 8,000 lb thrust; two Bell LLRV landing rockets; each 400 lb thrust.
Accommodation: pilot only.
Dimensions: width 19 ft 2 in, length 37 ft 6 in, height 10 ft 4 in.
Weights: empty equipped, without propellants 7,800 lb, gross 13,000 lb.
Performance (estimated): max level speed at 60,000 ft 1,000 mph, service ceiling 90,000 ft.

U-3A "Blue Canoe"

X-24B lifting-body research aircraft

Trainers

T-29

For more than two decades, USAF has used military versions of the Convair-Liner for aircrew training. First flown in September 1949, the unpressurised **T-29A** was the initial version, used for navigation, bombardment, and radar training. Forty-eight were built, with late aircraft modified to have outer wing fuel tanks for increased range. The pressurised **T-29B** was a development of the "A", with increased fuel capacity, and with three astrodomes and one periscopic sextant on top of the fuselage instead of the four astrodomes of the earlier version. The first T-29B flew in July 1952; 105 were built. Designated **T-29C,** a version with more powerful engines followed in July 1953; 119 were delivered. Similar to the "C" but without astrodomes, the **T-29D,** flown initially in August 1953, is equipped for advanced navigation and bombardment training, with a "K" system bombsight; 93 were built.

Contractor: Convair Division of General Dynamics Corporation.
Power Plant: T-29A/B: two Pratt & Whitney R-2800-97W piston engines; each 2,400 hp; T-29C/D: two R-2800-99W piston engines; each 2,500 hp.
Accommodation: crew of three; 14 students and 2 instructors in T-29A/B/C; only 6 students in T-29D.
Dimensions: span 91 ft 9 in, length 74 ft 8 in, height 26 ft 11 in.
Weight: T-29A gross 40,500 lb; T-29B/D gross 43,575 lb.
Performance (T-29D): max speed 299 mph, service ceiling 24,000 ft, range 1,500 miles.

T-33A

Although replaced as USAF's standard jet advanced trainer by the T-38, this version of the Shooting Star jet fighter is still widely used for proficiency training. A lengthened fuselage accommodates a second cockpit in tandem, with the canopy extended to cover both; the armament of the fighter was replaced by an all-weather "navigational nose". Production ended in August 1959, with deliveries to USAF having totalled more than 4,000.

Contractor: Lockheed Aircraft Corporation.
Power Plant: one Allison J33-A-35 turbojet engine; 4,600 lb thrust.
Accommodation: crew of two, in tandem.
Dimensions: span 38 ft 10½ in, length 37 ft 9 in, height 11 ft 4 in.
Weights: empty 8,084 lb, gross 11,965 lb.
Performance: max speed at 25,000 ft 543 mph, service ceiling 47,500 ft.
Armament: two 0.50 calibre machine-guns on some early aircraft only.

T-33

T-37B

Employed in primary training, this aircraft is the current version of the T-37, the USAF's first jet trainer specifically designed as such from the start. Deliveries of the T-37B, which superseded the T-37A, began in November 1959; all "A" models have subsequently been converted to "B" standard. In addition to training, this version can also be equipped to perform military surveillance and low-level attack duties. A further, armed version, the T-37C, is being produced for export. Well over a thousand T-37s have been built.

Contractor: Cessna Aircraft Company.
Power Plant: two Continental J69-T-25 turbojet engines; each 1,025 lb thrust.
Accommodation: two, side-by-side.
Dimensions: span 33 ft 9.3 in, length 29 ft 3 in, height 9 ft 2 in.
Weights: empty 3,870 lb, gross 6,574 lb.
Performance: max speed at 20,000 ft 425 mph, service ceiling 39,200 ft, range at 360 mph, standard tankage 870 miles.

T-37

T-38A Talon

Having consistently maintained the best

T-38A Talon

T-39A Sabreliner at Nellis AFB, Nev.

T-43A over Mount Rainier

safety record of any USAF supersonic aircraft, this lightweight twin-jet advanced trainer was in continuous production from 1956 to 1972. Like the F-5 tactical fighter, the Talon is derived from Northrop's private-venture N-156 design and is almost identical in structure to the former aircraft. The first T-38 flew in April 1959, with production models entering operational service in March 1961. More than 1,100 of the total 1,187 T-38As built were delivered to USAF.

Contractor: Northrop Corporation.
Power Plant: two General Electric J85-GE-5 turbojet engines; each 2,680 lb thrust dry, 3,850 lb thrust with afterburning.
Accommodation: student and instructor, in tandem.
Dimensions: span 25 ft 3 in, length 46 ft 4½ in, height 12 ft 10½ in.
Weights: empty 7,164 lb, gross 12,093 lb.
Performance: max level speed at 36,000 ft more than Mach 1.23 (812 mph), range, with reserves, 1,093 miles.

T-39 Sabreliner

To meet USAF "UTX" requirements for a combat readiness trainer and utility aircraft, the prototype Sabreliner was built as a private venture, making its first flight in September 1958, powered by two General Electric J85 turbojets. Subsequent production versions, all with J60 engines, utilised by USAF are: the **T-39A,** a basic utility trainer of which 143 were delivered for service with Air Training Command, Strategic Air Command, Systems Command, USAF Headquarters, and Military Airlift Command; six **T-39Bs,** used by Tactical Air Command to train aircrew for F-105 Thunderchief squadrons, and equipped with Doppler radar and NASARR all-weather search and ranging radar; and a few **T-39F** conversions, equipped to train ECM operators for the F-105G aircraft. (Data for T-39A.)

Contractor: North American Rockwell Corporation.
Power Plant: two Pratt & Whitney J60-P-3 turbojet engines; each 3,000 lb thrust.
Accommodation: crew of two; 4 to 7 passengers.
Dimensions: span 44 ft 5 in, length 43 ft 9 in, height 16 ft 0 in.
Weights: empty 9,300 lb, gross 17,760 lb.
Performance: max speed at 36,000 ft 595 mph, service ceiling 39,000 ft, range 1,950 miles.

T-41A Mescalero

Training for a student USAF pilot starts with about 30 hours in a standard Cessna Model 172 light aircraft, bought by USAF as a trainer under the designation **T-41A.** An initial order for 170 aircraft in 1964 was supplemented by a further 34 in July 1967. In October the same year, 45 T-41Cs, a more powerful version of the Model 172, were ordered for cadet flight training at the USAF Academy. (Data for the T-41A.)

Contractor: Cessna Aircraft Company.
Power Plant: one Continental O-300-C piston engine; 145 hp.
Accommodation: crew of two, side-by-side.
Dimensions: span 35 ft 10 in, length 26 ft 11 in, height 8 ft 9½ in.
Weights: empty 1,285 lb, gross 2,300 lb.
Performance: max speed at S/L 139 mph, service ceiling 13,100 ft, range 720 miles.

T-43A

On April 10, 1973, the first of these navigation trainers selected by USAF to replace the piston-engined T-29, made its initial flight. Basically a military version of the commercial Boeing Model 737-200, the T-43A is equipped with the same on-board avionics as the most advanced USAF operational aircraft, including celestial, radar, and inertial navigation systems, LORAN, and other radio systems. Deliveries of the 19 aircraft initially ordered by USAF are expected to be complete by July this year.

Contractor: The Boeing Aerospace Company.
Power Plant: two Pratt & Whitney JT8D-9 turbofan engines.
Accommodation: crew of two; 12 students, 4 advanced students, and 3 instructors.
Dimensions: span 93 ft 0 in, length 100 ft 0 in, height 37 ft 0 in.
Weight: gross 115,500 lb.
Performance: econ cruising speed at 35,000 ft Mach 0.7, operational range 2,995 miles.

Helicopters

UH-1F

UH-1N "Twin Huey"

UH-1F and HH-1H

Used for missile site support duties, 146 **UH-1Fs** were built for USAF between 1963 and 1967 following success in a design competition. Developed from the basic Bell Model 204 design, this version first flew in February 1964; deliveries began to the 4486th Test Squadron in September of the same year. A few UH-1Fs were modified to **UH-1Ps** for classified psychological warfare missions in Vietnam. **TH-1F** is a version of the UH-1F used for instrument and hoist training. Production of these versions has been completed, but in November 1970 USAF placed an initial order for 30 **HH-1Hs,** a larger 12- to 15-seat helicopter based on the Model 205, to replace the HH-43 for local base rescue duties. Deliveries began in 1972 and were scheduled for completion last year. (Data for UH-1F.)

Contractor: Bell Helicopter Company.
Power Plant: one General Electric T58-GE-3 turboshaft engine; 1,272 shp (derated to 1,100 shp).
Accommodation: one pilot and 10 passengers; or two crew and up to 4,000 lb of cargo.
Dimensions: rotor diameter 48 ft 0 in, length of fuselage 39 ft 7½ in.
Weight: 9,000 lb.
Performance: max speed 115 mph, service ceiling at mission gross weight 13,450 ft, max range, no allowances, at mission gross weight 347 miles.

UH-1N

This twin-engined version of the UH-1 utility helicopter was developed as a result of approval given by the Canadian government in 1968. Designated UH-1N, it is capable of sustaining cruising flight on one engine. An initial order made for the US services in 1969 included 79 of these aircraft for USAF; the Canadian government simultaneously ordering 50, with options on 20 more. Deliveries to USAF began in 1970.

Contractor: Bell Helicopter Company.
Power Plant: Pratt & Whitney (UACL) T400-CP-400 Turbo "Twin-Pac", consisting of two PT6 turboshaft engines coupled to a combining gearbox with a single output shaft; flat-rated to 1,250 shp.
Accommodation: pilot and 14 passengers or cargo.
Dimensions: rotor diameter (with tracking tips) 48 ft 2¼ in, length of fuselage 42 ft 4¾ in, height 14 ft 4¾ in.
Weight: gross 10,500 lb.
Performance: max speed at S/L 150 mph, service ceiling 15,000 ft, max range, no reserves 248 miles.
Armament: two General Electric 7.62 mm Miniguns or two 40 mm grenade launchers; two seven-tube 2.75 in rocket launchers.

CH-3E

Important design changes incorporated in this twin-engined amphibious transport heli-

copter, based on the US Navy's SH-3A, permit speedier cargo handling and ease of maintenance, with built-in equipment for the removal and replacement of all major components in remote areas. The initial version was the CH-3C, of which 41 were built for USAF. Introduction of uprated engines led to the new designation CH-3E in February 1966, applicable to both new production aircraft and the 41 re-engined CH-3Cs. A pod-mounted turret armament system developed for this version, with one pod on each sponson, achieves over 180° traverse on each side of the aircraft, to give complete 360° coverage with overlapping fire forward. A total of 83 new and uprated aircraft was produced, of which 50 were adapted as **HH-3Es** (see below).

Contractor: Sikorsky Aircraft, Division of United Aircraft Corporation.
Power Plant: two General Electric T58-GE-5 turboshaft engines; each 1,500 shp.
Accommodation: crew of two or three; 25 or 30 fully equipped troops, 15 litters, or 5,000 lb of cargo.
Dimensions: rotor diameter 62 ft 0 in, length of fuselage 57 ft 3 in, height 18 ft 1 in.
Weights: empty 13,255 lb, gross 22,050 lb.
Performance: max speed at S/L 162 mph, service ceiling 11,100 ft, max range, with 10% reserve, 465 miles.
Armament: General Electric six-barrel 7.62 mm Minigun mounted in each turret.

HH-3E Jolly Green Giant

Variant of the CH-3E for USAF's Aerospace Rescue and Recovery Service, developed originally to facilitate penetration deep into North Vietnam on rescue missions. Additional equipment includes self-sealing fuel tanks, armour, defensive armament, a rescue hoist, and a retractable flight refuelling probe. Some HH-3Es are modifications of CH-3Cs. An unarmed version (HH-3F) is used by the US Coast Guard. Other data basically similar to CH-3E above.

HH-43F Huskie

Evolved from an earlier piston-engined model, the HH-43 Huskie has been deployed as a local crash rescue helicopter at USAF bases throughout the world for more than a decade, with small wheel-skis fitted to the landing gear enabling it to operate from hard or soft surfaces. Initial production version was the **HH-43B,** flying for the first time in December 1958; but this was replaced by the **HH-43F,** with greater power and increased fuel capacity, in operations where optimum altitude performance under hot-weather conditions was required; the first "F" flew in August 1964. The **HH-43s** are being replaced by **HH-1Hs.**

Contractor: Kaman Aircraft Corporation.
Power Plant: one Lycoming T53-L-11A turboshaft engine; 1,150 shp (derated to 825 shp).
Accommodation: pilot, two firefighters, and rescue gear; or pilot, co-pilot, and 10 passengers; or pilot, medical attendant, and four litters.
Dimensions: rotor diameter 47 ft 0 in, length of fuselage 25 ft 2 in, height to top of rotor head 12 ft 7 in.
Weight: gross 9,150 lb.
Performance (at 6,500 lb): max speed at S/L 120 mph, service ceiling 23,000 ft, range at 8,270 lb, no reserve, 504 miles.

CH-3E

HH-53B

Ordered in September 1966 for USAF's Aerospace Rescue and Recovery Service to supplement the HH-3E, this twin-turbine heavy-lift helicopter carries the same general equipment as the Jolly Green Giant, including the flight refuelling probe and all-weather avionics, but is faster and larger. The first of eight HH-53Bs flew in March 1967, and, following delivery, which began in June the same year, the type was used extensively for rescue operations in Southeast Asia.

Contractor: Sikorsky Aircraft, Division of United Aircraft Corporation.
Power Plant: two General Electric T64-GE-3 turboshaft engines; each 3,080 shp.
Accommodation: crew of three; basic accommodation for 38 combat-equipped troops or 24 litters and 4 attendants.
Dimensions: rotor diameter 72 ft 3 in, length of fuselage (without refuelling probe) 67 ft 2 in, height 24 ft 11 in.
Weights: empty 23,125 lb, gross 42,000 lb.
Performance: max speed at S/L 186 mph, service ceiling 18,400 ft, max range, with 10% reserve, 540 miles.

HH-3E Jolly Green Giant

HH-53B

HH-53C and CH-53C

An improved version of the HH-53B, powered by 3,435 shp T64-GE-7 turboshaft engines; first delivered to USAF in August 1968. With a maximum speed of 196 mph, the **HH-53C** is faster than the "B" model; it can transport 60 passengers or 18,500 lb of freight and has an external cargo hook of 20,000 lb capacity. Other data basically as for HH-53B above. A total of 66 HH-53B/Cs was built. A similar version, the **CH-53C,** is used to provide battlefield mobility for the Air Force mobile Tactical Air Control System.

HH-53C

Strategic Missiles

LGM-25C Titan II

Operational since 1963, this two-stage ICBM is deployed in six squadrons, each with nine missiles, based at Davis-Monthan AFB, Ariz.; McConnell AFB, Kan.; and Little Rock AFB, Ark. Titan II is fitted with a thermonuclear warhead having the largest yield of any carried by a US missile and has a launch reaction time of one minute from its fully hardened underground silo. During flight, the second stage shuts down once a speed of 17,000 mph is attained; vernier nozzles then adjust the velocity and correct the trajectory for the proper ballistic delivery of the ablative-type re-entry vehicle, which finally separates from the burnt-out second stage. Advanced penetration aids are carried to hinder detection and destruction by enemy ABMs.

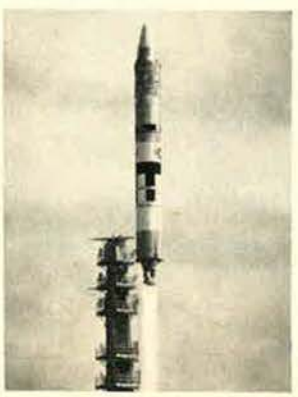
Contractor: Martin Marietta Corporation.
Power Plant: first stage: Aerojet-General LR87 storable liquid-propellant engine; 430,000 lb thrust; second stage: Aerojet-General LR91 storable liquid-propellant engine; 100,000 lb thrust.
Guidance: AC Electronics inertial guidance system.
Warhead: thermonuclear, in General Electric Mk 6 ablative re-entry vehicle.
Dimensions: length 103 ft 0 in, max body diameter 10 ft 0 in.
Weight: launch weight 330,000 lb.
Performance: max speed 17,000 mph (Mach 25.75), max range 6,300 miles.

LGM-30F/G Minuteman

Provision has been made in the FY 1974 budget for the acquisition of a further 115 Minuteman ICBMs. Of similar range, though smaller and lighter in weight than the liquid-propellant Titan, this three-stage solid-propellant second generation missile is designed to supersede earlier ICBMs and has a smaller payload. The latest operational versions are:

LGM-30F Minuteman II: similar in configuration to the original Minuteman I, which is still used by Wing V, Minuteman II has increased range and targeting coverage; also increased accuracy and payload capacity: operational since 1966, it is currently based at Wings I, II, and IV.

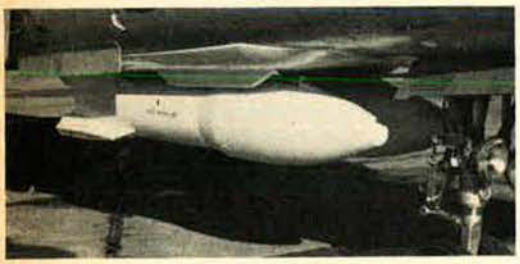
LGM-30G Minuteman III: with MIRV capability, this version increases the possibility of penetrating enemy defence systems. First highly successful test launch was made in 1968, and Minuteman III is now operational in Wings III, V, and VI.



Titan II

Minuteman III

SRAM, launched by FB-111



Genie

AIM-4D Falcon being loaded on F-4

Current plans provide for the entire force of 1,000 Minuteman missiles to consist eventually of 450 LGM-30Fs and 550 "G" models.

Assembly and Integration: The Boeing Company.
Power Plant: first stage: Thiokol M-55E solid-propellant motor; 200,000 lb thrust; second stage: Aerojet-General SR19-AJ-1 solid-propellant motor; 60,600 lb thrust; third stage: LGM-30F Hercules, Inc., solid-propellant motor; LGM-30G Aerojet-General SR73-AJ-1 solid-propellant motor; 34,000 lb thrust.
Guidance: Autonetics Division of Rockwell International inertial guidance system.
Warhead: LGM-30F single thermonuclear warhead in Avco re-entry vehicle; LGM-30G multiple thermonuclear warheads, each in a General Electric Mk 12 re-entry vehicle.
Dimensions: length 59 ft 10 in, diameter of first stage 5 ft 6 in.
Weight: launch weight (approx) LGM-30F 70,000 lb; LGM-30G 76,000 lb.
Performance: speed at burn-out more than 15,000 mph (Mach 22.75), highest point of trajectory approx 700 miles, range with max operational load LGM-30F more than 6,000 miles; LGM-30G more than 7,000 miles.

AGM-28B Hound Dog

Developed to arm B-52G and H aircraft, this long-range air-to-surface strategic standoff missile was first launched in 1959 and entered service in 1961 under the original designation GAM-77A. Each aircraft carries two Hound Dogs, one beneath each wing on pylons that contain the astro-tracking system and launching equipment; the missile's engine can be used to supplement those of the aircraft to augment thrust at take-off or during cruise, and it can be refuelled in the air from the aircraft's tanks before release. Capable of high- or low-level attack, of changing course or altitude, and of making dog-leg or feint runs, all of the several hundred Hound Dogs still operational are of the AGM-28B version.

Contractor: North American Aviation Inc.
Power Plant: Pratt & Whitney J52-P-3 turbojet; 7,500 lb thrust.
Guidance: North American Autonetics Inertial guidance system, supplemented by a star-tracking system produced by Kollsman Instrument Company.
Warhead: thermonuclear, with reported yield of 4 megatons.
Dimensions: length 42 ft 6 in, body diameter 2 ft 4½ in, wing span 12 ft 2 in.
Weight: launch weight 9,600 lb.
Performance: cruising speed Mach 2, max range 600 miles.

AGM-69A SRAM

This supersonic air-to-surface nuclear missile was designed fundamentally to attack and neutralise enemy terminal defences such as the Soviet SAM missile sites. The inertial guidance system makes the missile impossible to jam, while its radar signature is said to be no larger than that of a machine-gun bullet. Initial delivery of the SRAM (Short Range Attack Missile) was made in 1972, and current contracts cover the production of 1,500 missiles. Each SAC B-52G and "H" can carry 20 SRAMs, twelve in three-round underwing clusters and eight in a rotary dispenser in the aft bomb-bay, together with up to four Mk 28 thermonuclear weapons. Alternatively, the rotary launcher can be carried simultaneously with two underwing AGM-28B Hound Dogs and decoy missiles. An FB-111A can carry four SRAMs on swivelling underwing pylons and two internally. When carried externally, a tailcone, 22.2 in long, is added to the missile for aerodynamic reasons. Future carriers should include the B-1.

Contractor: The Boeing Aerospace Company.
Power Plant: Lockheed Propulsion Company LPC-415 restartable solid-propellant two-pulse rocket engine.
Guidance: General Precision/Kearfott inertial system, permitting attack at high or low levels, and dog-leg courses. CEP stated to be well within lethal radius of warhead.
Warhead: nuclear, of similar yield to that of single Minuteman III warhead.
Dimensions: length 14 ft 0 in, body diameter 1 ft 5½ in.
Weight: launch weight approx 2,230 lb.
Performance: speed up to Mach 2.5, range 100 miles at high altitude, 35 miles at low altitude.

Airborne Tactical and Defence Missiles

AIR-2A Genie

When, on July 19, 1957, the Genie was launched from a F-89J Scorpion, it became the first nuclear-tipped air-to-air rocket ever tested in a live firing. Production ended in 1962, but thousands were delivered and continue in first-line service with F-101B and F-106 squadrons of USAF, as well as with the Canadian Armed Forces. Unguided in flight, Genie is normally fired automatically by the Hughes fire-control system fitted in the launching aircraft. As one of many safety precautions, the missile remains inert in a nuclear sense until it is armed in the air, a few moments before firing. A training version, without nuclear warhead, is also in service.

Contractor: McDonnell Douglas Astronautics Company.
Power Plant: Thiokol SR49-TC-1 solid-propellant rocket motor; 36,000 lb thrust.
Guidance: no guidance system.
Warhead: nuclear, with reported yield of 1.5 kilotons.
Dimensions: length 9 ft 7 in, body diameter 1 ft 5.35 in, fin span 3 ft 3½ in.
Weight: launch weight 820 lb.
Performance: max speed Mach 3, max range 6 miles.

AIM-4A/C/D Falcon

Standard armament on all US all-weather interceptors, Falcon was the first air-to-air guided weapon to come into USAF service. Versions include:

AIM-4A: improved version of the original radar-homing production model; about 12,000 built between 1956 and 1959.

AIM-4C: similar airframe to AIM-4A but with infra-red guidance system. About 9,500 were delivered simultaneously with the "A"s.

AIM-4D: "cross-bred" version, combining the improved infra-red homing head of the AIM-4G Super Falcon with the basic airframe of the AIM-4C. Used to arm F-4 fighters of Tactical Air Command and F-101 and F-102 fighters of ADC and later the Air National Guard. Thousands of older Falcons have been converted to AIM-4D standard.

Contractor: Hughes Aircraft Company.
Power Plant: Thiokol M58-E4 solid-propellant rocket motor; 6,000 lb thrust.
Guidance: AIM-4A: Hughes semi-active radar homing system; AIM-4C/D: infra-red homing system.
Warhead: high-explosive.
Dimensions: length AIM-4A 6 ft 6 in, AIM-4C/D 6 ft 7½ in, body diameter 6.4 in, wing span 1 ft 8 in.
Weight: launch weight AIM-4A 110 lb; AIM-4C 122 lb; AIM-4D 134 lb.
Performance (AIM-4D): max speed Mach 4, range 6 miles.

AIM-4F/G Super Falcon

Arming the F-106 Delta Dart, the Super Falcon is a developed version of the AIM-4A/C Falcon, having a reduced susceptibility to enemy countermeasures and higher performance. A mixed armament of four AIM-4F/Gs is carried internally. The two versions were introduced simultaneously in 1960, superseding the interim AIM-4E.

Contractor: Hughes Aircraft Company.
Power Plant: Thiokol M46 two-stage solid-propellant motor; first-stage rating of 6,000 lb thrust.
Guidance: AIM-4F: Hughes semi-active radar homing guidance; AIM-4G: infra-red homing system.
Warhead: high explosive, weighing 40 lb.
Dimensions: length AIM-4F 7 ft 2 in; AIM-4G 6 ft 9 in, body diameter 6.6 in, wing span 2 ft 0 in.
Weight: launch weight AIM-4F 150 lb; AIM-4G 145 lb.
Performance: max speed Mach 2.5, max range 7 miles.

AIM-7E/F Sparrow

Currently one of the most important guided weapons in service with the NATO air forces and their allies, the **AIM-7E** is a radar-homing air-to-air missile of all-weather all-altitude operational capability, suited also for use against shipping targets from aircraft or ships. Up to four Sparrow missiles can be carried by the F-4 Phantom II. A variant of the standard AIM-7E, the **AIM-7E-2** is similar but has better manoeuvrability to improve its "dog-fight" capability. The **AIM-7F** is an advanced solid-state version of the Sparrow that has been undergoing operational testing and evaluation, is intended to supersede the current AIM-7E, and will arm the F-15. (Data for AIM-7E.)

Contractor: Raytheon Company.
Power Plant: Rocketdyne Mk 38 solid-propellant rocket motor.
Guidance: Raytheon continuous-wave semi-active radar homing system.
Warhead: high-explosive, weighing 60 lb.
Dimensions: length 12 ft 0 in, body diameter 8 in, wing span 3 ft 4 in.
Weight: launch weight 450 lb.
Performance: max speed more than Mach 3.5, range AIM-7E 14 miles; AIM-7F 28 miles.

AIM-9 Sidewinder

Said to have fewer than two dozen moving parts and no more electronic components than a domestic radio, the Sidewinder air-to-air missile is one of the simplest and cheapest guided weapons yet produced in quantity. The standard AIM-9B, first fired successfully in September 1953, was produced in very large numbers by Philco and General Electric for USAF and USN, and has been supplied to many foreign armed services, including those of nine NATO countries. New versions of Sidewinder reported to be under development for USAF, or in service, are:

AIM-9E: an advanced version of AIM-9B produced by Philco for USAF.

AIM-9J: an advanced version of AIM-9E developed and produced by Philco-Ford to overcome limitations experienced during air fighting in Vietnam; to equip all Sidewinder-capable aircraft.

AIM-9L: new version with much enhanced capability, under development jointly by USAF and USN. No details available. (Data for AIM-9B.)

Contractor: Naval Weapons Center.
Power Plant: Naval Propellant Plant solid-propellant rocket motor.
Guidance: infra-red homing guidance.
Warhead: high-explosive, weighing 25 lb.
Dimensions: length 9 ft 3½ in, body diameter 5 in, fin span 1 ft 10 in.
Weight: launch weight 159 lb.
Performance: max speed Mach 2.5, max range 2 miles.

AIM-26B Falcon

Though generally similar to the AIM-26A, which, in 1960, became the first nuclear-tipped guided missile to enter service and which was subsequently deployed with the F-102 Delta Dagger squadrons of ADC, the AIM-26B differs fundamentally in having a conventional warhead. Production began in 1963, and it is now the only version still operational. The basic radar homing guidance of the AIM-4A was fitted in this advanced variant, as it provides better all-weather capability, longer acquisition range, and is more suitable for attack from any direction than infra-red systems.

Contractor: Hughes Aircraft Company.
Power Plant: Thiokol M60 solid-propellant rocket motor.
Guidance: Hughes semi-active radar homing guidance.
Warhead: high-explosive.
Dimensions: length 7 ft 0 in, max body diameter 11 in, wing span 1 ft 8 in.
Weight: launch weight 203 lb.
Performance: max speed Mach 2, range 5 miles.

AGM-45A Shrike

Introduced into operational service in Vietnam during 1965, where it played a vital role in the US air offensive, this supersonic air-to-surface missile is designed to home on enemy radar installations and is carried as a standard penetration aid by USAF tactical aircraft. Many improvements have subsequently increased Shrike's effectiveness, and it continues in production for both USAF and USN.

Contractor: Naval Weapons Center.
Power Plant: Rocketdyne Mk 39 Mod 7 or Aerojet Mk 53 solid-propellant rocket motor.
Guidance: passive homing head by Texas Instruments.
Warhead: high-explosive/fragmentation.
Dimensions: length 10 ft 0 in, body diameter 8 in, span 3 ft 0 in.
Weight: launch weight 400 lb.
Performance: max range 10 miles.

AGM-65A Maverick

The self-homing capability of this tactical air-to-surface missile, which is the smallest of the US TV-guided weapons currently in production and operational use, distinguishes it from the earlier types. This enables the pilot of the launch aircraft to seek other targets or leave the target area once the missile has been launched. Production was initiated in 1971 following the success of test launches over distances ranging from a few thousand feet to many miles, and from high altitudes down to treetop level. Orders now total 5,000, with the first production Maverick having been formally accepted by USAF in August 1972. The missile is carried by the A-7D, F-4D, F-4E, and the A-10, normally in two three-round underwing clusters, and is intended for use against pinpoint targets such as tanks and columns of vehicles. It has also been successfully test-launched from RPVs.

Contractor: Hughes Aircraft Company.
Power Plant: Thiokol TX-481 solid-propellant rocket motor.
Guidance: self-homing electro-optical guidance system (a laser-guided version, CASM, is under development).
Warhead: high-explosive, shaped charge.
Dimensions: length 8 ft 1 in, body diameter 1 ft 0 in, wing span 2 ft 4 in.
Weight: launch weight 462 lb.
Performance: classified.

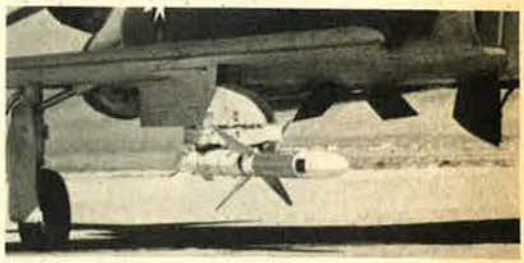
AGM-78 Standard ARM

Designed to provide a significant increase in capability over earlier weapons in countering the threat of radar-controlled anti-aircraft guided missiles and guns, the AGM-78 Standard ARM (Anti-Radiation Missile) has been in production since 1968, with several models scheduled for development. The initial version used the passive homing target-seeking head of the Shrike missile; current models have improved seeker heads and avionics for better target selection, increased effectiveness against target countermeasures, and still greater attack range. Standard ARM is deployed on USAF's F-105 and also by USN.

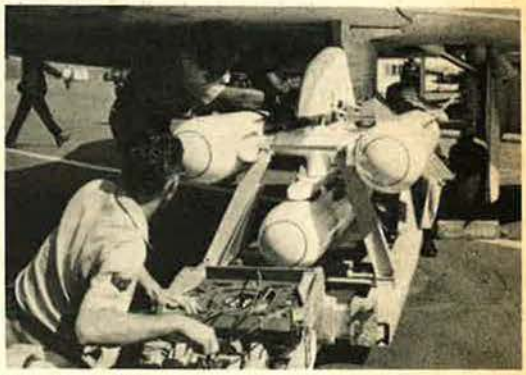
Contractor: General Dynamics Corporation, Pomona Division.
Power Plant: Aerojet-General Mk 27 Mod 4 dual-thrust solid-propellant rocket motor.
Guidance: passive homing guidance system, using seeker head that homes on enemy radar emissions.
Warhead: high-explosive.
Dimensions: length 15 ft 0 in, body diameter 1 ft 0 in.

Sparrow

Sidewinder



Shrike on F-4D



Maverick on F-4

Walleye (early test model)

Weight: launch weight, basic version 1,800 lb.
Performance: max speed Mach 2, max range 15.5 miles.

Electro-Optical Guided Bomb (EOGB)

EOGB is a modular weapon system, in the form of a kit, able to convert a variety of standard unpowered bombs into highly accurate guided weapons, with moderate/long-range stand-off capability. Each kit consists of a forward guidance assembly, the warhead or interconnect section (including the bomb), and the aft control section, including an autopilot. When installed, it does not alter the conventional bomb suspension, release, or jettison functions. Some Mk 84 EOGBs have been fitted with a swept wing assembly, the wings extending after launch, to increase the weapons' range. Known as modular guided glide bombs (MGGB), they carry a data link to allow controllability at extended ranges. Another modified version incorporates a new mid-course guidance system, including distance measuring equipment, for increased accuracy. The effectiveness of the EOGB bomb was demonstrated in a large number of air drops in Southeast Asia.

Contractor: Rockwell International Corporation.
Guidance: current EOGBs use electro-optical guidance systems.
Warhead: current EOGBs are built around standard Mk 84 (2,000 lb) bombs.

Walleye

Operational use in Vietnam showed this unpowered air-to-surface glide bomb to be an extremely accurate and effective weapon. Officially designated Guided Weapon Mark 1 Mod-0 (Walleye), it was put into production in 1966 and can be carried by a wide variety of aircraft, including the A-7, F-4, and F-111. Production is now complete.

Contractor: Martin Marietta Corporation.
Guidance: self-homing electro-optical guidance system, enabling the pilot of the carrier aircraft to take any necessary evasive action once he has focused Walleye's TV camera on target and launched the bomb.
Warhead: high-explosive.
Dimensions: length 11 ft 3 in, body diameter 1 ft 3 in, wing span 3 ft 9 in.
Weight: launch weight 1,100 lb.

Launch Vehicles

Atlas SLV-3A (with Agena + OGO-E)

Agena

A payload section (nosecone) able to accommodate a variety of earth-orbiting and space probes weighing up to several hundred pounds gives this space vehicle an inherent versatility. Agena is normally utilised as the upper stage of such launchers as Atlas, Titan III, and, formerly, Thor. The Agena system and attached payload have functioned for longer than six months on some USAF missions. An Agena spacecraft was the first to accomplish a rendezvous and docking by spacecraft in orbit and to provide propulsion power in space for another spacecraft. The three basic versions are:

Agena A: first flown in 1959 and used in the Discoverer programme with a Thor launcher.

Agena B: a new "restart" version of the Bell Agena rocket engine permits this version to change orbit; used in later Discoverer launchings and with the Atlas in the now-discontinued Midas programme.

Agena D: tested successfully in June 1962 and able to accept a variety of payloads, unlike the earlier "A" and "B" which have integrated payloads. Agena is used in most USAF reconnaissance satellite launchings, except for the latest Big Bird missions.

Prime Contractor: Lockheed Missiles and Space Company Inc.
Power Plant: Bell Aerosystems liquid-propellant rocket engine; 16,000 lb thrust.
Dimensions (Agena D): length (typical) 23 ft 3 in, diameter 5 ft 0 in.
Weights (typical Agena D): launch weight 15,037 lb, weight in orbit, less payload, 1,277 lb.

Atlas Launchers

Atlas-Agena: Used by the USAF for military satellite and scientific launchings, this is a general-purpose space launch vehicle (SLV), consisting of the Atlas SLV standardised launcher with an Agena upper stage. Atlas-Agena vehicles have successfully launched Ranger lunar probes, Mariner Mars and Venus probes, Vela nuclear detection satellites, and OAO, OGO, and ATS satellites.

Atlas SLV-3A: An uprated version of the earlier SLV-3, with lengthened propellant tanks, the SLV-3A was evolved primarily for use with the Agena upper stage, but it could serve as a direct-ascent vehicle or in conjunction with other upper stages. Of the fourteen SLV-3As produced under initial contracts, seven were for use by the USAF in classified missions, with the remainder for NASA.

Atlas SLV-3D: Although intended for use primarily with the Centaur D-1A upper stage, the SLV-3D is standardised like the SLV-3A and can be used on other missions. In 1972, Pioneer 10 was launched on its flight path to Jupiter with the highest velocity ever imparted to a spacecraft, the launch vehicle being an Atlas/Centaur with an additional TE-M-364-4 solid-propellant rocket motor.

Prime Contractor: General Dynamics Corporation, Convair Aerospace Division.
Power Plant: uprated Rocketdyne MA-5 propulsion system, comprising central sustainer motor and two boosters; total S/L thrust approx 431,000 lb (60,000 lb from the central sustainer motor, 370,000 lb total from the two boosters, 1,040 lb from two verniers).
Dimensions (Atlas SLV-3A-Agena): height 100 ft 0 in, body diameter 10 ft 0 in.
Launch Weight (SLV-3A): 314,000 lb.
Performance (SLV-3A-Agena): capable of putting payload of 8,800 lb into a 115 mile circular orbit, or of launching 2,920 lb into synchronous transfer orbit.

Burner II

Suitable for mating to the current range of space vehicles, Burner II is a low-cost guided solid-propellant upper-stage booster capable of injecting small-to-medium payloads into orbit and then orientating them precisely. Since the initial contract, covering one ground test and three flight test vehicles, eleven additional flight vehicles have been ordered and delivered. Its first launching took place in September 1966 when it was used in combination with a Thor vehicle to put into orbit a secret USAF satellite. A developed version of Burner II, with a larger motor, is under consideration for use as a booster in conjunction with Titan III/Centaur for outer planet exploration missions.

Prime Contractor: The Boeing Company.
Power Plant: Thiokol TE-M-364-2 rocket motor; 10,000 lb thrust.
Guidance: Honeywell system similar to that used on NASA Scout launch vehicle.
Dimensions: length overall 5 ft 8 in, diameter 5 ft 5 in.

Burner IIA

A two-stage development of Burner II, for use with virtually all USAF space boosters on missions requiring high-velocity earth escape speeds or for placing satellites in synchronous equatorial orbit. First commissioned in 1969 by the USAF's Space and Missile Systems Organization, th

initial contract covered six Burner IIAs and one ground test unit. A second-stage Thiokol TE-M-442 motor, with 8,800 lb thrust, is added to Burner II's first stage, and the latter's sub-systems are mounted on the new stage.

Centaur

First US high-energy upper stage and first to utilise liquid hydrogen as a propellant. The latest version, Centaur D-1, retains the same propulsion and structural features as its predecessor, Centaur D, but has several redesigned or repackaged astrionics components. Used in conjunction with the Atlas SLV-3D or the Titan IIIE, it provides widely ranging applications and capabilities: the nose section of the former is modified to a constant 10 ft diameter to accommodate the Centaur D-1A which, in turn, generates most of the electronic command and control systems for the launch vehicle; the Centaur D-1T also provides guidance for its Titan booster. Atlas/Centaur D-1A launch missions have been assigned into 1976. The proving flight of the Titan IIIE/Centaur D-1T was scheduled for early this year, to be followed by the launching of the German Helios sun probe, the Viking Mars orbiter/landers, and the 1977 Mariner Jupiter/Saturn missions.

Prime Contractor: General Dynamics Corporation, Convair Aerospace Division.
Power Plant: two Pratt & Whitney RL10A-3 liquid hydrogen engines; each 15,000 lb thrust.
Guidance: inertial guidance system.
Dimensions: Centaur: length 30 ft 0 in, diameter 10 ft 0 in; Atlas/Centaur: length 103 ft 11 in.
Launch Weight (approx): 37,000 lb.
Performance: Atlas/Centaur: 11,200 lb into 115 mile circular orbit, or 4,000 lb into synchronous transfer orbit, or 1,300 lb to nearest planet; Titan/Centaur: 34,000 lb into 115 mile circular orbit, or 7,400 lb into synchronous equatorial orbit, or 8,200 lb to nearest planet.

Scout

Designed to make possible space, orbital, and re-entry research by NASA and the Department of Defense at comparatively low cost, using "off-the-shelf" major components where available, Scout is a four/five-stage launch vehicle, first ordered in 1959. A subsequent version with an improved fourth stage was launched successfully for the first time in August 1965. In addition to increasing the payload, this version can be manoeuvred in yaw and can send a 100 lb payload more than 16,000 miles into space. A fifth-stage velocity package is being developed, which will increase the Scout's hypersonic re-entry performance, make possible highly elliptical deep-space orbits, and extend the vehicle's probe capabilities to the sun. Using the latest Algol III first-stage motor, Scouts can put 425 lb payloads (320 lb with the earlier motor) into a 310 mile easterly orbit and have been used to launch many unmanned spacecraft, including classified military satellites.

Prime Contractor: LTV Aerospace Corporation.
Power Plant: first stage: Aerojet-General Algol IIB solid-propellant motor; 115,000 lb thrust, or Algol III; second stage: Thiokol Castor II solid-propellant motor; 60,000 lb thrust; third stage: Hercules Antares II solid-propellant motor; 21,000 lb thrust; fourth stage: UTC FW-4S solid-propellant motor; 6,000 lb thrust; fifth stage under development.
Guidance: simplified Honeywell gyro guidance system.
Dimensions: height overall 72 ft 0 in, max body diameter 3 ft 3½ in.
Launch Weight: 37,600 lb.

Titan III

As the US's standard heavy-duty space "workhorse" booster, Titan III can be modified to launch a wide variety of payloads, both manned and unmanned, ranging from 35,000 lb in earth orbit to 7,000 lb for planetary missions. The basic core section consists of two booster stages evolved from the Titan II ICBM and an upper stage, known as Transtage, capable of functioning both in the boost phase of flight and as a restartable space propulsion vehicle. Principal configurations are:

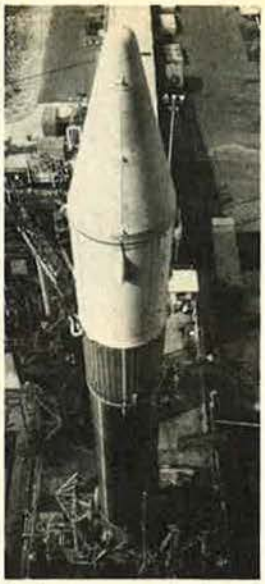
Titan IIIB: basically the first two stages of the core section, able to accommodate various upper stages. First launched in July 1966 and used subsequently with Agena upper stages to launch classified USAF payloads.

Titan IIIC: consisting of the core section with two five-segment strap-on motors functioning as a booster before ignition of the main engines. First launched in June 1965; payloads include USAF early warning satellites.

Titan IIID: basically similar to IIIC but using only the first two stages of the core section and able to accept a variety of upper stages. Radio guidance is used instead of the standard inertial guidance. Production order placed by USAF in 1967; first used in June 1971 to orbit the first Lockheed Big Bird photo-reconnaissance spacecraft.

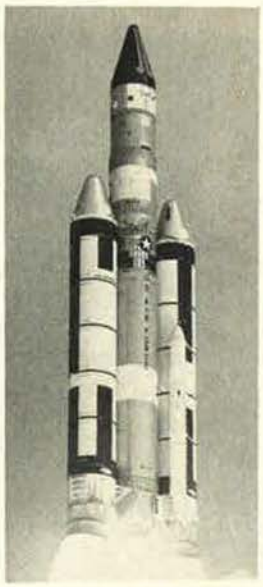
Titan IIIE-Centaur: basically a Titan IIID which has been modified to accommodate a Centaur high-energy upper stage. Primary mission is to place two Viking spacecraft on Mars in 1976. More than 100 Titan IIIs of all versions were ordered between 1964–73.

Prime Contractor: Martin Marietta Corporation.
Power Plant: first and second stages: Aerojet liquid-propellant engines; first stage 470,000 lb thrust; second stage 100,000 lb thrust; Transtage Aerojet twin-chamber liquid-propellant engine; 16,000 lb thrust; Titan IIIC/D also have two UTC five-segment solid-propellant booster rocket motors; each more than 1,200,000 lb thrust.
Dimensions: first and second stages of core: height 96 ft 3½ in, diameter 10 ft 0 in; Transtage: height 15 ft 0 in, diameter 10 ft 0 in.
Launch Weight (approx): for the core vehicle: 345,000 lb; Titan IIIC: 1,400,000 lb.
Performance (Titan IIIC approx): speed at burn-out: solid-propellant boosters 4,100 mph, first stage 10,200 mph, second stage 17,100 mph, Transtage 17,500 mph.



Centaur at Cape Canaveral

Scout at Wallops Island



Titan IIIG at Cape Kennedy

Remotely Piloted Vehicles (RPVs)

Boeing YQM-94A

Under the USAF's Compass Cope programme, Boeing and Teledyne Ryan (see below) received contracts for prototypes of a long-range high-altitude RPV to be evaluated in a competitive fly-off. The winning design was to be used primarily for signal intelligence collection and was intended to replace the RB-57 in the Pave Nickel programme.

An all-fibreglass fuselage permits the YQM-94A's (known as Compass Cope B) use as a "flying radome" in which radar and other sensing equipment can be installed. A TV camera mounted in the nose enables a pilot to control the aircraft from a ground station, using advanced digital communications systems. The prototypes are each powered by a single J97 turbojet, pod-mounted above the fuselage to reduce

Boeing's Compass Cope RPV

YQM-98A Teledyne Ryan RPV for Compass Cope

AQM-34 Ryan Model 147 RPV on DC-130A

AQM-91A RPVs under DC-130A

BGM-34 with Shrike missile under right wing and Mk IV bomb under left wing

vulnerability to infra-red missiles launched from below; a final decision on whether to adopt a single- or twin-engined configuration for production aircraft will depend on flight test results. Re-engined with a turbofan, more than twice the endurance of the RC-135s, used currently in electronic intelligence collection, could be expected. Unlike present RPVs, the YQM-94A takes off and lands from a conventional runway and so requires an all-weather landing capability, plus a main undercarriage track of 21 ft for maximum ground stability. The first of the two prototypes ordered in the initial contract in 1971 flew on July 28, 1973, five months after delivery to the USAF, but crashed a week later. No decision to complete the second has yet been announced.

Contractor: Boeing Aerospace Company.
Power Plant: one General Electric J97-GE-100 turbojet engine; 5,270 lb thrust.
Dimensions: span 90 ft 0 in, length (excluding nose probe) 42 ft 0 in.
Weights: payload for 24 hr mission 700 lb, gross approx 13,000 lb.
Performance (prototype): cruising speed at altitudes from 50,000 ft to 70,000 ft Mach 0.5 to 0.6, max endurance 30 hr.

YQM-98A

With the prototype contract received in spring 1972, development of the Teledyne Ryan YQM-98A (Compass Cope R) was some months behind that of the Boeing vehicle. Construction began in February 1973 with the first flight scheduled for the summer of this year. Representing a third-generation aircraft, superseding the Ryan AQM-34N(H) and AQM-91A, the YQM-98A, or Ryan Model 235, is very similar to the latter vehicle in general configuration, with extremely high aspect ratio wings and an over-fuselage pod mounting for its power plant which, in the prototypes, is a Garrett AiResearch ATF 3 turbofan. A decision regarding the power plant of production models has not yet been made. Method of operation and applications are generally similar to those of the Boeing YQM-94A, given above.

Contractor: Teledyne Ryan Aeronautical, division of Teledyne Inc.
Power Plant: one Garrett AiResearch ATF 3 (XF104-GA-100) turbofan engine; 5,000 lb design thrust.
Dimensions: span 81 ft 2.4 in, length 47 ft 0 in.
Weights and performance similar to YQM-94A.

Ryan AQM-34

Of the large "family" of surveillance/reconnaissance RPVs encompassed within this basic USAF designation and the Ryan Model number 147, a total of twenty-four versions has been revealed, all evolved from the BQM-34A Firebee I target drone. Many hundreds of Model 147s have been delivered for operational use, while versions have also been widely utilised in testing the effectiveness of new combat equipment in a combat environment without risk to personnel. The original 147A was no more than a modified Firebee, with a new guidance system and increased fuel capacity. Typical subsequent versions are: **AQM-34N,** Ryan 147H, a medium-altitude reconnaissance vehicle; operational with SAC from about 1968. **AQM-34H(NC),** Ryan 147NC, a medium-altitude ECM version, with two underwing hard points for electronic warfare pods or ALE-2 chaff dispensing pods; equipment includes Sperry Univac APW-25 or 26 transponder. Like USAF's other tactical drones, this one is air-launched from DC-130s of the 11th Tactical Drone Squadron of TAC. **AQM-34L(SC),** Ryan 147SC, a low-altitude reconnaissance RPV, with nose-mounted camera or other sensor. Long used for missions over North Vietnam, this vehicle and the Lockheed SR-71 manned strategic reconnaissance aircraft were the only USAF reconnaissance types permitted to overfly that country after the cessation of bombing in January last year. Under the Lear Siegler Update programme, six AQM-34Ls have been modified to improve low-level navigational accuracy and photographic coverage of ground targets. Redesignated **YAQM-34U,** these RPVs are also being equipped to carry Igloo White acoustic sensor dispensers on two underwing hard points. The first YAQM-34U was lost at the end of its first flight in March 1973 when the main recovery parachute failed to deploy. **AQM-34M(SD),** Ryan 147SD, very similar to the AQM-34L. One model was scheduled to be flight-tested under the USAF Compass Robin programme in 1973. **AQM-34Q/R,** Ryan 147TE/TF, medium-altitude surveillance drones with span extended from basic 12 ft 10 in to 27 ft. Used in electronic intelligence operations over Southeast Asia, with mid-air recovery by helicopter. (Data for AQM-34L.)

Contractor: Teledyne Ryan Aeronautical, division of Teledyne Inc.
Power Plant: Teledyne CAE J69-T-41A turbojet engine; 1,920 lb thrust.
Weight: gross 3,287 lb.
Performance: range at low-altitude variable from 177 miles at 645 mph to 748 miles at 485 mph.

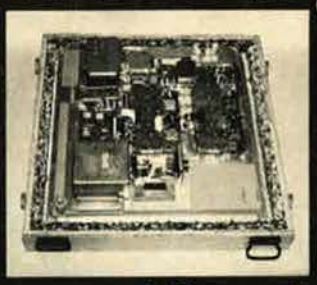
Ryan AQM-91A

This large high-altitude reconnaissance and electronic surveillance RPV, known by the Ryan Model number 154, was developed basically for operation under the now-inactive Compass Arrow programme. After a design competition in which North American also took part, Ryan received an initial R&D contract in 1966. The flattened undersurface of the airframe, with smooth curves elsewhere, and the over-fuselage mounting of the 5,270 lb st General Electric J97 turbojet power plant underline the care that was taken to reduce to a minimum radar reflectivity and susceptability to lock-on by infra-red missiles, following the loss of a number of earlier drones to ground defences. Equipment includes a 325 lb Itek KA-80A optical bar panoramic camera, with Raytheon electronic intelligence (elint) and HRB Singer infra-red sensors. Navigation is by a self-contained system utilising a Teledyne Ryan Doppler sensor. Teledyne inertial stabilised platform, and a digital computer. Final recovery is by a Sperry Rand Univac UPQ-3 microwave command guidance system, with a range of about 200 miles, operated from either a recovery aircraft or a ground station via transponders on the drone. Estimated span of the AQM-91A is about 49 ft and overall length about 35 ft.

Ryan BGM-34

Plans to evolve combat drones for a variety of missions which at present require manned aircraft are reflected in this RPV which, though sharing the Firebee I parentage of the AQM-34, is intended to fulfill a more aggressive role. Demonstrations of unarmed air-to-air combat against a piloted F-4 fighter, and the dropping of inert 500 lb bombs from a modified Firebee have been followed up by the production of small test batches of two versions: **BGM-34A,** used to evaluate the capability of RPVs to deliver missiles and bombs for defence suppression by day, under real-time control. Initial trials have involved the release of single Shrike anti-radiation missiles and EOGBs (electro-optically guided bombs), with good results. Development is continuing to permit multiple weapons to be carried and launched. The RPVs themselves are directed from their DC-130 launch aircraft, via a TV camera mounted in the nose. **BGM-34B,** generally similar to the BGM-34A, but with modified tail unit, enlarged control surfaces, and added operational capability. Delivery of the eight vehicles ordered is under way. Maximum launching weight is approximately 5,000 lb. At least one BGM-34B has been fitted with an extended, modified nose that houses target acquisition and designation equipment of the kind contained in the Philco-Ford Pave Knife pods carried by the F-4D Phantoms for use with laser-guided "smart bombs"; this enables the RPV to be used in a pathfinder role.

By anyone's measurement Teledyne Ryan's AN/APN-200 is 10 times more reliable than any other Doppler radar.



And more.

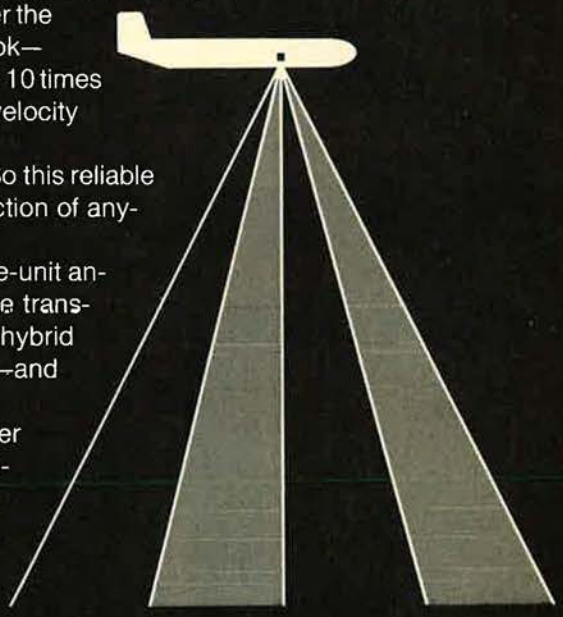
Teledyne Ryan's newest Doppler radar velocity sensor has stood the test of time: More than 25,000 operating hours—with an MTBF of 2600 hours in Lockheed's S-3A Reliability Assurance Measurement (RAM) program. Over 1400 hours under the MIL-STD-781 reliability test program—the toughest test in the book—produced documented proof that Ryan's AN/APN-200 is at least 10 times more reliable than any other fixed-wing Doppler . . . with aircraft velocity accuracy of 0.1%.

Better reliability means better operational cost effectiveness. So this reliable Doppler's life-cycle cost, or total user's cost projection, is a fraction of anything else like it in the air.

How did Teledyne Ryan bring it off? Starting with unique single-unit antenna construction, the AN/APN-200 features an IMPATT diode transmitter, stripline microwave receivers and integral BITE. The hybrid packaged integrated circuitry is a refinement of our aerospace—and outer space—proven radar technology.

Then, we piggybacked the Doppler's signal trackers and power supply on the top side of the four-fixed-beam planar array antenna. Result: The finest fixed-wing Doppler radar in the free world.

Teledyne Ryan's AN/APN-200 . . . far and away the reliability leader.



TELEDYNE RYAN AERONAUTICAL
SAN DIEGO, CALIFORNIA 92112

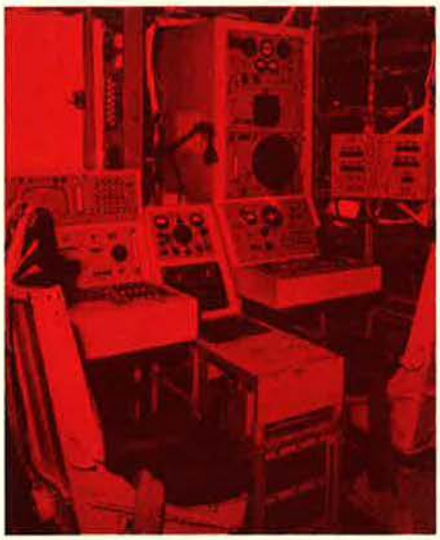
UNIVAC

new multiple drone control

A "whizzbang for Willie". Conditions on the Western Front in 1916 included heavy concentrations of enemy AAA (called "Archies"); tactical air superiority over the Allies in certain sectors; and an extremely static battlefield situation — over 470 miles of front. The need for munitions delivery on certain targets indicated the requirement for a new weapon system: the pilotless bomb. The initial fulfillment of that need, built and tested in the U.S. between 1916 and 1918, was the Kettering Bug. Airframe and propulsion of this bi-winged wonder were created by Charles Kettering. A rail system and detachable undercarriage served as the launch platform. The guidance system, the means of delivering the Bug "unerringly" to its target, was developed by Elmer Sperry. *That's* how long we've been in the drone business.

The Bug was only the beginning. The latest requirement stated: "How can we control many drones at the same time?" SPERRY UNIVAC has answered that question with MDC — Multiple Drone Control. It has a lot to do with the Air Force's ability to control *eight* RPV's, all airborne simultaneously. MDC has definitely proven the required command capability. To achieve it, MDC combines SPERRY UNIVAC's grasp of digital technology with years-long experience in RPV microwave command guidance.

on time, on target



MDC is quite a handle. It meshes an AN/UYK-15 digital computer, a ruggedized processor already in inventory, with a modified multiple-drone air director. The MDC system maintains its modularity for easy troubleshooting and rapid maintenance. In fact, it's smaller and lighter than the single-drone control system it replaced. The system allows rapid ripple-launching of up to four drones from the control platform; sequential monitoring of up to eight in-flight drones. MDC controls the radar system for automatic acquisition, updates drone positions in real time, and includes a continuous CRT display of flight data transmitted from each drone every time the radar locks on.

Effective control is the result. MDC sets up a time-shared sequence for the drones it controls. It achieves in a single system what would normally have taken eight separate directors to accomplish. Flight data from all eight drones is monitored, processed, updated, and displayed in seconds. The single operator can take direct control of any drone to transmit corrections, should deviations in the pre-programmed flight path occur. The system's range capability is far beyond line-of-sight, and provides real-time control. It's the combination of the AN/UYK-15 digital computer with the microwave director that gives the system all its capabilities.

New RPV parameters? MDC means multi-missions: ECM, ELINT, photo recon, target acquisition, sea surveillance, CAP, defense suppression, ordnance delivery. Because multiple drone control is no longer in the realm of the theoretical. It's here, and it works. A long way from Kettering's torpedo-aeroplane.

SPERRY UNIVAC is the only company that has capabilities in digital technology *and* control guidance. We've combined our knowledge of both to achieve the desired result, on time and on target. There's no limit to the future. For requirements that call for advanced command guidance with a multi-drone mode, as well as non-drone applications, we've got the system. Let's get together. Call or write, Director of Marketing, Sperry Univac Defense Systems Division, Univac Park, St. Paul, Minnesota 55165. (612) 647-4500.

SPERRY UNIVAC

AN AIR FORCE ALMANAC

THE UNITED STATES AIR FORCE IN FACTS AND FIGURES

On the following pages appears a variety of information and statistical material about the US Air Force—its people, its organization, its equipment, its funding, its wartime activities, and its heroes. This "Almanac" section was compiled by the staff of AIR FORCE Magazine, and only unclassified information has been used. We especially acknowledge the help of the Secretary of the Air Force Office of Information in bringing data up to date from last year's comparable "Almanac." Also, we welcome suggestions from readers about the kinds of information they would like to see in future editions of this Almanac Issue. A word of caution: Personnel figures that appear in this section in different forms will not always agree because of differing cutoff dates, rounding off, or categories of personnel (such as those serving outside the Air Force) that are excluded in some cases. These figures do illustrate trends, however, and may be helpful in placing force fluctuations in perspective. —THE EDITORS

USAF—HOW IT GOT ITS NAME

DATE	NAME
August 1, 1907	Aeronautical Div., US Signal Corps
July 18, 1914	Aviation Section, US Signal Corps
April 6, 1917	Aeronautical Div., US Signal Corps

(NOTE: During World War I, the air arm of the American Expeditionary Force (AEF) was designated Air Service, but this designation did not apply to the entire Aeronautical Div. of the Signal Corps.)

May 21, 1918	Div. of Military Aeronautics, US Army
June 4, 1920	Army Air Service
July 2, 1926	Army Air Corps
June 20, 1941	Army Air Forces
September 18, 1947	United States Air Force

UNITED STATES AIR FORCE PERSONNEL STRENGTH—1907 THROUGH 1974

YEAR	STRENGTH	YEAR	STRENGTH	YEAR	STRENGTH	YEAR	STRENGTH
1907	3	1924	10,547	1941	152,125	1958	871,156
1908	13	1925	9,670	1942	764,415	1959	840,028
1909	27	1926	9,674	1943	2,197,114	1960	814,213
1910	11	1927	10,078	1944	2,372,292	1961	820,490
1911	23	1928	10,549	1945	2,282,259	1962	883,330
1912	51	1929	12,131	1946	455,515	1963	868,644
1913	114	1930	13,531	1947	305,827	1964	855,802
1914	122	1931	14,780	1948	387,730	1965	823,633
1915	208	1932	15,028	1949	419,347	1966	886,350
1916	311	1933	15,099	1950	411,277	1967	897,426
1917	1,218	1934	15,861	1951	788,381	1968	904,759
1918	195,023	1935	16,247	1952	973,474	1969	862,062
1919	25,603	1936	17,233	1953	977,593	1970	791,078
1920	9,050	1937	19,147	1954	947,918	1971	755,107
1921	11,649	1938	21,089	1955	959,946	1972	725,635
1922	9,642	1939	23,455	1956	909,958	1973	690,999
1923	9,441	1940	51,165	1957	919,835	1974	645,420*
						1975	630,345*

* Projected

USAF AND AIR RESERVE FORCES PERSONNEL BY CATEGORIES

CATEGORY	FY '60	FY '64	FY '68	FY '73	FY '74	FY '75
AIR FORCE MILITARY						
Officers	130,000	133,000	140,000	115,000	111,000	107,000
Airmen	683,000	721,000	761,000	572,000	530,000	519,000
Cadets	2,000	3,000	4,000	4,000	4,000	4,000
TOTAL, AIR FORCE MILITARY	**815,000**	**857,000**	**905,000**	**691,000**	**645,000**	**630,000**
Career Reenlistments	42,000 [1]	61,700	56,500	55,800	52,200	60,200
Rate	44% [1]	86%	88%	93%	91%	90%
First-Term Reenlistments		14,900	10,600	15,800	16,900	15,500
Rate		23%	18%	20%	25%	34%
CIVILIAN PERSONNEL						
Direct Hire	307,000	289,000	316,000	271,000	270,000	270,000
Indirect Hire Foreign Nationals	48,000	33,000	26,000	17,000	18,000	17,000
TOTAL, CIVILIAN PERSONNEL	**355,000** [2]	**322,000** [2]	**342,000** [2]	**288,000**	**288,000**	**287,000**
TOTAL, AIR FORCE MILITARY AND CIVILIAN PERSONNEL	**1,170,000**	**1,179,000**	**1,247,000**	**979,000**	**933,000**	**917,000**
AIR RESERVE FORCES						
Air National Guard, Paid	71,000	73,000	75,000	90,000	92,000	90,000
Air Force Reserve, Paid	67,000	59,000	46,000	45,000	56,000	54,000
Air Force Reserve, Nonpaid	136,000	119,000	145,000	135,000	101,000	91,000
TOTAL, READY RESERVE	**274,000**	**251,000**	**266,000**	**270,000**	**249,000**	**235,000**
Standby	304,000	130,000	101,000	46,000	42,000	39,000
TOTAL, AIR RESERVE FORCES [3]	**578,000**	**381,000**	**367,000**	**316,000**	**291,000**	**274,000**

NOTE: All personnel data for FY '60–'73 columns are actual. FY '74–'75 data are programmed.

[1] FY '60 reenlistment data only reflect combined Career and First-Term performance.
[2] Excludes Air National Guard Technicians who were State Employees until FY '69 when they were changed to Federal Employees by Public Law.
[3] Excludes Retired Air Force Reserve.

UNITED STATES AIR FORCE—PERSONNEL STRENGTH BY COMMANDS AND AGENCIES

COMMAND	OFFICERS	AIRMEN	TOTAL MILITARY	CIVILIANS	TOTAL PERSONNEL
Aerospace Defense Command (ADC)	4,230	29,208	33,438	5,375	38,813
Air Force Communications Service (AFCS)	2,679	39,893	42,572	6,777	49,349
Air Force Logistics Command (AFLC)	2,881	8,221	11,102	97,858	108,960
Air Force Systems Command (AFSC)	9,839	18,304	28,143	29,411	57,554
Air Training Command (ATC)	14,793	81,831	96,624	18,081	114,705
Air University (AU)	5,367	3,297	8,664	2,285	10,949
Alaskan Air Command (AAC)	995	7,911	8,906	2,169	11,075
Headquarters Command, USAF (HQ COMD USAF)	9,121	14,995	24,116	3,485	27,601
Military Airlift Command (MAC)	9,932	48,289	58,221	15,011	73,232
Pacific Air Forces (PACAF)	6,407	42,225	48,632	17,924	66,556
Strategic Air Command (SAC)	23,660	120,144	143,804	20,017	163,821
Tactical Air Command (TAC)	11,967	76,130	88,097	10,927	99,024
United States Air Forces in Europe (USAFE)	6,258	41,110	47,368	12,327	59,695
USAF Security Service (USAFSS)	1,237	18,193	19,430	2,369	21,799
USAF Southern Command (USAFSO)	230	1,394	1,624	795	2,419
TOTALS	**109,596**	**551,145**	**660,741**	**244,811**	**905,552**

SEPARATE OPERATING AGENCY	OFFICERS	AIRMEN	TOTAL MILITARY	CIVILIANS	TOTAL PERSONNEL
Air Force Accounting and Finance Center (AFAFC)	39	243	282	2,257	2,539
Air Force Audit Agency (AFAA)	444	116	560	529	1,089
Air Force Data Automation Agency (AFDAA)	299	677	976	567	1,543
Air Force Inspection and Safety Center (AFISC)	283	60	343	160	503
Air Force Intelligence Service (AFIS)	202	231	433	150	583
Air Force Military Personnel Center (AFMPC)	455	754	1,209	600	1,809
Air Force Office of Special Investigations (AFOSI)	512	960	1,472	377	1,849
Hq. Air Force Reserve (AFRES)	197	646	843	10,092	10,935
Air Reserve Personnel Center (ARPC)	51	101	152	759	911
United States Air Force Academy (USAFA)	1,061	5,308	6,369	2,012	8,381
TOTALS	**3,543**	**9,096**	**12,639**	**17,503**	**30,142**

NOTE: Military strength figures are current as of January 31, 1974. Figures are assigned strength. Civilian figures are current as of December 31, 1973. and represent "total chargeable employees," including 16,076 non-US citizens.

USAF TOTAL ACTIVE-DUTY STRENGTH BY GRADE

(As of January 31, 1974)

OFFICERS

GRADE	NUMBER
GENERAL	14
LIEUTENANT GENERAL	38
MAJOR GENERAL	134
BRIGADIER GENERAL	214
COLONEL	5,988
LIEUTENANT COLONEL	13,867
MAJOR	21,349
CAPTAIN	43,996
FIRST LIEUTENANT	13,511
SECOND LIEUTENANT	13,942
WARRANT OFFICER	86
TOTAL	**113,139**
CADETS	3,922
AIRMEN	556,319
TOTAL STRENGTH	**673,380**

AIRMEN

GRADE	NUMBER
CHIEF MASTER SERGEANT	5,439
SENIOR MASTER SERGEANT	10,737
MASTER SERGEANT	40,329
TECHNICAL SERGEANT	74,226
STAFF SERGEANT	121,142
SERGEANT	138,788
AIRMAN FIRST CLASS	102,997
AIRMAN	41,770
AIRMAN BASIC	20,891
TOTAL	**556,319**

USAF MILITARY PERSONNEL BY GRADE, RACE, AND SEX

(As of December 31, 1973)

OFFICERS

GRADE	FORCE	BLACK (%)	OTHER (%)	WOMEN (%)
GENERALS	408	3 (0.7%)	—	2 (0.5%)
COLONELS	6,016	62 (1.0%)	22 (0.3%)	69 (1.1%)
LIEUTENANT COLONELS	13,995	196 (1.4%)	72 (0.5%)	249 (1.8%)
MAJORS	21,497	359 (1.6%)	125 (0.6%)	767 (3.6%)
CAPTAINS	44,502	990 (2.2%)	307 (0.7%)	1,677 (3.8%)
1ST LIEUTENANTS	13,151	274 (2.0%)	64 (0.5%)	1,145 (8.7%)
2ND LIEUTENANTS	13,916	491 (3.5%)	102 (0.7%)	852 (6.1%)
WARRANT OFFICERS	92	1 (1.1%)	1 (1.1%)	—
TOTALS	**113,577**	**2,376 (2.1%)**	**693 (0.6%)**	**4,761 (4.2%)**

AIRMEN

GRADE	FORCE	BLACK (%)	OTHER (%)	WOMEN (%)
CHIEF MASTER SERGEANTS (E-9)	5,438	239 (4.4%)	23 (0.4%)	10 (0.2%)
SENIOR MASTER SERGEANTS (E-8)	10,752	644 (6.0%)	57 (0.5%)	32 (0.3%)
MASTER SERGEANTS (E-7)	40,586	3,512 (8.6%)	210 (0.5%)	103 (0.3%)
TECHNICAL SERGEANTS (E-6)	74,887	9,379 (12.5%)	473 (0.6%)	180 (0.2%)
STAFF SERGEANTS (E-5)	121,187	17,132 (14.1%)	897 (0.7%)	1,047 (0.9%)
SERGEANTS (E-4)	139,789	21,202 (15.2%)	1,491 (1.1%)	4,495 (3.2%)
AIRMEN FIRST CLASS (E-3)	100,370	13,663 (13.6%)	1,080 (1.1%)	5,306 (5.3%)
AIRMEN (E-2)	42,742	7,279 (17.0%)	574 (1.3%)	4,019 (9.4%)
AIRMEN BASIC (E-1)	20,527	3,837 (18.7%)	274 (1.3%)	2,163 (10.5%)
TOTALS	**556,278**	**76,887 (13.8%)**	**5,079 (0.9%)**	**17,355 (3.1%)**
TOTALS, INCLUDING OFFICERS	**669,855**	**79,263 (11.8%)**	**5,772 (0.9%)**	**22,116 (3.3%)**

AVERAGE AGES OF MEMBERS OF USAF

Officers	Average 32.2 years of age
Noncommissioned Officers (Top 6 Grades)	Average 28.8 years of age
Airmen	Average 26.0 years of age

AIR FORCE FULL-TIME CIVILIAN EMPLOYMENT BY GRADE *

(As of January 31, 1974)

GS		WP		WS		WL		WG	
GR	POP	GR	POP	GR	POP	GR	POP	GR	POP
1	221	4	1	1	61	1	1	1	373
2	2,967	8	4	2	47	2	98	2	3,817
3	13,818	9	7	3	130	3	28	3	1,338
4	18,884	10	6	4	162	4	147	4	3,237
5	19,731	11	7	5	439	5	80	5	7,003
6	6,993	12	12	6	707	6	153	6	7,031
7	10,750	13	1	7	880	7	67	7	6,210
8	2,239	14	7	8	984	8	304	8	9,748
9	17,449	15	3	9	1,740	9	562	9	9,712
10	983	16	7	10	1,705	10	1,490	10	25,992
11	15,206	17	5	11	854	11	170	11	6,600
12	12,175	18	2	12	494	12	18	12	2,738
13	8,193	19	1	13	373	13	1	13	617
14	2,946	20	1	14	282	14	1	14	44
15	1,000	21	2	15	138				
16	115	23	1	16	81				
17	21	24	1	17	17				
18	6			18	26				
				19	25				
TOTALS	**133,697**		**68**		**9,145**		**3,120**		**84,460**

GR = Grade
GS = General Schedule
POP = Population
WP = Printing and Lithographic Pay Schedules
WS = Supervisory (Foreman) Pay Schedules
WL = Leader Pay Schedules
WG = Non-Supervisory Pay Schedules

* Source: USAF Civilian Grade Trends Comparison by Month, RCS: RRAQ-0028, as of January 31, 1974.

FEDERAL CIVILIAN PAY SCALE

General Schedule
(Effective October 1973)

	1	2	3	4	5	6	7	8	9	10
GS- 1	$5,017	$5,184	$5,351	$5,518	$5,685	$5,852	$6,019	$6,186	$6,353	$6,520
2	5,682	5,871	6,060	6,249	6,438	6,627	6,816	7,005	7,194	7,383
3	6,408	6,622	6,836	7,050	7,264	7,478	7,692	7,906	8,120	8,334
4	7,198	7,438	7,678	7,918	8,158	8,398	8,638	8,878	9,118	9,353
5	8,055	8,323	8,591	8,859	9,127	9,395	9,663	9,931	10,199	10,467
6	8,977	9,276	9,575	9,874	10,173	10,472	10,771	11,070	11,369	11,668
7	9,969	10,301	10,633	10,965	11,297	11,629	11,961	12,293	12,625	12,957
8	11,029	11,397	11,765	12,133	12,501	12,869	13,237	13,605	13,973	14,341
9	12,167	12,573	12,979	13,385	13,791	14,197	14,603	15,009	15,415	15,821
10	13,379	13,825	14,271	14,717	15,163	15,609	16,055	16,501	16,947	17,393
11	14,671	15,160	15,649	16,138	16,627	17,116	17,605	18,094	18,583	19,072
12	17,497	18,080	18,663	19,246	19,829	20,412	20,995	21,578	22,161	22,744
13	20,677	21,366	22,055	22,744	23,433	24,122	24,811	25,500	26,189	26,878
14	24,247	25,055	25,863	26,671	27,479	28,287	29,095	29,903	30,711	31,519
15	28,263	29,205	30,147	31,089	32,031	32,973	33,915	34,857	35,799	36,741*
16	32,806	33,899	34,992	36,085*	37,178*	38,271*	39,304*	40,457*	41,550*	
17	37,976*	39,242*	40,508*	41,774*	43,040*					
18	43,926*									

* The rate of basic pay for employees at these rates is limited by Section 5308 of Title 5 of the United States Code to the rate for Level V of the Executive Schedule (currently $36,000 per annum).

MONTHLY BASIC PAY RATES

(Effective October 1, 1973)

PAY GRADE	Under 2	2	3	4	6	8	10	12	14	16	18	20	22	26	30
						YEARS OF SERVICE									
						COMMISSIONED OFFICERS									
O-10	2,564	2,654	2,654	2,654	2,654	2,756	2,756	2,967	2,967	3,179*	3,179*	3,392*	3,392*	3,603*	3,603*
O-9	2,272	2,332	2,382	2,382	2,382	2,442	2,442	2,543	2,543	2,756	2,756	2,967	2,967	3,179*	3,179*
O-8	2,058	2,120	2,170	2,170	2,170	2,332	2,332	2,442	2,442	2,543	2,654	2,756	2,866	2,866	2,866
O-7	1,710	1,827	1,827	1,827	1,908	1,908	2,019	2,019	2,120	2,332	2,492	2,492	2,492	2,492	2,492
O-6	1,267	1,393	1,483	1,483	1,483	1,483	1,483	1,483	1,534	1,776	1,867	1,908	2,019	2,189	2,189
O-5	1,013	1,191	1,272	1,272	1,272	1,272	1,311	1,381	1,474	1,584	1,675	1,725	1,786	1,786	1,786
O-4	885	1,040	1,110	1,110	1,130	1,180	1,260	1,332	1,393	1,453	1,494	1,494	1,494	1,494	1,494
O-3	794	888	948	1,050	1,100	1,140	1,201	1,260	1,291	1,291	1,291	1,291	1,291	1,291	1,291
O-2	692	756	908	939	958	958	958	958	958	958	958	958	958	958	958
O-1	600	625	756	756	756	756	756	756	756	756	756	756	756	756	756
						WARRANT OFFICERS									
W-4	809	867	867	888	928	969	1,009	1,030	1,130	1,170	1,201	1,241	1,282	1,381	1,381
W-3	735	798	798	807	817	877	928	958	989	1,018	1,050	1,090	1,130	1,170	1,170
W-2	644	696	696	717	756	798	828	858	888	918	948	979	1,018	1,018	1,018
W-1	536	615	615	666	696	726	756	787	817	847	877	908	908	908	908
						ENLISTED MEMBERS									
E-9	—	—	—	—	—	—	919	940	961	983	1,005	1,025	1,079	1,183	1,183
E-8	—	—	—	—	—	771	792	813	835	856	877	898	951	1,057	1,057
E-7	538	581	602	623	645	665	686	708	740	761	782	792	846	951	951
E-6	465	507	528	550	571	592	613	645	665	686	697	697	697	697	697
E-5	408	444	465	486	518	539	560	581	592	592	592	592	592	592	592
E-4	392	414	438	473	491	491	491	491	491	491	491	491	491	491	491
E-3	377	398	414	430	430	430	430	430	430	430	430	430	430	430	430
E-2	363	363	363	363	363	363	363	363	363	363	363	363	363	363	363
E-1	326	326	326	326	326	326	326	326	326	326	326	326	326	326	326

(Amounts less than $1 have been omitted)

* The rate of basic pay for military personnel at these rates is limited by Section 530B of Title 5, United States Code to the rate for Level V of the Executive Schedule ($36,000 per annum, or $3,000 per month, as of the date of this computation).

USAF STRENGTH BY BASES

(As of December 31, 1973)

BASE	MIL.	CIV.	TOTAL
ALTUS AFB, OKLA.	4,436	658	5,094
ANDREWS AFB, MD.	7,107	2,791	9,898
ARNOLD AFS, TENN.	111	154	265
BARKSDALE AFB, LA.	6,699	1,089	7,788
BEALE AFB, CALIF.	4,846	572	5,418
BELLOWS AFS, HAWAII	55	1	56
BERGSTROM AFB, TEX.	5,432	596	6,028
BLYTHEVILLE AFB, ARK.	2,901	385	3,286
BOLLING AFB, D. C.	1,925	828	2,753
BROOKS AFB, TEX.	1,381	909	2,290
CANNON AFB, N. M.	4,580	428	5,008
CARSWELL AFB, TEX.	4,574	964	5,538
CASTLE AFB, CALIF.	5,579	518	6,097
CHANUTE AFB, ILL.	10,225	1,785	12,010
CHARLESTON AFB, S. C.	4,841	1,338	6,179
COLUMBUS AFB, MISS.	2,929	587	3,516
CRAIG AFB, ALA.	2,178	568	2,746
DAVIS-MONTHAN AFB, ARIZ.	7,496	1,710	9,206
DOBBINS AFB, GA.	202	692	894
DOVER AFB, DEL.	5,307	1,424	6,731
DULUTH INT'L AIRPORT, MINN.	1,516	418	1,934
DYESS AFB, TEX.	5,183	510	5,693
EDWARDS AFB, CALIF.	3,549	2,087	5,636
EGLIN AFB, FLA.	7,834	3,324	11,158
EIELSON AFB, ALASKA	2,729	483	3,212
ELLINGTON AFB, TEX.	586	1,002	1,588
ELLSWORTH AFB, S. D.	6,311	652	6,963
ELMENDORF AFB, ALASKA	6,859	1,656	8,515
ENGLAND AFB, LA.	3,458	464	3,922
ENT AFB, COLO.	2,604	1,043	3,647
FAIRCHILD AFB, WASH.	4,693	712	5,405
F. E. WARREN AFB, WYO.	4,141	553	4,694
GEORGE AFB, CALIF.	4,988	462	5,450
GLASGOW AFB, MONT.	113	26	139
GOODFELLOW AFB, TEX.	1,928	311	2,239
GRAND FORKS AFB, N. D.	6,353	561	6,914
GRIFFISS AFB, N. Y.	4,432	3,462	7,894
GRISSOM AFB, IND.	3,209	672	3,881
GUNTER AFS, ALA.	1,124	870	1,994
HAMILTON AFB, CALIF.	510	621	1,131
HANCOCK FIELD, N. Y.	1,161	280	1,441
HANSCOM FIELD, MASS.	1,727	2,784	4,511
HICKAM AFB, HAWAII	6,301	2,370	8,671
HILL AFB, UTAH	3,455	15,395	18,850
HOLLOMAN AFB, N. M.	5,492	1,096	6,588
HOMESTEAD AFB, FLA.	5,106	846	5,952
HURLBURT FIELD, FLA.	3,479	342	3,821
INDIAN SPRINGS AUX. FLD., NEV.	207	20	227
KEESLER AFB, MISS.	16,031	3,050	19,081
KELLY AFB, TEX.	4,802	21,581	26,383
KINCHELOE AFB, MICH.	3,040	455	3,495
KING SALMON AIRPORT, ALASKA	437	27	464
KINGSLEY FIELD, ORE.	527	232	759
KIRTLAND AFB, N. M.	4,008	2,940	6,948
K. I. SAWYER AFB, MICH.	4,316	535	4,851
LACKLAND AFB, TEX.	19,584	2,378	21,962
LANGLEY AFB, VA.	8,784	1,471	10,255
LAUGHLIN AFB, TEX.	2,598	622	3,220
LITTLE ROCK AFB, ARK.	6,138	656	6,794
LOCKBOURNE AFB, OHIO	2,888	793	3,681
LORING AFB, ME.	4,164	647	4,811
LOS ANGELES AFS, CALIF.	1,253	978	2,231
LOWRY AFB, COLO.	9,028	1,559	10,587
LUKE AFB, ARIZ.	5,642	1,104	6,746
MAC DILL AFB, FLA.	6,006	890	6,896
MALMSTROM AFB, MONT.	5,726	635	6,361
MARCH AFB, CALIF.	5,359	820	6,179
MATHER AFB, CALIF.	6,695	1,324	8,019
MAXWELL AFB, ALA.	3,771	1,799	5,570
MC CHORD AFB, WASH.	5,279	1,521	6,800
MC CLELLAN AFB, CALIF.	5,303	15,010	20,313
MC CONNELL AFB, KAN.	4,439	546	4,985
MC COY AFB, FLA.	1,100	260	1,360
MC GUIRE AFB, N. J.	5,879	1,620	7,499
MINOT AFB, N. D.	6,670	694	6,364
MOODY AFB, GA.	2,497	564	3,061
MOUNTAIN HOME AFB, IDAHO	4,019	435	4,454
MURPHY DOME AFS, ALASKA	150	26	176
MYRTLE BEACH AFB, S. C.	3,043	467	3,510
NELLIS AFB, NEV.	6,678	978	7,656
NIAGARA FALLS INT'L AP, N. Y.	42	348	390
NORTON AFB, CALIF.	6,078	3,013	9,091
OFFUTT AFB, NEB.	11,208	1,849	13,057
PATRICK AFB, FLA.	3,001	2,014	5,015
PEASE AFB, N. H.	4,240	545	4,785
PETERSON FIELD, COLO.	2,602	499	3,101
PLATTSBURGH AFB, N. Y.	4,414	519	4,933
POPE AFB, N. C.	3,459	328	3,787
RANDOLPH AFB, TEX.	5,714	2,579	8,293
REESE AFB, TEX.	2,548	661	3,209
RICHARDS-GEBAUR AFB, MO.	2,244	1,789	4,033
ROBINS AFB, GA.	4,787	15,916	20,703
SCOTT AFB, ILL.	4,997	2,458	7,455
SEYMOUR JOHNSON AFB, N. C.	5,763	562	6,325
SHAW AFB, S. C.	5,993	626	6,619
SHEMYA AFB, ALASKA	699	43	742
SHEPPARD AFB, TEX.	11,761	2,249	14,010
TINKER AFB, OKLA.	3,205	20,074	23,279
TRAVIS AFB, CALIF.	9,710	2,503	12,213
TYNDALL AFB, FLA.	3,926	962	4,888
VANCE AFB, OKLA.	1,258	145	1,403
VANDENBERG AFB, CALIF.	5,310	1,656	6,966
WEBB AFB, TEX.	2,336	698	3,034
WESTOVER AFB, MASS.	2,255	809	3,064
WHEELER AFB, HAWAII	872	319	1,191
WHITEMAN AFB, MO.	3,478	439	3,917
WILLIAMS AFB, ARIZ.	3,416	718	4,134
WRIGHT-PATTERSON AFB, OHIO	6,182	8,463	14,645
WURTSMITH AFB, MICH.	3,411	429	3,840
TOTALS	**472,615**	**200,849**	**673,464**

COMPARISON OF DOD BUDGETS FOR FY '73–FY '75 BY MILITARY PROGRAMS AND COMPONENTS

(Billions of dollars)

Military Program	Total Obligational Authority		
	FY '73	FY '74	FY '75
Strategic Forces	$ 7.2	$ 6.9	$ 7.6
General Purpose Forces	25.8	27.9	29.2
Intelligence and Communications	5.7	5.9	6.5
Airlift and Sealift	.9	1.0	1.1
Guard and Reserve Forces	3.9	4.4	4.8
Research and Development	6.5	7.0	8.4
Central Supply and Maintenance	8.6	8.9	9.3
Training, Medical, and General Personnel Activities	16.4	18.2	20.1
Administration	1.7	1.8	2.2
Support of Other Nations	3.8	5.1	3.4
TOTALS	**$80.5**	**$87.1**	**$92.6**
Components			
Department of the Army	$21.7	$22.1	$23.6
Department of the Navy	25.4	27.6	29.6
Department of the Air Force	24.7	25.5	28.0
Defense Agencies/OSD	2.0	2.2	2.6
Defense-wide	5.5	6.4	7.4
Civil Defense	.1	.1	.1
Military Assistance Programs	1.1	3.2	1.3
TOTALS	**$80.5**	**$87.1**	**$92.6**

THE AIR FORCE'S INSTALLATIONS

Major Installations	FY '60	FY '64	FY '68	FY '72	FY '73
Total in Continental US	163	151	129	112	111
Total overseas (incl. Alaska and Hawaii)	90	65	69	49	46
Totals	**253**	**216**	**198**	**161**	**157**

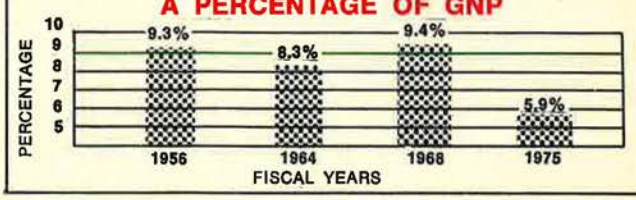
By Function	FY '60	FY '64	FY '68	FY '72	FY '73
Operational	147	126	109	90	
Operational Flying Support	16	12	10	10	NOT AVAIL-
Operational Nonflying Support	12	16	14	10	ABLE*
Operational Foreign-Owned	7	5	18	8	
Training	48	38	30	29	
Research and Test	7	9	9	8	
Logistical	16	10	8	6	
TOTALS	**253**	**216**	**198**	**161**	**157**

Other Installations	FY '60	FY '64	FY '68	FY '72	FY '73
Ancillary	2,740	2,849	1,899	1,655	
Ballistic Missile	(none)	1,083	1,158	1,157	
Industrial	76	55	43	36	NOT
Radar	410	331	182	108	AVAIL-
Air National Guard	(none)	103	107	109	ABLE*
Tenant, Non-Air Force	235	348	358	288	
For Use In Wartime Only	22	49	44	44	
TOTALS	**3,483**	**4,818**	**3,791**	**3,397**	**3,074**
Of which, in Continental US	2,212	3,435	2,524	2,316	2,204
And Overseas	1,271	1,383	1,267	1,081	870
TOTAL INSTALLATIONS, MAJOR AND OTHER	**3,736**	**5,034**	**3,989**	**3,558**	**3,231**

* "Other Installations" for FY '73 have been reclassified in the automated systems as follows:

Missile Site	1,156
Electronic Station or Site	609
General Support Annex	1,171
ANG Installation	115
Auxillary Airfield	23
TOTAL	**3,074**

DEFENSE SPENDING AS A PERCENTAGE OF GNP



AIR FORCE BUDGET AND FINANCE—FISCAL YEARS 1960–75

(Figures in millions of dollars)

	FY '60	FY '64	FY '68	FY '73	FY '74	FY '75
Gross National Product	495,200	612,200	826,000	1,220,000	1,340,000	1,455,000
Federal Budget Outlays	92,223	118,584	178,833	246,526	274,660	304,445
DoD Budget, Outlays	42,823	50,786	78,027	73,828	79,500	85,800
DoD Percent of: GNP	8.6%	8.3%	9.4%	6.1%	5.9%	5.9%
Federal Budget	46.4%	42.8%	43.6%	29.9%	28.9%	28.2%
Air Force Budget Outlays						
Current Dollars	19,066	20,456	25,734	23,627	24,411	25,487
Constant FY 1975 Prices	35,236	36,777	40,467	27,460	26,045	25,487
AF Percent of: GNP	3.9%	3.3%	3.1%	1.9%	1.8%	1.8%
Federal Budget	20.7%	17.3%	14.4%	9.6%	8.9%	8.4%
DoD Budget	44.5%	40.3%	33.0%	32.0%	30.7%	29.7%
Total Obligational Authority						
Current Dollars	18,132	19,959	24,974	24,707	25,495	27,471
Constant FY 1975 Prices	34,788	35,961	39,393	28,717	27,185	27,471
Appropriations, TOA (Current $)						
Aircraft Procurement (3010)	3,865	3,620	5,306	2,640	3,276	3,497
Missile Procurement (3020)	2,593	2,220	1,408	1,686	1,462	1,611
Other Procurement (3080)	1,021	876	2,358	2,073	1,780	2,072
Military Construction-AF (3300)	799	497	481	266	269	536
RDT&E (3600)	1,460	3,627	3,412	3,120	3,126	3,519
Operations and Maintenance (3400)	4,147	4,339	5,904	6,633	6,950	7,519
Military Personnel-AF (3500)	3,965	4,423	5,678	7,336	7,488	7,450
Reserve Personnel-AF (3700)	51	57	63	119	137	149
Military Construction-AFR (3730)	3	3	4	8	10	16
Operations and Maintenance-AFR (3740)	—	—	—	187	237	278
Military Construction-ANG (3830)	12	17	10	16	20	30
Operations and Maintenance-ANG (3840)	168	220	266	459	548	596
National Guard Personnel-AF (3850)	48	60	84	165	192	199
Programs, TOA (Current $)						
I Strategic Forces		6,527	5,188	4,607	4,394	4,722
II General Purpose Forces		3,030	7,272	5,481	5,747	5,997
III Intelligence and Communications		2,977	3,618	3,191	3,344	3,533
IV Airlift and Sealift Forces	Not	1,010	1,736	846	954	1,011
V Reserve and Guard Forces	Available	502	621	1,015	1,253	1,335
VI Research and Development	By	2,065	1,561	2,420	2,461	3,089
VII Central Supply and Maintenance	Program	1,767	2,375	2,682	2,785	3,151
VIII Training, Medical, and Other General Activities		1,726	2,079	3,110	3,360	3,414
IX Admin and Assoc Activities		342	352	492	526	547
X Support of Other Nations		11	173	864	671	673
Total Funds Avail. for Exp. Air Force	33,947	29,144	38,690	32,991	34,636	37,677
Outlays (Excludes MAP/FMS)	19,066	20,456	25,734	23,627	24,411	25,487
Unexpended Balance	14,881	8,688	12,956	9,364	10,225	12,190

HOW MANY ACTIVE AIRCRAFT IN THE USAF INVENTORY?

Type of Aircraft	FY '60	FY '64	FY '68	FY '73	FY '74	FY '75
Bomber						
Strategic	1,941	1,364	714	505	504	504
Other	252	145	65	—	—	—
Tanker	1,230	998	667	660	657	661
Fighter/Attack	2,358	2,200	3,104	2,341	2,328	2,317
Interceptor	1,564	1,338	881	190	184	162
Reconnaissance/Electronic Warfare	685	595	1,009	717	594	560
Airlift	941	1,043	1,096	394	376	389
Other Transports	1,608	1,284	1,262	626	606	601
Search and Rescue (Fixed Wing)	129	100	91	56	56	55
Helicopter (Including Rescue)	372	401	465	408	312	293
Special Research	2	3	5	—	—	—
Trainer	3,914	2,873	2,584	2,407	2,365	2,339
Utility/Observation	316	345	663	163	114	106
TOTALS	**15,312**	**12,689**	**12,606**	**8,467**	**8,096**	**7,987**
Plus total of Air Force Reserve	770	719	426	413	427	479
Plus total of Air National Guard	2,269	1,806	1,438	1,869	1,816	1,679
Plus total Free World Military Forces [1]	(none)	(none)	692	2,161	2,095	1,779
Plus aircraft earmarked	361	166	165	(none)	(none)	(none)
TOTAL ACTIVE AIRCRAFT	**18,712**	**15,380**	**15,327**	**12,910**	**12,434**	**11,924**

NOTE: Aircraft are categorized by modified mission category, *e.g.*, if a C-130 is performing a search and rescue function or mission, it is categorized as a search and rescue rather than an airlift aircraft.

[1] Total actual inventory for FY '60, '64, and '68 include "Earmarked" aircraft (aircraft identified for MAP, Navy, and Other Non-Air Force Agencies).

THE NUMBER OF SQUADRONS IN THE US AIR FORCE

MAJOR FORCE SQUADRONS	FY '60	FY '64	FY '68	FY '73	FY '74	FY '75
STRATEGIC FORCES						
ICBMs (UE)	5	821	1,054	1,054	1,054	1,054
Bombers	140	78	40	30	28	27
Reconnaissance	6	2	3	1	1	1
Tankers	59	55	41	38	38	38
Interceptors	65	40	26	7	7	6
GENERAL-PURPOSE FORCES						
Tactical Fighters	55	79	92	71	70	68
Other Fighters and Attack	13	11	9	1	1	1
Reconnaissance	14	14	21	13	13	13
Special Operations Force	—	6	22	7	5	5
Tactical Electronic Warfare (TEWS)	—	—	2	1	—	—
Tactical Missiles	5	8	2	—	—	—
Drones	—	—	—	1	1	1
Tactical Air Control	—	—	5	9	11	13
Tactical Airlift	24	28	33	17	17	17
Aeromedical Airlift	—	—	—	2	2	2
AIRLIFT FORCES						
Industrially Funded						
Military Airlift	31	33	30	17	17	17
Aeromedical Airlift	3	5	5	1	1	1
Special Air Mission	2	2	2	2	2	2
AIR NATIONAL GUARD, TOTAL	92	92	78[1]	92	91	86
AIR FORCE RESERVE, TOTAL[2]	45	50	43[1]	50	53	53

[1] Does not include 14 ANG Squadrons and 7 Air Force Reserve Squadrons which were reported in the Active Force.

[2] Includes Associated Squadrons.

NOTE: Data in FY '60–'73 columns are actual; FY '74 and FY '75 data are programmed.

USAF AIRCRAFT PROCUREMENT—FY '60–75

CATEGORY	FY '60	FY '64	FY '68	FY '73	FY '74	FY '75
Fixed-Wing Aircraft						
Total Budgeted	555	778	1,152	161	165	110
Accepted/Scheduled Acceptances	1,049	726	935	255	118	122
Helicopters						
Total Budgeted	42	43	38	6	0	0
Accepted/Scheduled Acceptances	41	37	36	29	1	5

NOTE: Excludes MASF, Navy, NASA, MAP, and FMS funded aircraft. Data in FY '60–'73 columns are actual. FY '74–'75 data are programmed.

THE AAF IN WORLD WAR II—A STATISTICAL SUMMARY

AAF COMBAT SORTIES FLOWN, BY THEATER—WORLD WAR II

		Theaters vs. Germany			Theaters vs. Japan					
Year	Total	ETO	MTO	Total	POA	FEAF	CBI	ALASKA	20th AF	Total
1941 (Dec.)	212					212				212
1942	26,688	2,453	7,296	9,749	130	14,311	1,341	1,157		16,939
1943	365,940	63,929	169,594	233,523	1,413	103,147	23,151	4,706		132,417
1944	1,284,195	655,289	356,812	1,012,101	26,364	163,397	78,999	815	2,519	272,094
1945 (Jan.–Aug.)	685,765	312,381	125,811	438,192	31,194	134,912	44,538	640	36,289	247,573
TOTAL	**2,362,800**	**1,034,052**	**659,513**	**1,693,565**	**59,101**	**415,979**	**148,029**	**7,318**	**38,808**	**669,235**

ETO—European Theater of Operations
MTO—Mediterranean Theater of Operations
POA—Pacific Ocean Areas

FEAF—Far East Air Forces
CBI—China-Burma-India Theater of Operations
20th AF—Operated out of China and Marianas Islands

THE AAF IN WORLD WAR II

TONS OF BOMBS DROPPED BY AAF OVERSEAS, BY THEATER—WORLD WAR II

		Theaters vs. Germany			Theaters vs. Japan					
Year	Total	ETO	MTO	Total	POA	FEAF	CBI	ALASKA	20th AF	Total
1941 (Dec.)	36					36				36
1942	10,203	1,713	4,410	6,123	35	2,633	697	715		4,080
1943	198,800	55,655	98,462	154,117	1,309	29,705	10,841	2,828		44,683
1944	1,085,978	591,959	346,993	938,952	17,546	92,134	27,987	295	9,064	147,026
1945 (Jan.–Aug.)	762,277	322,435	132,836	455,271	13,843	107,988	22,636	493	161,996	306,956
TOTAL	**2,057,244**	**971,762**	**582,701**	**1,554,463**	**32,733**	**232,496**	**62,161**	**4,331**	**171,060**	**502,781**

AAF AIRPLANE LOSSES ON COMBAT MISSIONS, BY THEATER—WORLD WAR II*

		Theaters vs. Germany			Theaters vs. Japan					
Year	Total	ETO	MTO	Total	POA	FEAF	CBI	ALASKA	20th AF	Total
1942	482	55	86	141	13	275	35	17		341
1943	3,847	1,261	1,767	3,028	25	539	217	38		819
1944	13,289	7,749	3,869	11,618	116	910	532	18	95	1,671
1945 (Jan.–Aug.)	5,330	2,622	1,009	3,631	224	769	292	15	399	1,699
TOTAL	**22,948**	**11,687**	**6,731**	**18,418**	**378**	**2,494**	**1,076**	**88**	**494**	**4,530**

* Includes period January 1942 until V-J Day. Accurate statistics not available for month of December 1941.

ENEMY AIRCRAFT DESTROYED, BY THEATER—WORLD WAR II*

		Theaters vs. Germany			Theaters vs. Japan					
Year	Total	ETO	MTO	Total	POA	FEAF	CBI	ALASKA	20th AF	Total
1942 (Feb.–Dec.)	935	169	158	327		518	53	37		608
1943	10,837	3,865	3,740	7,605	96	2,466	636	34		3,232
1944	19,442	10,425	5,239	15,664	226	2,518	772	8	254	3,778
1945 (Jan.–Aug.)	8,477	5,960	291	6,251	472	416	361	6	971	2,226
TOTAL	**40,259†**	**20,419**	**9,497†**	**29,916**	**794**	**26,298**	**1,913†**	**113†**	**1,225**	**10,343**

* Includes period February 1942 until V-J Day. No accurate statistics available for period Dec. 7, 1941, to Jan. 31, 1942.
† Includes 568 enemy aircraft destroyed, whose destruction cannot be allocated to specific months; 69 in Theaters vs. Germany (MTO), 499 in Theaters vs. Japan.

US ARMED FORCES DURING THE KOREAN WAR

(July 1, 1950—July 31, 1953)

Estimated number who served, by area of assignment

Location and Component	Army	Navy	Air Force	Marine Corps	Total
In the Far East	1,153,000	265,000	241,000	130,000	1,789,000
Other overseas	711,000	735,000	262,000	35,000	1,743,000
Continental US only	970,000	177,000	782,000	259,000	2,188,000
TOTAL	**2,834,000**	**1,177,000**	**1,285,000**	**424,000**	**5,720,000**

Estimated number who entered on active duty, by component

Regulars	383,000	499,000	671,000	138,000	1,691,000
Reserves	384,000	297,000	203,000	128,000	1,012,000
Inductees	1,474,000	(none)	(none)	84,000	1,558,000
TOTAL	**2,241,000**	**796,000**	**874,000**	**350,000**	**4,261,000**

DAMAGE SUMMARY, KOREAN WAR*

Items	USAF	Attached Units	Total
Sorties flown	716,979	119,898	836,877
Vehicles destroyed	74,589	8,331	82,920
Railcars destroyed	9,417	1,072	10,489
Bridges destroyed	869	341	1,210
Tanks destroyed	1,160	171	1,331
Troop casualties	145,416	39,392	184,808
Locomotives destroyed	869	94	963
Buildings destroyed	89,639	29,690	119,329
Gun positions destroyed (not broken down)			18,324
Barges and boats destroyed (not broken down)			592

* Reported figures for USAF and attached units from beginning of Korean War to and including 10:00 p.m., July 27, 1953, the hour of cease-fire.

FEAF STATISTICAL SUMMARY OF KOREAN AIR WAR

Enemy Aircraft Losses

Type	Destroyed	Prob. Destroyed	Damaged
MIG-15s	839	154	919
All types (Incl. MIGs)	1,020	182	1,010

USAF Aircraft Losses

Type	Air-to-Air	Ground Fire	Other	Total
Jet	83	259	93	435
Conventional	21	285	60	366
TOTAL	**104**	**544**	**153**	**801**

SUMMARY OF DELIVERIES, USAF AND ATTACHED UNITS, DURING THE KOREAN WAR

(As of June 30, 1953)

Tons of bombs	448,366
Rounds of ammunition	182,829,400
Number of rockets	611,329
Gallons of napalm	9,596,798
Tons of personnel and freight	670,000
Passengers	2,700,000
Air evacuees	325,000

A STATISTICAL SUMMARY OF THE WAR IN VIETNAM

FRIENDLY MILITARY FORCES IN SOUTH VIETNAM

	1966	1967	1968	1969	1970	1971	1972	1973
United States	385,000	486,000	537,000	474,000	335,000	157,000	24,000	N/A
Third Nation (Included forces of Australia, Korea, New Zealand, Philippines, Republic of China, Spain, and Thailand)	53,000	59,000	66,000	69,000	68,000	54,000	35,600	N/A

A STATISTICAL SUMMARY OF THE WAR IN VIETNAM

CASUALTIES

	1966	1967	1968	1969	1970	1971	1972	1973
United States								
Deaths from hostile action[1]	5,008	9,377	14,589	9,414	4,221	1,381	300	237
Deaths from other causes	1,045	1,680	1,919	2,113	1,844	968	251	34
Wounded[2]	30,093	62,023	92,817	70,216	30,643	8,936	1,221	66
Hospital care required	16,526	32,369	46,796	32,940	15,211	4,767	587	24
Hospital care not required	13,567	29,654	46,021	37,276	15,432	4,169	634	36
South Vietnam								
Deaths from hostile action	11,953	12,716	27,915	21,833	23,346	22,738	39,587	1,726
Wounded[3]	20,975	29,448	70,696	65,276	71,582	60,939	109,960	6,457
Missing	3,283	2,340	2,460	923	950	2,325	13,200	572
Third Nation								
Deaths from hostile action	566	1,105	979	866	704	526	443	4
Wounded[3]	1,591	2,318	1,997	2,218	1,830	1,148	739	8
Missing	15	3	9	1	11	2	12	—
Enemy								
Deaths from hostile action	55,524	88,104	181,149	156,954	103,638	98,094	131,949	5,625
SVN Civilian Casualties Resulting from VC Terrorism								
Assassinated	1,732	3,706	5,389	6,202	5,947	3,771	4,405	N/A
Abducted	3,810	5,369	8,759	6,289	6,931	5,389	13,119	N/A
Terrorist Incidents[4]	14,585	1,963	1,047	1,375	1,904	2,333	819	N/A
Viet Cong Armed Attacks	938	2,476	3,921	3,812	3,539	2,244	6,584	423

[1] Includes those who died of wounds and died while missing or captured.
[2] Approximately 85% of US military personnel wounded recovered sufficiently to return to duty.
[3] Includes only those seriously wounded.
[4] Terrorism and Harassment incidents were reported as terrorism prior to July 1966.

US AIR OPERATIONS IN SOUTH VIETNAM—BY SORTIES

	1966	1967	1968	1969	1970	1971	1972	1973
Fixed-Wing Aircraft								
Attack	128,972	176,568	221,757	166,541	79,802	18,593	99,151	8,551
Other Combat	41,072	45,708	59,973	88,300	50,053	22,023	19,424	2,426
TOTALS	**170,044**	**222,276**	**281,730**	**254,841**	**129,855**	**40,616**	**118,575**	**10,977**
Helicopters								
Attack	331,774	640,797	862,732	915,370	798,976	423,101	89,807	3,308
Combat Assault	672,621	1,124,422	1,685,210	1,825,862	1,467,407	736,551	145,472	1,846
Combat Cargo	289,500	544,317	820,104	797,793	689,847	406,191	61,286	2,904
Other	1,695,651	3,169,982	4,047,406	4,669,074	4,607,834	2,646,408	765,277	59,325
TOTALS	**2,989,546**	**5,479,518**	**7,415,452**	**8,208,099**	**7,564,064**	**4,212,251**	**1,061,842**	**67,383**

US AIRCRAFT LOSSES IN SOUTHEAST ASIA

	1966	1967	1968	1969	1970	1971	1972	1973
Fixed-Wing Aircraft								
Lost in North Vietnam	284	333	143	2	4	6	149	4
Lost in South Vietnam	118	141	239	156	59	29	63	3
SUBTOTALS	402	474	382	158	63	35	212	7
Other fixed-wing losses[1]	232	254	275	308	199	110	88	24
TOTALS	**634**	**728**	**657**	**466**	**262**	**145**	**300**	**31**
Helicopters								
Lost in North Vietnam	1	4	2	—	—	—	1	—
Lost in South Vietnam	127	276	558	521	431	224	128	4
SUBTOTALS	128	280	560	521	431	224	129	4
Other helicopter losses[2]	193	383	452	527	422	278	50	5
TOTALS	**321**	**663**	**1,012**	**1,048**	**853**	**502**	**179**	**9**

[1] Combat-type aircraft lost to nonhostile action, support aircraft losses, and all other fixed-wing losses in connection with the war.
[2] Helicopters lost to nonhostile action, and all other helicopter losses in connection with the war.

US MILITARY PERSONNEL IN SOUTH VIETNAM—1960–73

DATE	ARMY	NAVY	AIR FORCE	MARINE CORPS	COAST GUARD	TOTAL
Dec. 31, 1960	800	15	68	2	(none)	About 900
Dec. 31, 1961	2,100	100	1,000	5	(none)	3,205
Dec. 31, 1962	7,900	500	2,400	500	(none)	11,300
Dec. 31, 1963	10,100	800	4,600	800	(none)	16,300
Dec. 31, 1964	14,700	1,100	6,600	900	(none)	23,300
Dec. 31, 1965	116,800	8,400	20,600	38,200	300	184,300
Dec. 31, 1966	239,400	23,300	52,900	69,200	500	385,300
Dec. 31, 1967	319,500	31,700	55,900	78,000	500	485,600
Dec. 31, 1968	359,800	36,100	58,400	81,400	400	536,100
June 30, 1969	360,500	35,800	60,500	81,500	400	538,700
June 30, 1970	298,600	25,700	50,500	39,900	200	414,900
June 30, 1971	190,500	10,700	37,400	500	100	239,200
June 30, 1972	31,800	2,200	11,500	1,400	100	47,000
Jan. 31, 1973	12,400	1,400	6,900	800	(none)	21,500
Mar. 16, 1973	4,081	*	1,828	*	*	6,308

* Combined total of 399.
NOTE: By March 31, 1973, all US combat and combat-support troops had left South Vietnam. Fewer than 500 US military personnel remained through February 1974. Between 1954 and 1960, US military strength averaged about 650 advisors.

THE VIETNAM WAR—THE FINAL TOLL

Military Casualties	Killed	Wounded
United States	46,163	303,654
South Vietnam	184,546	495,931
Communist	927,124	N/A

Civilian Casualties	Killed	Wounded
South Vietnam	451,000	935,000
North Vietnam	N/A	N/A

Refugees (through 1972)

South Vietnam	6,500,000+
Cambodia	2,000,000+
Laos	1,000,000+
North Vietnam	N/A

US expenditures, 1965 through 1973: $111.7 billion

UNITED STATES AIR FORCE MEDAL OF HONOR WINNERS—1918–1974

NAMES, ALPHABETICALLY BY WARS AND RANK AT TIME OF ACTION	HOME TOWN	DATE AND PLACE OF ACTION	PRESENT ADDRESS OR DATE OF DEATH
WORLD WAR I			
Bleckley, 2d Lt. Erwin R.	Wichita, Kan.	Oct. 6, 1918, Binarville, France	KIA, Oct. 6, 1918
Goettler, 2d Lt. Harold E.	Chicago, Ill.	Oct. 6, 1918, Binarville, France	KIA, Oct. 6, 1918
Luke, 2d Lt. Frank, Jr.	Phoenix, Ariz.	Sept. 29, 1918, Murvaux, France	KIA, Sept. 29, 1918
Rickenbacker, Capt. Edward V.	Columbus, Ohio	Sept. 25, 1918, Billy, France	Deceased, July 23, 1973
WORLD WAR II			
Baker, Lt. Col. Addison E.	Chicago, Ill.	Aug. 1, 1943, Ploesti, Romania	KIA, Aug. 1, 1943
Bong, Maj. Richard I.	Superior, Wis.	Oct. 10-Nov. 15, 1944, Southwest Pacific	Killed, Aug. 6, 1945, Burbank, Calif.
Carswell, Maj. Horace S., Jr.	Fort Worth, Tex.	Oct. 26, 1944, South China Sea	KIA, Oct. 26, 1944
Castle, Brig. Gen. Frederick W.	Manila, P.I.	Dec. 24, 1944, Liège, Belgium	KIA, Dec. 24, 1944
Chell, Maj. Ralph	San Francisco, Calif.	Aug. 18, 1943, Wewak, New Guinea	Died as POW, Mar. 6, 1944
Craw, Col. Demas T.	Traverse City, Mich.	Nov. 8, 1942, Port Lyautey, French Morocco	KIA, Nov. 8, 1942
Doolittle, Lt. Col. James H.	Alameda, Calif.	Apr. 18, 1942, Tokyo, Japan	Santa Monica, Calif. (Ret. Lt. Gen.)
Erwin, SSgt. Henry E.	Adamsville, Ala.	Apr. 12, 1945, Koriyama, Japan	Birmingham, Ala.
Femoyer, 2d Lt. Robert E.	Huntington, W. Va.	Nov. 2, 1944, Merseburg, Germany	KIA, Nov. 2, 1944
Gott, 1st Lt. Donald J.	Arnett, Okla.	Nov. 9, 1944, Saarbrucken, Germany	KIA, Nov. 9, 1944
Hamilton, Maj. Pierpont M.	Tuxedo, N.Y.	Nov. 8, 1942, Port Lyautey, French Morocco	Santa Barbara, Calif. (Ret. Maj. Gen.)
Howard, Maj. James H.	Canton, China	Jan. 11, 1944, Oschersleben, Germany	Washington, D.C. (Ret. Brig. Gen.)
Hughes, 2d Lt. Lloyd H.	Alexandria, La.	Aug. 1, 1943, Ploesti, Romania	KIA, Aug. 1, 1943
Jerstad, Maj. John L.	Racine, Wis.	Aug. 1, 1943, Ploesti, Romania	KIA, Aug. 1, 1943
Johnson, Col. Leon W.	Columbia, Mo.	Aug. 1, 1943, Ploesti, Romania	McLean, Va. (Ret. Gen.)
Kane, Col. John R.	McGregor, Tex.	Aug. 1, 1943, Ploesti, Romania	Barber, Ark. (Ret. Col.)
Kearby, Col. Neel E.	Wichita Falls, Tex.	Oct. 11, 1943, Wewak, New Guinea	KIA, Mar. 5, 1944, Wewak, New Guinea
Kingsley, 2d Lt. David R.	Portland, Ore.	June 23, 1944, Ploesti, Romania	KIA, June 23, 1944
Knight, 1st Lt. Raymond L.	Houston, Tex.	Apr. 25, 1945, Po Valley, Italy	KIA, Apr. 25, 1945
Lawley, 1st Lt. William R., Jr.	Leeds, Ala.	Feb. 20, 1944, Leipzig, Germany	Montgomery, Ala. (Ret. Col.)
Lindsey, Capt. Darrell R.	Jefferson, Iowa	Aug. 9, 1944, Pontoise, France	KIA, Aug. 9, 1944
Mathies, SSgt. Archibald	Scotland	Feb. 20, 1944, Leipzig, Germany	KIA, Feb. 20, 1944
Mathis, 1st Lt. Jack W.	San Angelo, Tex.	Mar. 18, 1943, Vegesack, Germany	KIA, Mar. 18, 1943
McGuire, Maj. Thomas B., Jr.	Ridgewood, N.J.	Dec. 25-26, 1944, Luzon, P.I.	KIA, Jan. 7, 1945, Negros, P.I.
Metzger, 2d Lt. William E., Jr.	Lima, Ohio	Nov. 9, 1944, Saarbrucken, Germany	KIA, Nov. 9, 1944
Michael, 1st Lt. Edward S.	Chicago, Ill.	Apr. 11, 1944, Brunswick, Germany	Fairfield, Calif. (Ret. Col.)
Morgan, F/O John C.	Vernon, Tex.	July 28, 1943, Kiel, Germany	Scarborough, N.Y. (Ret. Col.)
Pease, Capt. Harl, Jr.	Plymouth, N.H.	Aug. 7, 1942, Rabaul, New Britain	KIA, Aug. 7, 1942
Pucket, 1st Lt. Donald D.	Longmont, Colo.	July 9, 1944, Ploesti, Romania	KIA, July 9, 1944
Sarnoski, 2d Lt. Joseph R.	Simpson, Pa.	June 16, 1943, Buka, Solomon Is.	KIA, June 16, 1943
Shomo, Capt. William A.	Jeannette, Pa.	Jan. 11, 1945, Luzon, P.I.	Pittsburgh, Pa. (Ret. Lt. Col.)
Smith, SSgt. Maynard H.	Caro, Mich.	May 1, 1943, St. Nazaire, France	Albany, N.Y.
Truemper, 2d Lt. Walter E.	Aurora, Ill.	Feb. 20, 1944, Leipzig, Germany	KIA, Feb. 20, 1944
Vance, Lt. Col. Leon R., Jr.	Enid, Okla.	June 5, 1944, Wimereaux, France	Killed July 26, 1944, near Iceland
Vosler, TSgt. Forrest L.	Lyndonville, N.Y.	Dec. 20, 1943, Bremen, Germany	Poland, N.Y.
Walker, Brig. Gen. Kenneth N.	Cerrillos, N.M.	Jan. 5, 1943, Rabaul, New Britain	KIA, Jan. 5, 1943
Wilkins, Maj. Raymond H.	Portsmouth, Va.	Nov. 2, 1943, Rabaul, New Britain	KIA, Nov. 2, 1943
Zeamer, Capt. Jay, Jr.	Carlisle, Pa.	June 16, 1943, Buka, Solomon Is.	Boothbay Harbor, Me. (Ret. Lt. Col.)
KOREA			
Davis, Lt. Col. George A., Jr.	Dublin, Tex.	Feb. 10, 1952, Sinuiju-Yalu River, No. Korea	KIA, Feb. 10, 1952
Loring, Maj. Charles J., Jr.	Portland, Me.	Nov. 22, 1952, Sniper Ridge, No. Korea	KIA, Nov. 22, 1952
Sebille, Maj. Louis J.	Harbor Beach, Mich.	Aug. 5, 1950, Hamch'ang, So. Korea	KIA, Aug. 5, 1950
Walmsley, Capt. John S., Jr.	Baltimore, Md.	Sept. 14, 1951, Yangdok, No. Korea	KIA, Sept. 14, 1951
VIETNAM			
Dethlefsen, Maj. Merlyn H.	Greenville, Iowa	Mar. 10, 1967, Thai Nguyen, No. Vietnam	Active duty, Lt. Col., Carlisle Barracks, Pa.
Fisher, Maj. Bernard F.	San Bernardino, Calif.	Mar. 10, 1966, A Shau Valley, So. Vietnam	Active duty, Col., Boise IAP, Idaho
Fleming, 1st Lt. James P.	Sedalia, Mo.	Nov. 26, 1968, Duc Co, So. Vietnam	Active duty, Capt., USAF Academy, Colo.
Jackson, Lt. Col. Joe M.	Newnan, Ga.	May 12, 1968, Kham Duc, So. Vietnam	Chicopee, Mass. (Ret. Col.)
Jones, Lt. Col. William A. III	Norfolk, Va.	Sept. 1, 1968, Dong Hoi, No. Vietnam	Killed, Nov. 15, 1969, Woodbridge, Va.
Levitow, A1C John L.	Hartford, Conn.	Feb. 24, 1969, Long Binh, So. Vietnam	Plainville, Conn.
Thorsness, Lt. Col. Leo K.	Walnut Grove, Minn.	Apr. 19, 1967, No. Vietnam	Sioux Falls, S.D. (Ret. Lt. Col.)
Wilbanks, Capt. Hilliard A.	Cornelia, Ga.	Feb. 24, 1967, Dalat, So. Vietnam	KIA, Feb. 24, 1967
Young, Capt. Gerald O.	Ancortes, Wash.	Nov. 9, 1967, Da Nang area, So. Vietnam	Active duty, Maj., Presidio of Monterey, Calif.

USAF WINNERS OF NATIONAL AVIATION AND SPACE AWARDS

The Collier Trophy

The Collier Trophy, established in 1911 by Robert J. Collier, is the oldest continuously awarded aeronautical honor in the world. It is awarded for the greatest achievement in aeronautics, astronautics, or spaceflight in America, with respect to improving the performance, efficiency, or safety of air or space vehicles, the value of which has been thoroughly demonstrated by actual use during the preceding year. USAF recipients since 1947 include:

1947 Capt. Charles E. Yeager, with the developers of the Bell XS-1
1955 Gen. Nathan F. Twining and the aviation industry, for the B-52
1961 Maj. Robert M. White and the other X-15 pilots
1964 Gen. Curtis E. LeMay, for his leadership as USAF Chief of Staff
1968 Col. Frank Borman, Capt. James A. Lovell, Jr. (USN), and Lt. Col. William A. Anders, for the Apollo-8 moon-orbital flight
1969 Neil A. Armstrong and USAF Cols. Edwin E. Aldrin and Michael Collins, for the Apollo-11 moon landing
1971 USAF Col. David R. Scott, Lt. Col. James B. Irwin, and Maj. Alfred M. Worden, for the flight of Apollo-15
1972 USAF and US Navy participants in Linebacker II in the Vietnam War
1973 Skylab Program Director William C. Schneider and the three Skylab crews: Alan L. Bean, Charles Conrad, Jr., Dr. Joseph P. Kerwin, and Paul J. Weitz, USN; Gerald P. Carr and Jack R. Lousma, USMC; Drs. Owen K. Garriott and Edward G. Gibson, civilians; and William R. Pogue, USAF

The Mackay Trophy

The Mackay Trophy, established in 1912 by Clarence H. Mackay, a philanthropist and aviation enthusiast, is the oldest award intended exclusively for flying officers of the US Air Force. It is awarded annually "for the most meritorious flight of the year" by an Air Force person, persons, or organization. Recipients since 1947 are:

1947 Capt. Charles E. Yeager, for his supersonic XS-1 flight
1948 Lt. Col. Emil Beaudry, for a rescue mission to the Greenland ice cap
1949 Crew of *Lucky Lady II,* for their nonstop, round-the-world flight
1950 27th Fighter Escort Wing, for a transatlantic flight
1951 Col. Fred J. Ascani, for 100-km closed-course speed record of 635 mph in an F-86E Sabre
1952 Maj. L. H. Carrington, Maj. F. W. Shook, and Capt. W. D. Yancey, for a nonstop transpacific jet flight
1953 SAC's 40th Air Division, for jet fighter deployment techniques
1954 SAC's 308th Bomb Wing, for a B-47 deployment
1955 Col. Horace A. Hanes, for world's first official supersonic speed record, 822.135 mph in an F-100C Super Sabre
1956 Capt. Iven C. Kincheloe, Jr., for an altitude record of 126,200 feet in the Bell X-2 rocketplane
1957 SAC's 93d Bomb Wing, for round-the-world nonstop flights
1958 TAC's Composite Air Strike Force, for deployment to the Far East
1959 The Thunderbirds demonstration team, for a Far East goodwill trip
1960 The 6593d Test Squadron (Special), for in-flight recovery of space capsules
1961 Lt. Col. W. R. Payne, Maj. W. L. Polhemus, and Maj. R. R. Wagener, for a record-setting B-58 flight to Paris
1962 Maj. R. G. Sowers, Capt. Robert McDonald, and Capt. J. T. Walton, for new transcontinental speed records
1963 Capt. Warren P. Tomsett and his C-47 crew, for air-evac of wounded in Vietnam
1964 TAC's 464th Troop Carrier Wing, for airlift from the Congo
1965 Col. Robert L. Stephens and the test force of the YF-12A and SR-71 for nine world speed and altitude records
1966 Col. Albert R. Howarth, for airmanship on a combat mission in Vietnam
1967 Maj. John H. Casteel, Capt. Richard L. Trail, Capt. Dean L. Hoar, and MSgt. Nathan C. Campbell, for proficiency and heroism in a SAC KC-135 tanker
1968 Lt. Col. Daryl D. Cole, for airmanship in a C-130 in Vietnam
1969 TAC's 49th Tactical Fighter Wing, for redeployment of its F-4D Phantoms from Germany to New Mexico
1970 Capt. Alan D. Milacek and his nine-man crew, for valor and perseverance in returning their severely damaged aircraft to base
1971 Lt. Col. Thomas B. Estes and Maj. Dewain C. Vick, for setting distance and duration records in the SR-71
1972 Capt. Charles D. DeBellevue, Capt. Richard S. Richie, and Capt. Jeffrey S. Feinstein, the three USAF aces of the Vietnam War

The Cheney Award

The Cheney Award, established in 1927, recognizes acts of "valor, extreme fortitude, or self-sacrifice in a humanitarian interest performed in connection with aircraft." It is awarded annually to a member of the US Air Force or its Reserve components, selected by the Chief of Staff and approved by the donors (the mother and sister of 1st Lt. William A. Cheney, who died in a midair collision in January 1918, becoming the first American casualty in Italy in World War I). Recipients since 1948 are:

1948 Lt. Gail S. Halvorsen
1949 Capt. William E. Blair
1950 Sgt. Paul Ramineda
1951 Capt. Daniel J. Miller
1952 Capt. Kendrick U. Reeves
1953 Capt. Edward G. Sperry
1954 Lt. Col. John P. Stapp
1955 TSgt. William G. Sutherland
1956 MSgt. Leonard J. Bachetti
1957 Lt. Robert M. Kerr
1958 Lt. James E. Obenauf
1959 Capt. Herbert L. Mattox, Jr.
1960 Capt. Alfred S. Despres, Jr.
1961 Lt. William A. Luther and MSgt. Lawrence G. Seckley
1962 Maj. Rudolph Anderson, Jr.
1963 Maj. James R. O'Neill
1964 Capt. Albert L. Villaret
1965 Capt. Robert S. Henderson and Capt. James A. Darden, Jr.
1966 Maj. Bernard F. Fisher
1967 Sgt. Duane D. Hackney
1968 Sgt. Thomas A. Newman
1969 Sgt. Isidro Arroyo, Jr.
1970 Maj. Travis Wofford
1971 SSgt. James H. Moore
1972 Capt. Steven L. Bennett (posthumous)

The Harmon International Trophy

Three trophies, established in 1926, are awarded annually to the world's outstanding aviator, aviatrix, and aeronaut or spherical balloonist. The original criteria for the aviator award demanded the "most outstanding international achievement in the art/science of aeronautics for the preceding year, with the art of flying receiving first consideration." This was broadened in 1969 to include pilot feats in earth-orbiting or other space vehicles controllable in some degree by the pilot. The trophies are named for pioneer aviator Clifford B. Harmon. Air Force recipients of the Harmon Aviation Trophy since 1949 are:

1949 Lt. Gen. James H. Doolittle
1950 Col. David C. Schilling
1951 Capt. Charles F. Blair
1952 Col. Bernt Balchen
1953 Maj. Charles E. Yeager
1956 Lt. Col. Frank K. Everest
1957 Gen. Curtis E. LeMay
1959 Capt. Joe B. Jordan
1960 Maj. Robert M. White
1961 Lt. Col. William R. Payne
1962 Maj. Fitzhugh L. Fulton, Jr.
1963 Maj. L. Gordon Cooper
1965 Col. Frank A. Borman and Lt. Col. Thomas P. Stafford
1966 Lt. Col. Edwin E. Aldrin, Jr.
1968 Maj. William J. Knight
1969 Col. Frank A. Borman, Lt. Col. William A. Anders, and Maj. Jerauld R. Gentry
1970 Col. Michael Collins and Col. Edwin E. Aldrin, Jr.
1971 Lt. Col. Thomas B. Estes and Maj. Dewain C. Vick

The General Thomas D. White USAF Space Trophy

The newest national award for Air Force personnel is the Gen. Thomas D. White Space Trophy, established in 1961 by Dr. Thomas W. McKnew, then executive vice president of the National Geographic Society. The award recognizes the "most outstanding contribution to the nation's progress in aerospace during the preceding calendar year by an Air Force military member, Civil Service employee, or organization." The trophy honors the memory of USAF's General White, who served as Chief of Staff from 1957 to 1961. Recipients include:

1961 Capt. Virgil I. Grissom, for his suborbital flight in the Mercury space program
1962 Maj. Robert M. White, for his record-setting flights in the X-15
1963 Maj. L. Gordon Cooper, for his flight in the Mercury program
1964 Air Force Systems Command, for contributions to space technology
1965 Lt. Col. Edward H. White, II, for his twenty-one-minute space walk during the flight of Gemini-4
1966 Hon. Alexander H. Flax, then Assistant Secretary of the Air Force (Research and Development)
1967 Gen. J. P. McConnell, USAF Chief of Staff
1968 Col. Frank Borman, Capt. James Lovell, Jr. (USN), and Lt. Col. William A. Anders, for the Apollo-8 moon-orbital flight
1969 Neil A. Armstrong and USAF Cols. Edwin E. Aldrin and Michael Collins, for the Apollo-11 moon-landing flight
1970 Brig. Gen. Robert A. Duffy, for his accomplishments as Vice Commander of SAMSO and Deputy for Reentry Systems
1971 Lt. Gen. Samuel C. Phillips, for his achievements as Commander of the Space and Missile Systems Organization (SAMSO)
1972 Hon. Robert C. Seamans, Jr., Secretary of the Air Force

WINNERS OF AFA'S AEROSPACE AWARDS

The Air Force Association's Aerospace Awards are presented annually to individuals or organizations contributing in some outstanding manner to furthering the development of various fields of aerospace power for the betterment of all mankind. In 1948, AFA established five national aerospace awards in the form of trophies. A sixth, the Thomas P. Gerrity Trophy, was added in 1968. The awards are made at AFA's annual National Convention, each September.

The **H. H. Arnold Trophy** goes to "Aerospace's Man of the Year" for the most outstanding contributions in the field of Aerospace Activity. The trophy is named for the wartime leader of the Army Air Forces. Winners include:

1948 Hon. W. Stuart Symington, Secretary of the Air Force
1949 Maj. Gen. William H. Tunner and the men of the Berlin Airlift
1950 Airmen of the United Nations in the Far East
1951 Lt. Gen. Curtis E. LeMay and the personnel of Strategic Air Command
1952 Senators Lyndon B. Johnson and Joseph C. O'Mahoney
1953 Gen. Hoyt S. Vandenberg, former Chief of Staff, USAF
1954 Hon. John Foster Dulles, Secretary of State
1955 Gen. Nathan F. Twining, Chief of Staff, USAF
1956 Sen. W. Stuart Symington
1957 Edward P. Curtis, Special Assistant to President Eisenhower
1958 Maj. Gen. Bernard A. Schriever, Commander, Ballistic Missile Div., ARDC
1959 Gen. Thomas S. Power, Commander in Chief, Strategic Air Command
1960 Gen. Thomas D. White, Chief of Staff, USAF
1961 Hon. Lyle S. Garlock, Assistant Secretary of the Air Force (FM)
1962 Dr. A. C. Dickieson and John R. Pierce, Bell Telephone Laboratories
1963 363d Tactical Reconnaissance Wing, TAC; 4080th Strategic Wing, SAC
1964 Gen. Curtis E. LeMay, Chief of Staff, USAF
1965 Second Air Division, PACAF, USAF
1966 8th, 12th, 355th 366th, and 388th Tactical Fighter Wings; 432d and 460th Tactical Reconnaissance Wings
1967 Gen. William W. Momyer, Commander, 7th Air Force, PACAF
1968 Col. Frank Borman, Capt. James Lovell, Jr., and Lt. Col. William Anders—the Apollo-8 crew
1969 *(Not awarded)*
1970 Apollo-11 team (J. L. Atwood, Lt. Gen. Samuel C. Phillips, Neil Armstrong, Col. Edwin E. Aldrin, Jr., and Col. Michael Collins)
1971 Dr. John S. Foster, Jr., Director of Defense Research & Engineering
1972 Air Units of the Allied Forces in SEA (Air Force, Navy, Army, Marine Corps, and the Vietnamese Air Force)
1973 Gen. John D. Ryan (Ret.), former Chief of Staff, USAF

The **Theodore von Kármán Trophy** is awarded for distinguished service in the field of Aerospace Science. Originally known as the Science Trophy, the award was renamed in honor of the late Dr. von Kármán, dean of US aeronautical scientists. Winners include:

1948 John Stack, NACA designer
1949 R. C. Sebold, R. H. Widmer, and Ray O. Ryan—contributors to the development of the B-36
1950 Dr. Theodore von Kármán, Chairman, Scientific Advisory Board, USAF
1951 Dr. George E. Valley, Department of Physics, MIT
1952 Dr. Edward Teller, Radiation Laboratory, University of California
1953 Dr. Mervin J. Kelly, Bell Telephone Laboratories
1954 Lt. Col. John Paul Stapp, USAF, for research into high-speed flight
1955 Dr. John F. von Neumann, Atomic Energy Commission
1956 Dr. Chalmers W. Sherwin, University of Illinois
1957 Dr. Charles Stark Draper, MIT
1958 Dr. H. Julian Allen, Ames Aeronautical Laboratory
1959 Dr. W. Randolph Lovelace II and Brig. Gen. Don D. Flickinger, USAF
1960 Dr. Louis N. Ridenour, Jr., Lockheed Aircraft Corp. *(posthumously)*
1961 Allen F. Donovan, Aerospace Corp.
1962 Dr. Charles H. Townes, Provost, MIT
1963 Clarence L. "Kelly" Johnson, Lockheed Aircraft Corp.
1964 Clarence L. "Kelly" Johnson, Lockheed Aircraft Corp.
1965 Capt. Robert M. Silva, USAF, developer of the first autonomous space sextant
1966 6555th Aerospace Test Wing, AFSC
1967 Col. Alterio Gallerani, Aerospace Audio Visual Service
1968 Lt. Col. Harry F. Rizzo, USAF, Air Force Weapons Laboratory, Kirtland AFB, N. M.
1969 *(Not awarded)*
1970 Maj. Gen. Kenneth W. Schultz, Deputy for Minuteman, SAMSO
1971 Fred D. Orazio, Sr., Scientific Director, Aeronautical Systems Div.
1972 Lt. Col. Donald G. Carpenter, USAF, for advancing the US space defense capability
1973 Lt. Col. Roy C. Robinette, Jr., USAF (Ret.), for contributions to a new satellite system important to national defense

The **David C. Schilling Trophy** is awarded for distinguished service in the field of Flight. Originally AFA's Flight Trophy, the award was renamed in 1957 in honor of the late Col. David C. Schilling. Winners include:

1948 Herbert H. Hoover, NACA test pilot
1949 Bill Odom, private pilot
1950 Capt. James Jabara, world's first jet ace
1951 Brig. Gen. Albert Boyd, Commanding General, Edwards AFB, Calif.
1952 Col. David C. Schilling, USAF, pioneer in long-distance flight of fighter aircraft
1953 Third Air Rescue Group, MATS
1954 Maj. Charles E. Yeager, USAF, research aircraft test pilot
1955 Maj. Stuart Childs, USAF, and George Welch *(posthumously)*, for contributions to USAF's first supersonic aircraft
1956 Lt. Col. Frank K. Everest, USAF, for flying the X-2 more than 1,900 mph
1957 Col. Patrick D. Fleming, USAF *(posthumously)*, for contributions to B-52 training and tactics
1958 Capt. Iven C. Kincheloe, USAF *(posthumously)*, jet ace and test pilot
1959 Tactical Air Command
1960 Lt. Gen. Elwood R. Quesada, FAA Administrator
1961 Maj. Robert M. White, USAF; A. Scott Crossfield, North American Aviation, Inc.; and Joseph A. Walker, NASA, for the X-15 project
1962 Maj. Robert M. White, USAF, America's "First Winged Astronaut"
1963 Maj. L. Gordon Cooper, Jr., Mercury Astronaut
1964 Maj. Sidney J. Kubesch, B-58 pilot
1965 Col. Frank Borman, Gemini-7 Command Pilot
1966 Maj. Hallett P. Marston, 15th Tactical Reconnaissance Photo Squadron
1967 Col. Robin Olds, USAF, for outstanding contributions in the field of flight
1968 Capt. Albert R. Kaiser, USAF, for aerial recovery of space capsules
1969 *(Not awarded)*
1970 Maj. James M. Rhodes, Jr., USAF, research test pilot at Edwards AFB, Calif.
1971 Col. David R. Scott, Col. James B. Irwin, Lt. Col. Alfred M. Worden—the Apollo-15 crew
1972 1st Strategic Reconnaissance Squadron, SAC
1973 17th Air Division (SAC), for Operation Linebacker II missions against heavily defended targets in North Vietnam

The **Gill Robb Wilson Trophy** is awarded for distinguished service to aerospace in the field of Arts and Letters. Originally AFA's Arts and Letters Trophy, the award was renamed in 1966 in honor of the late Gill Robb Wilson, veteran aerospace journalist and editor. Winners include:

1948 William Wister Haines, author of *Command Decision*
1949 *(Not awarded)*
1950 Dr. J. L. Cate and Dr. W. F. Craven, authors of *The Army Air Forces in World War II*
1951 Maj. Alexander P. deSeversky, author of *Air Power: Key to Survival*
1952 Edward R. Murrow, Columbia Broadcasting System
1953 Milton Caniff, King Features ("Steve Canyon" comic strip)
1954 Charles J. V. Murphy, *Fortune* Magazine
1955 Vern Haugland, Associated Press
1956 Beirne Lay, Jr., Metro-Goldwyn-Mayer
1957 Joseph and Stewart Alsop, syndicated columnists
1958 Air Photographic & Charting Service, MATS
1959 Maj. James F. Sunderman, USAF, for contributions to the Air Force book program
1960 Walter Lippmann, syndicated columnist
1961 Maj. Gen. Orvil A. Anderson, USAF (Ret.), and Dr. Albert F. Simpson, Air Force Historical Foundation
1962 Bob Considine, syndicated columnist
1963 Lt. Col. George C. Bales, USAF, for contributions to the Air Force art program
1964 Mark S. Watson, Baltimore *Sun*
1965 Elton C. Fay, Associated Press
1966 Society of Illustrators of New York City, Los Angeles, and San Francisco
1967 Robert F. Engel, 1352d Photographic Group, MAC
1968 Dr. Edward C. Welsh, Executive Secretary, National Aeronautics and Space Council
1969 *(Not awarded)*

Winners of AFA's Aerospace Awards—Continued

1970 Louis R. Stockstill, author of the magazine article "The Forgotten Americans of the Vietnam War"
1971 *Airman* Magazine
1972 Hanson W. Baldwin, veteran military writer and analyst
1973 Capt. Robert J. Hoag, Editor, *USAF Fighter Weapons Review*, Nellis AFB, Nev.

The **Hoyt S. Vandenberg Trophy** is awarded for distinguished service in the field of Aerospace Education. The trophy honors the late Gen. Hoyt S. Vandenberg, who served as USAF Chief of Staff from 1948 to 1953. Winners include:

1948 Jacqueline Cochran, aviatrix
1949 Capt. James Gallagher and the men behind the flight of *Lucky Lady II*
1950 D. W. Rentzel, Administrator, CAA
1951 Gen. Carl A. Spaatz, first Chief of Staff, USAF
1952 Gen. Hoyt S. Vandenberg, Chief of Staff, USAF
1953 Lt. Gen. James H. Doolittle, USAF (Ret.), pilot, soldier-scientist
1954 Gill Robb Wilson, Air Force Association
1955 Maj. Gen. Lucas V. Beau, Civil Air Patrol
1956 Arthur Godfrey, Columbia Broadcasting System
1957 Gen. George C. Kenney, USAF (Ret.)
1958 Ralph J. Cordiner, Chairman, Military Pay Study Committee
1959 Dr. Frank E. Sorenson, University of Nebraska
1960 Dr. Wayne O. Reed, Deputy Commissioner, US Office of Education
1961 Dr. Charles H. Boehm, Supt. of Public Instruction, Pennsylvania
1962 Dr. Lindley J. Stiles, Dean, School of Education, Univ. of Wisconsin
1963 Brig. Gen. Robert F. McDermott, Dean of Faculty, USAF Academy
1964 Aerospace Presentations Team, Air University
1965 Brig. Gen. William C. Lindley, Commandant, Air Force ROTC
1966 Dr. B. F. Skinner, Harvard University
1967 *(Not awarded)*
1968 Hon. Marion B. Folsom, former Secretary, HEW
1969 *(Not awarded)*
1970 Lt. Gen. Selmon W. Wells, Inspector General, USAF
1971 Hon. F. Edward Hébert, House of Representatives
1972 Maj. Richard L. Craft, Hq. Tactical Air Command
1973 Community College of the Air Force (ATC), Randolph AFB, Tex.

The **Thomas P. Gerrity Trophy** is awarded for outstanding accomplishment in the field of Aerospace Systems and Logistics. It was established in 1968 to honor the late Gen. Thomas P. Gerrity. Winners include:

1968 Maj. Gen. Charles G. Chandler, Jr., Deputy Chief of Staff for Materiel, Pacific Air Forces
1969 Maj. Gen. Frederick E. Morris, Jr., Director of Data Automation, Comptroller of the Air Force
1970 Col. Levin P. Tull, Deputy Director of Supply & Services, Air Force Deputy Chief of Staff, Systems and Logistics
1971 Col. Shirl M. Nelson, Director of Supply & Services, Hq. Tactical Air Command
1972 Col. Owen J. McGonnell, Asst. Deputy Chief of Staff/Logistics, Hq. Aerospace Defense Command
1973 Col. Allen R. Rodgers, DCS/Logistics, Hq. 8th Air Force (SAC)

AIR FORCE MAGAZINE'S GUIDE TO ACES

In compiling this list of aces who flew with USAF and its predecessor organizations (the Air Service and the Army Air Forces), AIR FORCE Magazine has used official USAF sources except for World War I. During that war, many Americans scored victories serving with foreign countries. As a result, these men do not appear on official lists as "American" aces. We have included in our list of World War I aces both those who flew with the American Air Service and with the British or French. The lists for World War II, Korea, and Vietnam include only AAF/USAF airmen.

The Albert F. Simpson Historical Research Center, Maxwell AFB, Ala., has completed a detailed accounting of the Air Service victory credits in World War I and USAF victory credits in Korea and Southeast Asia. The Center is still preparing the list of Army Air Forces victory credits for World War II. This has taken much time as a result of the great number of victories and the many different procedures used to record them. The final documented list of all World War II combat scores will not be available for several years. The changes this year from the similar list in last year's Almanac are based on findings concerning some of the aces' victory credits. However, all World War II awards are still tentative, and all are open to further change or challenge.

Although some World War I totals (notably Frank Luke's) include balloons, all entries for subsequent conflicts are for air-to-air victories.

—The Editors

LEADING AMERICAN ACES OF WORLD WAR I

(Ten or more victories)

Rickenbacker, Capt. Edward V. (AEF)	26	Iaccaci, Capt. Paul T. (RFC)	18	Baylies, Lt. Frank L. (FFC/LE)	12
Rosevear, Capt. S. C. (RFC)	23	Luke, 2d Lt. Frank, Jr. (AEF)	18	Bennett, 1st Lt. Louis B. (RFC)	12
Lambert, Capt. William C. (RFC)	22	Lufbery, Maj. Raoul G. (FFC/LE)	17	Kindley, Capt. Field E. (AEF)	12
Gillette, Capt. Frederick W. (RFC)	20	Kullberg, Lt. Harold A. (RFC)	16	Putnam, 1st Lt. David E. (LE/AEF)	12
Malone, Capt. John J. (RN)	20	Rose, Capt. Oren J. (RFC)	16	Springs, Capt. Elliott W. (AEF)	12
Wilkenson, Maj. Alan M. (RFC)	19	Warman, Lt. C. T. (RFC)	15	Iaccaci, Lt. Thayer A. (RFC)	11
Hale, Capt. Frank L. (RFC)	18	Libby, Capt. Frederick (RFC)	14	Landis, Capt. Reed G. (AEF)	10
		Vaughn, 1st Lt. George A. (AEF)	13	Swaab, Capt. Jacques M. (AEF)	10

AEF—American Expeditionary Force
FFC—French Flying Corps
RFC—Royal Flying Corps (British)
RN—Royal Navy (British)
LE—Lafayette Escadrille

LEADING ARMY AIR FORCES ACES OF WORLD WAR II

(Fifteen or more victories)

Bong, Maj. Richard T.	40	Duncan, Col. Glenn E.	19.50	Johnson, Col. Gerald W.	16.50
McGuire, Maj. Thomas B.	38	Carson, Maj. Leonard K.	18.50	Godfrey, Capt. John T.	16.33
Gabreski, Col. Francis N.	28*	Eagleston, Lt. Col. Glenn T.	18.50*	Anderson, Lt. Col. Clarence E., Jr.	16.25
Johnson, Lt. Col. Robert S.	27	Hill, Maj. David L. (AVG/USAF)	18.25†	Dunham, Col. William D.	16
MacDonald, Col. Charles H.	27	Older, Lt. Col., Charles H. (AVG/USAF)	18.25†	Harris, Lt. Col. Bill	16
Preddy, Maj. George E.	26.83	Beckham, Col. Walter C.	18	Welch, Maj. George S.	16
Meyer, Col. John C.	24*	Green, Col. Herschel H.	18	Beerbower, Capt. Donald M.	15.50
Schilling, Col. David C.	22.50	Zemke, Col. Hubert	17.75	Peterson, Maj. Richard A.	15.50
Johnson, Lt. Col. Gerald R.	22	England, Lt. Col. John B.	17.50	Whisner, Maj. William T., Jr.	15.50*
Kearby, Col. Neel E.	22	Beeson, Maj. Duane W.	17.33	Blakeslee, Col. Donald J. M. (ES/USAF)	15†
Robbins, Col. Jay T.	22	Thornell, Maj. John F., Jr.	17.25	Bradley, Col. Jack T.	15
Christensen, Capt. Fred J.	21.50	Foy, Maj. Robert W.	17	Brown, Capt. Samuel J.	15
Wetmore, Capt. Ray S.	21.25	Hampshire, Capt. John (AVG/USAF)	17†	Cragg, Maj. Edward	15
Mahurin, Lt. Col. Walker M.	20.75*	Reed, Maj. William N. (AVG/USAF)	17†	Herbst, Col. John C.	15
Voll, Maj. John J.	20.50	Varnell, Capt. James S., Jr.	17	Hofer, 1st Lt. Ralph K.	15
Lynch, Lt. Col. Thomas J.	20			Homer, Maj. Cyril F.	15
Westbrook, Lt. Col. Robert B.	20				
Gentile, Capt. Donald S.	19.83				

* Aces who added to these scores by victories in the Korean War.

AVG—American Volunteer Group
ES—Eagle Squadron

†—The Simpson Center has no way of verifying kills made while flying with AVG or ES.

USAF ACES OF THE KOREAN WAR

McConnell, Capt. Joseph, Jr.	16	Hagerstrom, Maj. James P.	8.50*	Baldwin, Col. Robert P.	5
Jabara, Lt. Col. James	15*	Risner, Capt. Robinson	8	Becker, Capt. Richard S.	5
Fernandez, Capt. Manuel J.	14.5	Ruddell, Lt. Col. George I.	8*	Bettinger, Maj. Stephen L.	5
Davis, Lt. Col. George A., Jr.	14*	Buttlemann, 1st Lt. Henry	7	Creighton, Maj. Richard D.	5*
Baker, Col. Royal N.	13*	Jolley, Capt. Clifford D.	7	Curtin, Capt. Clyde A.	5
Blesse, Maj. Frederick C.	10	Lilley, Capt. Leonard W.	7	Gibson, Capt. Ralph D.	5
Fischer, 1st Lt. Harold E.	10	Adams, Maj. Donald E.	6.50*	Kincheloe, Capt. Iven C., Jr.	5
Garrison, Lt. Col. Vermont	10*	Gabreski, Col. Francis S.	6.50*	Latshaw, Capt. Robert T., Jr.	5
Johnson, Col. James K.	10*	Jones, Lt. Col. George L.	6.50	Moore, Capt. Robert H.	5
Moore, Capt. Lonnie R.	10	Marshall, Maj. Winton W.	6.50	Overton, Capt. Dolphin D., III	5
Parr, Capt. Ralph S., Jr.	10	Kasler, 1st Lt. James H.	6	Thyng, Col. Harrison R.	5*
Foster, Capt. Cecil G.	9	Love, Capt. Robert J.	6	Westcott, Maj. William H.	5
Low, 1st Lt. James F.	9	Whisner, Maj. William T., Jr.	5.50*		

* These are in addition to World War II victories.

USAF ACES OF WORLD WAR II AND LATER WARS

	WW II	KOREA	TOTAL		WW II	KOREA	TOTAL
Gabreski, Col. Francis S.	28	6.5	34.5	Johnson, Col. James K.	1	10	11
Meyer, Col. John C.	24	2	26	Adams, Maj. Donald E.	4	6.5	10.5
Mahurin, Col. Walker M.	20.75	3.5	24.25	Ruddell, Lt. Col. George I.	2.5	8	10.5
Davis, Maj. George A., Jr.	7	14	21	Thyng, Col. Harrison R.	5	5	10
Whisner, Maj. William T.	15.5	5.5	21	Colman, Capt. Philip E.	5	4	9
Eagleston, Col. Glenn T.	18.5	2	20.5	Heller, Lt. Col. Edwin L.	5.5	3.5	9
Garrison, Lt. Col. Vermont	7.33	10	17.33	Chandler, Maj. Van E.	5	3	8
Baker, Col. Royal N.	3.5	13	16.5	Hockery, Maj. John J.	7	1	8
Jabara, Maj. James	1.5	15	16.5	Creighton, Maj. Richard D.	2	5	7
Olds, Col. Robin	12	4*	16	Emmert, Lt. Col. Benjamin H., Jr.	6	1	7
Mitchell, Col. John W.	11	4	15	Bettinger, Maj. Stephen L.	1	5	6
Brueland, Maj. Lowell K.	12.5	2	14.5	Visscher, Maj. Herman W.	5	1	6
Hagerstrom, Maj. James P.	6	8.5	14.5	Liles, Capt. Brooks J.	1	4	5
Hovde, Lt. Col. William J.	10.5	1	11.5	Mattson, Capt. Conrad E.	1	4	5

* Colonel Olds's 4 additional victories came in Vietnam

ACES OF THE VIETNAM WAR

DeBellevue, Capt. Charles D. (USAF)	6	Feinstein, Capt. Jeffrey S. (USAF)	5
Cunningham, Lt. Randy (USN)	5	Ritchie, Capt. Richard S. (USAF)	5
Driscoll, Lt. William (USN)	5		

LEADING AIR SERVICE/ AAF/USAF ACES OF ALL WARS

Bong, Maj. Richard T.	40	WW II	Kearby, Col. Neel E.	22	WW II
McGuire, Maj. Thomas B.	38	WW II	Robbins, Col. Jay T.	22	WW II
Gabreski, Col. Francis S.	34.50	WW II, Korea	Christensen, Capt. Fred J.	21.50	WW II
Johnson, Lt. Col. Robert S.	27	WW II	Wetmore, Capt. Ray S.	21.25	WW II
MacDonald, Col. Charles H.	27	WW II	Davis, Maj. George A., Jr.	21	WW II, Korea
Preddy, Maj. George E.	26.83	WW II	Whisner, Maj. William T., Jr.	21	WW II, Korea
Meyer, Col. John C.	26	WW II, Korea	Eagleston, Col. Glenn T.	20.50	WW II, Korea
Rickenbacker, Capt. Edward V.	26	WW I	Voll, Maj. John J.	20.50	WW II
Mahurin, Lt. Col. Walker M.	24.25	WW II, Korea	Lynch, Lt. Col. Thomas J.	20	WW II
Schilling, Col. David C.	22.50	WW II	Westbrook, Lt. Col. Robert B.	20	WW II
Johnson, Lt. Col. Gerald R.	22	WW II	Gentile, Capt. Donald S.	19.83	WW II

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AIR FORCE MAGAZINE'S GUIDE TO USAF'S BASES AT HOME AND ABROAD

Altus AFB, Okla. 73521; 3 mi. NE of Altus. Phone: (405) 482-8100. AUTOVON: 866-1110. MAC base. 443d Military Airlift Training Wing; transition training for C-141 and C-5 crews. Formerly SAC base; SAC's 11th ARS continues tanker operations as tenant. AFCS's 4th Mobile Communications Group has tenant status. Base activated Jan. 1943; inactivated May 1945; reactivated Jan. 1953. Area: 2,487 acres. Altitude: 1,376 ft.

Andrews AFB, Md. 20331; 11 mi. SE of Washington, D. C. Phone: (301) 981-9111. AUTOVON: 858-1110. Headquarters Command base. Hq. Air Force Systems Command; high-priority airlift for HQ COMD; also proficiency flying for HQ COMD, AFRES, ANG, Navy, Marines. Other units: 1st Composite Wing; 89th Military Airlift Special Missions Wing; 6th Weather Wing; 459th Tactical Airlift Wing, AFRES; 113th Tactical Fighter Wing, ANG. Base activated June 1943; named for Lt. Gen. Frank M. Andrews, military air pioneer, killed in an aircraft accident, May 3, 1943. Area: 4,279 acres. Altitude: 279 ft.

Arnold AFS, Tenn. 37389; approximately 7 mi. SE of Manchester. Phone: (615) 455-2611. AUTOVON: 882-1520. AFSC installation; site of the Arnold Engineering Development Center, the free world's largest complex of wind tunnels, jet and rocket engine test cells, space simulation chambers, and hyperballistic ranges, which support the acquisition of new aerospace systems by conducting research, development, and evaluation testing for the Air Force, other military services, and government agencies. Base activated Jan. 1, 1950; named for Gen. H. H. "Hap" Arnold, wartime Chief of the AAF. Area: 40,118 acres. Altitude: 950 to 1,150 feet.

Barksdale AFB, La. 71110; 4 mi. SE of Bossier City. Phone: (318) 456-2252. AUTOVON: 781-1110. SAC base. Hq. 2d Air Force; 2d Bomb Wing. Base is also site of AFRES special operations group. Base activated Feb. 2, 1933; named for Lt. Eugene H. Barksdale, WW I airman killed in Aug. 1926 aircraft accident. Area: 22,000 acres (20,000 acres reserved for recreational area). Altitude: 167 ft.

Beale AFB, Calif. 95903; 13 mi. E of Marysville. Phone: (916) 634-3000. AUTOVON: 368-1110. SAC base. 14th Air Division; 9th Strategic Reconnaissance Wing; 456th Bomb Wing. Beale is the only USAF base having SR-71 strategic recce aircraft. Originally US Army's Camp Beale; became AF installation in Nov. 1948; became AFB in Dec. 1951; named for Brig. Gen. E. F. Beale, Indian agent in Calif. prior to Civil War. Area: 22,944 acres. Altitude: 113 ft.

Bellows AFS, Hawaii (APO San Francisco 96553); approximately 12 mi. NE of Honolulu. Phone: (808) 259-9469. PACAF base. It is a closed airfield presently used by the Marine Corps as a tactical maneuver area, by the Army National Guard as an armory, and by the Air Force as a radio-transmitter site and recreation center. Activated in 1930 as Bellows Field in honor of 2d Lt. Franklin D. Bellows, killed in France during WW I. Became Bellows AFS on March 28, 1948. Area: 1,492 acres. Altitude: 15 ft.

Bergstrom AFB, Tex. 78743; 6 mi. SE of Austin. Phone: (512) 385-4100. AUTOVON: 685-1110. TAC base. Hq. 12th Air Force; 67th Tactical Reconnaissance Wing. Base activated Sept. 22, 1942; named for Capt. John A. E. Bergstrom, first Austin serviceman killed in WW II. Area: 3,147 acres. Altitude: 541 ft.

Blytheville AFB, Ark. 72315; 4 mi. NW of Blytheville. Phone: (501) 763-3931. AUTOVON: 637-1110. SAC base. 42d Air Division; 97th Bomb Wing. Base activated June 1942; inactivated Feb. 1947; reactivated Aug. 1955. Area: 3,067 acres. Altitude: 254 ft.

Bolling AFB, D. C. 20332; 3 mi. S of the US Capitol. Phone: (202) 545-6700. AUTOVON: 227-0111. Hq. Headquarters Command, USAF. Base activated Oct. 1917; named for Col. Raynal C. Bolling, Ass't Chief of Air Service, killed during WW I. Area: 604 acres. Altitude: 8 ft.

Brooks AFB, Tex. 78235; 7 mi. SE of San Antonio. Phone: (512) 536-1110. AUTOVON: 240-1110. AFSC base. Home of Aerospace Medical Division, USAF School of Aerospace Medicine, and USAF Human Resources Lab. Base activated Dec. 5, 1917; named for Cadet Sidney J. Brooks, Jr., killed Nov. 13, 1917, on his final solo flight before commissioning. Area: 1,352 acres. Altitude: 694 ft.

Cannon AFB, N. M. 88101; 7 mi. WSW of Clovis. Phone: (505) 784-3311. AUTOVON: 681-1110. TAC base. Hq. 832d Air Division; 27th Tactical Fighte Wing. Activated Aug. 1942; named fo Gen. John K. Cannon, WW II Con mander of all Allied Air Forces in Me iterranean. Area: 11,339 acres. Altitud 4,295 ft.

Carswell AFB, Tex. 76127; 7 m WNW of downtown Fort Worth. Phon (817) 738-3511. AUTOVON: 739-111 SAC base. 19th Air Division; 7th Bom Wing; 301st Tactical Fighter Win (AFRES). Activated Aug. 1942; name Jan. 30, 1948, for Maj. Horace S. Car well, Jr., native of Fort Worth, WW B-24 pilot and posthumous Medal Honor winner. Area: 2,000 acres. Alt tude: 650 ft.

Castle AFB, Calif. 95342; 8 mi. N of Merced. Phone: (209) 726-201 AUTOVON: 730-3350. SAC base. 93 Bomb Wing. Conducts training of SAC B-52 and KC-135 crews. Al houses ADC fighter-interceptor squa ron. Activated Sept. 1941; named f Brig. Gen. Frederick W. Castle, WW B-17 pilot and posthumous Medal Honor winner. Area: 2,700 acres. Alt tude: 188 ft.

Chanute AFB, Ill. 61866; 1 mi. S Rantoul; 14 mi. N of Champaig Phone: (217) 495-1110. AUTOVON: 86 1110. ATC base. Provides technic training in missile and aircraft maint nance and weather school. Base h museum, Chanute Technical Trainin Display Center. Base activated May 2 1917; named for Octave Chanute, aer nautical engineer and glider pione Area: 2,100 acres. Altitude: 737 ft.

Charleston AFB, S. C. 29404; 10 m NW of Charleston. Phone: (803) 74 4111. AUTOVON: 583-0111. MAC bas 437th Military Airlift Wing; C-141 a sociate AFRES 315th Wing. Base ac vated June 1942; inactivated Feb. 194 reactivated Aug. 1953. Area: 3,9 acres. Altitude: 45 ft.

Columbus AFB, Miss. 39701; 10 r NNW of Columbus. Phone: (601) 4 7322. AUTOVON: 742-1110. ATC ba 14th Flying Training Wing, undergra ate pilot training. Base activated 1941 for pilot training. Area: 4, acres. Altitude: 214 ft.

Craig AFB, Ala. 36701; 5 mi. SE Selma. Phone: (205) 874-7431. AU VON: 436-3350. ATC base. 29th Fl Training Wing, undergraduate training. Base activated Aug. 1 named for Bruce K. Craig, flight e neer for B-24 manufacturer, kille

941 crash. Area: 2,064 acres. Altitude: 76 ft.

Davis-Monthan AFB, Ariz. 85707; 4 mi. SE of Tucson. Phone: (602) 793-3900. AUTOVON: 361-1110. SAC base. 12th Air Division; 390th Strategic Missile Wing (Titan II); 100th Strategic Reconnaissance Wing; 355th Tactical Fighter Wing. TAC A-7D combat crew training. Also site of AFLC's Military Aircraft Storage and Disposition Center. Base activated in 1927; named in 1928 for two Tucsonan accident victims—1st Lt. Samuel H. Davis, killed Dec. 28, 1921; and 2d Lt. Oscar Monthan, killed Mar. 17, 1924. Area: 15,000 acres. Altitude: 2,705 ft.

Dobbins AFB, Ga. 30060; 2 mi. S of Marietta; 10 mi. NW of Atlanta. Phone: (404) 424-8811. AUTOVON: 925-1110. AFRES base. Hq. Eastern AFRES Region; 94th Tactical Airlift Wing (AFRES); 116th Tactical Fighter Wing (ANG); Naval Air Station Atlanta. Base activated in 1943; named for Capt. Charles Dobbins, WW II pilot, killed in action. Area: 1,095 acres. Altitude: 1,068 ft.

Dover AFB, Del. 19901; 4 mi. SE of Dover. Phone: (302) 678-7011. AUTOVON: 455-1110. MAC base. 436th Military Airlift Wing; air transport units; C-5 AFRES associate squadron. Dover is largest air freight terminal on East Coast. Base activated Dec. 1941; inactivated Sept. 1946; reactivated Feb. 1951. Area: 3,600 acres. Altitude: 28 ft.

Duluth International Airport, Minn. 55814; 4 mi. NW of Duluth. Phone: (218) 727-8211. AUTOVON: 897-1510. ADC base. Hq. 23d Air Division, ADC, and 3d NORAD Region; ANG fighter-interceptor squadron; SAGE region control center, NORAD. Activated Mar. 1951. Area: 2,191 acres. Altitude: 602 ft.

Dyess AFB, Tex. 79607; 2 mi. WSW of Abilene. Phone: (915) 696-0212. AUTOVON: 885-3400. SAC base. 96th Bomb Wing; 463d Tactical Airlift Wing. Base activated Apr. 1942; inactivated Dec. 1945; reactivated Sept. 1955; named for Lt. Col. William E. Dyess, WW II fighter pilot killed in accident Dec. 1943. Area: 5,186 acres. Altitude: 1,774 ft.

Edwards AFB, Calif. 93523; 2 mi. E of Rosamond. Phone: (805) 277-1110. AUTOVON: 350-1110. AFSC base. AF Flight Test Center. Also trains aerospace test pilots, engineers, and project managers. Base houses NASA Flight Research Center, concerned with supersonic and transonic flight research, and home for Army Aviation's Test Activity. Home of AF Rocket Propulsion Laboratory. Base activated Sept. 1933; named for Capt. Glen W. Edwards, killed June 5, 1948, in crash of a YB-49 "Flying Wing" experimental bomber. Area: 301,000 acres. Altitude: 2,302 ft.

Eglin AFB, Fla. 32542; 2 mi. SW of Valparaiso; 7 mi. SE of Fort Walton Beach. Phone: (904) 881-6668. AUTOVON: 872-1110. AFSC base. Air Force Armament Development and Test Center. AF Armament Laboratory; 3246th Test Wing; 39th Aerospace Rescue & Recovery Wing; 33d Tactical Fighter Wing; Tactical Air Warfare Center; USAF Special Operations Force. Base activated in 1935; named for Lt. Col. Frederick I. Eglin, WW I flyer killed in aircraft accident while en route from Langley to Maxwell, Jan. 1, 1937. Area: 464,980 acres. Altitude: 85 ft.

Eielson AFB, Alaska (APO Seattle 98737); 26 mi. SE of Fairbanks. Phone: (907) 372-2181. AUTOVON: (317) 377-1292. AAC base. SAC tanker operations; MAC weather recon; air defense and search and rescue for AAC; communications for AFCS; 6th Strategic Wing. Activated Oct. 1944; named for Carl B. Eielson, Arctic aviation pioneer. Area: about 35,000 acres. Altitude: 534 ft.

Ellington AFB, Tex. 77030; 15 mi. SSE of Houston. Phone: (713) 481-1400. AUTOVON: 954-2110. AFRES base. AFRES and ANG training and operations; Hq. Central AFRES Region; fighter-interceptor group (Texas ANG); USCG air station; AWS detachment; facilities for NASA's Lyndon B. Johnson Space Center. Base activated Nov. 27, 1917; after several reactivations through the years, transferred to AFRES in 1958; named for Lt. Eric L. Ellington, killed in crash Nov. 24, 1913. Area: 2,200 acres. Altitude: 40 ft.

Ellsworth AFB, S. D. 57706; 11 mi. ENE of Rapid City. Phone (605) 342-2400. AUTOVON: 823-1500. SAC base. 28th Bomb Wing; 44th Strategic Missile Wing; SAC post-attack command and control system squadron. Activated July 1942; named for Brig. Gen. Richard E. Ellsworth, killed Mar. 18, 1953, in crash of RB-36. Area: 5,675 acres. Altitude: 3,600 ft.

Elmendorf AFB, Alaska (APO Seattle 98742); 1 mi. NW of Anchorage. Phone: (907) 754-9125 or 754-9121. AUTOVON: (317) 754-9121. AAC base. Hq. Alaskan Command, Hq. Alaskan Air Command and 21st Composite Wing; aerospace rescue and recovery squadron, MAC; military airlift support squadron, MAC; 1931st Communications Group, AFCS; 6981st Security Group, USAFSS. Base activated July 1940; named for Capt. Hugh M. Elmendorf, killed in air accident Jan. 13, 1933. Area: 13,400 acres. Altitude: 118 ft.

England AFB, La. 71301; 5 mi. W of Alexandria. Phone: (318) 448-2100. AUTOVON: 683-1110. TAC base. 23d Tactical Fighter Wing. Base activated Oct. 1942; named for Lt. Col. John B. England, WW II ace, killed Nov. 17, 1954, in a crash. Area: 2,282 acres. Altitude: 89 ft.

Ent AFB, Colo. 80912; within Colorado Springs. Phone: (303) 635-8911. AUTOVON: 692-0111. ADC base. Though no flying operations (see Peterson Field), Ent is home of three major commands—North American Air Defense Command, Army Air Defense Command, Aerospace Defense Command, and Hq. 14th Aerospace Force (ADC). Ent also supports the Cheyenne Mountain complex where NORAD's Combat Operations Center is located. Base activated Jan. 1951; named for Maj. Gen. Uzal G. Ent, WW II leader who died Mar. 5, 1948. Area: 36 acres. Altitude: about 6,000 ft.

Fairchild AFB, Wash. 99011; 12 mi. WSW of Spokane. Phone: (509) 247-1212. AUTOVON: 352-1110. SAC base. 47th Air Division; 92d Bomb Wing; 3636th Combat Crew Training Wing. Base activated Jan. 1942; named for Gen. Muir S. Fairchild, USAF Vice Chief of Staff at his death in 1950. Area: 5,450 acres. Altitude: 2,462 ft.

Francis E. Warren AFB, Wyo. 82001; adjacent to Cheyenne. Phone: (307) 775-2510. AUTOVON: 481-1110. SAC base. 4th Strategic Missile Division; 90th Strategic Missile Wing. Base activated July 4, 1867; under Army jurisdiction until 1947 when reassigned to USAF. Home of first Atlas-D ICBM missile wing (1960–65); named for Francis Emory Warren, Wyoming senator and early governor. Base has 7,600 acres, plus 200 Minuteman missile sites distributed over some 8,300 sq. mi. Altitude: 6,000 ft.

George AFB, Calif. 92392; 6 mi. W of Victorville. Phone: (714) 269-1110. AUTOVON: 353-1110. TAC base. 35th Tactical Fighter Wing. Base activated in 1941; named for Brig. Gen. Harold H. George, WW I fighter ace largely responsible for adoption of "Off We Go" as official AF song, killed in Australia in aircraft accident Apr. 29, 1942. Area: 5,000 acres. Altitude: 2,875 ft.

Glasgow AFB, Mont. 59231; 19 mi. NW of Glasgow. Phone: (406) 524-6469. AUTOVON: 823-1811. SAC base. Heavy bomber satellite operations; also houses Army Safeguard ABM depot. Base deactivated in June 1968, was reopened Jan. 1972. Area: 5,815 acres. Altitude: 2,755 ft.

Goodfellow AFB, Tex. 76901; 2 mi. SE of San Angelo. Phone: (915) 653-3231. AUTOVON: 885-3450. USAF Security Service base. 6940th Security Wing; training for USAFSS. Base activated Jan. 1941; named for 2d Lt. John J. Goodfellow, Jr., WW I fighter pilot killed in combat Sept. 17, 1918. Area: 1,127 acres. Altitude: 1,877 ft.

Grand Forks AFB, N. D. 58201; 16 mi. W of Grand Forks. Phone: (701) 594-6011. AUTOVON: 362-1110. SAC base. 319th Bomb Wing; 321st Strategic Missile Wing; also houses ADC fighter-interceptor squadron. Base activated in 1956. Area: 5,400 acres. Altitude: 911 ft.

Griffiss AFB, N. Y. 13440; 1 mi. SE of Rome. Phone: (315) 330-1110. AUTOVON: 587-1110. SAC base. 416th Bomb Wing. Major tenant is Rome Air Development Center (RADC), part of AFSC. Base also houses hq. of AFCS's Northern Communications Area and ADC fighter-interceptor squadron. Base activated Feb. 1, 1942; named for Lt. Col. Townsend E. Griffiss, killed in aircraft accident Feb. 15, 1942. Area: 3,468 acres. Altitude: 515 ft.

Grissom AFB, Ind. 46970; 9 mi. S of Peru. Phone: (317) 689-2211. AUTOVON: 928-1110. SAC base. 305th Air Refueling Wing; 434th Tactical Fighter Wing (AFRES). Activated Jan. 1943 for Navy flight training; reactivated June 1954 as Bunker Hill AFB; renamed May 1968 for Lt. Col. Virgil I. "Gus" Grissom,

killed Jan. 27, 1967, with other Astronauts Edward White and Roger Chaffee, in Apollo capsule fire. Area: 2,810 acres. Altitude: 800 ft.

Gunter AFS, Ala. 36114; 4 mi. NE of Montgomery. Phone: (205) 279-1110. AUTOVON: 921-1110. AU base. Hq. Air Force Data Automation Agency and site of AF Data Systems Design Center. USAF Extension Course Institute; USAF Senior NCO Academy. Base activated Aug. 27, 1940; named for William A. Gunter, former mayor of Montgomery who died in 1940. Area: about 2 sq. mi. Altitude: 166 ft.

Hamilton AFB, Calif. 94934; adjacent to city of Novato. Phone: (415) 838-1110. AUTOVON: 997-1110. AFRES base. Hq. 452d Tactical Airlift Wing (AFRES), Western AFRES Region, and tactical airlift group. Base activated 1933; named for 1st Lt. Lloyd A. Hamilton, first American in WW I to fly with the Royal Flying Corps, killed in action Aug. 24, 1918. Area: 2,322 acres. Altitude: 10 ft.

Hancock Field, N. Y. 13225; 10 mi. NNE of Syracuse. Phone: (315) 458-5500. AUTOVON: 587-9110. ADC base. 21st NORAD Region/Air Division (ADC); also houses tactical air support group (ANG); SAGE region control center. Base activated Sept. 1941. Area: 1,125 acres. Altitude: 520 ft.

Hickam AFB, Hawaii (APO San Francisco 96553); 6 mi. W of Honolulu. Phone: (808) 422-0531. AUTOVON: 430-0111. PACAF base. Hq. Pacific Air Forces; 15th Air Base Wing, support organization for Air Force units in Hawaii and throughout the Pacific; ANG fighter group; 41st Air Rescue and Recovery Wing; 1st Weather Wing; 61st Military Airlift Support Wing. Base activated Sept. 1937; named for Lt. Col. Horace M. Hickam, air pioneer killed in crash Nov. 5, 1934. Area: 2,544 acres. Altitude: sea level.

Hill AFB, Utah 84406; 7 mi. S of Ogden. Phone: (801) 777-7221. AUTOVON: 458-1110. AFLC base. Hq. Ogden Air Logistics Center; furnishes logistic support for ICBMs; manager for F-101 and F-4 aircraft; also home of 1550th Aircrew Training Test Wing and drone test activity; tactical fighter squadron (AFRES). Base activated Nov. 1940; named for Maj. Ployer P. Hill, killed Oct. 30, 1935, test-flying the first B-17. Area: 7,000 acres. Altitude: 4,788 ft.

Holloman AFB, N. M. 88330; 6 mi. SW of Alamogordo. Phone: (505) 473-6511. AUTOVON: 867-1110. TAC base. 49th Tactical Fighter Wing. AFSC also conducts test and evaluation of airborne missiles, drones, recon systems, and missile reentry vehicles, and operates Central Inertial Guidance Test Facility, AFSC track facility, and Radar Target Scatter site (RATSCAT). Activated 1942; named for Col. George V. Holloman, guided-missile pioneer, killed in crash Mar. 19, 1946. Area: 97,877 acres. Altitude: 4,000 ft.

Homestead AFB, Fla. 33030; 5 mi. NNE of Homestead. Phone: (305) 257-8011. AUTOVON: 791-0111. TAC base. 31st Tactical Fighter Wing; site of ATC sea-survival school; AFRES early warning and control squadron; and aerospace rescue and recovery squadron. Base activated Apr. 1955. Area: 3,607 acres. Altitude: 7 ft.

Hurlburt Field, Fla. 32544 (Eglin AF Auxiliary Field #9); 6 mi. W of Ft. Walton Beach; part of Eglin AFB reservation. Phone: (904) 881-6668. AFSC base, operated by TAC. Home of 1st Special Operations Wing; special operations combat crew training; maintains combat-ready special operations squadrons. Also site of USAF Air-Ground Operations School and Special Operations School. Base activated in 1943; named for 1st Lt. Donald W. Hurlburt, WW II bomber pilot killed Oct. 2, 1943, in crash near Hurlburt. Altitude: 35 ft.

Indian Springs AF Auxiliary Field, Nev. 89018; 45 mi. NW of Las Vegas. Phone: (702) 879-6268. TAC base. Provides range support for TAC operations from nearby Nellis AFB; supports the Las Vegas Bombing and Gunnery Range, more than 3,000,000 acres, the largest reservation in the USAF inventory. Here the Atomic Energy Commission has conducted most of its tests, supported by a detachment of the AF Special Weapons Center. The base was activated in 1942. Altitude: 3,124 ft.

Keesler AFB, Miss. 39534; located in Biloxi. Phone: (601) 377-1110. AUTOVON: 868-1110. ATC base. Keesler Technical Training Center (communications and electronics training and personnel and administrative courses); Keesler USAF Medical Center; also provides technical training for foreign students. Hosts MAC weather recon squadron and AFRES airlift unit. Base activated June 12, 1941; named for 2d Lt. Samuel R. Keesler, Jr., WW I aerial observer, killed in action Oct. 9, 1918. Area: 1,576 acres. Altitude: 26 ft.

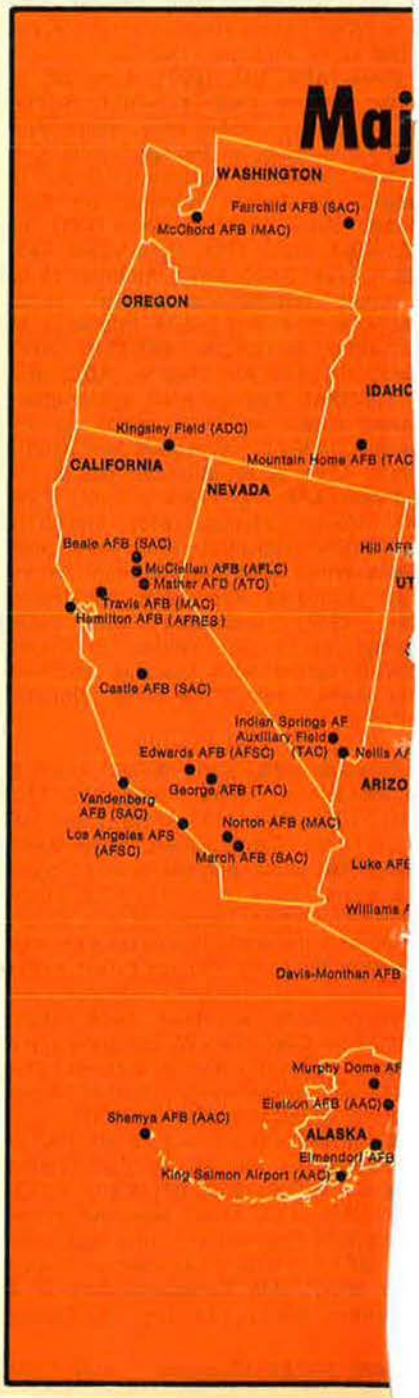
Kelly AFB, Tex. 78241; 5 mi. SW of San Antonio. Phone: (512) 925-1110. AUTOVON: 945-1110. AFLC base. Hq. San Antonio Air Logistics Center; Hq. USAF Security Service; AF Communications Security Center; AF Special Communications Center; USAF Environmental Health Laboratory; 433d Tactical Airlift Wing (AFRES); tactical fighter group (ANG). Base activated May 7, 1917; named for 2d Lt. George E. M. Kelly, first Army pilot to lose his life in a military aircraft, killed May 10, 1911. Area: 3,924 acres. Altitude: 689 ft.

Kincheloe AFB, Mich. 49788; 20 mi. S of Sault Ste. Marie. Phone: (906) 495-5611. AUTOVON: 741-1110. SAC base. 449th Bomb Wing. Base first activated 1941 as Kinross AFB; later renamed for Capt. Iven C. Kincheloe, Jr., jet ace of Korean War and later X-2 test pilot, killed July 26, 1958, in F-104 crash. Area: 3,700 acres. Altitude: 799 ft.

King Salmon Airport, Alaska (APO Seattle 98713); 340 mi. SW of Anchorage. Phone: (907) 721-3550. AAC base. Furnishes air defense and aircraft warning for Alaskan Air Command. Activated in 1950. Area: 1,700 acres. Altitude: 57 ft.

Kingsley Field, Ore. 97601; 5 mi. SE of Klamath Falls. Phone: (503) 882-4411. AUTOVON: 620-1470. ADC base. Fighter-interceptor dispersed operating base. Formerly a naval air station, base was activated by AF in April 1956; named for 2d Lt. David R. Kingsley, WW II B-17 bombardier and Medal of Honor winner, killed in action June 23, 1944. Area: 1,799 acres. Altitude: 4,081 ft.

Kirtland AFB, N. M. 87115; SE of Albuquerque. Phone: (505) 264-8211. AUTOVON: 964-8211. AFSC base. Hq. AF Special Weapons Center and Air Force Weapons Laboratory, AFSC. Furnishes nuclear and civil engineering research, development, and testing for USAF. Base houses ANG fighter group, AFSC NCO Academy, USAF Directorate of Nuclear Safety, AF Contract Management Division. Base activated Jan. 1941; named for Col. Roy S. Kirtland, air pioneer and Commandant of Langley Field in the 1930s, died in 1941. Area: 47,466 acres. Altitude: 5,352 ft.



K. I. Sawyer AFB, Mich. 49843; 16 mi. S of Marquette. Phone: (906) 346-6511. AUTOVON: 472-1110. SAC base. 410th Bomb Wing; ADC fighter-interceptor squadron. Base activated 1956; named for Kenneth I. Sawyer, who proposed site for a county airport, died in 1944. Area: 4,800 acres. Altitude: 1,220 ft.

Lackland AFB, Tex. 78236; 8 mi. WSW of San Antonio. Phone: (512) 671-1110. AUTOVON: 473-1110. ATC base. Provides basic military training for airmen, precommissioning training for officers; technical training of basic, advanced security police/law enforcement personnel; patrol dog/handler courses; training of instructors, recruiters, and career-motivation counselors; social actions/drug abuse counselors; USAF marksmanship training; also site of USAF Personnel Research Lab (AFSC); Defense Language Institute English Language School, under US Army; Wilford Hall USAF Medical Center. Known as "The Gateway to the Air Force" for its role in providing basic training and indoctrination since activation in 1941; named for Brig. Gen. Frank D. Lackland, early commandant of Kelly Field flying school, died in 1943. Area: 6,828 acres, including 4,017 acres at Lackland Training Annex. Altitude: 787 ft.

Langley AFB, Va. 23365; 3 mi. N of Hampton. Phone: (703) 764-9990. AUTOVON: 432-1110. TAC base. Hq. Tactical Air Command; 316th Tactical Airlift Wing; 5th Weather Wing; also houses ADC fighter-interceptor unit and Hq. Tactical Communications Area, AFCS. Base activated Dec. 30, 1916, is the oldest continuously active Air Force base in the US; named for aviation pioneer and scientist Samuel Pierpont Langley, who died in 1906. Area: 3,195 acres. Altitude: 10 ft.

Laughlin AFB, Tex. 78840; 7 mi. E of Del Rio. Phone: (512) 298-3511. AUTOVON: 732-1110. ATC base. 47th Flying Training Wing, undergraduate pilot training. Base activated Oct. 1942; named for 1st Lt. Jack T. Laughlin, killed in action Jan. 29, 1942. Area: 3,908 acres. Altitude: 1,080 ft.

Laurence G. Hanscom Field, Mass. 01730; 17 mi. NW of Boston. Phone: (617) 861-1001. AUTOVON: 478-1001. AFSC base. Hq. Electronic Systems Div., AFSC; also site of AF Cambridge Research Laboratories, AFSC, providing basic and applied research in electronics and geophysics. Joint federal-state use of the base began in 1946; named for Laurence G. Hanscom, pre-WW II advocate of private flying, killed in 1941 in a lightplane accident. Area: 1,668 acres. Altitude: 133 ft.

Little Rock AFB, Ark. 72076; 12 mi. NE of Little Rock. Phone: (501) 988-3131. AUTOVON: 731-1110. TAC base. 834th Air Div.; 314th Tactical Airlift Wing; 308th Strategic Missile Wing; combat crew training; SAC Titan ICBM

ctive Air Force Installations in the US

support base; SAC satellite base; ANG tactical recon group. Base activated in 1955. Area: 6,000 acres. Altitude: 310 ft.

Lockbourne AFB, Ohio 43217; 11 mi. SSE of Columbus. Phone: (614) 492-8211. AUTOVON: 950-1110. SAC base. 301st Air Refueling Wing; 121st Tactical Fighter Wing (ANG); 302d Tactical Airlift Wing (AFRES). Base activated April 1942. Area: 4,500 acres. Altitude: 744 ft. (Name will change to Rickenbacker AFB on May 18, 1974, in honor of Capt. Edward V. Rickenbacker, America's leading WW I ace and aviation pioneer who died July 23, 1973.)

Loring AFB, Me. 04750; 4 mi. NW of Limestone. Phone: (207) 999-1110. AUTOVON: 920-1110. SAC base. 42d Bomb Wing. Base activated Feb. 25, 1953; named for Maj. Charles J. Loring, Jr., WW II pilot killed Nov. 22, 1952, in North Korea; posthumously awarded the Medal of Honor. Area: more than 12,000 acres. Altitude: 746 ft.

Los Angeles AFS, Calif. 90045; 12 mi. SW of Los Angeles. Phone: (213) 643-1000. AUTOVON: 833-1110. AFSC support base. Hq. AFSC's Space and Missile Systems Organization (SAMSO); manages the development, production, test, and delivery of most of DoD's space and ballistic systems; 28 tenant units. Base activated Dec. 14, 1960.

Lowry AFB, Colo. 80230; 1 mi. SE of Denver. Phone: (303) 388-5411. AUTOVON: 926-1110. ATC base. Technical training center. Base activated Feb. 26, 1938; named for 1st Lt. Francis B. Lowry, killed in action Sept. 26, 1918. Area: 2,001 acres. Altitude: 5,400 ft.

Luke AFB, Ariz. 85309; 20 mi. WNW of Phoenix. Phone: (602) 935-7411. AUTOVON: 853-1110. TAC base. 58th Tactical Fighter Training Wing; houses SAGE region control center, NORAD, and Hq. 26th Air Division, ADC. Because of its 2,500,000-acre Gila Bend gunnery range, Luke is the largest fighter training base in the free world. Programs include training USAF pilots in F-4; West German students in F-104G; and MAP training in F-5 (at nearby Williams AFB). Base activated in 1941; named for 2d Lt. Frank Luke, Jr., America's balloon-busting ace in WW I, winner of Medal of Honor, killed in action Sept. 29, 1918. Area: 4,008 acres plus 2,500,000-acre range. Altitude: 1,101 ft.

MacDill AFB, Fla. 33608; adjacent SSW of Tampa. Phone: (813) 830-1110. AUTOVON: 968-1110. TAC base. Hq. US Readiness Command; 1st Tactical Fighter Wing conducts replacement training in F-4 Phantoms. Base activated May 24, 1940; named for Col. Leslie MacDill, killed in airplane accident Nov. 8, 1938. Area: 6,000 acres. Altitude: 6 ft.

Malmstrom AFB, Mont. 59402; 4 mi. E of Great Falls. Phone: (406) 731-9990. AUTOVON: 728-1500. SAC base. 341st Strategic Missile Wing; also Hq. 24th Air Division, ADC; SAGE region control center, NORAD. Base activated Dec. 15, 1942; named for Col. Einar A. Malmstrom, WW II fighter commander, killed in T-33 accident Aug. 21, 1954. Site of SAC's first Minuteman wing 1961. Area: 3,573 acres, plus abou 23,000 sq. mi. in missile complex. Alti tude: 3,525 ft.

March AFB, Calif. 92508; 9 mi. SE of Riverside. Phone: (714) 655-1110 AUTOVON: 947-1110. SAC base. Hq 15th AF; 22d Bomb Wing; air rescue squadron (AFRES). Base activated Mar 15, 1918; named for 2d Lt. Peyton C March, Jr., who died in US of crash injuries Feb. 18, 1918. Area: 8,84 acres. Altitude: 1,530 ft.

Mather AFB, Calif. 95655; 12 mi. ENE of Sacramento. Phone: (916) 364-1110 AUTOVON: 828-1110. ATC base. 323 Flying Training Wing; USAF's only training installation for navigators, navi gator-bombardiers, and electronic-war fare officers; also houses SAC 320t Bomb Wing. Base activated Feb. 191 named for 2d Lt. Carl S. Mather, kille in US Jan. 30, 1918, in midair collisio Area: 5,800 acres. Altitude: 96 ft.

Maxwell AFB, Ala. 36112; 1 mi. WNW of Montgomery. Phone: (205) 293-111 AUTOVON: 875-1110. AU base. Hq. A University, professional education cer ter for USAF; site of Air War College Air Command and Staff College, Squad ron Officer School, Academic Instructo and Allied Officer School, AU Institut for Professional Development; Hq. Civ Air Patrol-USAF; tactical airlift grou (AFRES). Base activated 1918; name for 2d Lt. William C. Maxwell, killed i air accident Aug. 12, 1920, Luzo Philippines. Area: 2,423 acres. Altitud 166 ft.

McChord AFB, Wash. 98438; 1 mi. of Tacoma. Phone: (206) 984-191 AUTOVON: 976-1110. MAC base. 62 Military Airlift Wing; Hq. 25th Air Div sion, ADC; fighter-interceptor squadron ADC; SAGE region control cente NORAD; AFRES military airlift grou Base activated June 7, 1940; named f Col. William C. McChord, killed in cras Aug. 18, 1937. Area: 4,500 acres. Alt tude: 550 ft.

McClellan AFB, Calif. 95652; 7 m NE of Sacramento. Phone: (916) 643 2111. AUTOVON: 633-1110. AFLC base Hq. Sacramento Air Logistics Cente management, maintenance, and supp support of such AF weapon systen as F-111, A-10, F-100, F-104, F-10 and various communications system houses military airlift group, AFRE USAF Environmental Health Laborator 552d Airborne Early Warning and Co trol Wing; 9th Weather Reconnaissanc Wing; aerospace rescue and recove squadron. Base activated July 193 named for Maj. Hezekiah McClella pioneer in Arctic aeronautical expe ments, killed in crash May 25, 19 Area: 2,583 acres. Altitude: 76 ft.

McConnell AFB, Kan. 67221; 5 m SE of Wichita. Phone: (316) 685-115 AUTOVON: 962-1000. SAC base. 38 Strategic Missile Wing; 384th Air fueling Wing; ANG F-105 squadr Base activated June 5, 1951; named Capt. Fred J. McConnell, WW bomber pilot who died in crash o private plane, Oct. 25, 1945; and his brother, 2d Lt. Thomas L. McC

GUIDE TO AIR FORCE STATIONS

In addition to the major facilities listed in this "Guide to Bases," USAF has a number of Air Force Stations (AFS) throughout the United States and overseas. These stations, for the most part, perform an air defense mission and house radar, SAGE, or AC&W units. Here is AIR FORCE Magazine's listing of those stations, with state and ZIP code.

Aiken AFS, South Carolina 29801
Almaden AFS, California 95042
Antigo AFS, Wisconsin 54409
Baudette AFS, Minnesota 56623
Bedford AFS, Virginia 24523
Benton AFS, Pennsylvania 17814
Blaine AFS, Washington 98230
Boron AFS, California 93516
Bucks Harbor AFS, Maine 04618
Calumet AFS, Michigan 49913
Cambria AFS, California 93428
Campion AFS, APO Seattle 98703
Cape Charles AFS, Virginia 23310
Cape Lisburne AFS, APO Seattle 98716
Caswell AFS, Maine 04750
Charleston AFS, Maine 04426
Dauphin Island AFS, Alabama 36528
Empire AFS, Michigan 49630
Fallon AFS, Nevada 89406
Finland AFS, Minnesota 55603
Finley AFS, North Dakota 58230
Fort Lee AFS, Virginia 23801
Fort Fisher AFS, North Carolina 28449
Fortuna AFS, North Dakota 59275
Galena AFS, APO Seattle 98723
Gentile AFS, Ohio 45401
Gila Bend AFAF, Arizona 85337
Gibbsboro AFS, New Jersey 08026
Indian Mountain AFS, APO Seattle 98748
Jacksonville AFS, Florida 32229
Kaala AFS, APO San Francisco 96786
Kalispell AFS, Montana 59922
Keno AFS, Oregon 97601
Klamath AFS, California 95548
Lake Charles AFS, Louisiana 70601
Lockport AFS, New York 14094
Makah AFS, Washington 98357
Martinsburg AFS, West Virginia 25401
Mica Peak AFS, Washington 99023
Mill Valley AFS, California 94941
Minot AFS, North Dakota 58702
Montauk AFS, New York 11954
Mt. Hebo AFS, Oregon 97122
Mt. Laguna AFS, California 92048
Newark AFS, Ohio 43055
No. Bend AFS, Oregon 97459
No. Charleston AFS, South Carolina 29404
No. Truro AFS, Massachusetts 02652
Oklahoma City AFS, Oklahoma 73150
Opheim AFS, Montana 59250
Osceola AFS, Wisconsin 54020
Othello AFS, Washington 99344
Point Arena AFS, California 95468
Port Austin AFS, Michigan 48467
Punamano AFS, APO San Francisco 96731
Richmond AFS, Florida 33157
Roanoke Rapids AFS, North Carolina 27870
San Antonio AFS, Texas 78208
Saratoga AFS, New York 12866
San Pedro Hill AFS, California 90000
Sault Sainte Marie AFS, Michigan 49783
Savannah AFS, Georgia 31402
Sparrevohn AFS, APO Seattle 98746
St. Albans AFS, Vermont 05478
Sunnyvale AFS, California 94088
Tatalina AFS, APO Seattle 98747
Tin City AFS, APO Seattle 98715
Watertown AFS, New York 13601

nell, also a WW II bomber pilot, killed July 10, 1943, during attack on Bougainville. Area: 34,500 acres. Altitude: 1,371 ft.

McCoy AFB, Fla. 32812; 8 mi. SSE of Orlando. Phone: (305) 855-3210. AUTOVON: 341-1110. SAC base. 306th Bomb Wing. Base activated Apr. 1943; named for Col. Michael N. W. McCoy, project officer for *Lucky Lady I,* first nonstop round-the-world flight, killed in USS Oct. 9, 1957, when his B-47 jet exploded. Area: 4,214 acres. Altitude: 127 ft. (Base to close July 1974.)

McGuire AFB, N. J. 08641; 18 mi. SE of Trenton. Phone: (609) 724-2100. AUTOVON: 440-0111. MAC base. Hq. 21st AF; 438th Military Airlift Wing; C-141 associate AFRES squadrons; 514th Military Airlift Wing (AFRES); 108th Tactical Fighter Wing (ANG); Hq. N. J. ANG. Base adjoins Army's Ft. Dix; activated as AFB in 1949; named for Maj. Thomas B. McGuire, Jr., second leading US ace of WW II, holder of Medal of Honor, killed in action Jan. 7, 1945. Area: 5,000 acres. Altitude: 133 ft.

Minot AFB, N. D. 58701; 13 mi. N of Minot. Phone: (701) 727-4761. AUTOVON: 783-1110. SAC base. 91st Strategic Missile Wing; 5th Bomb Wing; also houses fighter-interceptor unit, ADC. Base activated Aug. 1959. Area: 5,151 acres plus additional 19,058 for missile sites. Altitude: 1,668 ft.

Moody AFB, Ga. 31601; 10 mi. NNE of Valdosta. Phone: (912) 333-4211. AUTOVON: 460-1110. ATC base. 38th Flying Training Wing, undergraduate pilot training. Base activated June 1941; named for Maj. George P. Moody, killed May 5, 1941, while testing Beech AT-10. Area: 5,000 acres. Altitude: 233 ft.

Mountain Home AFB, Idaho 83648; 10 mi. SW of Mountain Home. Phone: (208) 828-2111. AUTOVON: 857-1110. TAC base. 366th Tactical Fighter Wing (F-111s). Base activated April 1942. Area: 6,639 acres. Altitude: 3,000 ft.

Murphy Dome AFS, Alaska (APO Seattle 98750); 20 mi. NW of Fairbanks. Phone: (907) 744-1202. AAC base. Air defense activities. Base activated Dec. 1950; named for veteran hard-rock miner John Murphy, who lived and worked in the area before the site was built. Area: 60 acres around immediate site but includes a total of 1,360 acres. Altitude: 2,990 ft.

Myrtle Beach AFB, S. C. 29577; 1 mi. W of Myrtle Beach. Phone: (803) 448-1311. AUTOVON: 748-1110. TAC base. 354th Tactical Fighter Wing. Site of first operational A-7Ds. Base activated Mar. 1941. Area: 3,800 acres. Altitude: 25 ft.

Nellis AFB, Nev. 89110; 8 mi. NE of Las Vegas. Phone: (702) 643-1800. AUTOVON: 682-1800. TAC base. 57th Fighter Weapons Wing; 474th Tactical Fighter Wing; tactical fighter training, including F-111 combat crew training; site of USAF Tactical Fighter Weapons Center for test and evaluation of air tactics and AF equipment; home of the USAF Thunderbirds aerial demonstration team. Base activated July 1941; named for 1st Lt. William H. Nellis, WW II fighter pilot, killed Dec. 27, 1944, in Europe. Area: 3,000,000 acres (see Indian Springs). Altitude: 1,868 ft.

Niagara Falls International Airport, N. Y. 14301; 6 mi. E of Niagara Falls. Phone: (716) 297-4100. AUTOVON: 822-1470. AFRES base. ANG fighter group, and AFRES tactical airlift group. Base activated Jan. 1952. Area: 979 acres. Altitude: 590 ft.

Norton AFB, Calif. 92409; 59 mi. E of Los Angeles, within corporate limits of city of San Bernardino. Phone: (714) 382-1110. AUTOVON: 876-1110. MAC base. 63d Military Airlift Wing; Hq. Air Force Inspection and Safety Center; Hq. Air Force Audit Agency; also houses C-141 AFRES associate unit; Aerospace Audio-Visual Service, MAC. Base activated Mar. 2, 1942; named for Capt. Leland F. Norton, WW II attack-bomber pilot, killed May 27, 1944, in Europe. Area: 1,981 acres. Altitude: 1,156 ft.

Offutt AFB, Neb. 68113; 8 mi. S of Omaha. Phone: (402) 291-2100. AUTOVON: 271-1110. SAC base. Hq. Strategic Air Command; 55th Strategic Reconnaissance Wing; 544th Aerospace Reconnaissance Technical Wing; AF Global Weather Center; 3d Weather Wing. Base activated 1888 as the Army's Ft. Crook; landing field named in 1924 for 1st Lt. Jarvis J. Offutt, WW I pilot who died Aug. 13, 1918, from wounds; entire installation renamed Offutt AFB in 1946. Area: 1,907 acres. Altitude: 1,049 ft.

Otis ANG Base, Mass. 02542; on Cape Cod; 7 mi. NNE of Falmouth. Phone: (617) 968-1000. AUTOVON: 881-3330. ANG base. Hq. Mass. ANG; 102d Fighter-Interceptor Wing (ANG). Base activated in 1938 as Army's Camp Edwards; reassigned to USAF in 1948; renamed in 1949 for 1st Lt. Frank J. Otis, member of Massachusetts ANG, killed Jan. 11, 1937, in crash. Area: 22,000 acres. Altitude: 132 ft. (Base to close June 1974.)

Patrick AFB, Fla. 32925; 2 mi. S of Cocoa Beach. Phone: (305) 494-1110. AUTOVON: 854-1110. AFSC base. Operates the AF Eastern Test Range in support of DoD, NASA, and other agency missile and space programs. Activated in 1940, base is airhead for Cape Kennedy AFS. Named for Maj. Gen. Mason M. Patrick, Chief of AEF's Air Service in WW I and Chief of the Air Service, 1921–27. Area: 2,332 acres. Altitude: 9 ft.

Pease AFB, N. H. 03801; 3 mi. W of Portsmouth. Phone: (603) 436-0100. AUTOVON: 852-1110. SAC base. 45th Air Division; 509th Bomb Wing; also houses air rescue and recovery unit, MAC; tactical airlift group, ANG. Base activated 1956; named for Capt. Harl Pease, Jr., WW II B-17 pilot and Medal of Honor winner, killed Aug. 7, 1942, during attack on Rabaul, New Britain Island. Area: 4,373 acres. Altitude: 101 ft.

Peterson Field, Colo. 80914; 6 mi. E of Colorado Springs. Phone: (303) 591-7321. ADC base. Supports NORAD, Hq. ADC, and Air Force Academy administrative flying activities; activated 1942; named for 1st Lt. Edward J. Peterson, killed in aircraft accident, 1942. Area: 995 acres. Altitude: 6,172 ft.

Plattsburgh AFB, N. Y. 12903; 2 mi. SW of Plattsburgh. Phone: (518) 563-4500. AUTOVON: 689-1450. SAC base. 380th Bomb Wing; medium bomber and tanker operations; FB-111 combat crew training. Established as military installation in 1814; activated as an Air Force base in 1955. Area: 3,100 acres. Altitude: 235 ft.

Pope AFB, N. C. 28308; 11 mi. NNW of Fayetteville. Phone: (919) 394-0001. AUTOVON: 486-1110. TAC base. 839th Air Division; 317th Tactical Airlift Wing; 1st Aeromedical Evacuation Group. Base adjoins Army's Ft. Bragg and provides tactical airlift support for airborne forces and other personnel, equipment, and supplies. Activated Sept. 1918; named for 1st Lt. Harley H. Pope, WW I flyer, killed Jan. 7, 1919, in a local crash. Area: 2,000 acres. Altitude: 218 ft.

Randolph AFB, Tex. 78148; 13 mi. ENE of San Antonio. Phone: (512) 652-1110. AUTOVON: 487-1110. ATC base. Hq. Air Training Command; 12th Flying Training Wing; Instrument Flight Center; T-37 and T-38 pilot instructor training; site of Air Force Military Personnel Center; Hq. USAF Recruiting Service; and Community College of the Air Force. Base activated Oct. 1931; named for Capt. William M. Randolph, killed Feb. 17, 1928, in a crash. Area: 2,618 acres. Altitude: 761 ft.

Reese AFB, Tex. 79401; 6 mi. W of Lubbock. Phone: (806) 885-4511. AUTOVON: 838-1110. ATC base. 64th Flying Training Wing, undergraduate pilot training. Base activated in 1942; named for 1st Lt. Augustus F. Reese, Jr., fighter pilot killed in Sardinia May 14, 1943. Area: 3,597 acres. Altitude of the base: 3,338 ft.

Richards-Gebaur AFB, Mo. 64030; 17 mi. S of Kansas City. Phone: (816) 348-2000. AUTOVON: 960-1110. AFCS base. Hq. Air Force Communications Service; 442d AFRES Tactical Airlift Wing; aerospace rescue and recovery squadron; AFCS NCO Academy. Base activated Mar. 1944; named for 1st Lt. John F. Richards and Lt. Col. Arthur W. Gebaur, Jr. Richards was killed Sept. 29, 1918, while on artillery-spotting mission. Gebaur was killed Aug. 29, 1952, over North Korea. Area: 2,418 acres. Altitude: 1,090 ft.

Rickenbacker AFB, Ohio 43217 (see Lockbourne AFB).

Robins AFB, Ga. 31098; at Warner Robins, 18 mi. SSE of Macon. Phone: (912) 926-1110. AUTOVON: 468-1001. AFLC base. Hq. Warner Robins Air Logistics Center; Hq. AFRES; site of 19th Bomb Wing; mobile communications group, AFCS. Base activated Sept. 1941; named for Brig. Gen. Augustine Warner Robins, an early Chief of the Materiel Division of the Air Corps, died June 16, 1940. Area: 6,783 acres. Altitude: 295 ft.

Scott AFB, Ill. 62225; 6 mi. ENE of

Belleville. Phone: (618) 256-1110. AUTOVON: 638-1110. MAC base. Hq. Military Airlift Command; hq. of two of MAC's services—Aerospace Rescue and Recovery Service and Air Weather Service; 375th Aeromedical Airlift Wing; AFRES associate aeromedical airlift group. Base activated June 14, 1917; named for Cpl. Frank S. Scott, first enlisted man to die in an air accident, killed Sept. 28, 1912. Area: 2,310 acres. Altitude: 453 ft.

Selfridge ANG Base, Mich. 48045; 3 mi. NE of Mount Clemens. Phone: (313) 465-1241. AUTOVON: 892-1790. ANG base. 127th Tactical Fighter Wing (ANG); fighter-interceptor group (ANG); 403d Tactical Airlift Wing (AFRES); also houses Navy Reserve training and US Coast Guard Air Station for Detroit. Base activated July 1917; named for 1st Lt. Thomas E. Selfridge, first Army officer to fly in an airplane and first fatality of powered flight; killed Sept. 17, 1908, at Ft. Myer, Va., when plane piloted by Orville Wright crashed. Area: 3,660 acres. Altitude: 583 ft.

Seymour Johnson AFB, N. C. 27530; 2 mi. SSE of Goldsboro. Phone: (919) 736-0000. AUTOVON: 583-1110. TAC base. 4th Tactical Fighter Wing; 68th Bomb Wing. Base first activated June 12, 1942; named for Navy Lt. Seymour A. Johnson, killed in 1942. Area: 4,124 acres. Altitude: 109 ft.

Shaw AFB, S. C. 29152; 7 mi. WNW of Sumter. Phone: (803) 668-8110. AUTOVON: 965-1110. TAC base. Hq. 9th AF, TAC; RF-4C recon crew training; 363d Tac Recon Wing. Base activated Aug. 30, 1941; named for 2d Lt. Ervin D. Shaw, one of first Americans to see air action in WW I; killed in action July 9, 1918. Area: 3,022 acres and supports another 10,339 acres. Altitude: 252 ft.

Shemya AFB, Alaska (APO Seattle 98736); located at western tip of the Aleutian chain, midway between Anchorage, Alaska, and Tokyo, Japan. Phone: 572-3400. AAC base. Activated in 1943, Shemya was used as a bomber base in WW II. The International Date Line has been "bent" around Shemya so that local date is the same as elsewhere in the US. Area: about 4½ mi. long by 2½ mi. wide. Altitude: 270 ft.

Sheppard AFB, Tex. 76311; 4 mi. N of Wichita Falls. Phone: (817) 851-2511. AUTOVON: 736-1001. ATC base. Sheppard Technical Training Center; 80th Flying Training Wing; furnishes undergraduate pilot training for the German Air Force and for foreign students under MAP. Base activated June 14, 1941; named for Morris E. Sheppard, US Senator from Texas, died in 1941. Area: 5,082 acres. Altitude: 1,015 ft.

Tinker AFB, Okla. 73145; 8 mi. SE of Oklahoma City. Phone: (405) 732-7321. AUTOVON: 735-1110. AFLC base. Hq. Oklahoma City Air Logistics Center; furnishes logistic support for bombers, jet engines, instruments, and electronics; hq., AFCS's Southern Communications Area; mobile communications group, AFCS; and AFRES tactical fighter group. Base activated May 1941; named for Maj. Gen. Clarence L. Tinker. On June 7, 1942, at the end of the Battle of Midway, General Tinker's LB-30 (an early model B-24) apparently went down at sea after attacking enemy ships retreating toward Wake Island. Area: 4,100 acres. Altitude: 1,291 ft.

Travis AFB, Calif. 94535; at Fairfield, 50 mi. NE of San Francisco. Phone: (707) 438-4011. AUTOVON: 837-1110. MAC base. Hq. 22d AF; 60th Military Airlift Wing; 349th Military Airlift Wing (AFRES); also houses SAC tanker operations; David Grant Medical Center. Base activated May 25, 1943; named for Brig. Gen. Robert F. Travis, killed Aug. 5, 1950, in a B-29 accident. Area: 6,000 acres. Altitude: 62 ft.

Truax Field, Wis. 53707; 2 mi. E of Madison. Phone: (608) 249-0461. AUTOVON: 884-1590. ANG base. ANG air defense wing; named for 1st Lt. Thomas L. Truax, killed in a crash on Nov. 2, 1941. Altitude: 859 ft.

Tyndall AFB, Fla. 32401; 7 mi. SE of Panama City. Phone: (904) 283-1113. AUTOVON: 970-1110. ADC base. Air Defense Weapons Center; conducts combat crew training for F-106 pilots; AF Civil Engineering Center. Base activated Dec. 7, 1941; named for 1st Lt. Frank B. Tyndall, WW I fighter pilot, killed in crash July 15, 1930. Area: 28,000 acres. Altitude: 18 ft.

Vance AFB, Okla. 73701; 3 mi. SSW of Enid. Phone: (405) 237-2121. AUTOVON: 962-7110. ATC base. 71st Flying Training Wing, undergraduate pilot training. Base activated Nov. 1941; named for Lt. Col. Leon R. Vance, Jr., Medal of Honor winner, killed July 26, 1944, when air-evac plane returning him to the United States went down in the Atlantic near Iceland. Area: 1,603 acres. Altitude: 1,307 ft.

Vandenberg AFB, Calif. 93437; 8 mi. NNW of Lompoc. Phone: (805) 866-1611. AUTOVON: 276-1110. SAC base. Site of 1st Strategic Aerospace Division, SAC; provides launch facilities and support for operational ICBM tests and unmanned polar-orbiting space operations of USAF, NASA contractors, et al.; Space and Missile Test Center, AFSC; 6595th Aerospace Test Wing. Originally Army's Camp Cooke; activated Oct. 1941, base was taken over by USAF June 7, 1957; renamed for Gen. Hoyt S. Vandenberg, USAF's second Chief of Staff, died Apr. 2, 1954. It is the only AFB from which are launched operational ballistic missiles in the SAC deterrent force and polar-orbiting satellites in US space program. More than 1,200 launches have taken place from Vandenberg since Dec. 1958. Area: 98,400 acres. Altitude: 400 ft.

Warren AFB, Wyo. (see Francis E. Warren AFB).

Webb AFB, Tex. 79720; 4 mi. SW of Big Spring. Phone: (915) 267-2511. AUTOVON: 866-0111. ATC base. 78th Flying Training Wing, undergraduate pilot training. Base activated Sept. 25, 1942; named for 1st Lt. James L. Webb, WW II fighter pilot, killed in a crash in Japan, June 16, 1949. Area: 2,311 acres. Altitude: 2,561 ft.

Westover AFB, Mass. 01022; 5 mi NE of Chicopee Falls. Phone: (413) 557-1110. AUTOVON: 589-1110. AFRES base. 439th Tactical Airlift Wing. Base activated Oct. 1939; named for Maj Gen. Oscar Westover, Chief of the Air Corps, killed Sept. 21, 1938, in aircraft accident. Area: 2,500 acres. Altitude: 244 ft.

Wheeler AFB, Hawaii (APO San Francisco 96515); located near center of the island of Oahu. Phone: (808) 422-0531. PACAF base. Furnishes administrative and logistic support to the Hawaiian Air Defense Division (326th Air Division); Joint Coordination Center, Far East; tactical air support squadron. Also supports US Army flying activities from adjacent Schofield Barracks. Hq. of Pacific Communications Area, AFCS. Base activated Feb. 1922; named for Maj Sheldon H. Wheeler, killed July 13, 1921, during aerial exhibition. Area: 1,423 acres. Altitude: 845 ft.

Whiteman AFB, Mo. 65301; 1.5 mi. S of Knob Noster. Phone: (816) 563-5511. AUTOVON: 975-1110. SAC base. 351st Strategic Missile Wing. Base activated 1942: named for 2d Lt. George A. Whiteman, shot down while taking off in fighter plane from Wheeler Field, Hawaii, on Dec. 7, 1941, the first Air casualty of WW II. Area: 3,384 acres plus area encompassed by missile complex of about 15,660 sq. mi. Altitude: 869 ft.

Williams AFB, Ariz. 85224; 16 mi. SE of Mesa; 10 mi. E of Chandler. Phone: (602) 988-2611. AUTOVON: 474-1011. ATC base. 82d Flying Training Wing, largest undergraduate pilot training base; also provides F-5 combat crew training for foreign students. Base activated July 1941; named for 1st Lt. Charles L. Williams, killed in crash July 6, 1927, during aerial demonstration. Area: 3,867 acres. Altitude: 1,385 ft.

Wright-Patterson AFB, Ohio 45433 Fairborn, 10 mi. ENE of Dayton. Phone: (513) 257-1110. AUTOVON: 782-1110. AFLC base. Hq. Air Force Logistics Command; Hq. Aeronautical System Division, AFSC; Foreign Technology Division, AFSC; AF Institute of Technology; USAF Medical Center, Wright-Patterson; AF Contract Maintenance Center, AFLC; Air Force Museum; 17th Bomb Wing; plus more than 150 other DoD activities and government agencies. Originally separate, Wright Field and Patterson Field were finally merged and redesignated Wright-Patterson AFB on Jan. 13, 1948; named for aviation pioneers Orville and Wilbur Wright and for 1st Lt. Frank S. Patterson, killed June 19, 1918, in the crash of a DH-4. The Wright brothers did much of their early flying on Huffman Prairie, now Areas A and C of present base. Area: 8,214 acres. Altitude: 824 ft.

Wurtsmith AFB, Mich. 48753; 3 mi NW of Oscoda. Phone: (517) 739-2011. AUTOVON: 623-1110. SAC base. 40th Air Division; 379th Bomb Wing. Base activated in 1926; assigned to SAC Apr. 1, 1960; named for Maj. Gen. Paul Wurtsmith, killed Sept. 13, 1946, in crash. Area: 5,200 acres. Altitude: 634 ft.

USAF'S MAJOR BASES OVERSEAS

Albrook AFB, Canal Zone
APO New York 09825
Hq. USAF Southern Command

Andersen AFB, Guam
APO San Francisco 96334
Hq. 8th Air Force, SAC

Ankara AS, Turkey
APO New York 09254
TUSLOG detachment, USAFE

Athenai Airport, Greece
APO New York 09223
Support base, USAFE

Aviano AB, Italy
APO New York 09293
Tactical group, USAFE

Bitburg AB, West Germany
APO New York 09132
Tactical fighter base, USAFE

Camp New Amsterdam, The Netherlands
APO New York 09292
Fighter-interceptor base, USAFE

Ching Chuan Kang AB, Taiwan
APO San Francisco 96319
Tactical fighter base, PACAF

Clark AB, Philippines
APO San Francisco 96274
Hq. 13th Air Force, PACAF

Erding AS, West Germany
APO New York 09060
Fighter-interceptor base, USAFE

Frankfurt, West Germany
APO New York 09101
Support base, USAFSS

Fuchu AS, Japan
APO San Francisco 96525
Hq. 5th Air Force, PACAF

Goose AB, Labrador, Canada
APO New York 09677
Strategic bomber base, SAC

Hahn AB, West Germany
APO New York 09109
Tactical fighter base, USAFE

High Wycombe AS, United Kingdom
APO New York 09241
Support base, USAFE

Howard AFB, Canal Zone
APO New York 09817
Support base, USAF Southern Command

Incirlik AB, Turkey
APO New York 09289
Tactical fighter base, USAFE

Iraklion AS, Crete
APO New York 09291
Support base, USAFSS

Izmir, Turkey
APO New York 09224
Support base, USAFE

Kadena AB, Okinawa
APO San Francisco 96239
Air division base, PACAF
Strategic operations, SAC

Keflavik Airport, Iceland
FPO (US Navy), New York 09571
Fighter-interceptor base, ADC

Korat AB, Thailand
APO San Francisco 96288
Tactical fighter base, PACAF

Kunsan AB, South Korea
APO San Francisco 96264
Tactical fighter base, PACAF

Kwangju AB, South Korea
APO San Francisco 96324
Combat support base, PACAF

Lajes Field, Azores
APO New York 09406
Airlift base, MAC

Lindsey AS, West Germany
APO New York 09633
Hq. European Communications Area, AFCS
Support base, USAFE

Misawa AB, Japan
APO San Francisco 96519
Support base, USAFSS

Moron AB, Spain
APO New York 09282
Support base, USAFE

Nakhon Phanom RTAB, Thailand
APO San Francisco 96310
US Support Activities Group, PACAF
Special operations base, PACAF

Osan AB, South Korea
APO San Francisco 96570
Air division base, PACAF
Tactical fighter base, PACAF

RAF Alconbury, United Kingdom
APO New York 09238
Tactical reconnaissance base, USAFE

RAF Bentwaters, United Kingdom
APO New York 09755
Tactical fighter base, USAFE

RAF Chicksands, United Kingdom
APO New York 09193
Support base, USAFSS

RAF Lakenheath, United Kingdom
APO New York 09179
Tactical fighter base, USAFE

RAF Mildenhall, United Kingdom
APO New York 09127
Hq. 3d Air Force, USAFE
Tactical airlift base, USAFE

RAF Sculthorpe, United Kingdom
APO New York 09048
Support base, USAFE

RAF Upper Heyford, United Kingdom
APO New York 09194
Tactical fighter base, USAFE

RAF West Ruislip, United Kingdom
APO New York 09218
Support base, USAFE

RAF Wethersfield, United Kingdom
APO New York 09120
Support base, USAFE

RAF Woodbridge, United Kingdom
APO New York 09405
Tactical fighter base, USAFE

Ramey AFB, Puerto Rico
APO New York 09845
Support base, MAC

Ramstein AB, West Germany
APO New York 09012
Hq. USAFE
Tactical fighter base, USAFE

Rhein-Main AB, West Germany
APO New York 09057
Tactical airlift base, USAFE

San Vito dei Normanni AS, Italy
APO New York 09240
Support base, USAFSS

Sembach AB, West Germany
APO New York 09130
Hq. 17th Air Force, USAFE
Support base, USAFE

Shu-Lin-Kou AS, Taiwan
APO San Francisco 96360
Support base, USAFSS

Sondrestrom AB, Greenland
APO New York 09121
Support base, ADC

Spangdahlem AB, West Germany
APO New York 09123
Tactical fighter base, USAFE

Tachikawa AB, Japan
APO San Francisco 96323
Support base, PACAF

Taegu AB, South Korea
APO San Francisco 96213
Combat support base, PACAF

Tainan AS, Taiwan
APO San Francisco 96340
Support base, PACAF

Taipei AS, Taiwan
APO San Francisco 96280
Air division base, PACAF

Takhli AB, Thailand
APO San Francisco 96273
Tactical fighter base, PACAF

Tempelhof Airport, Berlin, Germany
APO New York 09611
Support base, USAFE

Thule AB, Greenland
APO New York 09023
Aerospace defense base, ADC

Torrejon AB, Spain
APO New York 09283
Hq. 16th Air Force, USAFE
Tactical fighter base, USAFE

Ubon Airfield, Thailand
APO San Francisco 96304
Tactical fighter base, PACAF

Udorn Airfield, Thailand
APO San Francisco 96237
Tactical fighter/reconnaissance base, PACAF

U-Tapao Airfield, Thailand
APO San Francisco 96330
Strategic bomber base, SAC
Combat support base, PACAF

Wiesbaden AB, West Germany
APO New York 09332
Support base, USAFE
Weather base, MAC

Yokota AB, Japan
APO San Francisco 96328
Support base, PACAF

Zaragoza AB, Spain
APO New York 09286
Tactical fighter training base, USAFE

Zweibrucken AB, West Germany
APO New York 09860
Tactical fighter/reconnaissance base, USAFE

The Air Force maintains an extensive system of research and development, and test and evaluation facilities. Here, arranged functionally and supplemented by a list of Air Force contacts on major weapon systems, AIR FORCE Magazine presents . . .

A GUIDE TO USAF's R&D FACILITIES

The Air Force is the product of a technological breakthrough—the airplane. From its inception, USAF has been the nation's principal user as well as provider of aerospace technology. The Air Force's dependence on technology increases steadily and with it the importance of USAF's role as a catalyst of scientific and technological advance. The Air Force Systems Command (AFSC) and its many diverse components formulate and manage USAF's scientific and technological activities and programs. On the following pages, AIR FORCE Magazine presents a guide, complete with thumbnail sketches of all key installations, to the AFSC divisions, centers, and laboratories.

Principal R&D Facilities

From AFSC headquarters at Andrews AFB, Md., Gen. Samuel C. Phillips, AFSC Commander, directs the operations of the Command's divisions, development and test centers, ranges, and laboratories. AFSC manages and controls approximately 200 installations, valued at more than $2 billion. Following is a descriptive listing of these organizations and facilities, accompanied by a map showing the location of these installations.

Special AFSC Divisions

Foreign Technology Division (FTD), Wright-Patterson AFB, Ohio—To prevent possible technological surprise by a potential enemy, the FTD acquires, evaluates, analyzes, and disseminates foreign aerospace technology, in concert with other divisions and centers. Information collected from a wide variety of sources undergoes screening and is processed in unique electronic data handling and laboratory processing equipment. Then, it is analyzed by scientific and technical specialists who prepare reports, studies, and technical findings and assessments of potential hostile, technological, or operational environs with which USAF weapon systems must cope.

Aerospace Medical Division (AMD), Brooks AFB, Tex.—Conducts biomedical and biotechnical research, development, and test programs necessary to explore the capabilities and limitations of man in aerospace operations and enhance his ability to function as an integral part of the Air Force systems and operations. The Division provides clinical medical services and specialized advanced training and education in aerospace medical and paramedical specialties. AMD units include:

- **Wilford Hall USAF Medical Center,** Lackland AFB, Tex.—AMD's primary clinical facility has 1,100 beds and is the largest single-structure hospital in the Department of Defense. Postgraduate training in the form of internships, residencies, and fellowships is provided for medical, dental, administrative, and allied medical specialists.

- **6570th Aerospace Medical Research Laboratory,** Wright-Patterson AFB, Ohio—Specializes in theoretical and experimental medical research and development in the areas of biodynamics, human engineering, combined aerospace stress effects, and toxic hazards.

- **USAF School of Aerospace Medicine,** Brooks AFB, Tex.—Is concerne with research directed at the selectio care, and retention of pilots and oth aircrew members, and specialized A Force personnel. The School specialize in research into the effects of electr magnetic and ionizing radiation, atmos phere composition, and control and de velopment of medical equipment neede specifically for aerospace operations.

Product Organizations

Space and Missile Systems Organi zation (SAMSO), Los Angeles AF Calif.—Manages DoD space and balli tic missile systems. Its responsibility f space systems development encom passes engineering, test, program mar agement, installation, on-orbit trackin command and control, and evaluatio SAMSO manages development of spac boosters and related aerospace groun equipment for the launch and trackin of a wide variety of DoD and NAS payloads.

- **The Air Force Satellite Contr Facility (AFSCF),** headquartered at Lo Angeles AFS, conducts on-orbit rea time tests of more than thirty DoD satel lites a day.

- **The Space and Missile Test Cente (SAMTEC),** headquartered at Vande berg AFB, Calif., provides field-test ma agement for all DoD-directed ballist and space programs. SAMTEC manag satellite launches from Vandenberg a Patrick AFB, Fla., as well as a var of ICBM ballistic tests. The Test Ce also operates the Western Test Ra SAMTEC launches are conducted

he Center's 6595th Aerospace Test Wing, composed of the 6595th Space Test Group and the 6595th Missile Test Group at Vandenberg AFB and the 6555th Aerospace Test Group at Patrick AFB.

Aeronautical Systems Division (ASD), Wright-Patterson AFB, Ohio—Is responible for the development and acquisiion of aeronautical systems as well as or tactical warfare and reconnaissance ystems, subsystems, and related equipent.

Typical of the wide range of systems resently under ASD management are he F-15 air-superiority fighter; the B-1 dvanced strategic bomber; the Interational Fighter, or F-5E; the SRAM, a upersonic air-to-ground missile; and e Maverick, a television-guided, air-ground weapon.

Not only does ASD acquire new and dvanced systems for the future, but it odernizes aircraft and nonballistic misles of the force-in-being. In recent ears, ASD has been deeply involved a tactical warfare modernization proam. Old aircraft have been modified nd new ones developed for this purose. Noteworthy are the AC-47 and C-130 gunships and the A-7D attack ircraft. A new A-10 close-support airraft is now under development.

Electronic Systems Division (ESD), G. Hanscom Field, Mass.—Responsie for developing, acquiring, and deering electronic systems and equipent for the command, control, and mmunications functions of aerospace rces.

These systems take many forms, such undersea communications cables round the Indochina peninsula, line-ofght and tropospheric scatter communications throughout the Mediterranean, e underground North American Air efense Command (NORAD) combat perations center, long-range radars to arn of missile and aircraft attack, the r defense control net for the North merican continent, equipment for imoved weather forecasting, the free rld's satellite detection and tracking twork, and a new airborne radar-and-mmunications post, which can give e Air Force an instant air defense and ctical control system anywhere in the rld at jet speed.

ESD is heavily involved in the applition of computers to command and ntrol problems and is the Air Force's nter for evaluating contract proposals computer manufacturers.

evelopment Centers and Labs

Director of Science & Technology, drews AFB, Md.—Located at the Sys's Command headquarters, the Direcof Science & Technology manages command's research and developnt laboratories' programs and develnents. Laboratories under the Direcof Science & Technology supervision their respective functional areas

• **Air Force Weapons Laboratory (AFWL),** Kirtland AFB, N. M.—Conducts research and development programs in weapon effects and safety, fuzing, civil engineering, laser technology, and nuclear survivability/vulnerability.

• **Rome Air Development Center (RADC),** Griffiss AFB, N. Y.—Conducts research in electromagnetic energy conversion, signal detection and processing, computation and display, command and control, and test and evaluation. RADC furnishes research and development and engineering support of intelligence devices, ground communications hardware, ground environment equipment for surveillance, aircraft approach and landing, ground-based navigation aids, and electronic warfare.

• **Air Force Rocket Propulsion Laboratory (AFRPL),** Edwards AFB, Calif.—AFRPL is responsible for conducting exploratory and advanced development programs in the areas of liquid rockets, solid rockets, hybrid rockets, advanced rocket propellants, and the development of ground support equipment. AFRPL carries out numerous system support programs for other units and divisions of AFSC, other branches of the armed services, and NASA.

• **Air Force Armament Laboratory (AFATL),** Eglin AFB, Fla.—AFATL is the principal Air Force laboratory performing research and development of free-fall and guided nonnuclear munitions and airborne targets and scorers. AFATL conducts exploratory and advanced developments of aircraft armaments and performs engineering developments to provide munitions products to operational forces. The wide span of interest includes chemical and fuel-air explosives, energy sources and conversions, electronic and mechanical devices, aerodynamics, terradynamics, etc., as well as the product lines such as bombs, dispensers, fuzes, flares, guns, and ammunition.

• **Air Force Human Resources Laboratory (AFHRL),** Brooks AFB, Tex.—AFHRL has operating locations at Lackland AFB, Tex.; Williams AFB, Ariz.; Lowry AFB, Colo.; Wright-Patterson AFB, Ohio; Maxwell AFB, Ala.; the Air Force Academy; and in Alexandria, Va. AFHRL is the principal Air Force organization planning and executing development programs in the fields of manpower, personnel, training, and education. AFHRL provides technical and management assistance to Hq. USAF, USAF major commands, other US military services, other US governmental agencies, and to military services of allied countries.

• **Air Force Cambridge Research Laboratories (AFCRL),** L. G. Hanscom Field, Mass.—AFCRL is the center for basic and exploratory research in the environmental and physical sciences. In electronics, programs are devoted to data processing and solid-state and microwave physics. Its geophysics programs include optical and radio solar astronomy, meteorology, physics and chemistry of the upper atmosphere, geodesy, and geology.

• **The Frank J. Seiler Research Laboratory (FJSRL),** USAF Academy, Colo.—This in-house laboratory is engaged in basic research concerned with the physical and engineering sciences. The research usually centers around chemistry, applied mathematics, and gas dynamics. FJSRL sponsors related research conducted by the faculty and cadets of the USAF Academy.

• **Air Force Office of Scientific Research (AFOSR),** Arlington, Va.—This unit serves as the liaison with universities and private research organizations. Liaison and research contacts with the scientific community, primarily educational institutions and individual scientists, cover most of the free world.

• **European Office of Aerospace Research (EOAR),** London, England—This unit is the link between the Air Force and the scientific communities in Europe, Africa, and the Near East.

Five laboratories are at Wright-Patterson AFB, Ohio:

• **Air Force Aero Propulsion Laboratory (AFAPL)** works in the areas of air-breathing, electric and advanced propulsion, fuels and lubricants, and flight vehicle power.

• **Air Force Materials Laboratory (AFML)** handles research in material sciences, metals and ceramics, nonmetallic materials, manufacturing technology, and materials application.

• **Aerospace Research Laboratories (ARL)** conducts primarily in-house research programs in the physical and engineering sciences together with a wide scope of consulting and applications activities related to these programs. Among the program areas are those of mathematics, aerodynamics, general plasma and solid-state physics, chemistry, energy conversion, and metallurgy and ceramics.

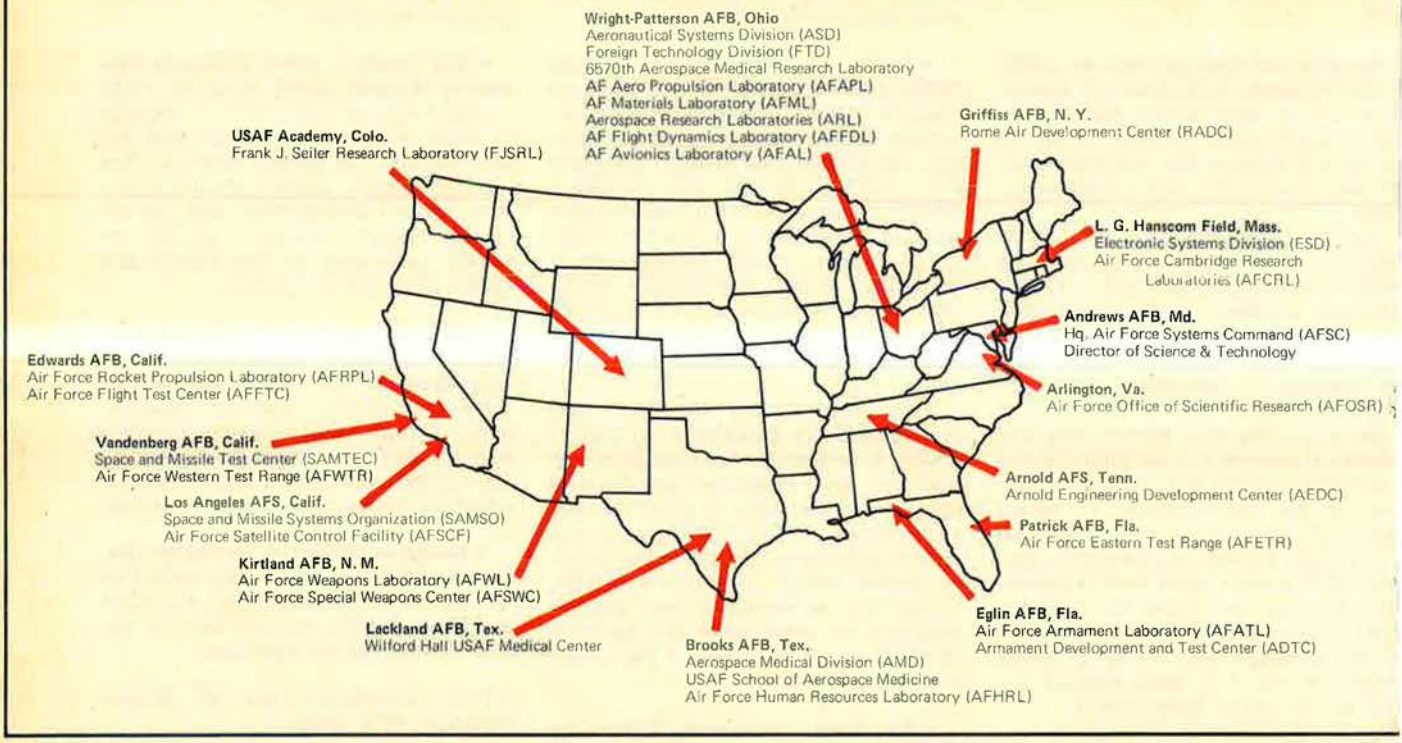
• **Air Force Flight Dynamics Laboratory (AFFDL)** is concerned with flight vehicle dynamics, performance, control, launching, alighting, and structures; crew station environmental control and escape; and aerodynamic decelerators.

• **Air Force Avionics Laboratory (AFAL)** conducts research and technology programs for electronic components, optics and photo materials, navigation and guidance, vehicle defense, electronic warfare, and communications.

Test and Evaluation Centers

Air Force Flight Test Center (AFFTC), Edwards AFB, Calif.—Responsible for

KEY INSTALLATIONS IN USAF SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES



This map shows the location of Air Force Systems Command's principal scientific and technical operations, including all laboratories and research centers.

test and evaluation of manned aircraft and aerospace vehicles. Conducts aircraft development testing and provides facilities for contractor tests and the functional tests and military demonstrations intended to determine the capability and suitability of a complete system in meeting established USAF requirements and design objectives. AFFTC is the home of the X-24B wingless plane, which is exploring the use of maneuverable reentry vehicles. The F-15, F-5E, and A-10 are currently being tested at AFFTC. The USAF Test Pilot School trains experimental test pilots to supervise and conduct flight tests of research, experimental, or production-type aerospace vehicles. Additionally, the school trains Aerospace Research Pilots for flight test, engineering design, and/or management in advanced aircraft and manned space research programs. The USAF Parachute Test Group, El Centro, Calif., develops recovery and retardation systems for DoD.

Air Force Special Weapons Center (AFSWC), Kirtland AFB, N. M.—The Center is principally responsible for evaluating nuclear systems, airborne missiles, aircraft fire control, inertial guidance, drones, missile reentry vehicles and aids, and advanced weaponry.

AFSWC operates a fleet of high-performance test-bed aircraft for evaluation of weapon systems and subsystems, guidance devices, and sensors over White Sands and other ranges. With a detachment at Indian Springs, Nev., it flies air support for underground nuclear testing, both for military and peaceful purposes. At Holloman AFB near Alamogordo, AFSC's 6585th Test Group conducts aerospace fly-before-you-buy test operations.

AFSWC's facilities include a 35,588-foot precision rocket sled track where engineers and scientists evaluate aircraft crew escape capsules, guidance systems, reentry vehicles, fuzing devices, new missile concepts, and missile components in a dynamic environment, at speeds up to 4,000 mph.

The Center's Central Inertial Guidance Test Facility at Holloman evaluates the performance of inertial guidance systems for the Air Force and the other military services prior to procurement. The Radar Target Scatter Site provides radar cross-section signatures to make it easier to track aerospace vehicles, decoys, nose cones, and reentry bodies.

Armament Development and Test Center (ADTC), Eglin AFB, Fla.—The Center manages the Air Force's nonnuclear munitions program. ADTC's primary mission is the development, testing, and initial purchase of all nonnuclear munitions. The Center also is responsible for the development and test of all nonnuclear munitions fo the Air Force as well as the initial pu chase of these munitions for the A Force's inventory. Among the items de veloped and tested by ADTC ar bombs, mines, dispensers, and fuze In addition, the Center conducts re search and development testing c aeronautical systems, such as aircra and their associated missiles and al borne electronic warfare devices.

Arnold Engineering Developmen Center (AEDC), Arnold AFS, Tenn.— This center is the largest complex wind tunnels, high-altitude jet an rocket engine test cells, space enviro mental chambers, and hyperballist ranges in the free world. The Center mission is to ensure that aerospac hardware—aircraft, missiles, space craft, jet and rocket propulsion sy tems, and other components—wi "work right the first time they fly. Tests are conducted for federal age cies, the Army, Navy, Air Force, an private companies. These custome reimburse AEDC for the costs of co ducting their tests. Currently valued more than $650 million, AEDC beg its first tests in the early 1950s. AR Inc., is the operating contractor.

Among the Center's thirty-eight te units are some of the largest a most adaptable of their respecti types currently available for testi They subject aerospace systems to

HQ. USAF, AFSC, AND SPO CONTACTS ON MAJOR USAF WEAPON SYSTEMS

PROJECT	HQ. USAF CONTACT OFFICE	TELEPHONE NUMBER	HQ. AFSC SYSTEM OFFICE	TELEPHONE NUMBER	DIVISION	PROGRAM PROJECT OFFICE	TELEPHONE NUMBER
A-10	RDPN	(202) 695-4901	SDNA	(301) 981-4374	ASD	XX	(513) 255-6151
B-1	RDPNB	(202) 695-5989	SDNI	(301) 981-3248	ASD	YH	(513) 255-3281
F-15	RDPNA	(202) 695-4434	SDNJ	(301) 981-5175	ASD	YF	(513) 255-3111
FB-111A and F-111A/C/D/E/F	RDPNA	(202) 695-4434	SDNS	(301) 981-4373	ASD	YB	(513) 255-3474
F-5E	RDPNC	(202) 695-4901	SDNS	(301) 981-5106	ASD	SD-5	(513) 255-3356
MAVERICK (AGM-65A)	RDPA	(202) 695-2093	SDWA	(301) 981-6411	ASD	SD-65	(513) 255-2753
SRAM (AGM-69A)	RDPQ	(202) 695-2093	SDWA	(301) 981-6411	ASD	YG	(513) 255-5811
AWACS	RDPE	(202) 695-2288	SDEY	(301) 981-5055	ESD	YW	(617) 274-4418
MINUTEMAN	RDPM	(202) 695-0405	SDSM	(301) 981-3214	SAMSO	MN	(213) 643-6014
C-5A	RDPNC	(202) 695-3810	SDNZ	(301) 981-4926	ASD	YA	(513) 255-6305
AIM-7F	RDPA	(202) 695-4430	SDWA	(301) 981-6411	NASC	PMA-262-2	(202) 692-8225
AIM-9L	RDPA	(202) 695-4430	SDWA	(301) 981-6411	NASC	PMA-2598	(202) 692-8225
AABNCP	RDPE	(202) 695-6138	SDEA	(301) 981-2955	ESD	YS	(617) 478-1001 MITRE Operator Ext. 2304

ctive testing across a broad range of ealistic and repeatable conditions—ften with engines operating. Full-size ardware or scale models can be sted at Arnold under conditions pre-isely matching altitudes of up to ,000 miles and velocities up to wenty-three times the speed of sound, about 6,500 mph at test altitude).

Air Force Eastern Test Range (AFETR), Patrick AFB, Fla.—AFETR is an operational component of the Air Force Systems Command. Executive management responsibility for AFETR is assigned to Hq., AFETR, Patrick AFB, Fla. The Eastern Test Range extends southeastward from Cape Canaveral across the Atlantic Ocean to ninety degrees east longitude in the Indian Ocean. Support capability is provided by a number of ground tracking stations, sites, and a fleet of instrumented ships and aircraft to provide mobile support in remote areas. Each station and tracking system is configured to complement the integrated range network. ■

The Air Force works closely with the National Aeronautics and Space Administration, whose facilities are described in AIR FORCE Magazine's . . .

GUIDE TO NASA's RESEARCH CENTERS

The National Aeronautics and Space dministration (NASA) continues to perate a number of research, develop-ent, test and evaluation (RDT&E) fa-lities that frequently participate in or oordinate their work with USAF R&D rograms.

Following is a descriptive listing of y NASA installations:

Ames Research Center, Moffett Field, alif.—Ames conducts laboratory and ght research such as atmospheric ntry, fundamental physics, ma-rials, chemistry, life sciences, guid-nce and control, aircraft supersonic ght, aircraft operational problems, d V/STOL. It manages such space-ght programs as Pioneer.

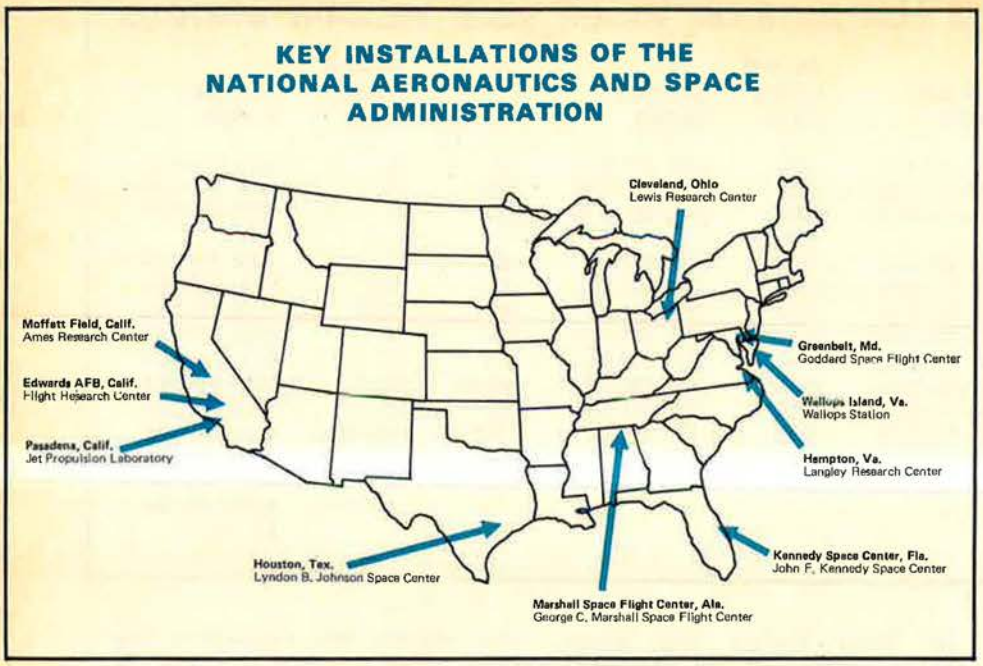
Flight Research Center, Edwards AFB, lif.—Flight Research Center is con-ned with manned flight within and ide the atmosphere, including low-speed, supersonic, hypersonic, and re-entry flight, and aircraft operations. Examples of its studies are lifting bodies (wingless vehicles whose bodies provide lift in the atmosphere) and integration between man and technological systems and vehicles.

Goddard Space Flight Center, Greenbelt, Md.—Goddard Space Flight Center is responsible for a broad variety of unmanned earth-orbiting satellites and sound-rocket projects. Among its projects are Orbiting Observatories, Explorers, Nimbus, Applications Technology satellites, and Earth Resources Technology satellites. Goddard is also the nerve center for the worldwide tracking and communications network for both manned and unmanned satellites.

Jet Propulsion Laboratory, Pasadena, Calif.—Jet Propulsion Laboratory is operated for NASA by the California Institute of Technology. The laboratory's primary role is investigation of the planets. It also designs and operates the Deep Space Network, which tracks, communicates with, and commands spacecraft on lunar, interplanetary, and planetary missions.

John F. Kennedy Space Center, Fla.—The Center makes preflight tests and prepares and launches manned and unmanned space vehicles for NASA. Launches from the Pacific Coast are conducted by the KSC Western Test Range Operations Division at Lompoc, Calif.

Langley Research Center, Hampton, Va.—Oldest of the NASA Centers, Langley has the task of providing technology for manned and unmanned exploration of space and for improvement and extension of performance,



NASA operates ten research and operational centers, some collocated with Air Force installations. Most centers are involved in some Air Force work.

utility, and safety of aircraft. Langley devotes more than half its efforts to aeronautics. The Center is charged with overall project management for Viking.

George C. Marshall Space Flight Center, Marshall Space Flight Center, Ala.—Launch vehicles for Apollo and other major missions are designed and developed by George C. Marshall Space Flight Center. The Center is concerne with launch vehicles of the Satur class, as well as payloads, related re search, and studies of advanced spac transportation. The Center is respon sible for development of Skylab com ponents.

Wallops Station, Wallops Island, Va —Wallops Station is one of the olde and busiest ranges in the world. Som 300 experiments are sent aloft eac year on vehicles which vary in siz from small meteorological rockets t the four-stage Scout with orbita capability. A sizable effort is devote to aeronautical research and develop ment.

Lewis Research Center, Cleveland Ohio—Aircraft and rocket propulsio and electric power generation in spac are among the major programs of Lewis These take the Center into such studie as metallurgy, fuels and lubricant magnetohydrodynamics, and ion pro pulsion. Lewis has technical manage ment of the Agena and Centaur rocke stages.

Lyndon B. Johnson Space Cente Houston, Tex.—The Center design tests, and develops manned spacecra and selects and trains astronauts. directs the Skylab and Space Shuttl programs. Mission Control for manne spaceflight is located at the Center.

AIR FORCE ELECTRONICS '74

JULY AIR FORCE MAGAZINE

In July, AIR FORCE Magazine presents its annual "Electronic Air Force" issue. This year, the subject matter will cover a broad range including . . . **Electronic Systems Division, where it stands and where it is going . . . Command and Control . . . Telecommunications . . . Data Automation . . . AWACS . . . A list of Air Force electronic contracts and prime contractors.** In addition, the July issue will feature a special report on the AFA-sponsored Strategic Weapons Development seminar at Vandenberg AFB, Calif., covering the keynote address by the Secretary of the Air Force and presentations by the Commanders of SAC, AFSC, ASD, and SAMSO.

Here is a great advertising opportunity! You can be sure of wide readership in both the Air Force and industry. Book your space early to insure a good position.

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AIR FORCE MAGAZINE

PUBLISHED BY THE AIR FORCE ASSOCIATION

The Bulletin Board

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

AFA Opposes Merger of ANG and AFRES

In a recent appearance before the Department of Defense Task Group studying the Guard and Reserve in the Total Force, AFA's National President, Joe L. Shosid, stated: "A major objective of this Study Group, we understand, is that of determining the feasibility of merging the Air National Guard and the Air Force Reserve. We suspect that this will be an enormously difficult objective on which to reach firm conclusions and recommendations. One reason for its being difficult, we submit, is that, with these two Reserve components now functioning so well—it is difficult to foresee any gain that would be sufficient to warrant the disruption inevitably necessary in such a merger. To date, we have heard nothing to indicate, or guarantee, any potential advantage to national defense that would outweigh the potential disadvantages of a merger of this nature.

"For example, we have seen no figures as to cost savings that would result from a merger (as distinguished from a reduction in forces). We suspect that the minimal cost reductions achieved by merging headquarters' staffs would not justify an impairment of operational readiness and the resultant serious impact on our overall military posture. Further, one cannot ignore the possible impact on desperately needed public support, particularly in those hundreds of areas around the nation in which the men and women of these components have so well established themselves as important and vital elements of their respective communities. In most communities throughout the land, the only United States military uniform ever seen by our citizens is worn by a Reservist or Guardsman.

". . . it is our firm opinion, in the absence of compelling new evidence, that the facts do not warrant a merger, now or in the immediate future."

While advising that AFA was pleased to know that the Department of Defense was supporting such Guard and Reserve incentives as Servicemen's Group Life Insurance and was giving serious consideration to financial assistance for members of the Reserve components who wish to enroll in community colleges and vocational schools, Mr. Shosid emphasized that AFA was disappointed that DoD is not pushing this year for Reserve enlistment and reenlistment bonuses.

Mr. Shosid also expressed the Association's disappointment in planned cutbacks in the Air National Guard and the Air Force Reserve, stating: "We have seen no evidence, especially in today's all-volunteer force environment, that would justify a reduction in the size of these two Air Reserve components." He stressed that "once lost, this well-trained resource, currently available at a relatively low cost, will be irreplaceable."

Mr. Shosid called the Study Group's attention to a resolution, unanimously adopted by AFA's National Board of Directors on February 9, 1974, calling for a reexamination of the potential of the involved individuals to assume new assignments within the Reserve components (*see April '74 issue p 74*).

Mr. Shosid informed the group of AFA's earnest belief that the Air National Guard and Air Force Reserve have proven to be well-managed, highly efficient, combat-ready, and cost-effective forces, and that their responsiveness was tested and proven during the Berlin call-up, the Cuban crisis, the *Pueblo* incident, and in the Vietnam conflict.

While not denying that there may be room for improvement, nor implying a desire to maintain the status quo for its own sake, he stated that AFA believes it unwise to effect major change merely for the sake of change.

In concluding his formal presentation, Mr. Shosid said: "There

Dr. Dan Callahan, left, Warner Robins, Ga., physician and AFA Board member, congratulates Maj. Gen. Earl O. Anderson on being the newest Life Member of AFA's Middle Georgia Chapter 296, and points to the spot his name will occupy on the wall plaque. General Anderson is Vice Commander of the Air Force Reserve (AFRES), Robins AFB, Ga.

are many factors essential to a strong national defense posture. Most assuredly they include well-trained and highly motivated people, modern equipment and facilities, and adequate funding. They also include the application of sound management procedures at all levels. But we must not forget another important factor, which is the full understanding, appreciation, and support of our military forces by the public in general."

Appearing with Mr. Shosid were Howard T. Markey, a former AFA National President and Board Chairman, a permanent National Director, and a major general in the Air Force Reserve; and John O. Gray, AFA's Assistant Executive Director.

Ed Gates . . . Speaking of People

Reduction in Force Threats Continue

It would be nice to report that career officers who have survived this year's reduction in force (RIF) are home free. But that's not necessarily so. The outlook for FY '75 forecasts another small RIF within the Air Force. That translates into continuing concern for a number of career non-Regulars with from three to seventeen years of service.

One wonders how long the government will (1) continue cutting forces to the point that RIFs are required, and (2) apply all the cuts to the non-Regular side of the force and none to the Regular establishment.

Squeezed by the Defense Department and Congress, the Air Force is slated to conclude FY '74, which ends in less than two months, with 110,959 officers. That is 3,900 fewer than were on board twelve months earlier. To absorb that reduction, the service trimmed new officer intake, offered a variety of "early outs" to members who weren't career-minded anyway, and nudged some veteran officers into early retirement.

It still wasn't enough, so USAF set up a RIF board and selected 970 officers for involuntary separation. This is thirty less than forecast originally *(see "Is a Big RIF Inevitable?" in the December '73 issue of* AIR FORCE *Magazine).*

Persons being ousted, some without severance pay because they lack five years of service, will depart in June and July. They have been notified. The July separations—slightly more than half the total—"will go toward satisfying a portion of reductions programmed for FY '75," USAF Headquarters recently announced. So will a new series of forced early releases for rated and nonrated officers with normal separation dates in FY '75.

"By taking action early in the fiscal year, Air Force intends to reduce the impact of involuntary separation programs that may be required later in FY '75," Headquarters added in the announcement.

The outlook is anything but rosy. The arithmetic tells why. While the Air Force will begin FY '75 with 110,959 officer members, the Administration's new budget provides funds for an end-year figure of only 107,300. That's a total of 3,659 officers the Air Force must shed during the period. And the service might need to remove more than that, for Congress almost every year has cut Air Force personnel deeper than Administration budgets required.

Though often plagued by personnel overages that carried RIF threats, Air Force has avoided officer force-outs since 1958. In that year, it found itself with more than 132,000 officers and was ordered to slash. It did so via thousands of voluntary early outs and early retirements, plus some 2,200 outright RIFs. All of the latter were non-Regulars.

Several times during the past decade, RIF vibrations resurfaced, but new early-out projects, or reduced procurement, or both, were invoked. RIF threats eased temporarily—until now.

And each year as officer personnel strength declines further, there is less room for personnel managers to manipulate, to maneuver, to massage the personnel inflow and outflow patterns so as to avoid force-outs.

Whereas in earlier years, non-Regular officers outnumbered Regulars, now the reverse is true. Recent figures show USAF's officer corps composed of about 61,000 Regulars and 51,000 non-Regulars. And many of the latter are not RIF-eligible, such as newcomers with one and two years of service, those in the eighteen- to twenty-year "sanctuary," and others in various specialized categories. In other words, the number of non-Regulars from whom a RIF quota can be met has shrunk significantly, and with it, pressures on the remaining eligibles increase. Keeping them in suspense, year after year, is in no one's best interests.

The continued presence of RIF possibilities may increase the demands for Congress to enact, and the services to adopt, rules shifting some of the force-out burden to the Regular establishment. This should include authority to (1) selectively retire veteran Regulars no longer carrying their weight, and (2) separate young Regulars involuntarily, perhaps in head-to-head competition with their non-Regular contemporaries. Such selections undoubtedly would result in the exit of considerably fewer Regulars than non-Regulars, since in earlier competition for Regular berths presumably the most promising were chosen.

Still, an all-officer RIF board arrangement would appear more equitable than the present system.

One solution to the entire RIF dilemma is contained in the Pentagon's legislative proposal, called the Defense Officer Personnel Management System (DOPMS). One plank in DOPMS would reshape the officer force so that all members chosen to stay aboard beyond their eleventh year of service would hold Regular commissions. Swinging over to such an alignment, of course, would require numerous RIFs, but an improved severance pay system, which Defense also is supporting, would remove some of the sting.

Getting these propositions through Congress is the problem. The lawmakers traditionally have refused to tackle omnibus-type legislation like DOPMS. Its chances of approval seem dim.

Other alternatives USAF could turn to include letting AFROTC scholarship graduates who are unhappy in uniform depart and cutting new OTS and AFROTC production sharply. Booting out competent, experienced officers to make way for untried newcomers is wasteful and unbusinesslike, critics of RIF actions insist.

The best way to eliminate RIFs, of course, is to stop cutting manpower, but there's nothing on the immediate horizon to indicate that the government will shift to such a course.

The forecast, we are sorry to report, is for the officer RIF-threat unpleasantness to continue. ■

The Bulletin Board

Senior Staff Changes

PROMOTIONS: (Air Force Reserve) To be **Major General:** Arthur W. **Clark;** William **Lyon;** Oscar D. **Olson;** Alfred **Verhulst;** John S. **Warner.**

(Air Force Reserve) To be **Brigadier General:** Bruce M. **Davidson;** Edward **Dillon;** George M. **Douglas;** Arthur A. **Gentry;** Irving B. **Holley,** Jr.; Harry J. **Huff,** II; Willard G. **Hull;** James D. **Isaacks,** Jr.; Orrin W. **Matthews;** Alvin J. **Moser,** Jr.; Dalton S. **Oliver;** Frank J. **Parrish;** Barnett **Zumoff.**

RETIREMENTS: B/G Woodrow A. **Abbott;** M/G James A. **Bailey.**

CHANGES: B/G (M/G selectee) Louis O. Alder, from DCS/Comptroller, Hq. AFSC, Andrews AFB, Md., to DCS/Comptroller, Hq. AFLC, Wright-Patterson AFB, Ohio, replacing retiring M/G James A. Bailey . . . **B/G (M/G selectee) Earl J. Archer, Jr.,** from V/C, 9th AF, TAC, Shaw AFB, S. C., to Dep. Cmdr., 7th AF, and C/S, USSAG, Nakhon Phanom RTAB, Thailand, replacing M/G Jack Bellamy . . . **M/G Jack Bellamy,** from Dep. Cmdr., 7th AF, and C/S, USSAG, Nakhon Phanom RTAB, Thailand, to V/C, 9th AF, TAC, Shaw AFB, S. C., replacing B/G (M/G selectee) Earl J. Archer, Jr. . . . **B/G Charles C. Blanton,** from Dep. Dir., Budget, AF Comptroller, Hq. USAF, to DCS/Comptroller, Hq. AFSC, Andrews AFB, Md., replacing B/G (M/G selectee) Louis O. Alder.

B/G Clyde R. Denniston, Jr., from Dep. Dir., Ops, DCS/P&O, Hq. USAF, to Dir., J-2, US Readiness Cmd., MacDill AFB, Fla., replacing retiring B/G Woodrow A. Abbott . . . **Col. (B/G selectee) Van C. Doubleday,** from DCS/Ops, Hq. AFCS, Richards-Gebaur AFB, Mo., to Dir., J-6, US Readiness Cmd., MacDill AFB, Fla., replacing B/G Robert E. Sadler . . . **Col. (B/G selectee) George A. Edwards, Jr.,** from Cmdr., 67th Tac Recon. Wg., TAC, Bergstrom AFB, Tex., to Asst. DCS/Logistics, Hq. TAC, Langley AFB, Va. . . . **B/G (M/G selectee) Charles A. Gabriel,** from Dep. Dir., Operational Forces, to Dep. Dir., Ops, DCS/P&O, Hq. USAF, replacing B/G Clyde R. Denniston, Jr.

Col. (B/G selectee) Claire M. Garrecht, from Cmd. Nurse, Hq. TAC, Langley AFB, Va., to Chief, AF Nurse Corps, OTSG, Washington, D. C. . . . **Col. (B/G selectee) Francis A. Humphreys,** from Dep. Dir., Military Asst. & Sales, DCS/S&L, Hq. USAF, to Chief, Air Sec., MAAG, Iran . . . **Col. (B/G selectee) Bobby W. Presley,** from DCS/Comptroller, USAFE, Ramstein AB, Germany, to Dep. Dir., Budget, AF Comptroller, Hq. USAF, replacing B/G Charles C. Blanton . . . **Col. (B/G selectee) John E. Ralph,** from Vice Cmdt., to Cmdt., Squadron Officer School, AU, Maxwell AFB, Ala., replacing B/G Earl G. Peck . . . **B/G Robert E. Sadler,** from Dir., J-6, US Readiness Cmd., MacDill AFB, Fla., to V/C, Hq. AFCS, Richards-Gebaur AFB, Mo. . . . **Col. (B/G selectee) Alonzo J. Walter, Jr.,** from Cmdr., 31st TFW, TAC, Homestead AFB, Fla., to Dir., Ops, Hq. PACAF, Hickam AFB, Hawaii.

—Compiled by Catherine L. Bratz

Col. Sheldon I. Godkin has been assigned as Director of Public/Legislative Affairs on the staff of Adm. Noel Gayler, CINCPAC. Colonel Godkin, a fighter pilot, served previously as Vice Commander of ADC's 26th Air Division.

Last Call!

Plans for the 1974 Air Force Association Aerospace Development Briefings and Displays scheduled for September 17, 18, and 19 at the Sheraton-Park Hotel, Washington, D.C., are moving fast. Nearly 90% of the exhibit space has already been assigned.

The Briefings and Displays offer a unique combination: the physical presentation of aerospace/defense equipment . . . and . . . informative company briefings, in the booths, to key military, government, and industry personnel.

Morning attendees are assembled into parties of 20 persons each and are escorted from briefing to briefing on schedule. Afternoon attendees may select any presentation offered in any order of preference.

Last year, 5,502 persons participated in the Briefings and Displays, including 153 General Officers and Admirals and 726 Colonels and Navy Captains. The Secretary and Chief of Staff of the Air Force were honored at a reception in the Exhibit Hall, attended by some 2,000 guests.

If you would like more details on AFA's 1974 Aerospace Development Briefings and Displays call us today. Better act now, as almost all the available space has been assigned.

To reserve Briefing and Display space write or call:

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Airman's Bookshelf

Events or the Man?

The Devil and John Foster Dulles, by Townsend Hoopes. Little, Brown, Boston, Mass., 1973. 562 pages. $15.00.

This nation is in the midst of a reappraisal of the policies and maior figures of the past thirty years. Secretaries of State Dean G. Acheson and John Foster Dulles have naturally been the focus of much of this attention. They were two of the most powerful American diplomats of the twentieth century, men of exceptional drive and intellectual power.

Professor Gaddis Smith has recently published a major work on Acheson, distinguished by depth of research and rare objectivity. And Michael A. Guhin's *John Foster Dulles: A Statesman and His Times* is perhaps the most favorable treatment yet of Dulles as diplomat. Townsend Hoopes's *The Devil and John Foster Dulles* is, on the other hand, severely critical of Dulles' tenure as Secretary of State.

On military affairs, Hoopes has difficulty assessing the New Look military policy. He correctly notes that it was the product of the Eisenhower Administration's desire to save money and "to regain control of an American policy that was perceived to have become largely a reflexive reaction to Communist initiative." Observing that Dulles did not play a major role in formulating the New Look, Hoopes fails properly to put into context Treasury Secretary George Humphrey's contribution, which was pivotal in connecting the fiscal and military implications. It was Humphrey's view that the buildup of Strategic Air Command should be accelerated and the nuclear deterrent should become the foundation of defense policy.

Hoopes correctly notes that the New Look was a shift toward greater reliance on nuclear forces with a concomitant downgrading of America's conventional capability. But his appraisal fails properly to credit the New Look with playing a major role in preventing general war. However, he grudgingly observes that it would be "plausible to argue" that this Eisenhower policy was an important factor in keeping the Administration from military intervention in Vietnam.

In conclusion, Hoopes falls into a massive contradiction. He faults Dulles for not plowing new ground in the 1950s, for not making notable diplomatic departures. But at the same time, he says that Truman and Acheson—with containment, the Truman Doctrine, the Marshall Plan, and NATO—had already set US postwar policy in concrete. Thus, as Hoopes writes, "the basic architecture of the postwar world . . . was already in place when the Eisenhower Administration came to office." One then waits fruitlessly for Hoopes to make the logical connection that Dulles generally continued the Truman-Acheson policies.

Hoopes is especially convincing when he probes Dulles' cast of mind. He describes an "intellectual loner," a true moral believer who often also became the amoral tactician. He depended to an extraordinary degree on his own counsel. State Department subordinates used to say that he "carried the State Department in his hat."

Much of Secretary Dulles' inflated rhetoric and sometimes self-righteous tone undoubtedly proved counterproductive and just plain confusing. It is Hoopes's opinion that President Eisenhower's instincts generally, and in foreign affairs particularly, were much sounder than Dulles'. The author concludes that Eisenhower sometimes softened Dulles' policies, and then, after Secretary Dulles' death, the President moved belatedly and ineffectively toward détente with the Soviet Union. Interestingly, Sherman Adams—Eisenhower's "Chief of Staff"—came to a similar conclusion.

This reviewer is much less certain than Hoopes that the Eisenhower Administration missed chances for long-range, meaningful détente after Stalin's death and then again because the U-2 flights caused Khrushchev to scuttle the Paris summit. And though Hoopes criticizes Khrushchev for his harsh demeanor, simplistic reactions, and policies, he blames Dulles for giving American politics "an anti-Communist intensity."

And finally, this legacy was bequeathed, because "although their accents and rhythms were different, the fervent anti-Communist absolutes of John Foster Dulles were embedded in the very bone structure of John Fitzgerald Kennedy's inaugural address."

Thus, in view of Hoopes's opinion that Kennedy followed Dulles down the cold-war trail, and his assertion that Truman-Acheson had led the way, it seems especially curious that the author failed to conclude that time and events had at least as much to do with policy as a man named John Foster Dulles.

—Reviewed by Herman S. Wolk, Air Force Office of History.

Truman on Truman

Plain Speaking, An Oral Biography of Harry S. Truman, by Merle Miller. G. P. Putnam's Sons, New York, N. Y., 1973. 448 pages. $8.95.

When Harry S. Truman became President in 1945, he followed a very tough act. At patrician Franklin Delano Roosevelt's death, many Americans thought, like Merle Miller: "My God, now we're left with Harry Truman . . ." who "looked and acted and talked like—well, like a failed haberdasher." Or party hack. Or cornball Midwesterner.

For many Americans, however, such critical first appraisals of the thirty-third President would turn 180 degrees in the traumatic upheavals that followed. (One knowledgeable and hard-to-please group—the Washington press corps—was highly skeptical of HST's ability to govern, but newsmen were among the first converts.)

Plain Speaking is HST's "oral biography," that is, transcribed from taped interviews with the former

President and many associates and friends during Truman's days of retirement in Independence, Mo.

The interviews by author Miller were to have been the basis for a network television series about the Truman years in the White House. The TV project fell through, and fortunately so, for many of HST's pungent—and revelatory—comments would certainly have been edited out of any TV film. Posterity would have been the poorer for that.

Plain Speaking has an obvious but oddly enough redeemable drawback: It makes no attempt at objectivity (most biographies lack objectivity to *some* degree; authors tend to side with their subjects). In the case of *Plain Speaking,* its format dictates a subjective approach; Truman's—and Miller's—biases are right there for all to interpret.

But well beyond that, the book offers such blunt and candid insights into the mind and life of one of America's most controversial Presidents that it defies classification. It may well be a biographical innovation, in that no former President has ever spoken so frankly about himself and his times.

It is unfortunate that early reviews of the book sensationalize Truman's verbal flaying of MacArthur, Nixon, Eisenhower, and others. The exaggerated impression is that Truman used the interviews primarily to vent his spleen. (Equally regrettable is the overemphasis given HST's comments on others' private lives, particularly Eisenhower's.)

On the other hand, Truman could lavish praise on men he thought measured up: ". . . there was never a parade for General [George C.] Marshall, and he deserved it more than all the rest put together. I gave him a decoration or two, but there wasn't a decoration anywhere that would have been big enough for General Marshall."

The HST biography consists for the most part of question-and-answer segments between Miller and Truman. They begin with HST's childhood and go on to the twilight years at the Truman Library in Independence. Interspersed throughout are relevant comments by family (Bess excluded), friends, and associates. Miller contributes asides in the form of personal observations and opinions. But nowhere does any of this come across as formal biography. It is more like you were sitting in on a bull session in the Truman kitchen, perhaps sharing a small "libation."

The man from Missouri never let the "big decisions" come back to haunt his sleep. Once he had thought a problem through to a solution, that was it. And, in many respects, Truman had more important matters to deal with than any man in American history.

Probably foremost—its implications will be with mankind for many years—was the decision to use the atomic bomb. Then there was a shattered Europe and the Marshall Plan to rebuild it—described by Churchill as the most "unsordid act" in history.

Foreign-policy crises Truman faced were the Berlin Blockade and armed aggression in Korea, the latter further emotionalized by MacArthur's insubordination. Major perplexities on the home front included the Taft-Hartley furor, the McCarthy era, integration of the armed forces, and, of course, the political campaigns (all but the last, either overlooked entirely in the book or given short shrift—unfortunately).

However history judges HST as President, a considerable "plus" certainly will be his remarkable capability for taking decisive action ("The buck stops here").

What comes through in *Plain Speaking* is an intimate closeup of a rare and honest man who left his mark—as President and American. Harry Truman may not have had the polish and aristocratic bearing of, say, a Franklin Roosevelt, but he damn well was Harry Truman.

—Reviewed by William P. Schlitz, Assistant Managing Editor, AIR FORCE *Magazine.*

Pragmatic Idealogue

Stalin: The Man and His Era, by Adam B. Ulam. The Viking Press, New York, N. Y., 1973. 760 pages. $12.95.

In a poem read privately in 1934, the brilliant Soviet poet Osip Mandelstam portrayed Stalin's Russia as a place where "the only one heard is the Kremlin mountaineer, the destroyer of life and the slayer of peasants." Several years later, Harry Hopkins, confidential adviser to Franklin D. Roosevelt, observed a sensible, businesslike, unassuming, almost attractive Stalin during his visit to Moscow in June 1941. Stalin came across as a reasonable leader beset by shadowy Politburo men. Perhaps the dark stories of purges and cruelties were fabrications or acts of other Kremlin figures. For too long we have viewed Stalin in these stereotyped images and caricatures.

Adam Ulam's enlightening new biography, *Stalin: The Man and His Era,* does much to strip away the myths, distortions, and encrustations of previous decades and to reveal the real Stalin. Ulam will satisfy neither Marxist purist nor cold warrior. Divorced from the excessive condemnation of his enemies and the partisan zeal of his supporters, Stalin emerges as a man with a dual mission—power for himself and strength for the USSR. Rather simply stated, Stalin "was corrupted by absolute power . . . which turned a ruthless politician . . . into a monstrous tyrant." Yet behind this straightforward analysis, Ulam weaves the threads of an extremely complex individual.

Ulam proposes to discuss Stalin and his era. We do get thoughtful insights into Bolshevik internal politics prior to 1917, the horrors accompanying collectivization of agriculture, the origins of the cold war, and the strengths and failings of Stalin's contemporaries. However, Ulam is at his best when discussing Stalin the man. Ironically, Stalin was as "two-faced" as those obsequious satraps who served him and fed his suspicions later in life. Stalin exhibited considerable ability as a "skillful and judicious political manipulator." Intelligent, well-read, a competent speaker, industrious, and a brilliant administrator, Stalin proved his worth to Lenin on numerous occasions during the years 1912–22.

Contrary to the claims of his enemies, Stalin's sense of timing, common sense, and even-handed approach to problems earned the "most active Communist" the respect of many Bolsheviks. Stalin's *Marxism and the National Question* (1913) manifested a strong understanding of a critical Russian problem. His tireless work restored some semblance of administrative order and unity to the confused Soviet regime during the years 1918–22. A shrewd diplomat and keen judge of character, the practical Stalin dealt effectively with Nazis and capitalists alike to advance Soviet interests before and after World War II.

The dark side of Stalin is con-

siderably more difficult to fathom. An inherently suspicious and misanthropic loner prior to 1917, Stalin's acquisition of absolute power by 1928 brought the tyrannical aspects of his nature into full flower. Power "enhanced his sense of insecurity [and] increased an already considerable vindictiveness."

Stalin suffered from a massive inferiority complex. A "practitioner" of revolution since 1902, Stalin bitterly resented the condescending treatment he received from more passionately intellectual revolutionaries such as Trotsky, Zinoviev, and Kamenev. While they talked revolution, Stalin undertook thankless revolutionary tasks and suffered an extremely lonely exile in Siberia during 1913–17. Upon Lenin's death in 1924, the "practitioner" determined that he, not the intellectual theorists, could best build the new Russia. Perhaps Stalin was correct. How could intraparty democracy and internal dissension contribute to the survival of a backward state surrounded by hostile capitalists?

Stalin proposed to make war on Russia to strengthen his own power and modernize the country. Like Lenin, Stalin defined the nature of Marxism for Russia. Where he stood, there was Marx; everywhere else was capitalistic darkness. To achieve his goals, Stalin employed a combination of hope, hard work, and terror. He offered Soviet citizens the vision of a strong, prosperous future to contrast with present and past sins and weaknesses.

In the struggle between Communist "good" and capitalist "evil," only eternal vigilance and terror could assure victory. Stalin's unique formula for perpetual terror—"the closer we get to socialism, the sharper becomes the character of the class war"—led to "government by suspicion" and a "democracy of fear" in the USSR. ". . . Life should prove the truth of dogma. . . . The terror was necessary, not only to keep men obedient, but even more to make them believe."

Ulam notes how absolute power blinded the otherwise brilliantly realistic Stalin and led to some colossal blindness in collectivization, purges of the military, and strategy during World War II. Yet he weathered his greatest crises by a combination of boldness, good luck, the mistakes of his enemies, and the fact that viable alternatives to Stalinist policies were often worse or nonexistent. Stalin was, in the author's view, "too much a part of Soviet reality to be torn from it without endangering the whole."

Ulam combines familiar sources with new memoir accounts and documentary collections to give us a lucid, witty, highly readable account of the man who molded the Russian Revolution into his own image. Eschewing ideological preoccupations, grandiose "psychological" theories, and fashionable trends, the author bases his judicious interpretations upon hard facts and careful analysis. Ulam's book supersedes Isaac Deutscher's masterful account as the standard biography of Stalin in English. Whereas Deutscher's ideological commitment to Trotsky tempered his objectivity in dealing with Stalin, Ulam suffers from no such impediments. Ulam's Stalin changes with circumstances, situations, and stages of life, not to fit preconceived notions or theories of the author.

Several minor irritations mar an otherwise outstanding book. Ulam whets our appetite with provocative comments or fascinating anecdotes on occasion, but then exasperatingly neglects to footnote the source of his remarks. Attempts at relevancy sometimes have unexpected results. Comparing popular attitudes toward police in Tsarist Russia and contemporary America overlooks the vastly different traditional perceptions of police in the two countries.

In many ways, the contemporary Soviet Union reflects much more of Stalin's Russia than Lenin's vision. Perhaps, as Ulam suggests, it is "only when the Soviet people are able to look at their recent past and recognize it for what it really was—tragic and heroic . . . and in many ways preposterous—that the spell will be lifted and the Stalin era will finally have ended."

—Reviewed by Capt. Bernard F. Oppel, Department of History, USAF Academy.

The Intelligence Panorama

The U.S. Intelligence Community, by Lyman B. Kirkpatrick, Jr. Hill & Wang, New York, N. Y., 1973. 212 pages. $7.95.

This is neither an exciting nor a controversial book, but a distillation of experience acquired during the course of a twenty-three-year career in the intelligence community. As such, it is a compact text on the American intelligence effort, its history, successes, reversals, and its future.

The author states at the outset that he plans to counteract the considerable amount of nonsense written about intelligence operations by setting the record straight. He has produced a brief, but thorough, discussion of ways, means, and reasons for intelligence operations and of the policy uses and abuses to which the resulting reports, analyses, and evaluations may be applied.

Mr. Kirkpatrick served as an Army intelligence officer during World War II and held high posts within the Central Intelligence Agency during its formative years. He is now a professor at Brown University.

While his approach is somewhat reminiscent of the classroom, he is an interesting teacher. The first chapter is a primer on intelligence with footnotes for readers who would expand their libraries on the subject. He discusses information-gathering methods and the impact that developing technology has had on the practice of using human agents. He examines reasons for secrecy and summarizes major targets to which one country typically directs its operations against another.

The book traces the history of US attempts to develop a coordinated and centralized intelligence agency, with an insider's special knowledge of events. We quickly learn that progress in these efforts may have been largely due to pressures to "get results, which often forced concessions on jurisdictional issues and retreat from parochial positions" of various competing agencies.

Yet Mr. Kirkpatrick disagrees with efficiency experts who would consolidate all intelligence services under one roof. He cites examples of the work of specialized agencies to meet specialized requirements. The Treasury Department, in the face of an unfavorable balance of payments and an embattled dollar, has assumed a newly important role in producing economic intelligence.

Political science professors, perhaps, will assign this book to students who seek understanding of the place intelligence operations occupy in a nation's domestic and foreign-policy planning. Mr. Kirkpatrick has well stated the complex reasons why intelligence is not a

panacea for problems in designing national policy.

—Reviewed by Marjorie Ulsamer, Deputy Director, Publications Division, HUD.

New Books in Brief

Double Strike: The Epic Air Raids on Regensburg/Schweinfurt, by Edward Jablonski. A fast-paced narrative of the August 17, 1943, two-pronged attack of the Eighth Air Force on the important German manufacturing cities of Regensburg and Schweinfurt. The deepest penetration made into the German heartland up to that time, the raid became one of the costliest and bloodiest air battles of World War II. Mr. Jablonski is also the author of *Flying Fortress.* Doubleday, New York, N. Y., 1974. 271 pages with appendix and index. $7.95.

I Was A Kamikaze, by Ryuji Nagatsuka. The inside story of the legendary suicide squads of World War II. The author writes about his training and gives detailed descriptions of the Japanese planes, their range, and deployment methods and weapons. He vigorously affirms that all kamikazes willingly volunteered for this service to save their homeland. Macmillan, New York, N. Y., 1974. 212 pages. $6.95.

Lightning in the Skies, by Arnold Sherman. The story of the evolvement of Israel Aircraft Industries—Israel's largest single industry. A former news editor of *Aviation Week,* Mr. Sherman in 1963 became the first director of public relations of IAI. Stone & Co., London, England, 1973. 271 pages.

The Ripening, by F. A. Randy Jaroch. Readers who like free verse that can be understood without special training will enjoy this small volume of poems by a former SAC man, covering the span of life with all its tragedies and triumphs. Each poem is set with a symbolic photograph, many of gallery quality. St. Mary's College Press, Winona, Minn., 1973. 110 pages. $3.00 paperback.

Soldiers & Civilians: The Martial Spirit in America, 1775–1865, by Marcus Cunliffe. The book covers the genesis of the American military tradition, its growth, its champions and opponents, its effects on civilian life, its more significant and flamboyant manifestations, and its role in the history of the United States. The author, a British historian, does not focus upon weapons, battles, and strategy, but upon social or cultural history; that is, military and antimilitary attitudes as an aspect of national character. The Free Press, New York, N. Y., 1973. 499 pages with index. $4.95 paperback.

United States Air Force History: A Guide to Documentary Sources, compiled by Lawrence J. Paszek. A guide to aid scholars and researchers in locating collections of primary and secondary documents on the Air Force. Not only official government documents are listed, but also the personal papers of individuals who helped develop the service and those of military commanders and pilots who flew in combat in two World Wars, Korea, and Vietnam. US Government Printing Office, Washington, D. C., 1973. 245 pages with index. $1.80 paperback.

World Military Aviation: Aircraft, Airforces & Weapons, edited by N. Krivinyi. A reference volume containing an up-to-date record of all the world's current military aircraft. The first section surveys 126 national air forces with individual strength, aircraft types, and bases. The second section details the dimensions and performance of more than 320 military airplanes, arranged alphabetically under the country of manufacture. Each plane is illustrated with three-view scale drawings. Arco Publishing Co., New York, N. Y., 1974. 224 pages with index. $10.00.

Several additions to Squadron/Signal Publications books on famous military aircraft were issued in 1973. Among them are: *B-17 In Action,* by Steve Birdsall; *A-4 Skyhawk In Action, F-100 Super Sabre In Action,* and *F-4 Phantom II in Action,* all by Lou Drendel; and *Junkers Ju-52 In Action,* by Uwe Feist. Each book has a brief history of the aircraft, a large collection of photographs, including combat shots, and color plates. All are paperback in 8″ by 11″ format and may be ordered from the Squadron Shop, 23500 John Rd., Hazel Park, Mich. 48030. 48 pages each. $3.95 each.

Two recent releases in Ballantine's Illustrated History of the Violent Century series are *Ploesti: Oil Strike,* by John Sweetman; and *Rundstedt,* by John Keegan. Ballantine Books, New York, N. Y., 1974. 160 pages. $1.50 each.

—By Catherine L. Bratz

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PLAN NOW TO ATTEND . . . .

AFA's 1974 Annual National Convention and Aerospace Briefings and Displays

SEPTEMBER 16, 17, 18, 19
WASHINGTON, D. C.

AFA's 1974 Annual National Convention and Aerospace Briefings and Displays will be held at the Sheraton-Park and Shoreham Hotels, September 16–19. Accommodations are limited at the Shoreham Hotel and will be used primarily by other organizations meeting in conjunction with AFA's 1974 National Convention.

All reservation requests for rooms and suites at the Sheraton-Park Hotel should be sent to: Reservations Office, Sheraton-Park Hotel, 2660 Woodley Road, N. W., Washington, D. C. 20008. Be sure to refer to AFA's Annual National Convention when requesting your reservations. Otherwise, your reservation requests will not be accepted by the Sheraton-Park.

AFA's Annual National Convention activities will include luncheons for the Secretary of the Air Force and the Air Force Chief of Staff and the Air Force Anniversary Reception and Dinner Dance. The National Convention will also include AFA's Business Sessions, Symposium, an Air Force Reserve and Air National Guard Seminar, and several other invitational events, including the President's Reception, the Annual Outstanding Airmen Dinner, and the Chief Executives' Reception and Buffet Dinner.

We urge you to make your reservations at the Sheraton-Park Hotel as soon as possible in order to obtain your reservations. Arrivals after 6:00 p.m. require guaranteed payment for the night of arrival.

AFA News

Unit of the Month

By Don Steele
AFA AFFAIRS EDITOR

THE THOMAS B. McGUIRE, JR., CHAPTER, N. J. . . .

cited for effective programming in support of AFA's mission, most recently exemplified in its successful efforts to establish Project Taproot, an educational assistance program.

Through the efforts of AFA's Thomas B. McGuire, Jr., Chapter, N. J., a project has been instituted to help high school graduates qualify for entry on the Federal Civil Service Register.

The program, designated Project Taproot, began last September at the Burlington City High School. It is designed to provide specialized study and supplemental practice to business students interested in federal Civil Service positions.

Jan Bowers, a guidance counselor at the high school, has the overall responsibility for the program. A grant of $1,000 has been provided by the federal government and is being administered through the New Jersey State Department of Education.

The idea for the project was stimulated by the need for more clerical and secretarial help in federal agencies in the Delaware Valley and by the need for business students to secure jobs upon graduation.

Project Taproot provides extra classroom instruction during normal school hours and gives access to extra rented typewriters for use during students' spare time. The students also were given help in preparing for a recent Civil Service test.

The program includes a visit to McGuire AFB to give students a firsthand look at how federal clerical and secretarial workers perform their jobs.

AFA President Joe L. Shosid said, "This program is great. It ties in with our efforts to involve youth, as well as with our increased activities recognizing the full AFA family, including Air Force civilians. I commend the Thomas B. McGuire, Jr., Chapter for its excellent support of AFA's mission and objectives, and, in recognition of the Chapter's successful efforts in establishing Project Taproot, I name the Chapter AFA's 'Unit of the Month' for May."

COMING EVENTS . . . Texas AFA Convention, Trade Winds Motor Hotel, Wichita Falls, May 10–12 . . . **Washington AFA Convention,** Holiday Inn-West, Spokane, May 10–12 . . . **South Carolina AFA Convention,** Myrtle Beach AFB, May 10–11 . . . **Utah AFA Convention,** Ramada Inn, Ogden, May 11 . . . **Illinois AFA Convention,** Augustine's Ramada Inn, Belleville, May 17–19.

New Hampshire AFA Convention, Howard Johnson Motor Lodge, Manchester, May 18 . . . **Oregon AFA Convention,** Dunes Ocean Front Resort, Lincoln City, May 24–26 . . . AFA's **Annual Dinner** honoring the Outstanding Squadron at the Air Force Academy, The Broadmoor, Colorado Springs, Colo., June 1 . . . **Louisiana AFA Convention,** Le Pavillion Hotel, New Orleans, June 7–8 . . . **Virginia AFA Convention,** Arlington, June 15.

New York AFA Convention, Wings Club, Biltmore Hotel, New York City, June 15 . . . **Georgia AFA Convention,** Desoto Hilton Hotel, Savannah, June 14–15 . . . **Wisconsin AFA Convention,** Marriott Motor Hotel, Waukesha, June 15–16 . . . **Colorado AFA Convention,** Sheraton Inn, Colorado Springs, June 21–22 . . . **AFA Charity Golf Tournament,** March and Norton AFBs, June 21–22.

Pennsylvania AFA Convention, Sheraton-Valley Forge Hotel, Valley Forge, June 22–23 . . . **AFA's Twenty-eighth National Convention and Aerospace Development Briefings,** Sheraton-Park Hotel, Washington, D. C., September 15–19 . . . **Air Force Ball,** Beverly Wilshire Hotel, Beverly Hills, Calif., October 26.

Brig. Gen. Thomas McMullen, Systems Program Director for the USAF/Fairchild Republic A-10 close-support aircraft, was the guest speaker at a recent meeting of AFA's H. H. Arnold Chapter, Bethpage, N. Y. In the photo, General McMullen, right, chats with, from left, Chapter member William Morris and Francis X. Battersby, Chairman of the Chapter's Council.

Retired Air Force Col. Paul G. Atkinson, right, receives an AFA Presidential Citation for his outstanding leadership as Commander of the Aerospace Research Labs (ARL) at Wright-Patterson AFB, Ohio, during the development of thrust-augmentation technology. Presenting the award on behalf of AFA President Joe L. Shosid is Edward Nett, President of AFA's Wright Memorial Chapter.

AFA News

Maj. Gen. W. B. "Benny" Putnam, center, USAF (Ret.), President of AFA's Eglin Chapter, Fla., distributes AFA literature to CMSgt. Neal Kaufman, left, and Capt. Roland D. Stanley, right. Sergeant Kaufman, Base Sergeant Major, will serve as enlisted liaison to the Chapter's Council, and Captain Stanley, a test pilot with the 3246th Test Wing, will serve as junior officer liaison to the Council.

AFA's Rushmore Chapter of Rapid City, S. D., recently saluted the Strategic Air Command and Ellsworth AFB at a banquet attended by more than 300 leaders of the Air Force, the community, and AFA. SAC's Commander, Gen. John C. Meyer, the guest of honor and speaker, congratulated the Chapter on its growth from 150 to 400 members in just two years. Here, Chapter President Kenneth R. Roberts visits with General Meyer.

—US Air Force Photo by TSgt. John Wehr

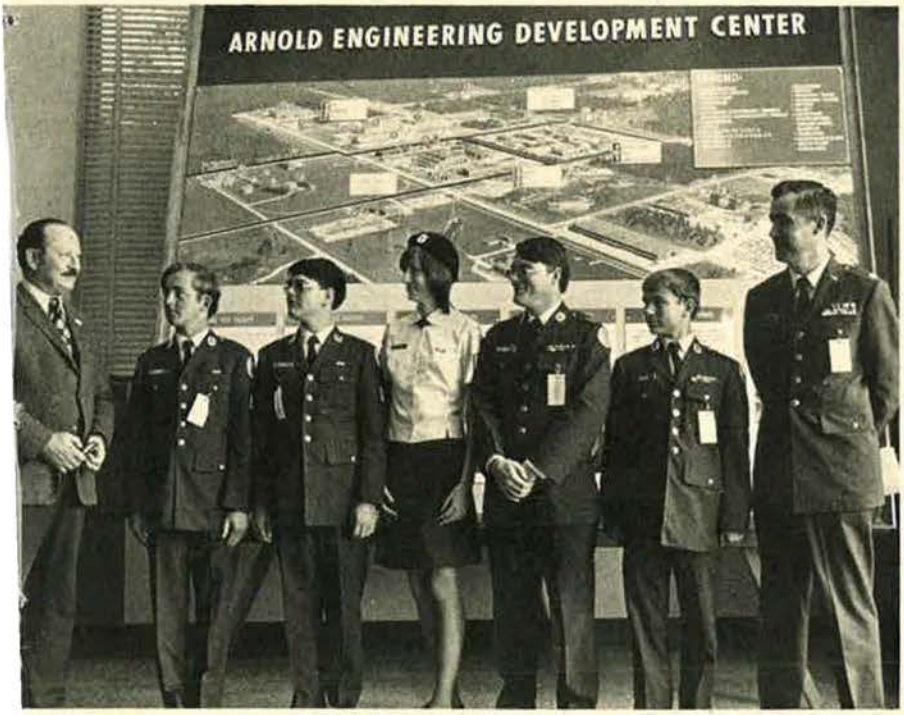
Gen. Robert J. Dixon, left, Commander, Tactical Air Command, visits with MSgt. Donald Bramlett, center, and CMSgt. C. W. Luckham during a reception sponsored by AFA's Langley Chapter to honor the noncommissioned officers assigned to Langley AFB, Va.

Boy Scouts of Troop 167, the Beck School in Cherry Hill, N. J., were special guests at a recent meeting of AFA's Greater Camden Chapter. During the meeting, they received an orientation briefing on the ATC-510 Personal Flight Simulator. In the photo, Chapter Activities Chairman Leo Connor watches as Judy Meitzner, Manager of Aviation Education Curriculums at the Training Center for Analog Training Computers, Inc., instructs the Scouts in the use of the simulator.

CHAPTER AND STATE PHOTO GALLERY

During the Alamo Chapter's recent awards banquet, Gen. John D. Ryan, USAF (Ret.), left, former Air Force Chief of Staff and now an AFA National Director and Chairman of AFA's National Membership Committee, presents Maj. Gen. William A. Jack, Commander, San Antonio Air Materiel Area, Kelly AFB, Tex., the Alamo Chapter's Ray Ellison Plaque. The award is presented annually to the Air Force installation in Texas that provides the most support to AFA during the year.

During a dinner recently held in New Orleans to commemorate "Go To College in the Air Force Week" activities, Louisiana AFA President Louis J. Kaposta, right, discusses AFA Chapter participation with, from left, Louisiana Lt. Gov. James E. Fitzmorris, Jr.; Col. John L. Phipps, President, Community College of the Air Force; and Brig. Gen. Conrad S. Allman, Commander, US Air Force Recruiting Service.



Leonard T. Glaser, left, President of AFA's H. H. Arnold Memorial Chapter, Tenn., greets leaders of the Lawrence County High School AFJROTC Unit and the Unit's Aerospace Education Instructor, Maj. Marcus E. Rinks, right, on their arrival for a Chapter-sponsored tour of the Arnold Engineering Development Center. More than ninety cadets were in the group.

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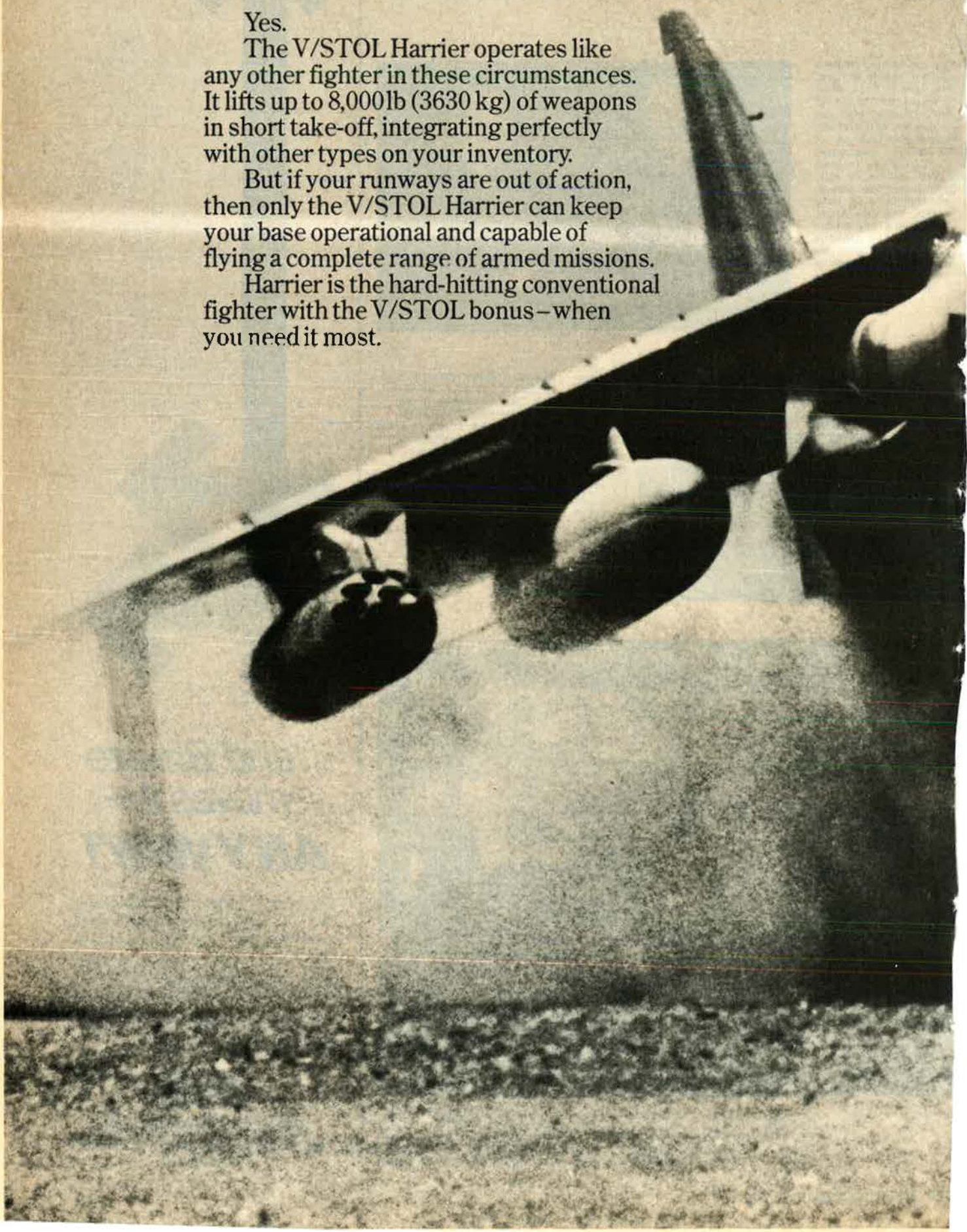

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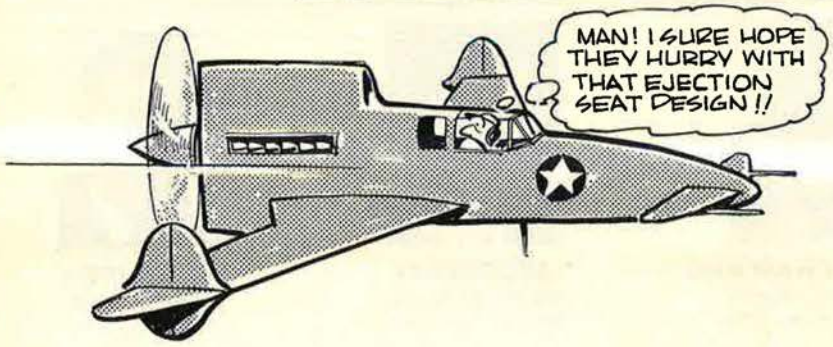
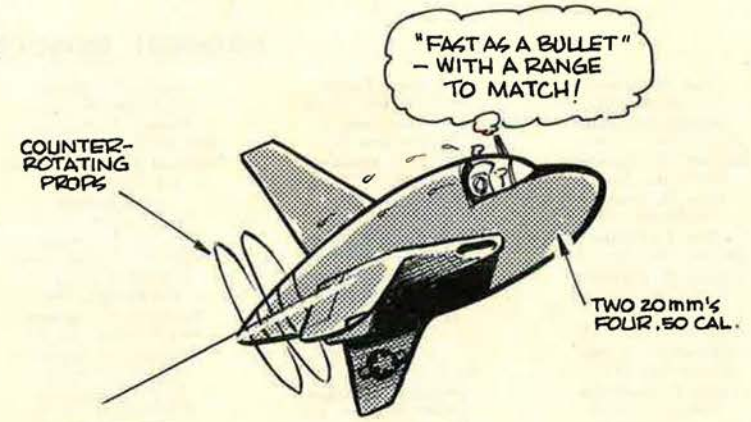
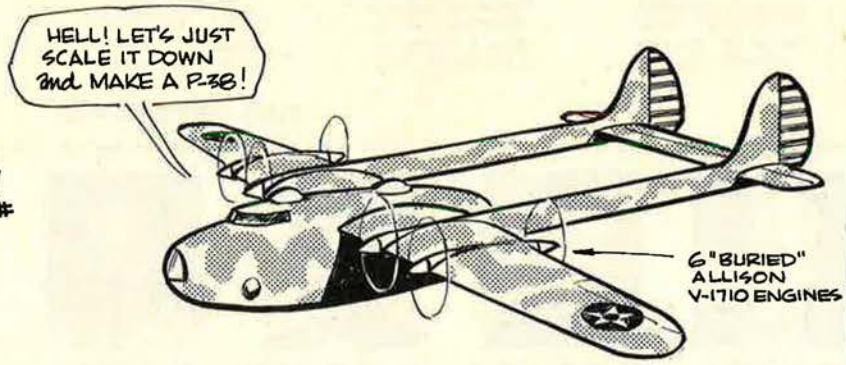


1941 • XP-55 (CURTISS)
THREE "ASCENDERS" ASCENDED. PROP WAS JETTISONABLE FOR BAIL OUT.



1941 • XP-56 (NORTHROP)
TWO "BLACK BULLETS" WERE BUILT (MAINLY OF MAGNESIUM). TOP SPEED WAS 465 mph.



1935 • XB-16 (MARTIN)
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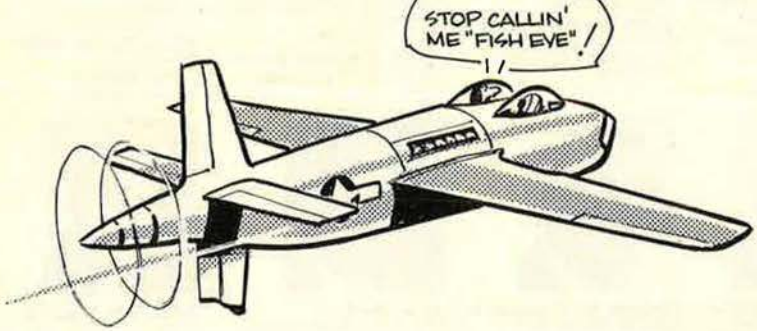

1943 • XB-42 (DOUGLAS)
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McDonnell Douglas VITAL II visual systems are FAA-approved for flight crew training in lieu of costly, fuel-using, non-revenue flights for this purpose. The FAA approval now includes low-altitude circling approach training.

The Canadian Ministry of Transport has also approved the VITAL II system for transferring recurrent proficiency checks from the aircraft to the simulator.

A four-window installation of the system by The Flying Tiger Line is particularly effective for circling approach training. Side-window views keep the airport fully visible to the crew as the aircraft simulator turns from

downwind through base onto final approach. New pilot checkouts and familiarization of veteran crews with new route destinations are conveniently accomplished.

VITAL II uses a computer-generated image to create an accurate out-the-window nighttime view of any and all airports. A compact, self-contained system, it is easily installed right in the cockpit simulation room with minimum interruption in training during installation and no requirement for additional staff.

Fuel savings are now added to cost savings, safety, and faster training as benefits of the new technologies permitted by digital simulation. The FAA is accelerating the implementation of new training regulations which will permit even greater use of simulation. Growth versions of VITAL II are being tested to continue these advances.

VITAL II installations are now operating in Canada and Europe as well as in the U.S. Eleven carriers and the U.S. Navy have already ordered VITAL II for 24 simulators, offering training on McDonnell Douglas DC-8, DC-9, DC-10, Boeing 707, 727, 737, and 747, BAC 111, Lockheed 1011, Dassault Falcon, and Grumman F-14 aircraft.