

MAY 1970 / \$1.25

# AIR FORCE

and **SPACE DIGEST**

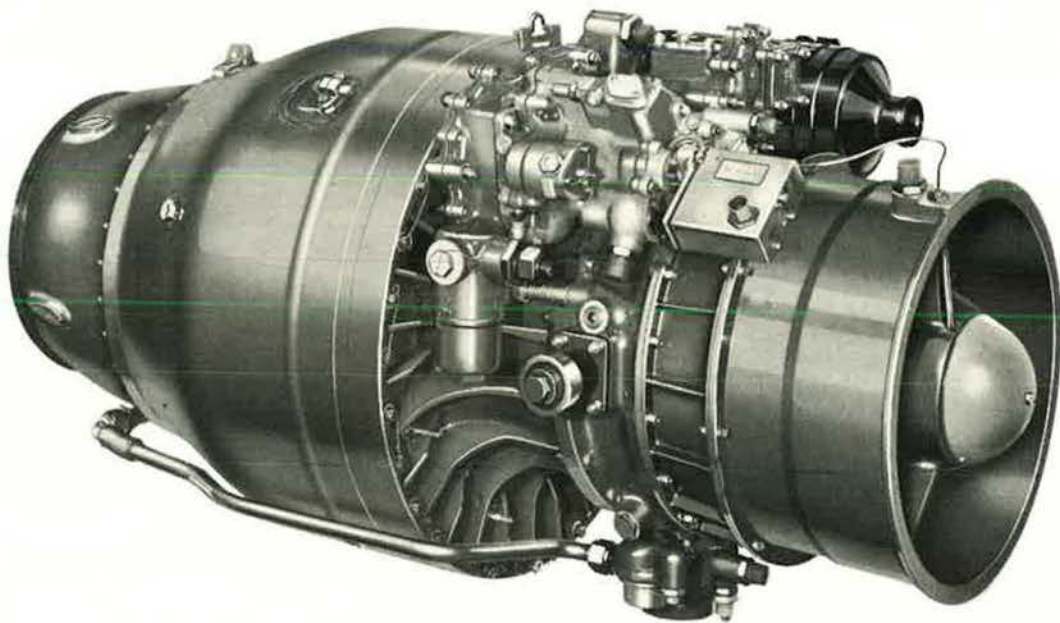
*The Magazine of Aerospace Power* / *Published by the Air Force Association*



*—F-4s Over Southeast Asia. A painting by Keith Ferris from the Air Force Art Collection*

**20th Annual  
Air Force  
Almanac**

# the power behind the drone



Our YJ69-T-406 turbojet engine has successfully completed its flight test program in the supersonic Firebee II target drone. The BQM-34E reached a speed of Mach 1.1 at sea level and Mach 1.5 at 60,000 feet. This same engine will also power the BQM-34F.

Naturally, we're proud of this performance. But it sure didn't come as any big surprise. We've been producing turbojet engines for unmanned aircraft ever since 1956. Of course, in those

days our name was Continental Aviation and Engineering (CAE).

Today our name is Teledyne CAE. But guess what. We're still the same people who've been producing turbojet engines for unmanned aircraft ever since 1956.

 **TELEDYNE CAE**

1330 LASKEY ROAD • TOLEDO, OHIO 43601

Boeing:  
 serving the nation  
 in defense and  
 space exploration.

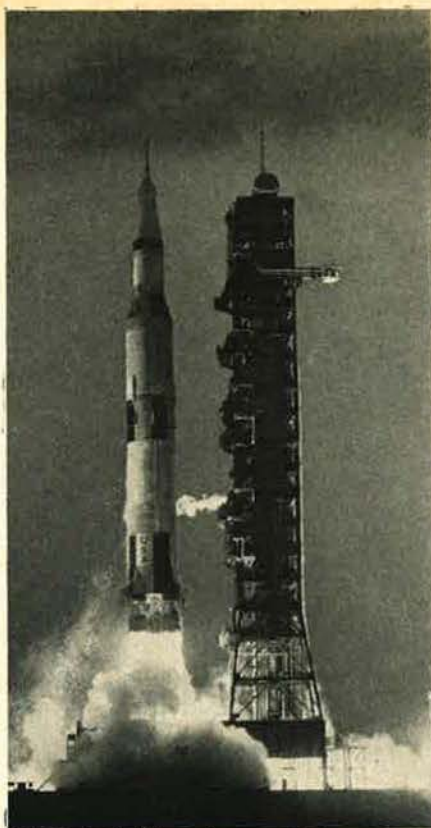


Boeing helicopter

Twin turbine helicopters, built by Vertol Division, are deployed to Vietnam. They serve with U.S. Army, Navy, Marine Corps.

**Burner II**, USAF's new Boeing-built upper stage vehicle, is smaller, less costly than other upper stages. It's applicable to almost all USAF launch vehicles, also scientific experiments, weather, navigation or communications satellites.

NASA's Apollo/Saturn 5 moon rocket, largest, most powerful in world, launches Americans on voyages to the moon. Boeing builds the first-stage booster, integrates Saturn 5 with Apollo command, service and lunar modules, and

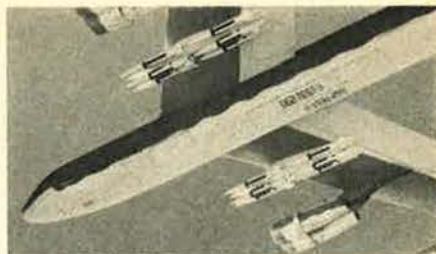


NASA's Apollo/Saturn 5 moon rocket

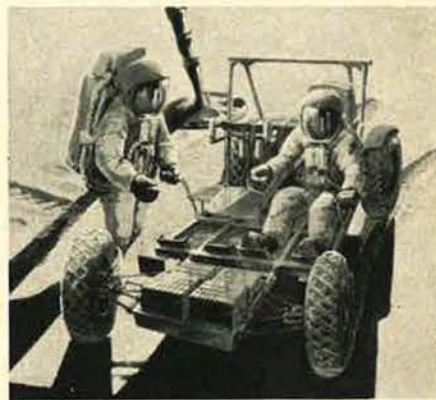
performs systems engineering, launch and integration support for NASA on entire Saturn 5 system.

**Boeing B-52** global nuclear weapons carrier and missile-launcher-bomber has demonstrated its versatility by carrying out conventional bombing missions against the Viet Cong.

**SRAM.** A Boeing B-52H is shown carrying U.S. Air Force short-range attack missiles. Now being flight tested, SRAM is an air-to-surface bomber-launched missile. It is designed to provide stand-off capability to assist in penetration of sophisticated enemy defense systems.



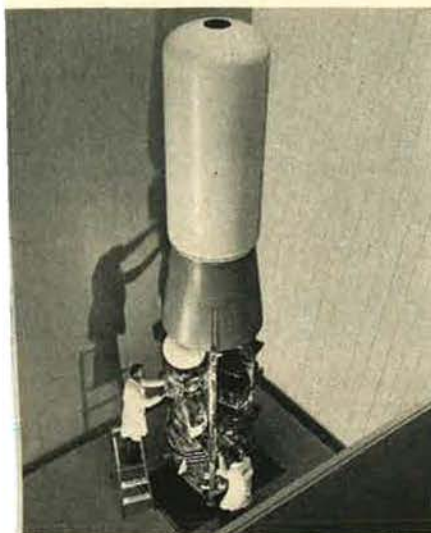
SRAM, Air Force short-range attack missile



Lunar Rover

**Lunar Rover.** Sometime in 1971, two astronauts will set off to explore the moon surface in a Boeing two-seater Lunar Rover. The vehicle, one of four now being designed and built by Boeing for NASA, will be carried to the moon in the storage bay of a manned lunar module.

**Minuteman** is U.S. Air Force's quick-firing, solid-fuel ICBM. Boeing is weapon system integrator, responsible for assembly, test, launch control and ground support systems.



Burner II



B-52 eight-jet stratofortress

**BOEING**



U.S. Air Force Minuteman ICBM



## Runways are now about a

Just like trenches, runways are static, easily identified targets. They severely limit tactical mobility.

Dependency on runways means that aircraft must operate at considerable distances from battle areas. Even so, they are still dangerously vulnerable.

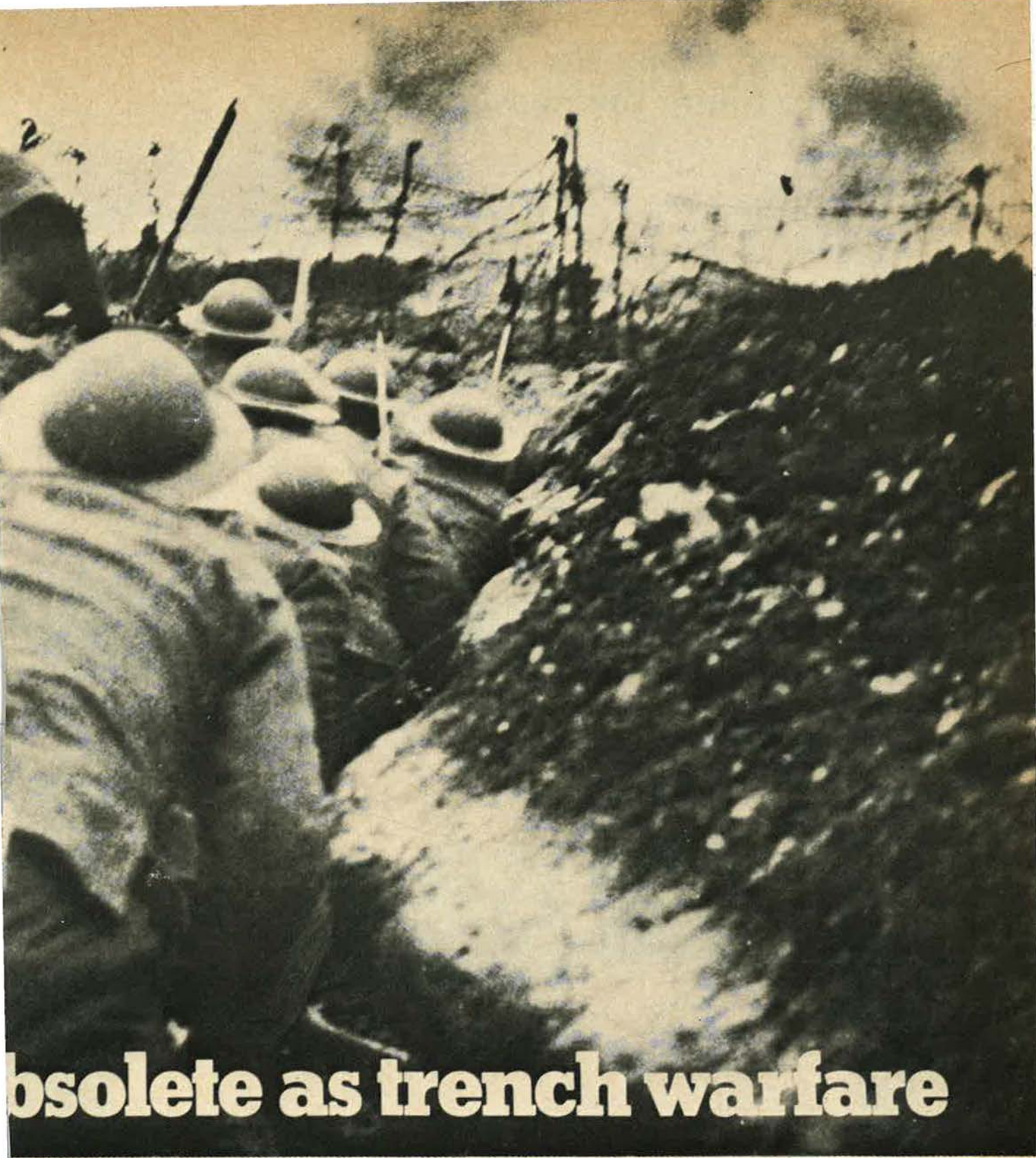
Missiles, or 'concrete dibber' bombs on the

runway, and a multi-million dollar strike force becomes so much cannon-fodder.

Alone in the world, the Hawker Siddeley Harrier vertical and short take-off and landing aircraft (V/STOL) is immune from such first strike tactics.

Its vectored thrust Rolls-Royce Bristol Pegasus engine enables it to operate in secrecy from small

 **Hawker Siddeley - the largest aerospace group in Europe**



# obsolete as trench warfare

earings. This gives it complete tactical flexibility; can deliver a 6000 lb warload from as close as miles to the battle area. And deliver faster, and with greater frequency.

The Harrier is a tactical revolution; it can mean the difference between having a strike force and not having one.



**The HS Harrier**

hmond Road, Kingston upon Thames, Surrey, England. Tel: 01-546 7741. Cables: Hawsidair, Kingston upon Thames. Telex: 23726  
wker Siddeley Group supplies mechanical, electrical and aerospace equipment with world-wide sales and service

# While exploring the Data Age, we found the missing link.

It's a digital communication terminal called the AN/UYA-7.

You don't know you need it till you use it.

Then you discover something fast: You've got more information and fewer foul-ups than ever before.

You've found the missing link in command and control communication.

**What's so hot about the UYA-7?**

Look at it this way: What's your big communication problem?

**Weather?** The UYA-7 gets your message through electrical storms when other systems won't.

**Range?** The UYA-7 talks directly

from outpost to outpost or continent to continent.

**Accuracy?** Imagine a data terminal that's practically goof-proof. That's what the UYA-7 amounts to. Has error detection and correction. Provides a record copy. Nothing's lost in translation.

**Speed?** Data rate ranges from 75 to 2,400 BPS.

**Compatibility?** The UYA-7 will work with other data-link systems like AUTODIN, with airborne navigation systems, communications satellites, modems and I/O equipment.

**Mobility?** UYA-7 weight and volume are one-fourth that of compar-

able equipment. Install the terminal in a jeep, plane, or ship. A suitcase version is man-transportable.

**Commonality?** The UYA-7's add-on modules give you exactly what you need: A jeep installation, a semi-permanent terminal, or a major control center for a large operation.

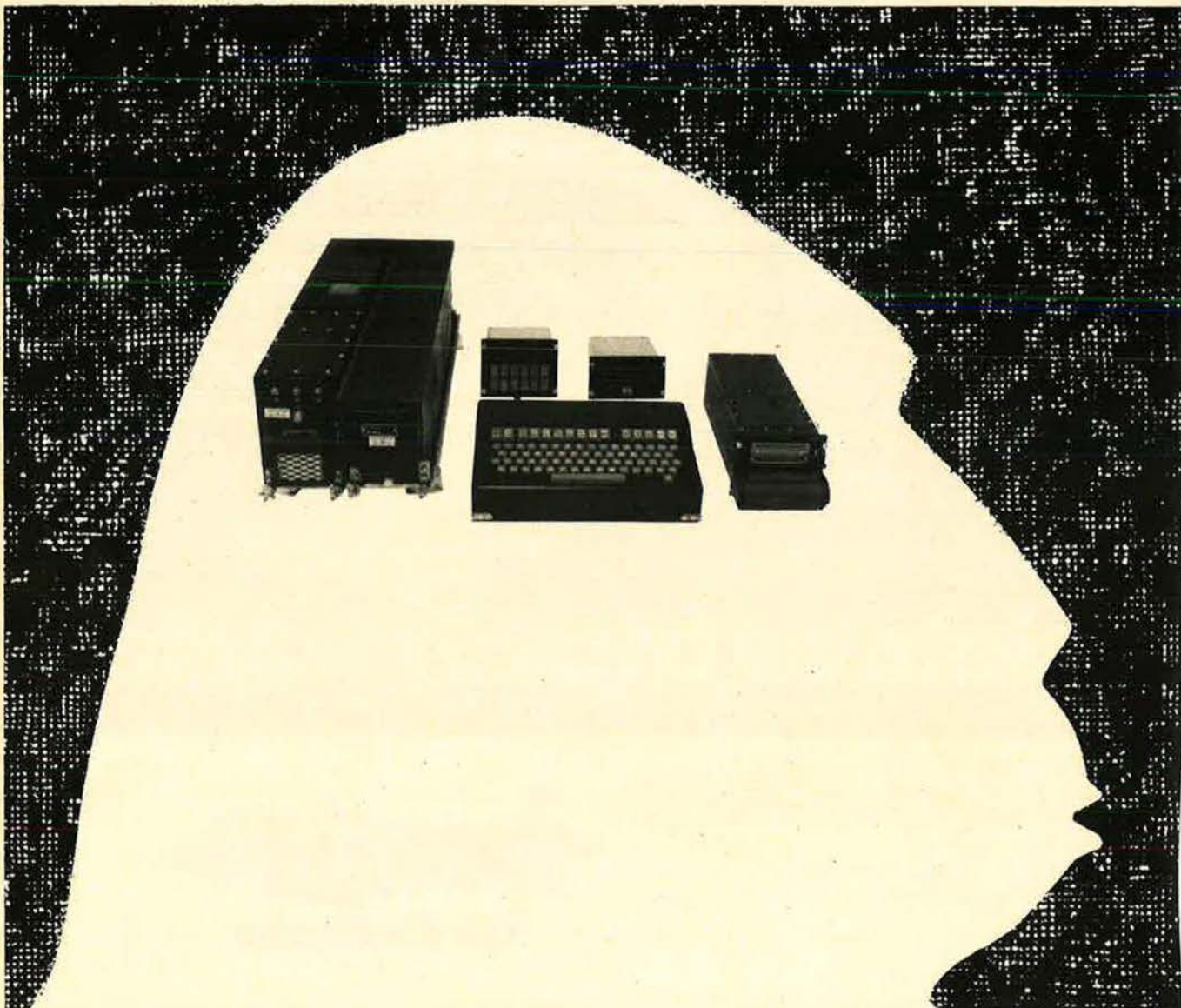
Sure it's hard to believe.

But the AN/UYA-7 is operating now in Southeast Asia. And you can see a demonstration. At NAECON, 18 to 20 May, or at AFCEA, 2 to 4 June. Or call us and we'll arrange a special show.

After all, you don't know how much you need it till you use it.

**LTV ELECTROSYSTEMS, INC.**

**GARLAND DIVISION**  
P. O. Box 6118 / Dallas, Texas 75222 / 214-276-7111



JAMES H. STRAUBEL  
Publisher

JOHN F. LOOSBROCK  
Editor and Assistant Publisher

**EDITORIAL STAFF**

1750 Pennsylvania Ave., N. W.  
Washington, D. C. 20006

Richard M. Skinner, Managing Editor

Claude Witze, Senior Editor; William Leavitt, Senior Editor/Science and Education; John L. Brisbee, Senior Editor/Plans and Policy; William P. Schlitz, News Editor; Edgar E. Ulsamer, Associate Editor; J. S. Butz, Jr., Technical Editor; Jackson V. Rambeau, Military Affairs Editor; Don Steele, AFA Affairs.

Philip E. Kromas, Art Director

James Keaton, Assistant Art Director

Mary Bixiones, Production Manager

Editorial Assistants: Nellie M. Law, Peggy M. Crowl, Joanne M. Miller, Pearlle M. Draughn, Kay Colpitts, Catherine L. Bratz.

Erving Stone, West Coast Editor, 10000 Santa Monica Blvd., Los Angeles, Calif. 90067 (213-787-1530). Stefan Geisenheyner, Editor for Europe, 6200 Wiesbaden, Germany, Wilhelmstr. 12a, Apt. 123.

**ADVERTISING DEPARTMENT**

Charles E. Cruze, Advertising Director, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006 (202-298-9123).

Mary Bixiones, Production Manager; Joanne M. Miller, Production Assistant, Suite 400, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006 (202-298-9123).

**EASTERN SALES OFFICE:** Douglas Andrews, Jr.; John Hemleb, Regional Mgr., 112 E. 40th St., New York, N.Y. 10016 (212-687-3544).

**MIDWEST:** James G. Kane, Mgr., 3200 Dempster St., Des Plaines, Ill. 60016 (312-296-5571).

**WESTERN:** Harold L. Keeler, West Coast Mgr., 10000 Santa Monica Blvd., Los Angeles, Calif. 90067 (213-878-1530). **SAN FRANCISCO:** William Coughlin, Mgr., 420 Market St., San Francisco, Calif. 94111 (415-421-0151). **UNITED KINGDOM AND EUROPE:** R. A. Ewin, European Sales Director, 20-23 Holborn, London CI, England (01-242-7484). **FAR EAST:** Yoshi Yamamoto, Regional Mgr., P.O. Box 410, Central Tokyo, Japan (535-6614).

**AFA** AIR FORCE Magazine and SPACE DIGEST is published monthly by the Air Force Association, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006 (phone Area Code 202, 298-9123).

PRINTED IN USA, by McCall Corporation, Dayton, Ohio. Second-class postage paid at Dayton, Ohio. Photogravings by Southern & Lanman, Inc., Washington, D.C.

TRADEMARK registered by the Air Force Association. Copyright 1970 by the Air Force Association. All rights reserved. Pan-American Copyright Convention.

ADVERTISING correspondence, plates, contracts, and related matter should be addressed to AIR FORCE/SPACE DIGEST, Advertising Hq., Suite 206, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006.

EDITORIAL correspondence and subscriptions should be addressed to Air Force Association, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006. Publisher assumes no responsibility for solicited material.

CHANGE OF ADDRESS: Send old and new addresses (including mailing label from this magazine), with ZIP code number, to Air Force Association, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006. Allow six weeks for change of address to become effective.

MEMBERSHIP RATE: \$7 per year (includes \$6 for one-year subscription to AIR FORCE/SPACE DIGEST). Subscription rate—\$7 per year, \$8 foreign. Single copy 60¢. Special issues (Spring and Fall Almanac Issues), \$1.25 each.

DELIVERED COPIES: Send notice on Form 3579, Air Force Association, 1750 Pennsylvania Ave., N.W., Washington, D. C. 20006.

# AIR FORCE



## and SPACE DIGEST

The Magazine of Aerospace Power  
Published by the Air Force Association



VOLUME 53, NUMBER 5

MAY 1970

### — TWENTIETH ANNUAL AIR FORCE ALMANAC —

Seed Corn for Survival / AN EDITORIAL BY JOHN F. LOOSBROCK 8

Air Force Almanac / A DEDICATION 37

The Growing Soviet Threat and What To Do About It  
BY ROBERT C. SEAMANS, JR., SECRETARY OF THE AIR FORCE 38

Quality Is the Key to Force Effectiveness  
BY GEN. JOHN D. RYAN, CHIEF OF STAFF, UNITED STATES AIR FORCE 42

Office of the Secretary of the Air Force  
AN AIR FORCE MAGAZINE PHOTOCHART 49

United States Air Force Command and Staff  
AN AIR FORCE MAGAZINE PHOTOCHART 50

USAF—Worldwide and Beyond / AN AIR FORCE ART PORTFOLIO 70

#### Reports from USAF's Major Commands and Separate Operating Agencies

STRATEGIC AIR COMMAND 52 HQ. COMMAND USAF 108

US AIR FORCES IN EUROPE 56 USAF SOUTHERN COMMAND 110

PACIFIC AIR FORCES 64 AF COMMUNICATIONS SERVICE 112

MILITARY AIR COMMAND 73 USAF SECURITY SERVICE 119

AF SYSTEMS COMMAND 77 US AIR FORCE ACADEMY 121

AF LOGISTICS COMMAND 82 AIR FORCE RESERVE 124

TACTICAL AIR COMMAND 86 AIR NATIONAL GUARD 127

AIR UNIVERSITY 93 OFFICE OF AEROSPACE RESEARCH 130

AIR TRAINING COMMAND 96 ACCOUNTING & FINANCE CENTER 132

AEROSPACE DEFENSE COMMAND 100 AIR RESERVE PERSONNEL CENTER 134

ALASKAN AIR COMMAND 104 DATA SYSTEMS DESIGN CENTER 136

AERONAUTICAL CHART & INFORMATION CENTER 138

#### A Gallery of USAF Weapons / BY ALLAN R. SCHOLIN

THE LAUNCH VEHICLES 140 ATTACK AND OBSERVATION 148

THE MISSILES 141 THE CARGO PLANES 150

THE BOMBERS 144 THE TRAINERS 153

THE FIGHTERS 146 THE HELICOPTERS 154

THE UTILITY AND EXPERIMENTAL AIRCRAFT 155

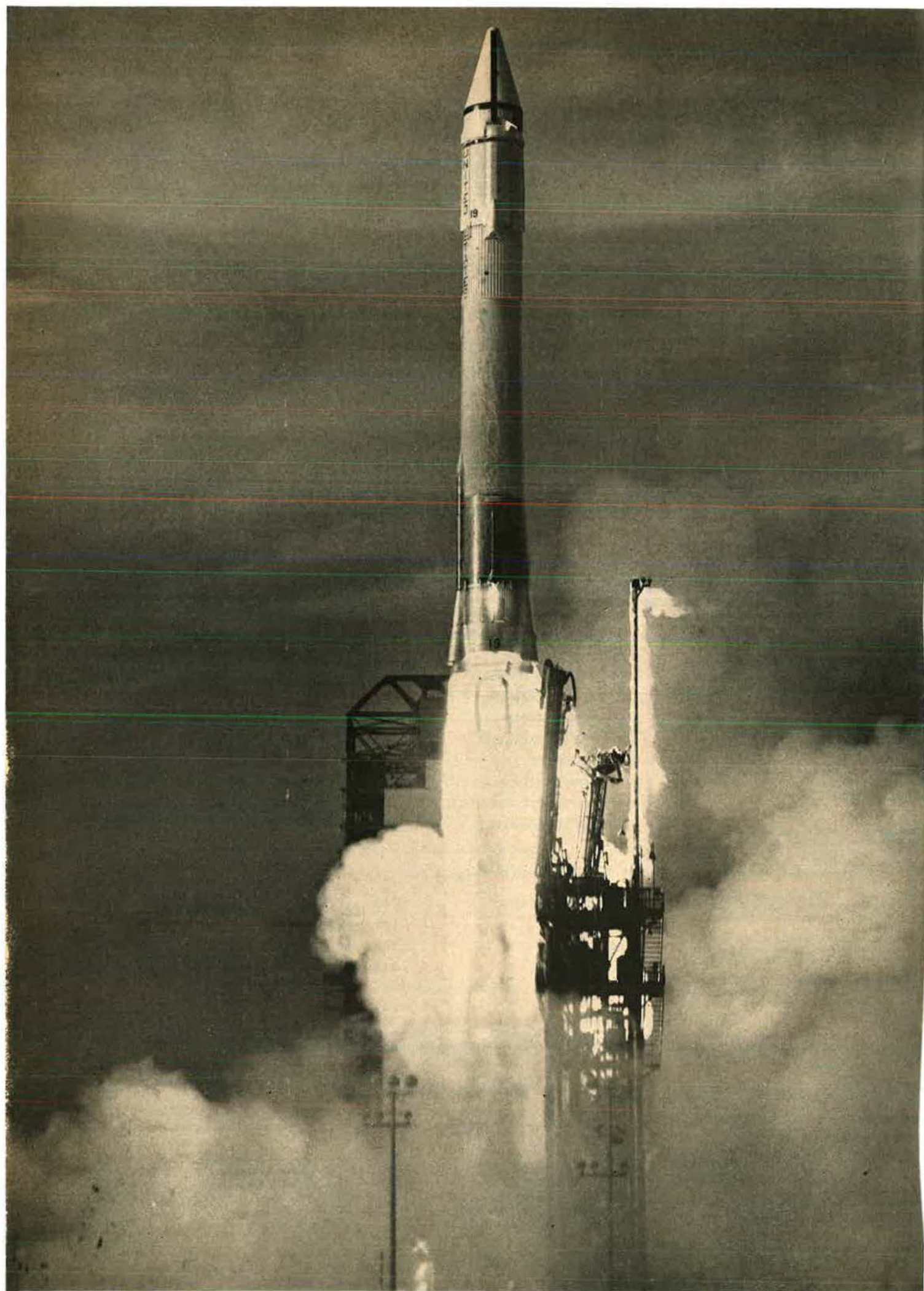
AIR FORCE Magazine's Guide to Air Force Bases 163

Major Active Air Force Installations in the United States  
AN AIR FORCE MAGAZINE MAP 168

USAF's Major Installations Overseas 173

#### DEPARTMENTS

Airmail ..... 12 New Books in Brief ..... 178  
Airpower in the News ..... 19 The Bulletin Board ..... 180  
Aerospace World ..... 24 Senior Staff Changes ..... 182  
Index to Advertisers ..... 32 AFA News ..... 186  
AF Museum's New Home ..... 157 This Is AFA ..... 191  
Airman's Bookself ..... 176 There I Was ..... 194





# It will keep on outdoing itself through the 1970's.

General Dynamics will probably build a more versatile space vehicle one day. But right now, our Convair division's Atlas-Centaur stands all alone in bringing off the tough, varied jobs assigned to it.

## **Designed as an ICBM**

Versatility was bred into Atlas from the start. Developed as an ICBM, it proved capable of launching human payloads—the Mercury astronauts—into earth orbit years ahead of any other U.S. booster.

In all, Atlas has logged more than 380 launches. And with Centaur, the nation's first high-energy upper stage, it has thrust seven Surveyors to the moon and two Mariners toward Mars.

With a record like this, Atlas-Centaur has now been selected to boost the INTELSAT IV series of communications satellites into orbit beginning in 1971.

## **What's next?**

Proved reliable, accurate and cost effective, Atlas and Centaur, working together or in combination with other launch vehicles or upper stages, will boost new astronomical satellites into earth orbit, send interplanetary missions to Venus, Mercury and Mars, and send the first U.S. spacecraft to Jupiter.

General Dynamics' commitment to continuing work on a variety of space programs includes not only Atlas and Centaur, but scientific satellites, reusable space transportation, space experiment modules, and expandable space antennas as well. At General Dynamics we put technology to work solving problems from the bottom of the sea to outer space...and a good bit in between.

## **GENERAL DYNAMICS**

1 Rockefeller Plaza, New York, N.Y. 10020

# Seed Corn for Survival

By John F. Loosbrock

EDITOR, AIR FORCE/SPACE DIGEST

**W**E SPENT the years of the Great Depression growing up in a small town in southern Iowa. Among the most vivid of our recollections are those years when the cruelties of nature compounded the cruelties of a broken-down economic system—when there not only was no money, there was no rain, and the chinch bugs and the grasshoppers ate up what little corn survived the burning droughts. This was in the days before science had come up with standardized hybrid seed corn, and a farmer had to pick out the best ears from his puny crop to save for next year's planting.

Those were desperate times, and the nadir of desperation was when you had to use your precious seed to keep your animals alive over the winter and only hope that you could beg or borrow more when plowing and planting time came along next spring. If you lost your seed corn, you'd had it. Seed corn was synonymous with survival; the lack of it spelled disaster.

In these more prosperous but no less dangerous days, the seed corn of national survival is research and development. There is ample evidence that the United States is neglecting its future crop of technology, not from necessity, as did the desperate farmer, but from choice. This is bad, in and of itself. It is doubly bad when one realizes that the R&D growth rate of our Soviet competitors is continuing to climb while that of the United States has turned downward.

Over the past ten years the Soviet research and development rate of growth has averaged between ten and thirteen percent per year. Over the same period the R&D growth rate in the United States has hovered at around four percent. This is barely enough to offset inflation, and in the past two years the trend actually has turned downward. In more absolute terms, this year the Soviets are investing between \$16 and \$17 billion in defense-related research and development. The United States is investing between \$13 and \$14 billion.

Granted, the Soviets had some catching up to do. Ten years ago the US R&D activity level was much higher than was theirs. But when one looks at what they got for their R&D rubles in present-day capability, the future harvest they can reap from today's bigger investment becomes a very legitimate cause for concern indeed. As Air Force Secretary Seamans points out on page 38 of this issue, already the Soviets have not only more intercontinental missiles than we do but also a wider range of missile capability with more than twice as much missile-payload capacity. At the moment only SAC's aging bomber fleet gives us any strategic edge at all.

The point is that the Russians got this strength from a relatively low research and development effort of a decade

ago. Secretary Seamans says, "It takes a long time for R&D to be translated into weapons. But if the Soviet Union is successful in adding technological superiority to its growing strategic programs, our national security could be severely jeopardized." We'd put it even stronger. If the Soviet research and development effort continues to grow and that of the United States continues to shrink, there must come a point at which both technological superiority and strategic superiority will inevitably pass to the USSR.

There are those who say that this is not important, that our first responsibility is to improve the quality of life in our own country, that the Soviets will not be any more interested in using their superior strength to blow up the world than we have been. And all this might be true if one viewed the two countries—and their politico-economic systems—as not very different after all, as mirror-image benevolent despotisms with basically the same goals for their peoples and for the world.

Those who hold this view generally are those who believe, often with sincerity, that the American military-industrial complex is a greater danger to ourselves than is the Soviet military-industrial complex; those who would obtain domestic tranquility at the expense of national security; who would abandon friends and allies to political, economic, and military domination by the Soviets if that is what it took to make American air purer and American water sweeter.

But the quality of life, which we hear so much about, is more than clean air, clear water, good housing, secure jobs, improved education, social justice, and all the good things we have not yet fully achieved in the United States. Sweden has many of these, we are told, and yet has the highest suicide rate in the world. There is more to quality of life than creature comforts.

It is simplistic and even chauvinistic, in our view, to seek the good life for Americans today while risking the loss of it for ourselves, and the chance of it for the rest of the world, in the future.

What it all boils down to is whether Soviet military superiority over the United States is a good thing or a bad thing, whether we can improve the quality of American life in a physical sense without also protecting the political environment that makes the good life both possible and worthwhile. We happen to think that the Soviet threat is as real as the filth in the Potomac.

The question is not one of the good life *or* security; it is a question of both. Asking the American people to make an either/or choice is more than unfair. It is asking them to take a long road toward the twilight of what still is man's best hope for everything that the word "humanity" signifies.—END



# This 20 Watt Solid State 3500 Channel UHF Transceiver...



*keeps your system options open.*

#### **CM-520: 20 WATT, 3500 CHANNEL TRANSCEIVER.**

An advanced design, 5000 hour MTBF, completely solid state, 20 watt transceiver, the 19-inch rack mounted CM-520 weighs only 65 lbs. and is equally suitable for fixed or mobile installations. Any 24 of the 3500 50kHz spaced channels may be preset for automatic tuning.

#### **OPTION 1: 40 WATT, 3500 CHANNEL TRANSCEIVER.**

Need 40 watts of transmitter output power? A solid state plug-in amplifier does the job without changing in any way the appearance or the basic circuitry of the CM-520.

#### **OPTION 2: 3500 CHANNEL RECEIVER.**

Want a separate or additional multichannel UHF receiver in its own package? A repackaged version of the CM-520 receiver section fills the bill.

#### **OPTION 3: 20 WATT, 3500 CHANNEL TRANSMITTER.**

Want a multichannel UHF transmitter to work in combination with option #2? We have repackaged the transmitter portion of the CM-520 as a separate unit.

#### **OPTION 4: 40 WATT, 3500 CHANNEL TRANSMITTER.**

Need 40 watts of power in a multichannel transmitter? We add the plug-in solid state amplifier from option #1 to option #3 and there you are.

To find out more about Motorola's complete family of VHF/UHF equipment write or call Communication Systems Office, 8201 E. McDowell Rd., Scottsdale, Arizona 85252, phone (602) 949-2798

**Take delivery 30 days A.R.O.**



**MOTOROLA**  
**Government Electronics Division**

VISIT OUR BOOTH AT AFCEA

Now for the U. S. Air Force

# The Twin-Engine Huey

Here's the start of a new generation . . . it's the UH-1N Twin-Engine Huey—destined to see service in the U. S. Air Force, the U. S. Navy, the U. S. Marine Corps and the Canadian Armed Forces.

With 7,500,000 fighting hours behind its proven airframe design this new Huey follows the Bell tradition in ease of maintenance and its twin pac insures higher mission completion reliability.

Power? The "N" utilizes the Pratt and Whitney T400CP400 Turbo "Twin Pac" Engines in this series power over 1100 corporate and commuter turbo-prop twins.

The package of two turboshaft power sections coupled to a single output combining gearbox delivers 1,800 SHP flat-rated to 1,250 SHP for takeoff and 1,100 SHP for continuous operation.

One engine can deliver 900 SHP for 30 minutes or 765 SHP continuously—plenty to cruise, even at max gross weight.

In passenger configuration—13 plus 2 pilots. As a cargo ship—220 cu. ft. interior or external load of 4,000 lbs.

Missions? Special operation forces—local base rescue—VIP transport—med/evac—utility transport—command and control—and with versatility enough for many others.

The Huey's big brother—this Huey Twin—is the proud start of a new generation; destined by the services to do its job in the Bell tradition.

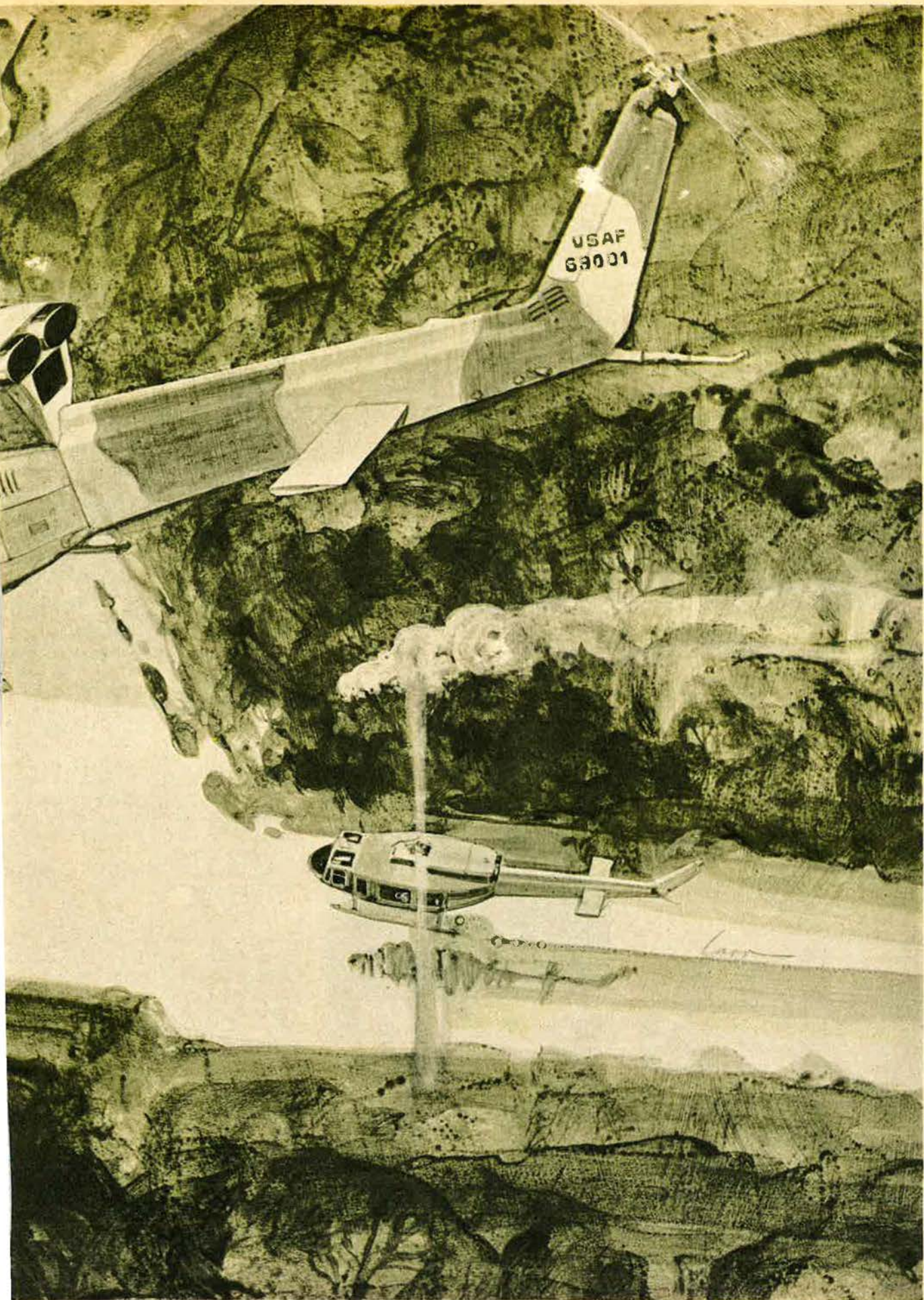
*The UH-1N— from the combat know-how generation of Bells.*



**BELL HELICOPTER**

Fort Worth, Texas • A **Textron** Company





USAF  
69001

Lynn



## "Chappie's" New Role

*Gentlemen:* Bravo on the article on General "Chappie" James [March issue]. It sounds like we put the right man in the right job. Let's hope that he's allowed to get very *public* because that's his forte. Number one, he'll tell it straight, something we need more of, and two, he has the charisma that it takes to be symbolic.

He's got a big job—we all have—so, as the "cat" said, "Let's all work a little harder and participate a little more."

LT. COL. W. SCHWEISFURTH  
San Antonio, Tex.

## Dunham, not Durham

*Gentlemen:* It is unfortunate that in noting the closeout of the distinguished career of Brig. Gen. William D. Dunham (March issue, page 25) your fine publication could not have demonstrated greater familiarity with General Dunham by spelling his name properly.

Just thought you'd like to know.

ROBERT F. BROOKS  
Information Officer  
Hq. 63d MAW  
(MAC)  
Norton AFB, Calif.

• *An unfortunate typo. Proof that we know better was demonstrated on page 30, same issue, in "Staff Changes," where we did manage to spell General Dunham's name correctly.—THE EDITORS*

## AC-119 Project

*Gentlemen:* Your February article by Maj. William R. Casey ["AC-119: USAF's Flying Battleship"] was well written and a welcome sight. It was more timely than you may have realized as the total Gunship III program was two years old in February. While the planning started in late 1967, the contract was let to Fairchild Hiller Corp. on February 17, and modified aircraft were first delivered in May, less than 100 days later.

Less than eleven months after the go-ahead, the AC-119G was in combat halfway around the world. Only twenty-one months elapsed for the first K to enter combat. Both aircraft have compiled an outstanding record in their respective efforts.

Therefore, you see, WRAMA is particularly proud of these aircraft, for the AC-119 is a totally WRAMA-managed effort. The aircraft is unique in this respect in that we borrowed some ASD Gunship II (AC-130) technology and systems and created the AC-119 completely in-house. This is a first for AFLC and an AMA on a project of this magnitude.

MAJ. KENNETH B. RICHARDSON  
C-119 System Manager  
Hq. WRAMA (AFLC)  
Robins AFB, Ga.

## Not a General's Decision

*Gentlemen:* Once again AIR FORCE/SPACE DIGEST has chosen to propitiate its reputation as the hard-line service-related journal. John L. Frisbee's editorial in the March edition ["The Mythical Menace of Militarism"] is characteristic of this tradition.

Critics who comment on American society's militarism are lamenting not civilian adulation or imitation of the



Where are these men now? The three mechanics of the 418th Squadron, 100th Bomb Group, Eighth Air Force, were stationed at Thorpe Abbots, England, in August 1944. From left to right they are "Slim," "Pop," and "Shorty." Their plane, *Royal Flush*, piloted by Lt. Alf Aske, was shot down at Villacoublay, France, near Paris, on August 11, 1944—about a week after this photo was taken. Lieutenant Aske and three crew members were killed. The crash was witnessed by a young Frenchman, Léon Croulebois, who has recently contacted some of the survivors and is now anxious to correspond with anyone else connected with *Royal Flush*. Send information to AF/SD's Managing Editor.

military. Rather, they are concerned for the most part with the (some would say disproportionate) economic weight that the services wield. With so many businesses as dependent as they are on military contracts and guaranteed markets, the fear is that a general's decision may influence much more than the defense posture of this country; it may play havoc with our economy.

Some argue that there is a growing interdependence between the military and corporate sectors of our society, visible on an obvious level when retired generals are hired as salesmen because of their service contacts. Even more crucial are the instances when retired officers are hired for administrative positions based on their demonstrated prowess—in the military context. Is it not conceivable that they will attempt to establish in the business world methods familiar to them, methods which will be passed on to their subordinates?

The weakness inherent in an economy such as ours, which is heavily beholden to the military for much of its health, is clear. What should be equally clear is that although the militarism which Mr. Frisbee so aptly describes is not presently a threat, it could very well become one if the merging of military with economic interests continues.

LT. ALEX. P. MAVRO, JR., AFRES  
Gainesville, Fla.

• *Generals do not make the kinds of decisions that Lieutenant Mavro apparently has in mind. Their recommendations on strategy, weapons requirements, and procurement practices are subject to approval by civilian superiors in the military departments, the DoD, the Administration, and finally by elected representatives in Congress who control the purse strings. So long as our system of government, with its checks and balance, and civilian control of the military (and with a free press) remains substantially unaltered, it's difficult to see how American society could become dominated by the military unless it chooses. Hence, the issue essentially is one of civilian attitudes, which*  
(Continued on page 15)

**A program  
manager  
understands  
our kind of  
systems  
support.**



Tough administrative and technical decisions are a program manager's way of life. That's something we understand. That's where we can help.

Our role is to furnish the program manager with decision-making criteria to enable him to:

*Formulate a basic concept and develop overall systems specifications, scheduling and cost.*

*Coordinate technical progress and monitor cost and schedule performance of suppliers.*

*Integrate the individual components of the total system and determine specification compliance.*


*Establish logistics, maintenance and training requirements.*

*Secure complete technical documentation: writing, editing, graphics and reproduction services.*

Vitro maintains complete computer, laboratory, shop, graphics and publications facilities staffed to support an entire program or any specific phase or subsystem. For complete information contact: Joseph C. Kinsey, Vitro Laboratories, 14000 Georgia Avenue, Silver Spring, Maryland 20910.



Arms Length Objectivity: Because Vitro does not supply production hardware, the program manager can be sure of completely objective analyses and unbiased judgments with regard to the hardware used in the program.

Systems support is a function of  
AUTOMATION INDUSTRIES 

**WE CAN  
HELP KEEP  
THE RED,  
WHITE AND  
BLUE IN  
THE BLACK.**

Whatever your branch and function, efficient communications can help you stay within budget. The reason: Efficient communications can save unbelievable amounts of time. And with today's manpower costs, time saved in your operation—and your procurement—can mean tremendous dollar savings.

As the most experienced practitioner in the field of communications, we have hundreds of examples of time saved in all kinds of operations—from single phones in better locations to entire communications systems.

Call us so we can agree on the best time to talk with you about time. In the meantime, may we suggest you read our column on the facing page.



## What we can do to help balance our budget

Every branch of the Federal government has found it can save time, effort and money by going to the Bell System first with any communications problem.

There are at least six good reasons why:

**Variety of Services Offered:** No other company can begin to match the variety of services offered by the Bell System—from single phones to complete nationwide communications systems—voice, written, drawn and specialized data. And we are constantly updating our network for even greater efficiencies.

**Versatility of Network:** Every day our customers find new ways to make our nationwide transmission network more useful and economical. Next year, for example, service over our switching network will accommodate higher bit-rate data transmission—all the way up to a 50,000 bit-rate level. Thus, lower costs, higher bits.

**Total Service Offered:** The Bell System offers a complete communications service—everything from the terminal facilities to the transmission network that carries the information. We are concerned with your total communications system.

**Savings:** Because you can subscribe to services from the Bell System, rather than buy equipment, you can avoid major capital investment. Also the network facilities—and thus your communications—are updated as Bell System technology advances.

**Maintenance:** We maintain all of the terminal equipment we provide, including replacement if necessary, at no additional cost. And since we also provide the network transmission service, our people are just as eager to keep equipment on the line as you are.

**Experience:** As the most experienced communications company in America, we have an outstanding record—in operations, research and manufacturing.

Before you make a decision about new or modified communications, please let us talk with you. No charge, no obligation. We'd just like you to know what we can do for you.



## AIRMAIL

CONTINUED

*certainly are not militaristic. And neither is the attitude of the military.*

*The defense budget clearly has tremendous impact on the American economy. That is not a matter of whim or intrigue, but rather of necessity. The dangers the lieutenant suggests are not newly discovered. They have been the subject of extensive preventive legislation. One example: Retired military people are prohibited by law from selling to any agency of the DoD.—THE EDITORS*

### WW II Bombing Raid

*Gentlemen:* As an avid reader of your magazine I was surprised at the gross inaccuracy of the picture caption on page 24 of the March issue.

This is a very famous photo taken of a bombing attack on *Dagua* air-drome in New Guinea on February 3, 1944, by the 501st Bomb Squadron, 345th Bomb Group—not Clark Field.

As my son says, "Everybody makes mistakes!" Please, not you! Let's not let time distort history.

NATHAN GOLDMAN  
(345th Bomb Group)  
El Paso, Tex.

• *You're right, of course. We were caught off base by faulty caption material furnished by Hq. PACAF, in their release of January 23, 1970. Needless to say, we've passed the word on to PACAF.—THE EDITORS*

### The Crowded Skies

*Gentlemen:* I read with interest the article, "Room Enough to Fly," by Associate Editor Edgar E. Ulsamer. Without any question, one of the problems facing both the DOT and the DoD is the wise and efficient use of premium airspace. Certainly some segregation of airspace by aerodynamic performance, pilot proficiency, or avionics capability is now accepted as inevitable by all the thoughtful planners in both the defense and civil community.

The financial burden of complying with the FAA's "ticket of admission to controlled airspace" is being accepted by the general-aviation community with essentially the same combination of reluctant good grace as Mr. Ulsamer describes for the Department of Defense—"unstinting and costly." About 8,000 of the 30,000 military aircraft, or 26.6%, are reported to have been equipped with identity-code capability to comply with FAA requirements. About 35,000 of the 125,000 estimated units in the general-aviation active fleet have been equipped with the same expanded

transponder identity-code capability to date, or a penetration of our fleet of some twenty-eight percent.

It appears probable that some residue of both the defense and general-aviation fleets will never be equipped—primary trainers, crop dusters, etc. But it is interesting to note that through completely different disciplines we are achieving about the same rate of compliance with ground rules which appear to be realistic and justified.

G. V. QUINCY, Vice President  
NARCO AVIONICS, Division of  
NARCO Scientific Industries  
Fort Washington, Pa.

*Gentlemen:* . . . I cannot help but feel more than a little concerned with regard to the article entitled "Room Enough to Fly," by Edgar E. Ulsamer, in the March issue. . . .

I have no quarrel with the apparent trend toward requiring increased pilot proficiency for flight in high-density traffic areas. I find that the majority of my high-proficiency pilot acquaintances agree with the need for increased competence requirements.

In the light of the disturbing anti-military movement now burgeoning in this country, especially on university campuses, a request for more airspace from the military is not quite reasonable. Not only does this furnish fuel for the fires these people seek to build under our system of democratic free enterprise, [but] such a demand goes against the grain of all civilian pilots and aviation-related persons.

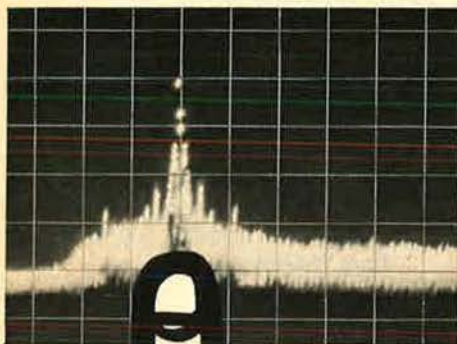
In view of the growing importance of the aviation industry to the nation, it would appear much more reasonable for the Air Force to seek practice areas in locations which interfere to the smallest possible extent with civilian air traffic. Many of the civilian pilots would like to remind you that the owners of civilian aircraft pay an outsized portion of the bills.

Somehow it seems unreasonable to suppose that there is no way for military aviation and civilian aviation to coexist without each hampering the other. The record of general aviation [does not] indicate a need for curtailment of its growth at any conceivable future time.

JOSEPH C. AINSWORTH, JR.  
Portales, N.M.

• *The article was not meant to be an evaluation of the DoD and USAF positions, but rather a straightforward report of fears expressed by qualified officials of these departments. There (Continued on following page)*

# Put your finger on It!



Find the signal that you didn't know was there with fully operational signal processing systems developed by Interstate. Higher resolution, wider frequency and dynamic ranges. We lead the state-of-the-art in very fast Fourier signal analysis. Dept. 0200, Box 3117, Anaheim, Calif. 92803 (714) 772-2811 • TWX 714-776-0280



**IEC**  
INTERSTATE  
ELECTRONICS  
CORPORATION

A Subsidiary Of A-T-O Inc.

## AIRMAIL

*was no intent to referee the general vs. commercial vs. military aviation issue. The article neither stated nor implied that the military is seeking additional airspace, and only warned of the danger of further reduction or curtailment of military airspace and ground facilities.—THE EDITORS*

### 3,000-Mile Error

*Gentlemen:* In the March issue the caption to the photo on page 13 states that the German Azur satellite was launched from Cape Kennedy. This is approximately 3,000 miles in error. The Azur was launched from Vandenberg AFB, Calif., on November 7, 1969.

The satellite was launched aboard a Scout Booster that was assembled, tested, and launched by the Standard Launch Vehicle #1 (SLV-1) Military Launch Team of the 6595th Aerospace Test Wing. The men of the team are justifiably proud of the part they played in the launch and the opportunity they had to participate in this international effort.

I'm sure you will rectify this error and give credit where credit is due.

1ST LT. ANDREW R. DONOVAN, JR.  
SLV-1 MLT  
Vandenberg AFB, Calif.

• *Thanks for calling this to our attention. We're happy to give credit where credit is due.—THE EDITORS*

### Static Militarism

*Gentlemen:* I am writing in regard to the editorial, "Survival in a Hostile Environment," by John L. Frisbee, in the February issue. I would like not only to disagree with him on several specific counts but to affirm his conclusion in a slightly different way.

First, it is oversimplification to say that the Vietnam War solved the "potential leadership problem." Quite the contrary. It only frustrated the situation further in that few future leaders remained long enough in SEA to become fully capable combat commanders. At present, the personnel policy of the Air Force insists on rotation to and from SEA as quickly as possible in order to placate emotions. I think it has only resulted in producing many young men skeptical of Air Force Staff leadership. These men may eventually come into similar circumstances as commanders but right now those prospects are very remote.

Secondly, Mr. Frisbee attributed, I think a little too heavily, the anti-military reaction today to the nation's

domestic problems. I don't think that the accusations from the public were drummed up out of thin air. Unfortunately, the military has an inherent propensity to be "reactionary, self-centered, inefficient, out of touch with the times," and, in a very general way, irresponsible. I think today's large military establishment is somewhat guilty of these traits, but I don't think the mood of the nation is cause enough to blame. The editorial itself is an example of how the military man squirms and lashes back when his sacred profession is questioned. However, this leads to where I would agree with Mr. Frisbee.

The Air Force is people and, even as the Vice Chief of Staff said in AF/SD in January, it's a young service. The pressures and mentality of our society cannot but affect these young men within the service. So it is here that the problem of the Air Force lies. "Another part of the solution is wholly in the hands of Air Force leaders who, through their own dedication, patience, and compassion must sustain *esprit* and the sense of corporate responsibility that has become an Air Force tradition." That is what is most important, but the present management concept of the USAF seems to be one of statics. These leaders today must create an atmosphere in which the young officers and future commanders can bring up their understanding of the modern society and thus with it a better public acceptance.

RANDOLPH S. REYNOLDS  
Enid, Okla.

### Biog of "Gabbie"

*Gentlemen:* I am writing the biography of Col. Francis Gabreski, and would like to hear from anyone who knows him and could supply personal recollections during his tour with the 56th Fighter Group in the ETO and the 51st Fighter Wing in Korea.

KEVIN V. BROWN  
9060 Palisade Ave. (703)  
North Bergen, N.J. 07047

### Frontal Assault

*Gentlemen:* It is most gratifying to see the efforts under way to publicize the plight of US prisoners of war in North Vietnam. I take strong exception, however, to the approach being employed. It is a sorry situation when the leadership of the strongest nation in the world must recommend that the already long-suffering wives and relatives of the POWs write letters to Hanoi, visit Paris to plead for information, and work on their own to en-

list support from the American public.

After one year of fighting the VC on the ground and another 100 missions by air over the North, I feel qualified to say that this approach to the POW problem is but another display of weakness, in keeping with the Bay of Pigs, the *Pueblo*, and our downed EC-121.

I am sorry but I shall write no pleading letters to the Communists. But I will make one more trip to Hanoi . . . by land . . . by sea . . . or by air . . . for I am your number-one volunteer to help go in and get those guys out. And I am sure that I will have lots of company.

LT. COL. ALAN G. NELSON  
FPO New York

### Friends of the 431st

*Gentlemen:* During World War II I was manager of the Ba Hotel in Fiji, 1942-44, and had the pleasure of meeting and caring for many thousands of men of the US Forces. I became particularly friendly with officers and men of the 431st Heavy Bombardment Squadron who came to Fiji as soon as they had time to lick their wounds after Pearl Harbor.

My wife and I hope to visit the United States sometime in August or September 1970 and would like to contact, if possible, some of our old friends.

I am wondering if the 431st has an Association to which I could write to ascertain the present whereabouts of men such as Bob Clifford, who came from Perth Amboy, N.J., and Charles (Tex) Defee of Houston, Tex.

Any assistance in my efforts to contact my friends of the 431st will be greatly appreciated.

C. SORENSEN  
P.O. BOX 704  
Port Moresby, Papua, New Guinea

### UNIT REUNIONS

#### Confederate Air Force

The Confederate Air Force Flying Museum, based at Rebel Field, Harlingen, Tex., will conduct its second annual "Seminar on WW II Combat Aviation," June 25-29. Some of the great names in American aviation, past and present, will attend as speakers and guests. For further information write or call

Confederate Air Force Flying Museum  
Harlingen, Tex. 78550

Phone: (512) 425-1057

#### Disabled Officers Association

The National Convention of the Disabled Officers Association will be held at the Sheraton-Biltmore Hotel, Atlanta, Ga., June 25-27. Officers interested in attending write

Disabled Officers Association  
1612 K St., N.W.  
Washington, D.C. 20006

#### 1st Air Commando Squadron

The reunion of the 1st Air Commando Squadron will be held May 22-23, at Colorado Springs, Colo. Further information from Maj. Raymond H. Armstrong  
1297 Hathaway Dr.  
Colorado Springs, Colo. 80915

Phone: home (303) 597-1269  
office (303) 635-8911, ext. 3186

#### 18th Pursuit Squadron

A reunion of the 18th Pursuit Squadron will be held in Denver, Colo., at the Cosmopolitan Hotel, 18th and Broadway, July 16-18, 1970. If you have not been located and received notice, phone Carl F. Riecke in Laramie, Wyo. (307) 745-3219, or write

William Schmidt  
Rte. 2, Box 44  
Dickenson, N.D. 58601

#### 22d Bombardment Group

The 2d, 19th, 33d, 408th, and Headquarters Squadrons of the 22d Bombardment Group, 5th Air Force, WW II, will hold a twenty-first annual reunion July 20-August 1, at Grand Hotel, Anaheim (Disneyland), Calif.

Jack A. Jones  
2476 Sierra Dr.  
Upland, Calif. 91786

Newsletter: Walt Gaylor  
105 Grove St.  
Oakland, N.J. 07436

#### 98th Bomb Group (H)

Known as "The Pyramiders," members of the 98th Bomb Group attached to the 9th and 12th Air Forces in North Africa and the 15th Air Force in Europe, 1942-45, have set July 21-23, 1970, for a reunion at Fairborn, Ohio. Former members are urged to contact

Gomer Wolf  
1 Public Square  
Mount Vernon, Ohio 43050  
or Al Schimmoeller  
Route 1  
Ft. Jennings, Ohio 45844

#### 384th Bomb Group

On July 10-12, the 384th plans to hold its second reunion at the Palmer House in Chicago. More than 300 are expected. Tex McCrary will be emcee, and Walter Cronkite, CBS News, will be the principal speaker. All former 384th personnel should write

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

Frank A. Celentano, V.P.  
(212) 344-9200

or  
Robert C. Chapin, Sec'y  
(215) 546-1383

#### 614th Bomb Squadron

The 614th Bomb Squadron (England), 401st Bomb Group, will hold a reunion in Dayton, Ohio, July 31-Aug. 1, 2. We've misplaced a few members, so please get in touch with

Edward J. Disken  
6173 Farmborough Dr.  
Dayton, Ohio 45424

# What's he going to use for security when he's seventeen?



A good education.

But college is expensive these days. And likely to be more so in the future.

That's why you should start planning now.

One of the best ways is a U.S. Savings Bond plan. When you buy Bonds, you're securing his tomorrow by investing in America today.

Bonds are easy to save. You can join a Payroll Savings Plan where you work. Or arrange a Bond-A-Month Plan where you bank.

One thing though.

If you think Savings Bonds are a get-rich-quick scheme, forget it. There are other places to make a fast buck. Or lose it just as fast.

But Bonds pay off when you'll need them, in the years to come, and at a guaranteed rate.

His future isn't too far away. But he'll need more than his blanket for security.



If they're lost, stolen, or destroyed, we replace 'em.

## Take stock in America Buy U.S. Savings Bonds



The U.S. Government does not pay for this advertisement. It is presented as a public service in cooperation with The Department of the Treasury and The Advertising Council.

# Who builds a family of turbine engines for small to medium aircraft?

Today a great need exists for engines to provide more economical and efficient propulsion for small to medium size transport aircraft.

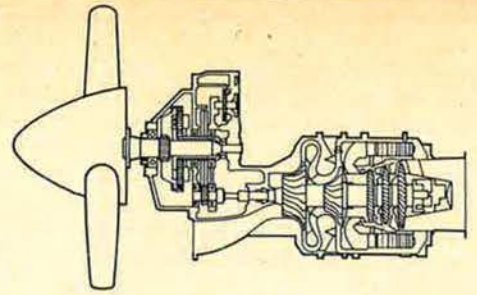
Garrett is meeting that need with its family of turbine powerplants. These engines include advanced turbofan engines from 2,700 to 8,000 pounds thrust—turboshaft and turboprop engines from 240 to 840 shaft horsepower.

Garrett is totally involved in the aircraft engine business to meet a vital need. And, of course, that goes for worldwide product support, too. The international Garrett support organization is prepared to serve customers anywhere in the world at a moment's notice.

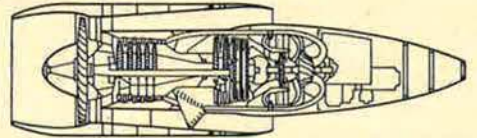


**The Garrett Corporation**

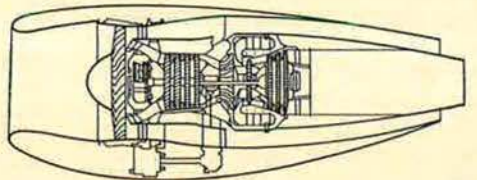
one of The Signal Companies



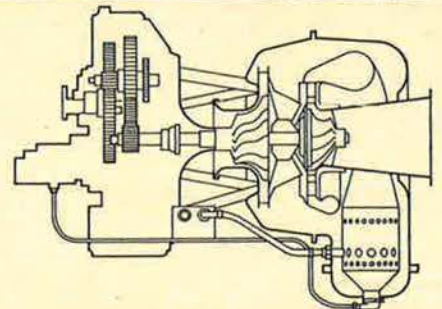
The TPE 331 turboprop has over 1½ million hours in the air.



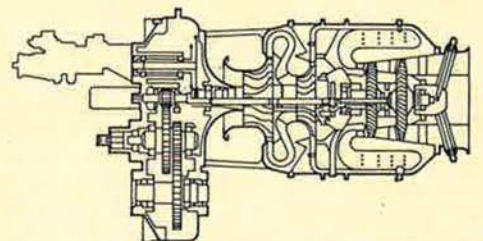
The new ATF 3 turbofan delivers a new low specific fuel consumption of 0.45.



The new TFE 731 turbofan gives 6 to 12-place compact jets longer range.



The 240 horsepower TSE 36 turboshaft provides small helicopters with smooth operation.



The TSE 231 turboshaft is designed for helicopters and provides 474 shaft horsepower.



By **Claude Witze**

SENIOR EDITOR, AIR FORCE/SPACE DIGEST

## Economy or Folly?

WASHINGTON, D.C., APRIL 13

A prominent American physicist recalled recently that in 1933 a number of Oxford University students took a pledge that they would not "fight for King and country." It was not many years later that some of them were piloting Spitfires and Hurricanes in the defense of London.

That is one example of how attitudes toward national security can be changed, quickly, by something done by another nation. It is a curious fact that here in the latter half of the twentieth century, in an era when technology has bestowed so many blessings and curses, the pendulum of our interest in technology also is sensitive to what others do. The prize example is our space program, which grew largely in reaction to achievements by the Russians. Had it not been for Sputnik, Cape Kennedy would probably still be Cape Canaveral and Walter Cronkite might not even know where it is.

This is a proper subject for discussion in the 1970 "Almanac Issue" of our magazine. Dr. John S. Foster, Jr., Director of Defense Research and Engineering, has pointed out that our freedom of today has been secured, for the most part, by weaponry based on research and development efforts of the 1940s, '50s, and '60s. And if the freedom is to continue, it will be because of the R&D accomplishments of the 1970s and '80s. Dr. Foster does not believe we can do this with technological parity. Superiority is required.

He has warned that our potential enemies do their R&D behind curtains of secrecy, which means they can pursue a new and revolutionary project and we will not know about it until a prototype appears. The Russians are putting record resources into R&D. In 1955, if we add the R&D budgets of military import listed by the Defense Department, NACA, and the Atomic Energy Commission, the US spent \$3.1 billion. The Soviet Union spent \$2.1 billion. By 1969, the US effort had risen to about \$14 billion and the Russians had upped their expenditures to \$14.8 billion. This means they have been increasing their outlay ten percent per year. Ours grows at the rate of about four percent a year. For Fiscal 1970, Congress has been asked to put up \$13.9 billion, and Dr. Foster is far from optimistic that it will be authorized. The Soviets are expected to spend \$16 billion. Their aim is technological superiority.

The Defense Department concern is that it will take another Sputnik to reverse the trend in Congress, and the next Sputnik probably will not be a peaceful mechanism. It could bring a crisis and near disaster to the US.

There have been many manifestations, in recent months, of a congressional determination to curb R&D expenditures. For approved weapon systems, those that have become authorized programs, there is little room for fiscal flexibility. If we are going to have an improved missile or airplane or submarine, development funding is a basic requirement. In the more primitive area of technological unknowns, however, the budget-cutters feel they have found real vulnerability.

Some of this arises from the kind of approach that was best typified by Charles Wilson, when he was Secretary of Defense in the Eisenhower Administration. Mr. Wilson

is credited with a remark to the effect that "basic research is what you do when you don't know what you're doing." There also was a widely quoted comment that he had no interest in what made grass green. Certainly he was in the forefront of the technological skeptics, despite his extensive background in the automobile industry.

Now, in 1970, comes Senator William Proxmire, a Democrat from Wisconsin, who has discovered that contractors to the Defense Department and NASA undertake some research on their own initiative. And that the Pentagon funds this work, picking up the tab for \$685 million worth in 1968. In the same year, NASA spent \$131 million on research.

This money is defined, in the Armed Services Procurement Regulations, as funding for "Independent Research and Development" (IR&D), which means it is R&D not sponsored by a contract, grant, or other agreement.

This kind of work is common to all industry. The product may be television sets or safety razors for the public market. It may be aircraft, electronic components, or weapon systems, or hardware for the space program. IR&D is the effort of industry to provide better products, and the expense of doing it is a recognized cost of doing business. Normally this cost is included as part of the price of the goods sold. It is the customer who pays the cost of developing color TV and the most improved razor blade that happens to hit the market this month.

In the case of defense contracting, the government, of course, places contracts for a great amount of R&D in areas where it knows what it wants to achieve. An example would be a contract with an engine company to develop  
*(Continued on following page)*

---

### S.3003: What it Does

S.3003 is a bill introduced in the Senate last October by Senator William Proxmire. Its most important clauses provide for amendment of Chapter 137 of Title 10, United States Code, with these new sections:

"Research and development costs.

"(a) No costs for research and development shall be allowable under any negotiated contract entered into by the agency concerned unless provision for such costs [is] specifically provided for in the contract; and no research and development costs shall be allowable under any such contract unless such costs provide a direct or indirect benefit to the work being performed under the contract.

"(b) Whenever funds are authorized under any negotiated contract for carrying out one or more independent research and development projects, the contractor or subcontractor shall be required to submit to the agency concerned a technical appraisal of each such project. A technical appraisal submitted pursuant to this subsection shall be prepared in accordance with regulations issued by the agency concerned.

"(c) Any research and development costs determined not to be of direct or indirect benefit to the work being performed under the contract may not be allowed as an overhead expense under the contract.

"(d) As used in this section, the term 'research and development' includes (1) either research or development, or both, and (2) any other work or service generally identified or classified as 'other technical effort.'"

---

a powerplant with improved thrust, or a reverse capability. On the other hand, left to its own devices, the same firm might experiment with some exotic new fuel and come up with a concept that the customer did not know was possible. It is the competition in this technological area that contributes most heavily to US technological superiority.

Dr. Foster says he considers IR&D "a proper and essential component of defense technology" and that "we get more than a dollar's worth of work for the dollar we expend" on IR&D.

In the face of this, Senator Proxmire, an advocate of stern economy, holds that any advancement that comes out of IR&D "would occur by accident at best." He charges that the government is paying contractors for work that benefits only the contractors. He calls IR&D "a back-door boondoggle" whose benefits are "at best, indirect, transitory, and evanescent and, at worst, nonexistent."

The Senator has his own definition of IR&D. He says it is "an amount of money." The money, he asserts, is used to "pay the salaries of engineers and other technical employees" for work unrelated "to any contract they have with the government." He can think of "no redeeming argument in favor of the present method by which DoD and NASA pay for IR&D." Further, he accuses the Pentagon and its contractors of usurping the prerogatives of Congress, because some of the products of IR&D meet new military requirements.

Out of this conviction, the Senator has produced a bill, S.3003, that would ban the funding of contractor-initiated research not related to the work being performed under contract. The entire amount of money involved, by current standards, is slightly in excess of \$800 million a year, a small percentage of the government's total R&D effort. At the same time, the Defense Department and industry consider the IR&D program both essential and economical.

This spring, two inquiries are under way on the Proxmire proposal. In the House of Representatives, an *ad hoc* Subcommittee on IR&D of the House Armed Services Investigating Subcommittee is headed by Rep. Philip J. Philbin, a Democrat from Massachusetts. On the Senate

side, there is a parallel subcommittee of Armed Services, of which the chairman is Senator Thomas J. McIntyre of New Hampshire, also a Democrat. Witnesses have been appearing at hearings on both sides of Capitol Hill from the General Accounting Office, industry, the Defense Department, and Congress itself.

Mr. Proxmire, of course, was the leadoff witness on the Senate program. He defended his proposal with a heated statement, liberally sprinkled with accusations—the military-industrial complex has "printed the checks and filled in the blanks themselves"—viewing IR&D as everything from immoral to illegal. What he advocates is:

"Necessary and direct research and development now given [*sic*] under IR&D should be converted to R&D contracts. Companies should be paid for 'allocable' expenses directly connected with their specific defense contract. They should be paid for research and development on weapon systems which Congress specifically authorizes and funds."

An example of the kind of project Mr. Proxmire has in mind is the Sikorsky S-64 Flying Crane helicopter. The concept was a Sikorsky idea that originated in the late 1950s. At that time, and for several years after, the Army did not have a requirement for such an aircraft and could not ask Congress to fund the research. The company went ahead, using IR&D money. Much of this was company money, but a negotiated part of it came from the Defense Department. In 1964, the Army changed its mind, in view of the war in Vietnam, and bought six Flying Cranes for trial. Later there was a production order. The S-64 proved itself from a cost-effectiveness point of view. The Army estimates that in its aircraft-retrieval role alone, S-64s have brought back some \$200 million worth of aircraft.

The usually economy-minded Senator Proxmire is not impressed. He says that \$20,299,000 of R&D funds went into the S-64—claiming he got his figures on this Army project from the Air Force—and that it should not have been made available because the Army had no requirement and there was no authorization from Congress. He would prefer to "take the IR&D funds, determine precisely what R&D we needed, convert them into regular R&D contracts, and have them performed by companies not now doing defense business." He does not explain how you could get a Flying Crane this way.

Facing the McIntyre subcommittee, it was clear that Mr. Proxmire had a skeptical audience and one that was well prepared to challenge his thesis. The questions were critical and probing. He frequently fumbled for answers. The chairman disagreed with the idea that IR&D is illegal. The witness was accused of including a great many "drastic oversimplifications" in his prepared statement. Senator George Murphy, of California, a subcommittee member, made it clear he holds Mr. Proxmire's degree of expertise in low regard, declaring the IR&D funding system is "most productive."

A second Senator appeared as a witness. He was Alan Cranston of California, who declared at the outset that IR&D "is the most economical long-run program to guarantee the security of the United States in an era of rapid technological innovation." Mr. Cranston said Mr. Proxmire's bill, S.3003, is based on the idea that it is wrong to give money to industry for research not supervised by the government. He said this is erroneous for two reasons:

The first is that the government, like the individual customer, pays for IR&D whenever it buys a product in the marketplace. He cited the example of funding for anti-

(Continued on page 23)

### Some Products of IR&D

The Defense Department, in a study of nine weapon system development histories, has identified 300 technological advances. Of these, thirty-four percent occurred in in-house laboratories. Another fifty-five percent came out of industry effort, and eleven percent from universities. At least forty-four percent "were initially financed by funds controlled internally by the performing organization." Among major advances attributed to IR&D are:

- The ruby laser.
- SYNCOM, Early Bird, and Comsat satellites I, II, and III.
- The MANPACK short-wave radio.
- Nonmetallic armor for men and aircraft.
- Boron composite structure.
- Electron beam welding.
- Automatic photomapping.
- The TV camera used on Apollo.
- The transistor.
- The Klystron tube.
- High-pressure rockets.
- Fuel cells.
- V/STOL propellers.
- The segmented solid booster.
- Interferometer terrain-following radar.
- Strapdown inertial-guidance system.
- Flying Crane helicopter.

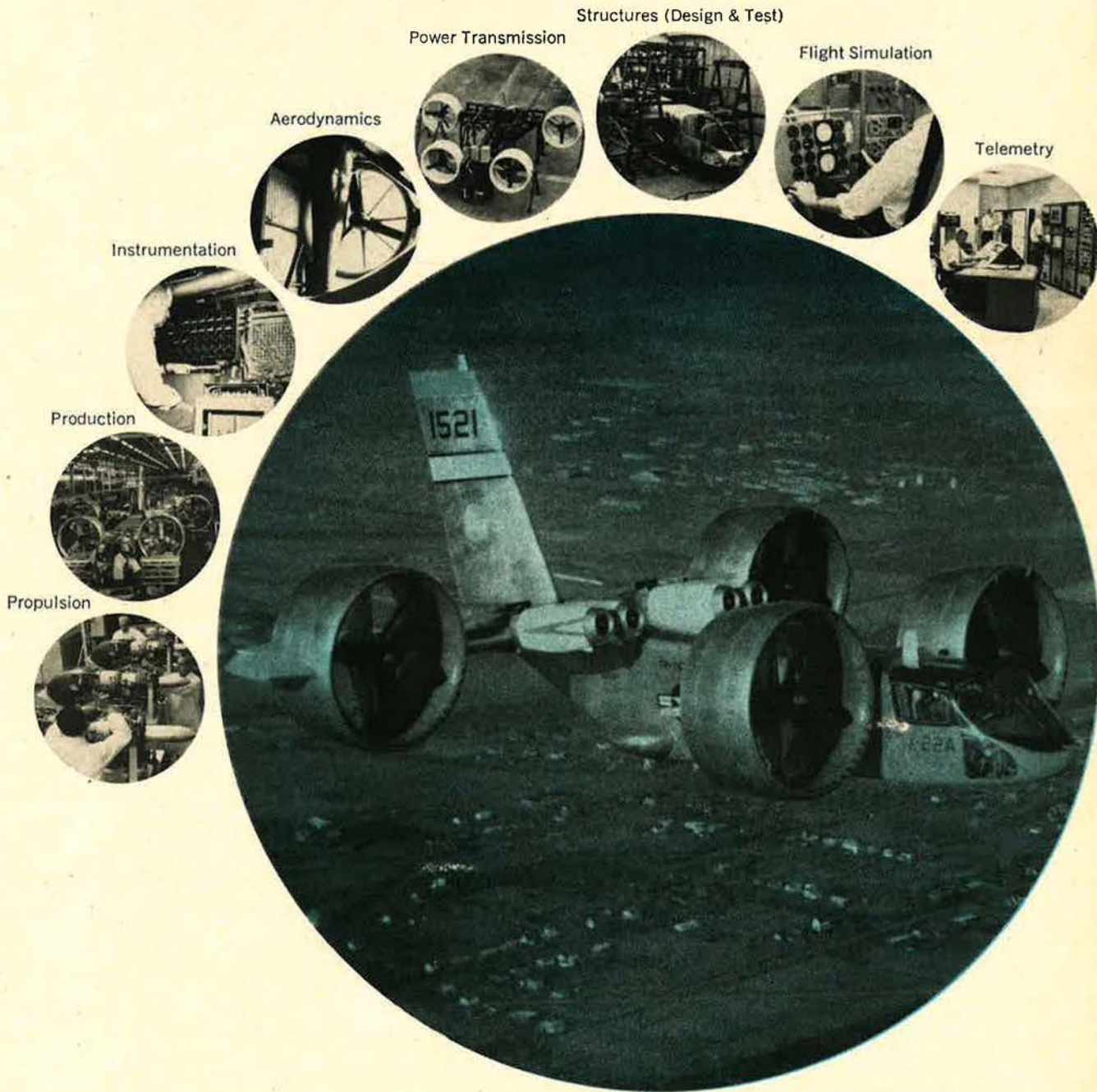
# Total systems capability works here

...X-22A, the Navy managed Tri-Service V/STOL Research Aircraft

is a dual-tandem, ducted propeller flight research system. Its variable stability system permits changing of flight characteristics while airborne to simulate various V/STOL configurations. The X-22A has completed more than 200 test flights.

**BELL AEROSPACE** — Division of **Textron** Buffalo, New York

Proven Systems Capabilities for Aerospace • Defense • Transportation • Communications



# The next development after EDP.

## It's EDC.



EDC is electronic data communications. It is Western Union's answer to America's overwhelming need to move data accurately and economically.

EDC is the modern way to transmit reports, schedules, instructions; administrative and operational information. It complements computers by efficiently moving data to and from them.

And EDC is an expanding service Western Union offers to meet the communications needs of the Federal Government.

Many government agencies now use Western Union EDC. For instance the Defense Communications Agency relies on a Western Union system for high-speed transmission of data throughout the world.

The U.S. Air Force, Army and Navy; the G.S.A., F.B.I., N.A.S.A., F.A.A., S.S.A., V.A. and the Post Office all use Western Union EDC.

Government agencies know how much they have benefited from electronic data processing. They are finding out how much they can benefit from electronic data communications.

Western Union, the EDC company.

**WU**  
western union



pollution research included in the price of a 1970 automobile. It doesn't make any difference whether the car is bought by Uncle Sam or one of his taxpayers. The research involved, Mr. Cranston said, is not of direct or indirect benefit to the car purchased; it is a legitimate cost of doing business.

"If a corporation does a substantial amount of business with the government under negotiated contracts," the Senator declared, "it must be able to conduct independent technical efforts like its competitive brothers. The only alternative . . . is technological stagnation and eventual corporate death."

Mr. Cranston's second argument is that, contrary to the Proxmire thesis, industry should try to meet unanticipated defense needs. And, he added, it cannot do this if its research is completely controlled by the government, as would be required by S.3003. He pointed out that we would have no polio vaccine today if every research project had to be cleared by a bureaucrat. The government thought Dr. Jonas Salk was wrong; a private foundation provided the funds. If the government did try to administer every research project, he added, the effort would swamp the agencies in charge, and "innovative drive would be discouraged."

Dr. Foster, the top Pentagon expert, has appeared before both the House and Senate subcommittees. In addition to viewing IR&D as a bargain, he was critical of S.3003 and insisted that the Defense Department has adequate control over IR&D allocations.

The witness argued, first, that defense contractors are forced to keep IR&D costs within reasonable limits, because if they do not, they may lose new business. Competition forces them to invest wisely in technological effort. He considers this pressure about as effective as any control DoD could impose.

On top of this, the present system lets DoD play the role of a customer who broadly specifies his own needs and lets industry respond. Contractors are forced to plan their IR&D programs in advance and figure out how much of the cost is recoverable. DoD negotiates a dollar ceiling before the costs are incurred. The agreements are carried out through the tri-service negotiation committee, with technical assistance from the Armed Services Research Specialists Committee. The government, he also emphasized, uses its power during negotiations, when past performance is reviewed, and helps to establish the new level of support.

Dr. Foster can wax eloquent on this subject, as he did during cross-examination. Senator McIntyre, at one point, asked whether Dr. Foster doubted the wisdom of letting Congress exercise its constitutional authority by deciding how much should be spent on R&D. The witness then held forth on the controls already held by the Pentagon. He said it is not feasible to set up machinery that can pick a number and make sure we stick to it. The costs of the machinery, he said, "far outweigh any value that I, for one, have seen advanced." In addition, if Congress puts a limit on what DoD can spend, the Pentagon would be in constant danger of violating the rule. Later, he continued:

"I recognize that throughout the country there is a cry for control, control of the military. I am deeply concerned about this because I do not understand the substance behind it. Frankly, I feel there may be none. . . ."

"What concerns me is the fact that in the late '50s and the early '60s . . . we found out that some of our concerns about the Soviet Union were not warranted. . . . It was very clear that one had to watch very carefully that this great power, this great effort [of the US] did not get out

of control. . . . It was put in control. But, unfortunately, the atmosphere and the attitudes associated with that time are perpetuated, in my view, as a myth, a myth that lives on with a life of its own, that is not influenced by facts. So, I want to know what it is that we have in the way of strong reasons why this independence, so vital to our security, must all of a sudden be controlled?"

"I have not seen that case made. . . . I do not see why we are fighting to control something whose independence is vital. . . . We cannot afford these additional controls and maintain our security."

While Dr. Foster fears a bill such as S.3003 could be detrimental to both government and industry, he does see room for improving the present system. He favors expanding the present advance agreement system to cover the hundred largest defense contractors. The present number is about half that. He would strengthen the present review and evaluation of contractor programs with new procedures. He agrees that a data bank may provide a useful repository for cost and technical information. He would expand application of the DoD formula for control to a number of smaller companies who recover IR&D costs.

There has not, within memory, been a heated issue up for debate and possible legislative action that has involved so little money and so much highly critical technological substance as IR&D. The industry is aware of this, the scientific world knows it, and the Pentagon is painfully aware of the peril. It is not likely that Senator Proxmire will find important support for his thesis that IR&D is a "bonanza," "unpoliced," practiced for reasons "without merit."

### The Wayward Press (cont.)

After a long, but not unreasonable, amount of deep consideration, Congress last year passed a law (PL 91-129) creating a new Commission on Government Procurement.

Under the law, the Commission is directed to "study and investigate the present statutes affecting government procurement; the procurement policies, rules, regulations, procedures, and practices followed by the departments, bureaus, agencies, boards, commissions, offices, independent establishments, and instrumentalities of the Executive branch of the Federal government; and the organizations by which procurement is accomplished, to determine to what extent these facilitate the policy."

On or about the morning of March 25, 1970, copies of this bill, quoted above, and of a House report favoring its adoption, were given to a representative of the *Washington Post*, Bernard D. Nossiter. This transaction took place in Room B373, Rayburn House Office Building.

In the *Washington Post* the next morning, under the byline of Mr. Nossiter, there is mention of the new Commission on Government Procurement. Mr. Nossiter refers to it only as the "commission on military waste."

This is a deliberate misrepresentation, suggesting a mission that is not proposed in the law.

\* \* \*

In *The Nation* for April 6 there is an article on the plight of the Lockheed Aircraft Corp. by Peter D. H. Stockton. Mr. Stockton is identified by the editors as "a specialist in defense matters working in the office of Rep. William S. Moorhead."

The author refers in his essay to "Senator Russell, Chairman of the Armed Services Committee."

Any "specialist" who does not know that Senator Stennis heads the Armed Services Committee should have his credentials lifted.—END



By William P. Schlitz

NEWS EDITOR, AIR FORCE/SPACE DIGEST

WASHINGTON, D.C., APRIL 14

In mid-1970, construction will begin at the Air Force's Cheyenne Mountain complex near Colorado Springs, Colo., to house the control center of the proposed Safeguard Ballistic Missile Defense System.

The facility, to be known officially as the Ballistic Missile Defense Center, will be contained in a three-story steel building deep inside the granite mountain.

The center will be controlled operationally by the Continental Air Defense Command (CONAD), responsible for the air and space defense of North America, under the North American Air Defense Command (NORAD).

Safeguard will be manned by the Army Air Defense Command, the US Army component of CONAD. Phase I of Safeguard's deployment is scheduled to be completed in four years at two bases—Malmstrom AFB, Mont., and Grand Forks AFB, N.D.—to protect the Minuteman sites in those areas.

Making up each Safeguard position will be two radars—for long- and short-range detection; two missiles for high- and low-altitude intercept (Spartan and Sprint); and electronic data-processing equipment.

As for additional deployment of the Safeguard system, Defense Secretary Melvin Laird recently announced details of the program's Modified Phase II being recommended to the Congress by President Nixon.

Secretary Laird referred to the considered next step in Safeguard deployment as "the minimum we can and must do, both in cost and in system development, to fulfill" national security objectives, in light of the postponement of work on offensive systems to enhance prospects for the Strategic Arms Limitation Talks (SALT) with the Soviet Union.

Under Modified Phase II, Congress is asked to authorize funds in Fiscal 1971 for an additional Safeguard site at Whiteman AFB, Mo., and for advanced preparatory work for five other sites without a deployment commitment being made. The sites would be in the Northeast, Northwest, National Capital Area,



US Green Berets and Vietnamese Civilian Irregular Defense Group soldier with a captured enemy twelve-barrel 107-mm rocket launcher. The potent weapon is part of a huge cache of arms found in a complex of bunkers forty-five miles from Saigon. One of the 22d Tactical Air Support Squadron FACs noticed suspicious activity in the area, and, after aerial surveillance, requested a search.

Warren AFB, Wyo., and Michigan/Ohio.

Additional Sprint sites would be added to the Phase I projects mentioned above, under Modified Phase II.

Modified Phase II is seen as giving the President the option of moving to a twelve-site Full Phase II in the late 1970s or curtailment, depending on the SALT negotiations.



North American Air Defense Command will soon have a system of radars to detect ballistic missiles being launched by enemy submarines off the continental coasts.

The Sea-Launched Ballistic Missile Defense System, made up of three radars on each coast and one in Texas to cover the Gulf Coast, will give NORAD for the first time the capability to detect such an attack.

The radars have been converted from the SAGE antibomber defense network. They will be operated by ADC's Fourteenth Aerospace Force, which also mans NORAD's missile and satellite-detection equipment.

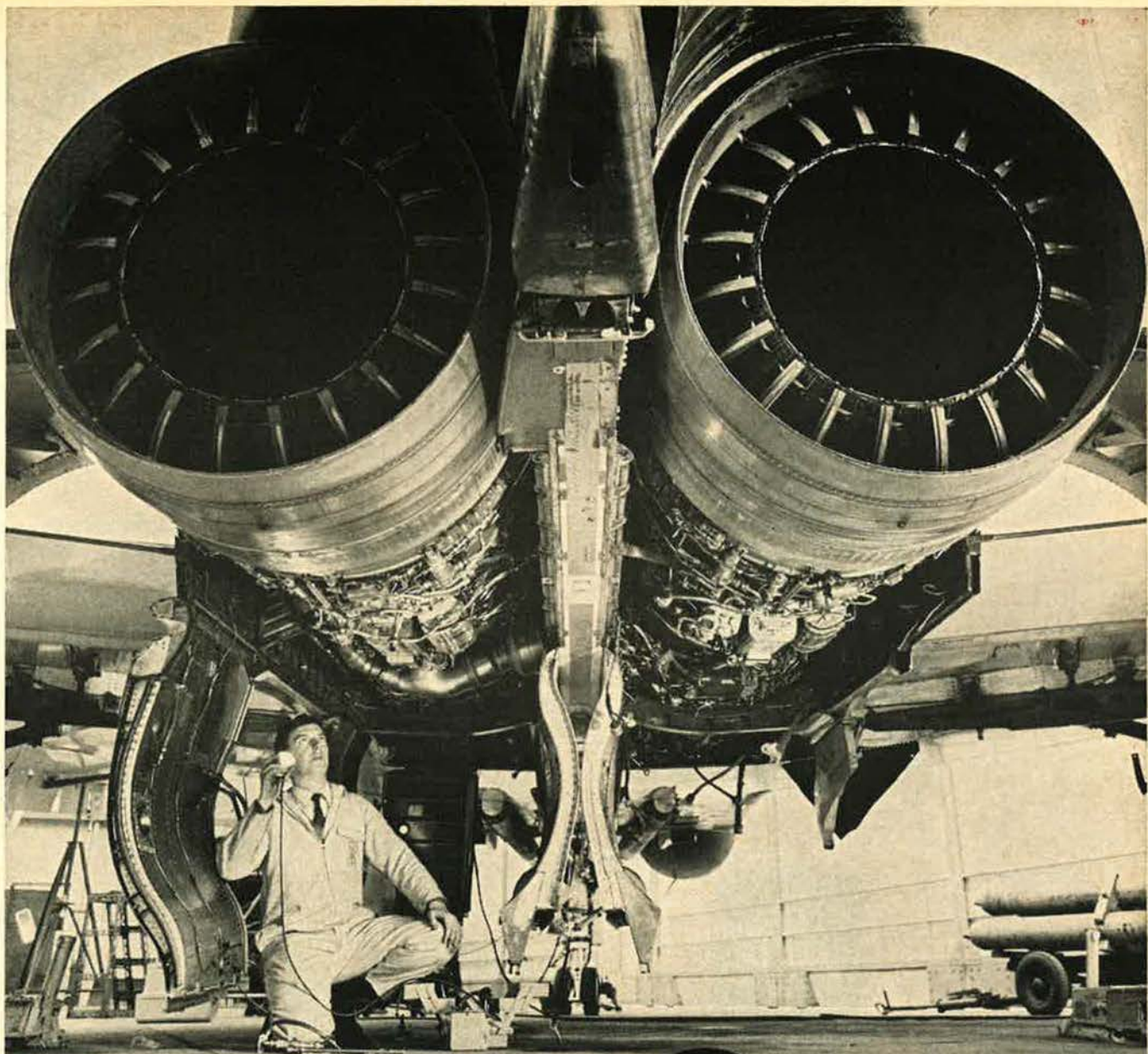
Defense Secretary Laird, in reference to Soviet submarine capability, said, "We believe that they are now building a ballistic missile submarine force which will be roughly comparable in numbers to our present Polaris fleet."



The aircraft hijacking epidemic is continuing to spread worldwide, although it has slackened recently in the US. From January 1 to March 31, 1969, fourteen US planes were victims, while for the same period this year the figure declined to three. Foreign aircraft seizures, however, are going strong; last year alone eight countries experienced their first hijackings. In addition to the US, thirty-eight other countries have had hijackings.

Desperation on the part of airline and government officials is mounting. Japan, still smarting after the recent pirating of one of its commercial aircraft to North Korea, is pressing for stiff legislation to contend with

(Continued on page 27)



# Spey

power for air power

Rolls-Royce Spey turbofans power British Phantom interceptors, Nimrod long-range reconnaissance and Buccaneer low-level strike aircraft.

The Spey TF41 powers versions of the LTV A-7 strike aircraft of the U.S. Air Force and U.S. Navy.



ROLLS-ROYCE LIMITED · AERO ENGINE DIVISION · DERBY · ENGLAND

ROLLS-ROYCE AERO ENGINES INC., 551 FIFTH AVENUE, NEW YORK, N.Y. 10017.



**fastening system  
extends the  
fatigue life of  
airframe structure**



The Hi-Lok/Hi-Tigue Fastening System is the first practical interference fit fastening method to be developed to meet high fatigue requirements. The Hi-Lok/Hi-Tigue design concept provides a controlled interference, a radially expanded and cold-worked hole along with the inherent benefits of consistent preloading by the Hi-Lok collar. These combined factors increase the structural fatigue life.

Extensive testing at Hi-Shear Corporation and at major airframe manufacturers shows the Hi-Lok/Hi-Tigue System to offer equal or better structural fatigue life than any other fastening method... including tapered fasteners.

Hi-Lok/Hi-Tigue straight shank pins are installed in straight holes prepared with standard drills... a major factor in substantially reducing cost to achieve high fatigue characteristics.

Installation of the Hi-Tigue pin and collar is accomplished with the same standard and volume production Hi-Lok tooling as used to install standard Hi-Lok fasteners in open or congested structure.

This Hi-Lok/Hi-Tigue pin features a subtly shaped bead added at the threaded end of the shank of a standard Hi-Lok pin. The bead shown on this pin is magnified in size to be more easily seen. The pin is shown with the mating Hi-Lok collar.

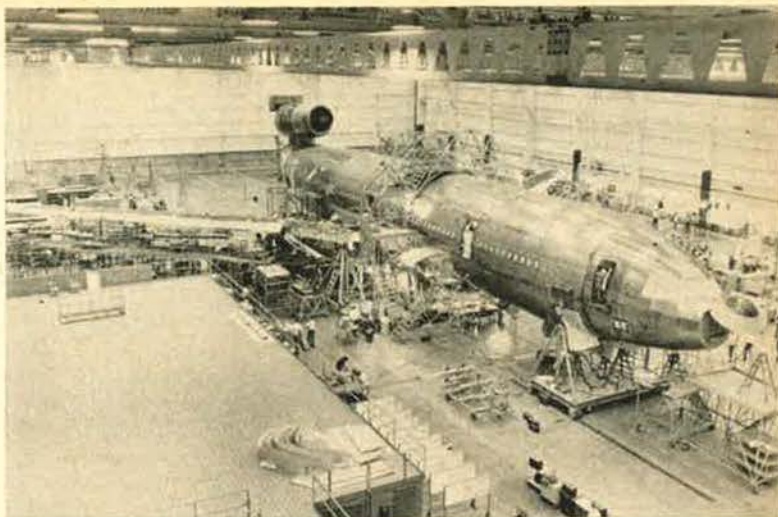


Write for the new  
**Hi-Lok/Hi-Tigue  
Fastening System brochure.**



2600 Skypark Drive, Torrance, California 90509  
Telephones: Area Code 213 / 775-7271 or 775-3181

U.S. AND FOREIGN PATENTS GRANTED AND PENDING.  
"HI-LOK" IS A REGISTERED TRADEMARK AND  
"HI-TIGUE" IS A TRADENAME OF HI-SHEAR CORPORATION.



Left, the flight station and forward fuselage of the first L-1011 TriStar jetliner are prepared for mating at Lockheed-California's plant at Palmdale, Calif. Rollout is set for September. Above, a milestone in McDonnell Douglas's DC-10 tri-jetliner is reached as the aft section joins the forward and center assembly at Douglas Aircraft Co.'s plant at Long Beach, Calif. A mid-July rollout is expected.

jacking and plans to introduce weapon-detecting devices at airports. Japan Air Lines said it would put a karate expert aboard each flight as security personnel.

In the US, Civil Aviation Board Chairman Secor D. Browne said recently that the day-to-day responsibility for dealing effectively with hijacking and crimes against aircraft ultimately falls on the individual air carrier management. Mr. Browne declared that while he did not advocate arming aircrews, "it is apparent that the pilot can carry any weapon," and "there is good law that the captain . . . has the authority to subdue any threat to passengers or cargo." He urged airlines to "make better use of their delegated authority to provide some sort of cabin enforcement." Without being specific, he said he "simply is trying to suggest a very strong, very immediate attitude." Arming aircraft crews has been opposed by airline pilot groups.

The installation of an antihijack system by major airlines possibly accounts for the decline in incidents in the US. FAA Administrator John H. Shaffer said that airlines are beginning to find discarded weapons in boarding areas where the system is in use, and that the system has actually spotted passengers with weapons. Details remain secret, however, "in the interests of security," a government official said.

The system is based on behavioral traits common to hijackers, combined with a passive weapon-screening de-

vice. None of the screened flights has been hijacked, the official said. TWA recently extended use of the system to its operations at London's Heathrow Airport.

Hijackers also are being punished, he said. Of forty-four apprehended, eighteen have been convicted, with sentences up to twenty years. Sentencing is pending in twenty cases.

While some progress has been made on an international level to discourage hijacking and establish extradition and prosecution agreements, international pilots' organizations have threatened to boycott countries without such agreements.

From the Air Line Pilots Association in the US came warning of a possible shutdown of the entire air system if "something concrete" isn't done about the hijacking situation.

Among on-board security measures that will probably be required in the future are bulletproof shields for cockpit bulkheads.



The Federal Aviation Administration's highest honor, the Award for Extraordinary Service, has been presented to Eastern Air Lines Capt. Robert W. Wilbur, Jr., by Secretary of Transportation John A. Volpe.

A similar award is to be made posthumously to First Officer James Hartley.

The award has been made only eight other times in history.

Captain Wilbur was shot in both arms by a gun-wielding passenger

aboard a New York-to-Boston flight in mid-March. First Officer Hartley was mortally wounded in the struggle but managed to wrest the gun from his assailant and shoot him before collapsing.

Although severely wounded, Captain Wilbur brought the DC-9 jetliner to a perfect landing at Boston, coolly going through such routine landing procedures as turning on the "No Smoking" and "Seat Belt" signs, an action that helped calm the passengers. Seventy other people were aboard the plane.

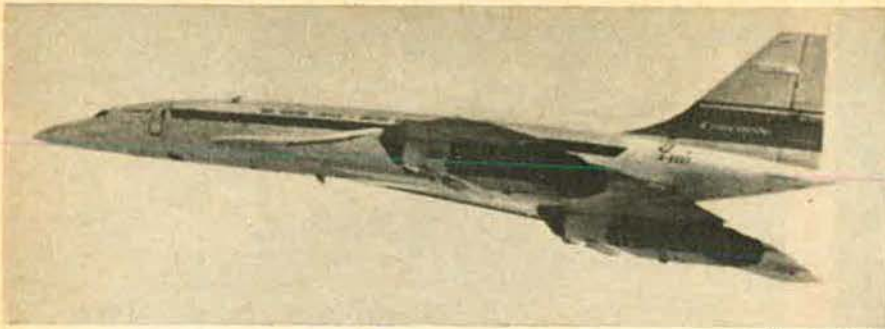


The Air Force has selected three contractors to further define the AIM-82 short-range tactical air-to-air missile (see *April AF/SD*, page 17).

Chosen for the ninety-day definition phase were General Dynamics Corp.'s Pomona, Calif., Division; Hughes Aircraft Co.'s Missile Systems Division, Canoga Park, Calif.; and Philco-Ford Corp.'s Aeronutronics Division, Newport Beach, Calif. Each has been funded with about \$1.5 million.

Since the Navy has a similar requirement for a new air-to-air missile of the AIM-82 type, a decision will be necessary by Defense Secretary Laird on how best to develop a missile suitable for both services.

AIM-82 is visualized as a short-range weapon for use in rapid-maneuver dogfight situations. If Secretary Laird approves it, it will probably go into the new F-15 and F-14 and  
(Continued on following page)



—Wide World Photos

Aircraft performance was "even better than we had expected," said test pilot John Cochrane of the Anglo-French's supersonic Concorde 002 jetliner after a recent flight during which the aircraft broke the sound barrier for the first time.

A Hawker Siddeley Harrier V/STOL fighter shepherds Britain's HMS Eagle during a recent exercise. Harriers flew sixty sorties from the carrier, and completed the program five days before schedule.



such existing aircraft as the F-4 Phantom, the A-7, and F-111.



Judge L. Howard Bennett, Acting Deputy Assistant Secretary of Defense for Civil Rights, has singled out Udorn RTAFB, Thailand, as having attained "healthy and wholesome race and intergroup relations" between white and black servicemen, which are better than at other SEA installations.

Judge Bennett's analysis follows an extensive fact-finding tour throughout Southeast Asia to ascertain the status of race relations in the area. There had been past evidence of strain among the races in some instances.

The positive factors leading to race harmony at Udorn can be applied as working policy by virtually all military units, according to Judge Bennett. Udorn's "highly complimentary social situation" is the result of:

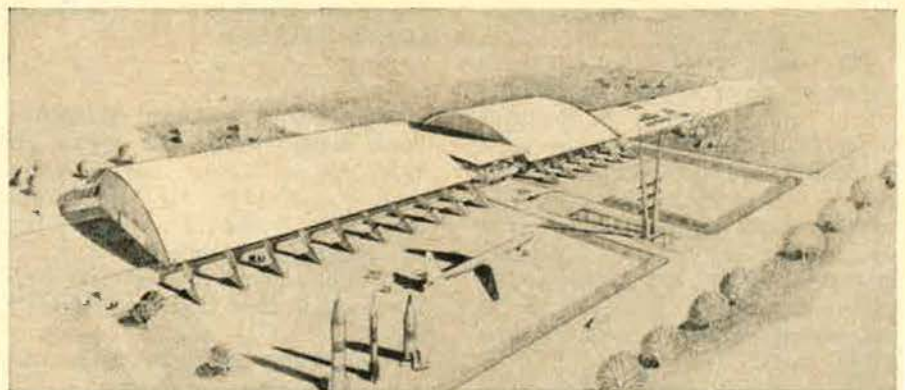
- An Equal Opportunity Council, "though deficient in regard to the representative character of its membership," provides a forum for the men to discuss their problems, and clearly has a "very beneficial" effect on the racial situation.

- A cross-racial stock of literature at the base library, containing such subjects as Afro-American history, is asked for increasingly by black and white servicemen alike.

- Activist chaplains, including a black chaplain, who move constructively in race relations, including organizing group discussions.

- Command leadership that makes the men aware that the base commander is concerned about their problems and gives them sympathetic attention. The commander also communicates a no-nonsense attitude to subordinate officers concerning equal treatment and opportunity.

- A communication program of formal and informal talks among the men contributes to mutual understanding, as well as instills a desire for constructive citizen participation after release from service.



Architect's concept of a new home for the Air Force Museum at Wright-Patterson AFB, Ohio. It is under construction and scheduled for completion next year.

A highlight of social activities was a dinner dance given by Udorn's interracial club, attended by the base commander and several senior officers. "Both black and white military personnel eagerly seek" membership in this club, Judge Bennett says.

He concludes that where such positive factors are operating, the probability of harmonious race relations will be high.



Construction of a new home for the Air Force Museum at Wright-Patterson AFB, near Dayton, Ohio, began in April (see story page 157).

A new design concept will provide considerably more enclosed display space than the previously planned structure (see *AF/SD*, March 1969, page 102).

The Museum, established in 1923, has had increasing numbers of visitors each year. In 1969 the count was 643,000, up 100,000 from the previous year. The Air Force Museum is considered Ohio's largest tourist attraction.

The building should be completed in a year and ready to receive visitors by early summer 1971. The internal display area will house up to 200 aircraft, twice the number able to be housed inside the Museum's present temporary structure.



On April 8, two Vela satellites, the last in the series, were orbited from Cape Kennedy by a Titan IIIC booster, the first operational launch of that giant.

Vela ("watchman" in Spanish) satellites are used to detect any violation of the nuclear test ban treaty in outer space or on earth. They also help the space program by alerting NASA (and the other agencies with an interest in atmospheric conditions) to

(Continued on page 31)

# Total

solid state, microminiature electronic converter line at Fairchild

ranges from single channel to multi-channel converters. From individual conversion circuit

cards to complete conversion or digital computer systems. From

# A/D

analog to digital (ac, synchro, or resolver to digital) ... to

# D/A

digital to analog (digital to ac, synchro, or resolver). All can be designed to 15-BITS resolution. All can be designed to inter-

face with any application. All feature outstanding reliability, speed, accuracy and ease of maintenance on space vehicles, aircraft, marine vehicles and

military equipment. All from Fairchild's vast, corporate-wide total engineering, design and production

# capability

Write or call today for technical assistance and literature.

---

**FAIRCHILD**

---

**SPACE AND DEFENSE SYSTEMS**

A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION  
300 ROBBINS LANE, SYOSSET, NEW YORK 11791  
(516) 931-4500 Ext. 489 • TWX: 510-221-1858

*When the image is critical, Fairchild is in the picture.*

**Design your own  
test equipment?**

**Before you even *think* about it,  
talk to the people  
who wrote the book.**



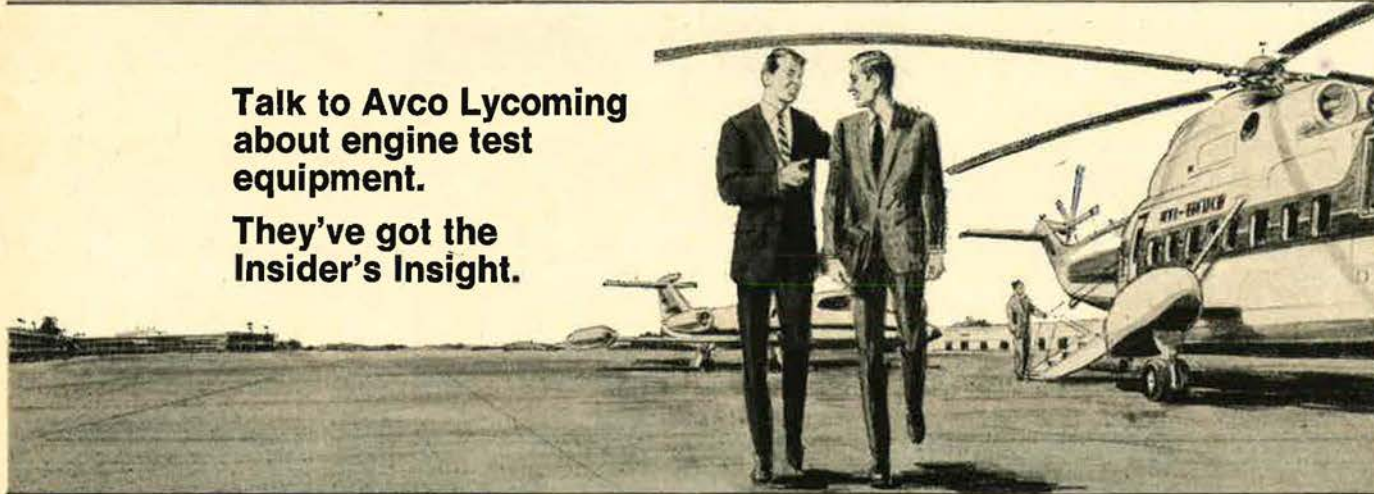
**They've been in the  
business 18 years and  
tested 15,000 of their own  
gas turbines.**

**They *know* what  
it's all about.**



**Talk to Avco Lycoming  
about engine test  
equipment.**

**They've got the  
Insider's Insight.**



And today, Avco Lycoming is performing a variety of tests, analysis, and training missions all over the free world . . . for every make of gas turbine — turboshaft, turboprop, pure jet, or fan jet.

Check us out. We have the know-how, the equipment, and the system

engineering to test anything in gas turbines, with the broadest spectrum of equipment available in the business.

Organizational, general support, or depot-level maintenance and overhaul operations all stand to

profit from the sophisticated engine test systems and equipment now available from Avco Lycoming.

It figures that the foremost name in gas turbine engines is now the first name in engine test equipment, Avco Lycoming.

**AVCO LYCOMING-CHARLESTON PLANT**

P.O. BOX 10048, CHARLESTON, SOUTH CAROLINA 29411 / PHONE (803) 554-1070



solar flares and other "space weather" conditions.

After a series of positioning maneuvers, the Chinese-lantern-shaped Vela will orbit at altitudes of about 65,000 nautical miles, on opposite sides of the earth.

The Vela program has been acclaimed as most successful, having achieved 100 percent of its objectives since its inception in 1963.

Also on April 8, from the Vandenberg launch complex on the West Coast, NASA launched a Nimbus-4 advanced meteorological spacecraft accompanied by a piggyback US Army mapping satellite. Nimbus-4 is designed to make the most comprehensive study of earth ever attempted from space. Scientists say that, if successful, the project might help them predict the weather perhaps as much as two weeks in advance.



In this age of concern for quality environment, the Federal Aviation Administration has spoken out against a growing eyesore at many of the nation's airports: junk aircraft—the counterpart of the derelict cars that clutter many city streets.

A new FAA program to persuade airport operators to eliminate junk planes "is aimed both at improving the appearance of our airports and maintaining public confidence in aviation," FAA Administrator John H. Shaffer said. The junk aircraft tend to convey "the erroneous impression to both the flying and nonflying public that aviation is inherently unsafe," he said.

Among several program provisions, the FAA would help airport managements identify such aircraft, and specify time limits under which the aircraft would be removed at owner's expense or repaired and returned to the flight line.



The first NATO communications satellite was launched from Cape Kennedy by the Air Force in mid-March. The satellite project, to eventually cost \$50 million, is being financed jointly by the participating NATO-member countries.

NATO 1 is in orbit about 22,000 miles over the eastern Atlantic. It will provide hot-line linkage among NATO headquarters at Brussels, Belgium, NATO national capitals, and NATO land and sea commands. The comsat will make possible the relay of hundreds of telephone and telegraph messages simultaneously between points as

**Professor Willi Messerschmitt chats with USAF Col. J. J. Burns, Commander, Luke AFB, Ariz. The aircraft designer visited recently to discuss Luke's methods of maintaining its F-104G Starfighters.**



distant as Ankara, Turkey, and Washington, D.C.

As part of the communications net, twelve ground terminals are to be constructed—one each in the US, Canada, Great Britain, Norway, Denmark, West Germany, The Netherlands, Belgium, Italy, Greece, Turkey, and Portugal.

The comsat system is intended as a greatly improved method of military communications, but will also upgrade existing communications facilities for political consultation and crisis management.



A bitter irony was the final result in the crash of a West German Starfighter early in March. Killed in the accident was Joachim von Hassel, only son of lower-House Speaker Kai-Uwe von Hassel.

The accident-prone F-104G fighter—designed by the US and built in Germany—have been in service since 1961 and to date have suffered 117 crashes, with young von Hassel being the fifty-fifth flyer killed.

In the summer of 1966, the senior von Hassel came under heavy fire from West Germany's Social Democratic Party, which demanded his resignation as defense minister because of the growing number of Starfighter crashes. The resulting political crisis led to a shake-up in Germany's armed forces, when several top military leaders resigned. Von Hassel dismissed the criticism; his own son flew an F-104G, he said.



The Aviation/Space Writers Association (AWA) has named AF/SD's Associate Editor Edgar E. Ulsamer the recipient of the 1970 James J. Strebiger Memorial Award, its principal award, which recognizes the best aviation writing in any print media during a given year.

AWA also named Mr. Ulsamer for its annual award recognizing excellence in aviation writing in an aerospace magazine.

An AF/SD staff member since 1964, he is a former staff correspondent of United Press International and had also worked for the Washington Star.

A special AWA citation also was awarded to AF/SD contributing writer Louis R. Stockstill for his widely noted exposé concerning the American POWs in Vietnam, which appeared as the cover story of the October 1969 issue of AF/SD and was reprinted as the lead article of the November issue of *Reader's Digest*.

Three other AF/SD staff members  
(Continued on following page)

## HOLD THESE DATES OPEN

24th ANNUAL AFCEA SHOW/CONVENTION  
**JUNE 2, 3, 4**

Sheraton-Park Hotel, Washington, D. C.

AFCEA is the military-industry teamwork organization involved in communications-electronics-technical photography. It promotes improved understanding between executive military, industry and government leaders.

### PANEL DISCUSSIONS BY MILITARY/INDUSTRY LEADERS

"Tactical Airlift Command and Control"  
"Radio and Transmission Equipment for Microwaves"  
"Education for Electromagnetic Compatibility"  
"Information Systems in the Seventies: Digital, Adaptive, Automated"

**KEYNOTE LUNCHEON  
BUFFET/FLOOR SHOW  
BANQUET/RECEPTION  
INDUSTRIAL LUNCHEON**

**EXHIBITS BY OVER 120 FIRMS**

All activities comply with D.O.D. directive. Complimentary military invitations are sponsored by AFCEA only.

**AFCEA**  
**COMMUNICATIONS  
& ELECTRONICS**  
**CREATIVITY POINTS THE WAY**

Armed Forces Communications and Electronics Association



—Staff Photo by Mo Lien

**AF/SD's Associate Editor Edgar E. Ulsamer, who recently won AWA's James J. Strebig aviation writing award.**

have won AWA's top overall awards in either aviation or space writing in previous years: Senior Editor Claude Witze, Senior Editor William Leavitt, and Technical Editor J. S. Butz, Jr. In addition, Mr. Witze has won AWA awards three times, and Mr. Leavitt and Mr. Butz once each in the aerospace magazine category.



The Air Force has successfully

utilized its new Backup Interceptor Control (BUIC) III computerized command-and-control system in the test launch of a Bomarc B guided missile from Tyndall AFB, Fla.

The BUIC III control center at Tyndall is equipped to provide high-speed, up-to-the-minute data on any airborne threat picked up by radar. Parallel to this is the center's capability to direct air defense weapons against enemy aircraft.

Bomarc is capable of hitting supersonic targets at 70,000-foot altitudes and at ranges of more than 400 miles. Its 2,000-mph speed is attained by a solid-propellant booster. Cruise is maintained by two ramjet engines.

Prior to BUIC III, Bomarc command and control was provided by the Semi-Automatic Ground Environment (SAGE) system for initial positioning. Within target proximity, the missile automatically switches to its own homing system for terminal guidance.



**NEWS NOTES** — Secretary of Transportation John A. Volpe announced the appointment of **William M. Magruder**, formerly of Lockheed-California Co., as **Director of the Supersonic Transport** Development Program, and transfer of the program from the FAA to the Office of the Secretary.

The **School of Systems and Logistics**, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, announced that, in cooperation with the Society of Logistics Engineers, it has

established a program to certify qualified military and Civil Service **logistics managers** of DoD. Similar programs for those not in DoD are in preparation at various universities and will be announced in the future.

The **Electronics Research Center**, Cambridge, Mass., will be used for **transportation research**, it was announced. The center, once sponsored by NASA but abandoned because of budget limitations, will become a major facility to study mass transportation problems—including air traffic control, DOT said.

**Air Force Systems Command** has issued requests for proposals to Philco-Ford Corp.'s Aeronutronic Division and General Electric Co.'s Armament Department for follow-on development of the GAU-7/A improved **Aerial Gun System** that will use caseless ammunition and eventually will go into the F-15.

On Armed Forces Day, Keesler AFB, Miss., will dedicate **McClelland Hall**, in memory of Maj. Gen. Harold McClelland, regarded as the father of Air Force communications electronics. The facility will be used to train **communications electronics technicians**.

Major **Air Force commands** and separate operating agencies have been invited to submit nominees for consideration by the Air Force in selecting the **Outstanding Airmen for 1970**. The USAF recognition program is run in conjunction with the AFA, which will host the Outstanding Airmen at its annual Convention in Washington, D.C., in September.—END

**INDEX TO ADVERTISERS**

|   |           |
|---|-----------|
| American Telephone & Telegraph Co. ....   | 14 and 15 |
| Armed Forces Communications & Electronics Association .....                           | 31        |
| Audio Productions .....   | 179       |
| Avco Lycoming-Charleston Plant .....  | 30        |
| Bell Aerospace Co., Div. of Textron .....   | 21        |
| Bell Helicopter Co. ....  | 10 and 11 |
| Boeing Co., The .....   | 1         |
| Colt Industries, Chandler Evans Control Systems Div. ....                             | 72        |
| Computing Devices of Canada, Ltd., a Subsidiary of Control Data Corp. ....            | 48        |
| Eastern Air Lines, Inc. ....  | 63        |
| Fairchild Space & Defense Systems, a Div. of Fairchild Camera & Instrument Corp. .... | 29        |
| Garrett Corp., The .....  | 18        |
| General Dynamics Corp. ....   | 6 and 7   |
| General Electric Co., Aircraft Engine Group .....                                     | 36        |
| Hawker Siddeley Aviation Ltd. ....  | 2 and 3   |
| Hi-Shear Corp. ....   | 26        |
| Interstate Electronics Corp. ....   | 16        |
| LTV Electrosystems, Inc., Garland Div. ....   | 4         |
| McDonnell Douglas Corp. ....  | Cover 4   |

|  |           |
|--|-----------|
| Motorola, Inc., Government Electronics Div. ....               | 9         |
| Northrop Corp. ....  | 46 and 47 |
| Onan Div., Studebaker Corp. ....                               | 107       |
| Pan American World Airways/Clipper Cargo .....                 | 60        |
| Pratt & Whitney Aircraft Div., United Aircraft Corp. ....      | 34 and 35 |
| Rolls-Royce Ltd. ....  | 25        |
| San Bernardino and Riverside, Calif., Chapters of AFA .....    | 190       |
| Singer Co., The, Link Div. ....                                | 92        |
| Solar, Div. of International Harvester Co. ....                | 129       |
| Sperry Rand Corp., Sperry Flight Systems Div. ....             | 33        |
| Sperry Rand Corp., Sperry Gyroscope Div. ....                  | 69        |
| Sperry Rand Corp., Univac Div. ....                            | 59        |
| Sylvania Electric Products, Inc., Electronic Systems Div. .... | 91        |
| System Development Corp. ....                                  | 117       |
| Teledyne CAE .....   | Cover 2   |
| Teledyne Ryan Aeronautical .....                               | 118       |
| United Technology Center .....                                 | Cover 3   |
| Univac Div., Sperry Rand Corp. ....                            | 59        |
| Vitro Corp. of America .....                                   | 13        |
| Western Union .....  | 22        |

# With or without pilots... Sperry makes them fly.

With all our background in automatic pilots, stabilization and control, you'd expect Sperry to be big in drone conversions. Fact is, we're Number One...with experience going back a quarter century to the QB-17s and right on through with QB-29s, QF-80s, QB-47s and QF-104s, among others.

If a percentage of your drone missions require pilots—as specified on Navy and Air Force T-33 conversions—you can have it both ways. Installations include assignments ranging from AEC sampling tests to surveillance programs with high-versatility command guidance control systems.

We can give you a full range of experience in controlling the redbirds—automatic takeoff, airspeed control, terrain avoidance, heading hold, station keeping—by command from the ground or from other remote stations. Whatever your mission needs—high performance jets for target work, or rotary wing aircraft for logistics support and surveillance—Sperry is qualified to define and produce systems to solve them. And in a minimum of time.

**SPERRY**  
FLIGHT SYSTEMS DIVISION  
PHOENIX, ARIZONA 85002

 SPERRY RAND

**“Looking at me  
you’d never guess  
I’m 50% stronger  
than I was  
10 years ago.”**



**J52 then**



**J52 now**

Growing more muscle comes naturally to Pratt & Whitney Aircraft engines.

The J52, for example, continues to grow in thrust without significant change in size, shape or weight. Because we designed it to take advantage of later advances in materials, cooling techniques and manufacturing methods.

That means extra thrust with-

out extra bulk. And without having to overhaul basic overhaul routines.

Engines that grow without growing pains can save you some headaches, too.

## Pratt & Whitney Aircraft

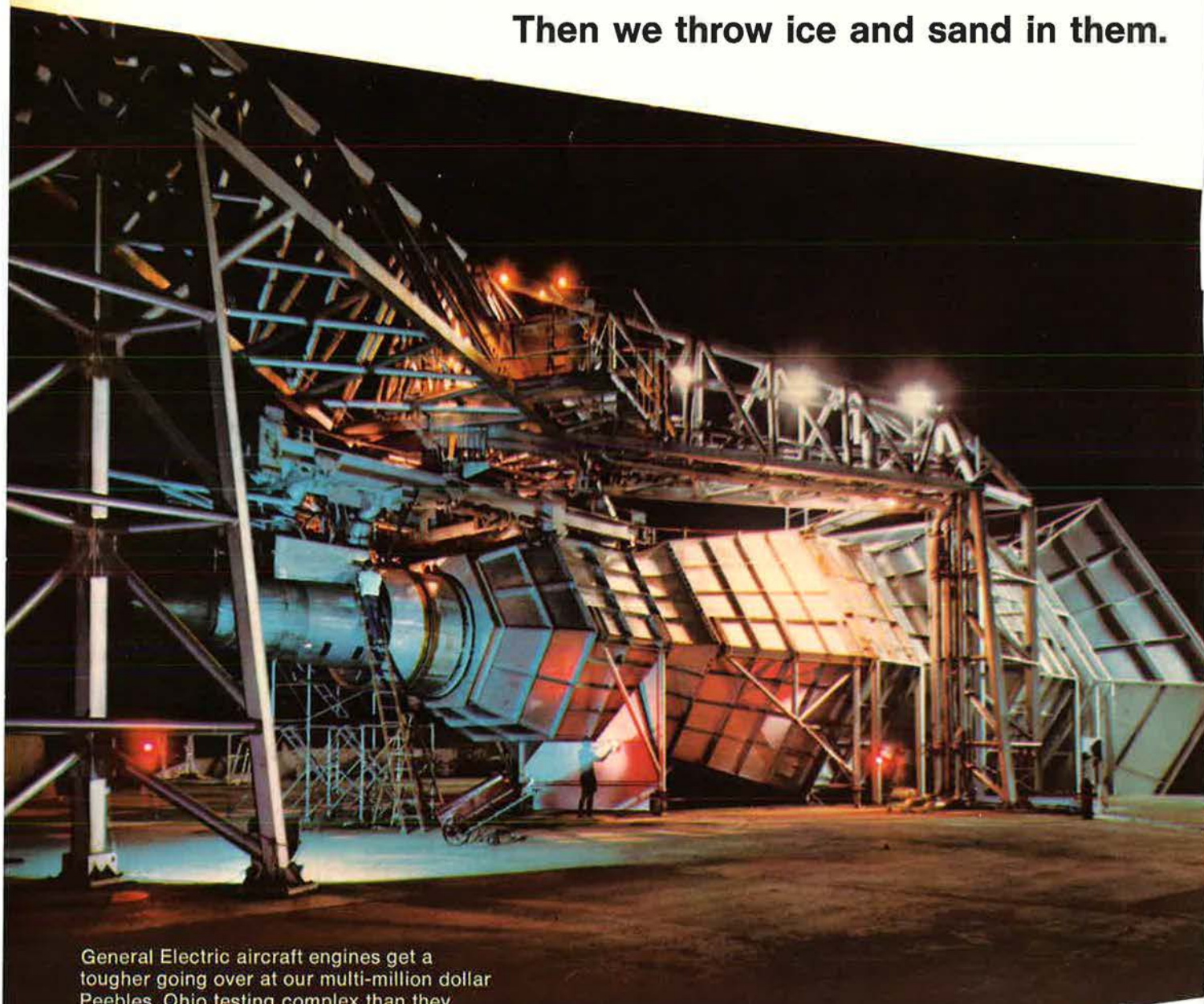


### J52 Growth History

| Model | First Flight | Thrust, lbs. | Thrust-to-Weight Ratio |
|-------|--------------|--------------|------------------------|
| P-3   | 1959         | 7,500        | 3.5                    |
| P-6A  | 1960         | 8,500        | 4.1                    |
| P-8A  | 1966         | 9,300        | 4.4                    |
| P-408 | 1970         | 11,200       | 4.8                    |

**We built this monster  
to challenge our engines  
with hurricane-force crosswinds. And tail winds.**

**Then we throw ice and sand in them.**



General Electric aircraft engines get a tougher going over at our multi-million dollar Peebles, Ohio testing complex than they ever will in service. For example, in this unique facility engines are subjected to crosswinds at all angles from 0° to 180°. It's the only one of its kind in the world.

**We go out of our way  
to make trouble down here . . .**

**so that trouble won't happen up there.**

AIRCRAFT ENGINE GROUP

GENERAL  ELECTRIC

205-06

**AIR FORCE**

MAY 1970

Twentieth Annual

# AIR FORCE ALMANAC

**T**HIS is the twentieth time that we have put together our annual special issue devoted to the structure, the purpose, and the accomplishments of the United States Air Force.

Back in 1951, when we published our first "Air Force Almanac," the war in Korea was still being fought, and Jim Jabara had just become America's—and history's—first jet ace. The intercontinental ballistic missile had not even entered the military vocabulary, let alone the inventory. The atomic bomb was measured in kilotons, and Edward Teller was far from being a household word. Harry S. Truman was President of the United States and had made history by refusing to spend \$800 million that had been appropriated for new aircraft. Gen. Hoyt S. Vandenberg was Chief of Staff of the Air Force, and the Secretary was Thomas K. Finletter.

The changes in twenty years have been many and far-reaching, but some things have remained the same—like the courage, the dedication, the sacrifices of the men and women of the United States Air Force. They continue to serve their country in faraway places and hazardous ways. To them, as we always have, we dedicate this annual Air Force Almanac issue.

—THE EDITORS

*The Soviet Union is in a major buildup in virtually all categories of military power—a buildup that is bigger and faster than earlier estimates had indicated. Here, the Secretary of the Air Force gives his views on this threat and what's needed to cope with it . . .*

# The Growing Soviet Threat and What To Do About It

BY ROBERT C. SEAMANS, JR.

Secretary of the Air Force

**A**FTER years of frustrating war in Southeast Asia, most Americans would prefer to turn their attention to our serious domestic problems. And many feel that the money to solve domestic problems could be obtained by the simple expedient of cutting the military budget.

Certainly, as the Vietnamese people take over their own security, we can reduce military expenditures, as we are doing. But at the same time, there are other defense needs that must be met. As President Nixon pointed out in his "State of the World" message to Congress, ". . . there is an irreducible minimum of essential military security: for if we are less strong than necessary, and if the worst happens, there will be no domestic society to look after."

With respect to strategic capabilities, we are facing a rapidly changing balance of forces. And there is a real possibility that neglect in that area could someday greatly increase the risk of nuclear war. We hope that the Strategic Arms Limitation Talks with the Soviets will lead, through limitations on weapons, to less danger of attack. We will continue to strive toward that objective. But in the absence of effective agreements, we must not unilaterally limit the forces that are required for our security.

Maintaining a proper strategic balance will depend on how well we perform two basic tasks:

*First*, we must analyze the threat. We must study as best we can the capabilities of potential enemies. Not as a scare tactic. Not to produce a panic reaction. But because the capabilities of potential enemies are, after all, the true measure of the forces we really need.

Our *second* major task is to act on our assessment of the threat by developing the forces we need to prevent an attack. In essence, we do not prepare to carry on a war of revenge or of conquest, but we must be strong enough to deter anyone else from starting a war. Some people argue that it doesn't make sense to worry about what happens after our own country

has already been largely destroyed. They miss the point. If our weapons can survive to retaliate, then it is not likely that we would be attacked, and there would be no destruction. We must make certain that an attack on the United States would be a very unprofitable business.

Looking at the threat, we find that the Soviets are engaged in a continuing major buildup in virtually all areas—a buildup that is exceeding almost all our earlier estimates of what was likely.

They have more ICBMs than we do. And although we still have a greater number of sub-launched missiles, they have more than *twice* as much missile payload as we do, counting both ICBMs and SLBMs—and payload could turn out to be one of the most important gauges of the threat, since it determines the number of multiple warheads that can be carried.

They are improving their older missiles and are continuing to expand their force. The most serious threat to our Minuteman seems to be the large SS-9s more than 230 of which are now operational or under construction. That missile has been tested with three multiple warheads—and each of these was many times the size of our own Minuteman warheads. It has been judged that if we do nothing to improve the survivability of our missiles, in a few years SS-9s wit

---

*Dr. Robert C. Seamans, Jr., ninth Secretary of the Air Force, was born in Salem, Mass., in 1918. A Harvard graduate, he holds a doctorate in science from MIT where he also taught and managed several research projects. In 1955, Dr. Seamans joined RCA, serving as Chief Engineer of the Missile Electronics and Controls Division until joining NASA in 1960 as Deputy Administrator. Dr. Seamans became Secretary of the Air Force in February 1969.*

---





Dr. Robert C. Seamans, Jr., ninth Air Force Secretary: a rare combination of scientist, administrator, and humanist.

multiple warheads might be able to destroy most of our land-based force. And this does not include the other types of Soviet missiles, many of which may soon be accurate enough to assist in such an attack.

But this is not all the Soviets are doing. At the same time, they are working hard on air and missile defense systems. They have already deployed an ABM system on a limited scale and have in operation thousands of antiaircraft missile launchers. They also maintain some 3,000 interceptor aircraft, which they are continually modernizing, compared to our own force of fewer than 700, including the Air National Guard.

We retain a lead in heavy bombers, but not in total heavy and medium bombers.

The longer range prospects are no less disturbing. We know that in the last five years Soviet space pro-

grams and military research and development taken together have been increasing more rapidly than our own. In fact, it appears that in the past few years their annual effort in these programs began to exceed ours in absolute terms. We have not yet seen the full results of this extensive Soviet research and development program. It takes a long time for R&D to be translated into weapons. But if the Soviet Union is successful in adding technological superiority to its growing strategic programs, our national security could be severely jeopardized.

The ultimate danger in all this is that some group of future Soviet leaders might believe they have a first-strike force capable of destroying or disrupting so many of our retaliatory weapons that their defenses could take care of the remainder. Should that point be reached, the danger of an attack or of nuclear blackmail would be serious indeed. We are not near that point today, but we cannot preclude it as a possibility some day in the future.

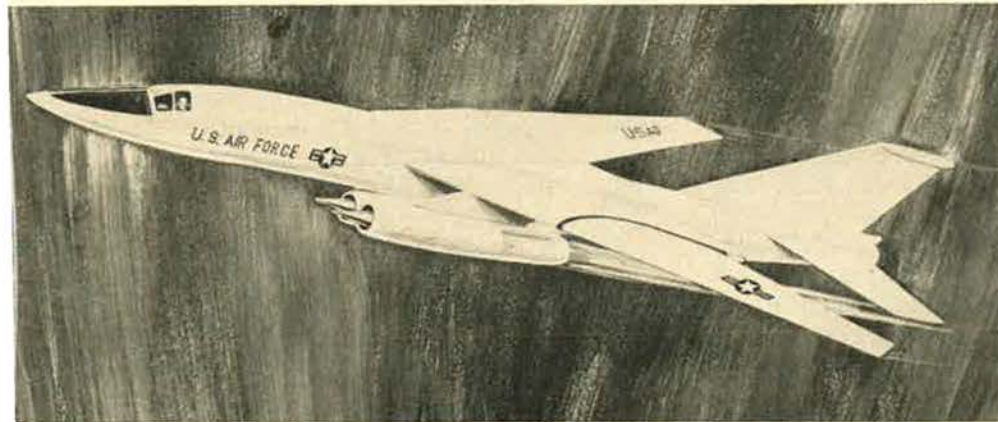
So we must come back to a very basic idea: The best way to prevent nuclear war is to ensure that there is no doubt at all in anyone's mind about our capability to withstand an attack and still strike back effectively. If we are to continue to meet the objective in spite of the increasing threat, we must modernize our forces.

One important program for countering the 2-to-1 Soviet advantage in missile payload is the Safeguard ABM system, which will help us to protect our missile force from attack. In addition, programs such as Minuteman III and Poseidon are being developed so that our surviving missiles will be able to penetrate Soviet defenses.

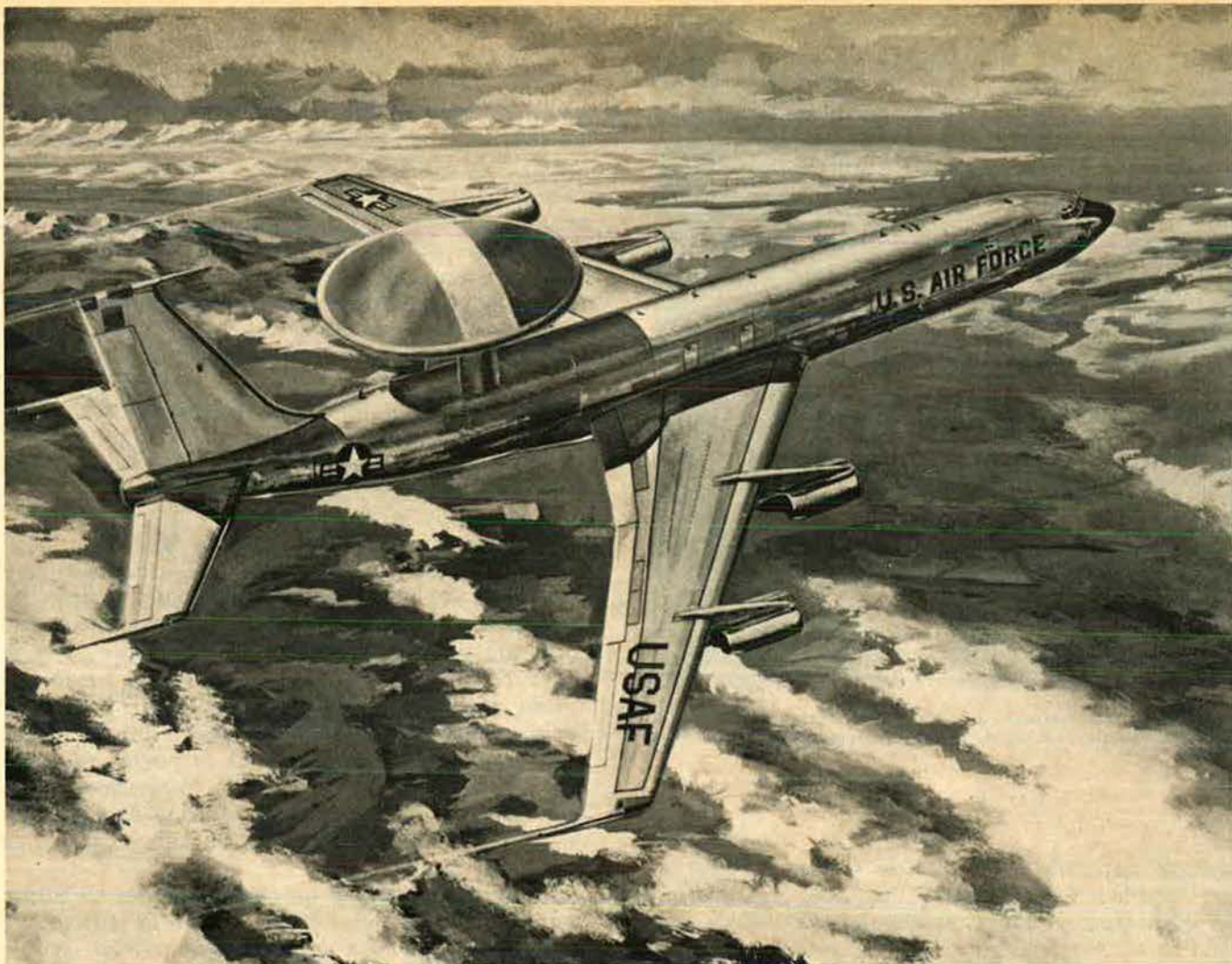
We are also working on other measures to ensure that more of our forces could survive an attack. We are developing a new satellite early-warning system that will detect missiles as they are launched from land or sea. This satellite system will significantly increase our warning compared to current systems, making our retaliation more certain and thus strengthening deterrence.

Another area in which we are working is detection of approaching enemy bombers. For the most part our present radars are ground-based. Consequently, they have a poor low-altitude detection capability and are vulnerable to enemy missile attack. Both of these weaknesses can be solved by an Airborne Warning

*(Continued on following page)*



An artist's concept of the B-1, an essential element of future deterrent forces. The Air Force will announce the winner of competition for the B-1 development contract in mid-May. Smaller than the B-52, new technology gives the B-1 greater speed, bomb load, penetration capability, and basing flexibility.



The Soviet bomber threat remains formidable. An artist's concept of AWACS, needed to improve low-altitude detec-

tion. See also the article on page 42, by General Ryan, for his discussion of the AF need for a tactical AWACS.

and Control System, called AWACS. With the capability to go rapidly on airborne alert, AWACS will be much less vulnerable to ICBM attack. In addition, its radar will be above the surface looking down, able to spot intruders at any altitude.

We must also modernize our strategic bomber force. If we let our security depend on missiles alone, a major breakthrough in Soviet missile defense systems could undercut deterrence. Adding strategic bombers to our missile force helps ensure against such a disaster. Since an enemy must deal with three different forces—land-based missiles, sea-based missiles, and bombers—he must divide his efforts and is less likely to be able to neutralize even one, let alone all three.

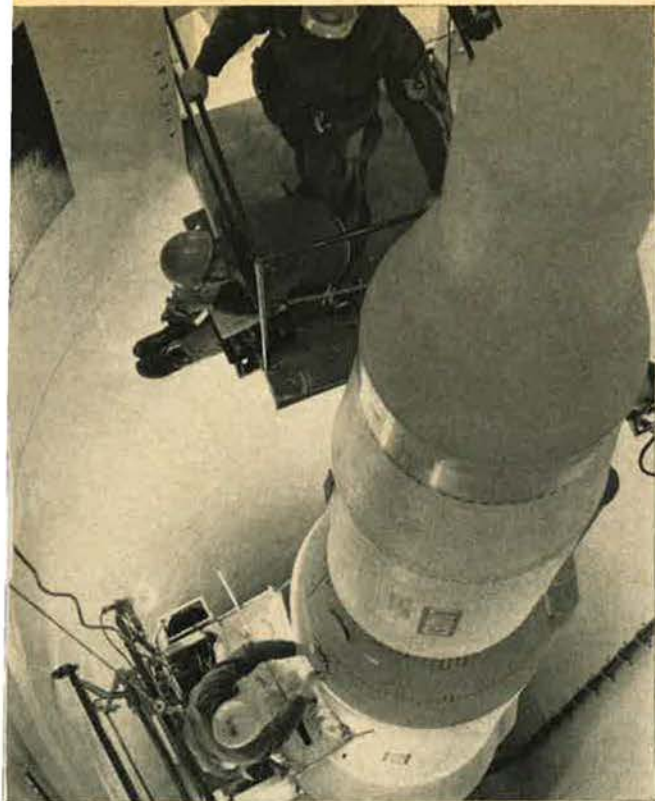
The B-52 aircraft has been the backbone of our bomber deterrent force for more than a decade. The prototype B-52 was based on technology of the late 1940s and first flew in 1952. The latest models were built in 1962. Eventually technology changes so much that either potential new developments cannot be incorporated into old aircraft or it is simply not economical to do so. Then it makes sense to produce a modern aircraft that can handle the threat and will have growth potential for future developments.

As I mentioned, the Soviets are improving their defenses as well as their offenses. The star of the Domodedovo Air Show of 1967 was the Foxbat interceptor. Regardless of tactics and penetration aids, it is asking a lot to assign a bomber the task of taking on a fighter that is fifteen years younger—on the fighter's home grounds.

For all these reasons, we are now developing a new strategic bomber, to be known as the B-1. This aircraft will take advantage of the many technical advances made during the past decade. It will be lighter than the B-52 and will have other characteristics necessary to operate from austere dispersal bases. With wider dispersal it will be harder for the enemy to target, and the B-1 will be able to take off faster, thus reducing its chance of being caught on the ground.

The B-1 will also have a reduced infrared signature and smaller radar cross section, which will make detection and interception more difficult. In addition, its capacity to carry more penetration aids and its improved electronic countermeasures will increase the chance of getting through even after discovery.

We in the Air Force recognize that we must a



The accuracy of Minuteman II and III missiles provides a capability against a variety of targets. Less accurate, shorter-range missiles are limited to area-type targets.

complete the modernization I have outlined at a time when the defense budget can be expected to decrease. We are thus working in every possible way to achieve maximum security at lowest possible costs. We are streamlining our management techniques and cutting back overhead costs wherever possible. For example, personnel strength in all Air Force headquarters above wing level will be cut nearly fifteen percent by this summer. This includes the Pentagon, the rest of the Washington area, all of our major commands, and

numbered air force and air division headquarters throughout this country and overseas. And it is perhaps significant that our planned procurement of new aircraft for the coming year is down to 390—the lowest number in any one year since 1935.

In view of past experiences with cost growth, we do not intend to go ahead with production of the AWACS or the B-1 until test aircraft have flown successfully. At that point we should have eliminated most of the development risks and should have a clear picture of those that remain. As a result, it should be possible to minimize costly changes after production has begun.

We also hope to reduce costs by decentralizing management. The program director will be given greater authority and responsibility for his program, thus speeding up day-to-day decisions that can cause expensive delays when they are not made in a timely fashion. At the same time, we will make sure that summary information is available for effective high-level review of technical performance, schedules, and costs.

In conclusion, I believe we must carefully study the growing Soviet strategic forces. We must consider the possible long-term effects of their 2-to-1, and still increasing, missile payload advantage; their large programs in submarine construction, ABM development, and air defense forces; and their growing research and development efforts. In the light of this threat, we must ensure that our land- and sea-based missiles and our strategic bombers can survive and retaliate effectively—and thus deter nuclear war. We must continue with Safeguard to help protect our land-based missiles, with our satellite warning system, with AWACS, with our new penetration capabilities for Minuteman and Poseidon, and with development of the B-1.

We in the Air Force do not want to be alarmists, nor do we lack confidence. We only want to face the facts. Our strategic programs must be viewed against the background of rapidly growing Soviet capabilities. —END



An F-102 (now operated by ANG) looks over a Soviet Bear off the North American coast. Since 1965, our active-duty interceptor force has been cut by two-thirds to fewer than 300, the newest of which—the F-106—is now a decade old. The USSR is believed to have about 3,000 interceptors, including the Mach 3 Foxbat.

*Only by combining the very best of people with sound operating concepts and superior equipment can the Air Force continue to perform the kind of job that the national interest demands of it. The Chief of Staff here examines a pertinent case history and then looks to the future . . .*

# Quality Is the Key to Force Effectiveness

BY GEN. JOHN D. RYAN, USAF

Chief of Staff, United States Air Force

**T**HE severe constraints on defense spending that apply today are causing the Air Force to give more and more attention to another important military fact of life. From now on, as we move toward lower force levels and smaller inventories, the key index to effectiveness in our deterrent role and in our preparations for combat operations will be *quality*.

On this score, I refer in part to quality in the sense of highly trained people with superior skill and ability, an asset that is now also the subject of intensive study at top levels of defense management. In addition, and as my primary topic, I refer to the growing importance of quality in terms of updated concepts and modernized equipment.

To illustrate this point, I could examine any area of mission responsibility—strategic, tactical, or airlift. I have decided, however, to focus on tactical air operations, because this is one field in which we have gained a high level of experience in training, test, and combat operations.

Looking first at the need for updating our concepts of tactical air operations, I think it is fortunate that we have now begun to take greater advantage of two sound operating principles that were proved out in the early stages of World War II. The first and most basic principle stressed the importance of assigning responsibility for coordinating the operations of all tactical air units in a combat zone to one commander. The second principle stressed the need for quality in a system of tactical air control to ensure close and continuous liaison between the cooperating elements of air and ground combat forces.

In the postwar years that followed, however, little success was achieved in sustaining a program of follow-up action to improve the quality and effectiveness of our tactical effort. There were several reasons for this. As one example, at the beginning of the Korean War, we still lacked a firm, joint service agreement on a

single air management concept as the best means of shifting and concentrating our forces, especially to conduct interdiction and close air support operation. As a result, we were in the late stages of that conflict before an almost *ad hoc* reevaluation of this problem brought the tactical air elements of the Air Force, Navy, and Marine Corps back into line with the operating principles that we had validated some ten years earlier. This move boosted the efficiency of our combined tactical air forces to a point that clearly substantiated the need for an official joint doctrine on air ground operations.

In the post-Korea period, follow-up action to obtain such an agreement again became sidetracked. We were several years into the Southeast Asia conflict before single air management again became a reality. The pressures toward a solution were stronger than ever in Vietnam because of the supplementing functions of tactical air in conducting airlift, escort, and herbicide operations. These pressures were also increased by the intensive air support operations needed to break the siege of Khe Sanh.

There can be little doubt about the essentiality of single air management at Khe Sanh. In that high-density operation, the air resources of all US military service and the Vietnamese Air Force saturated available air space. Strike sorties were flown around the clock b

---

*Gen. John D. Ryan became USAF's seventh Air Force Chief of Staff on August 1, 1969. A native of Iowa, General Ryan completed flight training in 1939, a year after graduating from West Point. During World War II, he flew fifty-eight missions over Europe in B-17s. Most of General Ryan's postwar career has been in SAC, which he commanded before moving to Hawaii as CinC, PACAF in 1967. He also has served as USAF Inspector General and was the Air Force Vice Chief of Staff prior to assuming his present position.*

---



**Gen. John D. Ryan, seventh Air Force Chief of Staff. A good man at the controls when there's rough flying ahead.**

Marine, Navy, and Air Force tactical aircraft, as well as by B-52s, against targets in an extremely small area. This situation was complicated still further by the extremely heavy air transport activities plus support operations by forward air control (FAC) aircraft and gunships.

On the basis of this total experience, we have a right to assume that we have learned the lesson of single air management well enough to avoid a repetition of the lapses that occurred in the aftermaths of World War II and the Korean conflict. If we have learned that lesson, we should also be able to accelerate progress in

developing a fully effective Tactical Air Control System (TACS) based on that concept.

Past progress in acquiring the personnel and hardware elements of a TACS has paralleled fairly closely the ups and downs of joint adherence to the principle of single air management. During the intervals between major conflicts, we had no adequate provisions for maintaining the levels of skill and experience that are requisite for an effective control system. To a like degree, we had no highly efficient provisions for conserving and improving our resources, especially ground-based elements of the system and FAC aircraft.

These deficiencies, prior to Vietnam, had imposed significant penalties on our overall effectiveness in tactical air operations, especially close air support. In that conflict, we have already scored major improvements in the various components of our TACS. We have also been successful in refining our techniques to gear these components into a single system that is reliable and responsive to the multiple requirements of control.

In the airborne element of the TACS, we have progressed from an improvised family of assorted light aircraft to the OV-10, a system which combines an advanced communications capability with enough armament to perform in a limited role of close air support.

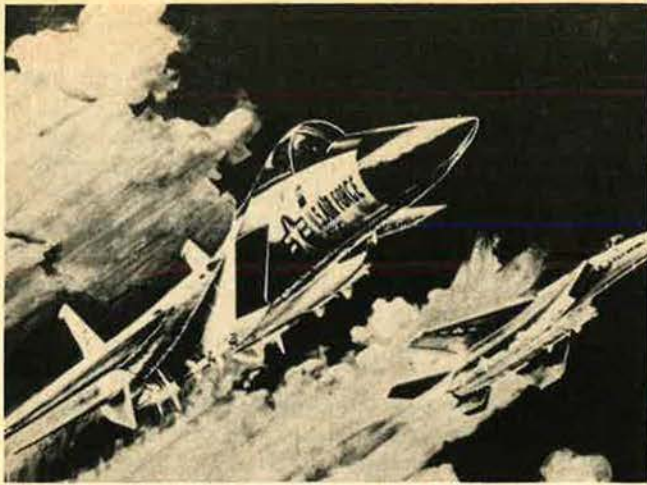
In the category of modernized communications and electronics equipment, we are acquiring many new control components of high capacity and mobility under an open-ended development program called 407L. This program, which has been in effect for several years, is designed to satisfy a broad range of new requirements that continually arise from the evolutionary nature of tactical forces and concepts. Through 407L, we should be able to achieve progressive modernization of many related types of communications equipment and facilities in the TACS.

Looking at our needs in this field several years ahead, we are also developing a Tactical Airborne Warning and Control System (Tactical AWACS) which will be an important part of the TACS. With advanced sensor and communications equipment, the Tactical AWACS will enable surveillance and command and control far

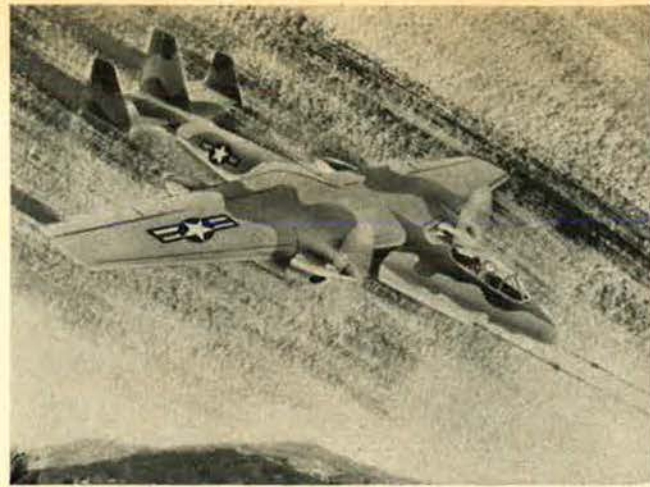
*(Continued on following page)*



**An outstanding Air Force technical achievement has been refinement of the Tactical Air Control System. This is a Direct Air Support Center developed by AFSC's Electronic Systems Division. The inflatable shelters house display and communications equipment. The DASC is part of the 407L Tactical Air Control System, an open-ended development program that has improved the quality of tactical air operations.**



An artist's concept of the F-15 air-superiority fighter being developed by McDonnell Douglas. It will combine high speed and maneuverability with flexible firepower.



The A-X—a turboprop, close-support aircraft—may look something like this. It will feature survivability, long loiter time, short-takeoff capability, and easy maintenance.

beyond the capability for existing ground-based elements of the TACS. This aircraft will be available for quick deployment with tactical forces anywhere in the world.

Operating within the TACS, we are developing an integrated family of aircraft with some members already in operation and others just coming into the inventory or under development. This family will provide an improved capability across the spectrum of tactical fighter operations—air superiority, close air support, and interdiction. In developing these aircraft, the emphasis is on quality to obtain desired results. Each type of aircraft is specialized for a particular role, but has the ability to perform one or more supplementary roles. We will achieve maximum combat effectiveness of the tactical force by ensuring a suitable overlap of aircraft capability.

For example, we will have the F-15, specialized for

air superiority. Combining power and high speed with the maneuverability and ease of handling of the early pre-jet fighters, it will be a "fighter pilot's fighter plane." The F-15 will be supplemented in the air-superiority role by the F-4.

We will have several aircraft specialized for different ground-support missions. Our primary night and all-weather deep-interdiction aircraft will be the F-111. It will also have a close air support capability and will be supplemented in the interdiction role by the A-7 and F-4. At first, the A-7 will be used primarily for close air support. Equipped with an internal gun, a Doppler inertial navigation and weapon delivery system, forward-looking radar, and improved survivability features, the A-7 will provide increased accuracy in weapons delivery. Eventually the A-7 will be used largely for battlefield interdiction and will have a backup role in close air support. The highly successful F-4,

**An A-7D takes off with very nearly two B-17 loads of bombs. A tough plane with sophisticated electronics, the A-7D will provide extremely accurate close support and effective battlefield interdiction. Along with the F-15, F-4, F-111, and an A-X—all under an advanced Tactical Air Control System—this team will be unequalled in quality by any other nation. And that goes double for the men and women behind the hardware!**



now the backbone of the tactical force, will be employed in all three tactical roles. We are planning now to introduce the A-X as our primary close air support aircraft, backed up by the F-4 and the A-7. The A-X will be the first USAF aircraft specifically designed for the close air support role.

Close air support, always a primary Air Force mission, becomes more intricate and complex as ground forces become more mobile. The close air support mission now entails more than simply "putting your bombs where the smoke is." Today, close air support can be broken into at least three subareas: close support of troops in battle, armed escort of troops moving on the ground or transported in the air, and armed reconnaissance in the battlefield area.

As Vietnam experience has shown, close air support aircraft now must be able to do more than "zip in, zap 'em, and zip out." (And we have been doing more than that, as attested to by reports from satisfied Army commanders in the field.) A review of stated Army requirements shows we need a responsive aircraft, capable of identifying, attacking, and destroying targets in extremely close proximity to friendly ground troops. It should be highly survivable and able to operate in poor weather. Its systems should be simple to maintain, it should be able to operate in austere forward areas without elaborate fixed facilities, and it should have radio equipment compatible with both Army and Air Force command and control systems. Existing aircraft can meet many of these requirements, but no single aircraft in the inventory can fill them all. The Air Force A-X is being developed to do all these things.

With its high cruising speed (above 300 knots) and long loiter time, the A-X can be immediately available over the battlefield, or, at the most, a few minutes away when scrambled from an austere forward operating

base. It will carry a mixed ordnance load, including a 30-mm gun, all types of conventional bombs, napalm, cluster bomblet units, and, for that matter, any existing or proposed weapons suitable for close air support. It will have two engines, redundancy of control systems, and heavy armor, increasing its survivability and enabling it to fly attack patterns lower and slower. This will permit a higher degree of accuracy and weapon density in ordnance delivery.

The A-X will have a small turning radius, survivability features, ordnance delivery system, and the types of munitions enabling it to perform in close proximity to ground troops and in conditions of extremely low ceiling and visibility. Operation from short airfields within 100 miles of the battle area will be SOP since the A-X, even when carrying a full ordnance load, will be able to take off in about 2,200 feet. Its simple systems will not require sophisticated support equipment.

Communications equipment will include both UHF and VHF-FM radios, enabling A-X pilots to communicate directly with supported ground forces as well as with elements of the TACS.

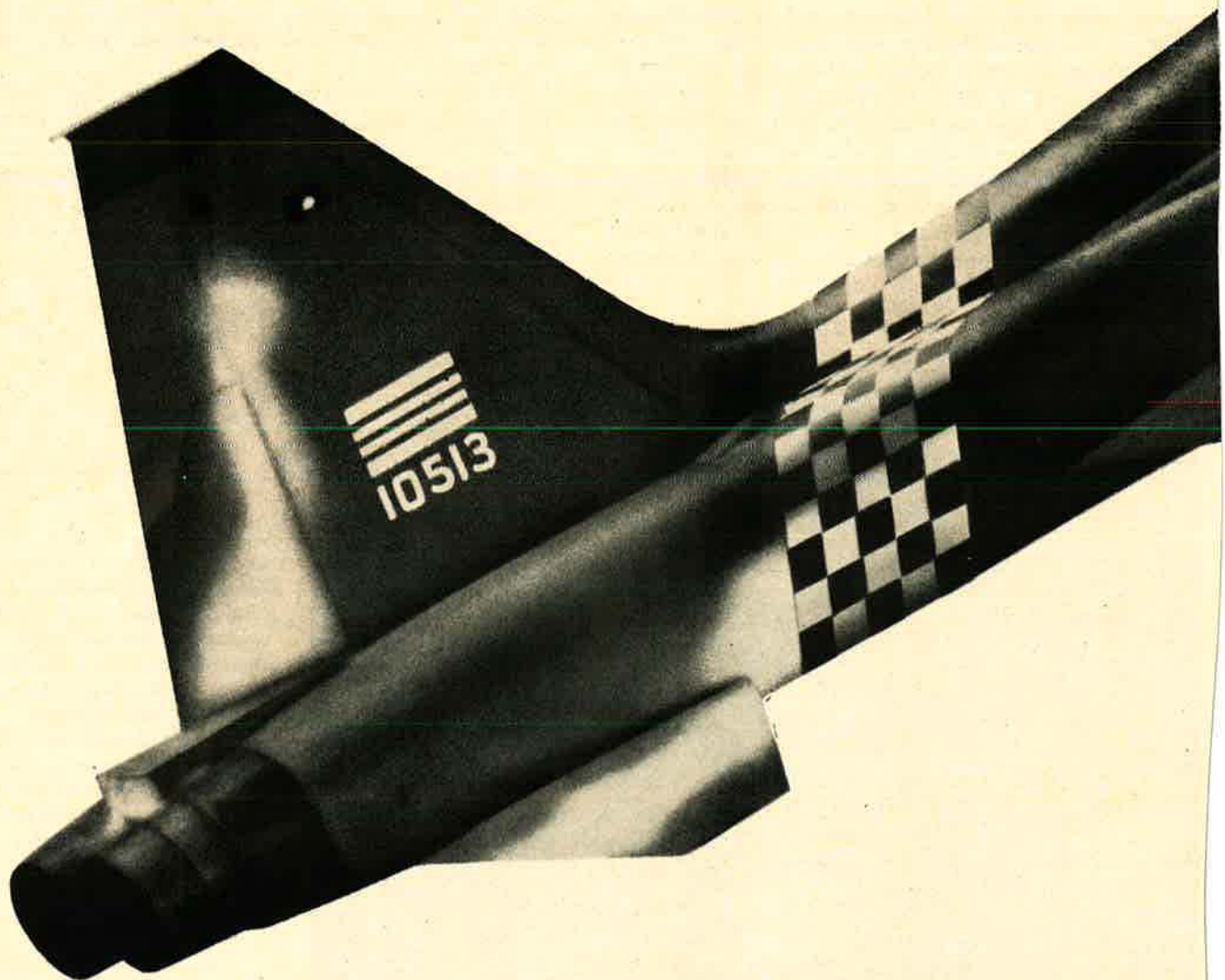
It will be capable of carrying more ordnance the same distance as an F-4, remain on station two and a half times as long, and deliver its ordnance more accurately under more adverse conditions. Its cost will be about half that of an F-4. There is no existing aircraft with comparable performance, even at twice the price.

All of these programs advancing the modernization of both the tactical air control and aircraft elements of our Tactical Air Forces are based on one primary conviction. Only by combining personnel of superior quality with operating concepts and equipment of superior quality can the Air Force continue to do an effective job.—END



**Across-the-board quality has been the key to Air Force effectiveness in Southeast Asia. Among the unsung heroes of Vietnam are the men who support remote sites, like the C-7 crew delivering supplies to this jungle strip. Without excellent command and control systems, air superiority, and suppression of ground fire, their job—always difficult—often would be impossible.**

# The F-5's Mission







# A proven idea that gets better with the times.

In five years of service the F-5 has become the most widely-used high performance aircraft in the Free World on duty with 15 nations. It is the supersonic backbone air forces in six Asian countries.

Day after day, it serves these highly capable air forces as an air superiority fighter, as a fighter-bomber, as an interceptor, as a reconnaissance aircraft.

The mission of the F-5 has been to perform these tasks effectively and to do it with a minimum of cost, money and materials. This is a vital mission in today's world, and the real measure of



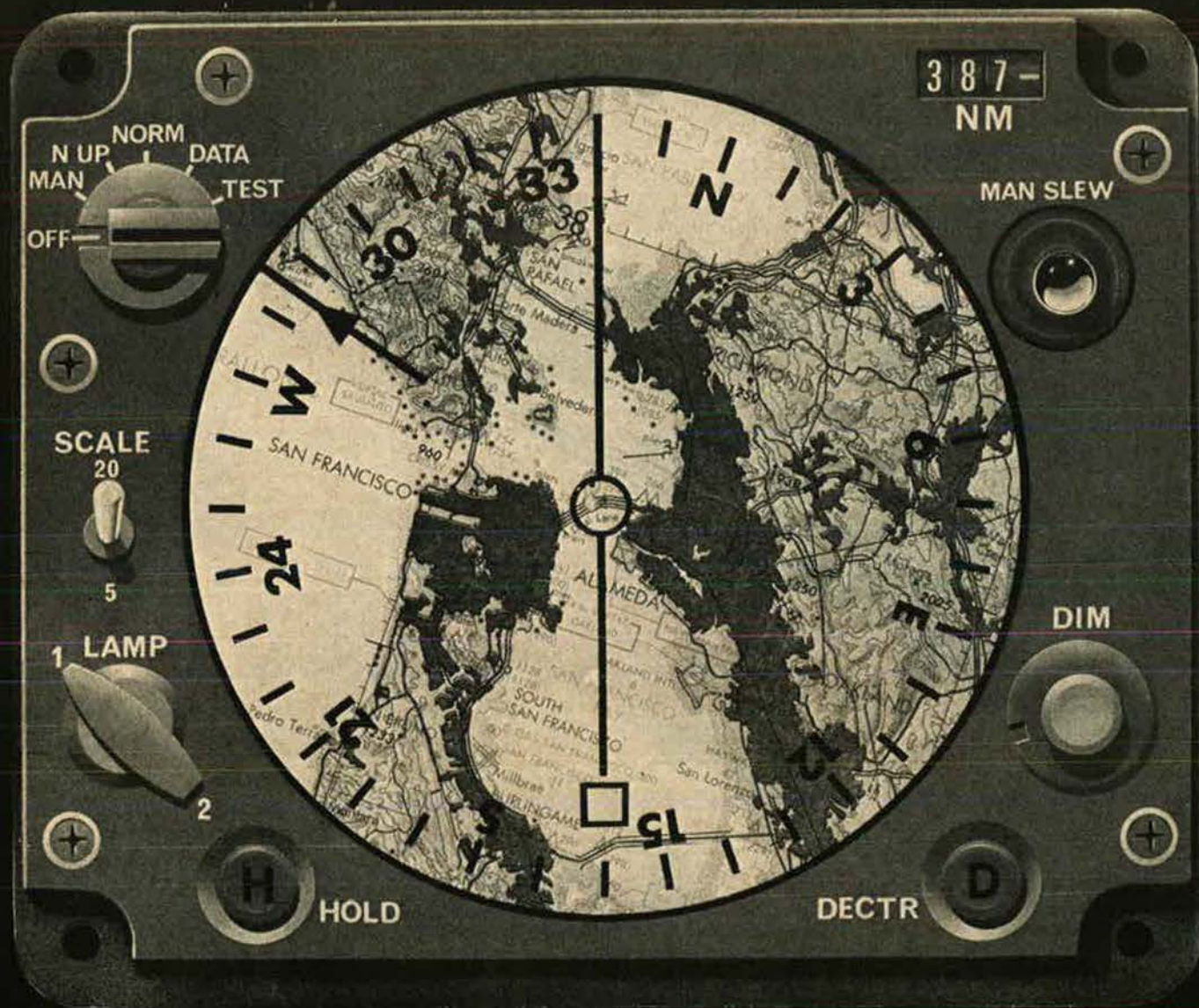
a nation's strength is the effectiveness with which it can use its resources.

A newer version of the aircraft carries this principle forward into another decade. Known as the F-5-21, it has been underway for over a year. Its more powerful engines have been tested since March 1969, and it brings together many aerodynamic improvements in service on other F-5 versions. The net result: Significantly greater performance and maneuverability.

Fully compatible with F-5's now in operation, this new fighter can be put into service quickly and efficiently. It can be a key factor in helping Free World nations maintain independent strength on into the future.

## **NORTHROP**

# Pilots shouldn't have to follow maps.



# Maps should follow pilots.

Our Projected Map System for tactical fighters does precisely that. Unlike stationary charts or even moving strip maps, its dynamic display pinpoints aircraft position anywhere in a theater of operations. All in tactical map scales. Think what all this means to pilots:

Automatic, up-to-the-second ground orientation in any weather from treetop altitude on up. A real pilot confidence booster, if ever there was one.

A real boost for mission flexibility, too. In-flight target



reassignments are a natural. So is updating navigational position to random visual or radar fixes. You even get infinite destination storage capability. System reliability? It's backed by eight years' development time. 1,000 hours of actual flight ex-

perience, too. And it's come through with flying colors aboard the U. S. Navy A-7E attack fighter.

In short, our Projected Map Display is enough to make any tactical fighter get up and fight. Write us for details: P. O. Box 508, Ottawa 4, Ontario, Canada.

**Computing Devices  
of Canada Limited**  
a subsidiary of

**CONTROL DATA**  
CORPORATION

P.O. Box 508 • Ottawa 4 • Ontario • Canada

# Office of the Secretary of the Air Force



1

**Secretary of the Air Force**  
Robert C. Seamans, Jr.



2

**Under Secretary of the Air Force**  
John L. McClucas

**An AIR FORCE Magazine Photochart**  
(As of April 10, 1970)



3

**Deputy Under Secretary (International Affairs)**  
Philip F. Hilbert



4

**Deputy Under Secretary (Systems Review)**  
Harry Davis



5

**Deputy Under Secretary (Space Systems)**  
F. Robert Naka



6

**Office of Space Systems**  
Brig. Gen. Lew Allen, Jr.  
Director



7

**The Administrative Assistant**  
John A. Lang, Jr.



8

**General Counsel**  
Jack L. Stempler



9

**Office of Legislative Liaison**  
Maj. Gen. John R. Murphy  
Director



10

**Office of Information**  
Maj. Gen. H. L. Hogan, III  
Director



11

**Assistant Secretary (Research and Development)**  
Grant L. Hansen



12

**Assistant Secretary (Installations and Logistics)**  
Philip N. Whittaker



13

**Assistant Secretary (Manpower and Reserve Affairs)**  
James P. Goode (acting)



14

**Assistant Secretary (Financial Management)**  
Spencer J. Schedler

# United States Air Force Command and Staff



16

Assistant Vice Chief of Staff  
Lt. Gen. John W. Carpenter, III



17

Vice Chief of Staff  
Gen. John C. Meyer



15

Chief of Staff  
Gen. John D. Ryan



24

Chairman, USAF  
Scientific Advisory Board  
Prof. Courtland D. Perkins



25

Chief, Operations Analysis  
Ross S. Thackeray



26

Chief of Air Force Chaplains  
Maj. Gen. Edwin R. Chess



27

The Inspector General  
Lt. Gen. Selmon W. Wells



28

The Judge Advocate General  
Maj. Gen. James S. Cheney

## THE DEPUTY CHIEFS OF STAFF



34

Comptroller of the Air Force  
Lt. Gen. Duward L. Crow



35

DCS/Personnel  
Lt. Gen. Austin J. Russell

An AIR FORCE Magazine Photochart (As of April 10, 1970)

## THE MAJO



40

Strategic Air Command  
Hq. Offutt AFB, Neb.  
Gen. Bruce K. Holloway  
Commander in Chief



41

United States Air Forces  
in Europe  
Hq. Lindsey AS, Germany  
Gen. Joseph R. Holzapple  
Commander in Chief



42

Pacific Air Forces  
Hq. Hickam AFB, Hawaii  
Gen. Joseph J. Nazzaro  
Commander in Chief



43

Military Airlift Command  
Hq. Scott AFB, III.  
Gen. Jack J. Catton  
Commander



44

Air Force Systems Command  
Hq. Andrews AFB, Md.  
Gen. James Ferguson  
Commander



50

Alaskan Air Command  
Hq. Elmendorf AFB, Alaska  
Maj. Gen. Joseph A. Cunningham  
Commander



51

Headquarters Command  
USAF  
Hq. Bolling AFB, D.C.  
Maj. Gen. Nils O. Ohman  
Commander



52

United States Air Forces  
Southern Command  
Hq. Albrook AFB, Canal Zone  
Maj. Gen. Kenneth O. Sanborn  
Commander



53

Air Force Communications  
Service  
Hq. Richards-Gebaur AFB, Mo.  
Maj. Gen. Paul R. Stoney  
Commander



54

United States Air Force  
Security Service  
Hq. Kelly AFB, Tex.  
Maj. Gen. Carl W. Stapleton  
Commander



18

**Chief Scientist**  
John J. Welch, Jr.



19

**Chief Master Sergeant of the Air Force**  
CMSgt. Donald L. Harlow



20

**Chief, Office of Air Force History**  
Maj. Gen. Richard A. Grussendorf



21

**Director, Air Force Board Structure**  
Col. Dean H. Schuyler



22

**Director of Administration**  
Col. John F. Rash



23

**Secretary of the Air Staff**  
Col. William E. Atwater



29

**Surgeon General**  
Lt. Gen. Kenneth E. Pletcher



30

**Assistant Chief of Staff, Intelligence**  
Maj. Gen. Rocky Triantafellu



31

**Assistant Chief of Staff, Studies and Analysis**  
Maj. Gen. Glenn A. Kent



32

**Chief of Air Force Reserve**  
Maj. Gen. Tom E. Marchbanks, Jr.



33

**Chief, National Guard Bureau**  
Maj. Gen. Winston P. Wilson



36

**DCS/Programs and Resources**  
Lt. Gen. George S. Boylan, Jr.



37

**DCS/Plans and Operations**  
Lt. Gen. Russell E. Dougherty



38

**DCS/Research and Development**  
Lt. Gen. Otto J. Glasser



39

**DCS/Systems and Logistics**  
Lt. Gen. Harry E. Goldsworthy

## COMMANDS



45

**Air Force Logistics Command**  
Hq. Wright-Patterson AFB, Ohio  
Gen. Jack G. Merrell  
Commander



46

**Tactical Air Command**  
Hq. Langley AFB, Va.  
Gen. William W. Momyer  
Commander



47

**Air University**  
Hq. Maxwell AFB, Ala.  
Lt. Gen. Albert P. Clark  
Commander



48

**Air Training Command**  
Hq. Randolph AFB, Tex.  
Lt. Gen. Sam Maddux, Jr.  
Commander



49

**Aerospace Defense Command**  
Hq. Ent AFB, Colo.  
Lt. Gen. Thomas K. McGehee  
Commander

## THE SEPARATE OPERATING AGENCIES



55

**United States Air Force Academy**  
Colorado  
Lt. Gen. Thomas S. Moorman  
Superintendent



56

**Air Force Reserve**  
Hq. Robins AFB, Ga.  
Maj. Gen. Rollin B. Moore, Jr.  
Commander



57

**Office of Aerospace Research**  
Hq. Arlington, Va.  
Brig. Gen. Harvey W. Eddy  
Commander



58

**Air Force Accounting and Finance Center**  
Hq. Denver, Colo.  
Brig. Gen. Edwin S. Wittbrodt  
Commander



59

**Air Reserve Personnel Center**  
Hq. Denver, Colo.  
Col. Benjamin S. Catlin, III  
Commander



60

**Air Force Data Systems Design Center**  
Hq. Washington, D.C.  
Col. Jack M. MacGregor  
Commander



61

**Aeronautical Chart & Information Center**  
Hq. St. Louis, Mo.  
Col. Edwin L. Sterling  
Commander



# Strategic Air Command

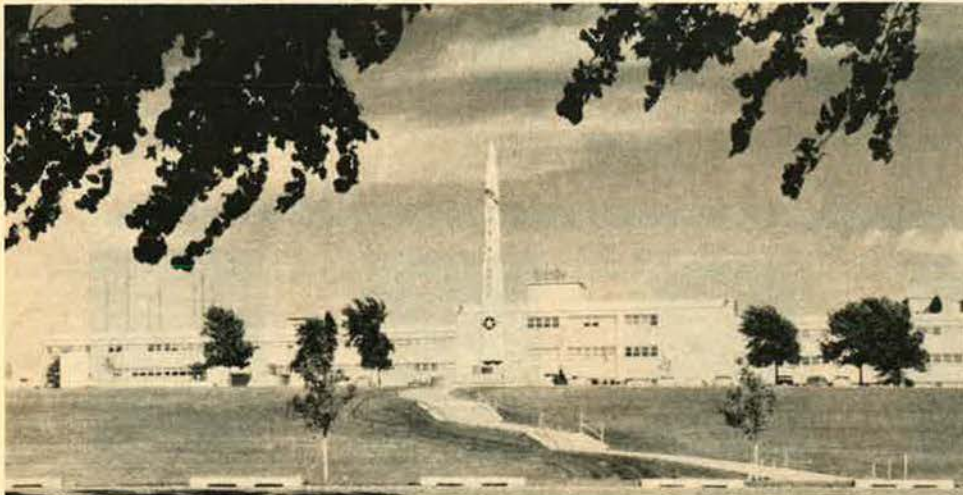
**W**HEN THE Strategic Air Command (SAC) was conceived in the final months of World War II, farsighted military planners were able to predict clearly the need for such a credible nuclear deterrent force. Over the past twenty-four years, SAC has improved its effectiveness through the development of its organization, weapons, and tactics. This evolution has been stimulated by science, the Communist threat, and the developing role of the United States as a leader of free nations. Most of all, it has been paced by the ingenuity and drive of SAC's professional manpower.

Though the men and machinery necessary to carry out its deterrent mission have changed, the primary mission of the command has remained the same. Briefly stated, SAC's peacetime mission is to maintain a force

capable of deterring aggression. Should deterrence fail, then SAC, the only specified command of the Joint Chiefs of Staff, must fight—and win.

The global concept of operations, the flexibility of its bombers and missiles, the tried and tested qualities of command, control, and communications, and its professional personnel have long been central to SAC. Together, they add up to the primary role of the command—deterrence—and they are basic to its secondary mission.

This "secondary" task is to meet the demands imposed by nonnuclear war. Under the cover of SAC's nuclear deterrent, bombers and tankers have continued their significant contribution to the Vietnam War. SAC has always had the potential for delivering conventional weapons, but until the B-52s actually began dropping



Command and control of the worldwide Strategic Air Command is exercised from headquarters near Omaha, Neb. Symbolic of SAC's missile force in today's climate of instant response is the Minuteman "shell" mounted in permanent display before the headquarters facility. It also reflects the major role assigned to the command since its inception following World War II—deterrence through the threat of massive retaliation.



Before he assumed command of the Strategic Air Command in August 1968, Gen. Bruce K. Holloway served as USAF Vice Chief of Staff. Upon graduation from the US Military Academy in 1937, he undertook pilot training at Kelly Field, Tex., receiving his wings in 1938. Shortly after the US entered World War II, General Holloway joined the "Flying Tigers" in China and remained with them when they were redesignated the 23d Fighter Group, becoming its Commander before returning to the US in 1944. In 1946, he assumed com-

mand of USAF's first jet fighter group. After graduation from the National War College in 1951, General Holloway held key staff posts at Headquarters USAF, and with Tactical Air Command and US Strike Command. He was named chief of USAFE in July 1965 and served in that position until becoming USAF Vice Chief of Staff in August 1966. A fighter ace with thirteen kills, General Holloway holds among his decorations the Distinguished Service Medal, the Silver Star, the Legion of Merit, Distinguished Flying Cross, and Air Medal.



Members of a SAC combat crew race toward their perennially ready-and-waiting B-52 heavy bomber. Forty percent of the SAC bomber and tanker force is on continuous ground alert, set to head for predetermined targets within the warning time provided by the Ballistic Missile Early Warning System. One of the bomber's two nuclear, air-to-ground, standoff Hound Dog missiles is shown in the foreground. The weapon has a range of more than 500 miles.

bombs on targets in Vietnam five years ago, the image of the command was nuclear. The B-52's greatest asset has been its tremendous bomb-carrying ability—one Stratofortress can carry thirty tons of 500- and 750-pound bombs. The precision that the crews bring to the operation enables them to deny the enemy sanctuary, to give direct support to ground troops locked in battle, and to interdict the supply areas and lines.

SAC's historic use of the strategic bomber force in support of tactical ground operations is one of the outstanding examples of the flexibility of airpower.

The bombers are only one part of the SAC operation in Southeast Asia. The other role is filled by the KC-135 air-refueling jet tankers. The crews of these aircraft are among the not-so-loudly sung heroes of the war. They have done an outstanding job. Their pres-

ence has made this the first conflict in which fighter-bomber and fighter-interceptor operations are not limited by fuel supply. The Stratotankers have also engaged in emergency refuelings to save men and aircraft, and they play an invaluable role in providing airlift for deployment to and redeployment from Southeast Asia.

To carry out its deterrent mission, SAC utilizes missiles as well as aircraft. The command's intercontinental ballistic missile (ICBM) force is comprised of fifty-four Titan IIs and 1,000 Minuteman missiles. The liquid-fueled Titan IIs have the heaviest warhead in the missile inventory. The solid-fueled Minuteman force is constantly being updated. Minuteman IIs have been added to the force and some of the original Min-

*(Continued on following page)*

## STRATEGIC AIR COMMAND

Headquarters, Offutt AFB, Neb.

Commander in Chief  
Gen. Bruce K. Holloway

**2d Air Force**  
Hq., Barksdale AFB, La.  
Lt. Gen. David C. Jones  
Commander

**8th Air Force**  
Hq., Andersen AFB, Guam  
Lt. Gen. Alvan C. Gillem II  
Commander

**1st Strategic Aerospace Division**  
Hq., Vandenberg AFB, Calif.  
Maj. Gen. William C. Garland  
Commander

**15th Air Force**  
Hq., March AFB, Calif.  
Lt. Gen. Paul K. Carlton  
Commander

19th Air Division  
40th Air Division  
42d Air Division  
45th Air Division  
47th Air Division  
817th Air Division  
823d Air Division

4th Strategic Aerospace Division  
12th Strategic Aerospace Division  
14th Strategic Aerospace Division  
17th Strategic Aerospace Division  
810th Strategic Aerospace Division  
821st Strategic Aerospace Division

A Titan II intercontinental missile roars out of its underground storage silo in a practice launch. A basic heavyweight in SAC's arsenal, Titan II plays a major role in the command's mission because of its nuclear warhead and range of more than 9,000 miles. The fifty-four-missile force of Titan IIs is to continue in operational status well into the current decade.



uteman Is are undergoing modernization. Those Minuteman Is that are not being modified will be replaced by Minuteman IIIs when that system becomes operational. These newer missiles will have an increased throw weight, greater accuracy, and a larger number of selectable target options.

Minuteman III, now in flight testing and slated to become operational later this year, will be a further step in force modernization. The first missile with the operational capability to carry Multiple Independently Targeted Reentry Vehicles (MIRV), Minuteman III



EC-135C airborne command post aircraft stand ready to take charge should SAC ground facilities become inoperative. EC-135Cs are airborne twenty-four hours a day.

can also carry penetration aids to confuse enemy defenses.

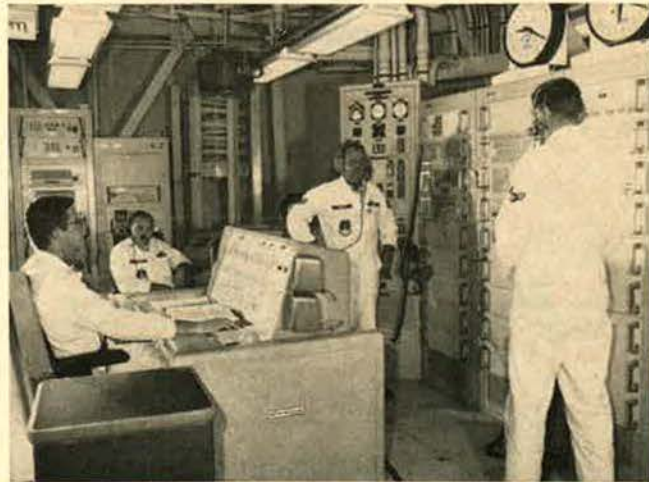
SAC missile combat crews, for the third time in missile history, met in a Missile Combat Competition at Vandenberg AFB, Calif. During April, missile crews and maintenance teams representing the finest of each Titan II and Minuteman wing competed in the week-long "Olympic Arena." This competition demonstrated the importance of the missile in the overall defense posture and helped sharpen the SAC missile force.

The strategic sufficiency the United States has today rests largely on the SAC bomber force. The manned strategic bomber force is able to respond to changing combat conditions and to provide several options to the National Command Authority. The core of this force is the B-52. Since 1965 the total bomber force has been reduced by the retirement of older models, from about 750 B-52s and B-58s to a current total of approximately 450 strategic bombers. The B-58, the nation's only supersonic bomber, was phased out of the bomber inventory early this year.

For the past thirteen years, SAC has maintained a sizable ground alert force. A further refinement of this continuous alert posture was tested last year. Known as Satellite Basing, bombers and tankers are dispersed to more bases to reduce vulnerability to missile attack. This dispersal further reduces the time required to launch the force and ensures a more credible deterrence.

This spring, the Air Force will consider design proposals on an Advanced Manned Strategic Bomber, the B-1. This aircraft has been identified as a possible replacement for the aging B-52 fleet. It would be capable of delivering large payloads, both nuclear and conventional, to long-range targets, at supersonic or subsonic speeds. The B-1 would also have the capability to penetrate enemy defenses in either full-scale or limited-war action. If approval for full-scale production is granted, the aircraft could be flown by SAC crews as early as 1977.

The FB-111 medium bomber is scheduled to become a part of SAC's operational bomber force in the near future. Operational units will be located at Plattsburgh AFB, N.Y., and Pease AFB, N.H.



A missile crew stands alert at one of SAC's Titan II missile complexes. Should it become necessary, the weapon can be launched from its silo home in less than a minute.





A B-52D Stratofortress releases its 60,000-pound load of bombs on enemy targets in Vietnam. Because it can strike from high altitudes without warning, the aircraft has deterred the enemy from assembling large-scale units for major assaults on ground bases. The B-52 bomber force is aging, however, and is already scheduled to be replaced by the upcoming B-1.

The air-refueling tankers, the KC-135s, continue to meet worldwide refueling requirements. SAC, as the single manager of the USAF jet tanker fleet, refuels Air Force tactical and strategic aircraft as well as US Navy combat aircraft.

Four SAC bombers competed in the RAF Strike Command Bomber-Navigation Competition in May and, this fall, all SAC bomber units will take part in the SAC Bombing-Navigation Competition. The realistic training and evaluation of flight crew and maintenance teams in a competitive atmosphere make the competition a valuable tool in the further refinement of the SAC bomber force.

One of the most significant command organization changes in SAC's history occurred in April 1970 with the reduction of SAC's three numbered air forces in the United States to two. The command functions of Eighth Air Force, Westover AFB, Mass., were assumed by Second AF, Barksdale AFB, La., and Fifteenth AF, March AFB, Calif. The action was a result of budget cuts and the modernization and realignment of the strategic bomber forces. This reorganization resulted in all SAC missile and reconnaissance units being assigned to a single numbered air force—the Fifteenth. Though some bomber and tanker units are assigned to the

Fifteenth, the majority of the aircraft force are under the command of the Second AF.

SAC's 3d Air Division, Andersen AFB, Guam, was inactivated in April 1970 and redesignated Eighth AF. Thereafter, all SAC units in the western Pacific and Southeast Asia came under the operational control of Eighth AF.

Strategic Air Command's greatest resource is the same as the nation's—its people. Using the weapon systems now in the inventory and planning for the future, they still maintain SAC's nuclear deterrent. It is still the primary mission, but with the success of the strategic bombers in Southeast Asia, SAC will continue to have an important role in conventional warfare.—END



An SR-71, the world's most advanced strategic reconnaissance aircraft, is refueled by a KC-135 Stratotanker. The SR-71 can fly at more than three times the speed of sound.



A three-stage, solid-fuel Minuteman ICBM is launched from a test silo at Vandenberg AFB, Calif. Six wings of the solid-propellant missile totaling a force of 1,000 form the backbone of SAC's missile strength. Minuteman III versions are designed to employ Multiple Independently Targeted Reentry Vehicle (MIRV), capable of carrying up to seven nuclear warheads to assigned targets.



## US Air Forces in Europe

**U**NITED States Air Forces in Europe (USAFE) will celebrate its twenty-fifth anniversary on August 7, 1970. The command was organized shortly after the end of World War II, in 1945.

Today USAFE is a lean, combat-ready command. Its airplanes are modern, and its aircrews are professional and experienced.

USAFE's job is the same as it was when the North Atlantic Treaty Organization was formed in 1949—to train and equip Air Force units pledged to NATO, and to aid other NATO nations in developing the combat effectiveness of their air forces. USAFE operates throughout Western Europe and the Middle East, covering an area that embraces roughly a quarter of the world.

Gen. Joseph R. Holzapple has been USAFE commander since January 1969. General Holzapple also commands the Fourth Allied Tactical Air Force (4ATAF), the international command to which the great bulk of USAFE's combat-ready units are committed for NATO control. Tactical air elements of the Royal Canadian and West German Air Forces are also assigned to 4ATAF, which is the largest of NATO's numbered tactical commands.

Completion of a vast conversion program that saw older aircraft give way to the sophisticated F-4 Phantom resulted in a streamlined organization geared to improving USAFE's tactical-airpower capabilities. The F-4E is the latest version of the McDonnell Phantom to be accepted by the Air Force. It is an all-weather, twin-engine jet fighter-bomber with a crew of two, which does double duty as an interceptor, has a top

speed of more than 1,600 mph, and an altitude ceiling of nearly 60,000 feet.

The first USAFE unit to complete transition from F-102s to the F-4 Phantom was the 32d Tactical Fighter Squadron based at Camp New Amsterdam, The Netherlands. Following the 32d were three other squadrons of F-102 interceptors. The four squadrons retain their primary air defense mission. USAFE has also activated the 86th Tactical Fighter Wing, November 1, 1969, and taken over Zweibrucken Air Base, Germany. The wing will have a dual mission with a reconnaissance squadron of RF-4Cs (already in place) and a tactical fighter squadron of F-4s.

The first F-4s to arrive in Spain replaced F-100s of the 401st Tactical Fighter Wing at Torrejon Air Base in January 1970.

The swingwing F-111 is scheduled to come into the USAFE command inventory later in the year. The 20th Tactical Fighter Wing at RAF Upper Heyford, England, will be the first unit to receive the multipurpose aircraft. The F-111 can reach speeds of Mach 2.5 at altitudes of 60,000 feet and is considered superior to other US tactical fighters with respect to its unrefueled transoceanic range, bomb-carrying capability, all-weather strike capability, and single-ship penetration capability. Until conversion, the 20th will retain its F-100 aircraft.

USAFE's strike capability consists of the F-4s, and two wings of F-100s. Reconnaissance wings are equipped with RF-4s.

USAFE is a component of the United States European Command (USEUCOM), which consists of the US Army, Navy, and Air Force in the European



*Prior to being assigned in January 1969 as Commander in Chief, US Air Forces in Europe, and Commander, Fourth Allied Tactical AF, Gen. Joseph R. Holzapple served as Deputy Chief of Staff, Research and Development, Headquarters USAF. A 1938 graduate of Bradley University, he received his wings in 1941. During the war General Holzapple flew ninety-one combat missions in Africa and Europe and commanded the Twelfth Air Force's 319th Bombardment Group. After assignments in planning and development work following the*

*war, he attended the National War College in 1954-55 and, on graduation, became Commander of the 47th Bombardment Wing in England. In 1956 General Holzapple joined USAFE as Deputy Chief of Staff for Operations and later became its Chief of Staff. The late 1950s and early '60s found him again in the US engaged in supervising various USAF research projects. He was named Deputy Chief of Staff for Research and Development in September 1966. A command pilot, he holds the DSM, the Silver Star, Legion of Merit, DFC, and Air Medal.*



Defending the skies over Europe is a relative newcomer to this theater—the F-4 Phantom, an all-weather, twin-jet, two-man fighter-bomber. It does double duty as an interceptor and has a top speed of more than 1,600 mph. F-4s have an altitude ceiling of 60,000 feet. They are replacing older aircraft in both US and allied squadrons.

theater. USAFE is responsible to the Commander in Chief, USEUCOM, and, in addition, comes under the Air Force Chief of Staff on questions of Air Force policy and on administrative matters that relate to the command over assigned units.

USAFE's NATO missions are directed by the Supreme Allied Commander, Europe (SACEUR).

Three numbered air forces assist in carrying out USAFE's mission—one each in England, Spain, and Germany. The Third Air Force with headquarters at South Ruislip, England, is a combat-ready tactical force. In the event of hostilities, its tactical air units would come under operational control of NATO's Fourth Allied Tactical Air Force.

The Sixteenth Air Force at Torrejon Air Base, Spain, is USAFE's southernmost European command. It has operational control of one tactical fighter wing with three squadrons. The Sixteenth Air Force has no NATO commitment. However, in time of war, Sixteenth's 401st Tactical Fighter Wing would be deployed outside Spain and become NATO-committed.

The Sixteenth Air Force has administrative command of The United States Logistics Group (TUSLOG), which has its headquarters at Ankara, Turkey. TUSLOG, formerly one of USAFE's major subcommands, has a primary mission to provide logis-

tic support for US forces, representatives, and activities in Turkey, Greece, and Crete, as well as in other areas of North Africa, the Middle East, and Asia. It also provides operational support for two NATO-committed tactical fighter squadrons on rotational assignment from other bases in Europe. Assignment of administrative command of TUSLOG to the Sixteenth Air Force provides better, more efficient command control and minimizes supply and logistics problems previously encountered throughout the Mediterranean areas where USAFE bases are located.

The Seventeenth Air Force, with headquarters at Ramstein Air Base, Germany, has both offensive and defensive capabilities, and in the event of hostilities would respond to the command of the Fourth Allied Tactical Air Force.

The gunnery range operated by the 7272d Flying Training Wing at Wheelus Air Base, Libya, ceased operations in early September 1969. Withdrawal of all military, dependents, and civilian employees of the wing is programmed for completion by June 30, 1970.

In the fall of 1969, the electronic-warfare capability of USAFE was beefed up with the assignment of the 39th Tactical Electronic Warfare Squadron to Spangdahlem Air Base, Germany. The 39th is equipped with

*(Continued on following page)*

## UNITED STATES AIR FORCES IN EUROPE

Headquarters, Lindsey AS, Wiesbaden, Germany

Commander in Chief  
Gen. Joseph R. Holzapple

**3d Air Force**  
Hq., South Ruislip, England  
Maj. Gen. John H. Bell  
Commander

**16th Air Force**  
Hq., Torrejon AB, Spain  
Maj. Gen. Eugene B. LeBailly  
Commander

**17th Air Force**  
Hq., Ramstein AB, Germany  
Maj. Gen. Royal N. Baker  
Commander

Douglas EB-66 aircraft—a twin-engine turbojet. The squadron represents a major upgrade of the electronic-warfare capabilities of tactical aircraft in the European area.

The European Communications Area, a component of the Air Force Communications Service, provides extensive communications support. A significant move to decrease overloading of communications systems was the introduction in Europe of the Automatic Digital Network (AUTODIN), the world's largest and most advanced digital communications system.

Installation of the AUTOVON (Automatic Voice Network) system in June 1969 linked USAFE with the Defense Communications System and greatly improved military telephone service in Europe.

In 1969 USAFE acquired the responsibility for tactical airlift in Europe. Previously USAFE's airlift function was managed by the 322d Air Division, Military Airlift Command (MAC), under a joint USAFE-MAC plan for coordinated control. With control of airlift operations turned over to USAFE, the Airlift Control Center, formerly located at High Wycombe, England, was moved to Wiesbaden. The 322d Air Division was inactivated. MAC then activated the 435th Military Airlift Support Wing and moved the headquarters to Rhein-Main Air Base, Germany, to support strategic airlift missions to and within Europe.

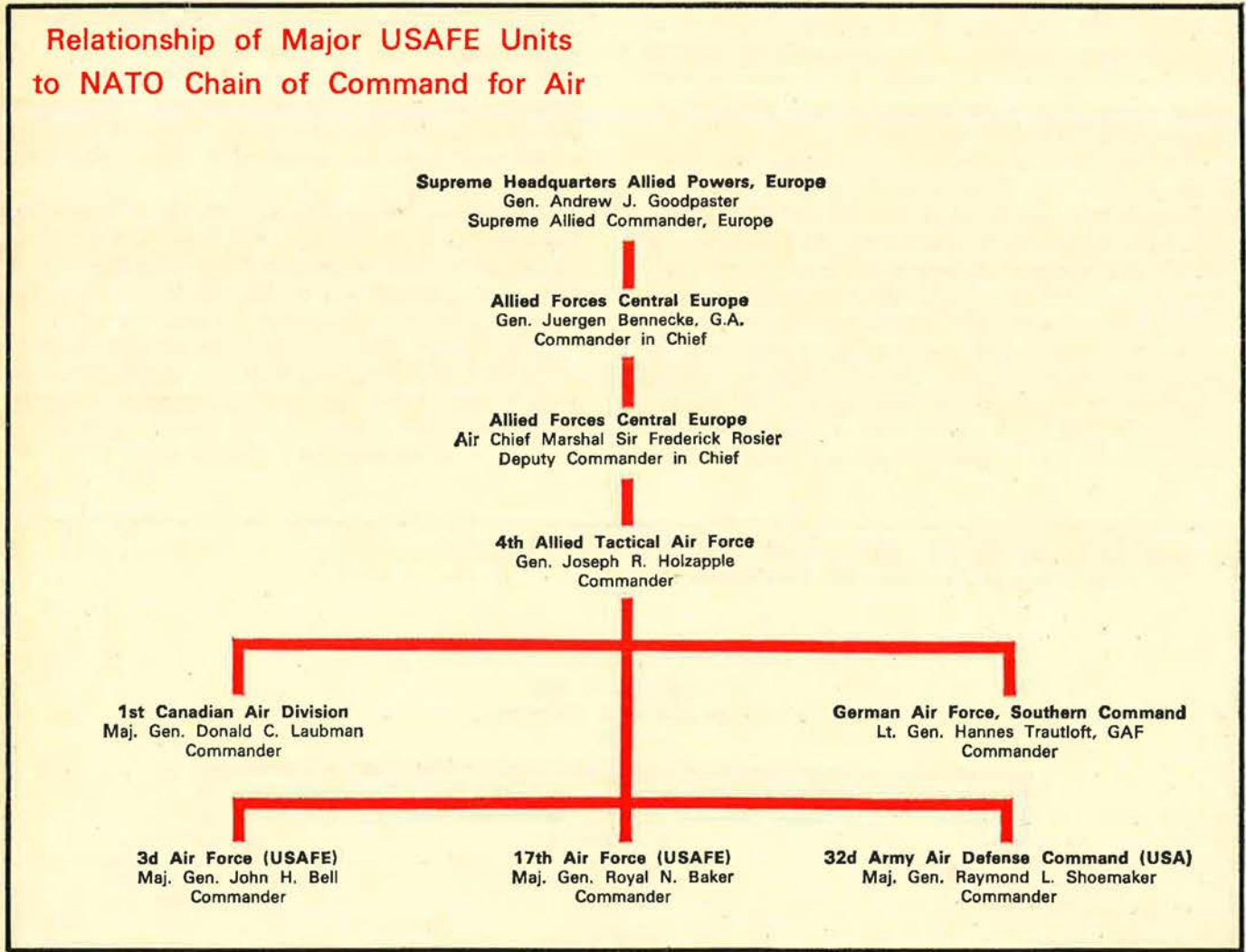
USAFE has two tactical airlift wings—one at RAF Mildenhall, England (the 513th), and one at Rhein-Main Air Base, Germany (the 322d). Both have C-130 Hercules, with the Tactical Air Command rotating aircraft and crews periodically.

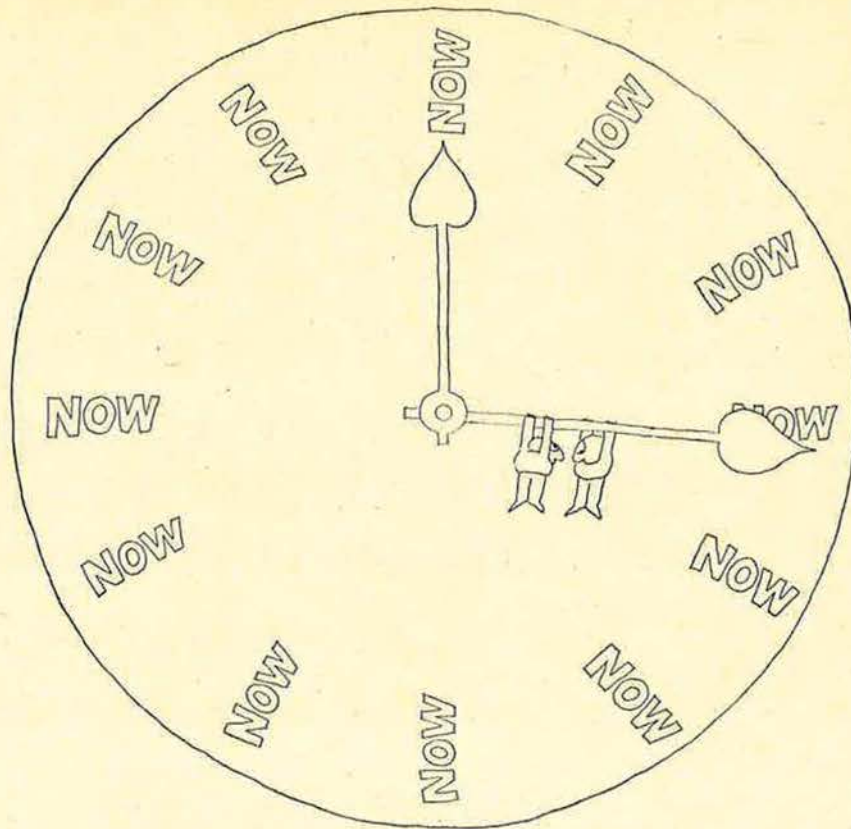
The 322d Tactical Airlift Wing at Rhein-Main Air Base also handles intratheater aeromedical evacuation, operating C-118s and C-131s with augmentation as necessary by C-130s.

Six dual-based Phantom squadrons, located in the United States for economy reasons, continue to train to meet USAFE and NATO-commitment standards. USAFE maintains suitable bases in Europe in a constant state of readiness to receive the dual-based squadrons. Dual basing serves a definite response capability in time of emergency and is intended primarily as an immediate reinforcement.

The shelter construction program TAB VEE (Theater Air Base Vulnerability), started in January 1969, is well under way at bases in Germany and one in The Netherlands. Initial construction was started at Ramstein Air Base, Germany, and was ninety percent complete in early 1970. The shelters, designed to better protect the Air Force's Phantom jets, are the same type as those now being used in Vietnam, and are scheduled for completion by fall of 1970. Overall, the

*(Continued on page 61)*





## 15 minutes ago things were fine. But how about now?

A UNIVAC® real-time information system can tell you at once. That's what real-time means.

Univac makes now mean now.

Actions you might take at 11:00 a.m. are based on all-inclusive information that is up-to-the-minute at 10:59.

You recognize problems much sooner, repond much faster to sudden developments.

Univac pioneered in real-time computer systems for space and govern-

ment. Today it wants to help you pioneer in better administration.

Our real-time information systems gather, organize, update and communicate information to all designated users. Only what's needed, only where it's needed.

The result is real-time administration, for the first time. Administration in the present. Always in the present.

Constant information, constant command of your operations.

If you're tired of old-time delays and out-of-date reports, if you want instant control for a change, just pick up your phone.

Univac has information for you. Now.

**UNIVAC**  
FIRST IN REAL-TIME INFORMATION SYSTEMS

**SPERRY RAND**



**Would you send  
your electronic components  
out on a day like this?**

**That's why we built  
the flying safe deposit box.**

If every day were a beach day, shipping vulnerable air cargo would be a snap.

Life is not that way.

Before your shipment reaches the airport, it can be exposed to a rough world and its weather.

So, if you were anxious about shipping anything overseas, it was understandable.

Until now.

Now, Pan Am® has introduced its 747 flying safe deposit box system to protect vulnerable cargo.

Once inside a flying safe

deposit box, your cargo is secure and private.

You can even have one to pack right on your own loading dock. You lock and seal it. And it stays that way until its final destination.

And, as they're intermodal, they'll be handled with top efficiency here and abroad.

Our flying safe deposit box can take up to 2400 lbs. of cargo. And every Pan Am 747 flight carries 14 of them.

Today, we're sending regularly scheduled 747 passenger/cargo

flights to London, Paris, Frankfurt, San Juan, Honolulu, Tokyo and Hong Kong. Soon, more of the world's major markets will be added.

For you, it'll mean a big savings in shipping costs and aggravation.

To find out more on how you can ship air cargo, regardless of what's doing outside, please call your nearest Pan Am office.

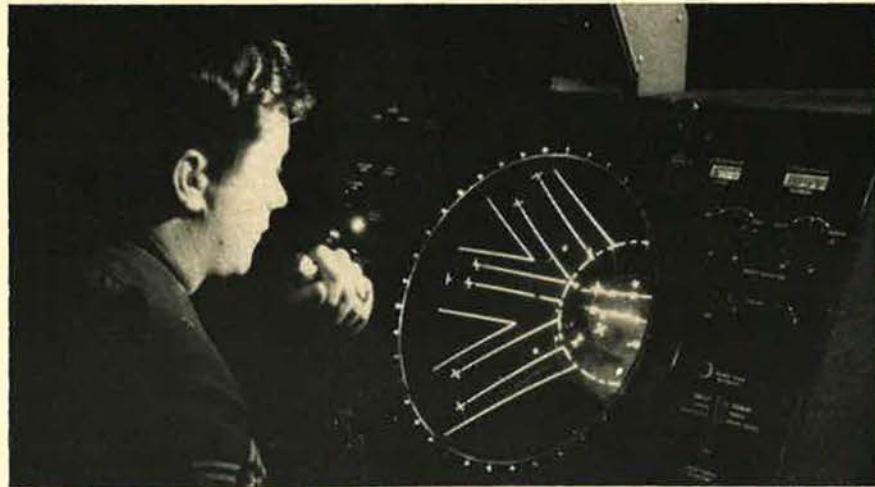


**The Pan Am 747 flying safe deposit box system  
to London, Paris, Frankfurt, San Juan, Honolulu, Hong Kong and Tokyo.**



In USAFE as well as throughout USAF the C-130 Hercules is a workhorse. Two rotational C-130 squadrons from the US help provide USAFE and NATO forces with day-to-day logistical airlift and delivery of cargo and personnel during training exercises. NATO forces participated in two large-scale exercises in the recent past. Deep Furrow was conducted in the southern region of Allied Command, Europe, and Arctic Express in Norway near Soviet Union and Finnish borders. Both operations were supported by USAFE aircraft.

The job of air traffic controller is one of the most exacting and exciting in the USAF. Doubly so if the post is in Berlin, where aircraft have to be guided in and out of one of three ten-mile-wide air corridors. This scene is reminiscent of several decades ago when the city was blockaded and the necessities of life for the entire population had to be brought in by air. The blockade was broken by a herculean effort of USAF aircrews who risked their lives daily.



With an icy Norwegian landscape as a background, a USAF C-130 Hercules roars off Bardufoss Air Station during the deployment phase of NATO's field exercise Arctic Express.



USAFE crew unloads gear at Bardufoss in support of NATO forces in Arctic Express, an exercise designed to test rapid deployment as well as winter operational capability.

shelter construction was fifty percent complete by the end of April.

To keep its airlift and tactical fighter units combat ready, USAFE participates in exercises with the US Army in Europe and with other NATO forces. Two large-scale NATO exercises were held in the last year—Deep Furrow in the fall of 1969 and Arctic Express in February/March 1970.

Deep Furrow took place in the southern region of Allied Command, Europe. Land forces held maneuvers in northwestern Turkey, and naval forces held exer-

cises in the eastern Mediterranean, including the Aegean Sea. NATO air units provided fighter-bomber support and photo reconnaissance throughout the area. Greece, Turkey, Italy, the United Kingdom, and the United States participated. The southern land forces were supported by an air deployment from the United States and Europe.

Arctic Express was held in the Tromsø area of Norway near the borders of the Soviet Union and Finland. The object was to test the deployment of the  
*(Continued on following page)*

mobile force of Allied Command, Europe and its ability to operate in a winter climate. Seven battalions—about 5,000 men—from the armies of the United States, Canada, Britain, and Italy were transported by sea and air to the exercise site. The Air Force flew more than 150 airlift missions with C-130s in the deployment phase. The same number of missions was required for redeployment.

USAFE deployed twenty-one F-100s, and the Canadian forces deployed a squadron of F-104G Starfighters for participation in the exercise.

USAFE's humanitarian aid included assistance to the people of Tunisia during a flood in October 1969. Members of the 58th Aerospace Rescue and Recovery Squadron at Wheelus Air Base flew HH-53 Jolly Green Giant helicopters and airlifted tons of food, medicine, clothing, and blankets to the victims. More than 2,000 people were rescued from rising water.—END



Forward air controllers direct close-in support sorties by USAFE fighter aircraft in joint USAF/US Army exercises as well as operations conducted by NATO combined forces.



A propeller from the famed *Lady Be Good* WW II bomber is removed from its site at Wheelus AB, Libya, as the base closes. The souvenir goes to the Air Force Museum, Ohio.



US Army assault troops, flown in by USAF C-130 Hercules, stage a mock attack during a joint USAF/US Army exercise in Europe. In 1969 USAFE acquired responsibility for all tactical airlift operations on the continent.



## Why the services like our services.

Because Eastern has service to 104 cities. So military men are almost certain to find a convenient Eastern flight to take them where they want to go. Especially on the East Coast, where most military installations are located. And in Portland, Seattle and Los Angeles on the West Coast.

Because Eastern has pioneered such service as the Air-Shuttle\* to make air travel easier and more convenient. To fly you between New York and Boston and New York and Washington. Flights you can hop any time without a reservation.

Because, above all, the 32,000 people of Eastern have made a commitment to the military. To make them as at home in the sky as they are on land.

Come fly with us. Let us show you how serviceable an airline can be.



**EASTERN** The Wings of Man.

\*Air-Shuttle is a service mark of Eastern Air Lines, Inc.



## Pacific Air Forces

**T**HE LAST fire fight of the siege was over. A weary Army sergeant, Carl Mayse, climbed down from his weapon-firing position, sat on a bullet-riddled sandbag, and counted his blessings at the tiny Ben Het Civilian Irregular Defense Camp in the Republic of Vietnam.

Airpower—PACAF style—had just saved his life. He was more than grateful. "We were really glad to see those Air Force fighters," said Mayse. "Things looked grim until they showed up." Another adviser echoed Mayse's words. "The B-52s and the fighters really rattled Charlie's teeth," said Army 2d Lt. Neal D. Fagan. "We couldn't have survived without them."

The sentiments of these two Americans were typical of remarks of more than 100 civilian and military defenders assigned the long, difficult task of defending the Ben Het Civilian Irregular Defense Camp in Kontum Province from North Vietnamese and Viet Cong forces. Their camp had been under attack during most of the spring of 1969, and now, the last week in June, US Air Force airpower had driven off the enemy.

Another success story was quietly recorded for the pilots, ground crewmen, and behind-the-scenes specialists of Pacific Air Forces, the big Air Force command that defends the Pacific. It was the bombing, strafing, illumination, and resupply missions by PACAF aircraft that permitted Ben Het—and Sergeant Mayse and Lieutenant Fagan—to live and fight another day. But the defense of Ben Het didn't just happen. It was a product of professional teamwork in the air and on the ground.

During the siege F-100 Supersabres, F-4 Phantoms, and A-1 Skyraiders from PACAF's Seventh Air Force and Vietnamese Air Force A-37s flew a combined total of 917 sorties. Strategic Air Command B-52s flew thirty-seven missions in direct support of the camp

while AC-47 Spooky and AC-119 Shadow gunships performed thirty-three night-illumination and firepower missions.

Ben Het's major source of supply was airdrop, and C-7 Caribou aircraft under direction of the 834th Air Division delivered urgently needed ammunition, water, and medical and food supplies. During the last twenty days of June, 215 tons were air-dropped.

Heaviest action took place during the week of June 23-29. On June 29, ninety sorties were flown by Seventh Air Force and VNAF pilots. At the end of the siege, Forward Air Controllers (FACs) of the 21st Tactical Air Support Squadron who directed area air strikes credited allied fighter-bomber pilots with killing 303 enemy soldiers and destroying 1,062 bunkers and twenty-four weapons positions.

Close air support like this at Ben Het is just a part of PACAF's mission in Southeast Asia, just as PACAF's Southeast Asia mission is only a part of its broad Pacific-area military responsibilities.

What is the mission of the Pacific Air Forces? To maintain air superiority in the Pacific. The command is responsible for roughly forty percent of the earth's surface—an area populated by more than one and one-half billion people of some twenty nations.

To meet this challenging mission, PACAF is manned by more than 150,000 men and women assigned to thirty-one bases from Hawaii to Thailand. The operations of three numbered air forces, five air divisions, and one air base wing are directed from Headquarters PACAF, Hickam AFB, Hawaii, by Gen. Joseph J. Nazzaro and his staff.

The air base wing serving as a major subcommand is the 6486th Air Base Wing, Hickam AFB. This wing is responsible for supporting all PACAF central Pacific activities, including the areas of Hawaii and Johnston



*Gen. Joseph J. Nazzaro became the Commander in Chief, Pacific Air Forces, in July 1968. Previously, he headed SAC. A 1936 West Point graduate, General Nazzaro attended advanced flying school at Kelly Field, Tex., and then transferred from the Infantry to the Army Air Corps in 1937. During the war years he served with the Eighth Air Force in Europe, and in January 1944 was named Deputy Director of Operations, US Strategic Air Forces in Europe. After postwar duty as bomb wing and division commander, staff officer, and Air Uni-*

*versity instructor, General Nazzaro became USAF Director of Personnel Planning in 1957. During the late 1950s and early 1960s, General Nazzaro held several important positions in SAC, including Commander of the Eighth Air Force. He was appointed SAC Vice Commander in Chief in December 1964, and in February 1967 became Commander in Chief. A command pilot, General Nazzaro includes among his military decorations the Distinguished Service Medal, the Silver Star, Legion of Merit, Distinguished Flying Cross, and Air Medal.*

Island. Due to its mid-Pacific location, the wing supports transiting tactical fighters and other aircraft en route to and from Southeast Asia. Additionally, Military Airlift Command flights passing through Hickam are serviced by the 6486th.

Also located at Hickam, within Headquarters PACAF, is the agency responsible for the unified Pacific Command's tactical airlift capabilities. The Directorate of Airlift (DOAL) integrates all key elements of a system responding to airlift needs of Army, Navy, Marine, and Air Force units in the Pacific Command. DOAL was formed in early 1969 to assume airlift functions previously performed by PACAF's 315th Air Division, which was deactivated.

Current focal point of public interest in PACAF operations is the air war in Southeast Asia. Two of PACAF's numbered air forces—Seventh Air Force in the Republic of Vietnam and Thirteenth Air Force units in Thailand—are committed to combat.

Since the November 1, 1968, bombing halt, PACAF missions have been restricted to air support of free world forces in the Republic of Vietnam. Prior to that halt, PACAF aircraft successfully carried the war to North Vietnam, striking military and industrial targets with great effectiveness.

Seventh Air Force, air arm of the Military Assistance Command, Vietnam (MACV), is headquartered near Saigon at Tan Son Nhut Air Base. Included in its

varied missions are close air support for Army, Marine, and allied ground forces, airlift, reconnaissance, air defense, psychological-warfare operations, and support functions necessary to each of these.

Approximately 1,000 combat aircraft and more than 52,000 personnel are assigned to Seventh Air Force. Its aircraft inventory ranges from the latest in jet fighter-bombers to World War II aircraft converted for special operations.

Thirteenth Air Force units in Thailand provide tactical support for Seventh Air Force operations in Vietnam. Although these units are assigned to Thirteenth, they come under operational control of Seventh.

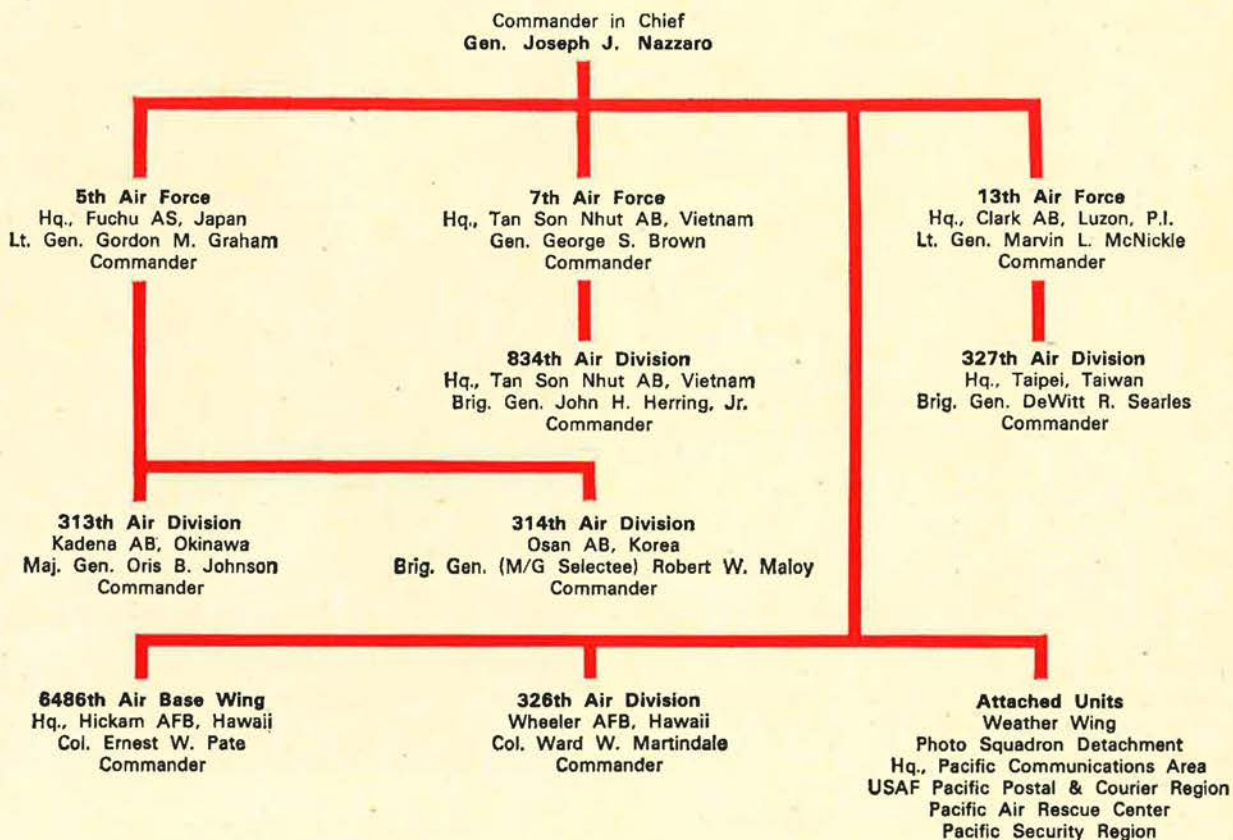
Flying a variety of missions, Thirteenth Air Force organizations operating from Royal Thai Air Force bases have established impressive combat records. For example, the 13th Tactical Fighter Squadron "Panther Pack" of the 432d Tactical Reconnaissance Fighter Wing at Udorn RTAFB, Thailand, logged its 10,000th mission in Southeast Asia on July 8, 1969. To achieve this mark, pilots flew more than 19,500 hours.

Headquarters Thirteenth Air Force is located at Clark Air Base, Republic of the Philippines. Manned by more than 49,000 men and women, including those assigned to Thailand, Thirteenth Air Force provides primary logistical support for Air Force units in Southeast Asia.

*(Continued on following page)*

## PACIFIC AIR FORCES

Headquarters, Hickam AFB, Hawaii





On the flight line at South Vietnam's Tuy Hoa Air Base, a USAF F-100 Supersabre of the 31st Tactical Fighter Wing awaits the coming of dawn and the inevitable call to combat.

PACAF operations in Southeast Asia are fast paced. From July 1, 1969, through February 1970, Air Force pilots flew some 48,000 tactical sorties. FACs directing these missions credited the pilots with killing more than 3,000 enemy troops and destroying approximately 37,000 fortifications, 57,000 bunkers, and some 2,000 enemy sampans. More than 16,000 of the strikes recorded during this period were in support of allied troops engaging the enemy.

One of the most effective methods of air support furnished by the Air Force in Southeast Asia is high-altitude bombing by Strategic Air Command (SAC) B-52 bombers. The giant eight-engine aircraft each delivers up to thirty tons of conventional ordnance from altitudes of six or more miles. Six B-52s can saturate a target area two kilometers square—an area about the size of 425 football fields.

Under the control of SAC's 3d Air Division at Guam (now redesignated Eighth Air Force), B-52s flew more than 1,600 missions in support of allied forces from July 1, 1969, through February 1970. The first B-52 strike against the enemy in the Republic of Vietnam was conducted in June 1965.

Continuous surveillance of the enemy's movements, logistics efforts, and offensive and defensive posture is one of the most complex missions of PACAF units in Southeast Asia. Employing a variety of aircraft and sensors, tactical reconnaissance forces collect information, process and interpret data, and provide a basis for responsive and decisive command action in the shortest possible time. Tactical reconnaissance produces approximately eighty-five percent of all tactical information and intelligence data in Southeast Asia.

To accomplish this enormous task, reconnaissance forces fly around the clock over potential battle areas, collecting information about the enemy. RF-4s, RF-101s, RB-57s, EB-66s, and EC-47s are used in this role and are equipped with a variety of optical, radar, and electronic sensors.

Meanwhile, the lifeline of extensive allied military operations in Southeast Asia is airlift. Airlift aircraft move troops into battle and supply them with food, weapons and ammunition, and equipment in a land of heavy rain, forests, soggy rice fields, and frequently unusable roads.

For example, US and Australian tactical airlift crews under the direction of Seventh Air Force's 834th Air Division were airborne some 260,000 times from July 1, 1969, through February 1970. During this period, they carried more than 2,600,000 passengers and approximately 470,000 tons of cargo. Total payload amounted to some 800,000 tons.

Another important mission is providing rescue support for downed PACAF airmen in Southeast Asia. The Military Airlift Command's 3d Aerospace Rescue and Recovery Group (ARRG) flies an average of fifty rescue missions a month in HH-43, HH-3C, and HH-53 helicopters and HC-130P aircraft. During 1969 they were credited with saving more than 650 lives, 468 of these in combat.

Since 1964, the 3d ARRG has rescued more than 2,850 downed airmen, including nearly 2,000 combat saves. On November 26, 1969, the unit was awarded the Presidential Unit Citation signed by President Richard M. Nixon. This award, highest United States unit award and the second received by the 3d ARRG, was presented for the period from July 1967 to January 1969.

Psychological-warfare operations also are a major role of several PACAF organizations. These are the four special operations wings in Southeast Asia. From July 1, 1969, through February 1970, these units dropped more than 3.3 billion leaflets urging enemy troops to rally to the side of the government in the Republic of Vietnam.

Results of this psywar program, called Chieu Hoi



Under attack by a night-hidden enemy, the defenders of a Vietnam hamlet call for area illumination by flares dropped from an AC-47 gunship on duty in close support.



**An F-4 Phantom streaks in to demolish an attacking force of enemy soldiers during action at Bien Hoa Air Base's eastern perimeter. Beside its support role in the Vietnam fighting, PACAF has the overall mission of maintaining air superiority throughout the entire Pacific, in an area that comprises nearly forty percent of the earth's surface.**

(Open Arms), have been outstanding. During the week of July 23, 1969, for example, the Seventh Air Force's 14th Special Operations Wing reported that 1,577 enemy troops rallied to the side of the Republic, a record in the Mekong Delta area.

Also in the special operations area, gunships have become an important part of PACAF's close air support operations. These converted cargo aircraft are equipped with Miniguns and otherwise modified as attack aircraft. They fly flare-drop illumination missions for night operations and firepower missions. From July 1, 1969, through February 1970, PACAF gunships flew more than 4,000 missions in support of allied ground forces.

In November 1969 another aircraft was added to the gunship fleet. This new model—the AC-119K—replaced the AC-47 Spookies, which were transferred to VNAF units. These more potent aircraft were nicknamed "Stinger." They carry four side-firing Miniguns but have an additional two 20-mm cannons. Two

J85 jet engines supplement the original two reciprocating engines.

Recently Vietnamese Air Force (VNAF) pilots have assumed greater responsibility for air operations in Vietnam, flying missions in such aircraft as the AC-47 Spooky gunship and the A-37 fighter-bomber. By February 1970, VNAF pilots were flying about twenty-five percent of allied in-country fixed-wing strike missions.

The Vietnamese Air Force has undergone a period of rapid growth and development. In 1961 the VNAF consisted of six squadrons with a total of 100 aircraft. In consonance with President Nixon's concept of "Vietnamization," VNAF size has grown.

Today VNAF has five tactical wings, an expanded Air Training Center, and an Air Logistics Command. It includes an AC&W Group and an Air Medical Center. All of these are under control of VNAF Headquarters, Tan Son Nhut Air Base.

*(Continued on following page)*

**An HH-3 Jolly Green helicopter takes an in-flight drink under the watchful eyes of an HC-130 Hercules loadmaster during a refueling operation conducted over South Vietnam. The two are part of a well-rounded team of aircraft that perform rescue operations in Southeast Asia.**





A South Vietnamese Air Force A-37 of the 520th Fighter Squadron scores hits on an enemy bunker in the Mekong Delta. The South Vietnamese are being given the training and equipment to assume a greatly beefed-up role in conducting air operations in defense of their homeland.

The 522d Fighter Squadron at Bien Hoa has operated F-5 Freedom Fighters in combat since mid-1967. Other VNAF fighter squadrons are equipped with the dependable A-1 Skyraider. In addition, several squadrons are flying the A-37.

Vital VNAF airlift functions are performed by C-119 and C-47 airlift squadrons. These aircraft fly throughout the country, delivering essential cargo and equipment and providing airlift for the Vietnamese Army.

VNAF O-1s and U-17s are utilized in the forward air control role and fly psychological-warfare missions. The VNAF is steadily assuming a greater share of FAC sorties and a number of VNAF pilots have been certified to control both VNAF and US strike sorties.

Important helicopter functions are filled by H-34 and several UH-1 squadrons. The jet-powered UH-1

is the most recent helicopter asset phased into the VNAF inventory. With these, VNAF pilots have assumed a greater responsibility in providing highly important supply, medical evacuation, and airmobile operations.

Combining a growing aircraft inventory with their new reconnaissance and special air missions capabilities, the VNAF is a young and growing force that has demonstrated capabilities comparable to USAF standards. As the "Vietnamization" program progresses, the VNAF can be expected to provide a viable, professional, self-sufficient force in the struggle against communism.

While the conflict in Southeast Asia continues, PACAF units in other parts of the Pacific continue to serve as major deterrents to Communist aggression. In addition to its units in Thailand, Thirteenth Air Force is responsible for the Western Pacific, including the Republic of the Philippines and the Republic of China, Taiwan.

Meanwhile, Fifth Air Force in the Far East is responsible for the area including Japan, Korea, and Okinawa. Headquartered at Fuchu Air Station, Japan, Fifth Air Force is manned by some 46,000 combat and support personnel.

Since the seizure of the USS *Pueblo* by North Korea in 1968, Fifth Air Force's area of responsibility has been a prime target for Communist aggression. To combat this challenge, Fifth Air Force units in Korea maintain a highly trained, well-equipped force capable of meeting any form of Communist advance.

In addition, the Republic of Korea Air Force has been bolstered by new aircraft. On August 29, 1969, six F-4D Phantom jet aircraft were delivered to the ROK Air Force. Earlier, in March 1969, six F-5A aircraft were turned over to the ROK Air Force in connection with the Military Assistance Program.

With such allies as Japan, Republic of Korea, Republic of China, Republic of the Philippines, Republic of Vietnam, Thailand, and many others across the Pacific area, the Pacific Air Forces will continue to carry out its mission of air superiority. While PACAF personnel stand guard in the hills of South Korea, other PACAF units continue to combat the Communist threat in Southeast Asia. From one end of the Pacific to the other, Pacific Air Forces men and aircraft stand as "Guardians of the Pacific."—END



US Army Sp. 5 John Shaw shouts, "Let's get out of here!" as his C-7 Caribou draws ground fire during a resupply mission last year to the garrison at the Ben Het outpost.

# RIGHT DOWN THE ALLEY.

There's a new LORAN-aided weapons delivery system designed for the Air Force's F-4.

Under test at Sperry Gyroscope... and developed by Sperry on their own... one year ahead of competitive systems.

Which saves time.

Fully integrated with the F-4's present inertial navigation systems and designed for low cost retrofit.

Which saves money.

Sperry initiative and LORAN expertise have made it the most advanced system of its type available today. Other aircraft requirements can be met with modular versions.

## SPERRY

GYROSCOPE DIVISION  
GREAT NECK, NEW YORK 11020

# USAF—Worldwide and Beyond

The paintings reproduced on these pages are from the United States Air Force Art Collection, which is administered by the Art and Museum Branch, USAF Office of Information. The collection contains more than 3,000 objects of art—predominantly paintings by eminent American artists. Many of the paintings are on exhibit at the Pentagon, the USAF Academy, Air University, the Air Force Museum at Wright-Patterson AFB, Ohio, and in traveling exhibits that have visited hundreds of communities and

bases throughout the United States. Nearly 5,000,000 Americans view portions of the collection each year.

The poems are by Lt. Col. Don Clelland, who served as an RF-101 pilot in Vietnam in 1966-67 and, a decade earlier, flew F-86s in combat in Korea. A former member of the USAF Academy history faculty, Colonel Clelland is now assigned to the Office of the Secretary of the Air Force. His article, "Air Interdiction: Its Changing Conditions," appeared in the June '69 issue of this magazine.



## THE LEGACY OF ROME

The jets from Wheelus roar across  
The sunlit silence of the ruins.  
Their husky voices mix, then fade  
Into the patterns of the past.  
The insects start again to hum,  
The ceaseless wind again to chip  
At fluted columns standing tall  
Above the legacy of Rome.  
But Forum crowds no longer mill  
About the shops which lined the square,  
And in the temple only dust  
Bows slowly to the crumbling floor.  
The theatre in silence sits  
Soft-echoing the wind's applause,  
As passing to the sea it goes,  
The sea which laps Sabratha's shores  
And speaks of days forever gone.

— PAINTING BY THORNTON UTZ





## DARK SIDE OF THE MOON

— PAINTING BY NEIL BOYLE

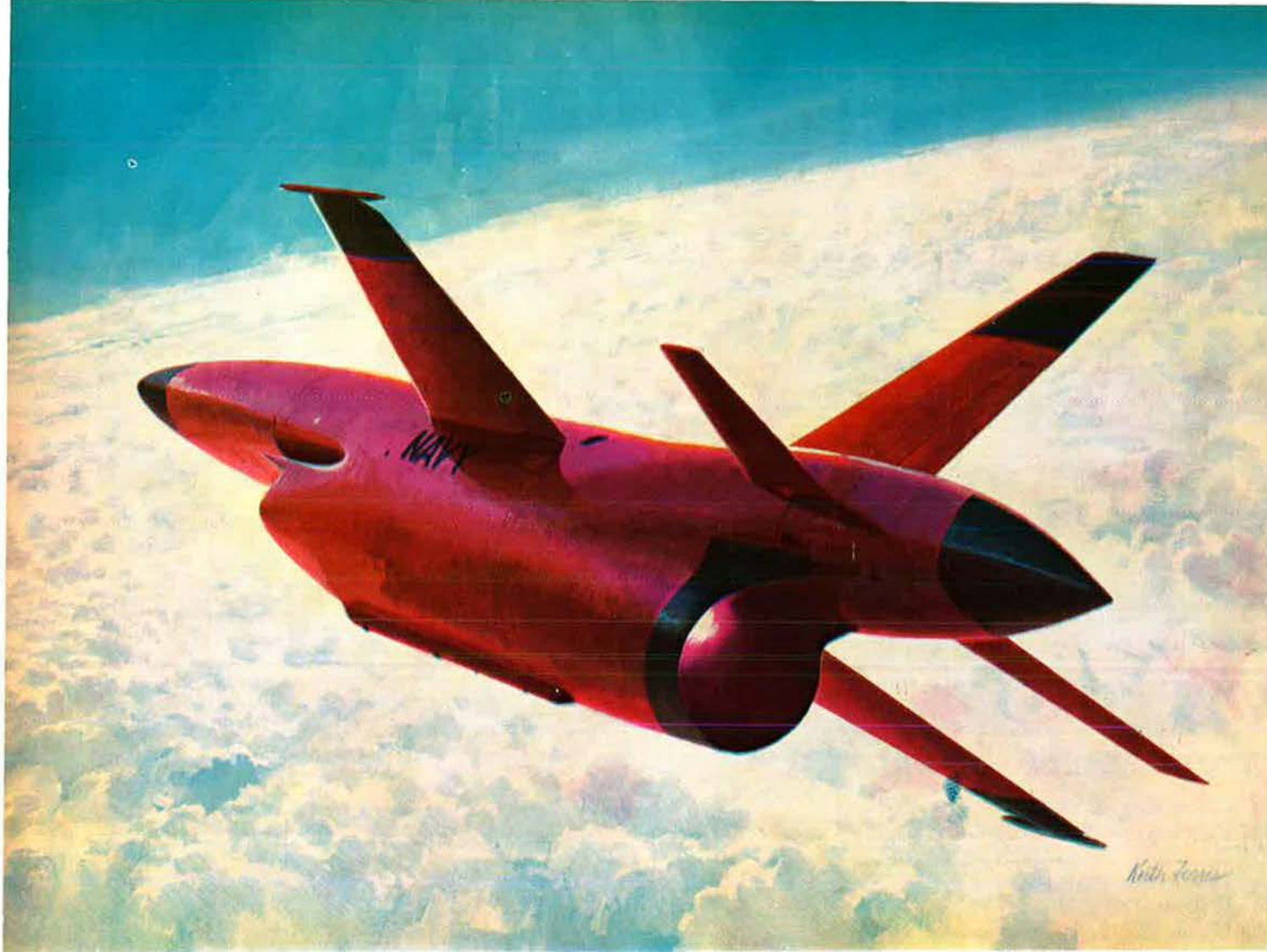
Throughout the world  
 The people lay their discord down,  
 The screen they scan with hope  
 To where the drab orb turns  
 In silent ignorance  
 Of how it holds the universal wish  
 That these men shall return  
 And say to all,  
 Together we have won again.  
 Then from the darkness into light  
 The spaceship moves,  
 Its wake a frenzied cheer  
 That settles far too swiftly,  
 To conclude a trip  
 That for a moment  
 Made so real the brotherhood of man.

## SCRAMBLE

The planes sit silver silent  
 On the ramp,  
 Tired wings outstretched  
 In temporary peace.  
 Relaxing pilots,  
 Once again on earth,  
 Look up into the brilliant blue  
 Crisscrossed with wispy marks  
 That they have made —  
 To still the klaxon voice.

— PAINTING BY STAN GALLI





FROM AN ORIGINAL PAINTING FOR CHANDLER EVANS

## MAIN FUEL CONTROL by Chandler Evans



MC-33 Main Fuel Control

Teledyne Ryan Aeronautical's new supersonic Firebee II is an unmanned aerial jet target produced for the U. S. Navy and the Air Force. The 1,000 m.p.h. remote control target is powered by a Continental J-69 engine equipped with a main fuel control engineered and precision-produced by Chandler Evans.

This CECO product on the Firebee II joins a distinguished line of pumps, main fuel controls, afterburner controls and other aerospace components in an array of important military aircraft as well as many of the latest missiles and commercial aircraft.

Chandler Evans is pleased to be "known by the company its products keep" and by the records those products establish.

**Colt Industries**  **Chandler Evans Control Systems Division**  
WEST HARTFORD, CONNECTICUT 06101

GAS TURBINE CONTROLS/PUMPS • AIRCRAFT/MISSILE CONTROLS, VALVES AND ACTUATORS



# The Military Airlift Command

**A** LOT of people, both in and out of the Air Force, know something about the Military Airlift Command (MAC), and the general impression is that MAC is deeply involved in the people-carrying business. But it ain't necessarily so!

Members of the armed services and their dependents, moving to and from overseas, get where they're going *because* of MAC, but few of them travel on MAC military aircraft.

As a general rule of thumb, all Department of Defense personnel traveling internationally move between designated MAC aerial ports in the US and overseas. But the greatest majority fly on US commercial air carriers, under contract to augment MAC's military airlift force. The number of commercial aircraft or missions contracted for is based on the estimates of passenger-movement requirements submitted to MAC by the armed services and DoD agencies.

In Fiscal Year 1969, for example, MAC was responsible for airlifting 2,920,000 passengers; about ninety-three percent (or 2,718,000) were moved by commercial contract aircraft. The other seven percent traveled on MAC aircraft configured to move both cargo and passengers simultaneously. These latter missions are utilized in those circumstances where—for political or military reasons—commercial contract aircraft are not suitable or are not compatible with the movement requirements.

The necessity for commercial augmentation of

MAC's airlift force, to handle routine passenger—and, to a much lesser degree, cargo—movement is obvious: MAC must be prepared at all times to accomplish its primary mission—the airlift of combat troops and equipment to any point on earth at a moment's notice, using its own force of approximately 750 aircraft.

MAC actually airlifts thousands of troops regularly throughout the year during training exercises, in support of Southeast Asia, and for unit moves. The most recent example involves the return of troops from Southeast Asia by MAC military and MAC contract carrier aircraft. By April, MAC had returned more than 50,000 troops. The other returnees were transported by sea or organizational aircraft.

Another example of a large-scale troop airlift in 1969 was Reforger I/Crested Cap I. During this operation, MAC airlifted more than 14,000 Army and Air Force troops to Germany and return, using 495 C-141 and forty-six C-133 missions.

A major Air Force command, MAC is also the purveyor of airlift and technical services for the entire Department of Defense. As DoD's Single Manager Operating Agency for strategic airlift, MAC is responsible for managing and directing a global airlift system. The Joint Chiefs of Staff decide who gets the airlift and in what order of priority. But the important thing to note is that the nation's ability to meet its worldwide defense commitments depends heavily on the mobility of its fighting forces. MAC supplies that

*(Continued on following page)*



*Commander of the Military Airlift Command since August 1969, Gen. Jack J. Catton previously had been chief of the Fifteenth Air Force. After graduation from Loyola University of Los Angeles, he entered the Army Air Corps as an aviation cadet in 1940 and completed pilot training at Kelly Field, Tex., in 1941. An instructor pilot during the early years of World War II, in 1944 he flew the first B-29 across the Pacific to the Marianas. With the XXI Bomber Command, he flew combat missions over Japan. Following the war, Gen-*

*eral Catton held key posts in SAC planning and operations. When given command of the 817th Air Division, Pease AFB, N.H., in July 1959, he was the youngest brigadier general in the Air Force. During the mid-1960s, General Catton served at Headquarters USAF, in planning activities and in August 1967 was assigned as Deputy Chief of Staff, Programs and Resources. General Catton, with more than 12,000 flying hours logged, is a command pilot and is qualified in MAC's primary airlift aircraft, including the C-5, and many other aircraft.*

mobility, with its flexible, responsive, and dependable airlift system—operating around the clock and around the world.

More than 90,000 MAC people are stationed in more than forty nations to support not only strategic airlift, but also to operate the four MAC technical services: Aerospace Rescue and Recovery Service (ARRS), Air Weather Service (AWS), Aerospace Cartographic and Geodetic Service (ACGS), and Aerospace Audio-Visual Service (AAVS).

AIRLIFT, however, is literally MAC's middle name and makes up the command's primary mission. With the introduction of the C-5 into MAC's operational inventory in December 1969, the revolution in airlift is rapidly reaching fruition. The airlift force of the future will be something to behold.

The majority of the C-5 and C-141 capability will be used in support of the day-to-day resupply mission of MAC—that is, in the movement of equipment and supplies in support of our armed forces deployed throughout the world. In the future, the C-5 and C-141 will perform increasing amounts of preplanned logistic resupply between established US ports and dispersed overseas destinations. This routine resupply mission will permit MAC to continually exercise the airlift system that would be used in the event of hostilities.

Should an outbreak of hostilities occur, MAC would use the C-5 and C-141 force to provide massive responsive strategic airlift for the deployment and support of DoD combat and support forces anywhere in the

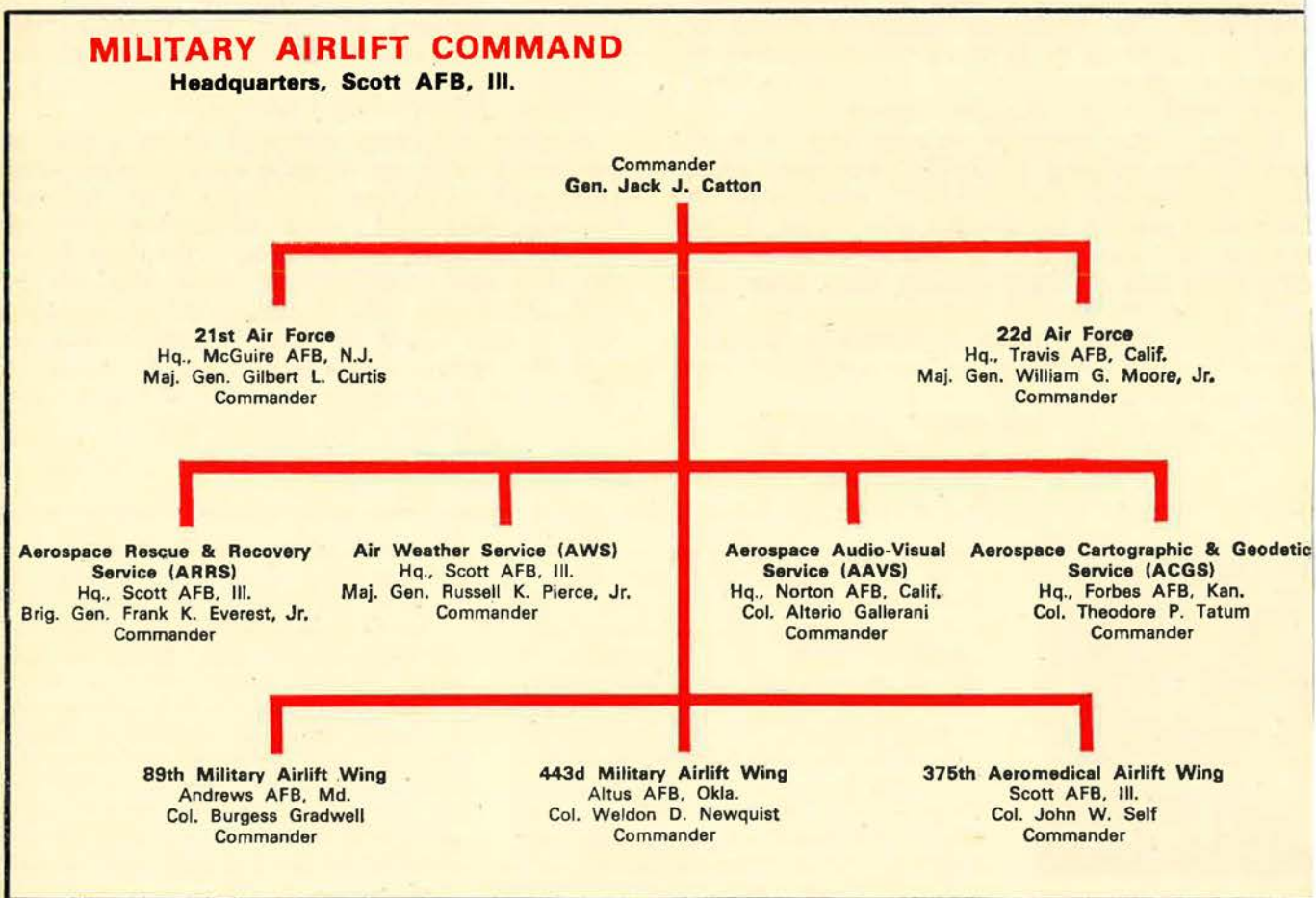
world. The troops would be airlifted in the C-141s with the C-5 airlifting cargo.

In addition to the day-to-day resupply mission, the C-5 and C-141 will be used in joint airborne/air transportability training operations and JCS-directed exercises with other combat forces. It is expected that these training activities will be conducted both within and outside the US and will exploit the full range of capabilities of these aircraft.

What this really represents is a revolutionary expansion in airlift capability. The all-jet C-5 and C-141 force will, for the first time, provide DoD with a true strategic airlift capability. MAC will be able to rapidly airlift entire ground combat and support units, including all their equipment and initial supplies, directly from the US to trouble spots around the globe.

This airlift force will be devoted to providing responsive combat mobility of US combat forces and will enable rapid repositioning of these forces to meet changing threats, as was done during the *Pueblo* crisis. Perhaps this capability can best be shown by making a comparison. In the 1960s, it would have taken about seventy days to deploy a joint Army-Air Force divisional size unit; in the 1970s, MAC will be able to move this same force in less than ten days. The inherent capabilities and flexibility of this force will significantly enhance the strategic airlift posture during the 1970s.

MAC hasn't done badly in the past, however. Statistically speaking, the MAC role in support of South





The workhorse of the Military Airlift Command is the C-141 StarLifter, an all-jet transport that can airlift up to 154 fully equipped troops, eighty litter patients, 70,000 pounds of cargo—or combinations of the three. The transport has a range of 6,325 miles.

The first all-jet aircraft to be designed specifically for aeromedical airlift missions, the C-9 Nightingale can accommodate thirty litter patients, forty ambulatory patients, or a combination of the two—along with flight nurses and attendants.



MAC's newest all-jet cargo transport and the world's largest aircraft, the C-5 can airlift ninety-nine percent of an Army division's equipment. It can carry 100,000 pounds of cargo and seventy-five troops over intercontinental distances.

east Asia has been one of increasing magnitude. For example, during Fiscal Year 1964 MAC airlifted some 325,000 passengers and more than 66,000 tons of cargo/mail into and out of Southeast Asia. During Fiscal Year 1969, passenger movement had increased 492 percent, to about 1,923,000 passengers. Cargo movement increased 721 percent, to approximately 544,000 tons.

Overall, during the period from 1964 through 1969, MAC airlifted about 6,117,000 passengers and 1,916,000 tons of cargo and mail in support of Southeast Asia.

Another key airlift role is MAC's aeromedical evacuation of patients. The C-141 StarLifter is the principal aircraft for worldwide aeromedical airlift of sick or wounded personnel. After completing normal airlift missions, the C-141 is reconfigured to accommodate patients moving to rear-area hospitals or to the US.

This fast and highly efficient aeromedical airlift system, bringing Southeast Asia patients to the US hospitals in as little as fifteen hours, plays an important role in helping to achieve the lowest death-to-casualty ratio of any war.

Last year, 172,879 patients were airlifted worldwide, including 46,259 battle casualties from Southeast Asia. Also included in the total figure were more than 67,000 patients airlifted within the US. MAC's domestic air- evac routes, which service some 534 medical facilities within the US, are covered by the new all-jet C-9 Nightingale—the first aircraft with an interior specifically designed for in-flight medical care of patients.

Finally, MAC provides special mission airlift for the President of the United States, Cabinet members, other key government officials, and foreign dignitaries.

The global MAC force is often called upon to pro-

*(Continued on following page)*



An HH-43 Huskie of the Aerospace Rescue and Recovery Service, with "Sputnik" fire-fighting equipment, takes off.

vide humanitarian airlift and, over the years, has flown many missions to help victims of earthquake, flood, and famine. MAC has provided disaster relief to countless people—from Africa to Alaska, Morocco to Chile, and from America's Gulf Coast to Japan.

MAC's technical services include:

- **Aerospace Rescue and Recovery Service**, whose personnel continued in 1969 to write some of the most thrilling chapters in Air Force history. Since the inception of Rescue, more than 7,140 persons have been saved as a direct result of ARRS efforts. Since 1964, when the buildup in Southeast Asia began, more than 1,500 Air Force, Army, and Navy personnel have been rescued under combat conditions and returned to duty. In the noncombat area, the exploits of Rescue have contributed immeasurably to US goodwill around the world; literally thousands of foreign nationals were saved during the past year in Tunis, Turkey, and Italy in the aftermath of floods and earthquakes.

- Using computers, satellites, and a variety of specialized aircraft, MAC's **Air Weather Service** provides a worldwide weather data vital to Air Force and Army operations, to commands around the globe, and to the US space program. Airborne weathermen have saved countless lives by tracking violent storms as



Air Force weathermen go to all lengths, even into jungles, to acquire information to prepare accurate forecasts.



An aerial mapping camera being installed aboard an RC-130A Hercules aircraft. The Aerospace Cartographic and Geodetic Service uses pictures of the earth taken from altitudes of 30,000 feet in its extensive charting activities.

"Hurricane Hunters." Prospects for the future are bright as more is learned about weather modification and control. AWS is already active in fog- and cloud-seeding operations, and fog-dispersal activities have proved especially valuable in Alaska, helping to maintain the flow of C-141s to and from Southeast Asia.

- The **Aerospace Cartographic and Geodetic Service** provides DoD with vital aerial cartographic photography, and aerial and ground geodetic data. Highly trained people, specially instrumented aircraft, and a spectrum of sophisticated equipment collect information vital to national defense and to worldwide efforts for the improvement of mankind.

- MAC's **Aerospace Audio-Visual Service** maintains a pictorial record of Air Force combat and support activities around the world and produces training films and special film reports for top-level Defense planning. Still-photo, motion-picture, and television teams operate around the globe to acquire combat air-strike and documentary photography. During the past year, AAVS consolidated two motion-picture production units, the Air Force Film Depository and Library at Norton AFB, Calif., along with new facilities that comprise a complete and modern audio-visual plant.—END



Pararescueman calls in a hovering helicopter to retrieve an injured pilot downed in heavy cover in Southeast Asia.



# Air Force Systems Command

**T**HE YEAR 1970 marks twenty years of successful aerospace research and development by the Air Force Systems Command (AFSC).

From its formation (as the Air Research and Development Command) on January 23, 1950, at Baltimore, Md., until the present, the command has been responsible for providing USAF virtually all its new systems, weapons, and equipment. These programs have ranged from the first intercontinental ballistic missile (ICBM), conceived in 1951 and delivered to the DoD as "hardware" in 1954, to the advanced Minuteman III . . . from laboratory work on advanced composites to providing launch crews and facilities for space shots . . . from wind-tunnel tests of aerodynamic structures to providing "quick fixes" for problems of the operating forces in South Vietnam.

R&D, the foundation of military superiority and national security, determines what the nation's military posture and world position will be ten years from now and beyond.

In the past year Systems Command registered major contributions toward more effective utilization of the portion of the national resources over which it exercises supervision.

Commanded by Gen. James Ferguson, AFSC consists of some 9,600 officers, 18,000 airmen, and 30,000 civilians who operate divisions, ranges, centers, and laboratories at 300 worldwide facilities valued at about \$2.5 billion. With a budget of \$7.45 billion for Fiscal 1970, representing 29.2 percent of the total Air Force budget, AFSC's scientists, engineers, and technicians supervise about 1,300 projects and tasks, ranging from solutions for immediate operational prob-

lems, to research on national defense requirements of the 1980s, and to the acquisition of present-day weapon and support systems.

The predominant themes set by the President, the Congress, and the Secretary of Defense are decentralization of authority, more selectivity among technological possibilities, and better defined goals and priorities. All have pledged that there will definitely be less risk-taking in the acquisition and production of major systems; and that development and production will be decoupled, with meaningful milestone decision points acting as the buffers. In advanced development it will be necessary to demonstrate the feasibility of certain subsystems to a much greater degree than ever before. Therefore, fewer items will be able to reach the demonstration stage.

Systems Command is the level at which all the essential ingredients for detailed review and timely decisions come together. At no other level of organization are all these ingredients constantly available for program decisions during the total system procurement cycle.

To effect this, certain functional responsibilities in the program management area have been realigned. For example, the functions, responsibilities, and personnel previously assigned to the Program Element Monitor (PEM) on the Air Staff for the F-15, C-5, Minuteman, and F-111 programs have been transferred to command headquarters at Andrews AFB, Md., under General Ferguson's direct management control. Consideration is also being given to the same sort of process with regard to various advanced development programs.

*(Continued on following page)*



*Gen. James Ferguson has been head of the Air Force Systems Command since September 1966. Born in Turkey of British parents, he became a US citizen in 1930 and enlisted in the Air Corps in 1934. He completed pilot training in 1936. During World War II General Ferguson commanded the 405th Fighter-Bomber Group in combat in Europe until he was named 9th Fighter Command's Assistant Chief of Staff. In the postwar years, he became Chief of the USAF advisory group in Turkey and 1951-52 served as Vice Commander of the Fifth Air Force*

*and FEAF. In July 1955 General Ferguson began a series of assignments in research and development that was to keep him in the Washington, D.C., area for a decade and a half. In December 1961, he was named Deputy Chief of Staff for Research and Development at Hq. USAF, responsible for monitoring USAF's total R&D effort. His decorations include the Distinguished Service Medal, Legion of Merit, DFC, Bronze Star, Air Medal, the Most Excellent Order of the British Empire, and Croix de Guerre of both France and Luxembourg.*

Placing this detailed program management at the Systems Command level will free the higher organization levels for routine, periodic monitoring and program approvals at significant milestones. This will give each level of management sufficient data for its required decisions, while decentralizing the detailed day-to-day program management.

The Air Force is moving in the direction of hardware verification—or prototyping—as a complement to the present practice of engineering studies in the contract-definition phase. This may be thought of as competitive “initial development,” or, a “contract definition in hardware.” This procedure has a definite advantage in that it surfaces technological and development difficulties before commitment to the high-cost production phase.

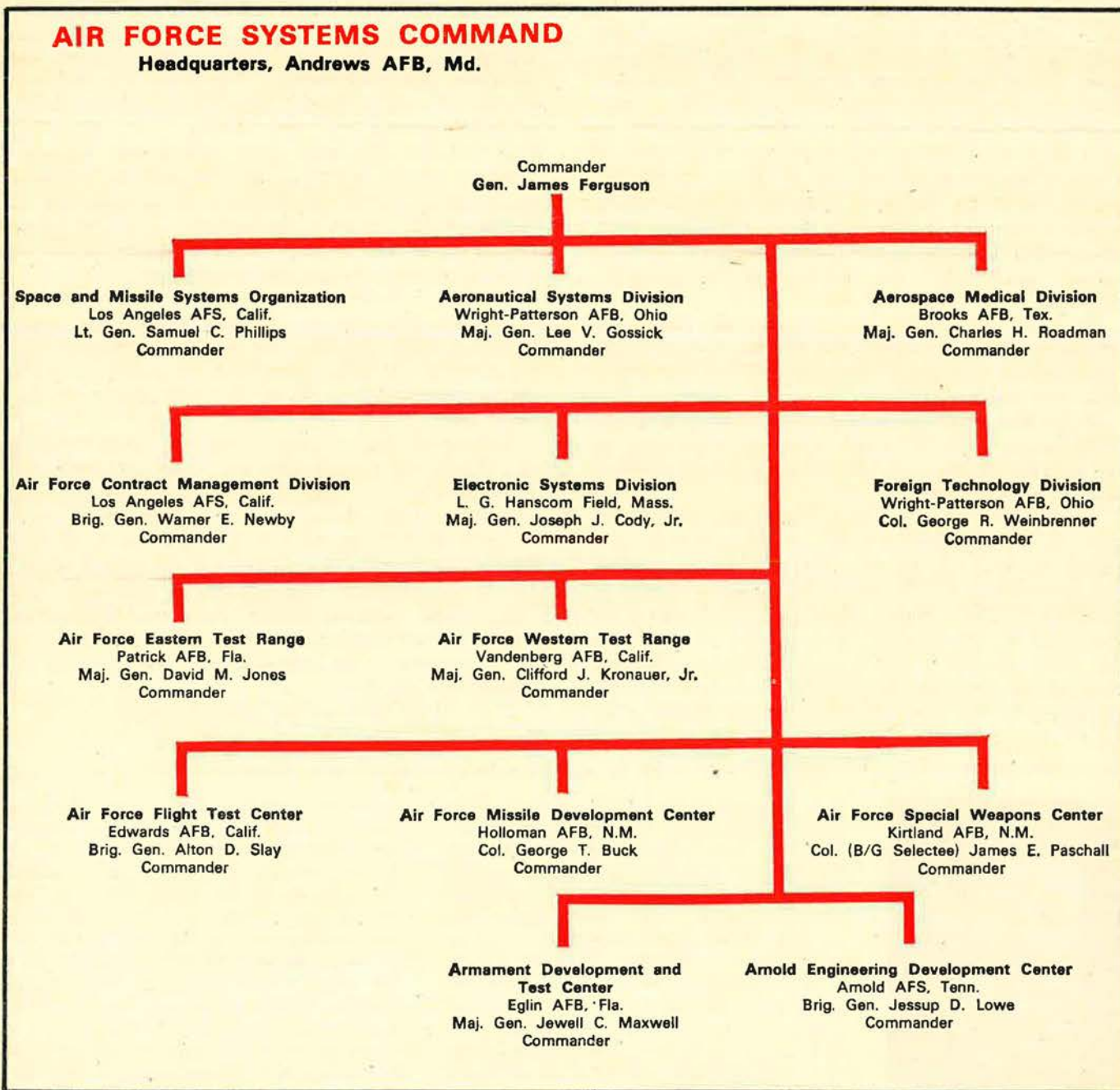
One part of AFSC's Cost Management Improvement Program is the specification approach to achieving a single integrated Cost/Schedule Control Systems

Criteria method (C/SCSC) by aerospace contractors to serve their own, as well as government and management needs. Recently, seven contractors reached the point of satisfactory compliance with the requirements of the Air Force criteria for cost/schedule control procedures. This new method of requiring contractors' management systems to meet Air Force criteria supersedes an older approach of specifying a particular, rigid system for contractor use, which frequently resulted in dual management systems.

In the present budgetary climate, it is necessary, in the words of Defense Secretary Melvin Laird, “to study new, imaginative ways to reduce the costs associated with our missions, and review again economy measures which have been suggested in the past.”

In addition to AFSC's long-standing Cost-Reduction and Zero-Defects programs, new emphasis is being given to an allied endeavor, Value Engineering (VE).

Value Engineering is a fruitful managerial area in







AFSC's Arnold Engineering Development Center sets up its J-1 high-altitude engine test cell, to qualify a GE TF39 engine for the Air Force's C-5 Galaxy transport program.

that it does not seek to save money by compromising the mission, hardware, people, or dollars that are really essential. It is, however, the establishment and maintenance of effective system management techniques to reexamine our methods of doing our jobs. The question must be constantly asked, "Do we really need this degree of sophistication?" If this question cannot be answered in the affirmative, it must be kept simple, whether it is an item of equipment or a managerial procedure.

Has this worked in the Systems Command? For Fiscal Year 1969, command-validated VE savings were slightly more than \$77 million, twice the assigned goal of \$36 million. In-house VE actions accounted for two-thirds of the saving, while contractor contribution was one-third.

## Aeronautical Systems

**F-15**—This is the Air Force's highest priority development program. Design objectives call for an air-superiority fighter that will be an advancement over any present or planned fighter in the US inventory. A "fighter pilot's fighter," it is expected to be operational in the mid-1970s. It will be a single-place, twin-engine plane in the 40,000-pound weight category. It will carry both short- and medium-range missiles and an internally mounted, rapid-firing gun. It will be highly maneuverable with extremely rapid acceleration and the ability to perform tight turns at high speeds. Plans call for it to fly at or above Mach 2. McDonnell Douglas Corp. has been selected as the prime contractor.

The need for a new US fighter is clear when it is recognized that the state of the art of the nation's best present fighter, the F-4E, will be more than twenty years old in the mid-1970s. During this same period the Soviets have been steadily improving their air-to-air capability with the regular introduction of new fighter aircraft.

**B-1**—The modernization of US bomber forces is essential if strategic forces are to be a credible deterrent to an enemy who continues to devote a large portion of his total resources to both offensive and defensive weapon systems. The present bomber force

is aging, and as age increases, so do the risks of incurring large modification costs, or "crash" programs with their inherent high costs to acquire a needed replacement.

Therefore, studies for an Advanced Manned Strategic Aircraft (AMSA)—now known as the B-1—were initiated in FY 1965 to establish requirements for an advanced bomber replacement for the B-52 in the late 1970s.

Through FY 1969, \$148.8 million had been appropriated for B-1 studies and advanced development. Most of those funds were devoted to system design, propulsion, and avionics development. A total of \$100.2 million was authorized for FY 1970, and the Air Force is seeking \$100 million for continued development in Fiscal 1971. As a result of these funded studies, the Air Force believes uncertainties and risks associated with development of a new bomber have been reduced to a minimum.

The B-1 will be a supersonic bomber with specifications calling for a weight of 350,000 to 400,000 pounds. It will incorporate many aeronautical principles and new materials, based on current research and development projects. It is expected to have variable-sweep wings and a flying range to cover long distances at high speeds. It will have advanced equipment to aid the penetration of enemy defenses and will carry heavy weapons payloads to destroy defensive positions and enemy targets.

Preliminary feasibility and proposal studies are under way. Several airframe and engine contractors are presently engaged in design proposals and engineering approaches.

*(Continued on following page)*



A new Goodyear tire shows that it can still function after suffering multiple punctures. It is being developed by Aeronautical Systems Division, Wright-Patterson AFB, Ohio.

**A-X**—The A-X is planned as a relatively inexpensive, rugged, highly survivable aircraft designed to meet future Air Force needs for specialized close air support. It would be a single-place craft and would feature blast-resistant and redundant structure, extensive armor provisions for the pilot, and subsystem engine protection. A relatively unsophisticated avionics package is also planned. The twin powerplant design would give a high thrust-to-weight ratio which, when combined with low wing loading, would give a wide, usable speed range and unusual maneuverability at speeds below 300 knots. The Air Force has asked for \$27.9 million in development funding for the A-X in Fiscal Year 1971.

**International Fighter**—To help small nations of the free world shoulder the self-defense burden as much as possible, RFPs were issued in March to eight companies for the development of the International Fighter aircraft. Since the aircraft is to be essentially off the shelf, procurement will be significantly shortened, with June the target for contract announcement. If approved for production, the International Fighter will be a supersonic, air-superiority fighter. Relatively low cost is a must. Also critical will be maintainability, both in the field and from the standpoint of depot maintenance. The Air Force has asked \$30 million in procurement funds for Fiscal 1971.

**C-5**—The Air Force's gigantic cargo transport, the C-5 Galaxy, joined the operational fleet December 17 in a ceremony at the Lockheed-Georgia plant at Marietta, Ga., with the delivery of the first operational aircraft to the Military Airlift Command. Designed for a gross weight of 728,000 pounds, the C-5 has set successive records for gross takeoff weight in the neighborhood of 800,000 pounds.

In mid-1969 one test aircraft began a thirteen-month, all-weather testing program at Eglin AFB, Fla., in the Climatic Laboratory operated by AFSC's Armament Development and Test Center (ADTC), during which it was subjected to temperatures ranging from minus sixty-five degrees to plus 125 degrees Fahrenheit. In December, another C-5 began a year-long series of tests of its cargo and troop delivery capability at Pope AFB, N.C. On February 18, pilots from AFSC's Aeronautical Systems Division (ASD) at Wright-Patterson AFB, Ohio—who conducted cold-weather tests from Eielson AFB, Alaska, during February—flew a C-5 around the North Pole on a test flight. Acknowledged to be a revolution in aeronautics, with profound implications for both military and commercial aviation, the C-5 is presently scheduled by USAF for four squadrons with a total of eighty-one aircraft.

**A-7D**—A new attack aircraft, the A-7D, which finished its cold-weather tests at Eielson AFB, Alaska, in February, took its place in the Air Force inventory with the delivery of the first production model to the Tactical Air Command last summer. The A-7D is a single-engine, subsonic attack aircraft, capable of accurately delivering 15,000 pounds of payload. It flies at more than 600 knots and is the first Air Force single-engine fighter to use a nonafterburning turbofan engine for maximum fuel economy.

**F-111**—Secretary Seamans, in his budget statement to the Senate Armed Services Committee, called the



Artist's conception of the AGM-69A short-range attack missile (SRAM), an air-to-surface weapon being developed by AFSC's Aeronautical Systems Division and the Boeing Co.

F-111 "a major step in modernizing our interdiction and long-range penetration capabilities." He said, "Its terrain-following radar permits penetration under enemy radar, and its extremely accurate radar delivery capability makes it highly effective once it reaches the target. No other aircraft can compete with the F-111 in night or all-weather attacks. There have been problems with the F-111, but we should remember that it marks a major advance in technology, and programs of this sort are always fraught with difficulty."

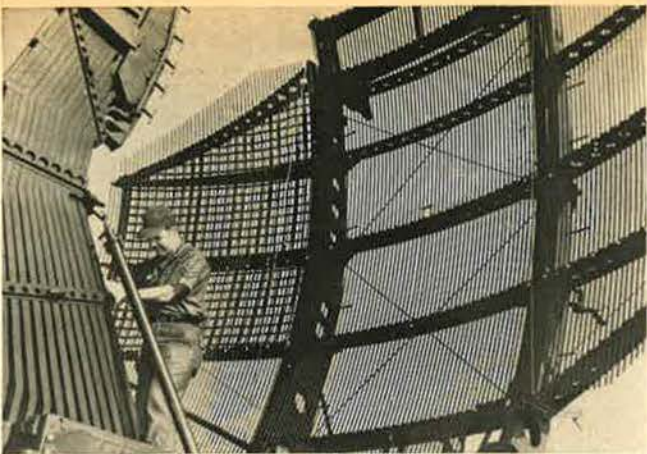
The first new bomber to enter the USAF inventory in a decade, an FB-111, was turned over to the Strategic Air Command in October. "The FB-111 will help us maintain the bomber portion of our strategic deterrent," Secretary Seamans said. "It is a necessary part of our planning because the older model B-52 are gradually phasing out, Soviet air defenses are rapidly improving, and a new bomber, the B-1, cannot be operational before the late 1970s."

**SRAM**—The Systems Command in July began powered flight testing of the AGM-69A short-range attack missile (SRAM) over the White Sands Missile Range in southern New Mexico. The test program is directed by the Air Force Missile Development Center (AFMDC) at Holloman AFB, N.M., for the Aeronautical Systems Division. SRAM is an air-to-surface, rocket-propelled, supersonic, strategic missile with nuclear-warhead capability. It is planned for use on the FB-111 and late models of the B-52.

**Maverick**—First air-launch separation test of the Maverick air-to-ground missile was successfully conducted at Edwards AFB, Calif., September 19. The missile is designed to attack small tactical targets such as tanks and field fortifications. It is TV-guided, eight feet long, twelve inches in diameter, and weighs 500 pounds. Its first successful guided launch against a target was conducted by AFMDC in December at the White Sands Missile Range.

## Electronics and Communications

**AWACS**—The AWACS is a USAF Airborne Warning and Control System designed to provide rapid response to fast-developing threats (such as low-



AFSC's Electronic Systems Division is developing a three-dimensional radar system to direct allied aircraft and detect enemy aircraft penetrating forward battle areas.

high-flying, missile-armed, enemy bombers), early warning and air surveillance information, and direction and control of offensive and defensive weapons. Basically, the system consists of high-performance aircraft equipped with extensive sensing, communication, display, and navigational devices. It will be used as a survivable command-and-control center. The Air Force is studying the competitive proposals of Boeing and McDonnell Douglas, but had not announced the winner at press time. USAF is asking \$87 million in Fiscal 1971 for engineering development funding.

**BUIC III**—BUIC III, a sophisticated backup air defense system (Backup Interceptor Control) designed to furnish air defense commanders with immediate information on any airborne threat to the North American continent, was completed in December when the fifteenth radar site, located at Fortuna AFS, N.D., was turned over to the Aerospace Defense Command by AFSC's Electronic Systems Division (ESD). Scattered throughout the United States and Canada, BUIC-III uses improved radars and high-speed electronic computers to back up SAGE (Semi-Automatic Ground Environment) system, which is the primary air surveillance and defense system for North America. Essentially, it is a high-speed, computerized control center.

**AUTOVON**—The overseas portion of the DoD Automatic Voice Network was completed in March with the last five of seventeen electronic switching centers of the Defense Communications System becoming operational. These centers—at Fuchu AS, Japan; Paternas, Greece; Coltano, Italy; Grass Mountain, Taiwan; and Futema, Okinawa—completed the interconnecting network that permits global telephone calls to be made in seconds. Besides the overseas centers, the system uses fifty-three centers in the United States and nine in Canada to link some 2,000 military facilities.

Other programs included:

- **TDA**—Tactical Data Automation—long-term application of computerized automatic techniques to spread information-handling process among smaller computers.

- **Inflatable Tactical Operations Centers**—Modular

operation and support centers . . . housed in air-supported, inflatable shelters.

- **Lightweight, 3-D Radars**—Highly mobile set replaces two heavy radars . . . to perform aircraft detection and control functions.

- **TACWE**—Custom-tailored weather data from three easily transportable, interchangeable electronics packages . . . for Air Force tactical command and control system elements, worldwide.

- **Common Digitizer**—New device interprets data received from long-range radars . . . first installation scheduled at Saint Albans, Vt., in mid-1970 . . . completion of system in 1973.

- **Signal Processing Lab**—Laboratory at Rome Air Development Center (RADC) for testing new signal-processing techniques . . . to identify signals, even though immersed in electronic noise.

- **Mobile Radio System**—Advanced Manpack/Vehicular Communications System . . . new, lightweight radio system using HF, VHF-AM, VHF-FM, UHF bands.

- **LIPS**—Laser Image Processing Scanner for high-resolution photography . . . records improved imagery on film . . . quantizes for computer.

- **Radio Location System**—Invention for locating moving vehicles with pinpoint accuracy . . . even when there is strong interference in radio channel . . . fixed-time-delay automatic synchronization technique.

- **Narrow Voice Band Communications**—Band width of around 120 Hertz instead of usual 3,500 Hertz . . . promises multichannel voice communications over circuits formerly limited to single channels.

- **Adaptive Data Modem**—Improved transmission from one computer or teletype to another . . . simultaneous transmission and receipt at rates up to 6,400 words per minute over all types of voice channels.

## National Space Efforts

From the very beginning of the US manned space program, the Air Force Systems Command played a major role in helping meet the challenge of a moon landing before the end of the decade. Working with other military services and government agencies, AFSC provided vital resources in such areas as communications, bioastronautics, aerodynamics and propulsion systems testing, parachute system testing, and many others.

For example, the Aeronautical Systems Division furnished zero-G training to the astronauts; studied intravehicular procedures; contributed to a system for containing lunar samples on the return to earth; and tested a new water container to eliminate excess hydrogen. The Flight Dynamics Laboratory provided the technique for electroluminescence in the space vehicle's control displays. Many years ago the Arnold Engineering Development Center began tests of spacecraft in its high-performance wind tunnels to obtain force, movement, heat transfer, and stability data to help determine final configuration of the vehicles and to preclude their reactions in space, or the low-density atmospheres of certain planets.

Two projects developed by the Electronic Systems  
(Continued on page 158)



# Air Force Logistics Command

**T**HE continued superiority of the United States Air Force depends upon the technological, logistical, and operational capability of its personnel and materiel. It is this demand for responsive logistic support of current and future aerospace forces in a dynamic environment that defines the mission of the Air Force Logistics Command (AFLC).

The ever-increasing sophistication and cost of Air Force weapon systems and materiel necessitates a continuing program within the Air Force Logistics Command to develop and implement managerial innovations to maximize the logistics support of USAF's operating commands at the lowest possible cost. AFLC, under the command of Gen. Jack G. Merrell, is progressing with the development of an Advanced Logistics System and other innovative management concepts to assure a logistics posture for the Air Force that is responsive to the dynamics of change.

These AFLC responsibilities are carried out through a headquarters activity located at Wright-Patterson AFB, Ohio, and a decentralized complex of five Air Materiel Areas (AMAs) and three specialized logistics activities geographically dispersed throughout the continental United States.

Of the \$22 billion appropriated by Congress for the Air Force this year, AFLC received about one-fourth. Included in this \$5.5 billion were \$2.3 billion for AFLC's procurement of aircraft and missile parts, munitions, vehicles, electronics, and other major equipment items. Keeping aircraft and missiles in repair and

distributing millions of tons of supplies around the world took another \$2.7 billion. Modification and modernization of Air Force weapon systems and equipment cost about \$400 million. In addition to managing appropriated funds, AFLC manages about \$4.7 billion in revolving funds used to buy and sell Air Force aviation fuel and other supplies and services.

The mission of AFLC encompasses the total life cycle of the system or equipment. AFLC becomes involved during the early stages of the acquisition process by working with the Air Force Systems Command's (AFSC) System Project Office (SPO) to incorporate logistics considerations during the design of the weapon system. Under the early System Manager assignment policy recently implemented by AFLC, a System Manager is designated at the AMA at the same time that the Project Management Office is established by AFSC. An AFLC officer actually serves as the director of logistics within the Air Force SPO organizations. The purpose is to assure that both weapon performance and support logistics are fully considered in the many important trade-off decisions made during the design and development of weapon systems.

After the system has transitioned to the operating inventory, AFLC assumes total responsibility for its logistic support.

In August 1969, General Merrell reorganized his headquarters to assure an improved command and staff interface between AFLC headquarters, Hq. USAF, and AMA counterparts.

It had become apparent that the AFLC headquarters



*Gen. Jack G. Merrell was appointed Commander, Air Force Logistics Command, in March 1968, following service as Vice Commander in Chief, USAFE. A 1939 graduate of West Point with a Cavalry assignment, he switched to the Air Corps and completed pilot training at Kelly Field, Tex., in 1940. US entry into WW II found General Merrell serving with the Air Corps Training Detachment, Lakeland, Fla. Tours with the 39th and 491st Bombardment Groups as Provisional Commander and Deputy Commander, respectively, followed.*

*He later commanded the Eighth Air Force's 389th Bombardment Group in Europe. General Merrell's postwar assignments included positions with the Military Air Transport Service and several command positions. After graduating from the Air War College in 1954, he served with MATS again, in addition to tours at Headquarters USAF, before becoming Director of the Budget, Headquarters USAF, in January 1962. After duty as Comptroller, USAF, he became Vice Commander in Chief, USAFE, in March 1968. He is a command pilot.*

needed to be realigned to provide improved lines of communication with the AMAs and the Air Staff. To provide a headquarters counterpart of the Materiel Management Directorate at the AMAs, for example, General Merrell created a new Deputy Chief of Staff for Materiel Management. This organization develops policy requirements for the support responsibilities of the DMM systems and commodity management functions encompassing managerial, technical, engineering, identification, and maintenance and materiel computations.

A second key change was the establishment of a Deputy Chief of Staff for Plans and Operations, who integrates the command planning and study capability and the control over command resources in one DCS. This DCS also provides the development planning interface with other Air Force commands.

Additional changes included establishment of the DCS/Distribution to be responsible for the command physical distribution processes, which include the transportation, packaging, and handling functions and the former supply distribution function. Similarly, the DCS/Maintenance Engineering was renamed DCS/Maintenance and made responsible for staff surveillance of the industrial operations and organic production functions in the field and the responsibility for direct interface with the AMA Directorate of Maintenance.

Logistic mission support to the Air Force is awesome. Its execution demands creativity and imagination by top managers, particularly in the austere funding period now facing all elements of the Department of Defense. It is in the use of new computer technology that AFLC has concentrated planning during the past three years in its pursuit of improved efficiency and economy.

Development of the Advanced Logistics System (ALS) during 1969 progressed from the conceptual planning stage to the point where equipment acquisition procedures were initiated, and the detail specifications of the new logistics system are now under active

development. The ALS, when completed, will bring into a single, fully integrated system the essential elements of some 375 individual logistics and data systems now used by AFLC to provide mission support to the Air Force worldwide. Modular third-generation computers will be located at each of the five Air Materiel Areas and at Hq. AFLC. As the ALS is progressively implemented, these six computer complexes will replace more than ninety of the current total of 120 computers in use throughout AFLC.

The AFLC Depot Maintenance Activity comprises 30,500,000 square feet of building and ramp area, has an annual budget of more than \$1 billion, and employs approximately 50,000 people. In 1970 the five Air Materiel Areas are programmed to repair, overhaul, and modify more than 4,000 aircraft engines; 3,600,000 items such as gyros, instruments, accessories, electric and electronic components; and 1,500 aircraft. The replacement value of items repaired annually by depot and contractor maintenance exceeds \$8 million.

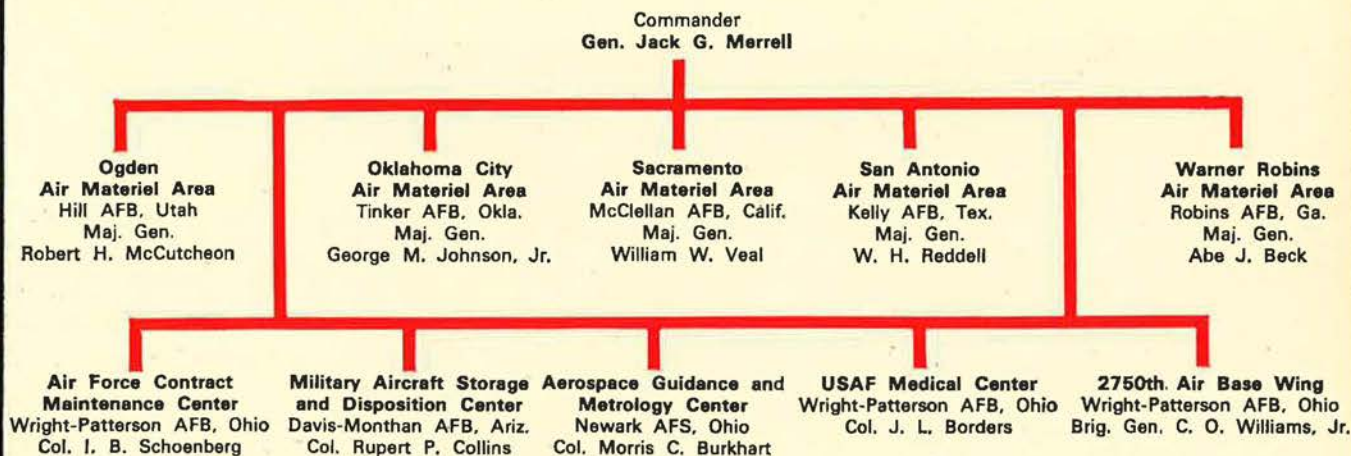
Accomplishment of depot-level maintenance by contract is an essential and integral part of the overall depot-level maintenance function of AFLC. Air Force policy envisions the maintenance contractors, their skills, and their facilities to be an extension of Air Force resources and stipulates that problems arising out of this method of maintenance will be afforded the same emphasis as problems arising from AFLC organic facilities. The FY '70 contract program for depot-level maintenance amounts to more than \$562 million or about forty-three percent of the total depot-level maintenance program.

Between September 1, 1969, and February 28, 1970, 1,080 aircraft were processed into storage at the Military Aircraft Storage and Disposition Center at Davis-Monthan AFB, Ariz., an increase of 150 percent over the entire input during FY '69. Force reductions during late 1969 and currently programmed will add to the storage inventory at Davis-Monthan as AFLC performs

*(Continued on following page)*

## AIR FORCE LOGISTICS COMMAND

Headquarters, Wright-Patterson AFB, Ohio



the storage and disposition function as DoD executive agent.

While AFLC continues to provide outstanding mission support to Stateside and other major Air Force commands, special attention continues to be directed to mission support of the Air Force in Southeast Asia.

General Merrell has continued the practice, started in 1964, of having an Assistant to the Commander, AFLC, on site at Hq. Seventh Air Force, Tan Son Nhut Air Base, Vietnam. His job is to supervise the Weapon System Liaison Officers (WSLOs), the Rapid Area Maintenance (RAM) teams, the Rapid Area Supply Support (RASS) teams, and the Rapid Area Transportation Support (RATS) teams. These teams are sent to Southeast Asia to provide on-site assistance to bases when needed. They are made up from skills within the AFLC combat logistics support squadrons and civilian technicians from within AFLC's Air Materiel Areas. The Assistant to the Commander also advises and assists the commanders of the Seventh Air Force and Thirteenth Air Force on logistics, and keeps General Merrell and the Air Materiel Area commanders advised of the status of mission support to SEA.

A primary management indicator that AFLC and the operational commands use to determine supply effectiveness is the "Not Operationally Ready—Supply" (NORS) rating system. Through the coordinated efforts and dedication of supply and maintenance personnel at all echelons of commands, average NORS rate for all aircraft worldwide is only 3.3 percent. Southeast Asia aircraft enjoy an even better average of only 2.8 percent. This means that, of the total inventory of USAF aircraft in SEA (in excess of forty different types), only 2.8 percent require some supply action to provide material necessary to bring the aircraft to a full operationally ready condition.

When a NORS rate so dictates, AFLC responds with special management action to expedite the acquisition of material.

During calendar year 1969 an average of 100 AFLC personnel were assigned to Rapid Area Maintenance (RAM) teams in Southeast Asia. These personnel repaired 161 aircraft, prepared eleven for one-time flight, and twenty-five for shipment to rear-area and depot-level repair facilities. The dollar acquisition value of these aircraft returned to duty in SEA amounted to

more than \$276 million. Turn-around time averaged forty-two calendar days per aircraft.

The AFLC physical distribution activity, which includes warehousing, packaging, and transportation, is the physical movement of the property phase of logistics. Approximately 19,000 people are employed to identify, package, store, select for shipment, and ship the 870,000 items of supply managed by AFLC to support worldwide customers and 1,300,000 items to support depot maintenance activities, other Air Materiel Area assigned activities, and tenants. As of June 30, 1969, the five depots had 811,000 tons of material in storage to support worldwide customers and AMA tenants. During FY '69, AFLC shipped some 453,000 tons of material to worldwide and tenant customers.

To provide high-priority movement of critical weapon or support systems components to CONUS Air Force bases and to Air Force aerial ports of embarkation for overseas shipments, AFLC operates the Logistic Airlift (LOGAIR) System. LOGAIR interconnects the AFLC AMAs and provides daily service to sixty-one CONUS Air Force bases and eight aerial ports of embarkation. The 1970 contract calls for 17,100,000 air-miles at a contract cost of \$32 million.

During the 1969 calendar year, 1,947 personnel were assigned to Rapid Area Supply Support (RASS) and Rapid Area Transportation Support (RATS) teams in Southeast Asia and other areas of the world. These RASS/RATS teams provided AFLC field assistance support to major commands worldwide in the distribution processes of supply, packaging, and transportation. These personnel spent a total of 57,508 man-days in support of this effort at a cost of \$2,506,465.

In order to improve management of the very large Air Force contract maintenance requirement, AFLC established the Contract Maintenance Center in mid-1969. The center is charged with supervising operations of eight field detachments which perform contract administration functions at thirteen industrial plants located in the east and southeast United States. AFLC contracts performed in these plants are for depot-level modification and IRAN (Inspect and Repair as Necessary) work on fighter, cargo, and other aircraft, and for the overhaul of aircraft engines. The center has responsibility for approximately twenty-five percent of



An F-105 Thunderchief rolls out of one of the maintenance shops at Air Force Logistics Command's Sacramento Air Materiel Area ahead of schedule after undergoing operational checks.

all such maintenance work performed on Air Force aircraft and engines.

AFLC has stressed the use of Multi-Year Procurements for maintenance requirements and in this regard has established an order of preference for all multiple year-type contracts. This order of precedence is as follows:

1. Multi-Year Procurement.
2. Fixed Price One-Year Contract with Priced Options for follow-on years.
3. Fixed Price One-Year Contract with Unpriced Options for follow-on years (this is normally referred to as the AFLC Five-Year Policy).

Each of these methodologies will permit a continuing relationship when a contractor's performance is satisfactory.

AFLC implements a wide range of multimillion-dollar programs in support of some fifty-five foreign countries under the International Logistics (IL) programs. Although IL business comprises a relatively small percentage of AFLC transactions, it is a most significant contribution to the defense of eligible recipient governments. Recognizing the impact of this support on the worldwide mutual defense of the United States and its allies, General Merrell has directed that AFLC's support of the program will be comparable to that given USAF organizations.

With the most sophisticated logistics operation in Air Force history, constant training of the 133,000 AFLC personnel is essential.

General Merrell's policy is to continuously promote the growth of his military and civilian managers by overutilization through internal promotions and assign-



Cargo is loaded on a C-141 transport with the use of a special loader that can lift 25,000 pounds. The big aircraft, at Kelly AFB, Tex., is headed for Southeast Asia.

ments to other related functional areas. This also applies to all echelons of the work force as well as to the managerial element. Those selected for their growth potential are to be "over-utilized"—rather than under-utilized, *i.e.*, put on a job and given a chance to grow up to it.

During 1969 some 7,000,000 man-hours of training were provided to increase the knowledge and skills of the AFLC civilian work force. Officer and civilian academic training in logistics culminates in assignment to AFIT's Graduate School of Systems and Logistics. Companion programs update middle management in the logistics force structure. In total, we estimate our training and education will consume four percent—or over 11,000,000 hours of our total available man-hours annually for the next five years.

Well-trained, well-educated people are the key to providing twenty-first century logistics by the early 1970s.

In summary, AFLC's business can be seen to be inextricably linked to and paced by the character and complexion of Air Force mission operations. It is a continuous, costly, complex, and ever-changing business always constrained by time and resources. The mainstream of business is made up of thousands of day-to-day decisions—a constant but invisible grind—which keeps the forces moving and determines their capability and flexibility.

To do the job, AFLC must continually assess the methods and resources it uses in the managerial, technical engineering, and industrial aspects of its mission.

The search for better ways of doing business is never-ending—all geared to responsive support of Air Force operations.—END



More than 100,000 pounds of thrust are represented in these six J57s at OCAMA's Jet Engine Overhaul Facility.



Automated data retrieval is indispensable to the instantaneous reaction demanded of the USAF's logistics system.



# Tactical Air Command

**D**URING Fiscal Year 1970, Tactical Air Command (TAC) took a major step forward in preparation for the dynamic demands of the 1970s. The central theme of TAC progress in recent years has been immediate, tailored response to worldwide tactical airpower requirements. FY '70 must be regarded as the starting point of a new dimension in TAC's ability to meet this obligation.

"Tactical airpower is a decisive deterrent in today's diplomacy," Gen. William W. Momyer, Commander of TAC, said recently. "It also plays a vital role when conflict is unavoidable. To put it another way, providing continuous air supremacy can mean the difference between threat and conflict.

"Maintaining sufficient tactical airpower in position to meet all contingencies is an appropriate action. But it is a costly action, and at times diplomatically impossible. Mobility can bridge this gap. With fast-reacting tactical airpower, forces and facilities can be immediately deployed to critical areas for the time needed, and then be recalled."

During the past year, TAC demonstrated the new look in the mobility of "forces and facilities" on an austere operating base in South Carolina. The two-week demonstration was named "Coronet Bare" and marked a highly successful beginning for a new era in United States tactical airpower. Essentially, it released TAC from the traditional requirement for established air bases from which to operate in meeting contingencies around the world.

Coronet Bare was a realistic demonstration of the effectiveness of a family of specially designed, reusable, lightweight, air-transportable, bare-base equipment. The package includes billets, messing, hangars, maintenance, electric power, water purification and distribution,

and other items necessary to convert an austere facility—with only a landing strip, taxi areas, and a source of water—into an operational airfield.

Into the austere environment of North Field, S. C., TAC airlifted the prepackaged facilities to support an F-4 fighter squadron of twenty-four aircraft, all on a carefully planned time schedule. Within fifty-four hours after the first of 339 airlift sorties landed, the newly converted bare base began receiving the fighters. Less than two hours later, the F-4s flew their first sorties against simulated targets, but under operational conditions that were quite real.

The entire base was fully operational on the third day of the demonstration. All personnel were efficiently housed, fed, and otherwise supported in a manner equal to an established base. Because of the equipment support, the fighters flew a considerably greater rate than is normally flown from a permanent base during war-time.

Upon completion of the employment phase of Coronet Bare, the entire base complex was dismantled, repackaged, and ready for airlift back to home base within two days after the fighters had departed. Much of the credit for the success of the bare-base demonstration went to TAC's civil engineering force, which plays a critical role in the new concept. Prime Beef and Red Horse elements were deeply involved in all phases of the operation.

Similarly, TAC's airlift forces were of primary importance, as they are in all of the command's activities. A fleet of thirty-two of TAC's C-130 aircraft, supported by MAC C-141s, airlifted some 3,000 tons of cargo, 1,160 personnel, and 451,000 gallons of POL to the South Carolina bare base. The C-130 fleet logged

*(Continued on page 89)*



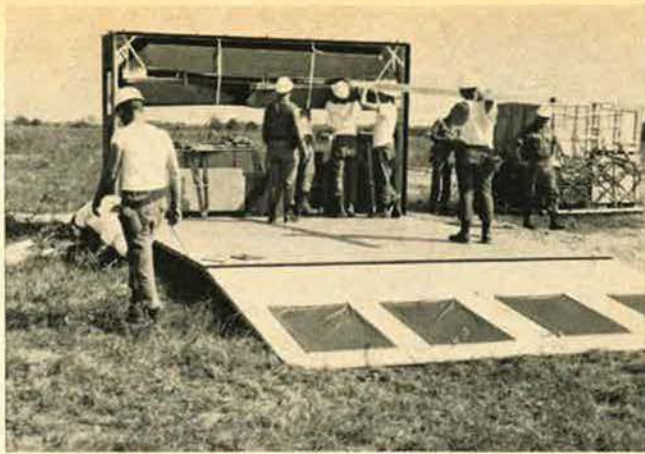
*Gen. William W. Momyer has commanded the Tactical Air Command since August 1968. Previously, he served simultaneously as Deputy Commander for Air Operations, Military Assistance Command, Vietnam, and Commander, Seventh Air Force. General Momyer entered the service in 1938 and graduated from pursuit school at Kelly AFB, Tex., in 1939. He led the 33d Fighter Group in combat over Europe during World War II. In the early postwar years General Momyer held top TAC posts and was a student and then a faculty member at*

*the Air War College. He commanded the Eighth Fighter-Bomber Wing in Korea and Japan during the mid-1950s, and in March 1955 was given command of all USAF units in Korea. He commanded the 312th Fighter-Bomber Wing and 832d Air Division, Clovis (now Cannon) AFB, N.M. From July 1958 to October 1961 he was Director of Plans, TAC. He headed the Air Training Command before going to Vietnam. A fighter ace, his decorations include the Distinguished Service Cross, the DSM, the DFC, the Silver Star, and the Legion of Merit.*





North Field, S.C., the austere site of TAC's demonstration of a new concept in tactical airpower—bare basing. The operation—called Coronet Bare—proved out the theory that a fully operational airfield can be set up from airlifted, especially designed equipment within hours.



Setting up shop, Air Force personnel erect from prepackaged stores the facilities required to conduct air combat operations. Within fifty-four hours of the arrival of the initial airlift sorties, the converted base received the first of a full squadron of twenty-four F-4 Phantoms.



During Operation Coronet Bare, all personnel were efficiently supported in a manner equal to an established base. Given a landing strip, taxi areas, and a water source, TAC proved that it could quickly establish bases ready to meet conditions prevailing during wartime situations.



Within two hours of arrival at North Field, the Phantoms flew their first sorties against simulated targets. With bare basing an actuality, TAC now is free of its traditional dependence on established airfields and has the capability of swift response in any sudden confrontation.



The challenge to airlift capability in the Coronet Bare operation was formidable. A fleet of thirty-two TAC C-130s was engaged, backed up by MAC C-141s. They brought in some 3,000 tons of cargo, 1,160 personnel, and 451,000 gallons of POL. Among the equipment essential in running a modern airfield is the AN/TSW-6 mobile control tower at the left.

# TACTICAL AIR COMMAND

Headquarters, Langley AFB, Va.

Commander  
Gen. William W. Momyer

**19th Air Force**  
Hq., Seymour Johnson AFB, N.C.  
Maj. Gen. Donavon F. Smith  
Commander

**9th Air Force**  
Hq., Shaw AFB, S.C.  
Maj. Gen. Richard H. Ellis  
Commander

**Shaw AFB, S.C.**  
USAF Tactical Air Reconnaissance Center (TAC)  
363d Tactical Recon Wing (9th AF)  
507th Tactical Control Gp. (9th AF)  
68th Tactical Air Support Gp. (9th AF)

**Pope AFB, N.C.**  
USAF Tactical Airlift Center (TAC)  
839th Air Div. (9th AF)  
464th Tactical Airlift Wing (839th AD)  
1st Aeromedical Evacuation Gp. (TAC)

**MacDill AFB, Fla.**  
836th Air Div. (9th AF)  
15th Tactical Fighter Wing (836th AD)

**Seymour Johnson AFB, N.C.**  
4th Tactical Fighter Wing (9th AF)

**Lockbourne AFB, Ohio**  
317th Tactical Airlift Wing (839th AD)

**Homestead AFB, Fla.**  
4531st Tactical Fighter Wing (836th AD)

**Myrtle Beach AFB, S.C.**  
4554th Tactical Fighter Wing (9th AF)

**12th Air Force**  
Hq., Bergstrom AFB, Tex.  
Maj. Gen. Albert W. Schinz  
Commander

**Bergstrom AFB, Tex.**  
75th Tactical Recon Wing (12th AF)  
602d Tactical Control Gp. (12th AF)  
71st Tactical Air Support Gp. (12th AF)

**Nellis AFB, Nev.**  
USAF Tactical Fighter Weapons Center (TAC)  
57th Fighter Weapons Wing (TFWC)  
474th Tactical Fighter Wing (832d AD)  
820th Civil Engineering Sqdn. (12th AF)

**Cannon AFB, N.M.**  
832d Air Div. (12th AF)  
27th Tactical Fighter Wing (832d AD)

**McCConnell AFB, Kan.**  
835th Air Div. (12th AF)  
23d Tactical Fighter Wing (835th AD)

**Little Rock AFB, Ark.**  
64th Tactical Airlift Wing (12th AF)  
4442d Combat Crew Training Wing (12th AF)

**George AFB, Calif.**  
831st Air Div. (12th AF)  
479th Tactical Fighter Wing (831st AD)

**Forbes AFB, Kan.**  
313th Tactical Airlift Wing (12th AF)

**Luke AFB, Ariz.**  
58th Tactical Fighter Training Wing (12th AF)

**Mountain Home AFB, Idaho**  
67th Tactical Recon Wing (831st AD)

**Langley AFB, Va.**  
4500th Air Base Wing (TAC)  
316th Tactical Airlift Wing (839th AD)  
1st Aerial Port Gp. (TAC)  
2d Aircraft Delivery Gp. (TAC)  
480th Recon Technical Gp. (TAC)

**Eglin AFB, Fla.**  
USAF Tactical Air Warfare Center (TAC)  
USAF Special Operations Force (TAC)  
33d Tactical Fighter Wing (836th AD)

**Holloman AFB, N.M.**  
49th Tactical Fighter Wing (835th AD)

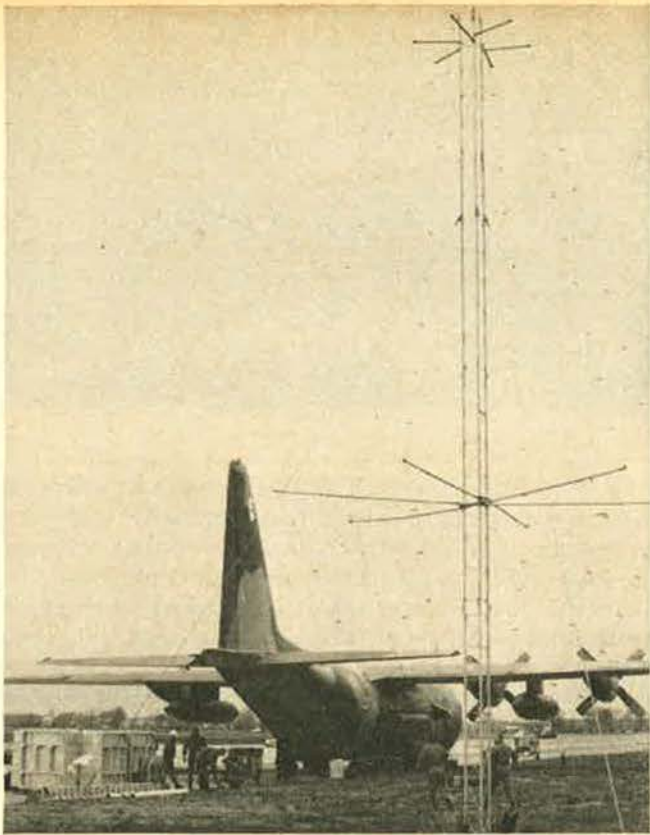
**Eglin AAF No. 2, Fla.**  
(Hurlburt Field)  
577th Civil Engineering Sqdn. (9th AF)

**Eglin AAF No. 9, Fla.**  
(Hurlburt Field)  
1st Special Operations Wing (SOF)  
Special Operations School (SOF)  
USAF Air-Ground Operations School (TAC)

**Davis-Monthan AFB, Ariz.**  
4453d Combat Crew Training Wing (12th AF)

**England AFB, La.**  
4410th Combat Crew Training Wing (SOF)

**Dyess AFB, Tex.**  
516th Tactical Airlift Wing (12th AF)



**"Talking Bird,"** an air-transportable communications package for worldwide deployment, can be set up within hours by its twenty-one-man crew for voice and teletype service.

approximately 1,600 hours during the two-week demonstration, which required around-the-clock operations.

In summary, every element of TAC was deeply involved in Coronet Bare and in preparing the way of the future. Soon, the major portion of the command will be capable of rapid deployment, in tailored packages, to any one of more than 1,400 facilities in the free world capable of accepting the bare-base equipment. These sites vary from bare airfields to international airports. The bare-base concept—titled "Harvest Bare" in TAC terminology—will become one of the most significant advances in the modern history of US tactical airpower.

Traditionally, TAC's airlift force typifies the command's versatility and wide-ranging obligations. FY '70 was no exception. From combat in Southeast Asia to support of the nation's moon explorations and humanitarian relief operations in the wake of Hurricane Camille, TAC C-130 aircrews logged untold hours of flying time. Two C-130s delivered 164 tons of food to the famine-stricken Central African nation of Chad; eight C-130s were on standby to provide relief supplies in Biafra; three C-130s circled the globe on a special scientific mission; two C-130s were engaged in a NASA test of winds and radiation. These were but a few of the airlift responsibilities added to the normal operational requirements. The scope of TAC airlift activity is emphasized by the fact that annually the C-130 force carries approximately 260,000 passengers and delivers more than 110,000 tons of cargo.

While the F-4 Phantom continued to serve as TAC's primary tactical fighter weapon system during FY '70, new advances were noted in the achievement of a balanced force. The second F-111 wing was established at Cannon AFB, N. M. (the 27th TFW), to join the 474th TFW at Nellis AFB, Nev. Also, the A-7D close air support fighter entered the inventory at Luke AFB, Ariz. The first A-7D wing will be located at Myrtle Beach AFB, S. C. In addition, the development contract for the F-15 air-superiority fighter was awarded to McDonnell Douglas.

During FY '70, TAC's fighter forces also began returning to total readiness status after accomplishing special replacement training in support of SEA requirements. The 4531st TFW at Homestead AFB, Fla., returned its last RTU unit to operational status. Similarly, the 15th TFW at MacDill AFB, Fla., will have completed its RTU mission in June. The RTU responsibilities of the 479th TFW at George AFB, Calif., also will be phased out in the months ahead.

In connection with these changes, TAC's combat crew training and RTU activities in the F-4 will be centralized and shifted from Davis-Monthan AFB, Ariz., to Luke AFB. Additionally, the A-7D combat crew training activity now at Luke AFB will be transferred to Davis-Monthan AFB.

Operationally, the integrated TAC force of fighters, reconnaissance, and airlift was involved with Army units in numerous training exercises such as Brass Strike and Bold Shot/Brim Fire. Annual exercises like Deep Furrow, Arctic Express, and Punch Card kept the close relationship between TAC and overseas commands intact. TAC also maintained two fighter squadrons in Korea, a rotational responsibility that began with the USS *Pueblo* crisis in 1968.

One of the most versatile of TAC's operational organizations is the Special Operations Force. Equivalent to a numbered air force, USAFSOF is TAC's "other option," designed for deployment of suitable forces when or before a situation necessitates the introduction of general-purpose or tactical strike forces.

At present, SOF is committed primarily to SEA requirements, providing aircrew training in twenty different weapon systems. In addition, SOF provides aircrew training for students from ten allied nations. In total, SOF will have trained more than 5,000 students during FY '71.

Gunship and strike training is conducted in seven different types of aircraft—AC-47, AC-119G/K, AC-130, A-37, T-28, A-1, and UH-1P. Forward air controller training is conducted in the O-1, O-2A, and OV-10. In late 1969, SOF completed training for and deployed two A-37 squadrons to SEA. Allied aircrew training (MAP) is conducted in the A-37, A-1, C-123, and C-47.

Despite its basic training role, SOF maintains a continuing capability to deploy mobile assistance or training teams in response to requests for instruction or assistance. One such team recently was deployed to Vietnam to instruct in VNAF helicopter gun system modernization.

One of the Special Operations Force's most important roles is in developing military civic action  
(Continued on following page)

One of the aircraft TAC uses for Forward Air Controller training is the OV-10 Bronco, shown here in flight.

The versatile OV-10 can perform not only as a FAC plane but also in an attack role, carrying up to 2,400 pounds of external stores. It's in service in Vietnam.



doctrine and techniques. The primary purpose is to prevent conflict by ensuring internal stability. In this connection, USAFSOF, in concert with overseas commands and allied authorities, provides country survey teams when required.

TAC's reconnaissance forces continued to move steadily ahead under the impetus of new techniques and equipment developed by the Tactical Air Reconnaissance Center at Shaw AFB, S. C. All-weather, day-night recce advanced significantly and response time effectiveness improved. In addition, the TAC reconnaissance force structure was enhanced by the return of the 18th Tactical Reconnaissance Squadron from Europe, combined with the reorganization from training mission requirements to operational status of the 29th TRS at Shaw AFB, S. C., and the 4th TRS at Bergstrom AFB, Tex. These additions greatly improved TAC's worldwide recce capability.

In addition, in other highlights during FY '70:

- TAC recorded the best aircraft safety mark in its twenty-three-year history, with an all-time low of 6.7 accidents per 100,000 flying hours.

- The command computerization program advanced during the year, with ten of nineteen bases equipped with the Burroughs B3500 program enabling immediate data acquisition in finance, personnel, and engineering management.

- The TAC Medical Service greatly increased mobility and flexibility by introducing the Mobile Air Transportable Hospital (MATH). This seven-module medical facility is air transportable and specifically designed to support TAC's bare-base concept. It was used in the Coronet Bare exercise in South Carolina.

- TAC also provided USAF with the sole source of tactical aeromedical evacuation capability with the establishment of the 1st Aeromedical Evacuation Group at Pope AFB, N. C., for worldwide deployment. In addition, two Reserve Medical Services units were established at Ellington AFB, Tex., and MacDill AFB, Fla.

- The 64th Tactical Airlift Wing and the 4442d Combat Crew Training Wing shifted from Sewart AFB, Tenn., to Little Rock AFB, Ark., as a result of the programmed closure of the Tennessee base.

- TAC's worldwide civil engineering capability was enhanced by acquisition of two Red Horse units (heavy repair), the 557th CES(HR) at Hurlburt Field, Fla., and the 820th CES(HR) at Lake Mead, Nev., which returned from Southeast Asia.

- In an additional move to increase civil engineering resources, TAC became gaining command for sixty-nine newly organized Reserve Civil Engineering Flights. Each of the eighty-five-man organizations contain the nucleus of a sixty-man Prime Beef team.

- Organizationally, several key changes were made during the year. A Deputy Chief of Staff for Requirements was established; the four Tactical Centers (fighter weapons, reconnaissance, airlift, and tactical air warfare) were realigned for improved responsiveness; and the Special Operations Center was realigned within the Special Operations Force as DCS/Requirements.

- The TAC-85 Study Group was established to conduct a comprehensive study of US Air Force tactical airpower requirements and objectives over the next fifteen years.—END



A tactical fighter for the Air Force is the A-7D Corsair II, capable of carrying twenty-eight 250-pound general-purpose bombs on its six wing pylons. The A-7D also is armed with the rapid-fire M61 Gatling gun.

*... 1422. All England mourns the death of King Henry V, the conqueror of France. The Dauphin decides to seize this opportunity to regain his possessions. Joan of Arc and four soldiers disguised as peasants pass through the gates of Rouen. She climbs a tower and raises a flaming torch. The Duke of Anjou sees the signal and cries to his troops, "Defer no time, delays have dangerous ends." The army attacks ...*

We've come a long way from communicating with a raised torch. And the more sophisticated the techniques of war, the more dangerous the delays.

Today's communications systems must be fast, sure and flexible.

That means they must be conceived and designed by people who think in terms of the total communication problem—from the original concept to production to personnel training to operation and maintenance.

We used this approach when we designed, built, and installed electronic command and control systems and trained operators for Minuteman—our primary missile retaliation capability.

We're using this approach in our work on Mallard—the most sophisticated tactical communications system ever conceived.

And we're proposing this approach on Sanguine—a new concept in Naval communications.

When minutes, or even seconds, can be the difference between success and failure, there is no room for error.

We understand the dangers of delay. After all, we are a communications company.

Sylvania Electronic Systems,  
Sylvan Rd., Waltham, Mass. 02154.

**SYLVANIA**  
GENERAL TELEPHONE & ELECTRONICS

**"Delays have dangerous ends."**

*William Shakespeare, King Henry VI, Pt 1*

Fort Rucker, Alabama is the home of the U. S. Army Aviation Center and School. There, the synthetic flight training branch operates two GAT-2\* trainers by Link.

The GAT-2 allows the instructor to spend more time with a man—all the time he needs. The result is better pilot training—especially in the very important area of emergency procedures. Training in the GAT-2 also simplifies scheduling and reduces cost.

The motion of the GAT-2 is real. The feeling of flying you get is exactly the feeling you get in a very responsive modern twin-engine aircraft. So the pilot's transition from GAT-2 to the real

twin-engine aircraft is a routine matter.

The GAT-2 is a complete training system created by the same people who provide training systems for everything from a single-engine craft to the new 747 commercial jet. Nobody knows aviation training like Link.

For complete information write: General Aviation Trainer Sales, Link Division, The Singer Company, Binghamton, New York 13902. \*A Trademark of Singer-General Precision, Inc.



**SINGER**  
LINK DIVISION

**If a man can fly a GAT-2  
he can fly any twin-engine  
aircraft in the Army.**





# The Air University

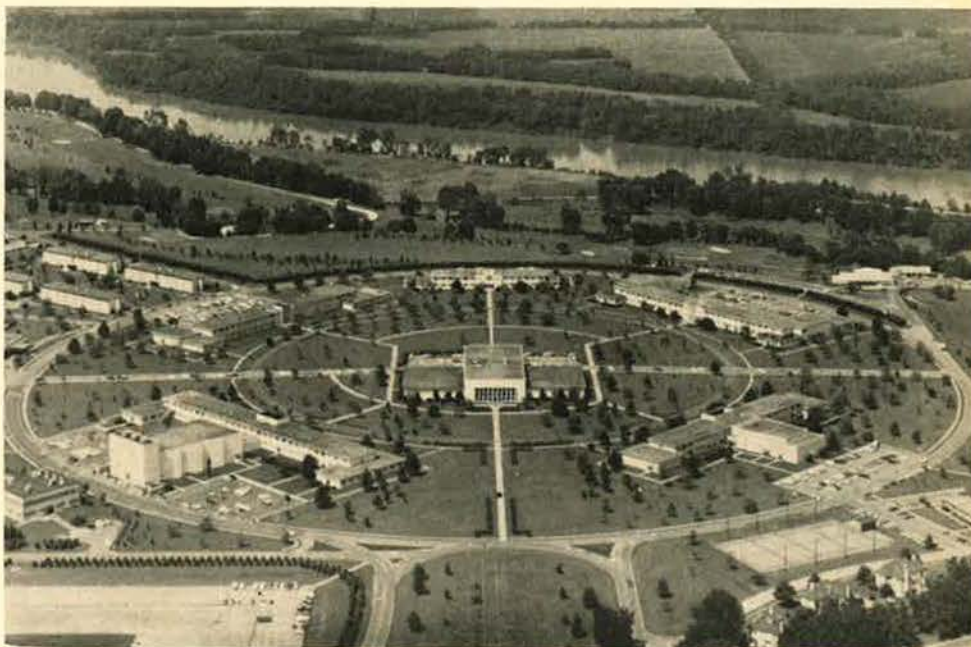
**A**IR University (AU), the professional education center for the United States Air Force, prepares the leaders who in large measure will determine the caliber of tomorrow's Air Force.

Air University today—and since its establishment twenty-four years ago—provides the many types of education and educational services required by a dynamic Air Force. These range from precommission education for career-minded young men to the preparation of top aerospace leaders, staff officers, and trained specialists.

The Air Force's military education schools are located on Maxwell's Academic Circle, in the center of which is the Air University Library, named for Gen. Muir S. Fairchild, Air University's first commander and later USAF Vice Chief of Staff. Air University helps prepare those who to a great extent will determine the quality and direction of tomorrow's Air Force. Its services range from precommission education for the career-minded to advanced courses for top-level aerospace leaders, staff officers, and specialists in many fields.

Commanding Air University is Lt. Gen. Albert P. Clark, whose headquarters are at historic Maxwell AFB, near Montgomery, Ala. The Air Force's professional military education schools are located on Maxwell's Academic Circle. They are the Air War College, Air Command and Staff College, and Squadron Officer School. Located in the center of the Circle is the imposing Air University Library, named for Gen. Muir S. Fairchild, Air University's first commander and later USAF Vice Chief of Staff.

Another AU school in the Academic Circle is the  
*(Continued on following page)*



*Lt. Gen. Albert P. Clark became Commander of the Air University in August 1968. His previous assignment was Vice Commander, Tactical Air Command. A 1936 graduate of West Point, he completed flying training at Randolph Field, Tex., in 1937. He then served at Selfridge Field, Mich., and in June 1942 went to England as second in command of the 31st Fighter Group, the first American fighter unit in the European Theater of Operations. He was shot down over Abbeville, France, in July 1942 and held prisoner of war until April 1945.*

*After World War II General Clark progressed through key staff jobs in TAC, Continental Air Command, and ADC. He commanded the 48th Fighter-Bomber Wing in France in the mid-1950s and then served as Chief of Staff, USAFE. General Clark served as Director of Military Personnel, Headquarters USAF, from 1959-63. He next commanded the 313th Air Division, Okinawa. In August 1965, General Clark was named TAC's Vice Commander. A command pilot, he holds the DSM, Legion of Merit, Air Medal, and Purple Heart.*



A student officer at Air University's Academic Instructor Course operates a prototype learning center that provides audiovisual systems to permit individual student study.

Air University Institute for Professional Development. It provides instruction in space operations, weapons employment, comptrollership, and personnel management. AUIPD's newest course is for new legal officers.

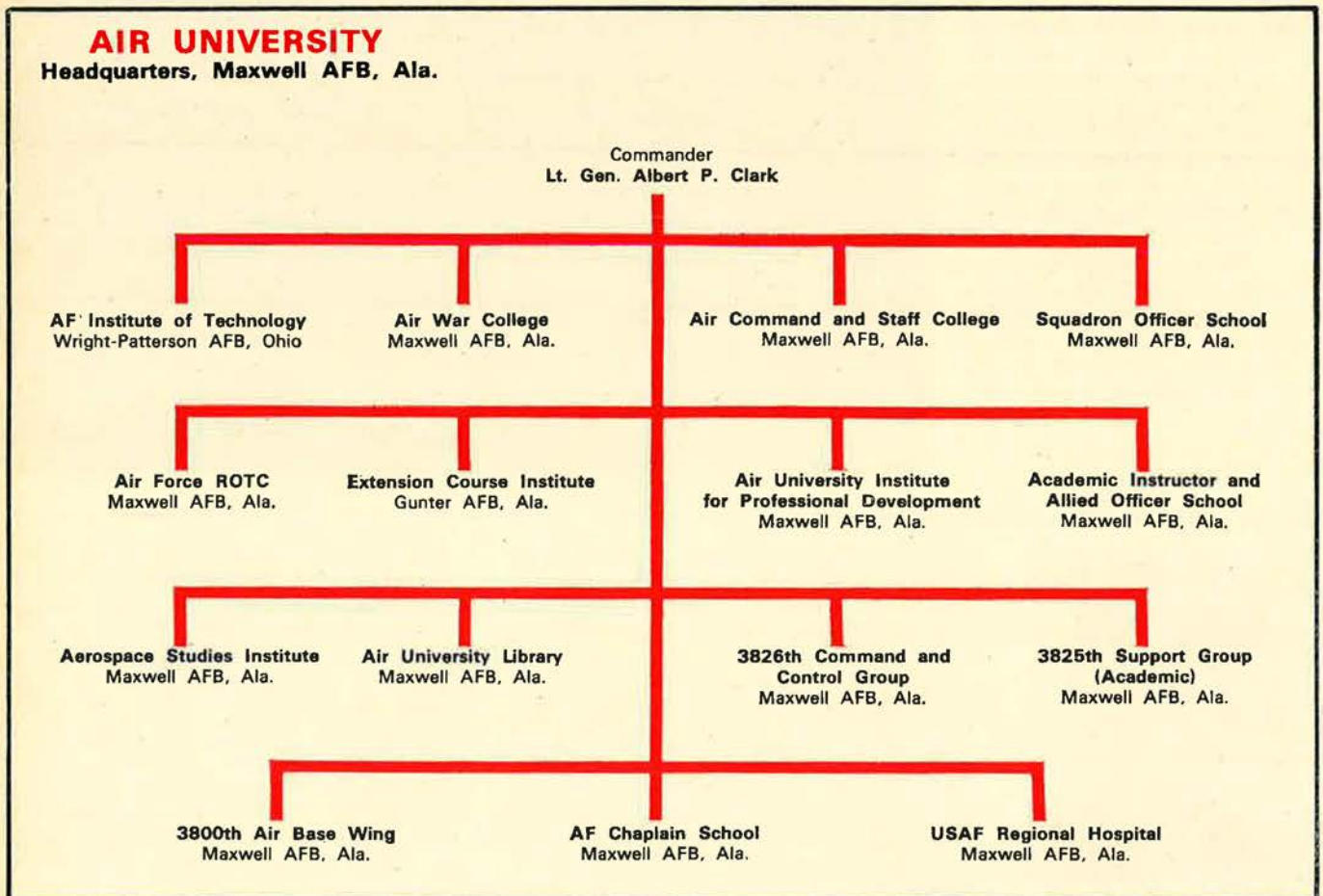
The Circle also houses Project Corona Harvest, an evaluation of the effectiveness of airpower in Southeast Asia since 1954. Although the project's steering committee is headed by the USAF Vice Chief of Staff, the AU Commander is responsible for the overall conduct of the study. Corona Harvest is just one of the agencies composing the Aerospace Studies Institute. Its Arctic,

Desert, and Tropic Information Center recently produced a manual and movie on survival in the inland waterways of Southeast Asia. Another division publishes the scholarly *Air University Review*. Other divisions include the USAF Historical Division, the Concepts Division, the Documentary Research Division, and the Communications-Electronics Doctrinal Project Office.

Elsewhere at Maxwell are the headquarters of Air Force ROTC—a dual-education system that offers aerospace education at 165 high schools and an Air Force-commissioning program at 174 universities. Enrollment in Air Force ROTC this fall is expected to total 40,000 college students, while enrollment in Air Force Junior ROTC is anticipated to total 18,000 high school students.

In addition, Maxwell houses the command's Academic Instructor and Allied Officer School. Its Academic Instructor Course prepares officers and airmen for instructor positions throughout the Air Force, while its Allied Officer Familiarization Course prepares allied officers to attend Squadron Officer School and Air Command and Staff College. Distinguished allied graduates include a vice president, air force commanders, military school commandants, ambassadors, and attachés.

During the past four years, since the Air Force Chaplain School moved to Maxwell, it has provided instruction to approximately one-fourth of the clergy in the Air Force. The Air University school conducts courses for both new and experienced chaplains.





**Students at Air University's Air War College meet in seminar with students from Squadron Officer School in a unique new program. The resulting interface brings to bear the mature judgment of senior officers and the enthusiasm of junior officers toward the solution of common professional military problems.**



Air University also directs the operation of the Extension Course Institute at Gunter AFB, across Montgomery from Maxwell, and the Air Force Institute of Technology at Wright-Patterson AFB, Ohio. Further, Air University has faculty members at Army and Navy schools throughout the country.

The Extension Course Institute operates the world's largest correspondence school with more than 300,000 enrollments and 310 courses. ECI provides study material in support of the Weighted Airman Promotion System (WAPS) and has, to date, shipped more than 175 tons of WAPS study material to Air Force units throughout the world. This involved more than one million study volumes.

The Air Force Institute of Technology provides education and training in scientific, technological, managerial, logistical, medical, and other specialized fields. It conducts resident courses at Wright-Patterson AFB, Ohio, and extension courses at US and allied installations around the world. It also supervises AF education programs at civilian universities, industrial plants, medical centers, and at six Minuteman ICBM missile sites. A nuclear engineering center, the largest nuclear test facility within DoD, became a permanent educational facility of AFIT during 1967.

Astronaut Edwin E. "Buzz" Aldrin, an Air Force

colonel, and one of the first men to walk on the moon, is a former AFIT student, having received his Doctor of Science degree from MIT through an AFIT-sponsored program. The famed astronaut is also a graduate of Air University's Squadron Officer School. His father, then a lieutenant, was one of nine graduates of the first AFIT class in 1920. The Institute was then called the Air Service Engineering School. AFIT is observing its fiftieth anniversary this year.

In 1967, Air University initiated the Thomas D. White Lecture Series in memory of the former Air Force Chief of Staff. The series is designed to provide a forum for the exploration of significant defense problems throughout the free world. The list of distinguished lecturers includes Gen. Maxwell D. Taylor, former ambassador to South Vietnam; Dr. Frank Trager, Professor of International Affairs at New York University; Gen. Bernard A. Schriever, former Commander of Air Force Systems Command; Ambassador Charles E. Bohlen; plus many more.

In 1968 Air University accepted corporate membership in The Institute for Strategic Studies. This London-based organization was founded in 1958 to create an international center for continuous study, discussion, and research on the problems of defense and disarmament.—END



**Pilot aptitudes are tested in the Air University-sponsored Flight Instruction Program on the campus level. Senior AFROTC cadets have the opportunity to earn pilot's certificates while participating. AFROTC enrollment at 174 universities this fall is expected to total some 40,000 students**



## Air Training Command

**A**IR Training Command (ATC), one of the world's largest vocational organizations, has trained more than 8,000,000 men and women during almost twenty-seven years of service as the school system for the US Air Force. The command will observe its twenty-seventh anniversary on July 1, 1970.

One of the largest commands in the Air Force, ATC's population during recent years averaged approximately 144,000. Its assets exceed \$2.5 billion, including real estate, aircraft, missiles, other equipment, and inventories.

ATC offers more than 3,000 courses at sixteen command bases across the nation, and through its 126 field training detachments at other US bases throughout the free world, including Southeast Asia. In addition, ATC training squadrons function on bases of other commands.

During the current fiscal year, the command will put more than 600,000 students through courses of its military, technical, and flying training systems.

Commanded by Lt. Gen. Sam Maddux, Jr., with headquarters at Randolph AFB, Tex., ATC has four broad missions—personnel recruiting, military training, technical training, and flying training, which includes survival training.

ATC's US Air Force Recruiting Service emphasizes quality in selecting recruits to fit the Air Force-wide needs. The command has a military training center and four technical training centers. The Medical Service School continues its program at one of the centers.

In its flying training mission, ATC has eleven undergraduate pilot training (UPT) wings, a navigator training wing, a survival training school, and five specialized

pilot training squadrons. The squadrons include the Instrument Pilot Instructor School (IPIS), two pilot instructor training units (PIT), a pilot indoctrination squadron at the Air Force Academy, and a pilot training squadron for the Military Assistance Training Program (MAP). A helicopter pilot training unit is part of one of the UPT wings.

In providing the lifeblood for the Air Force team, ATC during this fiscal year will initiate more than 100,000 airmen and officers in military training. Approximately 525,000 student entries will be made into technical training courses, and approximately 19,000 will complete the various flying training courses.

Transferred in July 1969 from Strategic Air Command to ATC, Columbus AFB, Miss., joined the ranks of the UPT bases which this fiscal year will produce about 3,450 Air Force pilots. Additionally, ATC provides some pilot training for the US Marine Corps, and for various allied countries, including the Republic of Vietnam.

"Vietnamization" effectively began in July 1969 with Headquarters ATC responsible for supervision of the entire training program, which includes training by the US Air Force of 5,000 Vietnamese students in the United States this year. Pilot training and technical training are involved.

To assist in the pilot training for the Vietnamese Air Force (VNAF), additional T-28 aircraft were obtained. Over the next fiscal year, the T-28 pilot training rate for the VNAF will about double. They also receive flying training in other aircraft types.

In the technical training area, 243 VNAF instructors were trained at ATC technical training centers to develop Vietnamese in-country training capability in



*Lt. Gen. Sam Maddux, Jr., assumed command of the Air Training Command in July 1966. Formerly he was Vice Commander in Chief, Pacific Air Forces. A 1936 graduate of the University of Oklahoma, General Maddux completed flight training at Randolph and Kelly Fields, Tex., in 1937. After several years flying pursuit aircraft, he was assigned as a B-17 pilot and participated in the first long-range over-water bomber flight from California to Hawaii. After duty in the Philippines, Australia, and New Guinea following Pearl Harbor,*

*General Maddux in November 1942 was sent to Washington, D.C., for staff duty. The postwar years saw General Maddux in a number of personnel and training posts, and from October 1959 to May 1960 he served as Senior Member, UN Command, Panmunjom, Korea. Following a stint as Deputy for Plans and Operations to the Commander in Chief of PACAF, General Maddux took command of the Thirteenth AF. In July 1965 he was named Vice CinC, PACAF. He holds the DSM, Legion of Merit, DFC, Bronze Star, and Air Medal.*

seventeen courses to be activated during March-September 1970. An ATC mobile training team of sixty-four personnel will provide advisory services to the VNAF in establishing its in-country training program.

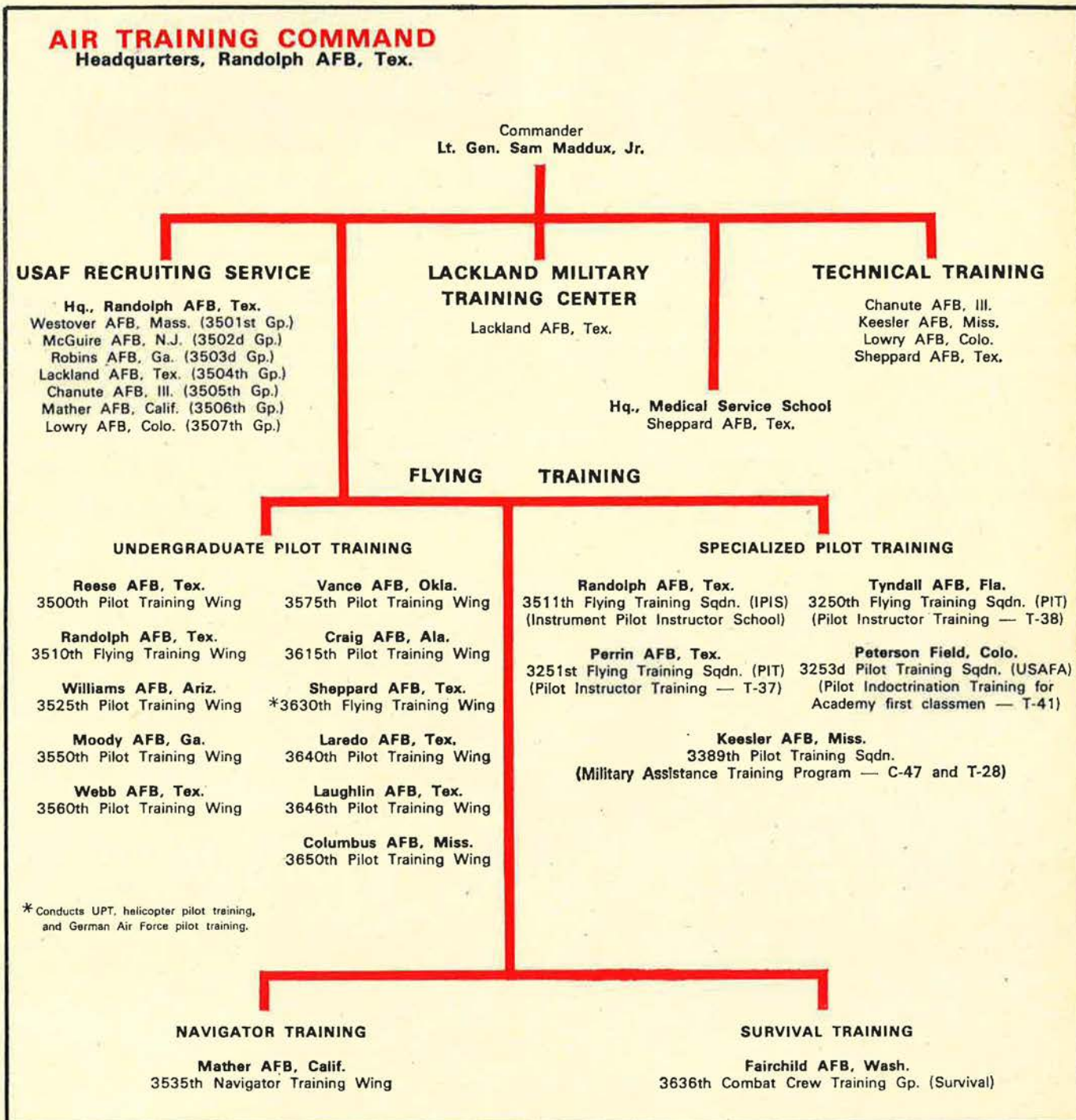
ATC also is providing course materials, lesson plans, and training graphics to the VNAF. Lists of equipment required to support the training were furnished to the VNAF for acquisition action. In addition, ATC's technical training centers and its military training center designed and fabricated various types of training equipment for use at VNAF locations.

In coordination with Southeast Asia operational requirements, ATC schedules VNAF student training to provide trained manpower availability concurrently with the delivery of operational equipment.

ATC makes every effort to provide the USAF and nations of the free world the best possible training on a responsive, cost-effective basis. All courses are reviewed continually, not only to keep the materials abreast of fast changing technology, but also to improve training procedures and methods.

For example, current contractual studies are focused on the pilot training system of the future, looking ahead to the systems and skills needed to provide USAF pilots for 1975-90. This systems-engineering study encompasses all phases of training technology and skills, as well as simulation and training requirements. Its findings are expected to help define the future undergraduate pilot training system.

*(Continued on following page)*





Among all of the technical training courses in the Air Training Command's curriculum, one of the most important—and productive—is the maintenance of jet engines.



Students in ATC's Electronic Digital Data Processing Repairman course learning to adjust the cathode-ray tubes that are basic components of situation display consoles.

A program to reduce the cost and improve the quality of ATC navigator training is now entering the initial procurement stage. A system of new aircraft and simulators promises to fulfill these needs. Reduction of training time is anticipated.

Designated the Undergraduate Navigator Training System (UNTS), it will employ a small fleet of new "T-X" jet navigator training aircraft and a complex of simulator units duplicating the navigator stations in the new aircraft. In the simulator, each student will

practice all aircraft navigation tasks. In-flight training will follow. A reduction in flying time of about forty percent is expected with implementation of the total UNTS. Procurement of a "T-X," similar to the McDonnell Douglas DC-9 or Boeing 737, is planned for FY 1971.

It is anticipated also that by FY 1972, navigators will have completely replaced the second pilot currently flying in the back seat of F-4 aircraft. This is in line with the Air Force policy of placing navigators in the



Capable of Mach 1.2 speed, these T-38s are aircraft ATC uses in its undergraduate pilot training program. During this fiscal year, the command will put approximately 19,000 personnel through its various flying training courses, 3,450 of whom will complete pilot training. More than 100,000 officers and airmen will be initiated in military training.



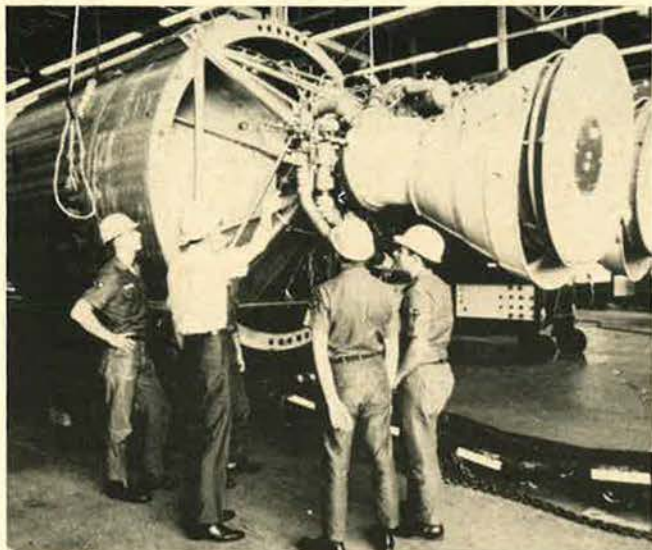
On a training mission, a student pilot flying a CH-3C Jolly Green helicopter picks up a weight and practices landings. Besides preparing pilots for USAF, ATC also provides some training of US Marine Corps pilots and pilots of various allies. "Vietnamization" began in July 1969 when ATC geared up to train 5,000 Vietnamese this year in flying and technical matters.

back and right seats of tactical fighters and reconnaissance aircraft, which has required an increase in production of navigators by 200 men per year. Approximately 1,000 undergraduate navigators will be produced this fiscal year.

Further development by ATC of its Manpower Management Engineering Program resulted in substantial manpower savings in technical and flying training. The program provides the means for studying work to be done, then applies scientific procedures in determining the number of people required to accomplish the workload. Computer tape files are developed in the procedure. These data systems now automatically detail the number and kind of manpower authorizations required to support given workloads. The systems have reduced manpower accounting files and computer machine time.



Good training and fun besides, as a student pilot becomes acquainted with the feel of parachuting during a practice session in the Air Training Command's parasail program.



A Titan II engine is the subject of a lecture by a civilian expert at one of the Air Training Command's four technical training centers. This fiscal year, ATC will put more than 600,000 students through various training courses.

On September 29, 1969, the US Air Force Officer Training School, Lackland AFB, Tex., commissioned its 40,000th second lieutenant while observing its tenth anniversary.

The FB-111 simulator was accepted, and crew training on the weapon system was started October 15 at Mather AFB, Calif.

On December 16, the US Air Force Survival School, Fairchild AFB, Wash., celebrated its twentieth anniversary. It will train about 10,000 this fiscal year.

On April 14, 1970, General Maddux was presented the Arnold Air Society's General Muir S. Fairchild Trophy, awarded annually for outstanding contributions to aerospace education.

ATC has more than 15,000 instructors. They contribute substantially to the accomplishment of ATC's motto, "Prepare the Man." This accomplishment in vocational training is recorded around the world.—END



# Aerospace Defense Command

**A** NEW look came to the US Air Force Aerospace Defense Command (ADC) in early 1970. ADC was reorganized and Lt. Gen. Thomas K. McGehee succeeded Lt. Gen. Arthur C. Agan as Commander.

General McGehee, formerly Commander of Fifth Air Force and US Forces, Japan, is a past commander of a number of ADC units, including the former Tenth Air Force at Richards-Gebaur AFB, Mo. He also has served as Director of Operations, ADC, and Deputy Chief of Staff for Operations, Hq. North American Air Defense Command (NORAD).

A command pilot, General McGehee is now responsible for the Air Force component of the joint US-Canadian North American Air Defense Command (NORAD), under the command of Gen. Seth McKee, USAF. ADC resources account for about seventy percent of NORAD operational forces.

As Commander of ADC, General McGehee's responsibility includes providing forces for the detection, identification, interception, and, if necessary, destruction of any aerospace threat to the North American continent and overseas land areas, as required.

While ADC continued to perform the global aerospace defense mission as a major USAF combat command, it experienced budget cuts and personnel reductions. This followed the Secretary of Defense's Project 703 base-closures announcement in late October 1969. These closures were designed to reduce operating and maintenance costs of equipment and facilities. They resulted in a reorganization, under which the continental US aerospace defense mission is now performed by six large air divisions.

Watching the depths of space for satellites has become an increasingly important role for ADC. The Fourteenth Aerospace Force performs this mission.

Information about payloads, the nuts and bolts from rockets and satellites in orbit, is available from ADC's airmen who operate the Space Defense Center inside Cheyenne Mountain near Colorado Springs. Daily, more than 20,000 satellite observations flow into the Center's data-processing facility.

Identification, as well as the position of each satellite in space, is vital to the NORAD mission, the Department of State, Department of Defense, the National



Protected on the ground by a barbed-wire screen, ADC F-106 Delta Darts in the Republic of Korea help provide air defense for free-world forces serving in the Asian nation.



*Lt. Gen. Thomas K. McGehee was named Commander of the Aerospace Defense Command in March 1970, following service in numerous ADC posts dating from 1958. Upon graduation from Alabama Polytechnic Institute in 1937, he entered active military service as an artillery officer. Receiving his wings at Randolph Field, Tex., in 1940, he served in several posts in the US before joining the Eighth Air Force's 305th Bombardment Group in Europe in 1942. Given command of the group in 1943, he later was named Assistant Operations Offi-*

*cer for Eighth Air Force. Among postwar assignments, General McGehee served as Deputy Chief of Staff for Operations, Fourteenth Air Force, and Chief of Operations, Armed Forces Staff College. Graduating from the Air War College in 1955, he became Deputy Chief of Staff for Operations, Fifth Air Force, Japan, and later its Chief of Staff. In 1968 General McGehee was named Commander, US Forces, Japan, and Fifth Air Force. His decorations include the Legion of Merit, Distinguished Flying Cross, Soldiers Medal, and the Air Medal.*



One arrow in ADC's defensive quiver in Bomarc, a long-range, area-defense guided missile designed to intercept and destroy enemy aircraft before they reach US targets. Less than a minute's warning is required before blastoff.

Aeronautics and Space Administration (NASA), the scientific community, and the exploration of space.

Around-the-clock aerospace surveillance data flows into the Space Defense Center from a worldwide network of radar and optical sensors, including those operated by ADC and other military, government, and private space detection and tracking agencies.

The United States and the Soviet Union are the biggest users of space. On April 10, 1970, the United States had 291 earth-orbit payloads and eighteen deep-space loads, plus 1,099 items of debris, for a total of 1,408 objects in orbit. By comparison, the Soviet Union had seventy-seven earth-orbit payloads and fourteen deep-space payloads, plus 298 items of debris, for a total of 389 objects in orbit.

To warn of a missile attack, there is the Ballistic Missile Early Warning System (BMEWS), with stations in Alaska, Greenland, and England. Their gigantic radar antennas, each with an area equivalent to that of a football field, are beamed to detect the trajectory of ballistic missiles from the Soviet Union. A greatly improved capability to predict hostile ICBM launch points and associated impact points in the United States has been achieved in the BMEWS. Data from BMEWS is transmitted to the ADC Central Computer and Display Facility inside Cheyenne Mountain.

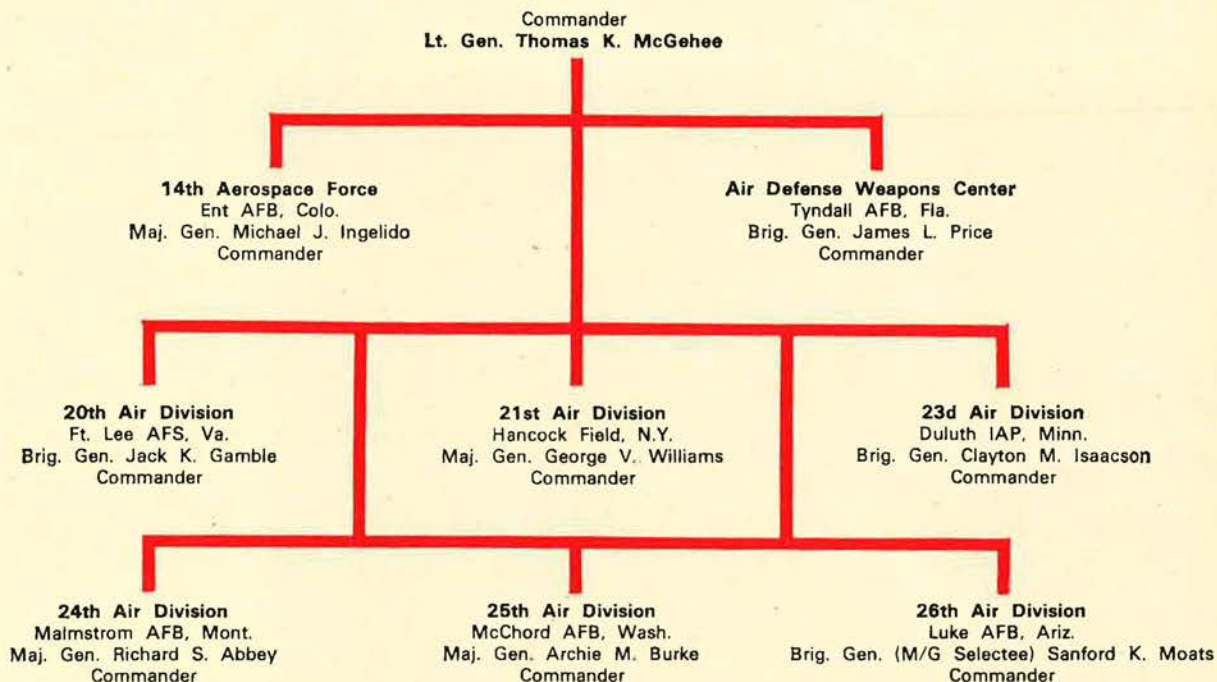
The Facility also receives data from an Over-the-Horizon (OTH) radar system that has the capability of providing information on missile launches, whatever their purpose.

Foremost of the threats faced by the United States is the Soviet arsenal of intercontinental ballistic mis-

*(Continued on following page)*

## AEROSPACE DEFENSE COMMAND

Headquarters, Ent AFB, Colo.



siles and the sea-launched ballistic missiles. The Soviets have developed a family of ICBMs that have shown improvement both in lifting and range capabilities. The range of currently deployed Soviet ICBMs is 5,000 to 7,000 nautical miles, which makes any target within the United States vulnerable.

Other Soviet missile threats include the Multiple Independently Targeted Reentry Vehicle (MIRV),



This Baker-Nunn camera, operated by ADC's Fourteenth Aerospace Force, is capable of photographing an object the size of a basketball at a distance of 25,000 miles in space.

which allows each ICBM to carry more than one warhead, and the Fractional Orbital Bombardment System (FOBS). FOBS, a satellite the Soviets may have tested as recently as September 1969, presents the threat of a weapon that can strike the United States from any direction. FOBS is a ground-based weapon, targeted before launch, with the sole intent of attack. It presents great problems in detection, tracking, and interception for aerospace defense forces.

In addition to the missile threat, there is the force of medium and heavy bombers that the Soviet long-range aviation can bring to bear on North American targets. The long-range bombers of the Soviet Union would most likely follow a missile attack, and could reach targets on the North American continent in five hours.

Interceptor crews at Keflavik, Iceland, intercept and make frequent motion pictures of Soviet Bear bomber aircraft conducting training over the North Atlantic. The Bear is a four-engine turboprop that can carry bombs or one air-to-surface missile.

To counter the Soviet bomber threat, ADC uses weapon resources that include the McDonnell F-101 Voodoo, the Convair F-102 Delta Dagger, and the Convair F-106 Delta Dart interceptors, plus Bomarc unmanned surface-to-air interceptor missiles.

The regular ADC forces are supplemented by highly proficient Air National Guard (ANG) units. Flying F-101s and F-102s, ANG units daily support ADC's continental air defense mission.

Both the ADC and ANG fighter-interceptor units are tested once a year at the Air Defense Weapons Center at Tyndall AFB, near Panama City, Fla. From all corners of the United States, pilots converge at the Center to test the effectiveness and capability of our nation's aerospace defense weapons. The supersonic jet fighters are capable of being armed from an arsenal of air-to-air missiles and rockets ranging from the large, nuclear-capable Genie to the smaller Falcon heat-seeking or radar-guided system, and conventional explosives.



An ADC Baker-Nunn camera snapped this remarkable photo of the comet Tago-Sato-Kisaka in its elliptical orbit around the sun. The camera is part of a network of electronic and optical sensors tracking man-made objects in space. The net's space surveillance data is provided to the joint US-Canadian North American Air Defense Command (NORAD) in Colorado Springs, Colo.





ADC personnel operate the Space Defense Center inside Cheyenne Mountain near Colorado Springs, Colo., for NORAD. A worldwide network of sensors furnishes data.



An anti-aircraft crew remains alert while on duty guarding ADC aircraft in Korea. From space surveillance to area defense, ADC is one of the most diversified AF commands.

Conventional ground-based radar and a wing of EC-121 airborne early warning and control aircraft serve as a link in the operation of ADC's fighter-interceptor fleet. Besides operations in the United States, the EC-121s fly missions in support of other commands located throughout the world. This includes a mission in Southeast Asia where the EC-121s are an integral part of the command and control system.

The conventional ground-based and airborne radar of ADC's defenses are linked together by a command and control system called Semi-Automatic Ground Environment (SAGE). Backup for SAGE is furnished by the transistorized computers of the Backup Interceptor Control (BUIC) system. Overall operational control of these defenses comes from the NORAD Combat Operations Center.

The efficiency of this system will be greatly increased by the forthcoming Airborne Warning and Control System (AWACS). AWACS is basically a high-speed, long-range jet aircraft carrying advanced early warning radar. Using either the well-known airframe of the Douglas DC-8 or an eight-engine Boeing design, the AWACS will sport a large antenna atop its fuselage. It is being designed to provide rapid response to fast-

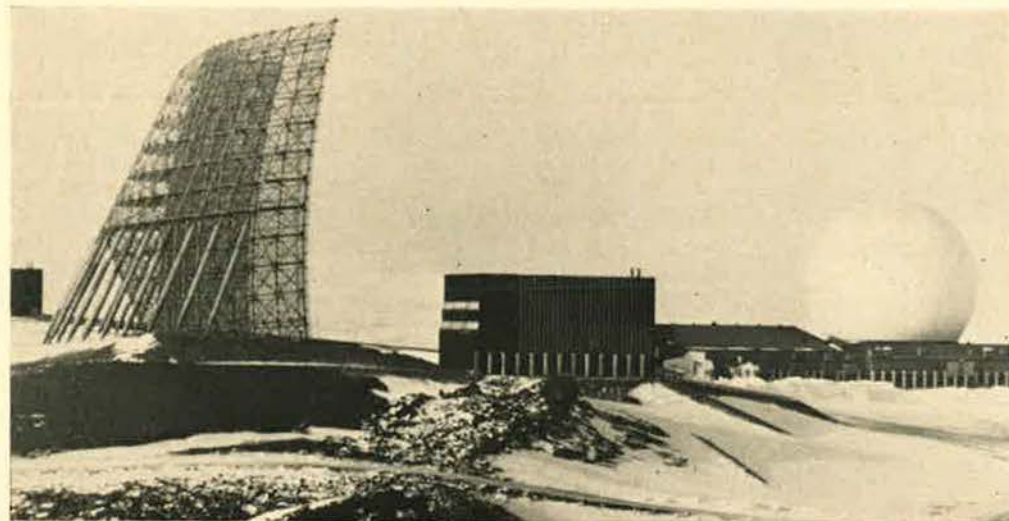
developing threats, early warning and air-surveillance information, and direction and control of offensive and defensive weapons.

To take full advantage of the extended defense resources offered by AWACS, it will be necessary to team up with a long-range, continuous-high-speed interceptor. ADC's requirement to meet the strategic bomber threat is an improved interceptor. Currently, the most advanced fighter-interceptor in ADC's inventory is the ten-year-old Convair air-refuelable F-106 Delta Dart.

As the development of AWACS and plans for an improved manned interceptor move ahead, ADC planners look to the future in other areas of systems development, particularly that of space.

In the space age, with man-made satellites probing the universe, the mission of aerospace defense becomes increasingly important. It now encompasses this relatively new potential battleground.

Today, the fighter-interceptor aircrews and radar operators on alert against a bomber threat have been joined by highly skilled technicians who operate sophisticated hardware for around-the-clock surveillance of space.—END



ADC operates Ballistic Missile Early Warning System sites in Alaska, Greenland, and the United Kingdom. Their information is transmitted to Cheyenne Mountain. Each BMEWS radar antenna has an area the size of a football field. Data from BMEWS is supplemented by ADC's Over-the-Horizon (OTH) radar system.



## Alaskan Air Command

**T**HE Alaskan Air Command (AAC), oldest of the United States Air Force's major commands, stands poised and ready on America's last frontier, providing "TOP COVER FOR AMERICA."

Under the command of Maj. Gen. Joseph A. Cunningham, the Alaskan Air Command's overall mission is to conduct, control, and coordinate offensive air operations according to the tasks assigned by the Commander in Chief, Alaska (CINCAL).

An equally important task is to provide combat-ready air defense weapon systems, aircraft control and warning elements, and air defense forces within Alaska for employment under the operational control of the Commander, Alaskan NORAD Region.

As a component commander of the Unified Alaskan Command, the AAC commander is the senior adviser to CINCAL on the appropriate employment of aerospace power. He plans for, conducts, controls, and coordinates tactical air operations employing aerospace forces made available to CINCAL.

As a major command, AAC exercises control over all assigned Air Force units, activities, and installations within CINCAL's area of responsibility. In carrying out this responsibility, the command provides tactical airlift support within Alaska as required or directed by Hq. US Air Force.

In addition, AAC provides airlift support between Sondrestrom Air Base, Greenland, and the Icecap Sites DYE 2 and DYE 3; and the aerial resupply of T-3, an ice island floating in the Arctic Ocean. Support of other major air command units as well as other military

services and government agencies throughout the Alaskan area is also a major AAC effort.

The Alaskan Air Command also provides search and rescue and aeromedical evacuation on the Alaskan mainland. Disaster relief is also supplied during domestic emergencies.

Literally topping the air defense routes of the world, AAC's location is the primary factor contributing to its ever-increasing importance. The command straddles the northern bomber routes between the Soviet Union and the industrial heart of the continental United States. It also links the polar air routes between Europe and the Far East and, more significantly, lies directly on the great-circle air route between the eastern United States and Southeast Asia. With the increased mobility of forces made possible by huge jet transports, Alaska occupies a strategically unique vantage point for protection of the free world.

The command has two main bases, Elmendorf AFB, near Anchorage, and Eielson AFB, near Fairbanks. In addition, two forward operating bases at King Salmon and Galena provide vital extensions for command and control of interceptor weapon resources.

The multiple mission of the Alaskan Air Command is further typified by the structure of thirteen remote radar installations. They are designed to enhance both the air defense and the tactical air operations roles levied on the command. Five of these installations serve as NORAD Surveillance Stations, providing for the earliest possible detection of manned bomber penetration of American airspace, from the Chukotskiy Peninsula.



*Maj. Gen. Joseph A. Cunningham has been head of the Alaskan Air Command since July 1969. Previously, he was Deputy Director, Civil Disturbance Planning and Operations, Office of the Chief of Staff, Department of the Army, Washington, D.C. Following graduation from West Virginia University, General Cunningham attended flying schools at Randolph and Kelly Fields, Tex., receiving his wings in 1939. He flew B-26s over Europe in the war and became Commander of the 319th Bombardment Group. Late in 1943 he was named to the*

*staff of the XII Fighter Command in North Africa. Among postwar assignments, General Cunningham, from 1954 to 1956, commanded the 317th Troop Carrier Wing and 7101st Support Group in Germany. From July 1959 to June 1963, he commanded the Air Rescue Service and in the 1960s held various posts in MATS, including command of the Twenty-Second Air Force from August 1966 to July 1968. General Cunningham, a command pilot, holds the Air Force and Army Distinguished Service Medals, Legion of Merit, and the Air Medal.*

Inland, five NORAD Ground Control Intercept Stations and three NORAD Control Centers serve as weapon-control facilities to expedite the intercept of any air-breathing intruders. In addition, all these units stand ready to act as combat-reporting centers or combat-reporting posts supporting tactical operations.

AAC's 21st Composite Wing provides aircraft for support missions in Alaska. Assigned are T-33s and EB-57s for intercept training, and C-123s, C-124s, C-118s, and C-130s, and H-21 helicopters for airlift. The H-21s are flown by the 5040th Helicopter Squadron for both airlift and search and rescue. They are scheduled for replacement by the newer, more versatile HH-3C helicopter. Conversion to the new craft will begin this spring.

The 17th Tactical Airlift Squadron carries the biggest share of AAC's airlift mission. In addition to its primary mission of tactical troop airlift and tactical resupply for Army units, the squadron has the unique task of supporting arctic operations in Greenland and Fletcher's Ice Island (T-3), floating in the Arctic Ocean.

Using ski-equipped C-130 Hercules aircraft, the 17th provides the only physical link between the DEW stations on the Greenland icecap and the outside world. Other Alaska-based C-130s of the 17th are used for supplying remote stations within Alaska, most of which have only gravel strips for runways.

Two C-124 Globemasters were recently added to the inventory of the 17th. They are used primarily for transporting oversized cargo to and from remote Alaskan stations.

Primary annual resupply of petroleum and non-perishable bulk supplies to AAC's stations is accomplished during the short Alaskan summer by commercial ocean and river barges. Named "Operation Cool Barge," this water resupply route is a joint operation of the Air Force and Military Sea Transport Service (MSTS).

Since the arrival of General Cunningham in July 1969, several major changes have occurred within the command's area of responsibility. Included were inactivation of the 317th Fighter-Interceptor Squadron and the reactivation of the 71st Aerospace Rescue and Recovery Squadron at Elmendorf. The 317th was inactivated on December 31, 1969. Earlier, the squadron had established a record of achievements unparalleled by any other unit of its kind in the US Air Force, including winning the coveted Hughes Trophy an unprecedented three times.

All but one of the F-102 Delta Daggers flown by the 317th are now assigned to Air National Guard units in Wisconsin and Texas. The lone "Deuce" remaining on the Alaskan scene is on public display at the Alaska Transportation Museum in Anchorage.

A squadron of F-4E Phantom jet aircraft is scheduled to arrive at Elmendorf AFB this summer. In addition to giving AAC an increased intercept capability, this unit will also provide the unified Alaskan Command's own tactical air capability.

Detachment 3, 25th Air Division, continues to maintain F-106 Delta Dart fighter-interceptors on alert at Alaskan bases. Both the aircraft and their crews serve in Alaska on a rotational basis from Aerospace Defense Command units in the "Lower 48."

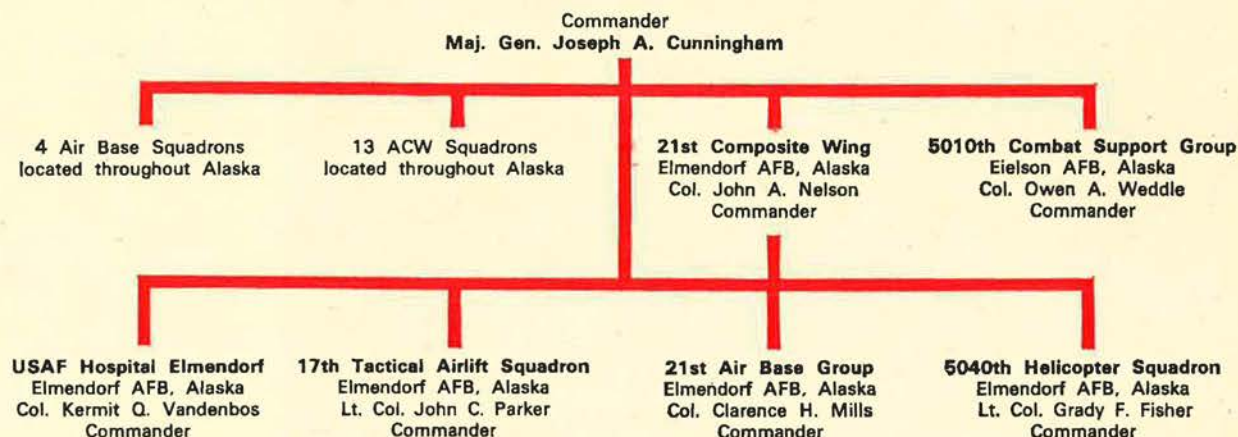
Another recent addition to the Alaskan Air Command is the 21st WAF Squadron Section, activated at Elmendorf during October 1969. Organization of the unit was part of an Air Force program to place more uniformed women in overseas locations. One hundred and eighty WAF are programmed for assignment to the unit by August 1970.

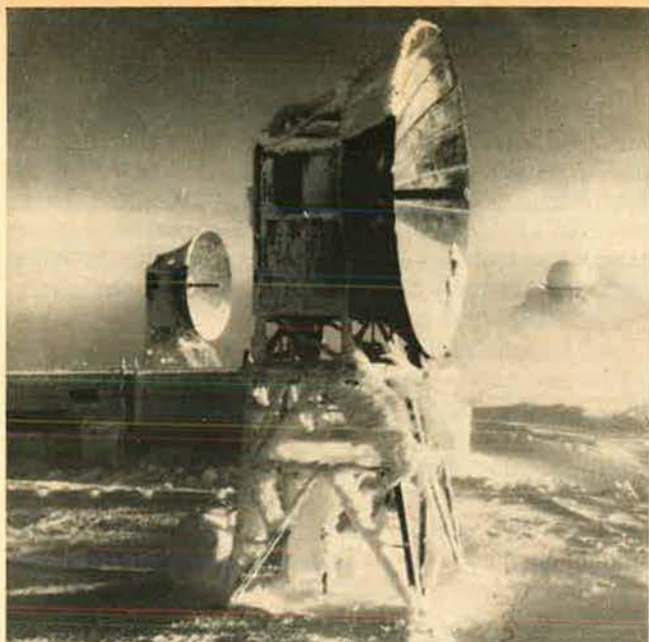
Support of the Military Airlift Command's (MAC's) Operation Combat Pacer—the ferrying of men and supplies to and from Southeast Asia—continues to lead the list of AAC support achievements. During 1969, 9,366 C-141s involved in Combat Pacer tran-

*(Continued on following page)*

## ALASKAN AIR COMMAND

Headquarters, Elmendorf AFB, Alaska





Located in remote central Alaska, Tatalina AFS is a vital link in the Alaskan Air Command's air defense network.

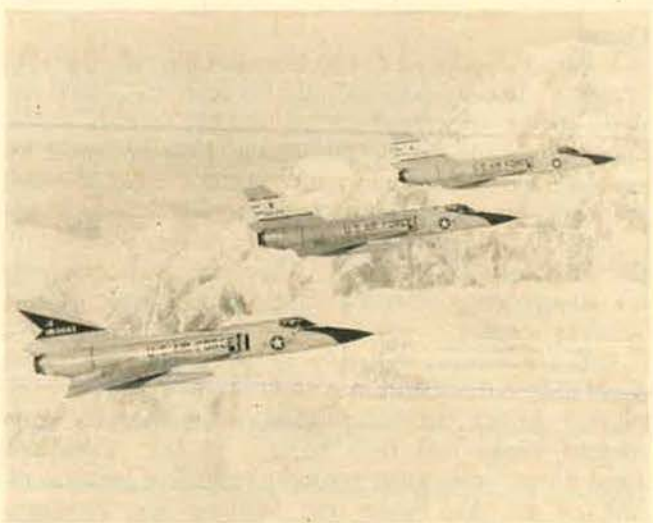


A C-130 of the Alaskan Air Command's 17th Tactical Airlift Squadron cruises over the Alaskan tundra. The unit's aircraft are used to resupply DYE sites on the Greenland icecap, and are the only USAF C-130s equipped with skis.

sited Elmendorf. This total included 687 aeromedical-evacuation flights, carrying Vietnam casualties to State-side hospitals. Since the program's inception in November 1965, nearly 40,000 MAC aircraft, including more than 30,000 Combat Pacer flights, have passed through Elmendorf.

Search and rescue is a major humanitarian mission of AAC. Each month, numerous Air Force, Civil Air Patrol, and civilian sorties are flown under the guidance of AAC's Rescue Coordination Center at Elmendorf. During 1969, sixty-four lives were saved through the combined efforts of the Center and military and civilian pilots throughout Alaska, where aviation and the airplane lead all other means of transportation.

After nearly twenty-five years of service on America's last frontier, AAC continues to blanket the 586,400 square miles of Alaskan terrain, providing "TOP COVER FOR AMERICA."—END



Air Force F-106 Delta Darts provide a supplement to the other resources of Alaskan Air Command. The aircraft and their crews serve in Alaska on a rotational basis from units of the Aerospace Defense Command in the "Lower 48."



Shown from the air, Cape Newenham Air Force Station is located on Alaska's southwest coast at a point overlooking the Bering Sea. The facility serves as one of a chain of thirteen remote radar installations that act as surveillance stations in the Alaskan Air Command's air defense network.

**One  
electric power plant builder  
offers 1,000 off-the-shelf  
models. All the result of  
50 years of R&D. All backed  
by worldwide parts/service.  
All American-made veterans  
of the toughest military  
and industrial campaigns.**

**No.1 is the One.**



**Onan**<sup>®</sup>

1400 73RD AVENUE N.E., MINNEAPOLIS, MINNESOTA 55432  
OUR 50TH YEAR BUILDING GENERATORS AND ENGINES



# Headquarters Command USAF

**T**HE evening of August 3, 1969, was no ordinary night for the Air Force personnel on duty at Andrews Air Force Base, Md. Several thousand spectators at the flight line in a drenching downpour provided the obvious clue: The "Gateway to the Nation's Capital" was about to receive a most illustrious visitor, President Richard M. Nixon. The Commander in Chief was returning to Andrews after his celebrated international goodwill trip. Among those on hand to greet the President as he emerged from *Air Force One* was the Commander of the 1st Composite Wing, Andrews.

. . . and at the Headquarters Command USAF (HQ COMD USAF) command post at Bolling AFB, the technician on duty was responding to a telephone call from the Commander of the 1141st USAF Special Activities Squadron, Stuttgart, Germany. The conversation concerned the humanitarian reassignment of a sergeant at the squadron's detachment at Oslo, Norway.

. . . while at Hq. Civil Air Patrol, USAF, a clerk in the Operations Directorate was about to put the finishing touches on a search and rescue (SAR) message reporting that a California Wing CAP aircraft had "found" a lightplane down in the Sierra Nevada Range.

Dissimilar as they are, these several events have a common organizational bond: Headquarters Command USAF, with a vested interest in more than 38,000 personnel at well over 800 locations throughout the world.

• **Malcolm Grow USAF Medical Center:** Headquarters Command USAF also takes care of its own with medical, dental, flight medicine, and veterinary

services for thousands of active-duty/retired military personnel and their dependents through the Malcolm Grow USAF Medical Center at Andrews. In a vital and direct assist for the war effort in SEA, the Center's 10th Aeromedical Staging Flight at Andrews AFB also provides medical care and processing for returning SEA wounded of all US armed services.

• **USAF Special Activities and Field Extensions:** Approximately 28,000 Air Force personnel are placed under the organizational umbrella of HQ COMD USAF in the category of either special activities or field extensions.

The personnel of the USAF Special Activities Squadrons are under the operational control of and perform duties for agencies outside the Air Force. As an example, the Air Force astronauts attached to NASA are actually assigned to HQ COMD USAF through its 1st USAF Special Activities Squadron at Ellington AFB, Tex. Other units support NATO, unified commands, the Federal Aviation Administration, DASA, MAAGs, and attachés.

Personnel assigned to the Command's field extensions are under the direct operational control of the Air Staff. Some of the larger units in this category are the 1005th Special Investigations Group, Washington, D.C.; the 1002d Inspector General Group, Norton AFB, Calif.; the 1105th Military Personnel Group, Randolph AFB, Tex.; the 1030th Auditor General Group, Norton AFB, Calif.; the Hq. USAF Postal and Courier Service; and the 1127th Field Activities Group.

All in all, there are twenty special activities and ten field extensions assigned to HQ COMD.

Thus, diversity is truly the hallmark of Head-



*Maj. Gen. Nils O. Ohman, formerly Vice Commander of the Air Training Command, took over as Commander of Headquarters Command in July 1968. A member of the US Military Academy Class of '37, he completed pilot training at Kelly Field, Tex., in October 1938. General Ohman flew thirty-four B-17 missions in Europe during World War II as Commander of the 97th Bombardment Group. Following the war, he served in many posts around the world, and during the Korean War completed forty-six combat missions in B-26 and B-29 aircraft*

*as Commander of the 3d Bombardment Wing. In the late 1950s General Ohman served as a SAC wing and division commander, and in September 1961 was named Senior Air Force Member, Military Studies and Liaison, Weapons Systems Evaluation Group, Washington, D.C. With Air Training Command since August 1964, he became Vice Commander in August 1965 and served in that capacity until his assignment to Headquarters Command in 1968. General Ohman is a command pilot and has more than 7,000 hours of flying time.*

quarters Command USAF—whose influence has been felt at many key points around the world.

• **1st Composite Wing, Andrews AFB, Md.:** Many of the 10,000 personnel under the command's operational control are stationed at Andrews AFB. Here, "superior performance" is a daily goal for the personnel responsible for operating a facility under the constant scrutiny of international heads of state, as well as the nation's top military and civilian leaders.

Precision and professionalism are carefully woven into the operational procedures of the 1st Composite Wing to support the more than 200,000 takeoffs and landings at Andrews each year. The great majority of the air operations are produced by the 1st Composite Wing itself, performing its executive airlift mission, transporting high-level government personnel throughout the world; and in its proficiency-flying program established for the pilots and navigators assigned to duties in the Washington, D.C., area.

The command has consistently displayed a high degree of ingenuity and responsiveness to contingency and emergency operations. A recent case in point was the command's support of the 4,500 troops of the Army and Marine Corps deployed to Washington, D.C., during the period from November 11 to 18, 1969, for possible use during the Vietnam Moratorium. Andrews flawlessly received and launched 355 sorties of TAC C-130s to accommodate airlift of the troops, who were then bivouacked at Bolling AFB.

• **1100th Air Base Wing, Bolling AFB:** Situated just south of the Capitol itself, at the confluence of the Potomac and Anacostia rivers, Bolling traditionally has been the nerve center of Air Force activity in the Washington area. The long-range master construction plan for the base will transform it into one of the Air Force's most modern bases. Meeting the stringent esthetic criteria established by the Washington, D.C., National Capital Planning Commission and Commis-



Andrews AFB, Md., was the scene of a fun-filled event in December when Bob Hope (flanked by Connie Stevens), entertained prior to his troupe's tour of military bases.

sion of Fine Arts, the construction plan will make one of the nation's oldest military facilities one of its most modern, and a showplace for Air Force activities in the nation's capital.

Bolling's 1100th Air Base Wing is the host for not only Headquarters HQ COMD USAF, but also the USAF Band and the USAF Honor Guard. The versatile US Air Force Band, goodwill ambassadors of the Air Force in the highest tradition, perform across the musical spectrum for official government functions around the world. And the crack precision of the US Air Force Honor Guard is on official display during daily ceremonies in the Washington area.

• **1100th Support Group, Bolling AFB:** Not as visible but just as distinctive is the 1100th Support Group at Bolling—the only Air Force field unit devoted solely to comptroller functions. This agency provides comptroller support to Hq. USAF, and Air Force Special Activities/Field Extension units, as well as the command. The more than 34,000 military and civilian personnel on its payroll include the Secretary of the Air Force and Air Force Chief of Staff. The agency's accounting responsibility exceeds \$3 billion annually.

• **Hq. CAP-USAF:** But concern for fiscal matters and resource management hasn't dimmed the Air Force's sense of destiny, as reflected through the support rendered by Hq. Civil Air Patrol-USAF, a subordinate unit of HQ COMD USAF, to the Civil Air Patrol, a civilian auxiliary of the USAF. Both fully recognize the unlimited potential in the youth of today as tomorrow's aerospace leaders and provide a well-rounded program for them, covering many aspects of air and space. Adult CAP members perform another vital job: participation in more than forty-eight percent of all aerial search and rescue missions flown under the supervision of the Air Force Aerospace Rescue and Recovery Service within the continental US.—END



President and Mrs. Richard M. Nixon wave to well-wishers as they board Air Force One on Andrews' flight line. The base is called "Aerial Gateway to the Nation's Capital."



# US Air Forces Southern Command

**I**N addition to its role as a major command of the US Air Force, the US Air Forces Southern Command (USAFSO), commanded by Maj. Gen. Kenneth O. Sanborn at Albrook AFB, Canal Zone, serves as the air arm of the unified US Southern Command.

Air defense of the Canal Zone and the administration of Air Force military assistance throughout Latin America are the two main responsibilities of USAFSO.

With a geographical area of responsibility second in the Air Force only to that of PACAF, USAFSO is comparatively small in terms of manpower. The command's area extends from the southern border of Mexico to the southernmost tip of South America, an area two and one-half times the size of the United States.

USAFSO provides logistic support for US Military Groups and their Air Force Sections throughout Central and South America from its two bases in the Canal Zone—Albrook and Howard. The command's 24th Special Operations Wing conducts these air support operations.

The Air Force's military assistance mission with Latin American nations takes several forms, such as materiel assistance through grant aid and foreign military sales, formal and informal training programs, and special airlift operations in support of civic action and community-relations projects.

In addition to advising on the provision of equipment and weapon systems for Latin American air forces, materiel assistance is aimed at providing the technical

knowledge to properly operate and maintain such equipment and systems. USAFSO has technical assistance teams available on a continuing basis to offer any help that may be requested.

Training programs for officers and airmen of Latin American air forces receive considerable emphasis. The Inter-American Air Forces Academy (IAAFA) at Albrook conducts much of the formal training provided by USAFSO. More than 200 students from eleven Latin American countries were graduated from the Academy last November, bringing the total graduated since classes began in 1943 to more than 9,000. All IAAFA courses are taught in Spanish by bilingual US Air Force instructors. Guest instructors, both officers and enlisted from various Latin American countries, also teach at the school.

Translating USAF training materials into Spanish for use in the school and in on-the-job training programs conducted by participating Latin American air forces is also a responsibility of IAAFA.

During Fiscal Year 1971, the IAAFA curriculum will be expanded to include professional education courses for officers of Latin American air forces. This includes an officer administrative course as well as a command and staff school. The first course is scheduled for November 1970. At present the only IAAFA course for officers is a five-week special air operations course conducted with the assistance of the 24th Special Operations Wing.

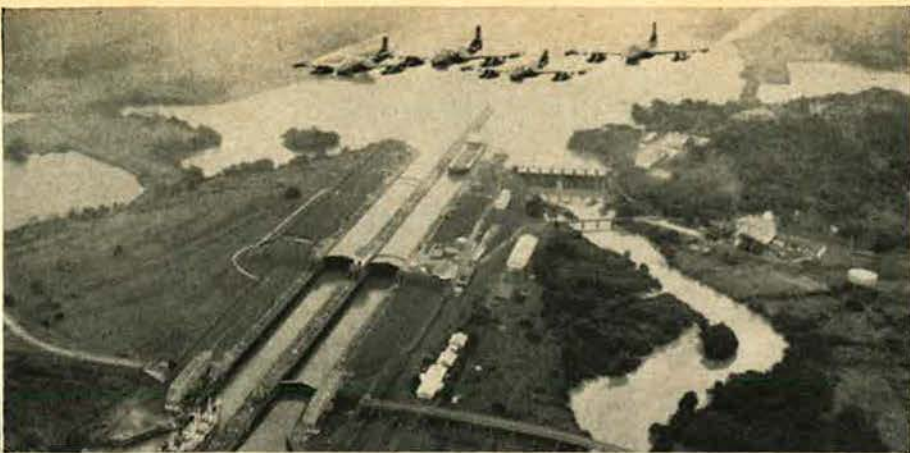
Administered by USAFSO and located at Albrook,



*The USAF Southern Command has been commanded by Maj. Gen. Kenneth O. Sanborn since June 1968. Formerly, he was Chief of Staff, AFLC, Wright-Patterson AFB, Ohio. A 1937 West Point graduate, General Sanborn received pilot training at Randolph Field, Tex., where he won his wings in October 1938. During World War II, he flew sixty-nine bomber missions, and served in the Caribbean and Pacific. In 1948, following various postwar assignments, General Sanborn began a four-year stint at Headquarters USAF, with the Joint*

*Strategic Plans Group and the NATO Military Committee. In November 1952 he was named Chief of Staff, Second Air Force, and in April 1954, Commander of the 306th Bombardment Wing. In the late '50s came a series of wing and division command assignments. From 1960 to 1965, General Sanborn held several posts at Taipei, Taiwan, including Chief of the Military Assistance Advisory Group. In September 1965 he began his assignment at Wright-Patterson AFB, Ohio. His decorations include the Legion of Merit, DFC, and the Air Medal*





Four A-37s recently assigned to the 24th Special Operations Wing at Howard AFB, Canal Zone, pass over Miraflores Locks on the Panama Canal. The A-37s brought some welcome modernization to the Southern Command wing, which previously flew T-28 aircraft.

the USAF Tropic Survival School has graduated more than 1,600 students from jungle- and water-survival courses. Astronauts of the National Aeronautics and Space Administration have attended the courses. All astronauts who have visited the moon underwent a portion of their training at the school. United States and Latin American airmen, members of the US Army, Navy, and Marine Corps, as well as other federal agencies, have also participated in the survival training.

A Familiarization Job Training Program is an important adjunct to the technical training provided by IAAFA. Under this program officers and enlisted men from Latin American air forces work directly with their USAF counterparts in the Canal Zone in a variety of technical and nontechnical fields. The training is done at either Albrook or Howard AFB.

USAFSO provides mobile training teams upon the request of Latin American countries to supplement training offered in the Canal Zone. Field training in a wide range of US Air Force specialties is offered by these teams.

Civic-action and nation-building programs continue to receive great emphasis from USAFSO. USAFSO's helicopters and fixed-wing aircraft log hundreds of hours of flight time in special airlift operations to sup-

port these programs. The USAFSO aircraft are augmented by the Tactical Air Command's C-130s on rotational duty in the Canal Zone.

Two welcome additions to the USAFSO aircraft inventory are the A-37 attack/fighter and C-123K cargo aircraft. The A-37 arrived in late 1969 as a modernization measure to replace the T-28 aircraft. Early in 1970 the C-123Ks arrived to replace the C-47 aircraft.

A number of search and rescue and humanitarian airlift missions were made during 1969. During the year, command aircraft made fifty-nine airlifts of sick or injured Panamanians to the capital for medical treatment. Fifty-six of these airlifts were made by USAFSO CH-3 or UH-1 helicopters while the other three were carried in fixed-wing aircraft.

The USAFSO Rescue Coordination Center at Albrook directed thirty-six rescue and recovery missions during 1969, involving a total of forty-four helicopter and thirty-four fixed-wing aircraft sorties. Air Force rescue boats stationed in the Canal Zone also made two sorties on these rescue and recovery missions. The Albrook-based center also acted as a recovery facility for Apollo manned spaceflights made during the year.—END



1Sgt. Jose M. Garcia, 24th USAF Dispensary, examines the throat of a patient during a medical trip to a village.



An instructor at Tropic Survival School, Albrook AFB, Canal Zone, gives water-survival tips to NASA astronauts.



# Air Force Communications Service

**T**HE SIGN on the main gate will read "Home of the Air Force Communications Service." This is significant because in its many years of operation, first as the old AACS (Airways and Air Communications Service) and later as a major command, the Air Force Communications Service has never before had a home of its own.

Now with the consolidation of AFCS and AFLC's Ground Electronics Engineering Installation Agency (GEEIA), AFCS headquarters will move from Scott AFB, Ill., to Richards-Gebaur AFB, Mo. On July 1, AFCS will take over operation of the base from the Aerospace Defense Command.

Merger of the two organizations extends one step further the USAF single-manager concept for communications-electronics, capable of performing engineering, installation, operation, and maintenance. In addition, the mission includes a ground C-E mobile depot maintenance capability previously exercised by GEEIA for the entire Air Force. AFCS, since its activation as a major command in 1961, has been responsible for the operation of on-base and long-haul communications, air traffic control, and navigational aid facilities.

The union of the two organizations, basically an economy move to meet Department of Defense military strength reductions, is seen by AFCS Commander Maj. Gen. Paul R. Stoney as "an opportunity to further streamline the management of the Air Force's C-E effort to provide more effective service for the 1970s and the future."

Eliminated as a result of the consolidation is the separation of the continental US into three geographical subordinate regions for both AFCS and GEEIA. Instead, AFCS Stateside activities will be directed through two areas—a Northern Communications Area with headquarters at Griffiss AFB, N. Y., currently the site of GEEIA headquarters; and a Southern Communications Area, with headquarters at Oklahoma City AFS, near Tinker AFB, Okla. A communications area is considered to be comparable in size and mission to a numbered Air Force.

Existing AFCS and GEEIA functions and personnel will be consolidated into the new command structure at all echelons by September 30, 1970. Overseas ele-



An F-4C Phantom sweeps by the Air Force Communications Service's ground control approach facility at Davis-Monthan AFB, Ariz., prior to landing after a checkout flight.



*Maj. Gen. Paul R. Stoney became Commander of the Air Force Communications Service in August 1969. Since July 1966 he had served as AFCS's Vice Commander. In October 1941, following graduation from Emory University, he enlisted as an aviation cadet and completed pilot training in July 1942. General Stoney served with the Instrument Flying Evaluation Group until March 1944, and then attended Communications Officer School. After tours in Japan and Hawaii, General Stoney in August 1949 was assigned to Headquarters*

*Airways and Air Communications Service where he planned a major updating of global communications and facilities. In July 1953 he entered the Air Command and Staff School and the following January was given command of the 1932d AACS Squadron Goose Bay, Labrador. In the 1960s General Stoney served as a communications expert with Headquarters USAF and with SAC. He helped establish the National Military Command System and the Consolidated Command Control Communications Program. He holds the Legion of Merit.*

ments also will be merged. New on the scene for AFCS will be electronics installation squadrons, developed from present GEEIA squadrons and responsible for the installation of communications-electronics-meteorology (CEM) facilities and systems and for specified on-site maintenance responsibilities.

AFCS thus enters the 1970s with far greater responsibilities than those that prevailed nine years ago when it was elevated to major command status. On the day it was created, July 1, 1961, AFCS inherited its nucleus of 30,000 personnel from the Airways and Air Communications Service (AACS). Today, the consolidation will push worldwide strength to nearly 60,000 personnel operating at more than 700 locations around the globe.

From these worldwide locations, AFCS personnel

achieved a number of milestones during the past year.

Air traffic control operations handled by command personnel exceeded 24,000,000, the highest yearly figure since World War II. This means that every one and one-third seconds, somewhere in the world one of the command's nearly 7,000 controllers was in contact with an aircraft taking off, landing, or requesting en-route flight information of some kind. At Da Nang Airport, Vietnam, the 769,886 operations handled by AFCS controllers exceeded the total recorded during the year at Chicago's O'Hare International Airport, with 676,473 operations the busiest commercial airport in the world.

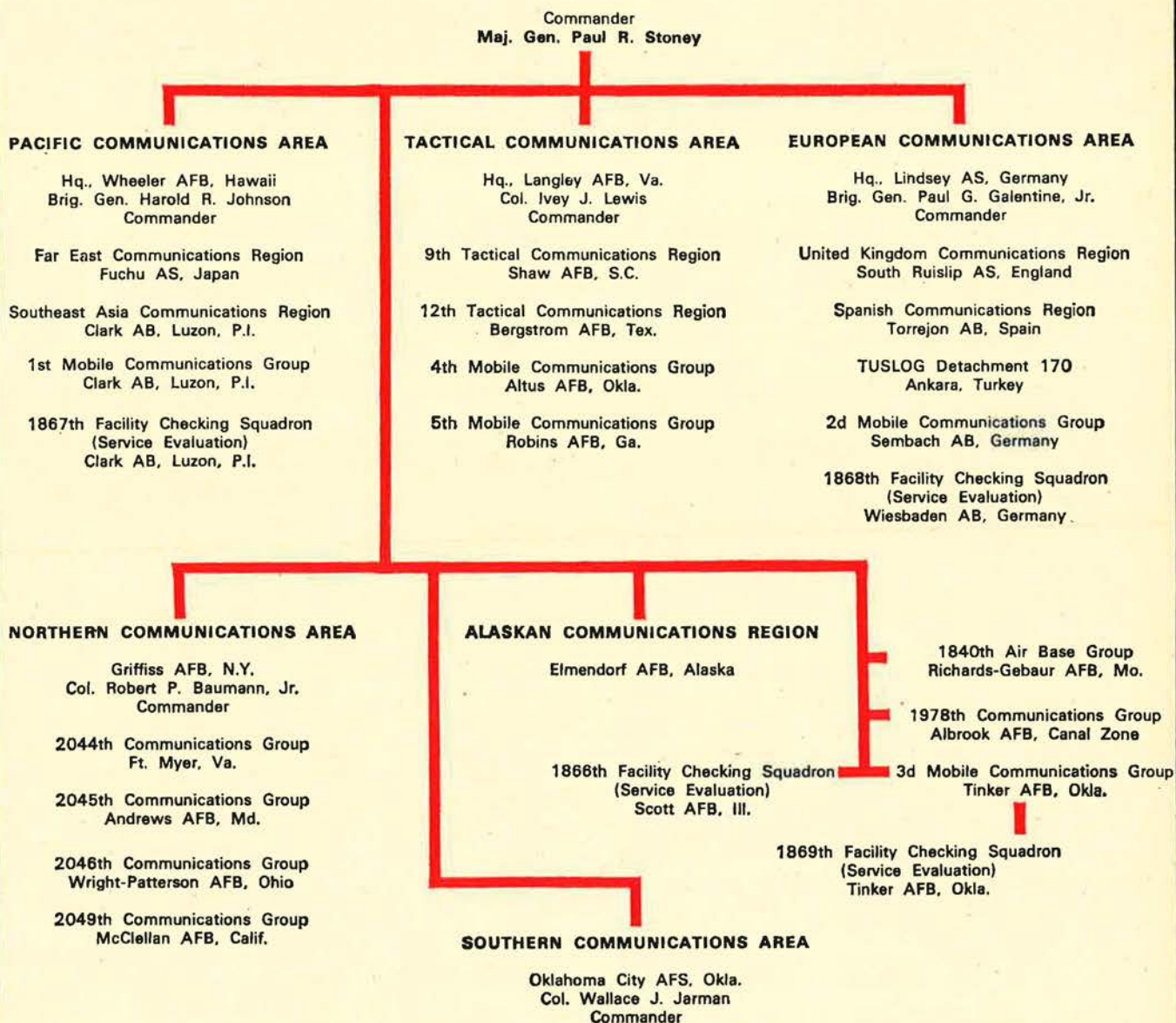
Aircraft "saves" credited to AFCS controllers during the year totaled ninety-one, involving almost 1,000 per-

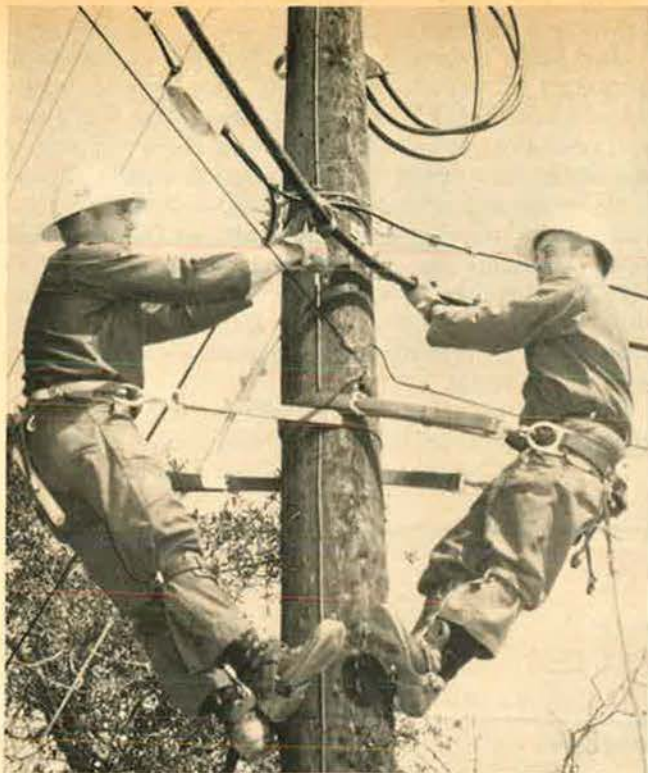
*(Continued on following page)*

## AIR FORCE COMMUNICATIONS SERVICE

**Headquarters, Richards-Gebaur AFB, Mo.**

(As of April 1. Full consolidation  
expected by September 30.)





Air National Guard squadrons play a significant role in GEEIA, now merging with AFCS. Shown here are members of an ANG unit undergoing training at Eglin AFB, Fla.



TSgt. Billy K. Whitmire of AFCS' 1st Mobile Communications Group works on the complex gear of the Fifth AF's ADVON Command Center site at Osan AB, Korea.

sons and more than \$125 million worth of equipment. A "save" is credited for the safe recovery of an imperiled aircraft through extraordinary and timely application of air traffic control knowledge, techniques, and procedures where there is reasonable doubt that the aircraft would have been recovered without such action. Since AFCS was activated in 1961, its controllers have been credited with saving more than 1,200 aircraft, worth more than \$1.2 billion and carrying nearly 3,900 crew members and passengers.

As part of its worldwide air traffic control mission, AFCS operates a highly specialized air traffic control operational evaluation program. Through a system of no-notice evaluations, dual-rated pilot/controllers in the command's facility-checking squadrons evaluate the effectiveness of air traffic controllers throughout the world. In Southeast Asia, and at other locations in the Pacific and Europe, this function is broadened to include the evaluation of navigational-aids equipment. These facility-checking units extended a perfect flying-safety record to five years during 1969, although individually some of the units have unblemished safety records dating back to 1962.

USAF Military Affiliate Radio System (MARS) stations—spurred by heavy traffic increases in Southeast Asia—established a new record during the year in helping American servicemen overseas with morale calls. MARS facilities operated by AFCS handled 447,963 telephone patches and telegraph messages from all over the world—nearly 100,000 more than the previous year. More than half of the year's total—268,512 transmissions—originated from the twenty-three MARS stations operated by AFCS in Vietnam and Thailand.

Increased capability and reliability resulted through a number of automation projects completed during the year. Last October, AFCS activated a new Automatic Digital Weather Switch (ADWS) at Carswell AFB, Tex., as part of the Automated Weather Network (AWN).

In March of this year a similar switch was activated at Clark AB, Philippines. The AWN, considered to be the most advanced weather communications system in existence, was pioneered jointly by AFCS and the Air Weather Service and became operational in 1965. Since its beginning, AFCS has upgraded and expanded the network's facilities in order to automate the entire system.

In addition to the new switches, AFCS operates similar switches at Fuchu AS, Japan, and High Wycombe, England. The overseas switches are equipped with central processor computers for collection of weather data from minor relay centers in their area of the world. Everything that is gathered is immediately sent to the Carswell switch, which comprises two high-speed digital computers. The Carswell ADWS automatically transmits the data to the USAF Global Weather Central at Offutt AFB, Neb., where experienced weathermen aided by computers prepare forecasts for virtually any spot on the globe. The finished products are sent back to Carswell and, in turn, relayed to the overseas switches for dissemination, all at the speed of computer electronics.

AFCS also became single manager for the USAF Notice-to-Airmen (NOTAM) system last October 1, the initial step of a far-reaching program designed to modernize the support given to military aircrews involved in worldwide flying operations. Time-phased

objectives included in the expansion program call for the modernization and relocation of the continental US Central NOTAM facility from Washington, D.C., to Carswell AFB. In addition, the program calls for a study of worldwide communications requirements to support achieving real-time communications handling of NOTAMs from the originator to the user; automated processing by Central NOTAM facilities, which is expected to reduce the number of personnel required to operate the facilities; and finally, a fully automated NOTAM system worldwide. Carswell AFB was selected for the location of the continental US Central NOTAM facility because of the programmed installation of computers and automated communications systems there, particularly those supporting the Automated Weather Network.

The bulk of AFCS personnel assets are involved in the command's communications operations, both in support of USAF missions and as the major contributor of all the military departments to the Defense Communications System (DCS). More than half of all the circuitry and personnel making up this long-haul global system are provided by AFCS. During the past two decades these communications facilities and operations have developed into the most extensive and highest quality long-haul communications systems ever known.

The overseas portion of the Automatic Voice Network was completed earlier this year with the last five of seventeen overseas electronic switching centers becoming operational. AFCS operates ten of the overseas centers and also the tri-service training switch at Sheppard AFB, Tex. The network provides the De-



A1C John F. Major, seated, and SSgt. Kenneth Meehan, of McClellan AFB, Calif., MARS station, complete a phone patch for a US serviceman making a morale call home.

partment of Defense with a worldwide system for handling both voice and graphic communications on an automatically switched basis. The continental US portion of this system is a leased-service operation. In total, AUTOVON links more than a million telephones, teletypewriters, and high-speed data sets at some 2,000 military bases throughout the world.

In the area of digital communications, the AFCS-operated system of Automatic Digital Network (AUTODIN) switching centers processed record amounts of traffic during 1969. AUTODIN provides a global capacity for handling more than 40,000,000 punched cards daily, or the equivalent of about 600,000,000 words a day. This high-speed, computer-controlled, common-user, secure data system was pioneered by AFCS and the Air Force. Twenty automatic switching centers make up the system, with AFCS operating the Air Force's ten centers.

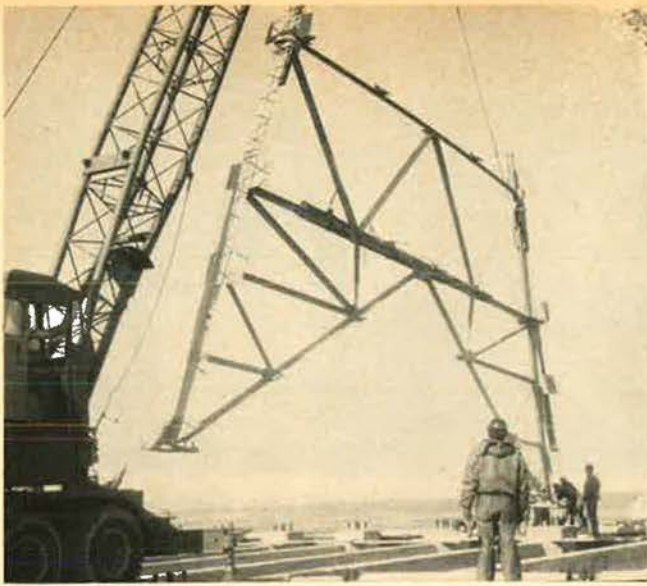
The first phase of a two-year modernization program to increase the speed, capability, and reliability of AUTODIN has been completed. When the final phase is completed in 1971, AUTODIN's transmission capacity will be doubled.

Not all of AFCS' communications and air traffic control operations involve fixed facilities. The command also has five strategically located mobile communications groups ready to respond to emergencies and contingencies anywhere in the world. These mobile communications activities were highlighted during the year with the presentation of the Presidential Unit Citation to AFCS' 1st Mobile Communications Group, Clark AB, Philippines. Presented for gallantry in action in Southeast Asia, it marked the first time in the history of AFCS that one of the command's units won the PUC in recognition solely of its own mission performance.

There were significant support projects, large and small, conducted during the year by mobile elements. Personnel and equipment from the 3d (Tinker AFB, Okla.), 4th (Altus AFB, Okla.), and 5th (Robins AFB, Ga.) Mobile Communications Groups assisted the 2052d Communications Squadron at Keesler AFB, (Continued on following page)



One of AFCS' many assignments is handling Notices to Airmen (NOTAMs), which provide useful and up-to-date information about the condition of airfields worldwide.

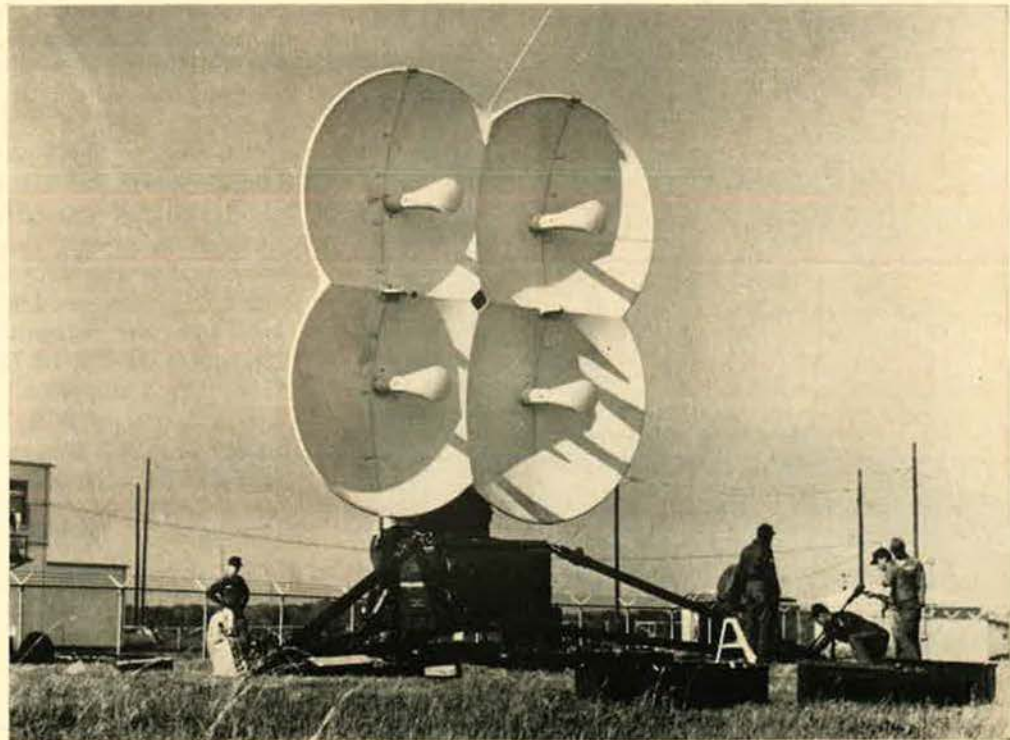


Men of the 2879th Squadron, Athenai Airport, Greece, constructing a billboard antenna in Karatas, Turkey. The project is part of a new communications net being built.

Miss., in recuperating from the devastating effects of Hurricane Camille. AFCS mobile and fixed elements around the world supported the Apollo space shots, including a tactical satellite communications test facility operated by AFCS near its Scott AFB headquarters. At the other end of the spectrum, but equally important, was the small cadre of 3d Mobile Communications Group personnel who deployed to Ketchikan, Alaska, with three mobile power generators. Working around the clock, they helped "turn on the juice" for the southeastern Alaskan community, which had lost a major power plant because of a landslide.

For the second consecutive year, AFCS last year

**This four-leaf-clover antenna of a mobile satellite communications terminal is capable of transmitting messages as far as 8,000 miles. The system utilizes comsats orbiting 18,000 miles above the earth. AFCS mobile and fixed communications groups—as part of their more dramatic enterprises—provide worldwide support for the Apollo space missions, in which communications are a vital element.**



won one of the Air Force's top management awards for support of the DoD Cost Reduction Program. AFCS almost quadrupled its validated savings goal of \$6.7 million in FY 1969 to earn the award. Nearly \$25.7 million in savings resulted from an intensified management effort and command-wide support of the program.

During the year, Air Force undertook a critical assessment of the specialty codes related to the communications-electronics career ladder. Many AFCS personnel have been assigned to the study, along with communicators from other Air Force agencies, to formulate the new career fields and assist in developing education and training requirements. The new codes and training will be specifically tailored with an eye toward the system of the future.

AFCS has instituted a project that works hand-in-glove with the restructuring of the C-E officer-career structure and training area. Called "Scope Creek," the project is designed to identify deficiencies through detailed technical analysis to bring the command's worldwide wide-band systems up to more acceptable standards. In effect, the "Scope Creek" philosophy supports the restructuring of the C-E training program: To place the emphasis on systems management and assessment, swinging the concept away from "restoration" and "alternate routing" as the prime job of maintenance. The communicator must now think "quality control" maintenance.

The marriage of the "Can Do" engineering and installation professionals of GEEIA with the "Will Do" operations and maintenance technicians of AFCS is easily translated into a "Can and Will Do" organization. And from its new home, AFCS confidently expects to achieve monumental new heights of effectiveness in its support of the overall Air Force mission. —END



## SDC introduces SPL

### Space Programming Language

Our nation's space program needed an advanced common-denominator computer language for navigation *and* guidance *and* control. One that would simplify programming significantly. Cut lead time considerably. And improve communications demonstrably.

That's why SDC—the spaceborne software leader—developed the first Space Programming Language for the Air Force. SPL will enable the men who program satellites to manage more data with fewer instructions.

Too rigid? Likely to thwart the innovator? Never. SPL will grab hold of any new idea the man on the ground comes up with. And will make it a lot easier for a computer specialist to execute that idea, or discuss it with another innovator.

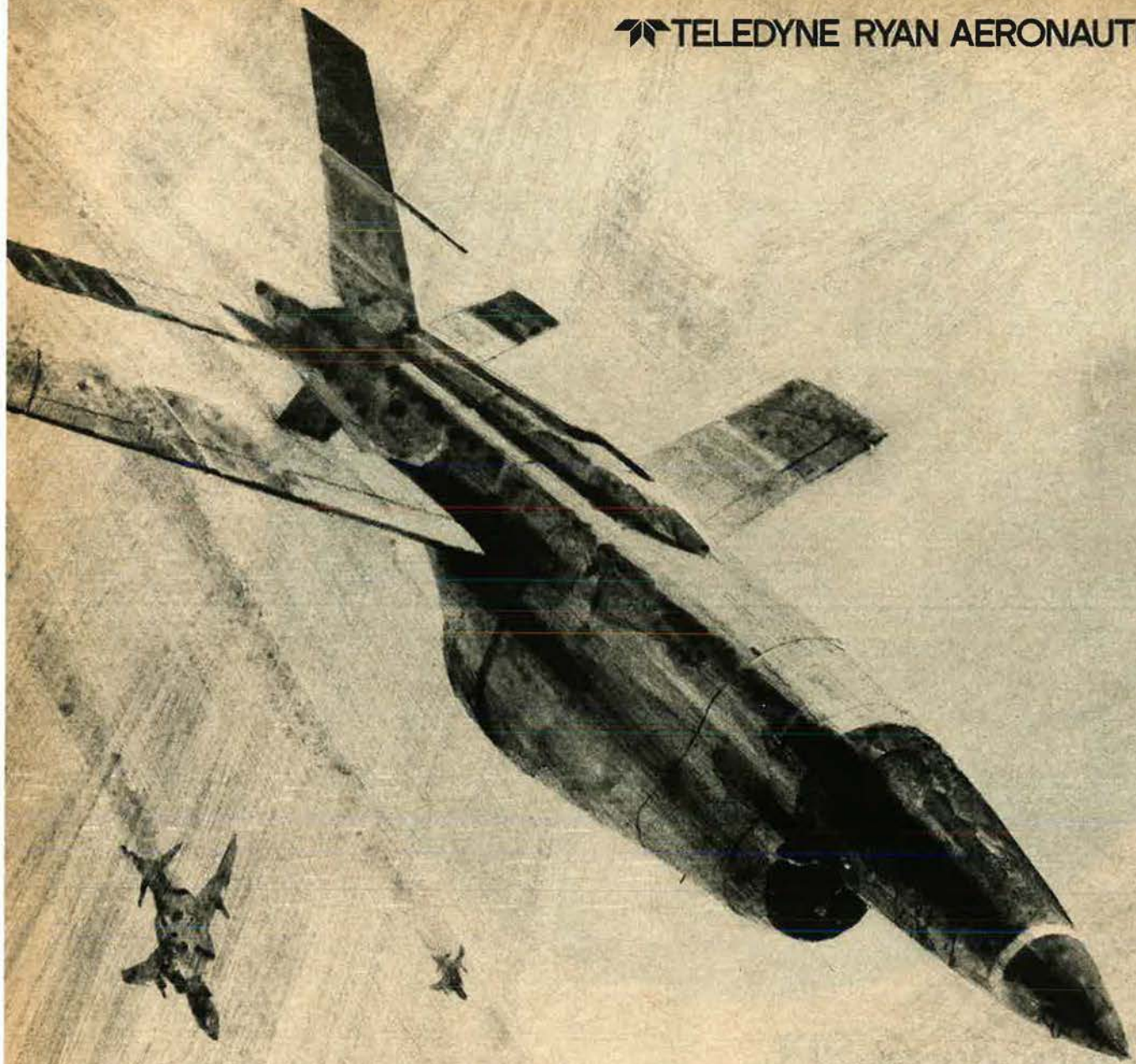
And SPL is fully compatible

with JOVIAL, the standard Air Force command and control language—another SDC contribution.

SPL compilers are available now. For more information, write or call: George Clement, Vice-President, Space and Range Division, (213) 393-9411.

SYSTEM DEVELOPMENT CORPORATION  
2500 Colorado Avenue  
Santa Monica, California 90406





# Ryan's reach



is pilot oriented, from jet fighter pilots to astronauts. Fighter pilots know that closing an enemy in combat — at supersonic speeds — is no time for on-the-job training. That's why Teledyne Ryan Aeronautical Firebees are flying today at 16 locations throughout the world as the "enemy" in combat training exercises. More than 4400 Firebees have been produced, more than 15,000 flights logged. For anti-submarine warfare aircraft and helicopter pilots, Ryan's Reach means 15 years of Doppler radar experience, leading to the advanced, solid state Doppler for the new Lockheed Navy S-3A. America's astronauts also know Teledyne Ryan landing radars make their moon landings successful. First, five unmanned Surveyors, now Apollo. Teledyne Ryan Aeronautical, 2701 Harbor Drive, San Diego, California 92112.



*A Major Air Command . . .*



## USAF Security Service

**T**HE "Decade of Challenges" is what the 1970s will pose for members of the USAF Security Service (USAFSS), whose worldwide headquarters are located at Kelly AFB, Tex.

Tighter budgeting, manpower cuts, and a reduction in the number of overseas military forces are but a few of the many challenges the command will have to overcome in this decade as it continues performing its role of denying—or minimizing—the amount of Air Force intelligence available to the enemy through interception and exploitation of Air Force electrical communications.

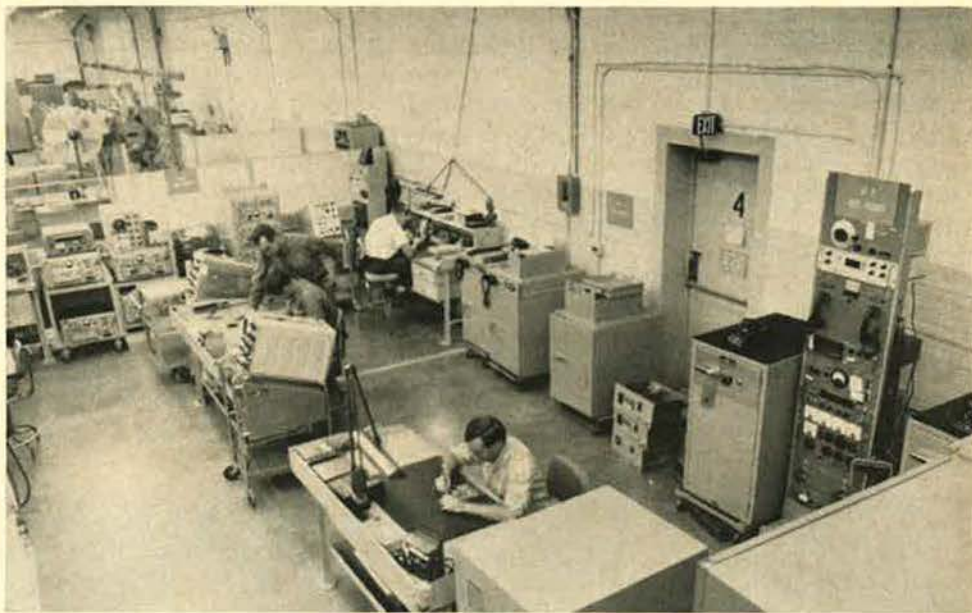
Maj. Gen. Carl W. Stapleton is commander of the

Air Force Security Service. His vice commander is Brig. Gen. Ernest F. John.

The Southeast Asian conflict has dictated many of the missions performed by this globally dispersed command during recent years, for denial of intelligence to any enemy under combat conditions often means the difference between the success or failure of a combat operation.

To accomplish this mission successfully, USAFSS employs the principles of communications security (COMSEC)—an extensive, Air Force-wide effort of applying special equipments, techniques, and procedures.  
*(Continued on following page)*

Technicians perform maintenance on ciphony equipment of the USAF Security Service at the Depot laboratory, Kelly AFB, Tex. Security Service personnel work with the major commands to minimize security weaknesses in the Air Force's worldwide electrical communications network.

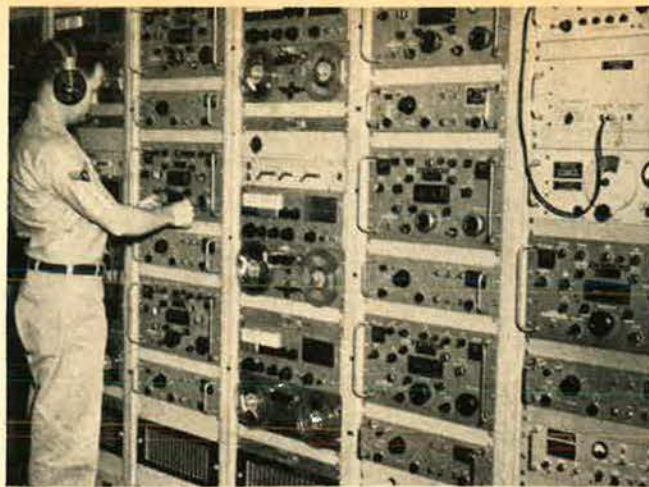


*Maj. Gen. Carl W. Stapleton assumed command of the USAF Security Service in July 1969; he had been Vice Commander of the Service since June 1966. After a hitch in the Cavalry at Fort Bliss, Tex., General Stapleton entered the US Military Academy, graduating in 1942. He received advanced pilot training at Roswell Air Field, N.M., and won his wings in November 1942. During the war he flew 113 fighter missions over Europe. In the postwar years, General Stapleton's USAF career was diversified, ranging from Commander of Tac-*

*tical Air Command's 108th Fighter-Bomber Wing, Godman AFB, Ky., to Air Attaché, Bangkok, Thailand. From March 1955 to March 1959, he served at Headquarters USAF, as Chief, Air Attaché Branch, Directorate of Collection and Dissemination, ACS/Intelligence. In July 1961, following a tour on Taiwan, General Stapleton took his first USAF Security Service assignment and in August 1964 was named Commander of the Service's Pacific Security Region. A command pilot, his decorations include the Legion of Merit, DFC, and Air Medal.*



Monitor operators record signals picked up from communications security recorder positions. The information is typed on roll paper for later study by Service experts.



A technician adjusts the frequency on a recording receiver at a COMSEC site. The tapes are then turned over to monitor operators who transcribe the acquired signals.

dures to electrical communications to deny any enemy the intelligence he seeks from them.

The Security Service also provides other Air Force organizations with cryptographic equipments and procedures, codes and authentication systems, along with the technical guidance concerning their operations, through its subordinate Air Force Cryptologic Depot. USAFSS also develops Air Force COMSEC doctrine and procedures and advises major air commands in their application.

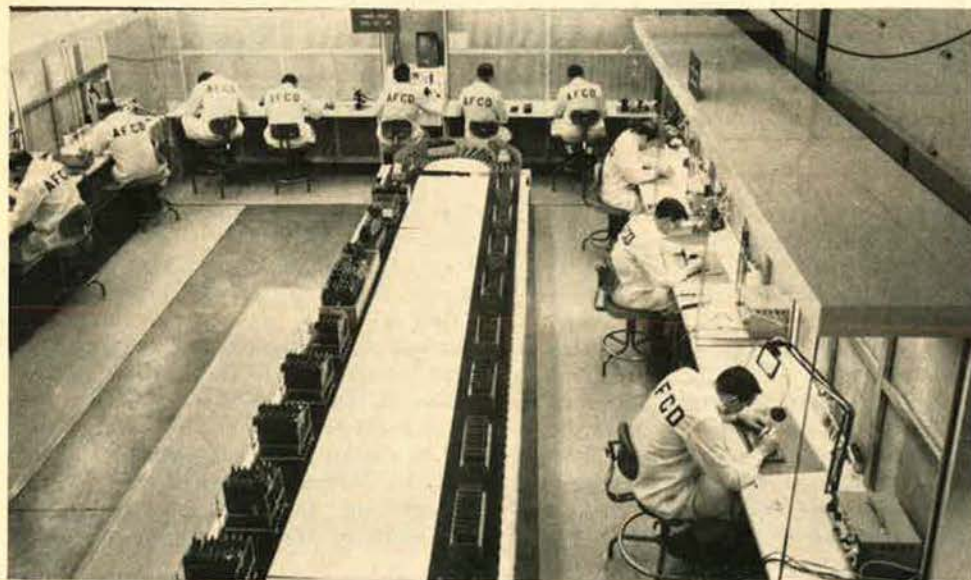
In a continuing effort to determine the effectiveness of Air Force COMSEC measures, the command also conducts a communications-surveillance program. Often the USAFSS teams who monitor Air Force communications detect security weaknesses that could provide an enemy with an opportunity to exploit these communications for intelligence content. Whenever this occurs, Security Service officials work with the major command involved to develop and implement COMSEC measures to plug or minimize the intelligence "leak."

Another field to which the Security Service will direct its attention in the '70s is in the area of communications-security education. Emphasis will continue to be placed on implementation of the USAF communications-security education program of transmission security.

This program, designed to reach every officer, airman, and civilian in the Air Force, applies only to unsecured electrical voice communications. The program is directed principally at the Air Force's largest communications system—the telephone.

The USAFSS communications security efforts during the 1970s will be dedicated to the task of maintaining maximum currency in rapidly changing intelligence-collection techniques and secure countermeasures in the field of electrical communications.

Regardless of myriad changes, innovations, and breakthroughs in 1970 technology, the USAF Security Service goal will remain steadfast: denying the enemy access to information of intelligence value in Air Force electrical communications.—END



Cryptologic Depot maintenance technicians work on a production assembly line. Equipment is produced, checked, and tested, and then stored until needed. USAFSS's efforts during the 1970s will be dedicated to the task of developing the latest in intelligence-collection techniques and secure countermeasures in electrical communications.

*A Separate Operating Agency . . .*



# US Air Force Academy

**T**HE mission of the US Air Force Academy (USAFA) is to prepare career officers for tomorrow's Air Force. According to Lt. Gen. Thomas S. Moorman, the Academy's Superintendent, this is accomplished through a broad "whole man" spectrum of studies in academics, military training, and physical education.

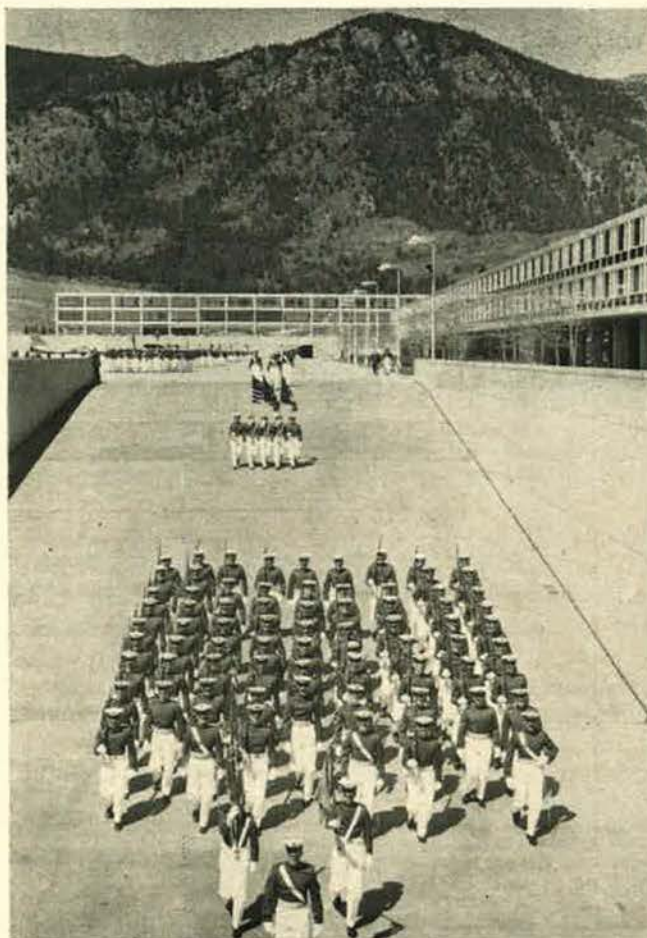
The basic mission elements are augmented by cadet experience in religious responsibilities, the social graces, and extracurricular activities.

The present strength of the Cadet Wing is 3,500-plus. An anticipated 1,400 "doolies," or freshmen, will enter the Academy in June. The enrollment is growing steadily toward a maximum of 4,417, the goal set for June 1972.

When June Week festivities draw to a climax on June 3 of this year, about 740 cadets in the Class of 1970 will receive their bachelor of science degrees and commissions as second lieutenants in the regular Air Force. This will be the twelfth class to be graduated from the Academy, a total of approximately 5,500 graduates.

During the past year, a facilities-expansion program was completed at a cost of under \$38 million. This was a noteworthy management achievement in that savings of more than \$2 million were realized on the original estimate. The four-year construction project includes a magnificent field house; extensions on the academic building and the dining facility; a new dormitory; an addition to the physical education building; expanded recreational facilities in Arnold Hall; and accompanying increases in utility services and parking space. Additional athletic fields provide more area for intramural sports.

*(Continued on following page)*



Air Force Academy's Cadet Wing parades with the Colorado Rampart Range as a backdrop. The Academy student body is formed into forty squadrons, totaling 3,500-plus cadets. By June, some 5,500 men will have graduated.



*Lt. Gen. Thomas S. Moorman, Jr., has been Superintendent of the Air Force Academy since July 1965. Formerly, he was Vice Commander in Chief and Chief of Staff, PACAF. General Moorman graduated from West Point in 1933 and entered pilot training at Randolph Field, Tex., earning his wings in October 1934. In 1937 he entered the field of meteorology, obtaining an M.S. from California Institute of Technology. General Moorman studied the subject further at MIT, and during the war served as a weather expert in several posts, Ninth Air*

*Force in Europe among them. Following the war, General Moorman performed duties in a number of assignments related to his special field of interest. He was appointed Air Weather Service Commander in April 1954, to provide environmental support to the Army and Air Force through the world net of weather forecasting. In 1958, General Moorman assumed command of the Thirteenth Air Force, in the Philippines, and in July 1961 began his assignments at PACAF. General Moorman wears the DSM, Legion of Merit, the Bronze Star, and the Air Medal.*



A cadet conducts an experiment in one of the many electrical-engineering labs at the Academy. Currently, twenty-eight majors are listed in the Air Academy's curriculum.

The four-year college-level curriculum is under the direction of Brig. Gen. William T. Woodyard, Dean of the Faculty. Cadets must earn a bachelor of science degree in one of twenty-eight major fields of study. To graduate, cadets need 187 semester hours, a stiff requirement in any university. The core curriculum, which ensures the cadet will be broadly educated, includes prescribed courses in all four of the divisions: social sciences, the humanities, basic sciences, and engineering sciences. Through forty-six hours of elective courses, the cadet gains a measure of depth in his chosen major field.

Each of the 500-plus, all-military faculty holds a master's degree, and twenty-five percent of the faculty have earned doctorates. In addition to academic instruction, faculty members motivate cadets—through personal example and professionalism—toward full careers in the Air Force.

The cadets are encouraged to progress academically as far and as quickly as they can. Through a cooperative master's program, selected cadets complete some graduate work while still at the Academy, and then earn a master's degree within nine months following graduation.

Brig. Gen. Robin Olds, as Commandant of Cadets, is responsible for the leadership and military training of the Cadet Wing. As the Vietnam War has emphasized the need for increased field training, experience in survival, air base defense, patrolling, and weapons training have been adapted to meet the requirement.

Last summer, under "Operation Third Lieutenant," 896 second classmen became involved in various types of Air Force operations through visits to US bases and

installations in Southeast Asia. The cadets flew in trainers and in first-line aircraft, and studied the environment and pressures of working in a war zone. Other cadets learned weaponry care and use at Army bases; more than 300 voluntarily attended the parajump school at Ft. Benning, Ga., and earned paratrooper wings.

Last year, 1,503 cadets participated in major airmanship programs, activities that have a definite bearing on morale and career decisions. The T-41 pilot indoctrination program, initiated in January 1968, permits cadets to complete Phase I of the UPT program. By earning an FAA private pilot's license before graduation, cadets are motivated toward a flying career.

Advanced military parachute training challenges cadets to qualify for jumpmaster and instructor ratings. Cadets learn delayed-drop and spot-landing procedures and help train fellow cadets. The best jumpers become members of the cadet intercollegiate parachute team. The Falcon parachute team has won the national intercollegiate jump title two years in a row, a modern college record.

Through the soaring program, cadets can qualify for advanced glider pilot and instructor ratings. Cadet members of the soaring team compete in intercollegiate sailplane meets.

Added emphasis on the Academy's physical-fitness program has come from the war in Southeast Asia. Conducted in three parts—physical education, intramurals, and intercollegiate sports—the training has met with considerable success from the cadet experience viewpoint.

Leadership training in its purest form is in intramural competition, the "laboratory" application of physical education. Cadets run the entire schedule, and act as coaches, officials, and players in fifteen competitive sports. A total of 450 teams took the field this year to compete for intramural supremacy.

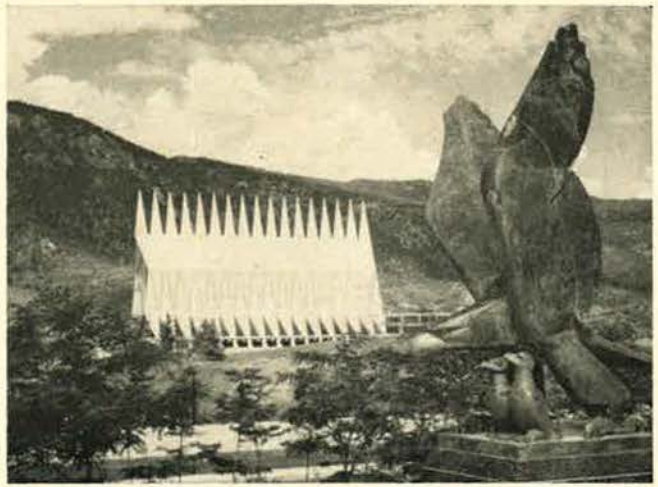
The Academy currently fields varsity teams in eighteen intercollegiate sports. Schedules are built around schools with comparable academic and athletic standards, particularly the other service academies. All



The falcon was adopted as the Air Academy's official mascot by the first class of cadets in 1954. Falcons trained by cadets perform at football games and other events.



The Cessna T-41 is used by senior-year cadets to earn an FAA private pilot license. After graduation, three out of every four Academy cadets go on to AF flight training.



The Eagle Statue, presented to the Cadet Wing by USAF's Air Training Command, symbolizes the Academy mission—to give cadets skills to fit them for service careers.

cadets participate in varsity athletics or intramural sports in season during their four undergraduate years.

Physical-education instruction covers a four-year program of aquatics, personal defense, physical development, and carry-over sports. Seventeen different physical-education activities are taught at the Academy.

The highly publicized unrest among American youth has not as yet had an impact on the number or quality of young men attending the Academy. Recruiting continues to receive high priority through the efforts of more than 1,000 Air Force Reservists who work through Candidate Advisory Service under the Registrar. These officers act as counselors and advisers to young men interested in seeking nominations.

Recruiting efforts received significant impetus with the passage of Public Law 90-374, which raised from six to ten the number of nominations per congressman for each vacancy. As a result, the candidate pool for the Class of 1974 has been substantially increased.

During the past eleven years, approximately seventy-eight percent of the graduates have gone directly to jet pilot training. An additional fifteen percent obtained their master's degrees first, then entered aircrew training. Scholastically, 198 graduates have received national scholarship or fellowship awards, including thirteen Rhodes Scholars and one White House Fellow.

The performance of Academy graduates throughout the Air Force has been impressive. More than half of all graduates have seen duty in Southeast Asia. Three graduates, members of the Class of 1959, have been promoted to lieutenant colonel "below the zone" for outstanding performance, and 101 graduates have been promoted to major ahead of their contemporaries.

The excellence of their preparation for careers as Air Force officers may be judged from the decorations graduates have won: five Air Force Crosses; 110 Silver Stars (with ten men having won two Silver Stars and two men having won three each); two Legion of Merits; some 600 Distinguished Flying Crosses; and more than 6,000 Air Medals. In addition, Academy graduates have brought down a total of fourteen MIG aircraft during the Vietnam War.—END



"Doolies," or new cadets, start their 7½ weeks of basic cadet training in June, including three weeks in nearby Jacks Valley where the fun includes this combat course.

A Separate Operating Agency . . .



## Hq. Air Force Reserve

**T**HE WINDS of Hurricane Camille had barely subsided along the Gulf Coast last August when volunteer crews of the Air Force Reserve (AFRES) began airlifting emergency supplies to the stricken area. Within hours of the disaster, items ranging from baby food to bulldozers were on their way aboard Air Force Reserve as well as Air National Guard and regular Air Force transport aircraft.

Coordination of all Air Force assistance in domestic and civil-defense emergencies is one of the responsibilities of the nationwide Air Force Reserve command, which has the primary mission of administering the citizen-airmen of the Air Force Reserve.



Utility trucks are loaded aboard Air Force Reserve C-119.

Aid to Hurricane Camille victims was only one of the significant events last year, which also included a command-wide accident-free flying-safety record, the addition of new missions and aircraft, and a streamlining of the AFRES regions.

Maj. Gen. Rollin B. Moore, Jr., is the commander of AFRES, which has headquarters at Robins AFB, Ga. Operating under the USAF Chief of Staff, AFRES receives policy guidance from the Office of Air Force Reserve (AFTOR), headed by Maj. Gen. Tom E. Marchbanks, Jr., in the Pentagon. Both men are Air Force Reservists who previously commanded Reserve flying wings.

AFRES was established as one of USAF's separate operating agencies on August 1, 1968. It succeeded the Continental Air Command (CAC), which was deactivated on that date.

On January 1, 1970, the five-region AFRES structure was realigned into three regions and renamed as follows: the Eastern Air Force Reserve Region, with headquarters at Dobbins AFB, Ga.; the Central AFRES Region, Ellington AFB, Tex.; and the Western AFRES Region, Hamilton AFB, Calif. Subordinate units were reassigned accordingly.

Flying units of the Air Force Reserve constitute a substantial portion of the Air Force's airlift and rescue capability. They represent a significant backup for USAF's continuing requirements as well as during periods of international tension or actual hostilities.

• Military airlift units include seven wings and sixteen groups equipped with C-124 Globemaster transports. These units flew 4,077 missions and airlifted 20,627 tons of cargo in calendar year 1969. Included in these totals were missions to Southeast Asia and



*Maj. Gen. Rollin B. Moore, Jr., has commanded the Air Force Reserve since August 1968. Previously, he commanded the 349th Military Airlift Wing, Hamilton AFB, Calif., a Reserve unit called to active duty in 1968. General Moore attended the University of California and entered aviation cadet training in December 1939. He graduated in 1940 and became one of a cadre that was to train large numbers of pilots in the US throughout the war. Released from active duty in March 1946, General Moore continued to serve in the Reserve, joining the*

*California Air National Guard in June 1948. In 1950 he was named Executive Officer of the 61st Fighter Wing and two years later became Wing Commander. In 1955, the unit was redesignated the 144th Fighter Wing (later 144th Air Defense Wing). In January 1959 he transferred to the Air Reserve and assumed command of the 349th Troop Carrier Wing, a post he held when the unit was called to active duty. In 1960, General Moore was picked to command all AF airlift forces in the largest joint Army-USAF exercise of that time.*



Lightplanes of the AFRES fleet. Air Reserve also has some 200 nonflying units for tasks such as maintenance and support.

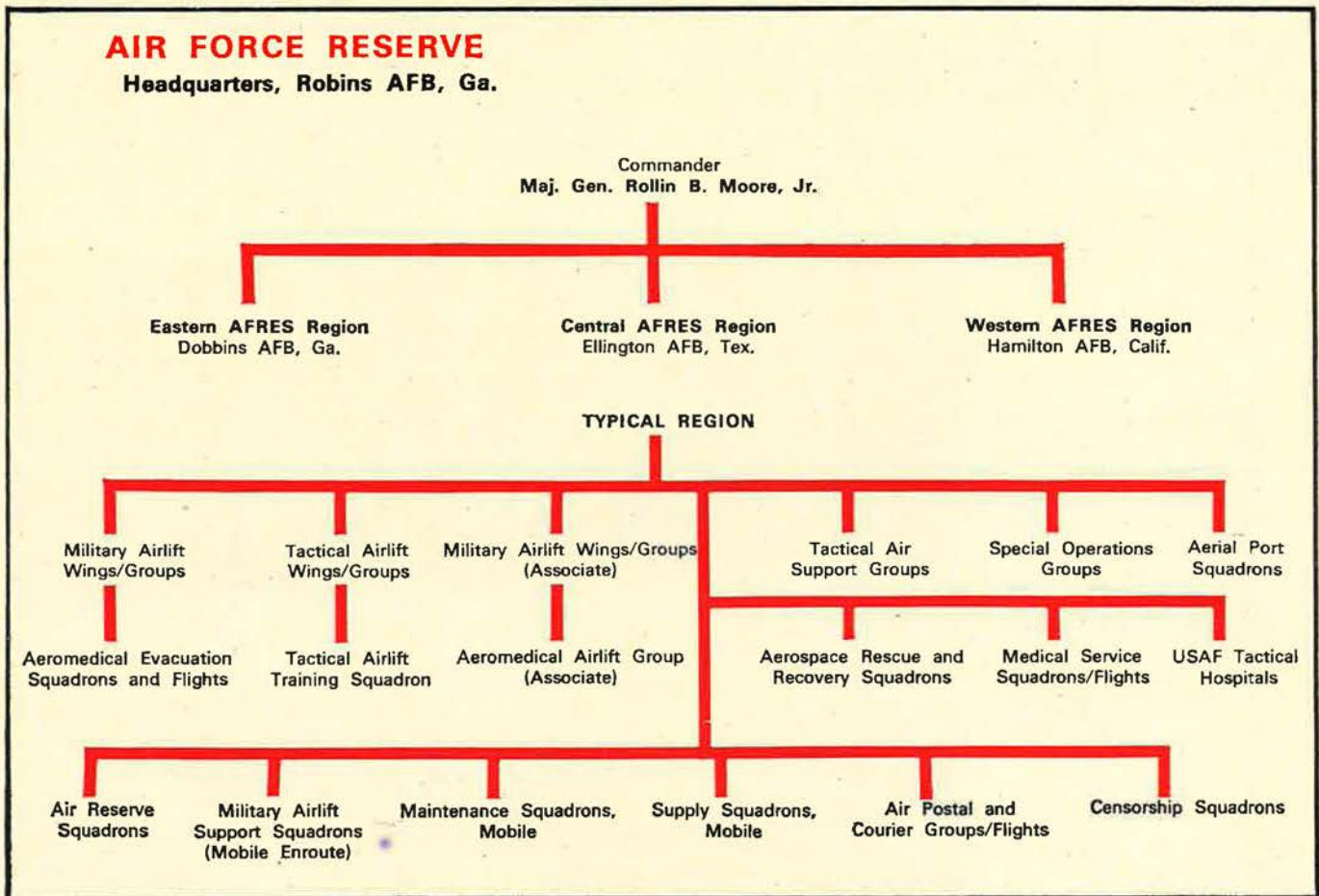
other global bases in support of the Military Airlift Command (MAC), the gaining command in the event of mobilization.

- Military airlift (associate) units include two wings and seven groups in which Reservists train with active-duty MAC wings, providing the Air Force with maximum utilization of C-141 StarLifter transports and C-9 Nightingale aeromedical-evacuation aircraft. Reservists in associate units have the capability to form all-Reserve

aircrews or to integrate with active-duty MAC crews. In addition, the program provides maintenance and aerial port augmentation to MAC wings.

- Tactical airlift units include three wings and nine groups. Last calendar year these units flew 7,065 missions, airlifting 2,710 tons. A significant part of the Army's airborne school training was provided by AFRES tactical airlift units, which air-dropped more

*(Continued on following page)*





Pararescuemen in a training session with an AFRES HU-16.

than 111,000 troops. In addition to the familiar C-119 Flying Boxcar flown by tactical units, the AFRES lineup now includes the C-130 Hercules transport. Two groups have been converted from C-119s in the past year, with more C-130 units planned. Also new are two Tactical Aeromedical Evacuation Squadrons (TAMES). These units are designed to provide aeromedical evacuation and support under any conditions in forward areas, using available outgoing tactical aircraft. In addition, C-119 and C-130 training for Air National Guard, Air Force Reserve, and regular Air Force aircrews is accomplished by AFRES at its tactical airlift training squadrons at Ellington AFB, Tex., and Clinton County AFB, Ohio.

- Tactical air support groups, of which there are

four, are using U-3 and O-2A aircraft, the U-3 being an interim aircraft for the O-2A. The O-2As already on hand represent the first "brand-new" aircraft to be delivered to AFRES.

- Two special operations groups have responsibility for training for the powerful new AC-119 Shadow gunships. These groups will be gained by Tactical Air Command in the event of mobilization.

- Five aerospace rescue and recovery squadrons, two equipped with HC-97 and three with HU-16 aircraft, provide global rescue and recovery capability for MAC's Aerospace Rescue and Recovery Service. In calendar year 1969, these units flew more than 354 missions, totaling some 1,720 hours.

Productive missions by AFRES aircraft in calendar year 1969 totaled 11,797. Airlift figures included 46,739 passengers and 23,445 tons of cargo. Along with these varied missions and accomplishments, AFRES was able to achieve an accident-free year while flying 145,282 hours.

Air Force Reserve also has more than 200 nonflying units that include squadrons and flights with the following missions: aerial port, military airlift support (mobile en route), mobile maintenance and supply, medical service, air postal and courier, and censorship.

Other Air Force Reservists serve as mobilization augmentees to active-duty Air Force units and commands, providing individual skills that are needed to augment key positions during a national emergency.

More than 7,000 Reservists are enrolled in Reserve element training courses and in Reserve project training, supervised by AFRES. A substantial number of these Reservists perform a wide variety of services in support of the active-duty Air Force, without pay other than points toward Air Force Reserve retirement.

AFRES also supervises Air Force cooperation with the Boy Scouts of America, acts as liaison with the Selective Service System, and coordinates a number of other missions for the Air Force.—END

**AFRES is responsible for coordinating all Air Force assistance in domestic and civil-defense emergencies. The Air Reserve can transport thousands of tons of emergency supplies in aircraft such as the C-119 and C-124. Within hours of Hurricane Camille last year, Air Reserve airlift was bringing relief to the stricken areas.**







## The Air National Guard

**A**LTHOUGH manned by citizen-airmen from the grassroots of America, the Air National Guard continues to make significant contributions to the nation's aerospace power by performing vital missions at home and abroad on a day-to-day basis. At the same time, the Air Guard is preparing, by reorganizations and retraining, to meet new challenges imposed by the ever-changing global military situation.

Even after the last of the Air National Guard units called to duty in the *Pueblo* crisis was demobilized, Air Guard pilots continued to fly F-100 fighters on combat missions in Southeast Asia. They were volunteers from Missouri's 131st Tactical Fighter Group, who served on tours lasting up to 139 days.

Meanwhile, other Air National Guard flyers manned active Air Force cockpit positions with F-102 outfits in Germany and the Philippines, again on a temporary-duty, short-tour basis. In all, 100 Air National Guard pilots volunteered for this duty.

In Operation Creek Party, a continual rotation of Air National Guard tankers to USAFE, the Air National Guard last year flew 400 sorties, off-loading nearly 15,000,000 pounds of fuel during 4,000 hook-ups with Europe-based fighters of the active Air Force.

At home, C-97 and C-124 aircraft of the Air National Guard's Military Airlift Command units flew 108 missions in emergency relief operations after Hurricane Camille devastated the Gulf Coast of Louisiana and Mississippi last August.

Among other examples of the Air National Guard's varied global operations:

- Air National Guard F-84 fighter groups from Indiana, Massachusetts, Ohio, and Virginia flew nearly 400

Dart tow sorties for active Air Force air-to-air gunnery training.

- Special operations groups from California, Maryland, Rhode Island, and West Virginia provided training support for US Army and Army National Guard Special Forces units. West Virginia's 130th Special Operations Group was awarded the Spaatz Trophy by the National Guard Association of the United States as the outstanding Air National Guard flying unit during Fiscal Year 1969.

- Sixteen active Air Force B-57 pilots and navigators received training from the 190th Tactical Reconnaissance Group, Kansas Air National Guard.

- Although it was reduced by thirty-two C-97 aircraft after July 1, the Air National Guard's military airlift units set an impressive record in 1969, flying 25,600 tons of cargo, 91,365 passengers, and 2,760 patients on missions overseas and within the United States. Flying hours totaled 25,693. The major portion of the airlift support for Project Bomex, a huge meteorological and oceanographic study in the Caribbean, was provided by Air National Guard military airlift groups from fourteen states. The units flew 736,250 ton-miles and 254,600 passenger-miles for the project.

- As they have since 1967, Air Guardsmen in nineteen Ground Electronics Engineering Installations Agency (GEEIA) squadrons continued to back up active Air Force counterparts overseas. Some 170 Air Guardsmen have volunteered for short tours in Turkey, where workloads at bases exceeded the capability of the active force during a February-to-June time frame.

By way of reorganization and retraining to meet new demands, three units—in Illinois, Pennsylvania, and  
*(Continued on following page)*



*Maj. Gen. Winston P. Wilson directed the Air National Guard for ten years before being appointed Chief of the National Guard Bureau in 1963, the first Air National Guardsman to hold that post. With a history in Guard affairs that dates back to 1929, he is the senior major general in the Air Force. A command pilot, he has about 4,000 military flying hours.*

*Brig. Gen. I. G. Brown, who succeeded General Wilson as Assistant Chief, National Guard Bureau for Air, now is Director of the Air National Guard, a two-star slot. A transport pilot during the war, he was Air Guard liaison officer at ADC and Executive Secretary, Air Reserve Forces Policy Committee, before his assignment to the National Guard Bureau in August 1962.*



New York—converted to tactical air support missions, trading in cargo aircraft and fighters for O-2A forward air control aircraft. In Maryland and New York, A-37B fighters are beginning to replace F-86Hs. Units in New York and Missouri converted from Military Airlift Command missions to Tactical Air Command air-refueling missions. Outfits in Texas and Iowa traded in F-102 aircraft and Aerospace Defense Command missions for F-84s and Tactical Air Command roles. The South Dakota Air National Guard is converting from F-102s to F-100s, and a group in southern California is picking up C-130s and a tactical airlift mission.

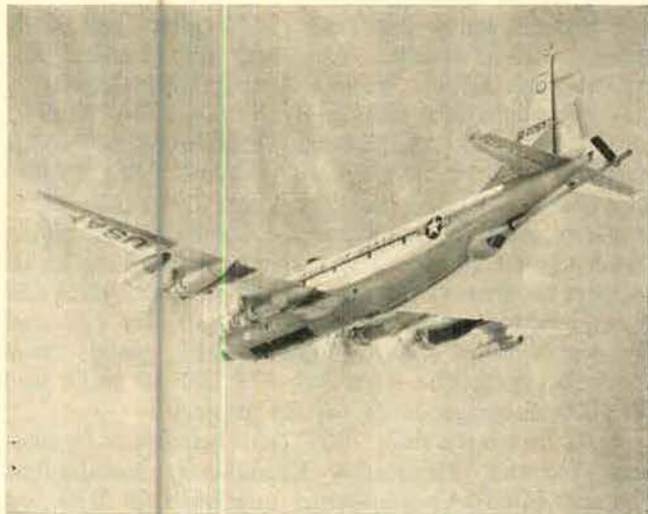
There was some reorganization at the top of the Air National Guard structure, too. At the National Guard Bureau, the directorate staff concept was authorized by the Air Force. Brig. Gen. I. G. Brown switched titles from Assistant Chief, National Guard Bureau for Air, to Director of the Air National Guard, a two-star slot. A brigadier general will serve as deputy director. This puts the top management of the Air National Guard into line with Pentagon staffing policies.

Faced with potentially heavy personnel losses, the

Air National Guard has reinstated "Try One," a recruiting program designed to attract airmen coming off active duty and to retain Air Guardsmen whose military obligations are about to expire.

The program, which proved such a success in rebuilding Air National Guard units in 1963 after the Berlin Crisis mobilization, provides for one-year enlistments instead of the normal three- or six-year hitches. It is hoped, however, that once airmen are exposed to the benefits, opportunities, and adventure of the Air National Guard service, they will stay on for longer periods. The Air Guard is also beginning to recruit women, other than nurses, into units with WAF-compatible occupation specialties.

With Try One, the Air Guard expects to reach and maintain a manning level of 86,624 officers and airmen, the minimum strength recommended by Congress. The experience, training, and leadership of experienced airmen who are enlisted or retained under the Try One program will contribute significantly to keeping the combat readiness of the Air National Guard at the highest possible level.—END



A KC-97L tanker of the Illinois Air National Guard during a training flight. KC-97Ls are used to refuel aircraft of the active USAF as well as those of Air Guard units.



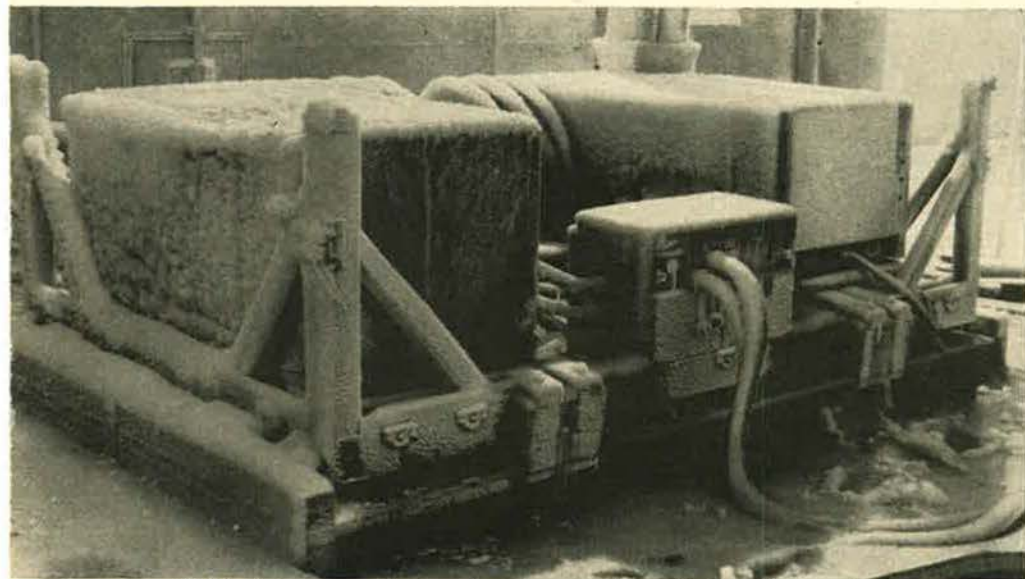
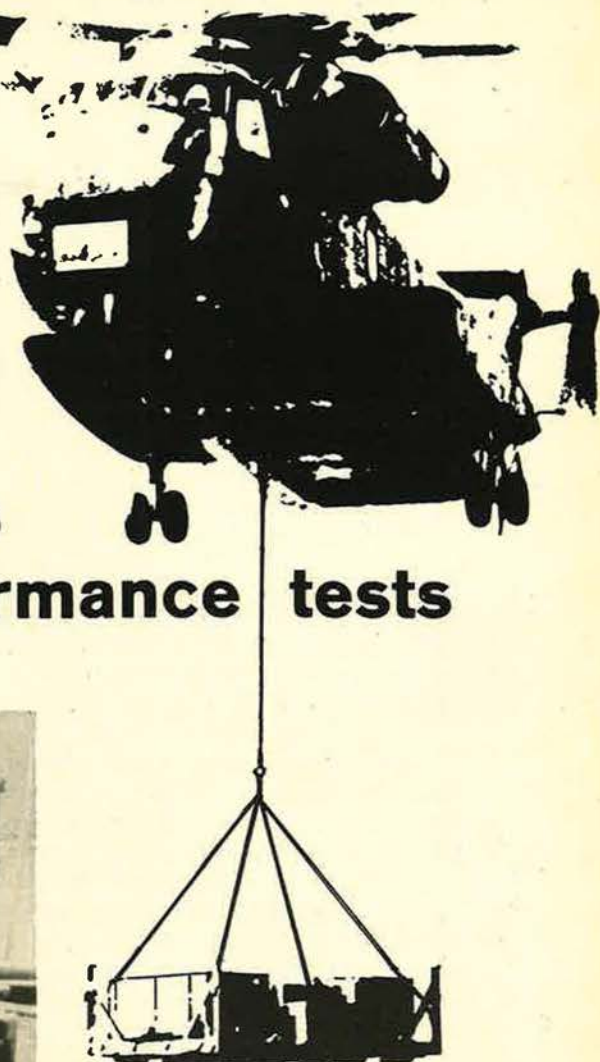
A victim of Hurricane Camille is prepared for air evac via an Air National Guard aircraft. The Air Guard assists AFRES in relief efforts in the wake of natural disasters.



Four RF-84F aircraft of the 117th Tactical Reconnaissance Group fly formation while on a training mission. The 117th is Alabama-based. With many active USAF units in combat in Vietnam, the Air Guard is a vital part of backup strength in the continental US.

Now in production

## New Solar 30/60 KW generator sets pass brutal military performance tests



60-kilowatt powerplant undergoing grueling wind-and-ice testing.

One of the most rigid series of tests ever required of a military ground power system has been completed successfully by Solar's new 30/60 kw generator sets designed for the Air Force.

Two of the gas turbine sets are combined in a power plant to provide up to 120 kw for such military programs as the Air Force's 407L, Bare Base and others.

These are *truly mobile* 30-kw and 60-kw gas turbine generator sets that supply *precise* power for communications, computer, radar, aircraft and ordnance ground support systems at forward bases.

Under severe testing conditions, the Solar sets logged over 2,000 hours of test time. They withstood a jarring 2,000 miles of torturous road tests, sustained jolting railroad humping and drop tests, and came through extreme tempera-

ture and environmental tests in good condition. The hump test subjected the sets to as much as 50 g's of force. And the units demonstrated their capability of starting at any temperature down to  $-65^{\circ}$  F and accepting full load within 60 seconds after cranking.

At the 60/120 kw rating, the power plant (two generator sets on lightweight aluminum pallet, cable reels, 400 feet of cable, distribution panel and line-drop correction regulator) weighs only 3640 lbs — in contrast with the over 12,000 lbs that reciprocating engine equipment would weigh.

The sets can be operated singly or in parallel. In operation, each unit acts as a standby for the other and will start and assume load automatically. The enclosure, solid-state controls, and all components (except alternator, gears

and turbine nozzle) are *identical* for both sets. Thus the 60-kw set can be converted easily to an economical 30-kw rating to cut down fuel consumption if full power is not required.

Both of these highly mobile generator sets use the battle-proven Solar *Titan*<sup>®</sup> gas turbine, over 4,000 of which are now in service on every U.S. military cargo helicopter program. And the sets operate on combat or aviation gasolines, JP-4, kerosene, CITE or diesel fuels.

For more information, write: Solar, Dept. S-474, San Diego, California 92112.

**H. SOLAR**  
DIVISION OF INTERNATIONAL HARVESTER COMPANY



# Office of Aerospace Research

**T**O THE layman, modern research is often mysterious, misunderstood, or perhaps even invisible. It has a language of its own, a language that is neither spoken nor understood by the uninitiated. To the scientist and engineer, research results are generally visible only in such media as technical publications, in scientific seminars, conferences, and through personal contacts.

Research is primarily a search for knowledge and understanding—not merely how something behaves, but why it behaves in a certain way. Research has been described as man's attempt to gain some understanding of the physical world while technology is man's attempt to get some measure of control over the physical processes of today's world.

Within the Air Force, the Office of Aerospace Research (OAR) is responsible for all basic research and a portion of exploratory development. As one of USAF's separate operating agencies, OAR has the procedural functions and responsibilities of a major Air Force command.

A small organization compared to other Air Force commands, OAR has slightly over 2,000 personnel assigned to its headquarters and the five scientific organizations and two scientific support units. These include:

- The Air Force Cambridge Research Laboratories (AFCRL), located at L. G. Hanscom Field, Bedford, Mass., which is the focal point for all environmental

research in the Air Force and a portion of the engineering sciences.

- The Aerospace Research Laboratories (ARL), Wright-Patterson AFB, Ohio, which conducts research in the physical and engineering sciences.

- The Air Force Office of Scientific Research (AFOSR), which is collocated with the OAR Headquarters in Arlington, Va. OSR contracts (or provides grants) primarily with educational institutions in all areas of research interests.

- The Frank J. Seiler Research Laboratory at the Air Force Academy, providing interface with the Academy and concentrating in mechanics, mathematics, and chemistry research.

- The Office of Research Analysis (ORA), Holloman AFB, N.M., which is an in-house analysis facility.

- The European Office of Aerospace Research (EOAR), Brussels, Belgium, which monitors the foreign research of OAR and DoD. EOAR will move to London on July 1.

- The Los Angeles Office of Aerospace Research (LOOAR), which is a small detachment located in Los Angeles to provide liaison with the Air Force Systems Command's Space and Missiles Systems Organization (SAMSO) and with industry in support of the OAR scientific satellite program.

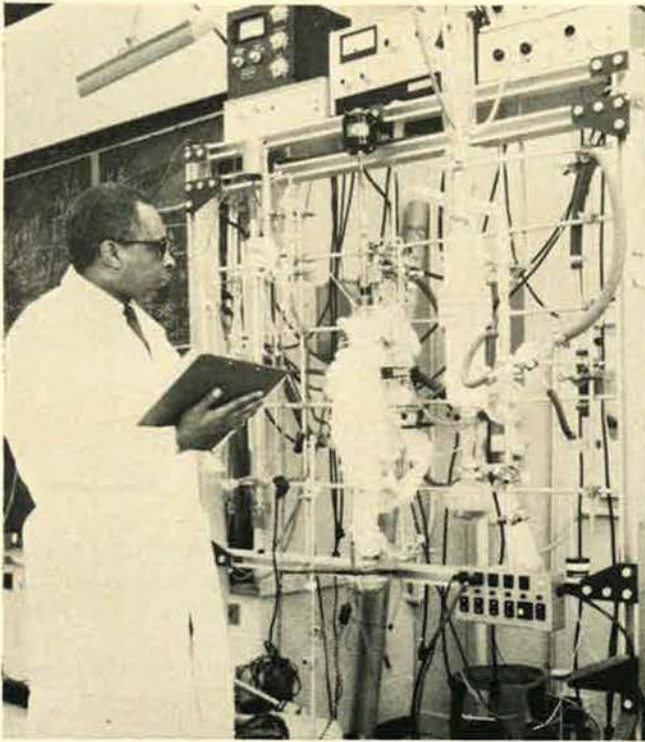
Some of the highlights of OAR's scientific research during the past year include:

A radically new concept in electronic gunsights for



*Brig. Gen. Harvey W. Eddy took command of the Office of Aerospace Research in August 1969. Previously he had been Deputy Director of Development, Deputy Chief of Staff for Research and Development, Headquarters USAF. General Eddy graduated from Worcester Polytechnic Institute in 1941 and entered the Engineering Cadet Training Program, receiving his commission in January 1942. Later he served as engineering officer, 47th Bombardment Squadron and 41st Bombardment Group, Seventh Air Force, in the Pacific. Mustered out*

*after the war, General Eddy later rejoined the USAF where he continued his military career, involved in a series of research and development projects. From January 1956 to September 1962, he was assigned to the Air Force Ballistic Missile Division. From September 1962 to September 1966, he served as Technical Advisor to the Commander, Headquarters Electronics Systems Division. This was followed by two tours at Headquarters USAF, before he undertook his current assignment. Among his decorations, he has the Legion of Merit.*



Modern chemistry laboratories are more than rooms filled with test tubes and Bunsen burners. Charles W. Harris, a research chemist at Aerospace Research Laboratories, uses this atomic absorption unit to study inorganic compounds.

fixed-gun fire control, developed by scientists at the USAF Academy and OAR's Frank J. Seiler Research Laboratory, was adopted by Aerospace Defense Command for use in fixed-gun air defense fighter aircraft.

AFCRL conducted an extensive research program at Ft. Churchill, Canada, to learn more about polar cap absorption (PCA). PCA results when high-energy protons are emitted from a solar flare and disrupt communications. More than forty AFCRL scientists participated in the program, which included the launch of twenty rockets, the use of a sizable array of ground instrumentation, and a KC-135 instrumented flying laboratory.

The solar eclipse of March 7 was observed by some fifty AFCRL scientists from ten different observation posts. Two instrumented KC-135 aircraft were used, ten rockets were launched from Eglin AFB, Fla., and Wallops Island, Va., and a number of ground observing stations, extending from Mexico to Cape Cod, contributed. Almost all AFCRL observations were concerned with atmospheric changes induced by the eclipse.

Extreme accuracy in measuring distances between widely separated points on earth was announced by Stanford University radio-astronomers with support from OAR's Air Force Office of Scientific Research. Their techniques include separate observations of radio stars from observatories in Australia, Sweden, and the US, and timing their signals with atomic clocks. Positions can be mapped to within 150 feet with this new method.

AFCRL's lunar laser facility near Tucson, Ariz., received the first reflections from the retroreflector array placed on the moon by Apollo-11 astronauts in



USAF Capt. Ashley S. Hilton and Dr. Robert E. Sievers, head of ARL's lunar analysis team, discuss a packet of lunar samples to be used in measuring mineral traces.



Members of AF Cambridge Research Laboratories Det. 1 at Holloman AFB, N.M., inflate a plastic balloon system similar to the largest ever built, which was launched on November 6, 1969, supporting a NASA research experiment.

August 1969. At present, this is the only observatory in the country specifically devoted to making measurements of lunar distances using retroreflectors.

AFCRL's backfire antenna, a high-gain antenna that gives the same performance as a Yagi antenna but without the multiple dipole elements of a Yagi, was adopted by the Air Force Systems Command as the primary ground antenna for the TACSATCOM system.

AFCRL's powerful new solar-vacuum tower telescope became operational on October 15. This telescope is the finest solar-observing instrument in the world and will give astronomers unequaled solar-image stability.

In March it was announced that the Office of Aerospace Research will be merged with the Air Force Systems Command on July 1, 1970.—END

*A Separate Operating Agency . . .*



## Air Force Accounting and Finance Center

**O**RVILLE Wright who, with his brother Wilbur built the first flying machine, lived until 1948 and so saw the "aeroplane" add a new dimension to the world in which man lives.

Also during his lifetime he saw his invention become so important a weapon of national defense that in 1947 a separate department of the uniformed services—the US Air Force—was organized to support it.

As technological advancements have surged ahead in the mechanics of Air Force flying machines since Orville's death, equally sweeping changes have taken place in the disciplines of Air Force financial management—especially on the pay and accounts side.

The reasons for these changes are many—new kinds of pay for a variety of conditions and services, the trend toward more paper rather than cash transactions, and increased budgets for more sophisticated weapon systems.

At the Air Force Accounting & Finance Center (AFAFC) in Denver and throughout the accounting and finance network, new concepts are constantly evolving. In 1968, authority for Air Force systems policy was transferred from the Pentagon to AFAFC, and Brig. Gen. Edwin S. Wittbrodt was designated the Assistant Comptroller of the Air Force for Accounting & Finance as well as Commander of AFAFC.

The Center's mission was expanded at that time to encompass four areas: Develop systems concepts, specifications, and technical background; furnish systems policy guidance and technical assistance to the Air Force-wide accounting and finance network; provide

meaningful information to USAF function and program managers and to other agencies of the federal government; and execute a variety of DoD and Air Force centralized accounting and pay programs.

More specifically, the Center pays all allotments deducted from a member's pay for dependents, insurance premiums, deposits to bank accounts, and other purposes. It issues all US Savings Bonds purchased by Air Force members through the payroll-deduction plan. It pays all Reservists, Air National Guardsmen, retired personnel, and most active-duty members assigned in Europe. It manages the Uniformed Services Savings Deposit Program, the plan whereby personnel stationed overseas may invest a portion of their income in a federal savings plan paying ten percent interest. And its accounts keep track of the entire annual Air Force appropriation, as well as those appropriations for which Air Force is assigned executive agent responsibility.

Beginning in October 1969, the Center started to assume responsibility for pay-records maintenance for active-duty personnel being assigned to South Vietnam, and three months later, for those being assigned to Thailand. By the end of 1970, AFAFC expects to have the pay records of all Southeast Asia active-duty personnel—about 80,000.

To meet the requirements of a changing Air Force, the Center underwent a major reorganization effective the first of this year. Its purpose was to prepare for major changes in the pay system planned for the 1970s, improve the Center's span of control, and pinpoint responsibility for systems requirements.



*Brig. Gen. Edwin S. Wittbrodt assumed the post of Commander, Air Force Accounting and Finance Center, and Assistant Comptroller of the Air Force for Accounting and Finance in August 1968. On active duty since March 1941, General Wittbrodt was commissioned at Fort Warren, Wyo., in 1942 and served with the US Army in Europe during World War II. Transferring to the Air Force in June 1949, he was assigned to the Directorate of the Budget, Headquarters USAF, where he served on two occasions—from 1949 to 1953 and*

*from 1956 to 1961. Between those tours he was Director of the Budget and Accounting for Northeast Air Command, St. Johns, Newfoundland; Comptroller, Space Systems Division, Los Angeles, Calif.; and Comptroller of AFSC's Aeronautical Systems Division, Wright-Patterson AFB, Ohio. He became Assistant Comptroller of the Air Force in 1966 and Director of Accounting and Finance in 1967. He is a graduate of the Industrial College of the Armed Forces. General Wittbrodt's decorations include the Legion of Merit and the Soldiers Medal.*

In carrying out these improvements, many existing organizational lines were erased and new ones drawn. For instance, the Center considered its most serious and complex problem to be that of designing new financial management systems. Therefore, it established a Directorate of Plans and Systems and made that office responsible for all systems policy. It is also responsible for completing development of all advanced systems such as the Joint Uniform Military Pay System (JUMPS), which is currently expected to be operational July 1, 1971.

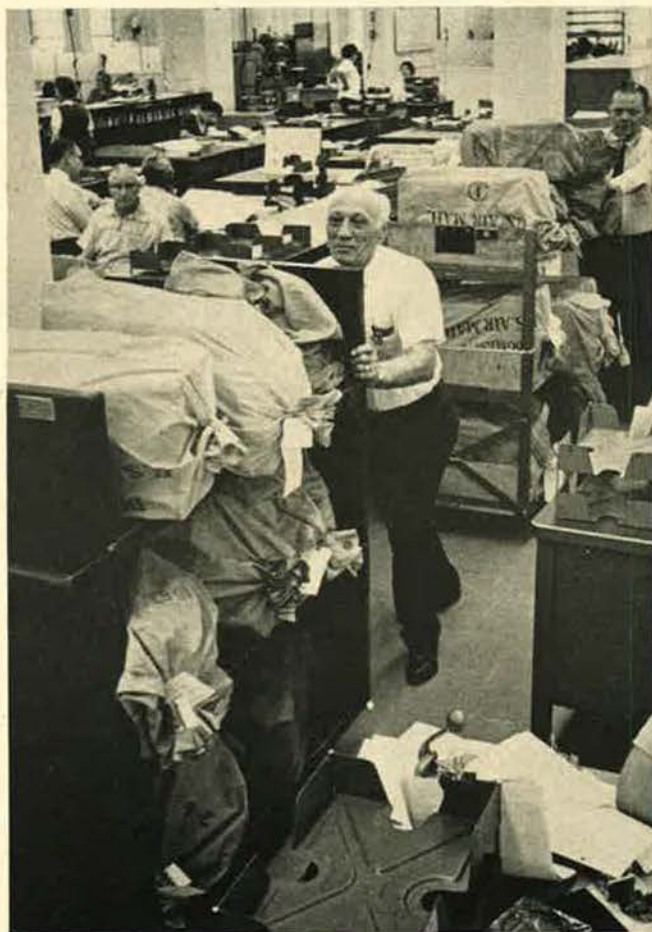
A Directorate of Military Pay Operations was organized to more efficiently operate the current Accrued Military Pay System (AMPS) as well as prepare for implementation of the JUMPS program. At present, the Directorate pays all allotments, maintains all pay accounts for personnel being assigned to Southeast Asia, and pays Air Force members in Europe.

The pay accounts of Reservists and retired personnel were grouped in a new Directorate of Reserve and Retired Pay. The Office of the Comptroller retained its traditional responsibilities for budget, accounting and finance, and management analysis, in addition to taking over direction of the Center's quality assurance program for all accounting and finance systems. The added responsibility for design and development of all Air Force accounting and finance systems was given

to the Directorate of Accounting, which was renamed Directorate of Accounting Operations. As in the past, it will continue to receive, accumulate, validate, and report accounting data in departmental-level reports. The remaining directorates and staff offices were left with their original responsibilities.

Looming large in the Center's planning is JUMPS, the system under which the pay records of all Air Force personnel will be centralized at AFAFC. As it will be necessary to have quick access to individual pay records, the Center acquired an IBM 360/65 computer last summer. With the 360, which utilizes disc-paks for data storage, it is possible to locate and receive a printout of a member's pay record in a matter of seconds.

AFAFC is already utilizing the 360/65 to prepare Air Force accounting reports, and has transferred to its memory banks the pay records of all Reservists and Air National Guardsmen. Records pertaining to the Uniformed Services Savings Deposit Program and Foreign Military Sales have also been moved to the new computer. The transfer from hard-copy active-duty pay records currently being maintained by AFAFC to the 360/65 will be completed by July. Allotment accounts, which will be transferred in the fall, will be integrated into JUMPS when that system is put into effect.—END



Paychecks for personnel assigned to US Air Forces in Europe are sacked and carted at the Finance Center facility and await shipment to their consignees abroad. The Center pays about 80,000 persons in the European area.



At the Finance Center an operator reads a computer report on the status of current programs. As in many other large-scale and complex operations in USAF, the Center relies more and more on automation to conduct its activities.



## Air Reserve Personnel Center

**N**EVER before in its history has the Air Reserve Personnel Center (ARPC) in Denver, Colo., occupied such an active role in the Air Force Reserve program as it will assume this year. On July 1, in addition to its present personnel management and mobilization roles, ARPC will become responsible for the training of individual reservists.

The new responsibilities will involve training and use of selected special reservists—chaplains, lawyers, Air Force Academy liaison officers, and Civil Air Patrol liaison officers—as well as monitoring the training of individual mobilization augmentees assigned to major commands. The Center's Office of Information will also assume responsibility for training the nation's scattered Air Force Reserve information flights.

For an organization that has steadily been assuming new responsibilities since it opened its doors for business sixteen years ago, the new workload should pose no great problems. The Center already handles personnel administration for the half-million members of the Air Reserve Forces not on active duty—about half the active-duty strength of the Air Force—and implements mobilization of the reserves in time of national crisis.

In fact, growing workloads have become a way of life for ARPC. Before the Center was activated in late 1953, personnel management for 250,000 Air Force Reserves was handled in eight locations throughout the country and required 2,500 people to do the job. Since that time, the number of Air Force Reservists has gradually increased to more than 480,000, plus another 85,000 Air National Guardsmen, while the number of employees at ARPC has decreased to about 900.

With these skilled technicians, aided by a computer



A pin-studded map of the US confirms the widespread responsibilities of ARPC's unit Personnel Records Office. Each pin represents a reserve unit serviced by the office.

system and automated methods, the Air Reserve Personnel Center serves as the only personnel action agency for the majority of the members of the Air Reserve Forces. Only Air National Guardsmen, members of organized Air Force Reserve units, and augmentees assigned to major commands receive any other personnel support. For all others, ARPC is a military personnel center dealing in policy, actions, personnel procedures, and personnel records, and also a Consolidated Base Personnel Office dealing with the individual and his status, his capability, and his availability.

In fulfilling its mission, and ensuring available man-



*Col. Benjamin S. Catlin assumed command of the Air Reserve Personnel Center on February 1, 1970. Previously, he was Executive to the Chief of the Air Force Reserve, Headquarters USAF. Enlisting in the Air Corps in 1942 to become a flying cadet, Colonel Catlin earned his wings in June 1944. Later, he flew B-29s from Okinawa with the 22d Bomb Group, acting as wing adjutant. Serving with the Military Air Transport Service following the war, he became Chief of the North Atlantic Control Center in England in 1954. During the*

*Cuban missile crisis, Colonel Catlin was Deputy Commander, 7th Tactical Airlift Wing. Graduating as an outstanding student from the Air War College in 1965, he was assigned as Deputy Chief of Operations and Training Division, Headquarters Tactical Air Command. From TAC, Colonel Catlin went to Vietnam, where he flew 169 combat hours. On his return from Southeast Asia, he was assigned to the Programs Directorate, Hq. USAF. Colonel Catlin's decorations include the Legion of Merit, the DFC, Bronze Star, and the Air Medal.*



power for mobilization, ARPC performs all types of personnel actions—assignment and reassignment, promotion, classification, discharge, or retirement. Many of these same services are also performed for members of the Air National Guard.

No mobilizations were effected last year. Instead, reserve strength grew as recalled units were released from active duty and returned to the reserve ranks. Conversion from military service numbers to Social Security account numbers was completed, and work continued on developing a more sophisticated system for computer input of personnel data. The Air Force Reserve Personnel Information System (REPIS-70) data-automation proposal is being finalized and will be submitted to the Air Staff for approval, after which ARPC will proceed with design and development of systems, then identification and application of third-generation hardware. REPIS-70 is scheduled to go into full operation in January 1973.

The new system, when completed, will allow ARPC to continue its prime objective of being compatible with active-duty personnel information systems and will increase the timeliness and responsiveness with which ARPC can furnish Air Force Reserve and Air National Guard managers with information and statistics.

It will also extend use of automated techniques to additional ARPC functions, now using time-consuming manual methods. Even more important, it will enable ARPC to respond in an even more up-to-date manner to a reserve program likely to be expanded and given increased emphasis.

Transfer of the individual training responsibility to ARPC is the result of a study that explored ways for management of the Air Force Reserve individual manpower resources to "incorporate better forecasting and adjust to the predictable range of Air Force needs." To develop a more aggressive individual augmentee system, a "mission-oriented" management structure was established. Management of flying units and Air Reserve squadrons will continue to be a responsibility assigned to Hq. Air Force Reserve (AFRES), while ARPC has responsibility for management of the individual training program, bringing both into closer contact with reserve personnel.



The Consolidated Reserve Personnel Office at ARPC takes care of unit-level personnel actions for units that do not have the service of a Consolidated Base Personnel Office.

Besides monitoring training of individual mobilization augmentees assigned to major commands, ARPC will place increased emphasis on assisting the commands in recruiting qualified personnel to meet their mobilization requirements. Current lists of reserve personnel with the necessary skills will be provided. Among members of the Obligated Reserve Section, ARPC will serve as a point of contact to motivate voluntary participation in a higher program element, such as organized units or the individual mobilization augmentee program.

Approximately 7,800 Air Reservists are now participating in the mobilization augmentee program. Another 500 are active in the Legal, Chaplain, and Information programs. After the July 1 implementation date, ARPC will play an increasing role in the training and use of these manpower resources.

Remaining unchanged will be the primary ARPC mission—personnel management for the half-million members of the Air Reserve Forces in peacetime and the ability to mobilize those forces when they are needed.—END



Utilizing computers and other automated equipment, ARPC administers to Air Reserve Forces numbering a half million men. By constantly updating its records it is able to keep on hand information concerning reserve personnel that is both accurate and complete. It hopes to extend automation in the near future to functions that are now performed manually.

*A Separate Operating Agency . . .*



# Air Force Data Systems Design Center

**I**N NOVEMBER of last year the Headquarters for the Air Force Data Systems Design Center (AFDSDC) was relocated from the Suitland Hall complex in Suitland, Md., to the new, modern Forrestal Building located in downtown Washington, D.C. This move has helped bridge the distance gap that previously existed between the Center and the Air Staff and helped facilitate dialogue between the planners, managers, and systems designers.

Remaining at Suitland and Bolling AFB are elements of AFDSDC's Directorate of Systems Control, which have a role of significance to the Center and Air Force installations involved with implementation of the prescribed systems. Although rigorous quality-control standards are applied by the functional areas through all stages of the systems design and program development, the Directorate of Systems Control performs the final quality check to assure the correctness of the system documentation, program logic, programs, and instructions prepared for release to the field. This Directorate also operates the Center computers (B263/B3500/UNIVAC 1050-II) just like a base or a major command data-processing installation, testing systems to ensure that they function as designed and programmed.

One of the principal objectives in USAF computer systems design is to establish master data bases that can be responsive to multiple users. That is, where a transaction or event originating in one area updates data elements associated with that activity, it also should trigger subsequent actions to update data elements re-

sponsive to other functional users. Exploitation of this concept eliminates much duplication of data elements among the various systems and subsystems and assures more effective use of computers, faster through-put of data, and dollar savings to the users.

Responsibility for general planning and identification of systems parameters using the integrated concept is lodged in the Center Directorate of Systems Integration. However, the final Center plan evolves from the joint effort of the Directorate of Systems Integration and the other Directorates representing the various functional activities of the Air Force, such as the Directorate of Logistics Systems, Directorate of Comptroller Systems, and Directorate of Medical Systems.

A recent example of an integrated system for the Phase II (B3500) computer application is a system designed for the Office of the Air Force Surgeon General—the Air Force Medical Materiel Management System. The initial system application provides for the establishment and use of a common data base to serve the Medical Materiel and the Accounting and Finance functional activities. The design, however, allows for expandability of this data base on a building-block method to add another functional activity—Base Procurement.

With the backdrop of previous Air Force experience and research performed by a staff of Center ADP and software specialists, rapid progress is being made in the art of developing and applying refined simulation techniques. By the conduct of simulation exercises at specified intervals (key milestones) of systems development AFDSDC will be able to determine the feasibility



*Col. Jack M. MacGregor moved from Vice Commander to Commander of the Air Force Data Systems Design Center in August 1969. Previously, he had been Deputy Chief of Staff, Comptroller, USAF Academy. His studies at Ohio State University interrupted by the war, Colonel MacGregor entered the service and received his wings in 1943. With the Eighth Air Force in Europe, he flew thirty combat missions in B-17s. Following World War II, Colonel MacGregor resumed his education, earning both a B.S. and M.S. from the University of*

*Alabama. In his Air Force career he held a series of posts in planning activities. He served in Europe from 1951 to 1954, and in key planning posts at Headquarters USAF, from 1957 to 1961. Colonel MacGregor was assigned to the Pacific Air Forces, Hawaii, from 1962 to 1966, where he was Director of Management Analysis. His tour as Comptroller, USAF Academy, ran from July 1966 to June 1969. Rated a command pilot, Colonel MacGregor holds among his military decorations the Legion of Merit, the DFC, and the Air Medal.*

and economy of the system being proposed. This will permit the introduction of systems modifications and improvements, and will assure software and hardware support capability early in the development cycle.

The Air Force-owned simulation system, COMET (Computer Operated Machine Evaluation Technique), was used in support of the Air Force Base Level Data Automation Standardization Program, now being implemented throughout the Air Force on the Burroughs B3500 computer. Also, it has been used to evaluate requests for additional hardware; for optimization of a series of programs in a large operational logistics system; and in determining the compatibility of proposed systems with related hardware. Identifiable payoff has been the halting of unnecessary equipment orders, reduction in computer running time, and systems optimization without the necessity of extensive field tests.

Currently, COMET is being used to evaluate the feasibility of assigning to a parent base the responsibility for providing computer service (B3500) to satellite locations—installations that cannot justify a separate computer based on their current and projected workloads. Also, AFSDC is simulating a new, sophisticated logistics system scheduled for test operation on the B3500 to determine the equipment augmentation required to support the test.

With full-scale implementation of the simulation program, the Center can be confident that the Air Staff functional managers and Air Force users will be provided cost-effective computer systems to serve their management needs.

The potential benefits to management of modern computer systems applications are illustrated in the following projects now under development or planned for development at the Center.

- **Maintenance.** Maintenance is one of the largest and most critical functions in the Air Force. About 285,000 people are assigned to this function. Currently, the operation and management of this function places heavy reliance on batch-processed, punch-card-oriented systems. The Center is engaged in developing a new system for application on the B3500. Anticipated benefits are: improved efficiency in the Maintenance function; improved readiness and utilization of the system support inventories; improved accuracy and reliability of the logistics data; and reduction in personnel and dollar costs of operating the Maintenance function.

- **Transportation.** The Air Force Transportation function requires about 56,000 people. Approximately 24,000 of these are assigned to operational activities that will be automated on the B3500—that is, at Aerial Ports of Embarkation, Surface Terminal Operations, and Traffic Management Offices. The new computer system should significantly reduce the paperwork processes and associated workload for these activities and should provide other improvements with associated personnel and dollar savings.

- **Civilian Personnel.** The Air Force has more than 300,000 civilian employees served by 168 Civilian Personnel Offices throughout the world. Approximately 4,300 people are directly engaged in the administration and management of the civilian work force. Implementation of the new CPMIS (Civilian Personnel Management Information System) on the B3500 should accelerate and improve the capability to respond to

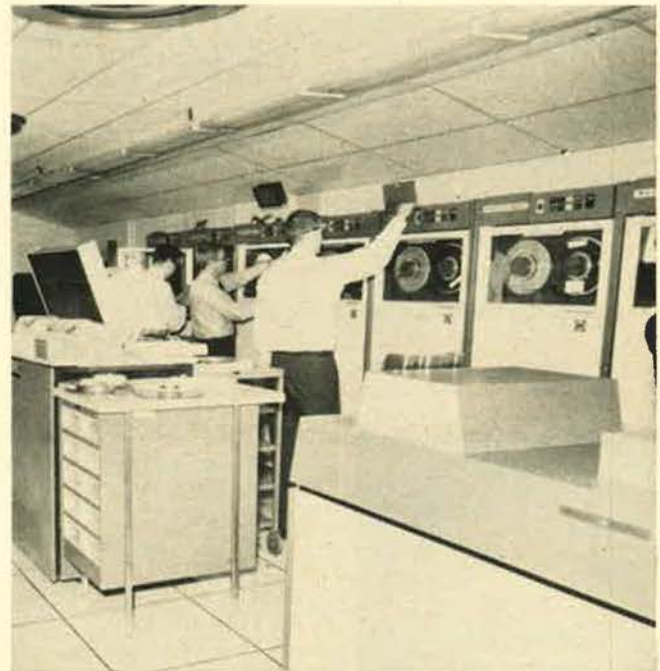
management's need for data and produce personnel and dollar savings.

- **Civil Engineer.** The Air Force Director of Civil Engineering manages an Air Force facility inventory in excess of \$16.5 billion. The new Base Level Civil Engineering Management System being designed for B3500 application should produce substantial returns in increased operating efficiency, work force utilization, and improved forecasts of maintenance requirements and costs.

The systems workload of the Center falls basically into three broad categories, namely: (1) Systems Maintenance—the work of keeping an operational system “on the air,” generally involving minor changes in operating and processing instructions and changes in computer programs; (2) Systems Modification/Optimization—including major changes in procedures, products, processes, or programs to achieve better throughput; to simplify system operation; or to produce different results or products; and (3) New System Development—designing a system as a new computer application.

The Center has a systems staff of approximately 600 engaged in the varied and complex tasks of designing and maintaining systems, solving field problems, and assisting with implementation and conversion of systems at bases around the world. The systems “inventory” now stands at 109 operational computer systems, large and small, and approximately 3,000 computer programs.

Additionally, many new system development projects have been earmarked for future assignment by the Air Staff. These assignments will be made under a system of rigidly controlled priorities, thereby assuring the Center's capability to accomplish the projects systematically in the time frame for their intended use.—END



One principal aim of the Air Force's computer design program is to create master data bases that can be responsive to multiple users, updating data in various areas of activity as changes occur in a related data element. This would help eliminate much duplication among systems.

A Separate Operating Agency . . .



# USAF Aeronautical Chart & Information Center

**A**ERONAUTICAL charts are standard cockpit items for any pilot or navigator and are oft-times taken for granted; yet much scientific knowledge and research and many professional man-hours are devoted to the production of each cartographic item used by the Air Force. The great array of talent necessary for the production of these vital products is assembled at the US Air Force Aeronautical Chart and Information Center (ACIC), St. Louis, Mo.

The organization provides all USAF commands with aeronautical charts, air-target materials, flight-information publications, geodetic-missile data, astronomical and geophysical charts, and reference materials. Other military organizations in the Department of Defense, civil aviation, and space agencies also use these Air Force cartographic products.

Some 4,000 military and civilian personnel are needed to supply the worldwide demand for the thousands of cartographic items ACIC publishes and distributes each year.

ACIC publications are developed side by side with the hardware stage of weapon systems or a support system.

So diversified and important are ACIC's products that each individual request from a user is considered of paramount importance.

Cartographic products of the Center not only aid the

forces in Southeast Asia, but are also used for manned aircraft preflight planning and in-flight operations throughout the world. Some charts are used for close air support and tactical air operations, for high-speed and strategic operations, and for very-long-range operations. Other charts are produced to various scales to support special missions and programs.

Flight Information Publications (FLIPs) are perhaps the most widely known and most widely used of the products produced by ACIC. These charts cover the entire free world with planning, departure, and en-route and terminal-phase information.

To produce the right product at the exact time needed, ACIC uses an array of sophisticated equipment in the printing, cartographic research, and production phases of the Center's operation.

ACIC is the warehousing point for maps, charts, and special products produced by the Center. Approximately 580,000 books, 8,000,000 sets and amendments of Flight Information Publications, and 64,000,000 charts are stored.

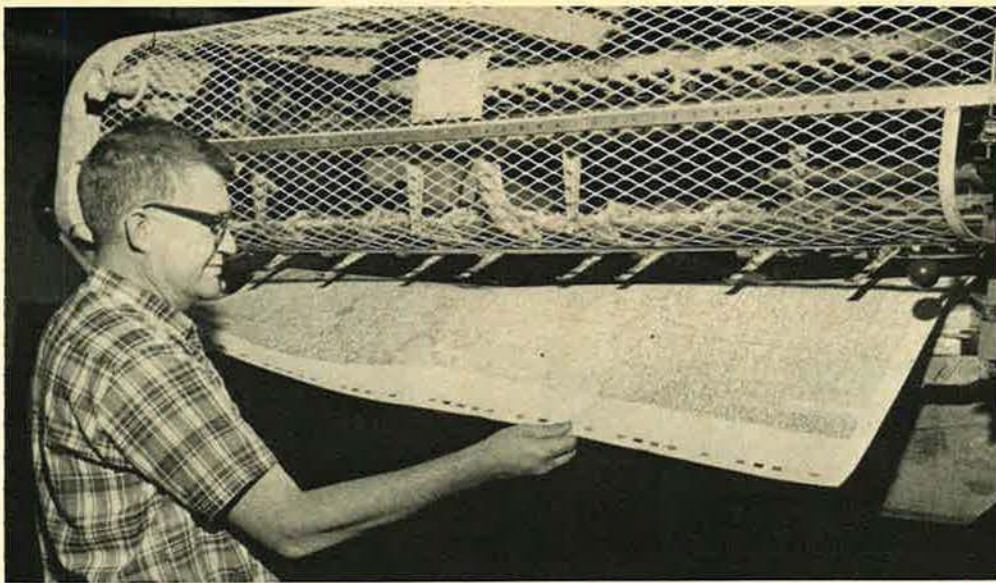
Housed at ACIC are the DoD Gravity Library and DoD Centralized Library of Aeronautical Charts.

The Gravity Library, established in 1964, is the official depository for all gravity information held by the Department of Defense. Services are provided to DoD and non-DoD agencies, as well as to the scientific community.



*Col. Edwin L. Sterling assumed command of the USAF Aeronautical Chart and Information Center in November 1968. Previously, he served as Deputy Director of Intelligence, at Headquarters of PACAF. A 1939 graduate of Pasadena Junior College, Colonel Sterling entered military service in 1941 as an aviation cadet and received his wings in 1942. He saw combat duty in both the European and Southwest Pacific theaters during the war. Since the end of World War II Colonel Sterling has held numerous staff and command positions in*

*intelligence and information-related areas, including tours at Headquarters USAF, and Director of Intelligence, Fifth Air Force. A graduate of the Air Command and Staff College, he has served in France and Germany, as well as Hawaii, where PACAF is headquartered. This is Colonel Sterling's second tour at the Center; he was assigned there as Director of Operations from 1962 to 1966. Rated a command pilot, Colonel Sterling has among his military decorations the Legion of Merit, Bronze Star, Air Medal, and Croix de Guerre.*



A lunar chart used in support of the Apollo space program rolls off one of the twelve presses at the USAF Aeronautical Chart and Information Center, St. Louis, Mo. Charts such as the one shown at left were used during the historical Apollo-11 mission, during which man first set foot on the lunar surface.

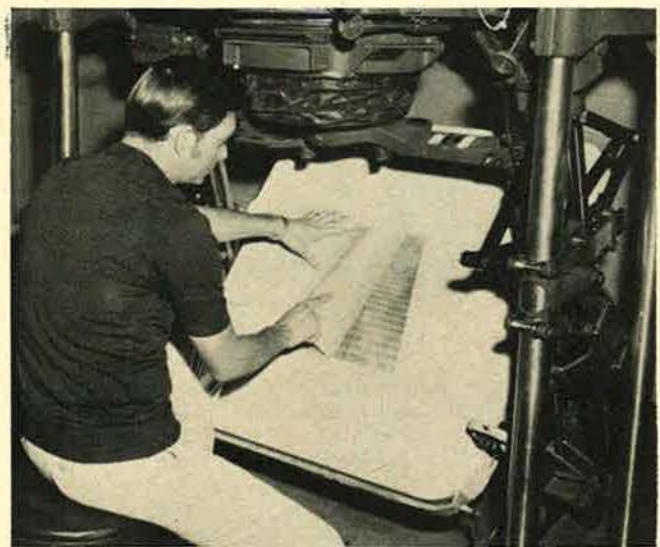
The Centralized Library of Aeronautical Charts contains thousands of charts linking all sections of the world. The library provides services to all members of the DoD community.

The Center also maintains a complete automated file of air-facility information, which provides instant data on any air facility in the free world.

Not all cartographic work is produced on paper. New computer flying demands that new techniques be developed by ACIC. One technique is the use of film chips or strips in conjunction with onboard computers. One of these aids is the Tactical Situation Display System used in the F-106. The TSD is a map-display instrument that presents tactical and navigational data pictorially during the various F-106 mission phases.

ACIC has been involved in the space mission since the first Mercury flight.

For last summer's historic first manned landing on the moon the Center provided some ninety support items. These items currently are being used in the con-



In preparing lunar charts, the easel of the enlarger tilts to correspond with the position of the space camera and the moon's curvature, to produce true horizontal scales.



A civilian ACIC employee uses an automated name-placement machine in his cartographic work. It is one of many sophisticated pieces of equipment used by ACIC.

tinued Apollo program, and include charts and graphics designed to support lunar-mission operations, lunar orbit, landing, and surface-exploration phases.

While the Center's headquarters, production, and printing plant are located in St. Louis, ACIC also has squadrons and detachments in other parts of the world so that cartographic support can be expeditiously supplied to the US defense organizations overseas. Squadrons and detachments are located in Alaska, Hawaii, Germany, England, the Philippines, Okinawa, Japan, the Canal Zone, and Vietnam.

From its detachment in Washington, D.C., ACIC provides liaison with other intelligence and mapping agencies and obtains data from them.

As charting needs become increasingly complex, ACIC's professional, scientific, and technical personnel will keep pace with the cartographic requirements so that pilots, navigators, and astronauts may continue to take ACIC charts for granted.—END

# The Launch Vehicles



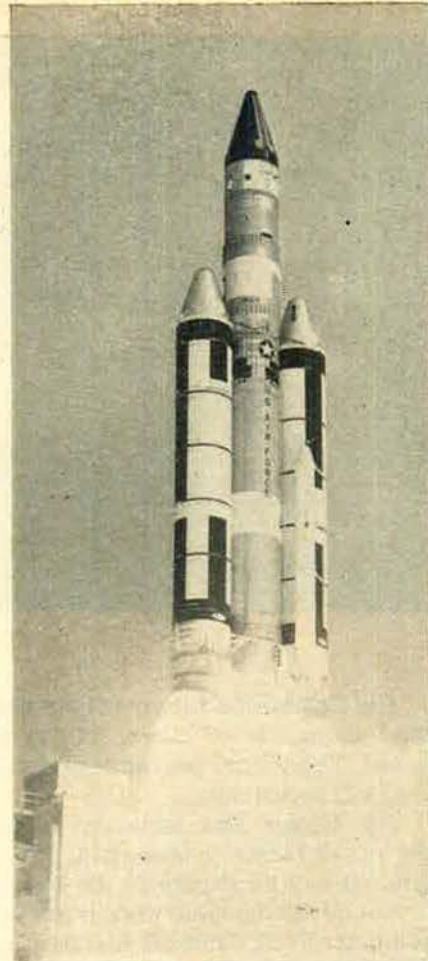
ATLAS WITH AGENA



THOR-ABLE



SCOUT



TITAN IIIC

Of four launch vehicles used by the Air Force, three were derived from ballistic missiles. They are the Titan III, Atlas, and Thor. The exception is Scout, developed as a joint NASA/DoD space research vehicle.

**Titan III** (SLV-5) served as the launch vehicle for NASA's two-man Gemini series. With a thrust range second only to that of the NASA Saturn booster, the 124-foot-tall Titan III is used to launch multiple communications and reconnaissance satellites and other heavy payloads. Options available for modifying the core vehicle to meet payload requirements include strap-on motors (IIIC), alternate third stages (IIIB), or strap-on motors without a third stage (IIID), providing a thrust range of 430,000 to 2,870,000 pounds, and launch weights from 171 to 700 tons. Martin Marietta provides the airframe and system integration, Aerojet-General manufactures the core propulsion, and United Technology Center produces the strap-on motors.

**Atlas** (SLV-3), the nation's first ICBM and booster for NASA's one-man Mercury spacecraft, is now used to launch DoD and NASA orbital and suborbital payloads, alone or in combination with various upper stages (*see below*). The SLV-3A is designed primarily for use with the Agena upper stage, while the -3C primarily serves the Centaur. Thrust totals 394,000 pounds—336,000 from

two boosters and 58,000 pounds from the central sustainer motor. General Dynamics/Convair is the prime contractor, while North American Rockwell/Rocketdyne produces both propulsion systems.

The basic **Thor** IRBM has now evolved into two uprated versions, the Thrust Augmented Thor (DSV-2C) and Long Tank Thor (DSV-2L), both produced by McDonnell Douglas. In the former, the basic Rocketdyne liquid-propellant motor has been augmented by three or more Thiokol solid-propellant strap-on motors, while the latter uses strap-ons plus additional liquid-propellant capacity, permitting a longer burning time for the main engine and making possible payloads 20 percent greater than for DSV-2C. Both are also used with upper stages to boost satellites and other space vehicles into orbit. NASA Delta boosters (DSV-3D, -3L) use much the same components. Typical payloads include boosting 2,600 pounds into low earth orbit, or 500 pounds to escape velocity.

The **Scout** (SLV-1A) is a three- to five-stage solid-propellant launch vehicle for orbital, high-altitude probe, and re-entry projects. Ling-Temco-Vought is the prime contractor and systems manager, while propulsion for various stages is produced by Aerojet-General, Allegheny Ballistic Laboratory, Hercules,

Thiokol, and United Technology Center. The first three stages produce a total of 181,600 pounds of thrust, and the optional fourth and fifth stages up to 6,000 pounds each. The 72-foot-long Scout can place a 320-pound payload into orbit, or send 50 pounds to escape velocity.

Principal upper stages used in conjunction with these boosters are the Lockheed Agena D, General Dynamics/Convair's Centaur, and the Boeing Burner II. The **Agena** employs a Bell Aerosystems restartable liquid-fueled engine with 16,000 pounds of thrust, capable of putting a 7,500-pound payload into earth orbit. It is 23 feet 5 inches long, five feet in diameter, and at launch weighs 15,000 pounds.

**Centaur** is the heavyweight among upper stages, with a launch weight of 37,000 pounds. Its two Pratt & Whitney RL-10 liquid oxygen/liquid hydrogen engines produce 30,000 pounds of thrust, enabling Centaur to send 11,800 pounds into orbit, 2,900 pounds on a lunar trajectory, or 2,100 pounds on an interplanetary probe.

**Burner II** is a solid-propellant upper-stage booster, with a launch weight of only 1,440 pounds. Its 10,000-pound-thrust Thiokol motor enables Burner II to place payloads of up to 5,000 pounds in orbit. A miniaturized IIA version weighs only 524 pounds but generates a thrust of 8,000 pounds.

## The Missiles



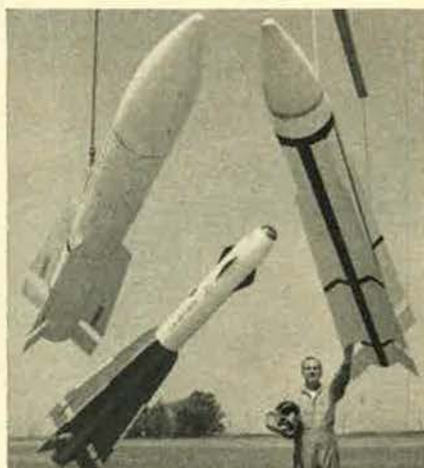
MINUTEMAN LAUNCH



TITAN II LAUNCH



BOMARC B



FALCONS—FOREGROUND, AIM-4D;  
UPPER LEFT, AIM-54A PHOENIX,  
UNDER DEVELOPMENT;  
UPPER RIGHT, AIM-47A.

The basic weapon of the US deterrent arsenal is the Boeing **Minuteman** intercontinental ballistic missile. A thousand silo-housed Minutemen have been operational since early 1967. A program to update the force began even before the last of six Minuteman missile wings was fully equipped, with early LGM-30As being replaced by Minuteman IIs (LGM-30F). Two modernization projects are now in progress—new Minuteman IIIs (LGM-30G) are replacing the remaining Is (LGM-30B), though at a pace slowed by budgetary restrictions; and Minuteman II warheads are being modified to withstand nuclear radiation effects in flight. Research is also proceeding on alternative basing concepts—to superharden silos against enemy nuclear blasts or, if that proves unfeasible, to make at least part of the force mobile. Meanwhile, the Army's Safeguard system is designed to protect launch sites in North Dakota, Montana, and Missouri from enemy missiles.

Minuteman III employs a more power-

ful third-stage booster, enabling it to carry the General Electric Mark 12 MIRV (Multiple Independently Targeted Reentry Vehicle) with three nuclear warheads. Range has been increased from 6,300 miles in the earlier models to 8,000 miles, and launch weight from 69,000 pounds to 76,000 pounds. Thrust of the first-stage Thiokol motor is 170,000 pounds, and that of the Aerojet-General second stage is 65,000 pounds. Early Minuteman models employ a Hercules third stage with 35,000 pounds of thrust; the G model's third stage is built by Aerojet-General.

Augmenting the Minuteman force are six squadrons of **Titan II** (LGM-25C) missiles, totaling 54. The two-stage Titan II, on which Martin Marietta is prime contractor, uses storable liquid propellant, but can be fired in less than a minute. Its thrust, range, and warhead size exceed those of the Minuteman. Titan II is the only US land-based ICBM capable of reaching targets deep in Red China.

The Minuteman and Titan II are USAF's only surface-to-surface missiles, now that the last Martin Marietta **Mace B** (CGM-13B) tactical missile squadron, based on Okinawa, is being deactivated.

The Air Force's only surface-to-air missile, more resembling an unmanned interceptor aircraft, is the Boeing **Bomarc B** (CIM-10B). This winged missile is launched by a 50,000-pound-thrust Thiokol booster, then flies under radar-homing guidance to its target, propelled at Mach 3 speed by two 12,000-pound-thrust Marquardt ramjet engines. Launch weight is 16,000 pounds and range 440 miles. Its warhead is nuclear. Bomarc B is operational at five sites in the US, and at two sites of the Canadian Defence Forces.

All other Air Force missiles are airborne, designed for use against air or ground targets.

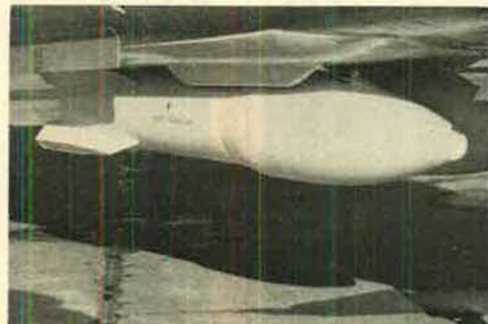
Foremost among its air-intercept missiles (AIM) are those of the **Falcon** family. The Hughes Falcon was USAF's first air-to-air guided weapon, and it is

*(Continued on following page)*

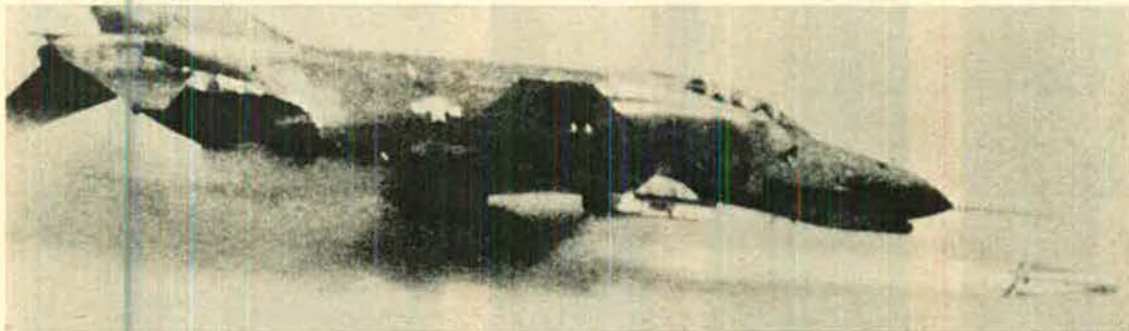
SIDEWINDER  
ON F-104



SPARROW III  
LAUNCH FROM  
NAVY F-3H2



GENIE



MAVERICK  
LAUNCH  
FROM F-4E

standard equipment on US all-weather interceptors. The family includes three standard Falcons, AIM-4A, C, and D; two Super Falcons, AIM-4F and -4G; a nuclear Falcon, AIM-26A, plus a nonnuclear counterpart, AIM-26B; and the long-range AIM-47A, developed for the Lockheed F-12 interceptor and a possible weapon for an interceptor version of the McDonnell Douglas F-15.

Launch weight of the standard Falcons is about 120 pounds. Powerplant is a 6,000-pound-thrust Thiokol motor, giving the missile a speed above Mach 2 and a five-mile range. The -4A is radar guided, while the C and D employ infrared guidance. Of the Super Falcons, the F employs radar guidance, the G infrared. They are equipped with a two-stage Thiokol rocket, giving them higher speed and ceiling, and a seven-mile range. Launch weight is 150 pounds.

The nuclear-tipped AIM-26A is similar to the Super Falcons except that its diameter measures 11 inches compared to 6½ inches for the -4F and G. Its range and speed are comparable to the standard Falcons.

Biggest and fastest of the family is the AIM-47A. It is 12 feet long, 13 inches in diameter, and weighs 800 pounds. Powered by a Lockheed Propulsion liquid-propellant rocket motor, it flies at

Mach 6, with a range of 100 miles and has a ceiling close to 100,000 feet.

Two other operational air-to-air missiles are the Sidewinder and Sparrow III, both initially developed by the Navy. The Sidewinder (AIM-9) has been built by both Philco and General Electric under direction of the Naval Weapons Center, which originated the design. Powered by a single-stage solid-propellant rocket produced by the Naval Propellant Plant, it uses either heat-seeking (AIM-9B, D, E) or semiactive radar (AIM-9C) guidance to attack its target with a conventional warhead at ranges up to two miles, or slightly greater for C and D models.

The Raytheon Sparrow III (AIM-7E) differs from other air-to-air missiles in that it can be launched from an oblique direction, homing on its target by semiactive radar over a range of up to 15 miles and Mach 3 speed. It is substantially bigger and heavier than the Sidewinder or Falcon, measuring 12 feet long and weighing 450 pounds. Two new versions are in test—the AIM-7F with a more powerful warhead and increased range, and the -7G intended for use in the F-111.

A new AIM-82 "dogfighting" missile, so-called because its much shorter turn radius will permit it to be fired at close

range, is under development for the F-15 air-superiority fighter, and may also be used on other USAF and Navy interceptors. Its contractor is to be chosen in a prototype fly-off competition.

Still in use aboard F-106 and F-101B interceptors is the AIR-2A Genie, an unguided rocket with a nuclear warhead. The McDonnell Douglas weapon is nine feet long, 17 inches in diameter, weighs 800 pounds, and owes its Mach 3 speed to a 36,000-pound-thrust rocket produced both by Aerojet-General and Thiokol. Range is six miles.

Still in concept-formulation stage is an air-to-air missile intended for the B-1 bomber for defense against enemy interceptors. The requirement may be met by an updated version of an existing air-to-air weapon.

Air-to-ground missiles (AGM) represent the largest category in the Air Force arsenal, some of which have been developed and are used by the Navy and Marine Corps.

Oldest in service is Bullpup (AGM-12B and C), initially built by Martin Marietta but now produced by Maxson Electronics. AGM-12B, called Bullpup A, has a launch weight of 571 pounds, including a 250-pound conventional warhead. Powered by a Thiokol 12,000-pound-thrust rocket, giving it a speed of



1,200 mph and a two-mile range, it is guided to the target by the pilot, who must track it until impact. AGM-12C, Bullpup B, is substantially bigger, weighing 1,750 pounds with a 1,000-pound warhead and three-mile range, boosted by a 33,000-pound-thrust Thiokol motor. Guidance is the same as in Bullpup A. Martin Marietta also produces the AGM-12D with a nuclear warhead, and the -12E featuring a high-fragmentation conventional warhead.

Supplementing Bullpup, particularly in attacks against heavily defended targets, is the Martin Marietta **Walleye** (AGM-62A). It is 11 feet long and weighs 1,100 pounds. Once the pilot visually sights the target and releases Walleye, he may take whatever evasive action is necessary while a TV camera in the missile's nose keeps it on target as it glides unpowered to its mark. Hughes is overall coordinator for Naval Air Systems Command on Walleye components. A larger Walleye, nicknamed **Pat Albert**, is in development at the present time.

Similar to Walleye, but powered by a Thiokol rocket, is the TV-guided AGM-65A **Maverick**, being developed by Hughes for use on the F-4, A-7, and F-111. The eight-foot-long missile weighs 475 pounds and is intended for use against moving targets and close-in enemy positions.

Other tactical air-to-ground weapons in various stages of development include the Martin Marietta XAGM-79 **Blue Eye**, Chrysler XAGM-80 **Viper**, and one tentatively designated the AGM X-3, reportedly with greater range than Walleye and Maverick. Blue Eye and Viper are experimental designs testing "launch and leave" techniques that may be applied in the Bullpup.

A separate category of air-to-ground

missiles are antiradiation missiles (ARM) designed to attack radar-guided anti-aircraft weapon sites. The AGM-45A **Shrike** was extensively used against SAM sites in North Vietnam. Its weakness is that it can be thrown off course if the site's radar signal is shut off even momentarily. An improved model, the AGM-78A **Standard ARM**, has been developed by General Dynamics/Pomona to overcome that handicap. Since it costs appreciably more than the Shrike—its launch weight is 1,300 pounds compared to Shrike's 390 pounds—the latter will continue to be used against less-sophisticated radar targets.

USAF's only operational strategic air-to-ground missile is the AGM-28B **Hound Dog**, carried by the B-52G and H as a standoff nuclear weapon. Built by North American Rockwell, the stubby-winged Hound Dog weighs more than 10,000 pounds. It is 42½ feet long, 28 inches in diameter, and has a 12-foot wingspan. Powered by a Pratt & Whitney J52 turbojet of 7,500 pounds thrust, it flies at Mach 2 with a range of 600

miles. Its inertial guidance is built by NR/Autonetics.

Still in development is the supersonic Boeing AGM-69A **SRAM** (Short Range Attack Missile) to be used by the B-1, FB-111, and late-model B-52s. Much smaller than Hound Dog, as many as 20 SRAMs may be carried aboard the B-52 and B-1 as penetration aids to attack enemy radar and missile sites. SRAM is 14 feet long, 1½ feet in diameter, weighs 2,240 pounds, and is powered by a Lockheed Propulsion restartable solid-fuel pulsed rocket motor.

The B-52 also employs the McDonnell Douglas ADM-20C **Quail**, an unarmed decoy missile simulating a B-52 in flight. Quail is 13 feet long, with a wingspan of 5 feet 4 inches. It flies at high subsonic speed, powered by a General Electric J85 engine, with a range of 350 miles.

In development to replace Quail is **SCAD** (Subsonic Cruise Armed Decoy), which will complement SRAM in aiding bombers to overcome sophisticated defenses. An unarmed version—**SCUD**—is also under consideration.



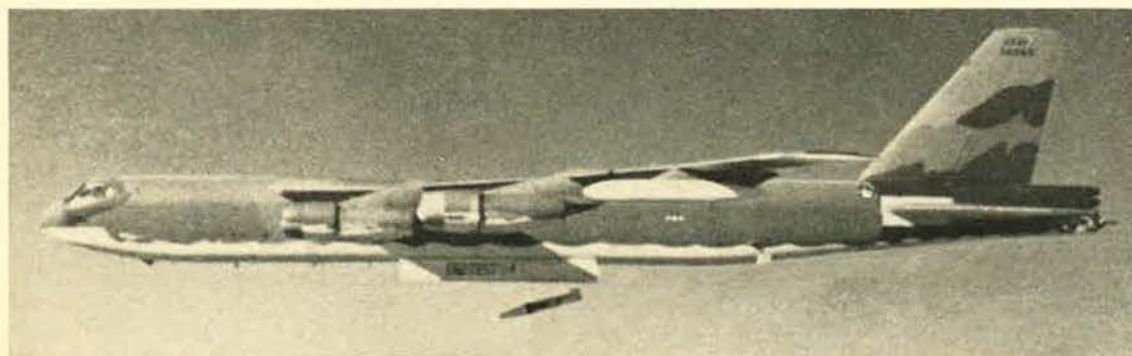
**BULLPUP  
FIRED BY  
F-100**



**SHRIKE ON F-4D**

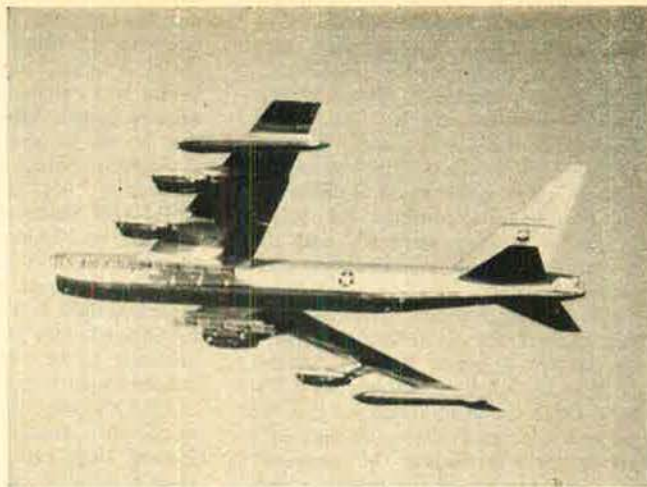


**QUAIL**

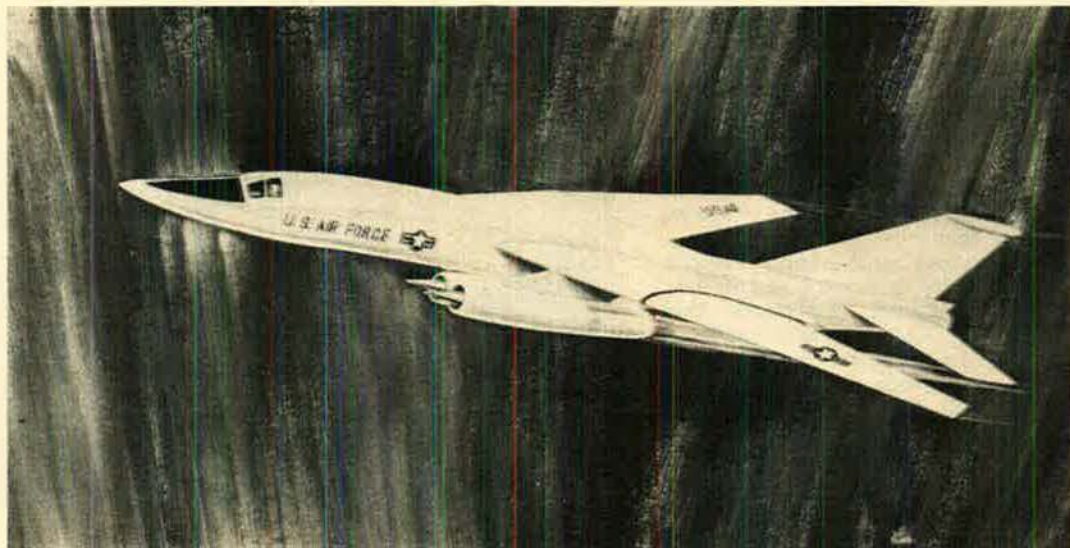


**SRAM (DUMMY)  
DROP FROM  
B-52H**

## The Bombers



B-52 STRATOFORTRESS



B-1 (ARTIST'S CONCEPTION)

To maintain its world leadership in long-range heavy bombers—regarded as an essential counterpart to intercontinental missiles in deterring global war—the US is moving into the engineering-development phase on the **B-1** bomber, formerly called AMSA (Advanced Manned Strategic Aircraft), to begin replacing the Boeing B-52 in the late '70s.

"This aircraft, in comparison with the B-52," said Defense Secretary Melvin Laird, "is designed to have greatly improved basing survivability, a smaller radar cross section, reduced infrared signature, lower penetration altitudes, higher penetration speed, and a greater payload."

The Pentagon is evaluating proposals from three finalists in the B-1 competition—Boeing, General Dynamics, and North American Rockwell. General Electric and Pratt & Whitney are vying for the engine contract.

Gross weight of the B-1 is expected to be from 350,000 to 400,000 pounds. The aircraft will probably utilize the swingwing technique to give it a 10,000-mile range and top speed above Mach 2. On a total production run of about 200, each aircraft, with navigation and bomb-

delivery avionics added, will cost more than \$20 million. B-1 payload will include SRAMs and SCADs to confuse or destroy enemy defenses and enable it to attack heavily defended targets at relatively long range.

Even with B-1s entering the Strategic Air Command, the Air Force expects to continue operating the Boeing **B-52 Stratofortress** into the 1980s. Between 1952 and 1962, Boeing built 742 Stratoforts in models ranging from the B-52A to the H. Older models have been retired, but the Fiscal Year 1971 defense budget calls for operating almost 500 B-52s from 28 main bases in the US and overseas and a large number of satellite bases.

As a conventional bomber in Southeast Asia, the B-52 has carried 60,000-pound bomb loads, with gross weight approaching 500,000 pounds. Equipped with eight Pratt & Whitney engines, with thrust of 17,000 pounds each in G and H models, the B-52's top speed is 650 mph. Range is from 6,500 miles in earlier models to more than 9,000 miles. G and H versions now employ two Hound Dog standoff missiles, and will add SRAM and SCAD when available.

An interim bomber now reaching operational status is the General Dynamics **FB-111**, derived from the swingwing F-111 fighter. As a result of budget cuts and emphasis on B-1 development, only 76 are to be built, forming two squadrons each at Plattsburgh AFB, N.Y., and Pease AFB, N.H. With weapons on eight wing pylons as well as in its bomb bay, the FB-111 can carry a 37,500-pound payload, including a limited number of SRAMs and SCADs. Fully loaded, it is restricted to subsonic speed, because its wings cannot then be swept. With external pylons jettisoned, the FB-111's top speed is Mach 2.2, powered by two Pratt & Whitney TF30-7 turbofans with afterburner, producing more than 20,000 pounds of thrust. It is 73 feet 6 inches long, and wingspan, fully extended, is 70 feet. Maximum takeoff weight is about 80,000 pounds.

The General Dynamics **B-58 Hustler** has been retired, leaving only two other bomber types in the USAF inventory. These are the Martin Marietta **B-57** (an extensive redesign of the English Electric Canberra) and the McDonnell Douglas EB-66 Destroyer. B-57s have been withdrawn from Vietnam to undergo modifi-



FB-111



B-57



EB-66

cation to a new B-57G configuration, featuring low-light-level TV and other sensors to find and hit moving targets at night and in bad weather. The B-57 carries an 8,000-pound payload, plus four .50-caliber guns or 20-mm cannons. Top speed, employing two Wright J65 jets, is 600 mph.

Three reconnaissance models also in service are the RB-57A and F and EB-57D. The RB-57F, modified by General Dynamics, has a wingspan of 122 feet, almost double that of the B-57G; its 4,000-mile range and 100,000-foot ceiling are also twice that of the bomber.

It is powered by two Pratt & Whitney 18,000-pound-thrust TF33-11 turbofans, plus two P&W J60-9 turbojets, each producing 3,300 pounds of thrust.

The EB-66 electronic-jamming aircraft is almost the only version remaining of a once sizable fleet of B-66 light bombers and RB-66 and WB-66 reconnaissance craft. Derived from the Navy A-3 Skywarrior, the EB-66 is powered by two Allison J71s of 10,200 pounds of thrust. It is 75 feet long with wingspan of 72 feet 6 inches. Top speed is 650 mph and maximum weight is 80,000 pounds.

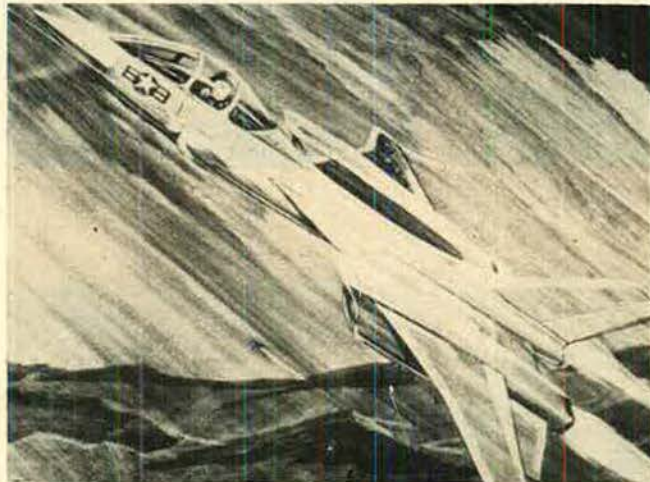
In a class by itself is the Lockheed SR-71, a Mach 3 aircraft similar to the YF-12 interceptor and operated by the 4200th Strategic Reconnaissance Wing at Beale AFB, Calif. The slim, jet-black SR-71 has been reported to have been sighted at bases in the Far East and Southeast Asia. USAF recently acknowledged that to date nine SR-71s have been lost in accidents. The aircraft employs a pair of Pratt & Whitney J58 engines with thrust estimated at 32,500 pounds with afterburner. Overall length is 107 feet, and wingspan of the SR-71 is 55 feet 7 inches.



SR-71

## The Fighters

F-15  
(ARTIST'S  
CONCEPTION)



When the McDonnell Douglas F-15 enters the Air Force inventory in the mid-1970s, the basic design of the F-4 Phantom II that it succeeds will be 20 years old. During this period the Soviets have steadily upgraded their air-to-air capability. But the F-15 should restore the US edge, for as Defense Secretary Melvin Laird has told a congressional committee, "We believe its performance will be superior to any present or postulated Soviet fighters in both close-in visual and long-range missile encounters."

The F-15 is a single-seat, fixed-wing, twin-turbofan, all-weather fighter in the 40,000-pound weight class. In addition to its air-superiority role, it will be able to perform some air-ground missions. Pratt & Whitney has been selected to build its advanced-technology engines, with thrust of almost 30,000 pounds each. The F-15's armament will include

the new dogfighting AIM-82A missile and a 25-mm Gatling-type gun firing caseless ammunition. The initial contract with McDonnell Douglas calls for 20 research, development, test, and evaluation aircraft at a cost of \$1.146 billion, but USAF hopes to get as many as 700 F-15s over the life of the production run.

Meanwhile, the McDonnell Douglas F-4 Phantom II is destined to serve the Air Force for many more years. USAF's latest model is the F-4E, with an internally mounted M61 20-mm rapid-firing cannon, an improved fire-control system, and 17,900-pound-thrust General Electric J79-17 engines. The F-4E joins the F-4C, first Phantom ordered by USAF, the F-4D, and a reconnaissance version, the RF-4C. All the latter are powered by the GE J79-15 with 17,000 pounds of thrust. The Phantom is 58 feet 3 inches

long, with a wingspan of 38 feet 5 inches, and can carry 14,000 pounds of weaponry with gross takeoff weight of 58,000 pounds.

When the General Dynamics F-111 overcomes its swingwing structural problems, it will take its place as the Air Force's primary all-weather fighter-bomber. With terrain-following automatic pilot, Mark II avionics, and extended unrefueled range, it can avoid enemy radar detection and hit pinpoint targets under zero-visibility conditions. More than 400 F-111 fighters are programmed for the Air Force: 141 F-111As, 96 F-111Es with redesigned air inlets to improve high-speed, high-altitude performance, 96 F-111Ds equipped with Mark II avionics, 58 stripped-down F-111Fs, and 18 preproduction F-111A test planes. The F-111 is 73½ feet long, with wingspan from 31 feet 11 inches swept to 63 feet extended. Its engines are two Pratt & Whitney TF30 turbofans, each with 20,000 pounds of thrust.

Gradually diminishing in numbers through transfer to the Air National Guard, retirement, or attrition, but still represented in the active inventory, are the North American Rockwell F-100 Supersabre and the Fairchild Hiller (Republic) F-105 Thunderchief. The F-100 has shared with the F-4 most of the close-support missions in South Vietnam, while the F-105 bore the brunt of bombing targets in North Vietnam.



F-4 PHANTOM II



F-111

USAF's dwindling manned interceptor force is now made up almost exclusively of the General Dynamics **F-106 Delta Dart** (11 squadrons), along with three squadrons of McDonnell Douglas **F-101B Voodoos** and two units of the F-106's predecessor, the **F-102 Delta Dagger**. These active forces are supported by three F-101 and 13 F-102 squadrons in the Air Guard.

The F-106 is a formidable weapon system, thanks to its Hughes MA-1 electronic guidance and fire control, which can take over the plane's controls after takeoff, guide it into attack position and, when it closes to optimum range, fire the F-106's missiles and immediately break off to seek other targets. The 35,000-pound gross weight plane is powered by a Pratt & Whitney J75-17 of 24,500 pounds of thrust, and is equipped for in-flight refueling.

A total of 66 F-101Bs, retired by the Aerospace Defense Command, are being acquired by the Canadian Defence Forces to replace their CF-101s because the F-101B's avionics are more advanced than those of the CF-101.

Several other well-known fighter types have been retired or serve now only in the Air Guard. The last Lockheed **F-104** squadron was disbanded early this year, though the Air Training Command continues to operate some Starfighters at Luke AFB, Ariz., in training West German pilots. Similarly, ATC



F-105 THUNDERCHIEFS



F-100 SUPERSABRE

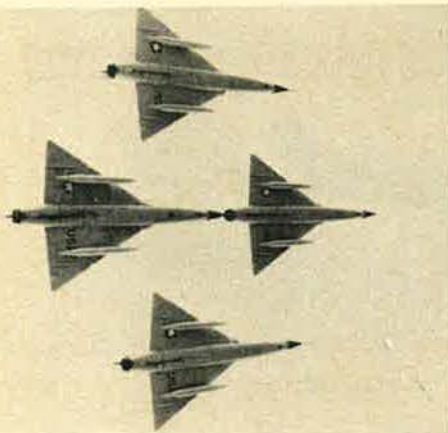
flies a few Northrop **F-5 Freedom Fighters** at Williams AFB, Ariz., to train Vietnamese and other foreign pilots.

The Lockheed **YF-12** interceptor is still a world record holder in absolute speed (2,070 mph) and sustained height (80,258 feet), but only three were built. The YF-12 is now engaged in a joint NASA/USAF high-altitude, high-speed research program.

The Air Guard continues to fly some **F-84 Thunderjets** and RF-84 recon planes, plus the North American **F-86 Sabrejet**, all of Korean War vintage, but is gradually phasing them out as it gains F-100s, F-105s, and RF-101s from the active force.

The other noteworthy developments in

the fighter category are, first, that either the Navy's F-14 or USAF's F-15 may be named to fill the role of an improved manned interceptor, on condition that an effective Airborne Warning and Control System (AWACS) can be developed. The second is a program being managed by the Air Force to develop a new **International Fighter**; the new aircraft would be supplied to such US allies as South Vietnam, South Korea, Taiwan, and Thailand to bolster their air forces. Under consideration are an improved version of the F-5, designated the F-5-21, a stripped-down F-4, and other designs. Requests for Proposals have been issued to eight US manufacturers.



F-106 DELTA DARTS



F-101B VOODOO

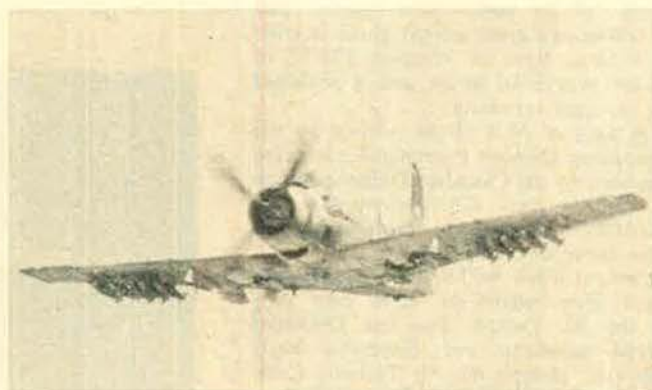


F-102 DELTA DAGGER

## The Attack and Observation Planes



A-7D CORSAIR II



A-1 SKYRAIDER



VNAF A-37



AC-47 SPOOKY

The ranks of USAF attack aircraft are dwindling in variety, but not in capability, as the first wing of Ling-Temco-Vought **A-7D Corsair IIs** assumes operating capability at Myrtle Beach AFB, S.C., in the coming fiscal year. A total of 202 A-7s has been ordered for the Air Force to date, the FY '71 budget includes funds for 88 more, and USAF expects eventually to get more than 600.

A subsorlic, long-range attack plane, the Air Force's Corsair II differs from the earlier Navy version in several ways, notably in its 14,250-pound-thrust Allison TF41 turbofan derived from the Rolls-Royce Spey, and in its avionics "suit," whose heart is a digital computer that handles all navigation and fire-control problems. The aircraft's empty weight is more than 19,000 pounds, 3,000 pounds above the Navy A-7A, and its top speed of 698 mph exceeds the

A-7A by 100 mph. Combat radius is about 700 miles.

The A-7 can carry up to 15,000 pounds of weaponry on eight wing pylons, plus an internal Vulcan 20-mm gun that fires at the rate of 6,000 rounds per minute. Maximum takeoff weight is 42,000 pounds.

Its survivability in a hostile air environment is enhanced by its ability to fly at treetop level to avoid radar detection; armor plate to protect the pilot, engine, and fuel lines; backup control systems; fire-suppressing foam in tanks; and its excellent maneuverability, enabling it almost literally to run off and hide from enemy fighters. A head-up display system permits the pilot to monitor instruments while looking ahead through the windshield.

The A-7D will replace the McDonnell Douglas **A-1 Skyraider**, or as it's known

in Vietnam, the Spad—another former Navy attack plane that the Air Force has put to outstanding use in Southeast Asia—and the **Cessna A-37**, developed from the T-37 trainer as an interim close-support aircraft, but now being transferred to the South Vietnamese Air Force and the US Air National Guard. The prop-powered Spad had already been retired when USAF resurrected it for Vietnam combat because of its 8,000-pound payload, four 20-mm cannon, and long loiter time. The A-1 is equipped with a 2,700-horsepower Wright R3350 engine, giving it top speed of 365 mph. Maximum weight is 19,000 pounds.

The A-37 has proved too short-legged and too light for the variety of missions USAF requires of its attack planes. With a gross weight of only 14,000 pounds, it carries up to 6,000 pounds of external stores on eight wing pylons, though two

are generally reserved for fuel tanks to boost range. It is powered by two 2,700-pound-thrust General Electric J85 engines, giving it a top speed of 450 mph. The first Air Guard unit to get the A-37 is the 175th Group of Baltimore, Md.

USAF's attack category includes three cargo planes converted to gunships for close-support operations in Vietnam. They are the venerable McDonnell Douglas AC-47 **Spooky**, the Fairchild Hiller AC-119 **Shadow**, and the Lockheed AC-130 **Super Spooky**. All are fitted with side-firing weapons—three 7.62-mm Miniguns in the AC-47, four in the C-119, and four 7.62-mm guns and four 20-mm Gatling-type cannon in the AC-130.

A new low-cost attack plane slated for prototype development in FY '71 is the **A-X**, envisioned as comparable to the A-1 in payload but with twice its speed. It may be the first USAF plane since the early 1950s to be selected after a prototype fly-off competition. It will be a single-seat, twin-engine, fixed-wing aircraft with a top speed of about 450 mph and mission duration of four hours, carrying up to 16,000 pounds of weaponry plus an internal Gatling gun. It will most likely be turboprop-powered, though a turbofan is a possibility.

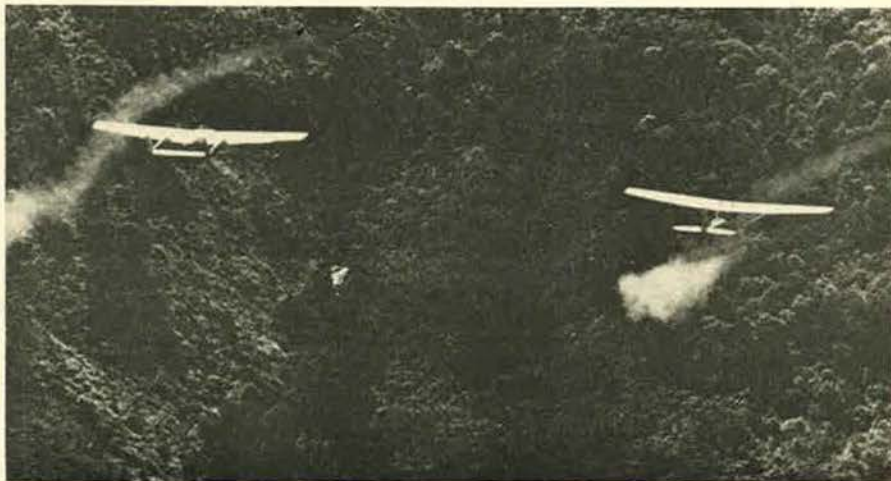
Though listed as an observation plane, the North American Rockwell **OV-10 Bronco** possesses a limited attack capability as well, carrying up to 2,400 pounds of external stores. The twin-tailed Bronco is equipped with two Garrett AiResearch T76 turboprops of 715 shaft horsepower, giving it top speed of 280 mph and a range of 850 miles. Takeoff weight of the attack version is 14,466 pounds, just above that of the A-37. The OV-10, however, can also be used as a light cargo plane, hauling up to 3,200 pounds or six paratroopers.

USAF's primary observation craft is the Cessna **O-2A**, a twin-tail, off-the-shelf version of the Cessna 337 Super Skymaster. It is powered by two push-pull Continental IO360D piston engines, one mounted conventionally in the nose, the other between the tail booms at the rear of the four-place cabin. Speed is 180 mph, and range 1,300 miles. Wing

pylons carry up to 1,400 pounds of external stores, including a 7.62-mm Minigun. An O-2B version is used as a leaflet-dropping psychological-warfare craft.

The O-2 is superseding the Cessna **O-1 Bird Dog**, a light, 2,400-pound gross

weight two-seater, using a 213-horsepower Continental O470 six-cylinder engine. Its only armament are target-marking smoke rockets mounted under its high wing, and whatever weapons the pilot may carry.



LEFT, FAC O-2A SUPER SKYMASTER; RIGHT, O-1 BIRD DOG



O-2B LEAFLET-DROPPER



OV-10 BRONCO



REARMING AN AC-47 GUNSHIP

## The Cargo Planes



C-5A GALAXY



C-133 CARGOMASTER



C-141 STARLIFTER

USAF has a greater variety of transports in active use than any other type of aircraft.

At one extreme is the ancient **C-47 Gooney Bird**, dating from the 1930s, still operating throughout the Air Force and which, as noted earlier, has embarked on a rejuvenated career as the AC-47 Spooky gunship in Vietnam. It is, incidentally, the most widely employed military aircraft in the world, flying in the air forces of more than 60 nations.

At the far end of the cargo spectrum is the Lockheed **C-5 Galaxy**. Deliveries of the Galaxy, slowed by Lockheed's financial problems, will not be completed to the first operational squadron, at Charleston AFB, S.C., until fall, almost a year behind the original program date. Delivery schedules for remaining aircraft in the projected four-squadron fleet now are being negotiated.

The C-5 is the only plane capable of transporting the heaviest pieces of Army combat gear, including not only tanks but their transporters, enormous GOER all-terrain logistic vehicles, and heavy guns. Over a 3,105-mile range it will carry a 220,000-pound payload, compared to 60,000 pounds in the C-141.

Moreover, with its 28-wheel landing gear, the C-5 can land on semi-improved landing strips, delivering its cargo directly to forward areas, with enough fuel in reserve to fly out again to a rear support base.

The C-5 is 247.8 feet long, with a wingspan of 222 feet 8 inches. Powered by four General Electric TF39 turbofans, each with 41,100 pounds of thrust, the C-5 can cruise at 530 mph. Maximum payload is 265,000 pounds over 2,875 miles; trading fuel for cargo, the C-5 can carry 100,000 pounds for a distance of 6,325 miles. Nominal gross takeoff weight varies between 728,000 and 764,500 pounds, depending on the mission. The plane already has been test flown at a gross takeoff weight of 798,200 pounds.

Because of delays in C-5 deliveries, USAF will retain two **C-133** squadrons through the next fiscal year. The 90-foot cargo hold of the McDonnell Douglas C-133 can accommodate bigger items of equipment than any other transport except the C-5. Four Pratt & Whitney T34-9W turboprops give it 300-mph speed over a range of 2,250 miles with a 90,000-pound payload, or 4,300 miles

with 44,000 pounds. Maximum gross weight is 300,000 pounds.

Next in size is the Lockheed **C-141 StarLifter**, now the mainstay of the Military Airlift Command. A total of 284 were built, equipping 14 squadrons, plus spares and training planes. Cubic capacity restrictions have limited the StarLifter to less than its full weight-lifting potential, but it will complement the C-5 by carrying a maximum of 154 combat troops and their equipment, while the C-5 handles heavier and bulkier cargo. The C-141 is 145 feet long; wingspan is 160 feet. Powered by four 21,000-pound-thrust Pratt & Whitney TF33-7 turbofans, it can carry a 60,000-pound payload 4,600 miles nonstop at 500 mph, or lesser weights over longer distances. Gross takeoff weight is 318,000 pounds.

A recent addition to the USAF transport inventory is the McDonnell Douglas **C-9 Nightingale**, military counterpart of the civilian DC-9. Used in aeromed missions, the C-9 is replacing the prop-driven McDonnell Douglas four-engine C-118 Liftmaster and the twin-engine General Dynamics C-131 Samaritan. The latter continue in service as utility transports in the US and overseas.



Twelve C-9s were bought in Fiscal Year 1969 for domestic aeromed routes, and the FY 1971 budget provides funds for nine more for routes in Europe and the Pacific. Powered by two Pratt & Whitney JT8D-9 turbofans of 14,500 pounds of thrust, the C-9 carries 30 liters or 40 ambulatory patients over a range of 2,200 miles at 520 mph. It is 119 feet 4 inches long, span is 93 feet 5 inches, and takeoff weight is 108,000 pounds.

Completing USAF's pure-jet transport force are the KC-135 tanker, a variation of the Boeing 707; the VC-137 Presidential transport; and the Lockheed C-140 JetStar. More than 600 KC-135s were built for the Air Force. A few have been converted to EC-135 configuration, serving Strategic Air Command as airborne command posts, and some C-135 transport versions remain in service for radar and weather reconnaissance (RC-

WC-135). The **KC-135B** is powered by four 18,000-pound-thrust Pratt & Whitney TF33-9 turbofans. It is 136 feet long with span of 130 feet 10 inches. Speed is 600 mph, range 5,000 miles, and gross takeoff weight 297,000 pounds.

The **VC-137**, known as Air Force One when the President is aboard, is derived from the intercontinental Boeing 707-320B, equipped with JT3D turbofans, civilian equivalent of the TF33. The aircraft's performance and dimensions are comparable to those of the KC-135B. The Presidential fleet also includes three VC-137Bs—Boeing 707-120s that have been reequipped with JT3D engines.

Also part of the White House fleet is the Lockheed **C-140 JetStar** light transport. Of 16 C-140s bought by the Air Force, six have been converted to the VC-140 configuration. Five C-140As are used by the AF Communications Service for checking navigation aids, and

five C-140Bs are in mission-support roles. The JetStar, 69½ feet long with a wingspan of 54½ feet, is equipped with four 3,000-pound-thrust Pratt & Whitney J60 jets. It carries up to 10 passengers at 550 mph over a 2,500-mile range. Maximum takeoff weight is 41,000 pounds.

Most numerous and versatile of Air Force transports is the propjet Lockheed **C-130 Hercules**, flown by both Tactical Air Command and MAC. More than 800 have been delivered to the Air Force, Navy, and Coast Guard, in 28 configurations. In addition, 13 foreign countries have bought C-130s. It is the workhorse of troop and cargo airlift in Vietnam. In addition, the AC-130, equipped with four Miniguns and four 20-mm Gatling guns, with infrared and radar for spotting ground targets, has proved to be an effective gunship in Southeast Asia.

Among the C-130's other missions are  
*(Continued on following page)*



C-9A NIGHTINGALE



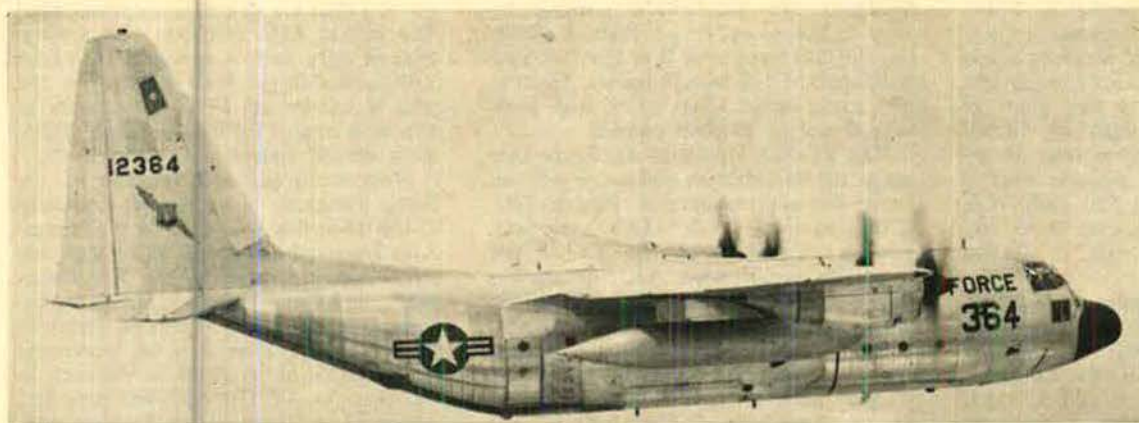
KC-135 REFUELING F-105



VC-137

VC-140 JETSTAR



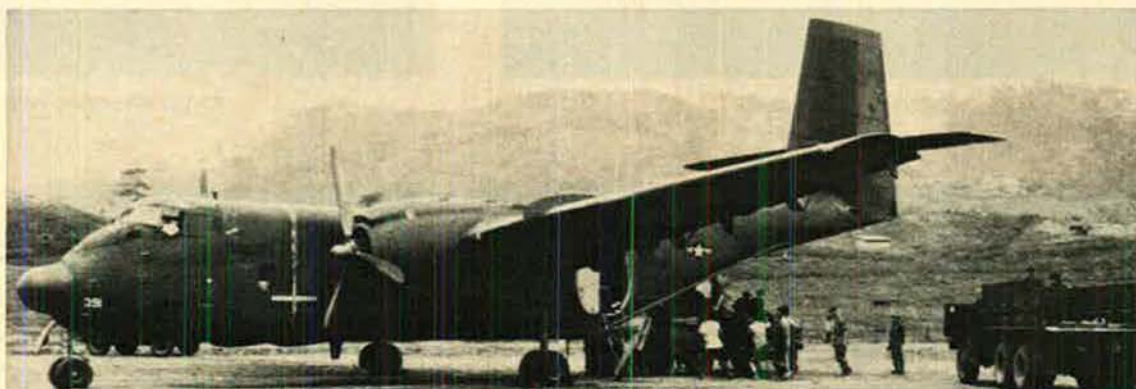


C-130 HERCULES

C-123 PROVIDER,  
SHORT-LANDING  
IN VIETNAM



C-7 CARIBOU,  
UNLOADING  
IN VIETNAM



aeromedical evacuation, tanker, search and rescue, weather reconnaissance, drone launching, satellite-capsule recovery, photomapping, and—fitted with skis—support of Arctic and Antarctic exploration teams. With a 25,000-pound payload, its range is over 4,500 miles.

The C-130 can carry 92 troops, 64 paratroopers, or 74 litter patients. Maximum takeoff weight is 155,000 pounds. Length is 97 feet 9 inches, and span is 132 feet 7 inches. Equipped with four Allison T56-7 turboprop engines, it cruises at 300 mph.

Sharing airlift missions with the C-130 in Vietnam are the Fairchild Hiller C-123 Provider and the de Havilland (Canada) C-7 Caribou. Many C-123s have been converted to C-123Ks, fitted with a pair of 2,850-pound-thrust GE J85 turbojets to augment their two Pratt &

Whitney R2800 piston engines of 2,500 horsepower, boosting payload and climb rate and shortening takeoff run. Within its maximum gross weight of 60,000 pounds, the Provider carries 24,000 pounds of cargo or 60 troops. C-123s also perform "Ranch Hand" defoliation missions in Vietnam.

The C-7 Caribou, with maximum takeoff weight of 28,500 pounds, can operate from dirt strips barely 1,000 feet long, carrying as much as 5,000 pounds of cargo or 32 troops over a 240-mile range. Using two Pratt & Whitney R2000 engines of 1,450 horsepower each, it cruises at 180 mph.

Rounding out USAF's transport forces are prop-driven planes as well known, and some almost as old, as the C-47. They include the McDonnell Douglas C-54 Skymaster and C-124 Globemaster,

Boeing C-97 Stratocruiser and KC-97 tanker, and Lockheed C-121 Constellation, most of them now flown primarily in the Air Reserve Forces.

Finally, in prospect are the Light Intratheater Transport (LIT), projected as a replacement for the C-123 and supplement to the C-130, and the Airborne Warning and Control System (AWACS) aircraft. The latter is expected to be either an off-the-shelf McDonnell Douglas DC-8, or an eight-engine Boeing design, fitted with special avionics and a large radar capable of spotting low-flying intruder planes and directing interceptors against them. Purchase of the aircraft depends on the success of the radar development. The LIT program continues on a relatively low burner, with only \$2 million allotted in the FY '71 budget for technology studies.

# The Trainers

USAF's three principal trainers, in the order they're encountered by the student pilot, are the prop-driven Cessna T-41A, the jet-powered Cessna T-37, and the Northrop T-38 Talon. Students get 30 hours in the T-41, many during their senior year at the Air Force Academy or in the Air Force ROTC program, mainly to test their aptitude and motivation. An off-the-shelf version of the Cessna 172, the T-41 is powered by a 145-horsepower Continental O300C, with a top speed of 138 mph.

The T-37 basic trainer differs from the A-37, described in the "Attack" section, mainly in that the T-37's 1,025-pound-thrust Continental J69 turbojets produce less than half the power of the A-37's General Electric J85 engines, and gross weight (6,600 pounds) is correspondingly lower. Top speed is 350 mph.

Advanced training is conducted in the T-38, forerunner of the F-5 Freedom

Fighter and almost identical to the F-5 in size and weight. Employing two General Electric J85-5s of 4,000 pounds of thrust, the Talon's top speed exceeds 800 mph, with a range of 1,000 miles.

For navigation training, the Air Force still uses the T-29, counterpart of the C-131 and derived from the Convair 240 transport. The FY '71 budget includes funds to begin acquiring a new navigation trainer, designated the T-X, which will probably be adapted from a commercial jetliner, as the T-29 was.

The North American Rockwell T-39 Sabreliner is better known as a light, fast, utility transport, but owes its trainer designation to the fact that it serves to train pilots and navigator-bombardiers in radar fire-control and navigation systems, and in Wild Weasel equipment used to attack enemy anti-aircraft missile sites. Early T-39s carried four passengers in addition to the two-



T-38

man crew, but a later version seats seven. It measures 43 feet 9 inches in length, with a 44.5-foot wingspan, and its gross weight is 18,560 pounds. Its two Pratt & Whitney J60-3 engines of 3,000 pounds of thrust give it a top speed of 575 mph. Range is about 1,000 miles.

The Lockheed T-33 T-Bird has been replaced by the T-38 in undergraduate pilot training, but remains in wide use for proficiency flying.



T-37



T-29



T-41



T-39A SABRELINER

# The Helicopters



HH-43 HUSKIE



HH-3E  
JOLLY  
GREEN  
GIANT



HH-21 WORKHORSE



UH-1F



HH-53 SUPER JOLLY

Helicopters have become almost synonymous with Air Force rescue operations in Vietnam, and three of USAF's four first-line helicopters have been extensively engaged in such operations. Perhaps the best known is the Sikorsky **HH-3 Jolly Green Giant**, an amphibian equally adept at recovering pilots from water or jungle.

The newest model, **HH-3E**, is capable of being refueled by the Lockheed HC-130P Hercules, modified to serve as a helicopter tanker. Employing two General Electric T58-5 gas turbines of 1,500 shaft horsepower, the **HH-3E** cruises at 140 mph. Unrefueled range is 748 miles with tip tanks. Rotor span is 62 feet, and overall length 72 feet 10 inches. The **Jolly Green** can carry 25 passengers or 5,000 pounds of cargo, with maximum takeoff weight of 22,050 pounds.

Bigger and faster is the Sikorsky **HH-53 Super Jolly**, supplementing the **HH-3** in Vietnam rescue operations. Two versions are in use, the **HH-53B** with

two General Electric T64-3 engines of 3,080 shaft horsepower, and the **HH-53C**, with T64-7s producing 3,435 shp, and also fitted with three 7.62-mm Miniguns. The B model cruises at 172 mph with 195-mph dash speed, while the C cruises at 195 mph, with dash speed of 220 mph. The C's unrefueled range is 575 miles, more than twice that of the B, and it can carry 60 passengers or 18,500 pounds of cargo, compared with the B's capacity of 38 passengers or 16,000 pounds. Rotor diameter of each is 72 feet 3 inches, length is 88 feet 3 inches, and maximum takeoff weight is 42,000 pounds.

For rescue operations within close range of airfields, the Air Force uses the Kaman **HH-43 Huskie**, known in Vietnam as Pedro. It also carries fire-fighting gear for crash rescue. The **HH-43B** is powered by a Lycoming T53-1 turbine of 860 shaft horsepower, giving it a speed of more than 100 mph and a range of 250 miles. It carries seven

passengers or 2,500 pounds of cargo. Takeoff weight is 9,100 pounds.

Employed primarily in USAF Special Operations is the Bell **UH-1F**, a light utility cargo or personnel carrier, with limited gunship capability. Powered by a 1,325-shaft-horsepower General Electric T58-3, it cruises at 130 mph with a combat range of 345 miles, carrying up to 10 passengers or a 2,000-pound cargo. Rotor diameter is 48 feet, length 57 feet, and maximum takeoff weight is 9,000 pounds. USAF is also receiving the **UH-1H**, powered by a more advanced T53-13, which improves hot-day, high-altitude performance.

Still used in utility roles in the US is the Boeing Vertol **HH-21 Workhorse**, noted for its banana-shaped fuselage. Equipped with a Wright R1820 piston engine of 1,425 horsepower, the **HH-21** cruises at about 100 mph with a range of 300 miles. Maximum takeoff weight is 15,000 pounds, accommodating up to 20 passengers or 3,000 pounds of cargo.

# The Utility and Experimental Aircraft



U-2



U-10B COURIER



U-3A BLUE CANOE

The best known of USAF's utility planes is the long-range, high-flying Lockheed **U-2** reconnaissance aircraft. Its role as a spy plane has been largely taken over by the SR-71 and by reconnaissance satellites, but the U-2 continues to keep track of Soviet and Chinese nuclear-weapon tests by high-altitude air sampling for the Defense Atomic Support Agency, and performs other weather and research projects.

The single-seat plane (the U-2D is a two-seater) is 49 feet 7 inches long and has an 80-foot wingspan to help it achieve its 90,000-foot ceiling. Its power-

plant is a Pratt & Whitney J75-13 with 20,000 pounds of thrust, which can be shut off in flight as the plane glides, to extend its range. Top speed is 500 mph and gross weight more than 22,000 pounds.

Another utility craft with some clandestine functions is the Helio **U-10 Courier**, employed in counterinsurgency operations in Southeast Asia. Its principal attribute is its STOL performance. The U-10 is capable of taking off from unimproved airstrips in 500 feet or less. It can fly as slow as 30 mph, offering an excellent visual reconnaissance plat-

form. Thirty feet long, with 39-foot wingspan, it carries six people, including pilot, or 1,000 pounds of cargo. The U-10's powerplant is a 380-horsepower Lycoming IGSO-540; earlier models use the 295-horsepower Lycoming GO480. Top speed is 150 mph, and range is 1,100 miles.

Two liaison planes flown mainly in the US are the Cessna **U-3 Blue Canoe**, military version of the Cessna 310, and North American Rockwell's U-4, adapted from the Aero Commander. The U-3, powered by a Lycoming O470 of 240

*(Continued on following page)*



U-4A



U-6A BEAVER

horsepower or IO470 with 260 horsepower, carries up to five persons at a speed of 240 mph and has a range of 1,400 miles. Gross takeoff weight is 5,100 pounds. The larger U-4 uses two Lycoming GO480s with 340 horsepower, giving it a 250-mph speed and 1,600-mile range. Takeoff weight is 7,500 pounds.

Employed in the Strategic Air Command for missile-site support is the de Havilland (Canada) U-6 Beaver. It carries six people or 1,000 pounds of cargo, powered by a 450-horsepower Pratt & Whitney R985 engine. Speed is 180 mph, and range is 600 miles.

USAF's only amphibious fixed-wing aircraft is the Grumman HU-16 Albatross, in semiretirement after more than 20 years of service, but still used in some areas as a search and rescue craft, and with the Air National Guard as a transport for Army Special Forces. The HU-16B has a wingspan of 96 feet 8 inches, is 60 feet 8 inches long, and has a maximum takeoff weight of 34,000 pounds. It is powered by two 1,425-horsepower Wright R1820s and has a top speed of 230 mph, and a range of 2,700 miles.

The only experimental planes active on USAF rolls are the Martin Marietta X-24 piloted lifting-body research craft, and the Bensen X-25 Gyrocopter. The wingless, flatiron-shaped X-24 is used in gathering data for designing a vehicle capable of returning from an orbiting spacecraft and landing at conventional airfields. It is 24.5 feet long, and its tail fins have a span of 13 feet 8 inches. It is controlled in flight by two pairs of flaps at the rear of the body and a pair of split rudders on each of the outer tail fins. Power is supplied by a Thiokol XLR-11 rocket engine with 8,000 pounds of thrust. The engine is ignited after the plane is air-launched from a B-52, and is capable of boosting the X-24's speed to Mach 2. The pilot also has available two Bell LRV 500-pound-thrust rockets to assist in landing.

The X-25 is a standard Bensen autogyro being tested as an escape vehicle for pilots forced to bail out over enemy territory. Both powered and glider models are being evaluated.—END



HU-16 ALBATROSS

X-24A



X-25B GYROCOPTER

"Since the beginning of time, there have been those men who looked to the sky, who envied birds their graceful soaring flight, who said to themselves, 'If I could but fly. . . .'"

"This is the story of those men, and how they learned to fly, and the remarkable things that have happened since."

—FROM THE ENTRANCE TO THE AIR FORCE MUSEUM  
WRIGHT-PATTERSON AFB, OHIO

## Air Force Museum to Have a New Home

**A**N AIR Force-wide fund-raising effort in support of the new \$6 million Air Force Museum being built at Wright-Patterson AFB, Ohio, will be conducted during July, the Air Force has announced.

The fund drive, sponsored by the Air Force Museum Foundation, Inc., will be conducted throughout the Air Force by volunteer military and civilian personnel and by Air Force auxiliary organizations.

Every military and civilian member of the Air Force will be afforded the opportunity to donate to the Air Force Museum Foundation, Inc., by direct mail to the Foundation and through local base volunteers.

To date, funds for the construction of the Museum have been provided largely by the late Eugene W. Kettering and his family, of Dayton, Ohio; by local and national business and industry; and by private citizens. This fund-raising activity by the Foundation, initiated in 1964, will continue during the months ahead to permit additional organizations and individuals to have a part in supporting this outstanding repository for aerospace artifacts.

Supporters wishing to contribute to the construction of the Museum may do so by sending a check or money order with the accompanying contribution slip to the Air Force Museum Foundation, Inc., Post Office Box, Air Force One, Wright-Patterson AFB, Ohio 45433.

Construction of the museum was announced in March by Robert S. Oelman, chairman, and Frank G. Anger, President of the Air Force Museum Foundation, Inc. Actual construction began in April and will be completed early next year. The new Museum will be open free to the public in the summer of 1971.

The facility exceeds 240 feet in width and 800 feet in length and contains some 200,000 square feet. More than 160,000 square feet will be clear-span enclosed exhibit space accommodating up to 100 aircraft—double the number currently displayed indoors at the present Museum's temporary structure at Wright-Patterson. In addition to the aircraft, a variety of exhibits will depict the evolution of flight.

The remaining approximately 40,000 square feet is allocated to administrative offices, a 500-seat theater, a restaurant capable of serving 200 people, and a technical research library.

The building's modular design allows for efficient unit construction and provides optimum flexibility for growth to meet future demands. Year-round air-conditioning will add to visitor comfort and help preserve the aging artifacts and memorabilia on display and in storage.

Prime contractor is the Pascoe Steel Corp., of Pomona, Calif., and Columbus, Ga. Subcontractors are Dalton, Dalton, Little, of Cleveland, Ohio—architect, engineer, planners; and Industrial Construction Co., Inc., of Cleveland, Ohio—building erector.

Commenting on the new Museum, Secretary of the Air Force Robert C. Seamans stated that it will be a fitting replacement for the temporary space now housing the Museum and will serve as an enticement for aviation experts, amateurs and their families alike. "It will be an ideal repository of Air Force history and technology," the Secretary said.

Since its establishment in 1923, the Air Force Museum at Wright-Patterson AFB has played host to an increasing number of visitors each year. In 1969, 643,000 people visited the Museum, an increase of 100,000 over the previous year.

Displays at the Museum depict American military aviation history from the era of the Wright brothers to the present. Through its new facility, the Museum will ensure that much of the tangible evidence of the Air Force's heritage is preserved and displayed for posterity.

Secretary Seamans and Gen. John D. Ryan, USAF Chief of Staff, have expressed their hope that personnel of the Department of the Air Force, members of the aerospace industry, Air Force Association members, and aviation enthusiasts throughout the country will join them in making a voluntary tax-deductible contribution to this heritage for all mankind.—END

Air Force Museum Foundation, Inc.  
Post Office Box, Air Force One  
Wright-Patterson AFB, Ohio 45433

Gentlemen:

Please accept my enclosed donation of \$\_\_\_\_\_ to the Air Force Museum Foundation, Inc., as my tax-deductible contribution toward the construction of the new Air Force Museum at Wright-Patterson AFB, Ohio.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

AF/SD 5-70

Division had key roles in the Apollo missions. Specially modified KC-135 A/RIA (Apollo/range instrumentation aircraft) jet transports served as tracking stations relaying telemetry when the moonbound spacecraft were beyond line of sight of ground or ship tracking stations. And the Tactical Satellite Communications System (TACSATCOM) ultrahigh-frequency communications terminals in a land, sea, and air network were the first line of communications with the spacecraft.

During the Apollo spacecraft flights themselves, AFSC personnel provided radar, telemetry, communications, weather information, and a complete complement of instrumentation ships on station in the Atlantic and Pacific Oceans.

By the end of March, AFSC's Space and Missile Systems Organization (SAMSO) had conducted eleven Minuteman II launches and six Minuteman III launches from the Western Test Range (WTR) at Vandenberg AFB, Calif., and nine Minuteman III launches from the Eastern Test Range (ETR) at Patrick AFB, Fla., since the beginning of 1969. In the Fiscal 1971 budget, \$686 million has been asked for Minuteman procurement, production, modification, and spares support. This figure includes \$528.3 million for Minuteman III.

## SAMTEC Established at Vandenberg AFB

April 1 marked the establishment of a new organization at Vandenberg AFB, Calif., the Space and Missile Test Center (SAMTEC). The new test center was formed by combining two major Systems Command elements at Vandenberg—the 6595th Aerospace Test Wing and the Air Force Western Test Range—with a third Systems Command element at Patrick AFB, Fla., the 6555th Aerospace Test Wing.

The new organization reports directly to Hq. Space and Missile Systems Organization (SAMSO) at Los Angeles. The new center will continue to perform the missions of the units it replaced. These include the field-test responsibilities for SAMSO ballistic and space programs at both the East and West Coast Air Force launch facilities.

In addition, SAMTEC will operate the resources of the former Air Force Western Test Range to provide support to all DoD and NASA launches conducted at Vandenberg.

The consolidation of the SAMSO field-test activities at Cape Kennedy with similar activities at Vandenberg is expected to provide beneficial integration of the experience acquired at both Patrick and Vandenberg in ballistic missile and space launch operations. The new management structure also is expected to produce more efficient use of the total resources at the two locations.

Maj. Gen. Clifford J. Kronauer, who previously commanded the Air Force Western Test Range, will command the new test center.

Col. Herbert Holdsambeck, commander of the 6595th ATW, will continue as head of SAMSO field-test activities at Vandenberg and will assume new responsibilities in overseeing the SAMSO launch activities at the Eastern Test Range. Range operations will continue to be directed by Col. James Tapp.

WTR assisted the European Space Research Organization (ESRO) and NASA in a ten-nation science satellite polar-orbit launch of ESRO 1B. An Air Force Scout vehicle sent the satellite into successful orbit October 1.

SAMSO is completing what may be one of the most significant means recently devised to ascertain appropriate space or missile vehicle selections on short notice. Called the Launch Vehicle Cost and Performance Study (L-2 computer program), it evaluates the production rates, performance, and costs in selecting a specific vehicle to perform a specific mission or missions.

Other recent highlights included these:

- **Time Sharing**—RADC's GE computer serves thirteen Central New York and ten DoD schools.

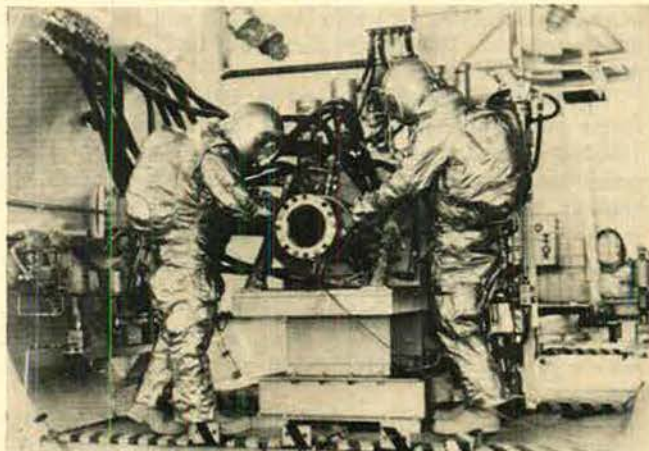
- **Computer Science Center**—supporting researchers, managers, personnel offices at Aeronautical Systems Division . . . services include feasibility studies, storing and retrieving personnel records, procurement data . . . includes analog, digital, and hybrid computers.

- **Air Force Central Tumor Registry**—automated storage and retrieval system in operation at Wilford Hall USAF Medical Center, Lackland AFB, Tex. . . . 7,000 follow-up entries expected to be entered yearly.

## The Laboratories

All Systems Command laboratory work is conducted with a view to practical applications for the research and development engaged in. One example was the recent provision of new types of portable equipment from expandable shelters to water-supply equipment for TAC's Bare Base exercise at North Field, S.C. Other examples of laboratory projects are:

- An in-house development of a new laser beam scanner at the Air Force Weapons Laboratory has been used to display the phenomenon of thermal

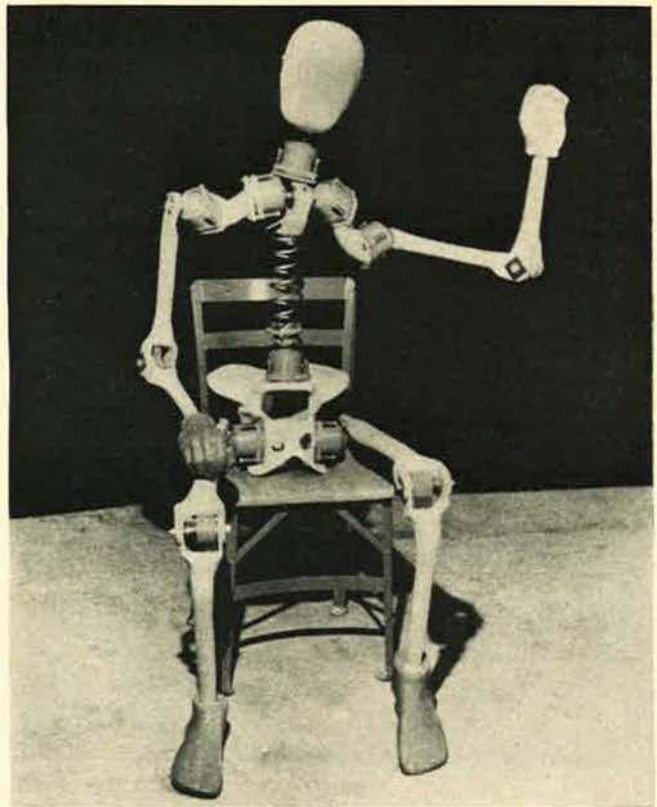


No spacemen, these technicians of the AF Rocket Propulsion Laboratory, Edwards AFB, Calif., don flash- and toxic-resistant gear to install a rocket engine on a test stand.





At Holloman AFB, N.M., is this 35,000-foot high-speed test track, an Air Force Missile Development Center facility that is in frequent use, testing the latest in equipment.



Remarkable "Dynamic Dan," a mechanical skeleton capable of slumping and deforming just like a human, is used to test pilot reaction to such shocks as aircraft ejection.

blooming, heretofore not possible with existing equipment.

- The Air Force Flight Dynamics Laboratory completed tests in twenty-eight days to determine that the O-2 forward air controller airplane can operate from unimproved runways.

- In September, Aerospace Medical Research Laboratory's Toxic Hazards Research Facility's construction program was completed. This has doubled its capacity for research in toxicology, hypobaric conditions, and other simulated atmospheric conditions.

- An LA-4 research aircraft equipped with an experimental Air Cushion Landing System successfully completed its first takeoff and landing on water in September. Developed for the Flight Dynamics Laboratory, the new landing system has also passed landing tests on ice, snow, grass, and hard-surface runways.

- A mechanical analog—a model of the mechanical characteristics of the human body—was developed by the Aerospace Medical Research Laboratories, primarily for use in tests of ejection seats and other airborne escape systems. Resembling in appearance the skeleton of a department store dummy, the analog is known as "Dynamic Dan."

- Integrated microwave technology developed by the Air Force Avionics Laboratory was utilized in a new-type radar known as MERA (Molecular Electronics for Radar Applications). MERA is an all solid-state (integrated circuit), multimode airborne radar operating in the X-band. It scans its field of vision electronically, eliminating the familiar rotating antenna which scans mechanically.

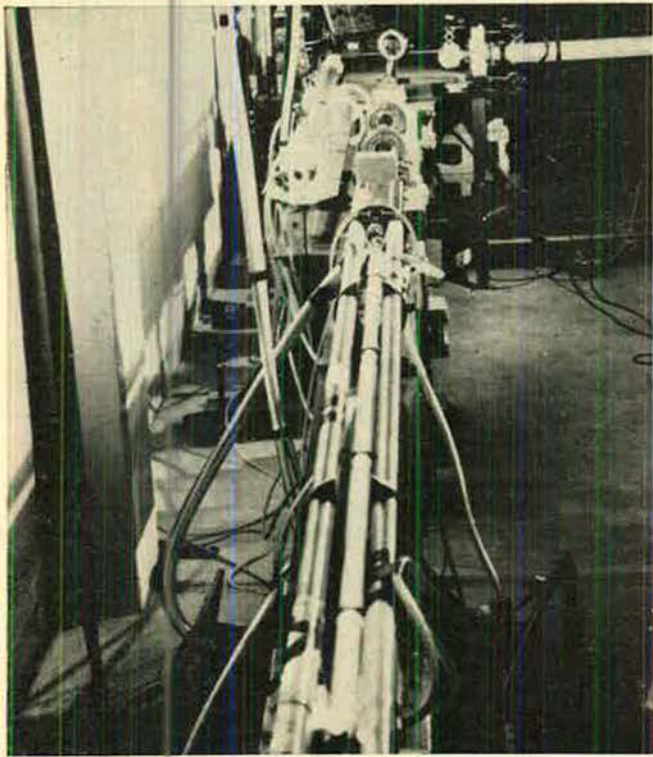
- A low temperature of eleven degrees Kelvin was achieved at the Air Force Flight Dynamics Laboratory on a flight-weight prototype Vuilleumier cryogenic refrigerator. This demonstrated that many critical problems associated with heat loss, staging, dynamic seals, and regenerator performance could be resolved. It also may have set a worldwide low-temperature record for the Vuilleumier cycle unit.

- The Daisy Decelerator, operated by the 6571st Aeromedical Research Laboratory, logged its 5,000th run during October. The facility is an invaluable research tool in the study of physiological effects of abrupt acceleration and deceleration and has been in operation about fourteen years.

- The Air Force Weapons Laboratory conducted its largest nuclear shock-wave effects simulation test near Cedar City, Utah, on August 14. The test, called HANDEC II for HEST and DIHEST environments combined, simulated two types of shock effects, one duplicating the atmospheric shock wave and the other duplicating the shock wave induced directly into the ground.

- An estimated 1,000 percent reduction in size and weight of integrated circuitry is possible by using a new device delivered to the Air Force Avionics Laboratory. It is a method of interconnecting large numbers of circuits or devices on a wafer (round disc) to perform a specific function without first physically separating them.

- An advanced X-ray radiography technique was developed by the Air Force Armament Laboratory,  
(Continued on following page)



The Air Force Weapons Laboratory, Kirtland AFB, N.M., uses the equipment of its Laser Optics Lab to study the effects of the powerful lasers on various test materials.

which demonstrated improved capabilities in nondestructive testing and inspection for production quality control and medical surgery. In the medical field this technology permits real-time observation of a patient's vital organs for diagnostic and post-surgery applications.

- Two important testing methods were initiated by the Air Force Human Resources Laboratory (AFHRL). A videotape system was installed in an F-4E aircraft at the Air Force Flight Test Center for use in measuring aircraft pilot performance during tests of new weapon systems. Tactical Air Command is using AFHRL's Personnel Activity Analysis Radio System to record human factors data on people as they perform their jobs.

- The use of aluminum alloys in cartridge cases for automatic guns has been tested and demonstrated jointly by the Air Force Materials Laboratory and

Frankford Arsenal. The use of aluminum rather than copper, as in the past, will provide savings of up to twenty-eight percent in weight and ten percent in cost.

- An F-4 beryllium rudder, forty percent lighter than the production aluminum rudder, exceeded critical design ultimate load conditions, although previously damaged during acoustic fatigue endurance tests. Failure finally occurred at 200 percent design limit load under static test conditions representing the most severe design conditions, such as maximum bending during rolling pullout maneuvers.

- The Flight Dynamics Laboratory began studying the problems involved with vertical and short take-off and landing (V/STOL) aircraft during rotor starting and stopping, and rotor folding and unfolding. The problem of landing large cargo aircraft on dirt airstrips also came under special study. The study was expected to shed new light on landing gear designs.

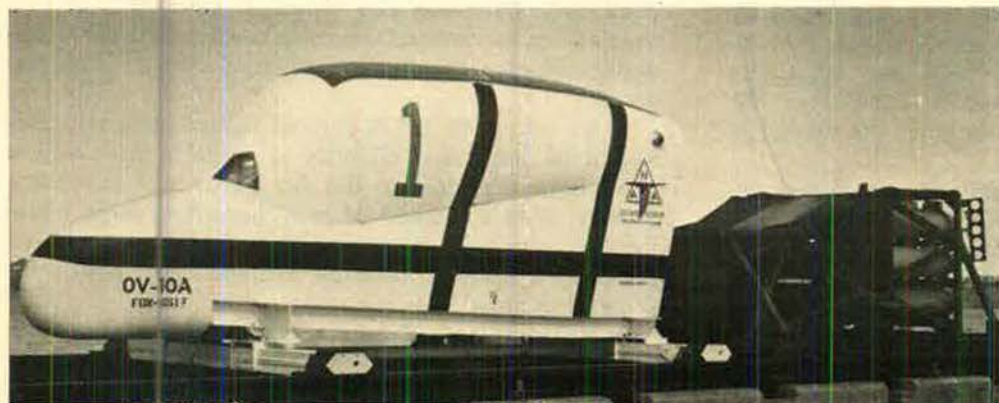
- The Air Force Materials Laboratory and ASD's Directorate of Flight Test began evaluating a paper parachute capable of handling loads up to one ton. In tests, the paper chute performed much like the standard nylon chute and showed that it could be used at least four times.

- A flyable, lightweight, integrated computer for fire and overheat detection in aircraft has been delivered to the Air Force Aero Propulsion Laboratory. Weighing slightly less than four pounds, it is capable of handling a total of twenty-four sensors, ultraviolet and infrared fire detectors, and continuous element overheat detectors.

- The Air Force Materials Laboratory has a prototype sample of transparent material suitable for duty on helicopters as armored windshields. It is polycrystalline magnesium oxide fabricated into the largest piece of optically transparent ceramic ever produced—eleven inches in diameter and 3/16-inch thick.

\* \* \*

In summary, the future promises to be difficult. Potential adversaries are pushing on all the frontiers of technology. This country must achieve its technological goals with less in the way of money, manpower, and facilities. This is the ultimate challenge to our ingenuity, our creativity, our sense of realism, and our managerial competence. This is the crossroad at which military research and development stands today.—END



AF Missile Development Center conducted extensive tests on a new seat-ejection system for one of the latest COIN aircraft, the OV-10A. The aircraft, developed by North American Rockwell, is now operational, serving in Vietnam.

to get  
**AIR FORCE/SPACE DIGEST**  
for yourself!

Take advantage of  
the low three-year  
membership rate!

If you liked this issue, join more than 120,000 readers who enjoy their own copies of the world's leading aerospace magazine every month. AIR FORCE/

SPACE DIGEST covers the wide aerospace world from Aerospace Education to Research and Development to Vietnam with authority, accuracy and interest.

**MAIL YOUR APPLICATION TODAY!**

AFA membership includes other valuable benefits (see other side).



**AIR FORCE ASSOCIATION**

A Non-Profit Organization  
1750 Pennsylvania Avenue, N.W., Washington, D. C. 20006

**PROPOSED APPLICATION INFORMATION**

|  |  |
|--|--|
| <p><b>General Classification (Check One)</b></p> <p><input type="checkbox"/> Military (USAF)<br/> <input type="checkbox"/> Military (Other)<br/> <input type="checkbox"/> Civilian (USAF)<br/> <input type="checkbox"/> Civilian (Other)</p> <p><b>Current Assignment (Check one if applicable)</b></p> <p><input type="checkbox"/> NASA<br/> <input type="checkbox"/> FAA<br/> <input type="checkbox"/> Other Government</p> <p><b>Business (Check one if applicable)</b></p> <p><input type="checkbox"/> Aerospace Industry<br/> <input type="checkbox"/> Other Business or Industry<br/> <input type="checkbox"/> Professional (Dr., Lawyer, etc.)<br/> <input type="checkbox"/> Education<br/> <input type="checkbox"/> News Media<br/> <input type="checkbox"/> Other</p> | <p><b>Job Function (Check One)</b></p> <p><input type="checkbox"/> Administration/Management<br/> <input type="checkbox"/> Engineering<br/> <input type="checkbox"/> Operation<br/> <input type="checkbox"/> Procurement<br/> <input type="checkbox"/> R &amp; D<br/> <input type="checkbox"/> Other</p> <p><b>Other Affiliation and/or Interests (Check all Appropriate Boxes)</b></p> <p><input type="checkbox"/> Air Force Reserve<br/> <input type="checkbox"/> Air National Guard<br/> <input type="checkbox"/> Air Force Retired<br/> <input type="checkbox"/> Aircraft Pilot<br/> <input type="checkbox"/> Aircraft Owner<br/> <input type="checkbox"/> Arnold Air Society Alumnus<br/>                 (School _____)<br/>                 Class _____</p> |
|--|--|

**APPLICATION FOR AFA MEMBERSHIP**

I wish to become a member of the Air Force Association and support its objective of adequate aerospace power for national security and world peace. I certify that I am a citizen of the United States, and understand that the annual membership fee of \$7 includes an annual subscription (\$6) to AIR FORCE/SPACE DIGEST.

Name \_\_\_\_\_

Rank (if any) \_\_\_\_\_ Soc. Sec. No. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

New     Renewal     Check Enclosed     Bill Me     \$7 (1 Year Membership)     \$18 (3 Year Membership)

5-70

facilities for USAF, other government agencies, and industry. Station activated Jan. 1, 1950; named for Gen. H. H. "Hap" Arnold, WW II AAF CG and generally acknowledged father of the modern USAF. Station has 40,121 acres and is from 950 to 1,150 ft. above sea level.

**Barksdale AFB, La. 71110;** 3½ mi. ESE of Shreveport. Phone: (318) 456-2252. SAC base; heavy bomber and tanker operations. Hq. 2d AF, SAC. Element of SAC's Post Attack Command and Control System to be relocated at Grissom AFB, Ind., by July 1970. Base is also site of AFRES military airlift group. Base activated Feb. 2, 1933; named for Lt. Eugene H. Barksdale, WW I airman; commissioned in Royal Flying Corps, credited with 3 enemy aircraft and shared in destruction of 5 others; killed Aug. 11, 1926, near Wright Field, Ohio, while flight-testing observation plane. Base has 22,000 acres (20,000 reserved for recreational area) and is 167 ft. above sea level.

**Beale AFB, Calif. 95903;** 11 mi. SE of Marysville. Phone: (916) 634-3000. SAC base. Heavy bomber, tanker, reconnaissance operations, 15th AF. Originally US Army's Camp Beale, named for Brig. Gen. Edward F. Beale, Indian agent in California before Civil War; became AFB in early 1948. Beale has 22,944 acres and is 113 ft. above sea level at runway, 300 ft. at base housing. Beale is the only USAF base having SR-71 strategic recon aircraft, capable of flying more than 2,000 mph at 80,000 ft.

**Bellows AFS, Hawaii, APO San Francisco 96333;** located on windward side of Oahu, adjacent to Waimanalo, approximately 12 mi. NE of Honolulu. Phone: (808) 262-0810.

Force Band. Base activated July 1, 1918, and is now one of oldest bases in USAF. Named for Col. Raynal C. Bolling, Ass't Chief of Air Service, who died saving the life of a 19-year-old private near Amiens, France, Mar. 26, 1918. Base has 604 acres and is 8.37 ft. above sea level.

**Brooks AFB, Tex. 78235;** 7 mi. SE of San Antonio. Phone: (512) 536-1110. AFSC base; home of Aerospace Medical Div. and USAF School of Aerospace Medicine, dedicated to supporting man in aerospace through research, education, and clinical medicine. Base activated Dec. 5, 1917, as Gosport Field; renamed for Cadet Sidney J. Brooks, Jr., local youth who was killed Nov. 13, 1917, on his final solo flight before commissioning; he was awarded lieutenant and pilot's wings posthumously. Base has 1,352 acres and is 694 ft. above sea level. Brooks is the second oldest AFB still in operation.

**Cannon AFB, N.M. 88101;** 8 mi. W of Clovis. Phone: (505) 784-3311. TAC base; the Air Force's second operational F-111 fighter base; 3 F-111 squadrons to reach full manning by July 1971. Also site of forward air controller training, TAC; and F-111 pilot, aircraft commander, and ground maintenance training, TAC. Base activated Aug. 1942 as Clovis AFB; in June 1957 renamed for Gen. John K. Cannon, WW II Commander of 12th AF and Mediterranean Allied TAC; later commanded all Allied Air Forces in Mediterranean; headed postwar ATC, USAFE, and TAC; retired 1954 and died of heart attack Jan. 12, 1955. Base has 11,339 acres and is 4,295 ft. above sea level.

**Carswell AFB, Tex. 76127;** 7 mi. WNW of downtown Fort

(Continued on following page)



If you're already an AFA member, please give this card to an aerospace minded friend or associate who would like to have the benefit of AFA membership for himself—benefits which include:

- 1 Five valuable, low-cost group insurance programs exclusively for members and their families.
- 2 A paid subscription to AIR FORCE/SPACE DIGEST.
- 3 Money-saving cash discounts on auto rentals for AFA members only.
- 4 Personal membership card and lapel pin.
- 5 Nationwide AFA educational activities.

**MEMBERSHIP IS OPEN TO ALL U. S. CITIZENS**



The Air Force uses the effects of

which der...  
structive t...  
control an...  
technology...  
vital orga...  
tions.

- Two the Air Fo...  
A videota...  
at the Air

uring aircraft pilot performance during tests of new weapon systems. Tactical Air Command is using AFHRL's Personnel Activity Analysis Radio System to record human factors data on people as they perform their jobs.

- The use of aluminum alloys in cartridge cases for automatic guns has been tested and demonstrated jointly by the Air Force Materials Laboratory and

**FIRST CLASS  
PERMIT  
NO. 4623R  
Wash., D. C.**

**BUSINESS REPLY MAIL**

No Postage Stamp Necessary If Mailed in the United States  
Or Any U.S. Military Post Office

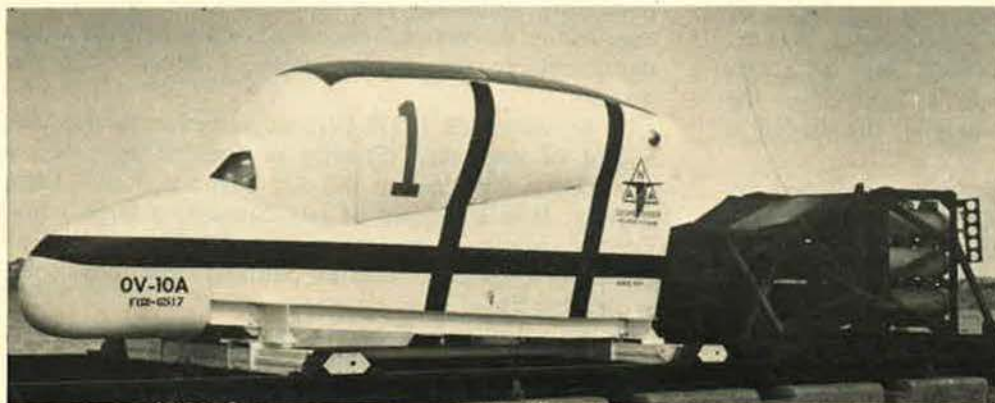
Postage Will Be Paid By —

**AIR FORCE ASSOCIATION**

1750 Pennsylvania Avenue, N.W.  
Washington, D. C. 20006



Potential adversaries are pushing on all the frontiers of technology. This country must achieve its technological goals with less in the way of money, manpower, and facilities. This is the ultimate challenge to our ingenuity, our creativity, our sense of realism, and our managerial competence. This is the crossroad at which military research and development stands today.—END



**AF Missile Development Center conducted extensive tests on a new seat-ejection system for one of the latest COIN aircraft, the OV-10A. The aircraft, developed by North American Rockwell, is now operational, serving in Vietnam.**

# Guide to Air Force Bases

WHERE THEY ARE • THEIR PHONE NUMBERS • WHAT THEIR JOBS ARE  
HOW THEY WERE NAMED • THEIR SIZE AND ALTITUDE

**Altus AFB**, Okla. 73521; 2 mi. NE of Altus. Phone: (405) 482-8100. MAC base; transition training for C-141, C-5 pilots and flight engineers. Formerly SAC base; SAC's 2d AF continues tanker operations as tenant. AFCS's 4th Mobile Comm. Gp. also has tenant status. Base activated Oct. 1953, named for nearby city. Altus has 2,487 acres and is 1,376 ft. above sea level.

**Andrews AFB**, Md. 20331; 11 mi. SE of Washington, D.C. Phone: (301) 981-9111. Headquarters Command base; high-priority airlift for HQ COMD USAF, MAC; also proficiency flying for HQ COMD USAF, AFRES, ANG, Navy, Marines. Hq. AFSC. Activated May 2, 1943, as Camp Springs Army Air Field; renamed for Lt. Gen. Frank M. Andrews, military air pioneer, WW II CG, European Theater, who was killed in an aircraft accident, Iceland, May 3, 1943. Base has 4,279 acres and is 279 ft. above sea level.

**Arnold AFS**, Tenn. 37389; 12 mi. E of Tullahoma. Phone: (615) 455-2611. AFSC station; site of Arnold Engineering Development Center, which conducts research, development, test, evaluation, and studies in aerospace environmental testing facilities for USAF, other government agencies, and industry. Station activated Jan. 1, 1950; named for Gen. H. H. "Hap" Arnold, WW II AAF CG and generally acknowledged father of the modern USAF. Station has 40,121 acres and is from 950 to 1,150 ft. above sea level.

**Barksdale AFB**, La. 71110; 3½ mi. ESE of Shreveport. Phone: (318) 456-2252. SAC base; heavy bomber and tanker operations. Hq. 2d AF, SAC. Element of SAC's Post Attack Command and Control System to be relocated at Grissom AFB, Ind., by July 1970. Base is also site of AFRES military airlift group. Base activated Feb. 2, 1933; named for Lt. Eugene H. Barksdale, WW I airman; commissioned in Royal Flying Corps, credited with 3 enemy aircraft and shared in destruction of 5 others; killed Aug. 11, 1926, near Wright Field, Ohio, while flight-testing observation plane. Base has 22,000 acres (20,000 reserved for recreational area) and is 167 ft. above sea level.

**Beale AFB**, Calif. 95903; 11 mi. SE of Marysville. Phone: (916) 634-3000. SAC base. Heavy bomber, tanker, reconnaissance operations, 15th AF. Originally US Army's Camp Beale, named for Brig. Gen. Edward F. Beale, Indian agent in California before Civil War; became AFB in early 1948. Beale has 22,944 acres and is 113 ft. above sea level at runway, 300 ft. at base housing. Beale is the only USAF base having SR-71 strategic recon aircraft, capable of flying more than 2,000 mph at 80,000 ft.

**Bellows AFS**, Hawaii, APO San Francisco 96333; located on windward side of Oahu, adjacent to Waimanalo, approximately 12 mi. NE of Honolulu. Phone: (808) 262-0810.

PACAF base. It is a closed airfield and the area is presently used by the Marine Corps as a tactical maneuver area for the 1st Marine Brigade, by the Army for the operation of a Nike missile site, and by the Air Force as a radio-transmitter site. Base has 1,492 acres and is 15 ft. above sea level.

**Bergstrom AFB**, Tex. 78743; 7 mi. SE of Austin. Phone: (512) 385-4100. TAC base; tactical reconnaissance. Hq. 12th AF, TAC. Base activated Sept. 19, 1942, as Del Valle Army Air Base; renamed for Capt. John A. E. Bergstrom, first Austin serviceman to be killed in WW II; died Dec. 8, 1941, during Japanese bombardment of Clark Field, P.I. Bergstrom AFB has 3,147 acres and is 541 ft. above sea level.

**Blytheville AFB**, Ark. 72315; 4 mi. NW of Blytheville. Phone: (501) 763-3931. SAC base; heavy bomber and tanker operations, 2d AF. Base activated June 1942; deactivated Oct. 1945; reactivated June 1955; named for nearby city. Blytheville AFB has 3,067 acres and is 254 ft. above sea level.

**Bolling AFB**, D.C. 20332; 3 mi. S of the US Capitol. Phone: (202) 574-5110. Hq. Headquarters Command USAF; Hq. Civil Air Patrol. Home of USAF Honor Guard and Air Force Band. Base activated July 1, 1918, and is now one of oldest bases in USAF. Named for Col. Raynal C. Bolling, Ass't Chief of Air Service, who died saving the life of a 19-year-old private near Amiens, France, Mar. 26, 1918. Base has 604 acres and is 8.37 ft. above sea level.

**Brooks AFB**, Tex. 78235; 7 mi. SE of San Antonio. Phone: (512) 536-1110. AFSC base; home of Aerospace Medical Div. and USAF School of Aerospace Medicine, dedicated to supporting man in aerospace through research, education, and clinical medicine. Base activated Dec. 5, 1917, as Gosport Field; renamed for Cadet Sidney J. Brooks, Jr., local youth who was killed Nov. 13, 1917, on his final solo flight before commissioning; he was awarded lieutenantcy and pilot's wings posthumously. Base has 1,352 acres and is 694 ft. above sea level. Brooks is the second oldest AFB still in operation.

**Cannon AFB**, N.M. 88101; 8 mi. W of Clovis. Phone: (505) 784-3311. TAC base; the Air Force's second operational F-111 fighter base; 3 F-111 squadrons to reach full manning by July 1971. Also site of forward air controller training, TAC; and F-111 pilot, aircraft commander, and ground maintenance training, TAC. Base activated Aug. 1942 as Clovis AFB; in June 1957 renamed for Gen. John K. Cannon, WW II Commander of 12th AF and Mediterranean Allied TAC; later commanded all Allied Air Forces in Mediterranean; headed postwar ATC, USAFE, and TAC; retired 1954 and died of heart attack Jan. 12, 1955. Base has 11,339 acres and is 4,295 ft. above sea level.

**Carswell AFB**, Tex. 76127; 7 mi. WNW of downtown Fort  
(Continued on following page)

Worth. Phone: (817) 738-3511. SAC base; heavy bomber and tanker operations, 2d AF. FB-111 combat crew training program to be transferred to Plattsburgh AFB, N.Y., by July 1971. Base is also the site of AFRES military airlift wing. Base activated June 28, 1942, as Tarrant Field; later known as Fort Worth Army Air Field and Griffiss Air Base; renamed Jan. 30, 1948, for Maj. Horace S. Carswell, Jr., native of Fort Worth; WW II B-24 pilot and Medal of Honor winner; killed Oct. 26, 1944, when his plane crashed after attacking Japanese convoy in South China Sea. Base has 2,000 acres and is 650 ft. above sea level.

**Castle AFB**, Calif. 95340; 7 mi. NW of Merced. Phone: (209) 726-2011. SAC base; heavy bomber and tanker operations and training 15th AF. Base activated Dec. 1, 1941, as Merced Army Air Field; renamed Jan. 17, 1946, for Brig. Gen. Frederick W. Castle, WW II B-17 pilot and Medal of Honor winner, killed Dec. 24, 1944, when shot down by enemy fighters while leading an air division of B-17s over Liege, Belgium. Castle AFB has 2,700 acres and is 188 ft. above sea level. This base trains all of SAC's B-52 and KC-135 combat crew members.

**Chanute AFB**, Ill. 61866; adjoining Rantoul; 14 mi. N of Champaign. Phone: (217) 893-3111. ATC base; provides technical training in missile and aircraft maintenance and weather school. Museum, Chanute Technical Training Display Center, open 9:00 a.m. to 5:00 p.m. daily except Monday and Tuesday. Base activated May 21, 1917; named for Octave Chanute, engineer and glider pioneer who was an adviser to the Wright brothers; died in the US in 1910. Base has 2,100 acres and is 737 ft. above sea level.

**Charleston AFB**, S.C. 29404; 10 mi. N of Charleston. Phone: (803) 747-4111. MAC base; air transport operations, 21st AF. Additional C-141 associate reserve squadron to be activated by July 1971. Base activated Mar. 1, 1955; named for nearby city. Base has 3,500 acres and is 45 ft. above sea level.

**Clinton Co. AFB**, Ohio 45177; 2 mi. SE of Wilmington; 45 mi. NE of Cincinnati. Phone: (513) 382-1661. AFRES training base; also serves ANG and Naval Air Reserve. Base activated in 1942; deactivated 1949; reactivated 1951; named for geographical location. Base has 582 acres improved, 1,223 acres semi-improved, and is 1,072 ft. above sea level.

**Columbus AFB**, Miss. 39701; 9 mi. N of Columbus. Phone: (601) 434-7322. ATC base; conducts undergraduate pilot training, ATC. Base was activated in 1941 for pilot training purposes; named for nearby city. Was formerly SAC heavy bomber and tanker base. Columbus AFB has 4,606 acres and is 214 ft. above sea level.

**Craig AFB**, Ala. 36701; 5 mi. SE of Selma. Phone: (205) 874-7431. ATC base; undergraduate pilot training. Base activated August 1940; named for Bruce K. Craig, flight engineer for B-24 manufacturer, killed in 1941 during test flight of a B-24 Liberator in US. Base has 2,064 acres and is 176 ft. above sea level.

**Davis-Monthan AFB**, Ariz. 85707; 4 mi. SE of Tucson. Phone: (602) 793-3900. SAC base; strategic recon, 15th AF; Titan II ICBM support base, site of nation's first operational Titan II unit. By Oct. 1971, TAC A-7D combat crew training squadron to be relocated from Luke AFB; F-4 combat crew training wing will be inactivated and functions relocated at Luke AFB; A-7D tactical fighter wing will be activated at Davis-Monthan. Also houses AFLC's Military Aircraft Storage and Disposition Center. Base activated in 1927 as Tucson Municipal Airport; renamed in 1928 for two Tucsonans, both early Air Corps officers—2d Lt. Samuel H. Davis, killed Dec. 21, 1921, at Carlstrom Field, Arcadia, Fla.; and 2d Lt. Oscar Monthan, killed Mar. 27, 1924, at Luke Field, near Honolulu; both men died in aircraft accidents. Base has 15,000 acres and is 2,705 ft. above sea level.

**Dobbins AFB**, Ga. 30060; adjacent to Marietta, 10 mi. NW of Atlanta. Phone: (404) 428-4461. AFRES base; Hq. Eastern AFRES Region; AFRES military airlift wing. Also site of ANG and Naval Air Reserve. Base activated in 1944 as Marietta Army Air Field; renamed in 1950 for Capt. Charles Dobbins, WW II pilot killed in action off coast of Sicily. Base has 2,095 acres and is 1,068 ft. above sea level.

**Dover AFB**, Del. 19901; 3 mi. SE of Dover. Phone: (302) 734-8211. MAC base; air transport units, 21st AF; one C-133

squadron to be inactivated by Oct. 1970. Also houses fighter-interceptor unit, ADC; number of F-106s to be reduced from 24 to 18 by July 1970. Dover is the largest air freight terminal on the East Coast. Base activated Feb. 1951; named for nearby city. Base has 3,600 acres and is 28 ft. above sea level.

**Duluth International Airport**, Minn. 55814; 5 mi. NW of Duluth. Phone: (218) 727-8211. ADC base; Hq. 23d Air Division, ADC; fighter-interceptor and air defense missile operations, including ANG; SAGE Direction Center. Formerly known as Williamson-Johnson Airport, Duluth International is one of the few AFBs collocated with a civil agency. Base has housed a fighter group since 1952, an air division since 1958. Duluth International has 2,191 acres and is 602 ft. above sea level.

**Dyess AFB**, Tex. 79607; 6 mi. SW of Abilene. Phone: (915) 696-2102. SAC base; heavy bomber and tanker operations, 2d AF. Tactical airlift base, TAC, 12th AF. Base activated Sept. 1, 1955; formerly Tye Field, Abilene Air Base; renamed in Dec. 1956 for Lt. Col. William E. Dyess of Albany, Tex., WW II fighter pilot; captured by the Japanese Apr. 8, 1942; survived "Bataan Death March"; escaped from island of Mindanao and was returned to US; died in crash of a P-38, Dec. 23, 1943, Burbank, Calif. Base has 5,186 acres and is 1,773.6 ft. above sea level. Dyess AFB was the first military installation to receive homes under National Housing Act of 1955.

**Edwards AFB**, Calif. 93523; 18 mi. E of Rosamond. Phone: (805) 277-1110. AFSC base; AF Flight Test Center conducts R&D of aerospace weapon systems and rocket propulsion systems and trains aerospace test pilots, engineers, and project managers. AFFTC has served as proving ground for new military craft from USAF's first jet, the XP-59A, to the X-15 rocket research plane and the XB-70 Mach 3 research plane. C-5 Galaxy test program started here in June 1969. Base also houses NASA Flight Research Center, concerned with supersonic and transonic flight research, and is home for Army's Aviation Test Activity. Base activated Sept. 1933 as Muroc Army Air Field; renamed Dec. 8, 1949, for Capt. Glen W. Edwards, veteran of 50 A-20 light bomber missions in Europe in WW II, killed June 5, 1948, at Muroc Field in crash of a YB-49 Flying Wing experimental bomber he was testing. Edwards, with 301,000 acres, is one of the largest AFBs in the US in total size; the base is 2,302 ft. above sea level.

**Eglin AFB**, Fla. 32542; 2 mi. SW of Valparaiso. Phone: (904) 881-6668. AFSC base; research and development testing. Site of Armament Development and Test Center (formerly Air Proving Ground Center); site of Air Force Armament Laboratory (AFATL). High-altitude-probe testing function to be relocated at Eglin from Holloman AFB, N.M., by Oct. 1970. Eglin also is the home of TAC's Special Operations Force (formerly Special Air Warfare Center) and location of Special Operations School (formerly Special Air Warfare School). Activated in 1935 and known as Valparaiso Bombing and Gunnery Range; became Eglin Field in 1937, named for Lt. Col. Frederick I. Eglin, WW I flyer, killed in aircraft accident Jan. 1, 1937, in Alabama, while en route from Langley Field, Va., to Maxwell Field, Ala. The base has 464,980 acres and is 85 ft. above sea level.

**Eielson AFB**, Alaska (APO Seattle 98737); 26 mi. S of Fairbanks. Phone: (907) 377-2289. AAC base; serves as tanker base for SAC. Also houses weather recon for MAC, air defense and search and rescue for AAC, and communications for AFCS. Base activated Oct. 1943 as a satellite of Ladd Field; named for Carl B. Eielson, Arctic aviation pioneer, native of Hatton, N.D., who flew airmail in Alaska in the 1920s. On Nov. 9, 1929, he was lost while searching for an ice-bound ship in distress near the Siberian coast. His body was recovered Feb. 18, 1930, by a joint US-Russian search party. Base has about 35,000 acres and is 534 ft. above sea level.

**Ellington AFB**, Tex. 77030; 17 mi. SE of Houston. Phone: (713) 487-1400. AFRES base; supports AFRES and ANG training and operations; Hq. Central AFRES Region; ARRS detachment; USCG air station; AFCS sqdn.; AWS detachment; Lunar Landing Training Vehicle (LLTV) facilities; flying facilities, warehousing, and office space for NASA's Manned Spacecraft Center. Base activated Nov. 27, 1917, but phased out during the 1920s and the land leased to ranchers; reactivated Dec. 1, 1940, and used for wartime training of pilots,

navigators; and bombers; deactivated again in 1946; transferred to ATC and reactivated in 1949; transferred to AFRES (then CAC) in 1958. Named for Lt. Eric L. Ellington, 1909 Naval Academy graduate who transferred to the US Army in 1911 and was killed in an aircraft crash near San Diego, Calif., Nov. 24, 1913. Base has 2,200 acres owned or leased and is 40 ft. above sea level.

**Ellsworth AFB, S.D.** 57706; 10 mi. NE of Rapid City. Phone: (605) 342-2400. SAC base; heavy bomber and tanker operations; Minuteman ICBM support base, 15th AF. Element of SAC's Post Attack Command and Control System to be relocated from March AFB, Calif., by July 1970. Activated June 1942; formerly known as Rapid City Air Base and Weaver AFB; renamed in June 1953 for Brig. Gen. Richard E. Ellsworth, veteran of 400 combat missions in WW II in the CBI; killed Mar. 18, 1953, near Nut Cove, Newfoundland, in crash of RB-36 of the 28th Strategic Recon Wing, the unit he commanded at Rapid City AFB. Base has 5,675 acres and is 3,600 ft. above sea level. Ellsworth AFB is in a popular tourist area, near the Black Hills and Mount Rushmore.

**Elmendorf AFB, Alaska** (APO Seattle 98742); adjacent to Anchorage. Phone: (506) 754-9125 or 754-9121. AAC base; Hq. Alaskan Command and Hq. Alaskan Air Command. Base has mission to defend Alaska and North American continent by maintaining combat-ready fighter-interceptors, supporting tactical airlift forces, providing support to AAC and NORAD region, and support of MAC's operation "Combat Pacer," ferrying men and equipment to and from SEA. Tactical fighter squadron of 18 F-4E Phantoms being reassigned from MacDill AFB, Fla., by July 1970. As part of merger of AFCS and GEEIA, a partial transfer of functions is to be made from Elmendorf to McChord AFB, Wash., by Oct. 1970. Base houses detachment of Alaskan Communications System, a public utility. Base activated Dec. 12, 1940; named for Capt. Hugh M. Elmendorf, killed Jan. 13, 1933, at Wright Field, Ohio, while testing a new type of two-seat pursuit plane. Base has 13,400 acres and is 118 ft. above sea level.

**England AFB, La.** 71301; 6 mi. NNW of Alexandria. Phone: (318) 443-1110. TAC base; home of 4410th Combat Crew Training Wing training counterinsurgency forces for rapid deployment to any trouble spot in the world; 4532d Combat Crew Training Squadron to be inactivated by Oct. 1970. Base activated in 1939; deactivated in 1946; reactivated in 1950; formerly Alexandria AFB, renamed in May 1955 for Lt. Col. John B. England, WW II P-51 pilot who destroyed 19 German aircraft (4 on a single mission) in his 108 combat missions in ETO; killed Nov. 17, 1954, in France in F-86 crash during first TAC deployment to Europe. Base has 2,282 acres and is 89 ft. above sea level.

**Ent AFB, Colo.** 80912; 1 mi. E of Colorado Springs. Phone: (303) 635-8911. ADC base; though it has no flying operations (see *Peterson Field*), Ent is home of 3 major commands—North American Air Defense Command, Army Air Defense Command, Aerospace Defense Command. In addition, Ent supports the Cheyenne Mountain complex where, deep underground, is located NORAD's Combat Operations Center. Hq. 14th Aerospace Force (ADC). Base activated January 1951; named for Maj. Gen. Uzal G. Ent, 1924 West Point graduate who directed the Aug. 1943 low-level heavy-bomber attack on the Ploesti, Romania, oil complex, for which he received the DSC. Severely injured Oct. 1944 when a propeller sheared off nose of bomber he was taxiing, and broke his spine. Hospitalized, he refused any anesthetic for fear he might reveal pending A-bomb operations then under his command. He died Mar. 5, 1948. Base has 36 acres and is about 6,000 ft. above sea level.

**Fairchild AFB, Wash.** 99011; 11 mi. WSW of Spokane. Phone: (509) 247-1212. SAC base; heavy bomber and tanker operations, 15th AF. Also houses ATC combat crew training group which conducts survival training. AFCS and GEEIA functions to be relocated at McChord AFB, Wash., by Oct. 1970. Base activated Mar. 1, 1942, as Spokane Air Depot; renamed in 1950 for Gen. Muir S. Fairchild, native of Bellingham, Wash., who was USAF Vice Chief of Staff at the time of his death in Mar. 1950. Base has 5,450 acres and is 2,462 ft. above sea level.

**Forbes AFB, Kan.** 66620; 7 mi. S of Topeka. Phone: (913) 862-1234. TAC base; tactical airlift operations; a C-130E tacti-

cal airlift squadron to be activated here by July 1970. Also location of MAC's Aerospace Cartographic & Geodetic Service (ACGS). Base activated Aug. 22, 1942, as Topeka Army Air Base; renamed in June 1949 for Maj. Daniel H. Forbes, Jr., native of Carbondale, Kan., WW II recon pilot, killed June 5, 1948, at Muroc Field, Calif., when experimental YB-49 Flying Wing exploded in midair during test flight. Base has 6,502 acres and is 1,064 ft. above sea level.

**Francis E. Warren AFB, Wyo.** 82001; adjacent to Cheyenne. Phone: (307) 775-2510. SAC base; Minuteman ICBM support base, 15th AF. Also houses MAC geodetic survey sqdn. Base activated July 4, 1867; was under Army jurisdiction until 1947 when it was reassigned to USAF. Warren, an active post for more than 100 years, was the home of the first Atlas-D ICBM missile wing (1960-65); base also housed, until 1966, USAF's only missile division having all three ICBMs—Atlas, Titan, and Minuteman. Originally (until 1930) Fort D. A. Russell; base renamed for Francis Emory Warren, long-time Wyoming senator and an early governor of the state; Medal of Honor winner at 19 for action during the Civil War. His daughter married General of the Armies John J. Pershing. Base has 7,600 acres, plus 200 missile sites distributed over some 8,300 sq. mi., and is 6,000 ft. above sea level.

**George AFB, Calif.** 92392; 6 mi. W of Victorville. Phone: (714) 269-1110. TAC base. Base activated in 1941 as Victorville Army Air Field; renamed in June 1950 for Brig. Gen. Harold H. George (not to be confused with WW II Air Transport Command leader Lt. Gen. Harold L. George), WW I  
(Continued on following page)

## Glossary of Acronyms

|          |  |
|----------|--|
| AAC      | Alaskan Air Command                                |
| AAVS     | Aerospace Audio-Visual Service                     |
| AC&W     | Aircraft Control and Warning                       |
| ADC      | Aerospace Defense Command                          |
| AEDC     | Arnold Engineering Development Center              |
| AF       | Air Force  |
| AFB      | Air Force Base                                     |
| AFCS     | Air Force Communications Service                   |
| AFLC     | Air Force Logistics Command                        |
| AFRES    | Air Force Reserve                                  |
| AFROTC   | Air Force Reserve Officers Training Corps          |
| AFSC     | Air Force Systems Command                          |
| AMA      | Air Materiel Area                                  |
| ANG      | Air National Guard                                 |
| ASD      | Aeronautical Systems Division                      |
| ATC      | Air Training Command                               |
| AU       | Air University                                     |
| AWS      | Air Weather Service                                |
| CAP      | Civil Air Patrol                                   |
| CBI      | China-Burma-India Theater                          |
| CG       | Commanding General                                 |
| CO       | Commanding Officer                                 |
| DEC      | Distinguished Flying Cross                         |
| DSC      | Distinguished Service Cross                        |
| ETO      | European Theater of Operations                     |
| GEEIA    | Ground Electronics Engineering Installation Agency |
| HQ COMD  | Headquarters Command, USAF                         |
| USAF     |  |
| ICBM     | Intercontinental Ballistic Missile                 |
| MAC      | Military Airlift Command                           |
| MAP      | Military Assistance Program                        |
| NAS      | Naval Air Station                                  |
| NORAD    | North American Air Defense Command                 |
| POW      | Prisoner of War                                    |
| RCAF     | Royal Canadian Air Force                           |
| SAC      | Strategic Air Command                              |
| SAGE     | Semi-Automatic Ground Environment                  |
| SEA      | Southeast Asia                                     |
| TAC      | Tactical Air Command                               |
| USAF     | United States Air Force                            |
| USAFSS   | USAF Security Service                              |
| WW I, II | World Wars I and II                                |

fighter ace, the man largely responsible for adoption of "Off We Go" as official AF song; one of MacArthur's staff in the Philippines; accompanied MacArthur in withdrawal to Australia and was killed there in aircraft accident near Darwin, Apr. 29, 1942. Base has 5,000 acres and is 2,875 ft. above sea level.

**Goodfellow AFB, Tex.** 76901; 2 mi. SE of San Angelo. Phone: (915) 653-3231. USAF Security Service base; training for USAFSS. Base activated Aug. 17, 1940, as Goodfellow Field; named for 2d Lt. John J. Goodfellow, Jr., native of Fort Worth. WW I fighter pilot killed in combat Sept. 17, 1918, near Metz, France. Base has 1,127 acres and is 1,877 ft. above sea level.

**Grand Forks AFB, N.D.** 58201; 15 mi. W of Grand Forks. Phone: (701) 594-6011. SAC base; heavy bomber and tanker operations, Minuteman ICBM support base; 15th AF. Also houses ADC fighter-interceptor squadron. Base activated Sept. 1958; named for nearby city. Base has 5,400 acres and is 911 ft. above sea level.

**Griffiss AFB, N.Y.** 13440; 2 mi. NE of Rome and 15 mi. NW of Utica. Phone: (315) 330-1110. AFLC base. For many years home of AFLC's Ground Electronics Engineering Installation Agency (GEEIA) with global responsibility for ground communications and electronics. By Oct. 1970 GEEIA functions will be relocated and merged with AFCS at Richards-Gebaur AFB, Mo.; Eastern GEEIA Region functions will be relocated from Keesler AFB, Miss., and Eastern Communications Area functions will be relocated from Westover AFB, Mass., to form the Northern Communications Area, also by Oct. 1970. Major tenant is Rome Air Development Center (RADC), a laboratory and engineering support agency of the Air Force Systems Command. Also houses ADC fighter-interceptor operations and SAC heavy bombers and tankers. Base activated Feb. 1, 1942, as Rome Air Depot; renamed Sept. 20, 1948, for Lt. Col. Townsend E. Griffiss, native of Buffalo, N.Y., killed in aircraft accident Feb. 15, 1942, on flight from USSR to England on completion of a confidential mission to Russia. Base has 3,468 acres and is 515 ft. above sea level.

**Grissom AFB, Ind.** 46970; 8 mi. S of Peru. Phone: (317) 689-2211. SAC base; tanker operations, 2d AF. Elements of SAC's Post Attack Command and Control System to be relocated from Barksdale AFB, La., by July 1970. Base activated June 22, 1954, as Bunker Hill AFB; renamed May 12, 1968, for Lt. Col. Virgil I. "Gus" Grissom, one of the seven original NASA Astronauts, native of Mitchell, Ind., and graduate of Purdue Univ.; veteran of 100 F-86 Sabrejet combat missions in Korean War; made suborbital flight downrange in Mercury program, July 21, 1961; made 3-orbit Gemini flight with Cmdr. John Young on Mar. 23, 1965; killed Jan. 27, 1967, with Astronauts Edward White and Roger Chaffee, in Apollo capsule fire at Cape Kennedy, Fla. Base has 2,810 acres and is 800 ft. above sea level.

**Gunter AFB, Ala.** 36114; 4 mi. E of Montgomery. Phone: (205) 279-1110. AU base; home of USAF's Extension Course Institute. Base activated Aug. 27, 1940; named for William A. Gunter, Mayor of Montgomery for 27 years, an ardent exponent of airpower; died in 1940. Base encompasses about 2 sq. mi. and is 166 ft. above sea level.

**Hamilton AFB, Calif.** 94934; 6 mi. NNE of San Rafael. Phone: (415) 838-1110. ADC base; fighter-interceptor operations, 1st Fighter Wing. Also houses Hq. Western AFRES Region, AFRES; Hq. Western Communications Region, AFCS (to be inactivated by Oct. 1970); Western Aerospace Rescue and Recovery Center, MAC; 41st Aerospace Rescue and Recovery Squadron, MAC; and ADC's NCO Academy. Base activated Dec. 1, 1934, as Marin Meadows Airfield; renamed Mar. 17, 1932, for 1st Lt. Lloyd A. Hamilton, first American in WW I to fly with Royal Flying Corps, later with 17th Aero Squadron; killed Aug. 24, 1918, leading low-level bombing mission on German airdromes; received posthumous DSC. Base has 2,322 acres and is 60 ft. above sea level.

**Hancock Field, N.Y.** 13225; 10 mi. NNE of Syracuse. Phone: (315) 458-5500. ADC base; SAGE Direction Center; ADC's 21st Air Division provides aerospace defense for 9 states, 40,000,000 people. Base activated Sept. 1941 as Syracuse Army Air Base; renamed geographically. Base has 1,125 acres and is 520 ft. above sea level.

**Hickam AFB, Hawaii** (APO San Francisco 96553); 8 mi. W

## BASE CLOSINGS SINCE SEPTEMBER 1969

The following bases have been closed since the last "Guide to Air Force Bases" appeared, in the September 1969 Almanac Issue:

- **Bakalar AFB, Ind.** AFRES base; provided AFRES training in C-119 aircraft.

- **Clinton-Sherman AFB, Okla.** SAC base; heavy bomber and tanker operations, 8th AF.

- **Oxnard AFB, Calif.** ADC base; fighter-interceptor squadron.

- **Sewart AFB, Tenn.** TAC base; C-130 tactical airlift wing.

- **Stewart AFB, N. Y.** ADC base; home of Hq. Eastern NORAD Region (NORAD); Hq. 1st Air Force (ADC); Hq. 1st Region Army Air Defense Command (ARADCOM).

- **Suffolk Co. AFB, N. Y.** ADC base; fighter-interceptor squadron.

of Honolulu. Phone: (808) 444912. Home of Hq. PACAF and location of 6486th Air Base Wing, support organization for 199 Air Force units in Hawaii and throughout the Pacific. Base activated May 31, 1935, as Hickam Field; named for Lt. Col. Horace M. Hickam, 1908 West Point graduate who earned Silver Star in 1916 during Punitive Expedition to Mexico; assigned to Air Service, 1917; helped fly airmail, 1934; killed Nov. 5, 1934, when his A-12 struck an obstruction on an unlighted runway at Fort Crockett, Tex. Base has 2,259 acres and is at sea level.

**Hill AFB, Utah** 84401; 8 mi. S of Ogden. Phone: (801) 777-7221. AFLC base; Hq. Ogden Air Materiel Area. Furnishes logistic support for ICBMs and is manager for F-101 and F-4 aircraft. AFCS and GEEIA functions will be relocated to Norton AFB, Calif., by Oct. 1970. Base activated Dec. 1, 1939, as Hill Field; named for Maj. Ployer P. Hill, killed Oct. 30, 1935, Wright Field, Ohio, test-flying the first B-17, which crashed immediately after takeoff. Base has 7,000 acres and is 4,788 ft. above sea level.

**Holloman AFB, N.M.** 88330; 11 mi. SW of Alamogordo. Phone: (505) 473-6511. AFSC base; Hq. AF Missile Development Center (whose functions will be merged by Oct. 1970 with AF Special Weapons Center at Kirtland AFB, N.M.). Base conducts and supports 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). Also houses TAC tactical fighter wing; a tactical fighter squadron to be transferred here from Mountain Home AFB, Idaho, by Jan. 1971. Activated 1942 as Alamogordo Army Air Field; renamed June 1949 for Col. George V. Holloman, guided missile pioneer who also invented many aircraft instruments and landing devices; killed Mar. 19, 1946, in B-17 crash on Formosa while en route from Shanghai to Nichols Field, Manila. Base has 97,877 acres and is 4,000 ft. above sea level.

**Homestead AFB, Fla.** 33030; 5 mi. NNE of Homestead. Phone: (305) 257-8011. TAC base, F-4 replacement training unit to transfer to Luke AFB, Ariz. Homestead is site of TAC sea-survival school; also houses AFRES airlift squadron. Base activated Jan. 1955; named for nearby city. Base contains 3,607 acres and is 7 ft. above sea level.

**Hurlburt Field, Fla.** 32544 (Eglin AFB Auxiliary Field #9); 6 mi. W of Ft. Walton Beach; part of Eglin AFB reservation. Phone: (904) 881-6668. TAC base; home of 1st Special Operations Wing; combat crew training; and maintains combat-ready Special Operations squadrons. Also site of Air-Ground Operations School, Special Operations School, and site of an ADC Bomarc missile training squadron. Base activated Mar. 1942; later named for 1st Lt. Donald W. Hurlburt, a WW II bomber pilot who completed 25 bombing missions over France and Germany; killed Oct. 2, 1943, in plane crash near Hurlburt. Base is 35 ft. above sea level.

**Indian Springs AF Auxiliary Field, Nev.** 89018; 45 mi. NW of Las Vegas. Phone: (702) 879-3345. TAC base; provides



range support for TAC operations near Nellis AFB. This installation supports the Las Vegas Bombing and Gunnery Range which, with more than 3,000,000 acres, is considered to be the largest single reservation in the USAF inventory. Within the boundaries of Indian Springs the Atomic Energy Commission has conducted most of its tests, including the early shots at Yucca Flats. In addition, the Sandia Corp. carries out experiments in one sector of the range. A detachment of the AF Special Weapons Center is based here to support AEC tests. The base was activated in 1942; the name derives from early frontier days when various Indian tribes used the water resources in the area. Countless WW II and post-WW II fighter pilots received at least part of their combat training on the Indian Springs range. Base is 3,124 ft. above sea level.

**Keesler AFB, Miss.** 39534; located in Biloxi. Phone: (601) 377-1110. ATC base; communications and electronics training and personnel and administrative courses. Also provides pilot training under Military Assistance Program for foreign students in T-28 aircraft. Technical training to be reduced by July 1971. Eastern Region, GEEIA, to be inactivated and functions consolidated with newly activated AFCS squadron by Oct. 1970. In WW II, base served as basic training center and trained aircraft mechanics. Now known as the Electronics Training Center of USAF, Keesler honored its one-millionth graduate in June 1968. Base activated June 12, 1941; named for 2d Lt. Samuel R. Keesler, Jr., native of Greenwood, Miss., WW I aerial observer, killed Oct. 9, 1918, when his Sopwith Camel was downed east of Verdun, France, by German Fokkers; Keesler received a posthumous DSC. Base has 1,576 acres and is 26 ft. above sea level.

**Kelly AFB, Tex.** 78241; 5 mi. SW of San Antonio. Phone: (512) 925-1110. AFLC base, Hq. San Antonio Air Materiel Area; Hq. USAF Security Service; military airlift base and inland aerial port of embarkation, MAC; training operations, Texas ANG; AFRES C-119 tactical airlift group to be inactivated by Oct. 1970. Base activated May 7, 1917; Kelly is one of the oldest AFBs in continuous operation; named for 2d Lt. George E. M. Kelly, first Army pilot to lose his life in military aircraft; killed May 10, 1911, when his Curtiss D Pusher Type IV Military biplane crashed on landing at Ft. Sam Houston, Tex. Plane was the second purchased by the US government. Base has 3,924 acres and is 689 ft. above sea level. Kelly AFB boasts the largest maintenance hangar of its kind in the world.

**Kincheloe AFB, Mich.** 49788; 3 mi. SE of Kinross. Phone: (906) 495-5611. ADC base; air defense missile base. Also houses heavy bomber and tanker operations, SAC. Base activated 1941; deactivated 1945; reactivated 1952; originally Kinross AFB; renamed Sept. 18, 1959, for Capt. Iven C. Kincheloe, Jr., jet ace of Korean War, one-time holder of world altitude record of 126,200 ft. set in 1956 in Bell X-2 rocket-plane; killed July 26, 1958, in crash of an F-104 at Edwards AFB, Calif. Base has 3,700 acres and is 799 ft. above sea level. Kincheloe is scheduled to close in late 1970.

**King Salmon Airport, Alaska** (APO Seattle 98713); 250 mi. SW of Anchorage. Phone: (907) 721-3550. AAC base; furnishes air defense and aircraft warning for Alaskan Air Command. Activated in 1951; originally known as Naknek Army Air Base. Base has 1,700 acres and is 57 ft. above sea level. King Salmon is located in one of the best hunting and fishing areas in the world.

**Kingsley Field, Ore.** 97601; 5 mi. SE of Klamath Falls. Phone: (503) 882-4411. ADC base; fighter-interceptor operations. Formerly a naval air station, deactivated by the Navy in 1944; previously known as Klamath Falls Municipal Airport, base was activated by AF in April 1956; renamed for 2d Lt. David R. Kingsley, native of Portland, Ore., WW II B-17 bombardier; killed June 23, 1944, on mission against Ploesti, Romania, oil refineries, for which he earned posthumous Medal of Honor. Kingsley Field has 1,799 acres and is 4,081 ft. above sea level.

**Kirtland AFB, N.M.** 87117; borders the southern edge of Albuquerque. Phone: (505) 247-1711. AFSC base; furnishes nuclear and civil engineering research, development, and testing for USAF. Hq. AF Special Weapons Center and Air Force Weapons Laboratory, AFSC. AF Missile Development Center from Holloman AFB, N.M., will merge with AF Spe-

cial Weapons Center by Oct. 1970. Base also houses N.M. ANG fighter group, AFSC NCO Academy, 58th Weather Reconnaissance Squadron, and USAF Directorate of Nuclear Safety. Base activated Jan. 1941; named for Col. Roy S. Kirtland; enlisted in Army 1898; learned to fly 1911 on early Wright plane in Dayton; helped run Aviation School at College Park, Md.; became CO of 1st Aero Squadron 1913; served in France in WW I; served as Commandant of Langley Field, Va., in the 1930s; retired in 1938 but returned to active duty in pre-WW II buildup; died of heart attack May 2, 1941, Moffett Field, Calif. Base has 2,000 acres and is 5,352 ft. above sea level.

**K. I. Sawyer AFB, Mich.** 49843; 23 mi. S of Marquette. Phone: (906) 346-6511. SAC base; heavy bomber and tanker base, 2d AF; also houses fighter-interceptor squadron, ADC. Base activated 1956; named for Kenneth I. Sawyer, Marquette Co. road commissioner who proposed site for a county airport; died in 1944. Base has about 3,200 acres and is 1,220 ft. above sea level.

**Lackland AFB, Tex.** 78236; 12 mi. W of San Antonio. Phone: (512) 671-1110. ATC base; provides basic military training for airmen, precommissioning training for officers; technical training of basic, advanced security police personnel; sentry dog/handler courses; training of instructors, recruiters, and career motivation counselors; USAF marksmanship training and competitive teams. Also site of USAF Epidemiological Lab; USAF Personnel Research Lab (AFSC); San Antonio NORAD Control Center and AC&W squadron (ADC); Defense Language Institute English Language School, under US Army. Lackland, popularly known as "The Gateway Base" for its role in providing basic military training and indoctrination to nonprior-service airmen and officer trainees since 1941, has met the basic training mission except for a brief period after WW II when the base served as Personnel Redistribution Center. Base activated in 1941 with first cadet class entering training Nov. 1941; originally San Antonio Aviation Cadet Center; renamed July 12, 1947, for Brig. Gen. Frank D. Lackland, who entered military service in 1911, transferring to Air Service in 1917; became commandant of Kelly Field flying school; died in 1943. Base has 6,835 acres, including 4,017 acres at Lackland Training Annex, and is about 787 ft. above sea level.

**Langley AFB, Va.** 23365; 3 mi. N of Hampton. Phone: (703) 764-9990. TAC base; Hq. Tactical Air Command; tactical airlift base. Also houses fighter-interceptor and air defense missile units, ADC; and Hq. Tactical Communications Area, AFCS. Base activated Dec. 30, 1916; is the oldest continuously active AFB in the US; named for aviation pioneer and scientist Samuel Pierpont Langley, whose work, largely for Smithsonian Institution, closely paralleled that of the Wright brothers; Langley successfully flew experimental, small-scale aircraft models but failed twice in 1903 to launch his "Aerodrome" by catapult from a Potomac River houseboat; died in 1906. Base has 3,195 acres and is 10 ft. above sea level.

**Laredo AFB, Tex.** 78040; 3 mi. NE of Laredo, with city limits extending to the base. Phone: (512) 723-9121. ATC base; furnishes undergraduate pilot training in T-41, T-37, and T-38 aircraft. Base activated May 1, 1942; named for adjacent city, which is located on Rio Grande, thus enabling the base to claim "nearest to foreign assignment in the US." Base has 2,095 acres and is 508 ft. above sea level.

**Laughlin AFB, Tex.** 78840; 8 mi. W of Del Rio. Phone: (512) 298-3511. ATC base; provides undergraduate pilot training. Base activated Aug. 15, 1942; named for 1st Lt. Jack T. Laughlin of Del Rio, Tex., killed by enemy ground fire Jan. 29, 1942, while piloting a B-17 over Java. Base has 3,908 acres and is 1,080 ft. above sea level.

**Laurence G. Hanscom Field, Mass.** 01730; 17 mi. W of Boston. Phone: (617) 864-4441. AFSC base; Hq. Electronic Systems Div., AFSC, providing systems engineering and acquisition. Also site of AF Cambridge Research Laboratories, OAR, providing basic and applied research in electronics and geophysics. AFRES airlift operations. Joint federal-state use of the base began in 1946; site activated earlier as Bedford Airport; renamed for Laurence G. Hanscom, a Boston and Worcester newsman, pre-WW II advocate of private flying; killed in 1941 in a lightplane accident near Boston while

*(Continued on page 170)*

# Major Active Air Force



# Installations in the US



An AIR FORCE Magazine Map  
(As of April 1, 1970)

giving flying lessons. Hanscom Field is a state airport, operated by Massachusetts Port Authority. The tower is FAA controlled, and USAF is present on long-term-lease arrangements. USAF buildings, including military housing, are on land ceded to the federal government. The field is an outstanding example of military-civilian cooperation in a joint-use facility. According to FAA statistics, fewer than 10% of total operations are military. Base has 1,623 acres and is 133 ft. above sea level.

**Little Rock AFB**, Ark. 72076; 15 mi. NE of Little Rock. Phone: (501) 988-3131. TAC base; tactical airlift operations and combat crew training; also serves as SAC Titan ICBM support base. By July 1970 will be used as a satellite base for SAC. Home of Arkansas ANG tactical recon group. Base activated Aug. 1, 1955; named for nearby city. Base has 6,000 acres and is 310 ft. above sea level.

**Lockbourne AFB**, Ohio 43217; 11 mi. SSE of Columbus. Phone: (614) 492-8211. TAC base; C-130 tactical airlift wing and replacement training unit; one squadron of C-130Es will be activated by Apr. 1971. Combat crew training squadron for AC-119 gunships and TAC special operations squadron; also houses SAC air refueling wing; TAC C-123 tactical airlift squadron; home of Ohio ANG fighter wing. Base activated June 1942; named for nearby city. Base has 4,500 acres and is 744 ft. above sea level.

**Loring AFB**, Me. 04750; 2 mi. W of Limestone. Phone: (207) 999-1110. SAC base; heavy bomber and tanker operations, 2d AF. Also houses fighter-interceptor unit, ADC. Base activated Feb. 25, 1953, as Limestone AFB; renamed Oct. 1, 1954, for Maj. Charles J. Loring, Jr., native of Portland, Me., WW II P-47 pilot shot down Dec. 24, 1944, in Belgium and became a POW until end of the war; killed Nov. 22, 1952, near Sniper Ridge, North Korea, when he deliberately crashed his damaged F-80 into enemy gun emplacements, completely destroying them, for which he was posthumously awarded the Medal of Honor. Base, northeasternmost AFB in the continental US and located in the midst of some of the best hunting and fishing country in the nation, has more than 12,000 acres and is 746 ft. above sea level.

**Lowry AFB**, Colo. 80230; 5 mi. ESE of Denver. Phone: (303) 388-5411. ATC base; technical training center. Base activated Feb. 1938; named for 1st Lt. Francis B. Lowry of Denver, posthumous recipient of DSC, killed near Crepion, France, when anti-aircraft brought down his plane during photo mission, Sept. 26, 1918, during Meuse-Argonne offensive; the only Colorado airman to be killed in WW I. Base has 2,001 acres and is 5,400 ft. above sea level.

**Luke AFB**, Ariz. 85301; 20 mi. WNW of Phoenix. Phone: (602) 935-7411. TAC base; furnishes tactical fighter crew training, 12th AF; all F-4 combat crew training to be consolidated at Luke by Oct. 1971; A-7D combat crew training squadron to be relocated to Davis-Monthan AFB, Ariz. Luke houses SAGE direction center, ADC and Hq. 26th Air Division, ADC. Because of its outstanding Gila Bend gunnery range, Luke is the largest fighter training base in the free world. Programs include training USAF pilots in F-4 and F-100; training 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., native of Phoenix, America's No. 2 ace in WW I, winner of Medal of Honor for his spectacular achievement of shooting down 18 airplanes and balloons between Aug. 16 and Sept. 29, 1918, with 13 victories in a single week in Sept.; killed Sept. 29, 1918, near Murvaux, France; recipient of 2 DSCs. Base has 4,008 acres plus 2,500,000-acre range and is 1,101 ft. above sea level.

**MacDill AFB**, Fla. 33608; 8 mi. SSW of Tampa on Interbay Peninsula between Hillsborough and Tampa Bays. Phone: (813) 830-1110. Hq. US Strike Command. TAC base; Hq. 836th Air Division; replacement training, using F-4 Phantoms and B-57 Canberras; F-4 training to phase out and be consolidated at Luke AFB, Ariz.; 1 squadron of F-4Es to move to Elmendorf AFB, Alaska, replacing F-106s. Base activated Apr. 15, 1941; named for Col. Leslie MacDill, who commanded an aerial gunnery school in France in WW I; killed in airplane accident near Washington, D.C., Nov. 8, 1938. Base has 6,000 acres and is 6 ft. above sea level.

**Malmstrom AFB**, Mont. 59402; 4 mi. E of Great Falls. Phone: (406) 731-9990. SAC base; missile support base, with Minuteman ICBMs, 15th AF. Also Hq. 24th Air Division,

ADC, and fighter-interceptor squadron, ADC, and SAGE direction center, ADC. Base activated July 1942 as East Base and later Great Falls Army Base; renamed Oct. 1, 1955, for Col. Einar A. Malmstrom, WW II commander of 356th Fighter Group in ETO, shot down April 24, 1944, while on 54th combat mission, and became a POW; was deputy wing commander at Great Falls when he was killed in T-33 accident, Aug. 21, 1954. Base was used during WW II as takeoff point for lend-lease materiel for Russia; training base for B-17 crews, and C-54 crews for Berlin Airlift after the war; SAC assumed command on Feb. 1, 1954. Site of SAC's first Minuteman wing, July 1961. Base has 3,573 acres, plus about 23,000 sq. mi. in missile complex, and is 3,525 ft. above sea level.

**March AFB**, Calif. 92508; 9 mi. SE of Riverside. Phone: (714) 655-1110. SAC base; heavy bomber and tanker operations; Hq. 15th AF. Element of SAC's Post Attack Command and Control System being transferred to Ellsworth AFB, S.D., by July 1970. Base also houses military airlift wing, AFRES. Base activated Mar. 15, 1918, as Alessandro Flying Field; on Mar. 11, 1918, renamed March Field for 2d Lt. Peyton C. March, Jr., who died Feb. 18, 1918, of injuries received in aircraft accident at San Antonio, Tex.; son of Army's WW I Chief of Staff. Base has 8,840 acres and is 1,530 ft. above sea level.

**Mather AFB**, Calif. 95655; 5 mi. E of Sacramento. Phone: (916) 364-2261. ATC base; is USAF's only training installation for navigators, navigator-bombardiers, and electronic-warfare officers. Also houses heavy bomber and tanker units, 15th AF, SAC. Base activated May 2, 1918; named for 2d Lt. Carl S. Mather, who learned to fly in 1915 at Curtiss plant, Hammondsport, N.Y.; joined Aviation Section of the Signal Corps in July 1917; killed Jan. 30, 1918, in mid-air collision with another plane, Ellington Field, Tex. Base has 6,500 acres and is 96 ft. above sea level.

**Maxwell AFB**, Ala. 36112; 1 mi. WNW of Montgomery. Phone: (205) 293-1110. AU base; Hq. Air University, professional education center for USAF. Site of Air War College, Air Command and Staff College, Aerospace Studies Institute, Squadron Officer School, Academic Instructor and Allied Officer School, USAF Chaplain School, AU Institute for Professional Development; Hq. AFROTC. Base activated 1918 as Engine and Repair Depot, later known as Montgomery Air Intermediate Depot; renamed Nov. 8, 1922, for 2d Lt. William C. Maxwell, native of Natchez, Ala., killed Aug. 12, 1920, while serving with 3d Aero Squadron, Camp Stotsenburg, Luzon, P.I., when plane developed engine trouble on a flight to Manila; struck flagpole while avoiding group of children playing on emergency landing site. Base has 2,423 acres and is 166 ft. above sea level.

**McChord AFB**, Wash. 98438; 8 mi. S of Tacoma. Phone: (206) 984-1910. MAC base; hq. military airlift wing, 22d AF. Hq. 25th Air Division, ADC; houses a fighter-interceptor squadron, ADC; SAGE direction center, NORAD; site of AFRES military airlift group. From this base men and supplies are airlifted to Japan, Korea, and Southeast Asia. Air Force Communications Service and Ground Electronics Engineering Installation Agency functions to be merged and a new AFCS squadron to be activated with AFCS/GEEIA functions relocated from Fairchild AFB, Wash., by Oct. 1970. Base activated May 5, 1938; formerly Pierce Co. Airport; renamed July 3, 1940, for Col. William C. McChord, 1907 West Point graduate; Chief of Training and Operations Div., Hq. Air Corps, at time of his death Aug. 18, 1937, while attempting forced landing at Maidens, Va., 30 mi. from Richmond, during flight from Bolling Field, D.C., to Randolph Field, Tex., in A-17 attack aircraft. Base has about 4,500 acres; elevation ranges from sea level to 550 ft.

**McClellan AFB**, Calif. 95652; 10 mi. NE of Sacramento. Phone: (916) 643-2111. AFLC base; Hq. Sacramento Air Materiel Area; management, maintenance, and supply support of such AF weapon systems as F-111, F-100, F-105, F-104, and various communications systems. Also houses airborne early warning and control wing, ADC; weather recon wing, MAC; Western GEEIA region, AFLC (to be inactivated by Oct. 1970); military airlift group, AFRES. Base activated Apr. 29, 1939; named for Maj. Hezekiah McClellan, pioneer in arctic aeronautical experiments; took part in Nov. 1935 flight of 10 B-10 Martin bombers from Washington, D.C., to Fair-

banks, Alaska, and return; made solo flight in Douglas C-29 amphibian from Washington, D.C., to Nome, 1935. Flew aerial recon and mapping missions over Alaska; was first military flyer to land at Pt. Barrow; killed in crash of Consolidated PG-2 near Centerville, Ohio, May 25, 1936. Base has 2,583 acres and is 76 ft. above sea level.

**McConnell AFB**, Kan. 67221; 5 mi. SE of Wichita. Phone: (316) 685-1151. TAC base; F-105 pilot training, TAC. Titan II ICBM support base, SAC. Also home of 184th Tactical Fighter Group, Kansas ANG; Hq., 835th Air Division, TAC. Base activated June 5, 1951, as Wichita AFB; renamed Apr. 12, 1954, for Capt. Fred J. McConnell and his brother, 2d Lt. Thomas L. McConnell, of Wichita. Fred, a B-24 pilot in South Pacific in WW II, died in crash of private biplane, Oct. 25, 1945, near Garden Plain, Kan. Tom, also a B-24 pilot of 13th AF's 307th Bomb Group, was killed July 10, 1943, during attack on Bougainville. A third McConnell brother, Lt. Edwin M. McConnell, also served in B-24s in the South Pacific in WW II, flew 56 missions, and returned to civilian life, Aug. 1945. Base has 34,500 acres, including missile sites, and is 1,371 ft. above sea level.

**McCoy AFB**, Fla. 32812; 8 mi. SSE of Orlando. Phone: (305) 855-3210. SAC base; heavy bomber and tanker operations, 2d AF. Also houses airborne early warning and control squadron, ADC. Base activated 1942 as secondary field for Orlando Army Air Field; deactivated 1946; reactivated 1952 during Korean War as Pinecastle AFB; renamed in May 1958 for Col. Michael N. W. McCoy; joined RCAF in 1941 as ferry pilot; transferred to AAF, flying B-29s from Guam in WW II; in late 1945 made first nonstop flight from Japan to Washington, D.C., in B-29 *Fluffy Fuzz*; in 1950 made 42-hour B-50 flight from US to Hawaii and back; was project officer for *Lucky Lady I*, first nonstop round-the-world flight; commanded SAC's first B-47 wing; killed at Pinecastle AFB, Oct. 9, 1957, when his B-47 exploded. Base has 4,214 acres and is 127 ft. above sea level.

**McGuire AFB**, N.J. 08641; 18 mi SE of Trenton. Phone: (609) 724-2100. MAC base; Hq. 21st AF (scheduled for reduction, according to DoD announcement of Mar. 6, 1970). Host unit 438th MAW. Furnishes airlift of troops and cargo to Southeast Asia; C-141 unit handles all med-evac from Europe. Additional C-141 associate reserve squadron to be activated by July 1971. Base also houses air defense missile unit (Bomarc), ADC. Base activated 1939 as Fort Dix Army Air Base; renamed in June 1949 for Maj. Thomas B. McGuire, Jr., native of Ridgewood, N.J., second leading ace of WW II, holder of Medal of Honor; P-38 pilot in South Pacific, 38 victories; killed Jan. 7, 1945, while leading flight of 4 P-38s in attack on enemy airstrip on Negros Island in the Philippines (not to be confused with Los Negros Islands in the Admiralty Islands group in the Bismarck Archipelago). Base has 5,000 acres and is 133 ft. above sea level.

**Minot AFB**, N.D. 58701; 13 mi. N of Minot. Phone: (701) 727-4761. SAC base; heavy bomber and tanker operations, 15th AF; missile support base, Minuteman ICBM. Also houses fighter-interceptor unit, ADC. Base activated Sept. 1, 1958; named for nearby city. Base has 5,151 acres plus 19,058 additional for missile sites, and is 1,668 ft. above sea level.

**Moody AFB**, Ga. 31601; 10 mi. NNE of Valdosta. Phone: (912) 333-4211. ATC base; undergraduate pilot training for USAF, ANG, USMC, and allied nations. Base activated June 1941; deactivated Jan. 1946; reactivated May 1951; named for Maj. George P. Moody, 1929 West Point graduate; killed May 5, 1941, at Wichita, Kan., while testing Beech AT-10 transitional trainer. Base has 5,000 acres and is 233 ft. above sea level. Moody has adjoining FAA radar approach facility.

**Mountain Home AFB**, Idaho 83648; 10 mi. SW of Mountain Home. Phone: (208) 828-2111. TAC base; tactical recon wing with attached tactical fighter squadron (to be transferred to Holloman AFB, N.M., by Jan. 1971). F-4D fighter unit and RF-4C recon unit are dual-based. NATO-committed squadrons; two RF-4C replacement training units. Base activated 1943; named for nearby city. Base has 6,639 acres and is 3,000 ft. above sea level.

**Murphy Dome AFS**, Alaska (APO Seattle 98750); 26 mi. NW of Fairbanks. Phone: (907) 744-1202. AAC base; air defense activities. Construction started in 1949, base completed 1951; for many years it was thought the station was named for Lt. Alexander Murphy, whose helicopter crashed on the

Dome, July 1949, where the remains of his aircraft may still be seen; name actually comes, however, from veteran hard-rock miner John Murphy, who lived and worked in the area many years before the site was built. Murphy Dome is the only remote site in Alaska boasting fresh milk and ice cream daily. Base has 60 acres around immediate site but includes total of 1,360 acres and is 2,990 ft. above sea level.

**Myrtle Beach AFB**, S.C. 29577; 3 mi. S of Myrtle Beach. Phone: (803) 448-8311. TAC base; to be site of first operational A-7D wing, summer 1970; fighter-recon training in T/AT-33 aircraft, 9th AF. Base activated Dec. 1956; named for nearby city. Base is located in summer resort area, has 3,800 acres and is 25 ft. above sea level.

**Nellis AFB**, Nev. 89110; 8 mi. NE of Las Vegas. Phone: (702) 643-1800. TAC base; 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. Base activated Jan. 25, 1941, as Las Vegas Army Air Corps Gunnery School; later Las Vegas AFB; renamed May 20, 1950, for 1st Lt. William H. Nellis, native of Santa Rita, N.M., who spent his youth in Nevada; WW II fighter pilot; 69 missions in P-47 Thunderbolts before his death Dec. 27, 1944, over Luxembourg. Base, known as "Home of the Fighter Pilot" and also home of the famed USAF Thunderbirds aerobatic team, has more than 3,000,000 acres, including gunnery ranges (see *Indian Springs*), and is 1,868 ft. above sea level.

**Niagara Falls International Airport**, N.Y. 14306; 4 mi. E of Niagara Falls. Phone: (716) 297-4100. ADC base; furnishes turnaround capability for F-106 aircraft; houses F-100 group, New York ANG, and AFRES tactical airlift group; 914th Squadron (AFRES) to be inactivated by Oct. 1970. Base activated in 1952 as Niagara Falls Municipal Airport; named for nearby city. Installation has 979 acres, and is 590 ft. above sea level.

**Norton AFB**, Calif. 92409; 59 mi. E of Los Angeles, within corporate limits of city of San Bernardino. Phone: (714) 382-1001. MAC base; military airlift wing, furnishing combat airlift of troops and cargo, using C-141 StarLifter aircraft. Also houses Inspector General and Auditor General groups; Space and Missile Systems Organization, AFSC, AFRES Associate Unit, Aerospace Audio-Visual Service, MAC, AFCS/GEEIA functions from Edwards and Vandenberg AFBs, Calif., and Hill AFB, Utah, will be merged at Norton by Oct. 1970. Base activated Mar. 2, 1942, as San Bernardino Air Depot; renamed in Mar. 1950 for Capt. Leland F. Norton, native of San Bernardino, WW II A-20 attack-bomber pilot, killed May 27, 1944, when plane was hit by antiaircraft fire at 12,000 ft. near Amiens, France. Base has 1,981 acres and is 1,156 ft. above sea level.

**Offutt AFB**, Neb. 68113; 10 mi. S of Omaha. Phone: (402) 291-2100. SAC base; Hq. Strategic Air Command; SAC recon wing. An AF Security Service activity to be transferred from Goodfellow AFB, Tex., by Oct. 1970. Former Strategic Aerospace Museum, containing various artifacts from strategic air history, has been turned over to Nebraska Game and Parks Commission and renamed Nebraska Museum of Aerospace History. Base activated 1896 as the Army's Fort Crook; renamed in 1924 for 1st Lt. Jarvis J. Offutt, native of Omaha, Phi Beta Kappa graduate of Yale, WW I pilot, died Aug. 13, 1918, from injuries received from enemy fire over Valheureux, France; Omaha's first airman to die in WW I. Base has 1,907 acres and is 1,049 ft. above sea level.

**Otis AFB**, Mass. 02542; on Cape Cod, 7 mi. NNE of Falmouth. Phone: (617) 968-1000. ADC base; houses fighter-interceptor and air defense missile squadrons, ADC, and ANG training site. Base activated in 1938 as Army's Camp Edwards; turned over to USAF in 1948; renamed 1949 for 1st Lt. Frank J. Otis, native of Illinois who received medical degree from Harvard, 1931; member of Massachusetts ANG; killed Jan. 11, 1937, in crash of ANG O-46A aircraft near Hennepin, Ill., on Illinois River, during flight from Chicago to Moline, Ill., in a snowstorm. Base has 22,000 acres and is 132 ft. above sea level.

**Patrick AFB**, Fla. 32925; 1 mi. S of Cocoa Beach. Phone: (Continued on following page)

(305) 494-1110. AFSC base; has mission to maintain and operate the AF Eastern Test Range; responsible for obtaining and coordinating all government and contractor services needed to provide effective support of DoD, NASA, and other agency missile and space programs consistent with established national policies and priorities. Base is airhead for Cape Kennedy AFS. A state highway runs through Patrick AFB, where a missile display is a tourist attraction; Cape Kennedy AFS is open for drive-through tours on Sundays from 9:00 a.m. to 3:00 p.m., with stopping point at Air Force Space Museum. Base, formerly Banana River NAS, reactivated Oct. 1, 1949; renamed Aug. 26, 1950, for Maj. Gen. Mason M. Patrick, Chief of AEF's Air Service in WW I and for 6 years, 1921-1927, Chief of the Air Service; 1886 graduate of West Point, No. 2 in his class, classmate of Gen. John J. Pershing; General Patrick died Jan. 29, 1942, Walter Reed Hospital, Washington, D.C. Base has 2,332 acres and is 9 ft. above sea level.

**Pease AFB**, N.H. 03801; 3 mi. W of Portsmouth. Phone: (603) 436-0100. SAC base; medium bomber and tanker operations, 2d AF. Also houses air rescue and recovery unit, MAC; military airlift group, ANG. Base activated 1956 as Portsmouth AFB; renamed Sept. 7, 1957, for Capt. Harl Pease, Jr., native of Plymouth, N.H.; WW II B-17 pilot, killed Aug. 7, 1942, during attack on enemy airdrome near Rabaul, New Britain Island; recipient of Medal of Honor. Base has 4,373 acres and is 101 ft. above sea level.

**Perrin AFB**, Tex. 75090; 6 mi. NNW of Sherman. Phone: (214) 787-2971. ADC base; F-102 interceptor training. Also conducts T-37 instructor pilot training, ATC. Base activated Aug. 9, 1941; named for Lt. Col. Elmer D. Perrin, native of Boerne, Tex.; enlisted in Army in 1917; took flight training; became Air Corps representative to Glenn L. Martin plant near Baltimore, Md.; killed there June 21, 1941, while test-flying B-26 medium bomber. Base has 1,879 acres and is 754 ft. above sea level.

**Peterson Field**, Colo. 80914; 6 mi. E of Colorado Springs. Phone: (303) 635-8911. ADC base; supports NORAD, Hq. ADC, and Air Force Academy administrative flying activities; USAFA T-41 pilot indoctrination; activated 1942; named for 1st Lt. Edward J. Peterson, killed in aircraft accident, 1942. Base has 995 acres and is 6,172 ft. above sea level.

**Plattsburgh AFB**, N.Y. 12903; 1 mi. SW of Plattsburgh. Phone: (518) 563-4500. SAC base; heavy bomber and tanker operations, 2d AF. FB-111 combat crew training program to be transferred here from Carswell AFB, Tex., by July 1971. Base activated July 14, 1956; named for nearby city. Base has 3,100 acres and is 235 ft. above sea level.

**Pope AFB**, N.C. 28308; 12 mi. NW of Fayetteville. Phone: (919) 394-4183. TAC base; home of 839th Air Division and 464th Tactical Airlift Wing; site of Tactical Airlift Center. Base activated 1919; named for 1st Lt. Harley H. Pope, WW I flyer; killed Jan. 7, 1919, when his JN-4 "Jenny" ran out of fuel near Fayetteville and crashed on flight from Emerson Field, S.C., to Newport News, Va. Base adjoins Ft. Bragg, largest in population of all Army installations. Base has 2,000 acres and is 218 ft. above sea level.

**Randolph AFB**, Tex. 78148; 16 mi. ENE of San Antonio. Phone: (512) 652-1110. ATC base; undergraduate pilot training. Hq. Air Training Command; site of USAF Military Personnel Center. Base activated June 20, 1930; named for Capt. William M. Randolph, native of Austin, Tex.; served on Mexican border in 1916; received flight training, Kelly Field, 1918; served as CO of 25th Bomb Squadron, France Field, Panama, 1924-27; killed Feb. 17, 1928, at Gorman, Tex., when his AT-4 crashed on takeoff. Base has 2,618 acres and is 761 ft. above sea level.

**Reese AFB**, Tex. 79401; 12 mi. W of Lubbock. Phone: (806) 885-4511. ATC base; undergraduate pilot training. Base activated in 1941 as Lubbock AAB; renamed in Nov. 1954 for 1st Lt. Augustus F. Reese, Jr., native of Josephine, Tex.; P-38 pilot with 1st Fighter Group's 94th Squadron, killed during strafing and bombing run on Cagliari, Sardinia, May 14, 1943. Base has 3,597 acres and is 3,338 ft. above sea level.

**Richards-Gebaur AFB**, Mo. 64030; 17 mi. S of Kansas City. Phone: (816) 331-4400. ADC base; combat support airlift squadron; also houses military airlift wing. Hq. AFCS from Scott AFB, Ill., and Hq. GEEIA from Griffiss AFB, N.Y., to be merged here by Oct. 1970; functions of those two services

to be assumed by two Air Force Communications Service Areas, Northern (at Griffiss AFB) and Southern (Oklahoma City AFS). Base activated Nov. 4, 1955, as Grandview AFB; renamed for 1st Lt. John F. Richards and Lt. Col. Arthur W. Gebaur, Jr., both natives of Kansas City. Richards joined Air Service, 1917; sent to France as recon pilot; killed Sept. 26, 1918, first day of the Argonne offensive, while on artillery-spotting mission. Gebaur enlisted in the Air Corps five days after Pearl Harbor, trained pilots during WW II; recalled during Korean War, qualified for jets; killed Aug. 29, 1952, over North Korea on his 99th F-84 mission; awarded posthumous DSC. Base has 2,000 acres and is 1,090 ft. above sea level.

**Robins AFB**, Ga. 31093; 18 mi. SSE of Macon. Phone: (912) 926-1110. AFLC base; Hq. Warner Robins Air Materiel Area; Hq. AFRES. Also site of heavy bomber and tanker operations, 2d AF, SAC; base houses military airlift squadron, MAC; 5th Mobile Communications Group, AFCS, to be increased in size by July 1971; AFCS/GEEIA functions to be transferred to Keesler AFB, Miss., by July 1970. Base activated Mar. 1942; named for Brig. Gen. Augustine Warner Robins, an early Chief of the Materiel Division of the Air Corps who devised a cataloging system in the 1920s; 1907 graduate of West Point; served with Punitive Expedition to Mexico, 1916-17; served as Commandant of Training Center, Randolph Field, Tex., 1939, during pre-WW II manpower buildup; died Randolph Field, Tex., June 16, 1940. Base has 7,246 acres and is 295 ft. above sea level.

**Scott AFB**, Ill. 62225; 6 mi. ENE of Belleville. Phone: (618) 256-1110. MAC base; Hq. MAC; hq. of two of MAC's services—ARRS and AWS; aeromedical airlift base; also houses AFRES aeromedical associate airlift group. Former site of Hq. AFCS; this hq. to merge at Richards-Gebaur AFB, Mo., with Hq. GEEIA (AFLC) by Oct. 1970. Base activated June 14, 1917, as Scott Field; named for Cpl. Frank S. Scott, first enlisted man to lose his life in an air accident; killed Sept. 28, 1912, College Park, Md., in crash of a Wright Type B Flyer in which he had "hitched" a ride. Scott AFB has 2,310 acres and is 453 ft. above sea level.

**Selridge AFB**, Mich. 48045; 3 mi. NE of Mount Clemens. Phone: (313) 465-1241. ADC base; AC&W squadron. Also houses Navy Reserve training and AFRES aerospace rescue and recovery unit; AFRES tactical support wing; US Coast Guard Air Station for Detroit. Base activated July 7, 1918, as Joy Field; renamed in June 1949 for 1st Lt. Thomas E. Selridge, first Army officer to fly an airplane and first military fatality of powered flight; 1903 West Point graduate; killed Sept. 17, 1908, at Fort Myer, Va., when plane piloted by Orville Wright crashed during demonstration flight. Base has 3,660 acres and is 583 ft. above sea level.

**Seymour Johnson AFB**, N.C. 27530; 2 mi. SSE of Goldsboro. Phone: (919) 736-0000. TAC base; tactical fighter operations, 9th AF; Hq. 19th AF. Also houses heavy bomber and tanker operations, 2d AF, SAC. Base activated June 12, 1942; closed May 31, 1946; reactivated Apr. 1, 1956; named for Navy Lt. Seymour A. Johnson, native of Goldsboro, killed in 1942. Base has 4,124 acres and is 109 ft. above sea level.

**Shaw AFB**, S.C. 29152; 7 mi. WNW of Sumter. Phone: (803) 775-1111. TAC base; RF-4C, RF-101, and EB-66 recon crew training; home of the 363d Tac Recon Wing, major tenant units include Hq. 9th AF, TAC; USAF Tactical Air Reconnaissance Center; 507th Tactical Control Group. Base activated Aug. 30, 1941; named for 2d Lt. Ervin D. Shaw, native of Alcolu, S.C.; enlisted in Army in 1917; received flight training and became one of first Americans to see air action in WW I; flew with Elliott White Springs and Fiorello La Guardia in 48th Squadron; killed July 9, 1918, when his Bristol fighter was shot down while on recon mission over France. Base has 3,022 acres and supports another 10,339 acres. It is 252 ft. above sea level.

**Shemya AFS**, Alaska (APO Seattle 98736); located at western tip of the Aleutian chain, midway between Anchorage, Alaska, and Tokyo, Japan. Phone: 572-3400. AAC base. Shemya was used as a bomber base in WW II, from which attacks were launched against the Japanese home islands; deactivated in 1945, the station was reactivated in 1958. *Island/base is about 4½ miles long by 2½ miles wide, with altitude varying from sea level to 270 ft. above sea level.* The

International Date Line has conveniently been "bent" around Shemya so that the local date is the same as elsewhere in the US.

**Sheppard AFB, Tex.** 76311; 5 mi. N of Wichita Falls. Phone: (817) 851-2511. ATC base; technical and flying training. Sheppard is unique in that it is the only AFB conducting both helicopter and fixed-wing pilot training. The base conducts all USAF helicopter pilot training, and furnishes undergraduate pilot training for the German Air Force. Base activated June 14, 1941; named for Morris E. Sheppard, US Senator from Texas, chairman of the Senate Military Affairs Committee; died in 1941. Base has 4,182 acres and is 1,015 ft. above sea level.

**Tinker AFB, Okla.** 73145; 8 mi. SE of Oklahoma City. Phone: (405) 732-7321. AFLC base; Hq. Oklahoma City Air Materiel Area; furnishes logistic support for bombers, jet engines, instruments, and electronics. AFRES military airlift group. AFCS and GEEIA Regions will be inactivated and their functions relocated to Oklahoma City AFS by Oct. 1970. Base activated Aug. 1942; named for Maj. Gen. Clarence L. Tinker, who was born in Kansas but grew up in Pawhuska, Okla., Indian Territory and was one-eighth Osage Indian; entered the Army in 1912; took flying training in 1921; promoted to brigadier general in May 1940 and to major general in Jan. 1942, he became commander of Air Forces in Hawaii; on June 7, 1942, at the end of the Battle of Midway, General Tinker in an LB-30, early model B-24 built for the British RAF but never delivered, led a flight of Liberators against Japanese ships retreating toward Wake Island. The formation became scattered in heavy cloud, and on the return to Oahu,

General Tinker's plane was seen diving toward the sea. Base has 4,100 acres and is 1,291 ft. above sea level.

**Travis AFB, Calif.** 94535; at Fairfield, 50 mi. NE of San Francisco. Phone: (707) 438-4011. MAC base; Hq. 22d AF; military airlift wing, furnishes strategic airlift of troops and equipment; Hq. 22d AF will be reduced and scope of aircraft maintenance operations will be reduced by July 1971. Also houses SAC tanker operations; by Jan. 1971 will be used as a SAC satellite base. Travis is presently the largest and busiest military aerial port in the US. Base activated May 17, 1943, as Fairfield-Suisun Army Air Field; renamed in Oct. 1950 for Brig. Gen. Robert F. Travis, 1928 West Point graduate; became pilot in 1929; in WW II served as CG of 8th AF's 41st Combat Wing, flying 35 combat missions; postwar commander of Pacific Air Command at Hickam Field, he took command of SAC's 9th Strategic Recon Wing in 1949 at the base now named for him; killed there Aug. 6, 1950, in B-29 accident; recipient of DSC, 3 Silver Stars. Base has 6,000 acres and is 62 ft. above sea level.

**Truax Field, Wis.** 53707; 2 mi. E of Capitol Square, Madison. Phone: (608) 249-0461. ANG base; accommodates ANG air defense wing. Base named for 1st Lt. Thomas L. Truax, 1939 Univ. of Wisconsin graduate; received wings and commission May 1940; killed Nov. 2, 1941, when he flew his P-40 into a hill during heavy fog near San Anselmo, Calif. Base is 868 ft. above sea level.

**Tyndall AFB, Fla.** 32401; 8 mi. E of Panama City. Phone: (905) 283-1113. ADC base; Air Defense Weapons Center; conducts combat crew training for F-101 and F-106 pilots. Also site of T-38 pilot instructor training, ATC. Base activated Dec.

*(Continued on following page)*

## USAF'S MAJOR INSTALLATIONS OVERSEAS

**Albrook AFB, Canal Zone**  
APO New York 09825  
Hq. USAF Southern Command  
Communications base, AFSC

**Andersen AFB, Guam**  
APO San Francisco 96334  
Strategic bomber base, SAC

**Ankara AS, Turkey**  
APO New York 09254  
TUSLOG detachment, AFCS

**Athenai Airport, Greece**  
APO New York 09223  
Support base, USAFE

**Aviano AB, Italy**  
APO New York 09293  
Tactical group, USAFE

**Bien Hoa AB, South Vietnam**  
APO San Francisco 96227  
Tactical fighter base, PACAF

**Binh Thuy AB, South Vietnam**  
APO San Francisco 96320  
Combat support base, PACAF

**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

**Cam Ranh Bay AB, South Vietnam**  
APO San Francisco 96326  
Tactical fighter base, PACAF

**Ching Chuan Kang AB, Taiwan**  
APO San Francisco 96319  
Combat support base, PACAF

**Cigli AB, Turkey**  
APO New York 09016  
Tactical fighter base, USAFE

**Clark AB, Philippines**  
APO San Francisco 96274  
Hq. 13th Air Force, PACAF  
Communications base, AFCS

**Da Nang Airport, South Vietnam**  
APO San Francisco 96337  
Tactical fighter base, PACAF

**Don Muang Airport, Thailand**  
APO San Francisco 96303  
Combat support base, 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  
Communications base, AFSC

**Goose AB, Labrador, Canada**  
APO New York 09677  
Aerospace defense base, ADC  
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  
Airlift base, MAC

**Hof AS, West Germany**  
APO New York 09684  
Support base, USAFSS

**Howard AFB, Canal Zone**  
APO New York 09817  
Support, USAF Southern Command

**Incirlik AB, Turkey**  
APO New York 09289  
Tactical fighter base, USAFE

**Iraklion AS, Crete**  
APO New York 09291  
Support base, USAFSS

**Itazuke AB, Japan**  
APO San Francisco 96529  
Combat support base, PACAF

**Izmir, Turkey**  
APO New York 09224  
Support base, USAFE

**Johnston Island AB, Central Pacific**  
APO San Francisco 96305  
Support base, air defense overseas

**Kadena AB, Okinawa**  
APO San Francisco 96239  
Air division base, PACAF  
Strategic bomber base, SAC

**Keflavik Airport, Iceland**  
FPO (US Navy), New York 09571  
Fighter-interceptor base

**Kimpo AB, South Korea**  
APO San Francisco 96276  
Support base, PACAF

**Kindley AFB, Bermuda**  
APO New York 09856  
Airlift base, MAC  
(Transfers to Navy July 1, 1970)

**Korat AB, Thailand**  
APO San Francisco 96288  
Tactical fighter base, PACAF

7, 1941; named for 1st Lt. Frank B. Tyndall, native of Sewalls Point, Fla.; WW I fighter pilot, CO of 22d Aero Squadron, 4 victories; recipient of Silver Star; killed in crash of P-1 near Mooresville, N.C., July 15, 1930. Base has 28,000 acres and is 18 ft. above sea level.

**Vance AFB, Okla.** 73701; 4 mi. S of Enid. Phone: (405) 237-2121. ATC base; undergraduate pilot training. Base activated Nov. 1941; deactivated Jan. 1947; reactivated Aug. 1948; originally Enid AFB; renamed July 7, 1949, for Lt. Col. Leon R. Vance, Jr., native of Enid, Okla.; 1939 West Point graduate; became Deputy CO of 489th Bomb Group which went to Europe in Apr. 1944; Vance severely injured over Wimereaux, France, June 5, 1944, in action that earned him the Medal of Honor; killed July 26, 1944, when air-evac plane returning him to US went down between Iceland and Newfoundland. Base has 1,603 acres and is 1,307 ft. above sea level. Vance AFB is unique as the only AFB whose complete support function is accomplished under civilian contract.

**Vandenberg AFB, Calif.** 93437; 10 mi. NW of Lompoc, 55 mi. WNW of Santa Barbara. Phone: (805) 866-1611. SAC base; site of 1st Strategic Aerospace Division, providing launch facilities and support for operational ICBM tests and unmanned polar-orbiting space operations of USAF, NASA contractors, et al. (see below). Also site of command and control center for AF Western Test Range, AFSC. Originally Army's Camp Cooke, a training post during WW II and the Korean War, base was taken over by USAF June 7, 1957, as Cooke AFB; renamed Oct. 1958 for Gen. Hoyt S. Vandenberg, USAF's second Chief of Staff; 1923 West Point graduate; CG of 9th AF in WW II; served as Chief of Staff from Apr. 30, 1948, until his retirement, June 30, 1953; died in Washington, D.C., Apr. 2, 1954. Base has 98,400 acres and is 400 ft. above sea level. Base is unique in that 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. ICBMs from the SAC alert fleet in the field are transported to Vandenberg with their crews and the missiles launched toward distant targets in the Pacific, with no danger of overflying populated areas. The jutting promontory of the California coast on which the base is located provides equally safe conditions for direct launch into polar orbit since such flights cross no land mass until reaching Antarctica. More than 800 launches have taken place from Vandenberg since Dec. 1958, with boosters ranging from Minuteman to the Titan III. Launch agencies have included SAC, AFSC, AFLC, NASA, USAF and industry teams, British RAF crews, US/Canadian crews, US/UK crews, US/ESRO crews, and US Navy.

**Webb AFB, Tex.** 79720; 3 mi. SW of Big Spring. Phone: (915) 267-2511. ATC base; undergraduate pilot training. Base activated Sept. 28, 1942, as Big Spring Bombardier School; renamed May 18, 1952, for 1st Lt. James L. Webb, native of Sweetwater, Tex.; WW II fighter pilot, 49 combat missions; separated after WW II but recalled Jan. 1948 and stationed in Japan; killed there June 16, 1949, when his P-51 Mustang became lost in a storm and crashed in Hokkaido Bay. Base has 2,311 acres and is 2,561 ft. above sea level.

**Westover AFB, Mass.** 01022; 3 mi. NNE of Chicopee Falls. Phone: (413) 557-1110. SAC base; heavy bomber and tanker operations, 2d AF. Eastern Communications Region, AFCS, to be inactivated and functions relocated to Griffiss AFB, N.Y., by Oct. 1970. Westover also houses AFRES military airlift group. Base activated Apr. 1940; named for Maj. Gen. Oscar Westover; 1906 West Point graduate; became Chief of the Air Corps, Dec. 22, 1935; killed Sept. 21, 1938, in aircraft accident near Lockheed plant, Burbank, Calif. Base has 4,931 acres and is 244 ft. above sea level.

**Wheeler AFB, Hawaii** (APO San Francisco 96515); located in geographical center of the island of Oahu; bounded on north by Army's Schofield Barracks and on the east by town

## THE MAJOR INSTALLATIONS OF THE

**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. US Air Forces in Europe  
Communications base, AFCS

**Misawa AB, Japan**  
APO San Francisco 96519  
Tactical fighter base, PACAF

**Moron AB, Spain**  
APO New York 09282  
Combat support base, USAFE

**Naha AB, Okinawa**  
APO San Francisco 96235  
Fighter-interceptor base, PACAF

**Nakhon Phanom Airport, Thailand**  
APO San Francisco 96310  
Special operations base, PACAF

**Nam Phong AB, Thailand**  
APO San Francisco 96310  
Tactical support base, PACAF

**Naples Admin., Italy**  
APO New York 09520  
Support base, USAFE

**Nha Trang AB, South Vietnam**  
APO San Francisco 96205  
Special operations base, PACAF

**Osan AB, South Korea**  
APO San Francisco 96570  
Air division base, PACAF  
Communications base, AFCS

**Phan Rang AB, South Vietnam**  
APO San Francisco 96321  
Tactical fighter base, PACAF

**Phu Cat AB, South Vietnam**  
APO San Francisco 96368  
Tactical fighter base, PACAF

**Pleiku Airport, South Vietnam**  
APO San Francisco 96295  
Special operations base, PACAF

**Quarry Heights, Canal Zone**  
APO New York 09826  
Hq. USAF Southern Command

**RAF Alconbury, United Kingdom**  
APO New York 09328  
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

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 reconnaissance base, USAFE

**RAF West Ruislip, United Kingdom**

APO New York 09128

Support base, USAFE

**RAF Wethersfield, United Kingdom**

APO New York 09120

Tactical fighter base, USAFE

**RAF Woodbridge, United Kingdom**

APO New York 09405

Tactical fighter base, USAFE

**Ramey AFB, Puerto Rico**

APO New York 09845

Strategic bomber base, SAC

**Ramstein AB, West Germany**

APO New York 09012

Hq. 17th Air Force, USAFE

Tactical reconnaissance base, USAFE

Communications base, AFCS

**Rhein-Main AB, West Germany**

APO New York 09057

Tactical airlift base, USAFE

**San Pablo, Spain**

APO New York 09284

Support base, USAFE

**San Vito dei Normanni AS, Italy**

APO New York 09240

Support base, USAFSS



of Wahiawa. PACAF base, commanded by Commander, 6487th Air Base Squadron. Furnishes administrative and logistic support to the Hawaiian Air Defense Division (326th Air Division); Joint Coordination Center, Far East; and 604th Direct Air Support Squadron. Hq. Pacific Communications Area, AFCS; Hq. Pacific Security Region. Functions of AFCS and GEEIA will be consolidated by July 1970. Base activated June 30, 1923, named for Maj. Sheldon H. Wheeler; 1914 West Point graduate; became member of 1st Aero Squadron and served in Punitive Expedition to Mexico; joined AEF in France, 1918; became CO of Luke Field, Hawaii, in 1919 and was killed there July 13, 1921, during aerial exhibition in conjunction with International Press Congress when his biplane nose-dived onto the field from low altitude. Base has 1,423 acres and is 845 ft. above sea level.

**Whiteman AFB**, Mo. 65301; 1.5 mi. S of Knob Noster. Phone: (816) 563-5511. SAC base; 15th AF support base for Minuteman missile wing. Base activated 1942; originally Sedalia AFB; renamed Oct. 1, 1955, for 2d Lt. George A. Whiteman, native of Sedalia, Mo.; fighter pilot assigned to 44th Squadron, 18th Pursuit Group, at Wheeler Field, Hawaii, when Japanese struck Pearl Harbor, Dec. 7, 1941; Whiteman's plane, struck by enemy bullets as he attempted takeoff, crashed just off end of runway; Whiteman awarded Silver Star posthumously; first AF casualty of WW II. Base has 3,384 acres plus area encompassed by missile complex of about 15,660 sq. mi. Whiteman is 869 ft. above sea level.

**Williams AFB**, Ariz. 85224; 16 mi. SE of Mesa; 10 mi. E of Chandler. Phone: (602) 988-2611. ATC base; undergraduate pilot training, TAC. Also provides F-5 combat crew training for foreign students. Base activated Sept. 1941; originally known as Mesa Military Airport, later known as Higley Field; renamed in June 1949 for 1st Lt. Charles L. Williams, native of Fort Huachuca, Ariz.; 1918 West Point graduate; flight training in 1922; stationed at Luke Field, Hawaii, in 1926; killed in crash of a bomber near Fort DeRussy, July 6, 1927,

during aerial demonstration by Army planes in honor of Lts. Lester J. Maitland and Albert F. Hegenberger, who the week before had made first nonstop transpacific flight, from California to Hawaii. Base has 3,867 acres and is 1,385 ft. above sea level. Williams trains more student pilots than any other USAF base and was the first jet training base in the nation.

**Wright-Patterson AFB**, Ohio 45433; at Fairborn, 10 mi. ENE of Dayton. Phone: (513) 257-1110. AFLC base; Hq. AFLC. Also houses heavy bomber and tanker operations, SAC; Hq. Aeronautical Systems Division and Foreign Technology Division, AFSC; home of the Air Force Museum. Also houses more than 150 other DoD activities and government agencies. Originally separate areas of Wilbur Wright Field and Patterson Field; the two were merged and redesignated Wright-Patterson AFB on Jan. 13, 1948; named for aviation pioneers Orville and Wilbur Wright, natives of Dayton and inventors of heavier-than-air craft; and for 1st Lt. Frank S. Patterson, a native of Dayton; member of 137th Aero Squadron; killed June 19, 1918, in crash of a DH-4 between Fairfield and Osborn, Ohio, while testing gun synchronization. The Wright brothers had done much of their early flying on Huffman Prairie, now Areas A and C of present base. Base has 8,242 acres; Wright Airfield area is 830 ft. above sea level; Patterson is 824 ft. above sea level.

**Wurtsmith AFB**, Mich. 48753; 3 mi. NW of Oscoda, 87 mi. NE of Bay City, 51 mi. S of Alpena. Phone: (517) 739-3611. SAC base; heavy bomber and tanker operations, 2d AF; also houses fighter-interceptor squadron, ADC. Base activated 1923; assigned to SAC since 1961; originally Camp Skeel; later Oscoda AFB; renamed in Feb. 1953 for Maj. Gen. Paul B. Wurtsmith, native of Detroit, Mich.; flight training, 1927-28; became CG of 13th AF in Southwest Pacific in WW II; recipient of 2 DSMs and the Silver Star; killed Sept. 13, 1946, in crash of his B-25 near Asheville, N.C., on flight between Selfridge Field, Mich., and MacDill Field, Fla. Base has 5,200 acres and is 634 ft. above sea level.—END

## UNITED STATES AIR FORCE OVERSEAS

**Sembach AB**, West Germany  
APO New York 09130  
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

**South Ruislip AS**, United Kingdom  
APO New York 09125  
Hq. 3d Air Force, USAFE

Communications base, AFCS  
**Spangdahlem AB**, West Germany  
APO New York 09123  
Tactical fighter base, USAFE

**Suwon AB**, South Korea  
APO San Francisco 96211  
Combat support base, PACAF

**Tachikawa AB**, Japan  
APO San Francisco 96323  
Air division 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 96373  
Tactical fighter base, PACAF

**Tan Son Nhut Airfield**, South Vietnam  
APO San Francisco 96222  
US Military Assistance Comd.  
(MACV)

**Tan Son Nhut Airfield**, South Vietnam  
APO San Francisco 96307  
Hq. 7th Air Force, PACAF  
Air division base, PACAF  
Combat support base, PACAF  
Rescue and recovery base, MAC  
Communications base, AFCS  
Support base, SAC

**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 09238  
Hq. 16th Air Force, USAFE  
Tactical fighter base, USAFE  
Communications base, AFCS

**Tuy Hoa AB**, South Vietnam  
APO San Francisco 96316  
Tactical fighter base, PACAF

**Ubon Airfield**, Thailand  
APO San Francisco 96304  
Tactical fighter base, PACAF

**Udorn Airfield**, Thailand  
APO San Francisco 96237  
Tactical reconnaissance base,  
PACAF  
Communications base, AFCS

**U-Tapao Airfield**, Thailand  
APO San Francisco 96330  
Strategic bomber base, SAC  
Combat support base, PACAF

**Wakkanai AS**, Japan  
APO San Francisco 96270  
Support base, USAFSS

**Wheeler AB**, Libya  
APO New York 09231  
Flying training base, USAFE  
(Closes June 30, 1970)

**Wiesbaden AB**, West Germany  
APO New York 09332  
Support base, USAFE  
Weather base, MAC

**Yamato AS**, Japan  
APO San Francisco 96323  
Support base, PACAF

**Yokota AB**, Japan  
APO San Francisco 96328  
Tactical fighter base, PACAF

**Yongsan AB**, South Korea  
APO San Francisco 96301  
Hq. United Nations Command/  
US Forces, Korea/US 8th Army

**Zaragoza AB**, Spain  
APO New York 09286  
Support base, USAFE

**Zweibrucken AB**, West Germany  
APO New York 09052  
Tactical fighter/reconnaissance base,  
USAFE



## The Lessons of Korea

*War In Peacetime: The History and Lessons of Korea*, by J. Lawton Collins. Houghton Mifflin, Boston, 1969. 416 pages. \$10.

As Army Chief of Staff throughout the Korean War, General Collins was the member of the Joint Chiefs of Staff charged with monitoring operations in the Far East. He participated intimately in the political-military considerations that determined US action in Korea. No book on Korea has been written by a member of the JCS as then constituted. Gen. Omar Bradley, who was then the JCS Chairman, and Collins are the only officers still living who were members of the JCS throughout the war. Thus, Collins' account of Gen. Walton Walker masterminding the desperate defense of Pusan, Gen. Matthew Ridgway taking over a dispirited Army and rebuilding its morale, Gen. James Van Fleet dealing with the bloody fighting during negotiations, and others whose skill or blunders affected the course of the war, is particularly valuable. Moreover, he has a pleasant style, mixing his personal reminiscences with solid historical documentation, interesting photographs and maps, a select bibliography, and an extensive index.

Collins expresses his opinions with candor. He is not very sympathetic to General MacArthur. He believes that MacArthur's early decision to bomb airfields in North Korea undoubtedly was warranted from a strictly military viewpoint, but that this action—contrary to the President's instructions—was the precursor of later insubordination and unilateral actions. MacArthur's prestige after the successful Inchon amphibious assault and the ensuing counter-offensive was so great that, when he thereafter exceeded JCS instructions, the JCS offered little or no objection.

Collins suggests that MacArthur's Inchon success might have been due to his imagination and intuition rather than to a realistic appraisal of the situation. And that the same imagination and intuition—substituting for firsthand, up-to-date knowledge of the military situation, a realistic appraisal of Chinese Communist capabilities, and a sound evaluation of airpower under conditions existing in Korea—likely contributed to the failure of MacArthur's campaign against the Chinese Communist forces in North Korea.

Collins defends the "great American tradition" of civilian control over the military, noting that the JCS made recommendations, not decisions, for consideration by the Secretaries of Defense and State, the National Security Council, and the President. He makes the special point that the JCS not only supported removing MacArthur from his command; they also backed the Administration's efforts to prevent the Korean War from expanding into a war with Russia or China, or both.

Collins draws some parallels between US military experience in Korea and other military situations. He is harsh on US intelligence agencies for incorrectly predicting enemy action in Korea, Vietnam, and Cuba because they based their conclusions on probable enemy intentions rather than capabilities. He believes that control of the air is a determining factor in war, but that no amount

of aerial bombing can prevent completely the forward movement of supplies, as was proved in Germany during WW II, and again in Korea and Vietnam.

In a less strictly military judgment, he believes that the near-collapse of the ROK Army under the North Korean attack was the result of our continuing unwillingness in peacetime to maintain military preparedness. The General admits that the JCS shared with the Administration and the Congress responsibility for reductions in the military budget which so hampered initial conduct of the Korean War. Similarly, he believes that the tactics used by the Communists during the long negotiations at Panmunjom hold a lesson for the current negotiations over Vietnam.

If Collins' military opinions provoke discussion, his foreign-policy opinions are still more provocative. He believes the US must reassess its foreign-policy role in order to clarify, especially to the American people, our national interests. The author subscribes to neither a "no more Vietnams" nor a "Fortress America" concept. Rather, he supports aiding European nations and other small countries threatened by Communist aggression, providing they have the will to resist to the limit of their resources. To avoid the precipitous action in Korea and the aimless drift in Vietnam, the US must be prepared to make an early decision on what action is necessary to protect national interests and resolutely carry out that action.

Collins maintains that the US should avoid being the world's policeman and should seek allied or UN help in restraining aggression. We should not delude ourselves into thinking that Communists will cease taking advantage of critical situations in various countries of the world or will give up fomenting "wars of national liberation."

The impression one gets is that General Collins continues to believe in a unified international Communist movement, as though increasing manifestations of nationalism among Communist nations—especially the apparent Sino-Soviet animosity—had scarcely changed the nature of communism's threat in the world. But these stimulating opinions add to the value of a Joint Chief's view of the Korean War and its lessons for US military and foreign policy.

—REVIEWED BY JOSEPH W. ANNUNZIATA

## A 'Torrent of Crises'

*Confirm or Deny*, by Phil G. Goulding. Harper & Row, N.Y., 1970. 361 pages. \$7.95.

Phil Goulding, who used to be a newspaperman himself, has written a book that tries to do two things at once. He is highly successful at explaining why the Assistant Secretary of Defense for Public Affairs faces a career of inevitable "misadventures" in a "torrent of crises." My own intimate contact with this atmosphere goes back at least to World War II and, in the Pentagon newsroom, most vividly to the postwar wrangle over the B-36 bomber. Every word that Goulding has written about how it is nearly impossible to avoid a credibility gap in the light of human frailties and stupidity is true. His case histories to illustrate this—our reconnaissance flight over a French atomic plant in 1965, the H-bombs missing at Palomares and Thule in

1966 and 1968, the attacks on the *Liberty* and the *Pueblo* in 1967 and 1968, and the US attack on the Russian ship *Turkestan* at Cam Pha in 1967—are fascinating and essential chapters.

On the other hand, Goulding's second mission in *Confirm or Deny* seems to be that of defending the Pentagon management career of Robert S. McNamara, who was his boss for a long time. Naturally, he bogs down here, because the McNamara management of everything from war to personnel matters was sad. The conflict in Vietnam probably is the worst-managed war in our history, including the Spanish-American. The mess that has been inherited from McNamara's insistence on "commonality" and "total-package procurement" is one that will have military system project offices in a spin for years. Some men honestly believe we never will recover, having moved all the decision-making up to the level of the Secretary of Defense and now seeking to get it back where it belongs, while the shells pour in from Capitol Hill.

Phil Goulding gets into some of this in a couple of chapters where he discusses the antiballistic missile (ABM) issue and what he calls "McNamara's fight for deescalation," by which he means the Secretary's effort to put shackles on strategic airpower. Mr. McNamara, in public, supported his President. But, Goulding says, "neither the public nor the Congress ever knew that he was attempting to move the country in precisely the opposite direction at this time. . . ." In the case of the ABM, Goulding goes to great lengths to justify the McNamara advocacy of the Sentinel system. Then, there is a vital story about how he and the Defense Secretary managed the news, with special briefings for selected reporters and stern control over what the military services—particularly the Army—could say about the project.

Probably the most interesting chapter in *Confirm or Deny* is the one about Harrison Salisbury of the *New York Times* and his two-week visit to North Vietnam in 1966. The result was a "grossly distorted and inaccurate picture," derived in large part from Communist propaganda, some of which Salisbury simply rewrote and printed as fact in the *Times*. The sad thing, to Goulding, was that "many Americans became more disillusioned with their government and more convinced that it was lying to them." He includes several pages where he analyzes Salisbury, and the conclusion is inevitable that it was Salisbury who was playing fast and loose with the facts.

—REVIEWED BY CLAUDE WITZE

## The Military-Industrial Complex

*The Lonely Warriors: Case for the Military-Industrial Complex*, by John Stanley Baumgartner. Nash, Los Angeles, 1970. 237 pages. \$6.95.

Few critics of the military-industrial complex would contend that we need no military establishment today, or that armies, navies, and air forces could defend national interests without modern arms. There are two obvious methods of equipping the military services. The first—which this country follows—is by contracting the production of defense hardware and equipment to highly competitive private industries whose relations with government are closely controlled by law and regulation. An alternative is through noncompetitive, government-owned arsenals, ill-suited by their exclusive purpose to meet the ebbs and flows of military hardware procurement. In many respects, the latter course would come closer to the definition of a complex than does the former.

The author has been on both sides of defense procurement—as a government contracting officer, and as a manager in the aerospace industry. He is concerned that the

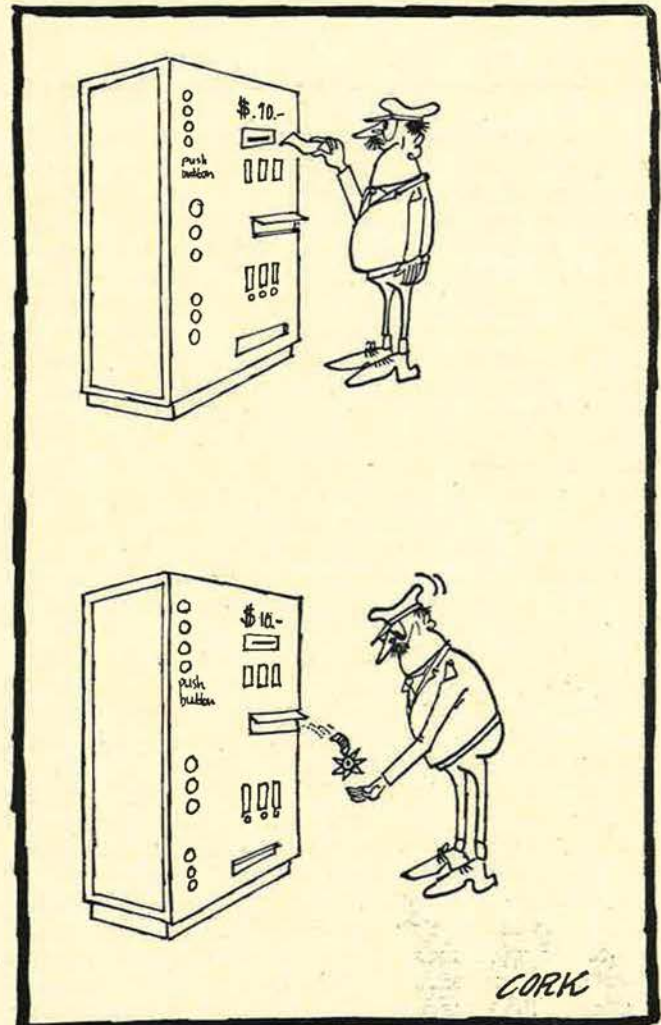
barrage of abuse, much of it ill-informed, that has been leveled at military/industrial relations, together with relatively low profits, the high cost of bidding on major military procurements, and the administrative difficulties of doing business with the government will drive private companies out of defense work. ". . . They can do without defense business . . . more easily than the country can do without their services."

Mr. Baumgartner presents evidence that companies in the defense business generally make a smaller profit on either sales or investment than they do on their commercial interests. With varying degrees of persuasiveness he refutes a gamut of criticism of the military-industrial complex, though admitting that where humans are involved, some errors are inevitable. Baumgartner's case histories should better qualify the reader to distinguish a real from a mythical cost overrun.

The book's greatest value is in its detailed description of the almost unbelievably complicated process that both contracting officers and industry bidders go through in the competition for contracts and in their administration. Generally these complexities are designed to (and do) prevent exactly the irregularities and errors that frequently have been alleged to exist in military-funded R&D and procurement.

*The Lonely Warriors* should be required reading for Monday-morning quarterbacks who have a genuine interest in commenting objectively on the real or imagined dangers of business relationships between the Department of Defense and industry. Unfortunately, the author's flip style

(Continued on following page)



and his fondness for clichés, dubious literary devices, and strained analogies are likely to turn off precisely those who would profit most from the book.

—REVIEWED BY JOHN L. FRISBEE

## The Two Germanies

*One Germany or Two: The Struggle at the Heart of Europe*, by Eleanor Dulles. Hoover Institution Press, Stanford, Calif., 1970. 315 pages. \$7.95.

Eleanor Dulles undoubtedly would applaud the historic meeting of the East and West German heads of government in Erfurt on March 19, 1970. In her analysis of the postwar history of the two Germanies, Mrs. Dulles observes that: "The interests of the United States are best served by a strong and politically vigorous Federal Republic that is expanding its relations with the East, retaining its position as an active partner in the Atlantic Alliance, trading on a worldwide basis, participating in investment in the less developed countries, and taking as active a part as possible in the councils of the international bodies."

The landmark Brandt-Stoph talks represent a step away from the cold war, away from airlifts, walls, denial of access routes, and heightened tensions which have occurred over the last twenty-five years—a period longer than that between the two world wars. Their second meeting in May portends that a new and more hopeful era is at hand in relations between the two Germanies and between nations in the heart of Europe. Americans and West

Germans have every reason to be proud of their mature response to the Brandt-Stoph meeting.

Perhaps still another harbinger of things to come was the meeting of the four powers in Berlin on March 26—the first attempt in eleven years to ease tension in the divided city.

Mrs. Dulles remains convinced that, although prosperity has come to West Germany in the postwar years, it obviously has not satisfied the German desire for unification and a more normal pattern of European security. There is ample evidence that both East and West Germany want closer relations, an atmosphere of détente, and a reduction of forces (and tensions) in central Europe.

But reunification is not possible now. Although the road to more normal relations will surely be a long and tortuous one, citizens of the Federal Republic and the United States should not—indeed cannot—erect any obstacles against the apparently powerful geopolitical and psychological tides that are flowing in the direction of closer relations between the two Germanies.

As far as the events leading to the division of Germany are concerned, Mrs. Dulles notes that the critical mistake made by the US at the end of World War II was the failure to perceive the true nature of Soviet aims and methods. Although FDR was surely lacking this realization, others (including Sir Winston Churchill) cannot be held blameless.

Mrs. Dulles' book is a balanced, sympathetic, and understanding account of what has been for a quarter of a century the crucial issue of the cold war.

—REVIEWED BY HERMAN S. WOLK

## NEW BOOKS IN BRIEF



*Ace of the Iron Cross*, by Ernst Udet, edited by Stanley M. Ulanoff. This new translation of the memoirs of Germany's second-ranking World War I ace is an intensely exciting cockpit view of the Western Front. Udet's descriptions of dogfights—including one with Georges Guynemer—are brief but dramatic. He has some interesting comments on von Richthofen, with whom he flew. The last third of the book is devoted to Udet's postwar flying in the US, Argentina, Africa, and the Arctic. The appendix includes much valuable information on early aces and aircraft. Doubleday & Co., N.Y. 215 pages. \$5.95.

*Aircraft 'Seventy*, edited by John W. R. Taylor. Articles and photographs, some in color, on a variety of aviation-related subjects. Several discussions of the early days of flying, aviation highlights of the last year, and reports on Greenland's ice-reconnaissance flights and on some of the world's lesser-known air museums—and the unusual aircraft to be seen in them—are included. Arco Publishing Co., Inc., N.Y. 96 pages. \$3.95.

*The Battle for North Africa*, by John Strawson. Maps detailing battles, photographs, and eyewitness impressions of soldiers of many nations are included in Mr. Strawson's recounting of the three-year campaign in North Africa and the Mediterranean. The author, who served in World War II in the 4th Hussars, Winston Churchill's one-time regiment, digresses occasionally to include literary and historical references. Written in a detached, leisurely manner. Charles Scribner's Sons, N.Y. 226 pages. \$7.95.

*Conservation, Now or Never*, by Nicholas Roosevelt. At a time when man's despoilment of his environment is a subject of wide concern, this book reminds us that the issue of conservation is not a new one. Mr. Roosevelt writes of the efforts of his cousin, Theodore Roosevelt,

and other early conservationists. He concentrates, however, on recounting recent incidents in which the challenge to conserve our natural resources has been successfully met. He does not discuss urban environmental problems or pollution. Dodd, Mead & Co., N.Y. 238 pages. \$5.95.

*The Forgotten Fleet: The British Navy in the Pacific, 1944-1945*, by John Winton. Written by an Englishman, this book contributes to a little-researched aspect of the Pacific sea war in World War II—the activities of the Royal Navy in the latter months of the war. The British fleet was greatly inferior to the American fleets in numbers of men and ships and in quantities of supplies, and was affected by British feeling that the offensive against Japan wasn't primarily Britain's concern. Nevertheless, it helped in actions such as the capture of the island stronghold of Okinawa and the strikes at the Japanese mainland. Coward-McCann, Inc., N.Y. 433 pages. \$8.95.

*No Parachute*, by Arthur Gould Lee. This collection of almost daily letters and diary entries, written by a retired Air Vice Marshal when he was a young pilot in France in 1917, makes interesting reading. Although some editing has been done, Air Vice Marshal Lee's pride in his squadron, his sorrow at the death of fellow pilots, and his experiences on patrol have all been vividly retained. Harper & Row, N.Y. 234 pages. \$5.95.

*Pictorial History of the RAF, Volume 2, 1939-1945*, by John W. R. Taylor and Philip J. R. Moyes. The authors attempt to trace the history of the air war in each theater, with the emphasis on the new equipment and aircraft introduced as the war progressed. More than 200 photographs, with detailed captions, are included in this history. Arco Publishing Co., Inc., N.Y. 240 pages. \$5.95.

—JOANNE M. MILLER



## a small miracle at \$875

The right community relations tool at the right time at the right price. It's *The New Thrust in Education*, a five film library showing how today's exciting breakthroughs in education can help communities attack their most pressing problems: unemployables, drug abuse, illiteracy, student motivation, etc. These motion pictures inform, stimulate, motivate positive action. A small miracle to reach mass audiences. Sets are yours to give to school districts in your plant communities. Your cost? Only \$875 per library. We'll add your company credit on each film, if you wish. Produced under sponsorship of The National Laboratory for the Advancement of Education, letters of endorsement have come from the U.S. Office of Education. The National Education Association. Even Encyclopaedia Britannica. Our brochure, *The New Thrust in Education*, tells you everything. Write or phone for a copy.



**Audio Productions / Educational Services**

Contact: Thomas Pyle, Executive Producer (212) 757-0760  
630 Ninth Avenue, New York, N.Y. 10036

a division of NOVO





**By Jackson V. Rambeau**

AFA DIRECTOR OF MILITARY RELATIONS

## Readjustment Pay

Officers retained for an indefinite period under the Continuation of Captain/Major Programs in FY 1967 and FY 1968 after they had not been selected for promotion to the temporary or permanent grade of major, have been given established dates of separation if they will have less than eighteen years' total active service computed as of June 30, 1970.

Normally these officers would have been separated when they were not selected for promotion. However, when the Continuation Programs were initiated, the authorized officer strength had been increased to meet Southeast Asia requirements, and the Air Force allowed those who were selected for continued active duty to serve until such time as the Secretary of the Air Force determined that their services were no longer required.

These officers were guaranteed at least one additional year of service as well as a minimum of six months' notice of a new separation date. Upon release from active duty they are entitled to readjustment pay under Section 687, Title 10, USC, if otherwise eligible. Such pay is computed by multiplying the years of active service, but not more than eighteen, by two months' basic pay of the grade in which serving at the time of release, or \$15,000, whichever is less.

The purpose of readjustment pay is to assist officers in transitioning from military to civilian life. These officers may also elect to enlist in the Regular Air Force to complete twenty years' active service. Should they choose to do so, they could then qualify for retirement under Section 8911, Title 10, USC. However, if they do qualify for retired pay, they must repay seventy-five percent of the readjustment pay prior to being eligible to draw retired pay.

## ADC Hosts Career-Motivation Conference

The Aerospace Defense Command will host the 1970 Air Force-wide Career-Motivation Conference May 19-22 at Ent AFB, Colo.

Nearly fifty representatives from major air commands will meet to hear briefings on subjects of interest to of-

ficers and enlisted men. Theme for the conference will be "Into the Seventies—Change and Challenge."

In addition to the briefings, seminar discussions and a joint symposium to prepare the conference recommendations will also be held.

Representatives from the major commands will include officers and airmen from various Air Force career fields, as well as members of junior officers' councils and NCO and airmen advisory councils.

This is the sixth in a series of conferences that began in 1962. Purpose of the Career-Motivation Conference is to make recommendations that will improve personnel programs, policies, and procedures throughout the Air Force.

## Top Three

Involvement of the top three NCO ranks with, and their sincere interest in, younger airmen is one of the most significant results achieved so far by the Top Three program. Better understanding and communication between today's Air Force leaders and the men who will assume that task tomorrow is evident in all commands. The effect of this ability to better understand and communicate has resulted in increased career satisfaction. Many commands have found the briefing, "Profile of a Generation," to be extremely effective in creating an awareness and understanding of the needs, attitudes, and goals of our young airmen.

## New Reserve Region Commanders Named

Maj. Gen. Tom E. Marchbanks, Jr., Chief of Air Force Reserve, announced recently the selection of three officers to serve as commanders of the new Eastern, Central, and Western Air Force Reserve Regions (AFRRs).

The three general officers and their new commands are: Maj. Gen. Rollin B. Moore, Jr., Western AFRR, headquartered at Hamilton AFB, Calif.; Brig. Gen. Earl O. Anderson, Eastern AFRR, Dobbins AFB, Ga.; and Brig. Gen. John W. Hoff, Central AFRR, Ellington AFB, Tex.

The generals will be designated the permanent Air Reserve Technician (ART) commanders for the Regions, serving in an Air Force Reserve major general's position, and will be responsible for the activities of all Air Force Reserve units within their geographical areas.

General Moore, currently serving on active duty as Commander, Hq. AFRES, Robins AFB, Ga., will remain on active duty until the expiration of his current tour, in the summer of 1972, unless it is determined advantageous to the Air Force to release him prior to that time. An interim commander for the Western Region will be selected to serve until then.

Presently on active duty as Deputy to the Chief of Air Force Reserve, General Anderson will be released from active duty this summer to assume command of the Eastern AFRR. A replacement for the Pentagon position he is currently occupying has not yet been chosen.

Since July 1967, General Hoff has commanded the Re-

**Maj. Gen. Alonzo A. Towner, right, formerly USAF Deputy Surgeon General, will replace Lt. Gen. Kenneth E. Pletcher who will retire as the Air Force's chief physician. General Towner also has been nominated for promotion to lieutenant general.**





Theodore C. Marrs, left, previously Deputy for Reserve Affairs in the Office of the Secretary of the Air Force, has replaced retiring Ernest L. Massad as Deputy Assistant Secretary of Defense for Reserve Affairs.

serve's 512th Military Airlift Wing, Carswell AFB, Tex. He will take the reins of the Central Region sometime this summer. The exact date will be determined by the Hq. AFRES commander.

In announcing the assignments, General Marchbanks called this the next step in bringing stability to the management structure of the Air Force Reserve. The Air Reserve Technician has proved to be the backbone of the unit program, assuring day-to-day supervision of Air Force Reserve activities.

### AFROTC Instructor Duty

Approximately 250 AFROTC instructor vacancies are projected for the summer of 1971. This is an increase over last year's requirements for both rated and support-skilled officers.

Basic eligibility criteria for AFROTC instructor duty include at least an M.A. degree and four years' active commissioned service by the summer of 1971. Rated officers must have completed five years in cockpit duties. Rated officers and officers serving in a SEA-critical skill must be ineligible for assignment to SEA.

Officers from all utilization fields are needed. Interested officers desiring a challenging and interesting tour working with young people are encouraged to apply. Applications should be forwarded to Air University by August 1, 1970.

### First All-Reserve C-9A Mission

The Air Force Reserve's "Associate" program reached another milestone in March when seven members of the Reserve's 932d Aeromedical Airlift Group (Associate), Scott AFB, Ill., became the first all-Reserve crew to fly a C-9A aeromedical mission. Their mission—to deliver patients to more than five military hospitals in the Midwest.

Col. Allen A. Beaumont, 932d commander, said the flight was the culmination of over eight months of training his personnel in the C-9A. USAFR pilots, nurses, and medical technicians have been training with the active-duty 375th Aeromedical Airlift Wing since the Reserve unit's mission changed from military airlift to aeromedical airlift in July 1969.

Each of the stops on the first all-Reserve flight lasted less than thirty minutes, deplaning patients for base hospitals along its route. The C-9A jet, a fully equipped hospital plane similar to the commercial DC-9 airliner, will handle thirty litter or forty ambulatory patients or a combination of both, Colonel Beaumont said.

Maj. Jackie VanHooerbeke, an Air Reserve Technician from O'Fallon, Ill., was the aircraft commander on the mission. Lt. Col. Mary Reeves, the flight's medical crew director, is a Smithboro, Ill., housewife.

Other crew members were Lt. Col. Nathan Polinsky, copilot, a Clayton, Mo., insurance executive; Capt. Lorraine Steiner, flight nurse, a Belleville, Ill., resident recently released from active duty; MSgt. Carl Stubblefield, first medical technician, an employee of the Missouri State Health Department, Poplar Bluff, Mo.; SSgt. Michael Hutchins, second medical technician, St. Louis, Mo.; and Sgt. Virgil Tebbe, third medical technician, a student at Southern Illinois University, Edwardsville, Ill.

### Parting Shots

\* The Wright-Patterson AFB JOC organized a "Job Visitation Program." For two days junior officers were encouraged to visit organizations on base to see if other jobs might interest them, and to gain more knowledge about the operation of the command (AFLC).

\* Three USAFR airlift units are scheduled to be inactivated as a result of the most recently announced plan to reduce military expenditures. The three units, all C-119 equipped, are the 914th TAG, Niagara Falls IAP, N.Y.; 922d TAG, Kelly AFB, Tex.; and the 933d TAG at Gen. Billy Mitchell Field, Wis. Inactivation is scheduled to be completed by September 30, 1970. At the same time, activation of new C-141 associate units is planned at McGuire AFB, N.J., and Charleston AFB, S. C., by June 30, 1971. Changes are, however, in the wind because of congressional opposition.

\* Eleven Air Force Reservists are attending OTS at Lackland AFB, Tex., on their way toward becoming the first members of the Air Force Reserve to participate in the Air Force Undergraduate Pilot Training (UPT) program.

After successful completion of both OTS and UPT, six of the men will train in C-130s, four in the C-141, and one in the C-9A.

The men are Dan P. Abercrombie, Robert J. Boss, II, Donald A. Esperson, Dennis M. Fitzgerald, Richard L. Highstrom, and Whitney E. Hill. Also, Thomas A. Kosh, Thomas D. McMichael, Gregory E. Nelson, John R. Stowers, and Herbert J. Thayer.

Reserve officials have requested additional UPT slots in the future to help fill forecast USAFR pilot requirements.

\* A selection board will convene at the Air Reserve Personnel Center on May 28 to select nonactive-duty officers for promotion to the permanent grades of captain, major, and lieutenant colonel. The board will consider.  
(Continued on following page)



Air Force Reserve's "Associate" program set another mark in March when seven members of a Reserve unit became the first all-Reserve crew to fly a C-9A aeromedical mission.

Curtis W. Tarr, formerly Assistant Secretary of the Air Force, has been appointed Director of the Selective Service, replacing Gen. Lewis B. Hershey, who is retiring after twenty-six years in the post. Mr. Tarr's replacement had not been named at press time.



officers recommended for promotion to fill unit and mobilization-augmentation vacancies, with the number to be promoted limited by grade ceilings and vacancies which exist on the boards' convening date.

\* Effective this August, the USAFR Colonels' Screening Board will meet annually rather than every two years. Officials believe the annual meeting of the Board, which selects a list of qualified colonels from which USAFR general-officer vacancies are filled, will be more responsive to USAFR's general-officer requirements.

\* Officers of the Reserve Forces and Air National Guard have an excellent opportunity to keep abreast of their Regular Air Force counterparts through the Air War College (AWC) Correspondence Program. For some students, individual study through correspondence is a quick and relatively easy way to acquire their professional military education. Other students, however, seem to prefer group study. Accordingly, the AWC Correspondence Program, which parallels the Resident Program as closely as practicable, can be pursued on an individual basis or through group study meetings.

\* The girls are now out of the rain. The Air Force has recently approved carrying an umbrella by Women in the Air Force while in uniform. It will be an optional item, dark blue or black in color, and may not be used while in military formations.

\* For several years AFA asked Congress to pass legislation which would allow retirement in the highest grade held in any service.

A strange solution has been worked out for this problem: The Comptroller General ruled that there really has been no problem all along. Persons affected should check with their services.

\* The CAB has been considering the elimination of low-cost charter flights for DoD personnel. Mendel Rivers, Chairman of the House Armed Services Committee, and DoD both strenuously opposed their elimination. Several service associations such as AFA also have informed CAB of their objection. An agreement has been reached that no action will be taken until after the summer travel period. We still believe that the low-fare charter service can be maintained after the summer period.

\* The President has recently and reluctantly signed legislation which will increase veteran's benefits for educational purposes by thirty-five percent. This new law will affect approximately 52,000 active duty personnel and 600,000 veterans.

### SENIOR STAFF CHANGES

Chaplain (B/G Selectee) John F. Albert, from Cmd. Chaplain, SAC, Offutt AFB, Neb., to Dep. Chief of Chaplains, Hq. USAF . . . Dr. Thomas G. Belden, from Research Staff Mem-

ber, Inst. for Defense Analyses, Arlington, Va., to AF Historian, GS-16, Office of AF History, Hq. USAF . . . B/G (M/G Selectee) Jones E. Bolt, from Dept. Dir., Ops. for Strike Forces, DCS/P&O, Hq. USAF, to DCS/Ops. Hq. USAF, Lindsey AS, West Germany, replacing M/G Gordon F. Blood . . . M/G Allison C. Brooks, from Cmdr., ARRS, MAC, Scott AFB, Ill., to Dep. Dir. Insp. Svcs. OASD (Admin), OSD, Hq. USAF, replacing retiring M/G Robert W. Strong, Jr. . . . B/G Richard G. Cross, Jr., from Asst. DCS/Ops, ADC, to Cmd. IG, ADC, Ent AFB, Colo., replacing B/G (M/G Selectee) Jimmy J. Jumper . . . B/G Frank K. Everest, Jr., from Asst. Dir. (Operational Test and Evaluation), OSD/DDR&E, Hq. USAF, to Cmdr., ARRS, MAC, Scott AFB, Ill., replacing M/G Allison C. Brooks.

B/G John H. Germeraad, from Cmdr., 62d Mil. Alft. Wg., MAC, McChord AFB, Wash., to Cmdr., 60th Mil. Alft. Wg., MAC, Travis AFB, Calif., replacing B/G James A. Hill . . . Mr. James P. Goode, from Dep. for Personnel Policy, GS-17, Office, Asst. Sec. of the AF, to Dep. Asst. Sec. (Personnel Policy), GS-18, Hq. USAF . . . Col. (B/G Selectee) Erwin A. Hesse, from Cmdr., 363d Tac. Recon. Wg., TAC, Shaw AFB, S.C., to Dir., J-2, USAFSO, Quarry Heights, Canal Zone, replacing B/G (M/G Selectee) James G. Silliman . . . Col. (B/G Selectee) John R. Hinton, Jr., from Cmdr., 410th Bomb Wg. (H), SAC, K. I. Sawyer AFB, Mich., to Cmdr., 307th Strategic Wg., SAC, U-Tapao Airfield, Thailand . . . B/G Arthur W. Holderness, Jr., from Cmdr., 314th Air Div., PACAF, Osan AB, South Korea, to Cmdr., 19th Air Div., SAC, Carswell AFB, Tex.

Col. (B/G Selectee) Eugene L. Hudson, from Cmdr., 42d Bomb Wg. (H), SAC, Loring AFB, Me., to Cmdr., 40th Air Div., SAC, Wurtsmith AFB, Mich., replacing B/G Carlton L. Lee . . . B/G Daniel James, Jr., from Cmdr., 7272d Flying Tng. Wg., USAF, Wheelus AB, Libya, to Dep. Asst. to the Asst. Sec. Def. (Public Affairs), OSD, Hq. USAF . . . B/G (M/G Selectee) Jimmy J. Jumper, from Cmd. IG, ADC, to DCS/Plans, ADC, Ent AFB, Colo. . . . B/G (M/G Selectee) John R. Kullman, from Asst. DCS/Plans, J-5, NORAD/CONAD, to DCS/Intelligence, J-2, NORAD/CONAD, Ent AFB, Colo., replacing retiring M/G Stebbins W. Griffith . . . B/G Carlton L. Lee, from Cmdr., 40th Air Div., SAC, Wurtsmith AFB, Mich., to Cmdr., 1st Comp. Wg., HQ COMD USAF, Andrews AFB, Md. . . . Col. (B/G Selectee) Oliver W. Lewis, from Cmdr., 1400th AB Wg., MAC, to DCS/P, MAC, Scott AFB, Ill., replacing M/G William V. McBride.

B/G Douglas T. Nelson, from Asst. DCS/Plans, SAC, Offutt AFB, Neb., to Dep. Sys. Prog. Dir., B-1, ASD, AFSC, Wright-Patterson AFB, Ohio . . . B/G (M/G Selectee) James G. Silliman, from Dir., J-2 USAFSO, Quarry Heights, Canal Zone, to Cmdr. and Chief, AFTAC, 1035th USAF Fld. Acty. Gp., HQ COMD USAF, Alexandria, Va. . . . Col. (B/G Selectee) George H. Sylvester, Dir., Test, Armament Development and Test Center, AFSC, Eglin AFB, Fla., to Asst. Dir. (Operational Test and Evaluation), OSD/DDR&E, Hq. USAF, replacing B/G Frank K. Everest, Jr. . . . Col. (B/G Selectee) Edwin J. White, Jr., from Cmdr., 3535th Nav. Tng. Wg., ATC, Mather AFB, Calif., to Dir., J-5, USAFSO, Albrook AFB, Canal Zone.

Col. (B/G Selectee) Thomas B. Wood, from Vice Cmdr., Pacific Security Rgn., USAFSS, Wheeler AFB, Hawaii, to Chief Opnl. Support Gp., NSA, USAFSS, Ft. Geo. G. Meade, Md.

**PROMOTIONS:** Nominated to Major General: James G. Silliman.

**Air Force Reserve:** Nominated to Major General: Homer I. Lewis; James L. Murray; Wendell B. Sell; Frank H. Spink, Jr. Nominated to Brigadier General: Stuart G. Haynsworth; Robert H. Hutchinson; Ralph M. Lain; Vorley M. Rexroad; Benton C. Tolley, Jr.; David Waxman; Alfred J. Wood, Jr.

**Air National Guard:** Nominated to Major General: I. G. Brown. Nominated to Brigadier General: John J. Pesch.

**RETIREMENTS:** M/G Grover C. Brown; L/G John W. Carpenter, III (Aug. 1); M/G Stebbins W. Griffith; L/G Thomas S. Moorman (Aug. 1); L/G Kenneth E. Pletcher; M/G Luther H. Richmond; M/G Robert W. Strong, Jr.; M/G Emmett M. Tally, Jr.—END.



# A mouse has already been saved from leukemia. Help us save a man.



For years, you've been giving people with leukemia your sympathy. But sympathy can't cure leukemia. Money can. Give us enough of that, and maybe we'll be able to do for a man what has already been done for a mouse.

**American Cancer Society**



AFA'S BOLDEST, NEWEST

# EXTRA INCOME

THREE PLANS TO CHOOSE FROM

MEMBER

MEMBER & SPOUSE

ENTIRE FAMILY

## WHAT IS AFA EXTRA INCOME HOSPITAL INSURANCE?

For every day you (or members of your family, if you have elected family coverage) are hospitalized AFA sends you money for up to 365 days . . . money you can use as you wish, without restrictions of any kind.

## WHO IS ELIGIBLE?

Any United States citizen under the age of 60 who is or becomes a member of the Air Force Association is eligible to apply for AFA Extra Income Hospital Insurance for himself, his spouse, and unmarried children more than 14 days and less than 21 years of age.

## HOW ARE BENEFITS PAID?

Once AFA receives verification that hospitalization has taken place, you will receive a benefit check within seven days with additional checks thereafter on a weekly basis upon AFA receiving certification of your continued hospitalization.

**FIRST TIME OFFERED  
TO ACTIVE DUTY  
MILITARY PERSONNEL**

## HOW MUCH EXTRA INCOME DO YOU NEED? CHOOSE THE BENEFIT AMOUNT YOU REQUIRE FROM THIS FLEXIBLE GROUP PLAN!

1. You are the key to family finances. How much extra money would your family need if you were hospitalized? Check Plans A-1 and AA-1.
2. Does part of the family income depend on a working spouse? Would a cook, or maid or housekeeper be needed during a wife's hospitalization? How much would this, and other expenses cost? Check Plans A-2 and AA-2.
3. If you have a family, you should consider providing extra income for children's hospitalization. Accidents involving whole families do happen, especially with military families living around the world. Check Plans A-3 and AA-3.

And remember: Benefits are paid up to 365 days of hospital confinement for each accident or sickness for each insured person while the patient is under the care of a legally qualified Doctor of Medicine.

## WHY DO YOU NEED EXTRA INCOME HOSPITAL INSURANCE?

### Hospital costs for Non Military Families are climbing out of sight!

In 1966, according to the American Hospital Association, average total cost per hospital admission was \$380.39 — up 412% in just 20 years.

Average 1966 cost per hospital day, over an average hospitalization of 7.9 days, was \$48.15 — a figure which includes only basic costs.

And costs are going higher. Other authorities estimate that average cost per hospital day may reach \$100 by 1980.

Would your present hospital benefits begin to cover this cost? Do they even cover today's costs?

### Military Families Can Have Severe Money Losses Caused By Hospitalization

Military families as well as civilian families can be financially hurt by the indirect expenses of hospitalization and serious illness.

Even if every cent of direct hospital cost is covered by government benefits (or hospital insurance) there may be hundreds or thousands of dollars in indirect losses. For example:

Loss of income, especially when more than one member of the family works

Extra travel expense (sometimes for long distances) for other family members

Cost of housekeeper or "sitters"

Special diets, sometimes for long periods

Expense of special home care.

**AFA EXTRA INCOME HOSPITAL INSURANCE PROVIDES THIS MONEY. BENEFITS ARE PAID DIRECTLY TO YOU — AND YOU USE THIS MONEY TO BEST SUIT YOUR NEEDS.**

## BENEFIT SCHEDULE

| PLAN | INDIVIDUAL PLAN    | LIMITED FAMILY PLAN    | FULL FAMILY PLAN         |
|------|--------------------|------------------------|--------------------------|
| A    | MEMBER<br>\$20/DAY | AND SPOUSE<br>\$15/DAY | AND CHILDREN<br>\$10/DAY |
| AA   | \$40/DAY           | \$30/DAY               | \$20/DAY                 |

## COST SCHEDULE

| Member's Age | INDIVIDUAL PLAN<br>PLAN A-1 |             | LIMITED FAMILY PLAN<br>PLAN A-2 |             | FULL FAMILY PLAN<br>PLAN A-3 |             |
|--------------|-----------------------------|-------------|---------------------------------|-------------|------------------------------|-------------|
|              | Annual                      | Semi-Annual | Annual                          | Semi-Annual | Annual                       | Semi-Annual |
| Under 40     | \$ 29.00                    | \$15.50     | \$ 59.00                        | \$ 30.50    | \$ 74.00                     | \$ 38.00    |
| 40-49        | \$ 37.00                    | \$19.50     | \$ 72.00                        | \$ 37.00    | \$ 86.00                     | \$ 44.00    |
| 50-59        | \$ 53.00                    | \$27.50     | \$103.00                        | \$ 52.50    | \$118.00                     | \$ 60.00    |
| 60-64        | \$ 76.00                    | \$39.00     | \$147.00                        | \$ 74.50    | \$162.00                     | \$ 82.00    |

| Member's Age | PLAN AA-1 |             | PLAN AA-2 |             | PLAN AA-3 |             |
|--------------|-----------|-------------|-----------|-------------|-----------|-------------|
|              | Annual    | Semi-Annual | Annual    | Semi-Annual | Annual    | Semi-Annual |
| Under 40     | \$ 54.00  | \$28.00     | \$107.00  | \$ 54.50    | \$134.00  | \$ 68.00    |
| 40-49        | \$ 68.00  | \$35.00     | \$132.00  | \$ 67.00    | \$156.00  | \$ 80.50    |
| 50-59        | \$100.00  | \$51.00     | \$195.00  | \$ 98.50    | \$222.00  | \$112.00    |
| 60-64        | \$147.00  | \$74.50     | \$294.00  | \$143.00    | \$312.00  | \$157.00    |

# HOSPITAL INSURANCE

Pays CASH benefits up to \$40 per hospital day for each insured person!

All AFA members — military and civilian — and their families are eligible.

**OTHER BENEFITS**

Protected AFA members may continue their coverage at the low, group rate to Age 65, or until they become eligible for Medicare, whichever is earlier. Hospitalization for all sicknesses and accidents is covered, except for a few standard exceptions listed under "Exclusions."

**LIMITATIONS**

Hospital confinements separated by less than three months for the same or related conditions will be considered continuations of the same confinement.

Coverage will continue through the life of the master policy unless terminated for whichever of the following reasons occurs first for the protected person: (a) attains age 65; or (b) becomes eligible for Medicare; or (c) AFA membership dues are due and unpaid; or (d) a premium payment is due and unpaid. For dependents, coverage will continue through the life of the master policy unless terminated for whichever of the following reasons occurs first: (a) such dependent ceases to be an eligible dependent; or (b) the protected person's insurance terminates hereunder; or (c) the dependent spouse either attains age 65 or becomes eligible for Medicare; or (d) any required dependent premium payment is due and unpaid.

**EXCLUSIONS**

The plan does not cover losses resulting from (1) declared or undeclared war or act of war; (2) service in the armed forces of a country other than the United States; (3) acts of intentional self destruction or attempted suicide while sane or insane; (4) pregnancy (including childbirth or resulting complications); (5) confinement in any institution primarily operated as a home for the aged or engaged in the care of drug addicts or alcoholics; (6) illnesses for which the insured has received medical treatment or advice or has taken prescribed drugs or medicines within 12 months prior to the effective date of his insurance. Coverage for such pre-existing illnesses will begin after 12 consecutive months during which he is covered under the policy and receives no such medical treatment or advice and takes no such prescribed drugs or medicine; (7) hospital confinement commencing prior to the date the protected person or eligible dependent becomes insured under this policy.

**HOW TO APPLY**

Fill out the attached application and mail it to AFA with your first premium payment. You may elect to pay premiums either annually or semi-annually.

## APPLICATION AFA EXTRA INCOME HOSPITAL INSURANCE

Underwritten by Mutual of Omaha Insurance Co. Omaha, Nebraska.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

DATE OF BIRTH \_\_\_\_\_ CURRENT AGE \_\_\_\_\_ HEIGHT \_\_\_\_\_ WEIGHT \_\_\_\_\_ SEX \_\_\_\_\_

**PLAN OF INSURANCE**

**MEMBER ONLY**

- PLAN A-1
- PLAN AA-1

**MEMBER & SPOUSE**

- PLAN A-2
- PLAN AA-2

**MEMBER SPOUSE & CHILDREN**

- PLAN A-3
- PLAN AA-3

**METHOD OF PAYMENT**  Annual  Semi-Annual

This insurance coverage may only be issued to AFA members. Please check the appropriate box:

- I am currently an AFA member.
- I enclose \$7 for annual AFA dues (includes subscription (\$6) to AIR FORCE/SPACE DIGEST).

I enclose my initial premium in the amount of \$\_\_\_\_\_ (Refer to premium table to determine correct premium amount.)

Please complete this section only if you are requesting coverage for dependents (Limited Family or Family Plan) and list only those persons for whom you are requesting coverage.

| FULL NAME | RELATIONSHIP TO AFA MEMBER | SEX | DATE OF BIRTH |
|-----------|----------------------------|-----|---------------|
|           | WIFE (HUSBAND)             |     |               |
|           | child                      |     |               |
|           | child                      |     |               |
|           | child                      |     |               |
|           | child                      |     |               |
|           | child                      |     |               |
|           | child                      |     |               |

In applying for this insurance coverage, I understand and agree that:

1. coverage shall become effective on the last day of the calendar month during which my application together with the proper premium amount is mailed to AFA.
2. only hospital confinements commencing after the effective date of insurance are covered, and
3. any condition for which I or any of my eligible dependents received medical treatment or advice or have taken prescribed drugs or medicine within twelve months prior to effective date of the insurance coverage will not be covered until the expiration of twelve consecutive months of insurance coverage without medical treatment or advice or having taken prescribed drugs or medicine for such condition.

DATE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

Application must be accompanied by check or money order. Send remittance to:

**INSURANCE DIVISION, AFA, 1750 PENNSYLVANIA AVE., N.W., WASHINGTON, D.C. 20006**

Form 2332MGC App.

5-70



THE GEORGIA STATE ORGANIZATION . . .  
*cited for effective support of the AFA mission  
 through its AFJROTC programs and "Project POW."*

More than fifty AFJROTC cadets from Washington and Wayne County High Schools of Jesup, Ga., recently attended an AFJROTC Aerospace Seminar cosponsored by the Georgia AFA and the 165th Military Airlift Group of the Georgia Air National Guard.

During the two-day event, the cadets were quartered in the 165th's barracks at the Savannah Municipal Airport. The Seminar program included a tour and briefing on crash-fire equipment; a survival demonstration; a weather briefing; a briefing for flight; an orientation flight aboard a C-124 aircraft; a tour of the 165th's facilities; and a tour of the Federal Aviation Agency's Weather Bureau and Terminal.

Also part of the program were presentations by **Col. William Kelly**, Georgia AFA President and Base Commander, on "The Value of the AFJROTC Program," "The Forgotten Americans of the Vietnam War," and "Operation POW"; and a presentation entitled "24,000 Miles to Vietnam with the Georgia Air National Guard."

Participants from the 165th who contributed to the success of the Seminar included **Col. William F. Summerell**, Commander, **Colonel Kelly**,



During the Georgia AFA's Aerospace Seminar, AFJROTC cadets from Wayne County High School, Jesup, Ga., assemble for a photo beside a C-124 of the 165th MAG, Georgia Air National Guard, before taking an orientation flight.

**Lt. Col. Harold Newton, Maj. Frank Tinley, CWO George W. Adams, MSgt. Ennis Hagin, TSgt. Gerald Ulery, SSgt. James E. Newman, and Sgt. Preston Woods.** Other participants included Savannah Chapter President **Jack Berry; Lt. Col. John F. Parker, USAF (Ret.), Aerospace Education Instructor; and MSgt. Stanley H. Whonic, Assistant Aerospace Education Instructor.**

The consensus of the cadets was that the program was most enjoyable

and contributed invaluable to a better understanding of the United States Air Force, the Air National Guard, and the Air Force Association.

In recognition of the Georgia AFA's efforts in this program and its continuing "Operation POW" project—distribution of more than 4,000 reprints of "The Forgotten Americans of the Vietnam War"; speeches before numerous organizations throughout Georgia; and virtually unexcelled news coverage, including a four-part, full-page reprint of the article in a local newspaper—we are happy to name the Georgia AFA the "AFA Unit of the Month" and congratulate the officers and members on their outstanding contributions to AFA's mission.

\* \* \*

More than 350 persons, including leaders of Congress, the Air Force, industry, and AFA attended the Nation's Capital Chapter's second annual dinner dance at the Bolling AFB Officers Club in early February to celebrate AFA's twenty-fourth anniversary.

Heading the congressional and Air Force guest lists were **Sen. Howard Cannon (D-Nev.), Air Force Under Secretary John L. McLucas, and Air Force Vice Chief of Staff Gen. John C. Meyer.**

Highlight of the evening was presentation of Chapter awards to designers of World War II Army Air Force



AFA President **George D. Hardy**, left center, guest speaker at the Pope, N.C., Chapter meeting, presents AFA's "Outstanding Civil Air Patrol Cadet of the Year" Trophy to Cadet **Col. Richard L. Delanoy, CAP**, right center. Chapter Secretary **Arthur Hurr**, left, and Southeast Regional VP **Lester C. Curl**, right, look on. Cadet **Delanoy**, of Silver Spring, Md., is a freshman at Wake Forest College, Winston-Salem, N.C., and a member of CAP's National Capital Wing.



Gen. John P. McConnell, retired former USAF Chief of Staff, left, is welcomed by Nation's Capital Chapter President V. M. Rexroad, left center, Mrs. Rexroad, and Chapter Vice President Robert Schissell, at the Chapter's dinner dance observing AFA's twenty-fourth anniversary.



Enjoying a story being told by Senator Howard Cannon (D-Nev.) are, from left, Lt. Gen. Earl C. Hedlund, Director, Defense Supply Agency; Senator Cannon; AFA National Treasurer Jack B. Gross, and James T. Ashworth, a member of the Nation's Capital Chapter's Committee.

combat aircraft. The awards were presented by **Gen. John P. McConnell**, USAF (Ret.), former USAF Chief of Staff and now an AFA National Director. Those honored included: **Edward H. Heinemann** (A-20 Havoc and A-26 Invader), **Edward C. Wells** (B-17 Flying Fortress and B-29 Superfortress), **I. M. "Mac" Laddon** (B-24 Liberator), **J. Leland Atwood** (B-25 Mitchell and P-51 Mustang), and **Payton Magruder** (B-26 Marauder).

Also, **Clarence L. "Kelly" Johnson** (P-38 Lightning), **Robert J. Woods** (posthumously) (P-39 Airacobra), **Don R. Berlin** (P-40 Warhawk), **Alexander Kartveli** (P-47 Thunderbolt), and **John K. Northrop** (P-61 Black Widow).

Chapter President **V. M. Rexroad** presided and AFA National Treasurer **Jack B. Gross** installed the Chapter's 1970 officers. They are: **Robert J. Schissell**, President; **Brig. Gen. F. L. Vidal**, USAF (Ret.), Vice President; **James McGarry**, Secretary; and **Douglas M. Wood**, Treasurer.

The Air Force's Strolling Strings provided dinner music, and Bruce Snyder and his VIP Orchestra provided music for dancing.

\* \* \*

**Gen. Jack J. Catton**, Commander, Military Airlift Command (MAC), was the featured speaker at the **Central Florida Chapter's** first meeting of 1970. General Catton spoke on USAF's global airlift mission and the mobility requirements of MAC. He stated that "rapid, responsive, reliable mobility of the United States fighting forces is a basic requisite to credible, flexible response." He reminded the audience, which numbered about 200 persons, "that flexible response is a basic requisite to an efficient and effective national military strategy." General Catton called on the Air Force

Association for help and understanding to meet the future needs of the Air Force and the Military Airlift Command.

AFA National Director **Martin H. Harris** was master of ceremonies and presented General Catton a citation "for his outstanding contributions to the development of adequate aerospace power for the United States."

During the program, Florida AFA President **Taylor Drysdale** installed Mr. Harris as the President of the Central Florida Chapter. Other officers installed are: **W. Allen Porter** and **Maj. Gen. Edward Suarez**, USAF (Ret.), Vice Presidents; **Charles Heltsley**, Secretary; **Charles Tanner**, Treasurer; and **Robert Coward**, Chaplain.

Special guests included **Air Vice Marshal Denis Crowley-Milling**, Air Attaché to the United States from Great Britain; **Col. Walter Carter**, Rear Echelon Commander, 306th Bomb Wing; Southeast Regional Vice

President **Lester C. Curl**; Florida AFA Vice Presidents **Al Clark** and **Bud West**; and Florida Chapter Presidents **Charles Widaman** (Eglin), **Al Scholin** (Florida West Coast), **Frank White** (Holiday Highlands), and **William Truxal** (Panama City).

\* \* \*

Washington, D.C., was the site of AFA's **sixth annual State Presidents' Orientation Meeting**, March 6-7. In conjunction with the meeting, the newly restructured **Organizational Advisory Council** held its first meeting.

Twenty-nine State Presidents attended the two-day meeting, which convened at AFA's Headquarters offices for briefings on AFA—its mission and internal operation.

AFA Executive Director **James H. Straubel** moderated a series of briefings on the responsibilities and operation of the various departments within AFA Headquarters, the political scene  
(Continued on following page)



Gen. Jack Catton, left, Commander, Military Airlift Command, receives a citation from Martin H. Harris, Central Florida Chapter President and AFA National Director. General Catton was guest of honor and featured speaker at a recent dinner meeting sponsored by the Chapter.



During a reception in Washington honoring AFA's State Presidents, Secretary of the Air Force Robert C. Seamans, Jr., right center, enjoys a visit with Michigan AFA President Marjorie O. Hunt, and OAC members Nolan Manfull, left, and Sam E. Keith, Jr., right. Missouri AFA President Rodney Horton can be seen in the center background.

as it relates to AFA's mission, the Aerospace Education Foundation and Arnold Air Society, and a report on AFA's campaign in support of American POWs and their families.

A luncheon at the Army-Navy Club featured a speech by AFA President **George D. Hardy** and remarks by Board Chairman **Jess Larson**. In his talk, President Hardy said, "AFA has never been needed more than it is today. It is an honor, in my opinion, for all of us in our positions to have the opportunity to make a contribution to our country and to, indeed, the cause of free men everywhere.

"There is no time—there is no place—in AFA for minor, internal, insignificant, petty grievances to be allowed to waste our energies and warp our thinking. Remember that, please. The issues are too great, the task too monumental."

After lunch, **Capt. William Turk**, AFA Project Officer, conducted the group on a tour of the Pentagon, followed by an up-to-date briefing on the Air Force by **Maj. Gen. Henry L. Hogan, III**, Director, Office of Information.

That evening, the State Presidents and members of the OAC were guests of honor at a reception at which Secretary of the Air Force **Robert C. Seamans, Jr.**, and USAF Chief of Staff **Gen. John D. Ryan** headed a most impressive guest list of civilian and military leaders of the Air Force.

The second day's session was conducted at the Sheraton-Park Hotel and included presentations by President Hardy and National Treasurer **Jack B. Gross**, and featured a motion picture on the Utah AFA's second "Project Navajo."

The following State Presidents attended the meeting: **Dr. Boyd Macrory**, Alabama; **Gordon Wear**, Alaska; **Hugh W. Stewart**, Arizona;

**Alexander E. Harris**, Arkansas; **Gene DeVisscher**, California; **Richard E. Stanley**, Colorado; **Taylor Drysdale**, Florida; **William H. Kelly**, Georgia; **Donald M. Riley**, Idaho; **Ludwig Fahrenwald, III**, Illinois; **Ric Jorgensen**, Iowa; **H. John McGaffigan**, Louisiana; **Andrew W. Trushaw, Jr.**, Massachusetts; **Marjorie O. Hunt**, Michigan; and **Victor J. Vacanti**, Minnesota.

Also, **Milton E. Castleman**, Mississippi; **Rodney G. Horton**, Missouri; **Pat Sheehan**, New Mexico; **William C. Rapp**, New York; **Bernard D. Osborne**, Ohio; **Edward L. McFarland**, Oklahoma; **Robert Ringo**, Oregon; **Gilbert E. Petrina**, Pennsylvania; **James F. Hackler**, South Carolina; **B. L. Cockrell**, Texas; **Harry L. Cleveland**, Utah; **Richard C. Emrich**, Virginia; **Clyde Stricker**, Washington; and **Lyle W. Ganz**, Wisconsin.

OAC members included **Nolan Manfull**, chairman, Utah; **Lester C. Curl**, Florida; **Rodney G. Horton**,

Missouri; **Sam E. Keith, Jr.**, Texas; **Dr. Boyd E. Macrory**, Alabama; **Robert Maltby**, Ohio; and **Ed Millson**, California.

\* \* \*

**CROSS COUNTRY . . .** AFA National Director **Jack Withers** has established his own consulting firm in Dayton, specializing in aerospace industry management, marketing, and corporate practices as they relate to DoD and NASA development programs . . . **A. H. "Gus" Duda**, former AFA Program Director, is now the Manager of the Washington Office, Las Vegas Convention Authority.

**CONGRATULATIONS TO . . .** **Stuart Haynsworth** of Houston, Tex., a Past President of the Texas AFA; and to **V. M. Rexroad** of Washington, D.C., immediate Past President of the Nation's Capital Chapter, both of whom recently were promoted to the rank of brigadier general in the Air  
(Continued on page 190)



AFA Executive Director **James H. Straubel**, center, guest of honor and speaker at a luncheon in Seattle sponsored by the Washington State AFA, chats with Washington AFA President **Clyde Stricker**, left, and Northwest Regional Vice President **Clair Whitney**. Mr. Straubel was in Seattle to receive the National Aeronautic Association's 1969 **Frank G. Brewer Trophy** for outstanding contributions to the development of aerospace education in the US and abroad.



# 1970 ANNUAL NATIONAL CONVENTION AND AEROSPACE BRIEFINGS AND DISPLAYS

## Washington, D.C. — September 21-22-23-24

### SCHEDULE OF EVENTS

#### Sunday, September 20

- 12:00 NN Registration Desk Open
- 3:00 PM AFA Board of Directors Meeting

#### Monday, September 21

- 8:00 AM Registration Desk Open
- 9:30 AM Opening Ceremony & Awards
- 2:30 PM 1st AFA Business Session
- 7:00 PM AFA President's Reception For Chapter Officers and Convention Delegates

#### Tuesday, September 22

- 8:00 AM Registration Desk Open
- 8:30 AM 2nd AFA Business Session
- 9:00 AM Briefings & Displays Open
- 11:45 AM AF Chief of Staff Reception
- 12:00 NN Briefing Participants Buffet Luncheon
- 2:30 PM AF Reserve Seminar
- 6:00 PM AF Secretary & Chief's Annual Reception

#### Wednesday, September 23

- 8:00 AM Registration Desk Open
- 9:00 AM Briefings & Displays Open
- 9:00 AM Air Force Symposium
- 11:45 AM AF Secretary's Reception
- 12:00 NN Briefing Participants Buffet Luncheon
- 12:30 PM AF Secretary's Luncheon
- 4:00 PM Briefing Participants Reception
- 7:00 PM AF Anniversary Reception
- 8:00 PM AF Anniversary Dinner-Dance

#### Thursday, September 24

- 9:00 AM Briefings & Displays Open
- 12:00 NN Briefing Participants Buffet Luncheon
- 4:00 PM Briefings Participants Reception

AFA's 1970 National Convention, now combined with its Annual Fall Meeting and Aerospace Development Briefings and Displays, will be held in Washington, D.C., September 21-24. All major Convention activities will be conducted at the Sheraton-Park, Shoreham, and Washington Hilton Hotels. Additional housing also will be reserved at the Windsor Park Hotel. Reservation requests should be addressed to the AFA Housing Office, 1129 20th St., N.W., Washington, D.C. 20036. All reservation requests for rooms and suites must be mailed (no phone calls, please) to the AFA Housing Office. Do not make any reservation requests directly with the hotels.

AFA's 1970 National Convention activities will include a luncheon for the Air Force Chief of Staff, a luncheon for the Air Force Secretary, a reception in honor of the Secretary and Chief, and the Annual Air Force Anniversary Reception and Dinner-Dance. The National Convention also will feature AFA's Business Sessions, Seminars, and several other activities, including a reception in honor of AFA Chapter Officers, the Annual Outstanding Airmen Dinner, and the Chief Executives Buffet Reception.

The Advance Registration fee for AFA's 1970 Annual Convention is \$50.00, which includes credentials and tickets to all major Convention functions (except as referred to below), including the Secretary's Luncheon, the Chief's Luncheon, and the Reception honoring the Secretary and the Chief. After September 7, the Current Registration fee is \$60.00, which includes the above credentials and activities. The Air Force Anniversary Reception and Dinner-Dance is not included in Advance or Current Registration fees. Individual reservations are \$30.00 (includes both Reception and Dinner-Dance). All seating at Dinner-Dance is reserved and tables of 10 are available at \$300.00. Dress is black tie. All Convention registrants are cordially invited to attend the Aerospace Briefings and Displays each afternoon, as our guests and to join us for a complimentary reception Wednesday and Thursday afternoons at 4:00 PM.

### ADVANCE REGISTRATION FORM

#### 24th ANNUAL AIR FORCE ASSOCIATION CONVENTION & AEROSPACE BRIEFINGS & DISPLAYS

SEPTEMBER 21-24, 1970

SHERATON-PARK HOTEL

WASHINGTON, D. C.

Type or print

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

AFFILIATION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY & STATE \_\_\_\_\_

Reserve the following for me:

- Advance registrations  
@ \$50.00 per person ..... \$ \_\_\_\_\_
- Current Registrations\*  
@ \$60.00 per person ..... \$ \_\_\_\_\_
- AF Anniversary Reception &  
Dinner-Dance Tickets  
@ \$30.00 per person ..... \$ \_\_\_\_\_

Amount enclosed ..... \$ \_\_\_\_\_

\*Current Registration fee (after Sept. 7): \$60.00

Make checks payable to AFA and mail to  
1750 Pennsylvania Ave., N.W., Washington, D.C. 20006



The AFA Mothers' Chapter of Pittsburgh, Pa., recently donated \$100 to the Aerospace Education Foundation. On behalf of the Foundation, Executive Director James H. Straubel, center, accepts the check from Northeast Regional Vice President John Brosky as Assistant Executive Director John O. Gray looks on. The Chapter, which also maintains a fund to assist airmen stranded in Pittsburgh without funds, sustains its projects through bake sales, raffles, and the like.

Force Reserve . . . **Dr. Theodore C. Marrs** on receiving the Air Force Exceptional Civilian Service Medal for his outstanding service as Deputy Assistant Secretary of the Air Force for Reserve Affairs, and on his new posi-

tion as Deputy Assistant Secretary of Defense for Reserve Affairs.

And to the **United States Air Force Band**, recipient of the **Freedoms Foundation's** coveted **George Washington Honor Medal** for 1969. The

medal was presented for the Band's production of its patriotic and inspiring record album, "America the Beautiful." When presenting the medal to **Lt. Col. Arnauld Gabriel**, the Band's Commander and Conductor, **Carmen Dragon**, internationally acclaimed conductor, composer, and arranger, said, ". . . my only regret lies in the fact that your thrilling record production, 'America the Beautiful,' is not commercially available so that all Americans could share in the patriotic experience that this outstanding album evokes. . . ."

\* \* \*

AFA extends its deepest sympathy to the families of . . . **Stewart Rice** of Farmington, Mich., an AFA National Honorary Member, who died December 31, 1969 . . . **Col. Charles Brown, USAF (Ret.)**, of San Bernardino, Calif., a Past President of the San Bernardino Chapter, who died March 6 . . . **Robert Ewing, Jr.**, of Shreveport, La., a former Trustee of the Aerospace Education Foundation, who died March 10 . . . and **Ben Regan** of New York City, a Past President of the Iron Gate Chapter, who died March 14.

—DON STEELE



**All The Friends Of The Air Force  
Are Cordially Invited To Participate In**

## **The 2nd Annual AFA Charity Golf Tournament**

Sponsored By The

San Bernardino and Riverside, California Chapters

On

### **Friday, June 19 and Saturday, June 20, 1970**

At March AFB and Norton AFB Golf Courses

**FEATURING 300 GOLFERS, INCLUDING THE HOLLYWOOD HACKERS,  
SPORTS CELEBRITIES, INDUSTRY SPONSORS & HONORED GUESTS**

Two fun filled days of golf, friendship, and entertainment. Last year's tournament netted more than \$8,000 for the Air Force Village, AFA's Aerospace Education Foundation, the local Armed Services Center, and other Air Force oriented charities.

FOR INFORMATION or sponsorships, golfing participation, or advertisements in the tournament program, telephone, TWX, or write AFA Charity Golf:

Telephone (714) 889-7000 • TWX (714) 869-7580 • P.O. Box 6187, San Bernardino, Calif., 92408





# THIS IS AFA

The Air Force Association is an independent, nonprofit airpower organization with no personal, political, or commercial axes to grind; established January 26, 1946, incorporated February 4, 1946.

### Objectives

• The Association provides an organization through which free men may unite to fulfill the responsibilities imposed by the impact of aerospace technology on modern society; to support armed strength adequate to maintain the security and peace of the United States and the free world; to educate themselves and the public at large in the development of adequate aerospace power for the betterment of all mankind; and to help develop friendly relations among free nations, based on respect for the principles of freedom and equal rights for all mankind.

### Membership

**Active Members:** US citizens who support the aims and objectives of the Air Force Association, and who are not on active duty with any branch of the United States armed forces—\$7 per year.

**Service Members** (nonvoting, nonofficeholding); US citizens on extended active duty with any branch of the United States armed forces—\$7 per year.

**Cadet Members** (nonvoting, nonofficeholding): US citizens enrolled as Air Force ROTC Cadets, Civil Air Patrol Cadets, or Cadets of the United States Air Force Academy—\$3.50 per year.

**Associate Members** (nonvoting, nonofficeholding); Non-US citizens who support the aims and objectives of the Air Force Association whose application for membership meets AFA constitutional requirements—\$7 per year.

### Officers and Directors

**GEORGE D. HARDY**, President, Hyattsville, Md.; **GLENN D. MISHLER**, Secretary, Akron, Ohio; **JACK B. GROSS**, Treasurer, Harrisburg, Pa.; **JESS LARSON**, Chairman of the Board, Washington, D.C.

**REGIONAL VICE PRESIDENTS:** Will H. Bergstrom, Colusa, Calif. (Far West); John G. Brosky, Pittsburgh, Pa. (Northeast); Lester C. Curl, Melbourne Beach, Fla. (Southeast); A. Paul Fonda, Washington, D.C. (Central East); Jack T. Gilstrap, Huntsville, Ala. (South Central); Sam E. Keith, Jr., Fort Worth, Tex. (Southwest); Nolan W. Manfull, Roy, Utah (Rocky Mountain); Edward T. Nedder, Hyde Park, Mass. (New England); Dick Palen, Edina, Minn. (North Central); Clair G. Whitney, Bellevue, Wash. (Northwest); W. M. Whitney, Jr., Detroit, Mich. (Great Lakes); O. Earl Wilson, St. Louis, Mo. (Midwest).

**DIRECTORS:** John R. Alison, Beverly Hills, Calif.; Joseph E. Assaf, Hyde Park, Mass.; William R. Berkeley, Redlands, Calif.; Milton Caniff, New York, N. Y.; M. Lee Cordell, Berwyn, Ill.; Edward P. Curtis, Rochester, N. Y.; S. Parks Deming, Colorado Springs, Colo.; James H. Doolittle, Los Angeles, Calif.; Joe Foss, Scottsdale, Ariz.; Paul W. Gailard, Omaha, Neb.; Martin H. Harris, Winter Park, Fla.; John P. Henebery, Kenilworth, Ill.; Joseph L. Hodges, South Boston, Va.; Robert S. Johnson, Woodbury, N. Y.; Arthur F. Kelly, Los Angeles, Calif.; George C. Kenney, New York, N. Y.; Maxwell A. Kriendler, New York, N. Y.; Thomas G. Lanphier, Jr., La Jolla, Calif.; Curtis E. LeMay, Bel Air, Calif.; Joseph J. Lingle, Milwaukee, Wis.; Carl J. Long, Pittsburgh, Pa.; Howard T. Markey, Chicago, Ill.; Nathan H. Mazer, Roy, Utah; John P. McConnell, Washington, D. C.; J. B. Montgomery, Tulsa, Okla.; Warren B. Murphy, Boise, Idaho; Martin M. Ostrow, Beverly Hills, Calif.; Earle N. Parker, Fort Worth, Tex.; Julian B. Rosenthal, New York, N. Y.; Peter J. Schenk, Arlington, Va.; Joe L. Shosid, Fort Worth, Tex.; Robert W. Smart, Washington, D. C.; C. R. Smith, Washington, D. C.; Carl A. Spaatz, Chevy Chase, Md.; William W. Spruance, Wilmington, Del.; Thos. F. Stack, San Francisco, Calif.; Arthur C. Storz, Omaha, Neb.; Harold C. Stuart, Tulsa, Okla.; James M. Trail, Boise, Idaho; Nathan F. Twining, Hilton Head Island, S. C.; Robert C. Vaughan, San Carlos, Calif.; Jack Withers, Dayton, Ohio; Charles Azukas, National Commander, Arnold Air Society, Tulane University (ex-officio); Rev. Henry J. McNulty, C.S.Sp., National Chaplain, Pittsburgh, Pa. (ex-officio).

### State Contacts

Following each state name, in parentheses, are the names of the localities in which AFA Chapters are located. Information regarding these Chapters, or any place of AFA's activities within the state, may be obtained from the state contact.

**ALABAMA** (Auburn, Birmingham, Huntsville, Mobile, Montgomery, Selma): **Dr. Boyd E. Macroy**, 3721 Princeton Rd., Montgomery, Ala. 36111 (phone 293-6871).

**ALASKA** (Anchorage, Fairbanks, Kenai, Nome): **Gordon Wear**, Box 777, Fairbanks, Alaska 99701 (phone 452-4411).

**ARIZONA** (Phoenix, Tucson): **Hugh P. Stewart**, 709 Valley Bldg., Tucson, Ariz. 85705 (phone 622-3357).

**ARKANSAS** (Fort Smith, Little Rock): **Alex E. Harris**, 3700 Cantrell Rd., Apt. 612, Little Rock, Ark. 72202 (phone 664-1915).

**CALIFORNIA** (Antelope Valley, Burbank, Chico, El Segundo, Fairfield, Fresno, Harbor City, Long Beach, Los Angeles, Monterey, Newport Beach, Norwalk, Novato, Pasadena, Riverside, Sacramento, San Bernardino, San Diego, San Francisco, Santa Barbara, Santa Clara County, Santa Monica, Tahoe City, Vandenberg AFB, Van Nuys, Ventura): **Gene DeVisscher**, 2775 Cottage Way, Sacramento, Calif. 95825 (phone 487-7818).

**COLORADO** (Boulder, Colorado Springs, Denver, Pueblo): **R. E. Stanley**, 7644 Heath Dr., Colorado Springs, Colo. 80907 (phone 473-3154).

**CONNECTICUT** (Torrington): **Cecil H. Gardner**, 21 Field Rd., Cos Cob, Conn. 06807 (phone 869-3146).

**DELAWARE** (Wilmington): **Vito A. Panzarino**, Greater Wilmington Airport, Bldg. 1504, Wilmington, Del. 19720 (phone 328-1208).

**DISTRICT OF COLUMBIA** (Washington, D. C.): **Robert J. Schissell**, 1700 Pennsylvania Ave., N. W., Washington, D. C. 20006 (phone 223-4430).

**FLORIDA** (Bartow, Daytona Beach, Fort Lauderdale, Eglin AFB,

Gainesville, Homestead, Jacksonville, Miami, Orlando, Panama City, Patrick AFB, Redington Beach, Tampa): **Taylor Drysdale**, 5526 Parkdale Dr., Orlando, Fla. 32809 (phone 855-3632).

**GEORGIA** (Savannah, St. Simons Island, Valdosta, Warner Robins): **William H. Kelly**, 241 Kensington Dr., Savannah, Ga. 31402 (phone 234-2535).

**HAWAII** (Honolulu): **John H. Felix**, Suite 2012, 1441 Kapiolani Blvd., Honolulu, Hawaii 96813 (phone 946-8080).

**IDAHO** (Boise, Burley, Pocatello, Rupert, Twin Falls): **Donald M. Riley**, 6925 Copper Dr., Boise, Idaho 83704 (phone 375-2948).

**ILLINOIS** (Champaign, Chicago, Elmhurst, Le Grange, Park Forest, Peoria): **Ludwig Fahrwald III**, 108 N. Ardmore, Villa Park, Ill. 60181 (phone 832-6566).

**INDIANA** (Indianapolis): **George L. Hufford**, 419 Highland Ave., New Albany, Ind. 47150.

**IOWA** (Cedar Rapids, Des Moines): **Ric Jorgensen**, 4005 Kingsmen, Des Moines, Iowa 50311 (phone 255-7656).

**KANSAS** (Wichita): **Don C. Ross**, 10 Linwood, Eastborough, Wichita, Kan. 67201 (phone 686-6409).

**LOUISIANA** (Alexandria, Baton Rouge, Bossier City, Lafayette, Monroe, New Orleans, Ruston, Shreveport): **H. John McGaffigan**, 205 Stuart, Shreveport, La. 71105 (phone 861-1990).

**MARYLAND** (Baltimore): **Henry R. Johnston**, 106 Taplow Rd., Baltimore, Md. 21212 (phone 435-3366).

**MASSACHUSETTS** (Boston, Florence, Lexington, Northampton, Plymouth, Randolph, Saugus, Taunton, Worcester): **Andrew W. Trushaw, Jr.**, 204 N. Maple St., Florence, Mass. 01060 (phone 584-5327).

**MICHIGAN** (Battle Creek, Dearborn, Detroit, Kalamazoo, Lansing, Mount Clemens): **Marjorie O. Hunt**, P. O. Box 822, Mount Clemens, Mich. 48043 (phone 463-1528).

**MINNESOTA** (Duluth, Minneapolis, St. Paul): **Victor Vacanti**, 8941 10th Ave., Minneapolis, Minn. 55420 (phone 888-4240).

**MISSISSIPPI** (Biloxi, Jackson): **M. E. Castleman**, 5207 Washington Ave., Gulfport, Miss. 39501 (phone 863-6526).

**MISSOURI** (Kansas City, Springfield, St. Louis): **Rodney G. Horton**, 4314 N. E. 53d St., Kansas City, Mo. 64119 (phone 452-7834).

**NEBRASKA** (Lincoln, Omaha): **Lloyd Grimm**, P. O. Box 1477, Omaha, Neb. 68101 (phone 553-1812).

**NEVADA** (Las Vegas): **Barney Rawlings**, 2617 Mason Ave., Las Vegas, Nev. 89102 (phone 735-5111).

**NEW HAMPSHIRE** (Pease AFB): **R. L. Devoucoux**, 270 McKinley Rd., Portsmouth, N. H. 03801 (phone 624-4011).

**NEW JERSEY** (Atlantic City, Belleville, Chatham, Fort Monmouth, Jersey City, McGuire AFB, Newark, Paterson, Trenton, Wallington): **James P. Grazioso**, 208 63d St., West New York, N. J. 07093 (phone 867-5272).

**NEW MEXICO** (Alamogordo, Albuquerque, Roswell): **Pat Sheehan**, P. O. Box 271, Albuquerque, N. M. 87103 (phone 255-7629).

**NEW YORK** (Binghamton, Buffalo, Elmira, Forest Hills, Freeport, Ithaca, Kew Gardens, Lakewood, Newburgh, New York City, Patchogue, Plattsburgh, Rochester, Rome, Staten Island, Sunnyside, Syracuse, White Plains): **William C. Rapp**, Suite 1400, 1 M&T Plaza, Buffalo, N. Y. 14203 (phone 857-6871).

**NORTH CAROLINA** (Fayetteville, Raleigh): **Edwin A. Capps**, 4913 Yadkin Dr., Raleigh, N. C. 27609 (phone 829-7196).

**OHIO** (Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Youngstown): **Bernard D. Osborne**, 3046 Tralee Trail, Dayton, Ohio 45430 (phone 255-2581).

**OKLAHOMA** (Altus, Enid, Oklahoma City, Tulsa): **Ed MacFarland**, Suite 1100, Shell Building, Tulsa, Okla. 74119 (phone 583-1877).

**OREGON** (Corvallis, Portland): **Robert Ringo**, 605 S. W. Jefferson St., Corvallis, Ore. 97330 (phone 753-4482).

**PENNSYLVANIA** (Allentown, Ambridge, Erie, Harrisburg, Lewistown, Philadelphia, Pittsburgh, Wayne): **Gilbert E. Petrina**, Box 113, RD #1 Hershey, Pa. 17033 (phone 367-3368).

**RHODE ISLAND** (Warwick): **Matthew Puchalski**, c/o 143' SOG RIANT, T. F. Green Airport, Warwick, R. I. 02886 (phone 737-2100, ext. 27).

**SOUTH CAROLINA** (Charleston, Columbia, Myrtle Beach): **James F. Hackler, Jr.**, Box 2065, Myrtle Beach, S. C. 29577 (phone 449-3331).

**SOUTH DAKOTA** (Sioux Falls): **Cletus Harner**, S. D. ANG, Joe Foss Field, Sioux Falls, S. D. 57104.

**TENNESSEE** (Memphis, Nashville): **Enoch B. Stephenson**, 4318 Esteswood Dr., Nashville, Tenn. 37215 (phone 244-6400).

**TEXAS** (Abilene, Amarillo, Austin, Big Spring, Corpus Christi, Dallas, Del Rio, El Paso, Fort Worth, Houston, Lubbock, San Angelo, San Antonio, Sherman, Waco, Wichita Falls): **B. L. Cockrell**, CMR Box 41594, Kelly AFB, Tex. 78241 (phone 925-4408).

**UTAH** (Bountiful, Brigham City, Clearfield, Hill AFB, Ogden, Salt Lake City, Springville): **Harry L. Cleveland**, 224 N. Jackson Ave., Ogden, Utah 84404 (phone 777-3466).

**VERMONT** (Burlington): **R. F. Wissinger**, 158th CAM SD, Burlington International Airport, Vt. 05401 (phone 863-4494).

**VIRGINIA** (Arlington, Danville, Hampton, Lynchburg, Norfolk, Richmond, Roanoke, Staunton): **Richard C. Emrich**, 6416 Noble Dr., McLean, Va. 22201 (phone 962-0710).

**WASHINGTON** (Bellevue, Port Angeles, Seattle, Spokane, Tacoma): **Clyde Stricker**, P. O. Box 88850, Seattle, Wash. 98188 (phone 534-2396 or 244-8650).

**WEST VIRGINIA** (Clarksburg): **Nelson Matthews**, 248 E. Main St., Clarksburg, W. Va. 26301 (phone 624-1490).

**WISCONSIN** (Madison, Milwaukee): **Lyle W. Ganz**, 1536 N. 69th St., Wauwatosa, Wis. 53213 (phone 444-4442).

**WYOMING** (Cheyenne): **Conley B. Stroud, Jr.**, 6421 Evers Blvd., Cheyenne, Wyo. 82001 (phone 638-9517).



# Air Force Association Military Group For Immediate, Worldwide, Full-Time

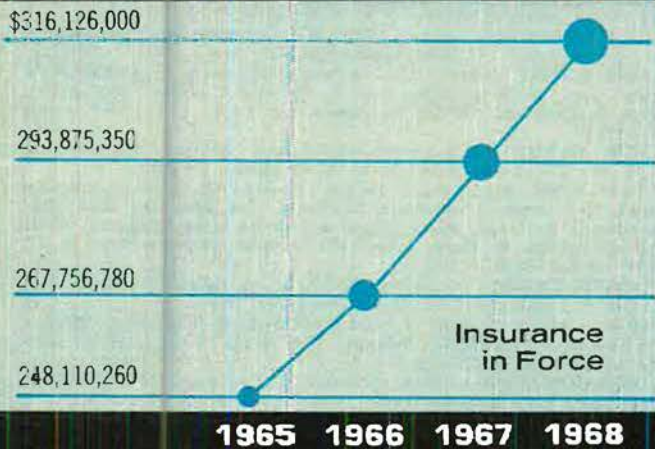
## 8 Years of Continuous Growth and Service!

**BIG BENEFITS! LOW PREMIUMS!**  
**Professionally Administered by AFA!**

### BENEFIT SCHEDULE

| Age   | Basic Coverage* | Extra Accidental Death Benefit  |
|-------|-----------------|---|
| 20-39 | \$20,000        |  |
| 40-44 | 17,500          |   |
| 45-49 | 13,500          |   |
| 50-59 | 10,000          |   |
| 60-64 | 7,500           |   |

\* A flat sum of \$15,000 is paid for all deaths which are caused by an aviation accident in which the insured is serving as pilot or crew member of the aircraft involved. In this case, the accidental death benefit does not apply.



### LOW PREMIUM!

A low premium of \$10 per month (reduced by dividends each year since 1962) provides COMPLETE coverage.

Policyholders Have Shared in Dividends (Plus Increased Benefits) for Seven Consecutive Years—Including Four War Years.

1961

Policy changed to permit policyholders to keep insurance at the low, group rate when leaving military service.

1962

20%

20% dividend paid to all policyholders.

1963

25%

25% dividend paid to all policyholders. Coverage extended to include AF Ready Reserve and Air National Guard.

1964

20%

20% dividend paid to all policyholders. Accidental death benefit increased to \$12,500. Coverage increased for flying personnel at no increase in premium.

1965

9%

9% dividend paid to all policyholders, a decrease reflecting AFA's decision not to limit coverage in combat zones.

1966

10%

10% dividend paid to all policyholders. Coverage continues to insure policyholders in combat zones with no restrictions.

1967

8%

8% dividend paid to all policyholders. Coverage continues to insure policyholders in combat zones with no restrictions.

1968

8%

8% dividend paid to all policyholders. Unrestricted coverage continues to offer broadest possible protection.

VIETNAM WAR YEARS

# Life Insurance Protection!

No Hazardous Duty Restriction, War Clause, or Combat Zone Waiting Period!

## NO WAR CLAUSE! NO HAZARDOUS DUTY RESTRICTION!

There is no war clause, combat-zone waiting period, other hazardous duty restriction or geographical limitation on AFA Military Group Life Insurance coverage. It is AFA's policy to continue to provide the broadest possible protection to all of our member-policyholders, including those in combat zones. We believe we can best fulfill our mission of service to the Air Force and to members in this way.

## \$12,500 ACCIDENTAL DEATH BENEFIT

An additional benefit of \$12,500 is paid for accidental deaths—even those caused by aviation accidents—except when the insured is serving as pilot or crew member of the aircraft involved.

## EQUAL COVERAGE — AT THE SAME LOW PREMIUM — FOR FLYING AND NON-FLYING PERSONNEL

All policyholders are insured for the same basic amounts, at the same low premium, whether or not they are on flying status. This eliminates the penalty of lower coverage for the men on flying status whose death is caused (as most are) by illness or ordinary accident. There is one exception\* to this provision which is clearly stated below in the benefit table on the opposite page.

## PROFESSIONALLY ADMINISTERED

Military Group Life Insurance is administered by professionally trained insurance personnel within the Air Force Association. This provides efficient, thorough service at the lowest possible cost.

## EXCLUSIONS — FOR YOUR PROTECTION

In order to provide maximum coverage at minimum cost for all participants, there are a few exclusions which apply to your coverage. They are:

Death benefits for suicide or death from injuries intentionally self-inflicted while sane or insane shall not be effective until your policy has been in force for twelve months.

The Accident Death Benefit shall not be effective if death results: (1) From injuries intentionally self-inflicted while sane or insane, or (2) From injuries sustained while committing a felony, or (3) Either directly or indirectly from bodily or mental infirmity or poisoning or asphyxiation from carbon monoxide, or (4) During any period while the policy is in force under the waiver of premium provision of the master policy, or (5) From an aviation accident, military or civilian, in which the insured was acting as pilot or crew member of the aircraft involved.

## OTHER BENEFITS

COVERAGE MAY BE RETAINED AFTER LEAVING ACTIVE DUTY TO AGE 65

GUARANTEED CONVERSION TO PERMANENT INSURANCE

WAIVER OF PREMIUM FOR DISABILITY

FULL CHOICE OF SETTLEMENT OPTIONS

## ELIGIBILITY

All active duty personnel of the United States Air Force (under Age 60) and all members of the Air Force Ready Reserve and Air National Guard (under age 50) are eligible for this insurance provided they are now, or become, members of the Air Force Association.

## PAYMENT OF PREMIUMS

Premiums may be paid direct to AFA in quarterly (\$30), semiannual (\$60), or annual (\$120) installments. AFA will send statements 30 days before each premium due date. Active-duty personnel may also pay monthly by government allotment (\$10), thereby having their premiums paid automatically and preventing any possible lapse in coverage.

# AF Active Duty, Ready Reserve & National Guard Personnel Are Eligible

## OTHER FACTS ABOUT YOUR POLICY

All certificates are dated and take effect on the last day of the month in which your application for coverage is postmarked. Coverage runs concurrently with AFA membership. AFA Military Group Life Insurance is written in conformity with the Insurance Regulations of the District of Columbia.

The insurance will be provided under the group insurance policy issued by United Benefit Life Insurance Company to the Air Force Association. However, National Guard and Reserve members who are permanent residents of Ohio, Texas, Wisconsin, and New Jersey, will not be covered under the group policy, but will be eligible for individual policies providing somewhat similar benefits.

## MAIL YOUR APPLICATION TODAY!

### AFA MILITARY GROUP LIFE INSURANCE

(UNDERWRITTEN BY UNITED OF OMAHA)

Rank (please print)      Name      Service Number

Mailing Address

City      State      Zip Code

Date of Birth

Beneficiary      Relationship

This insurance is available only to AFA members:

I enclose \$7 for annual AFA membership dues (includes subscription (\$6) to AIR FORCE/SPACE DIGEST).

I am an AFA member.

I understand the conditions governing AFA's Group Life Insurance Plan. I certify that I am eligible for this insurance under the category indicated, that I am currently in good health, and that I have successfully passed, within the past two year period, the last physical examination required by my branch of service. (Reserve and Guard personnel not on extended active duty must include with this application a copy of their most recently completed SF88.)

Signature of Applicant \_\_\_\_\_ Date \_\_\_\_\_

Application must be accompanied by check or money order. Send remittance to:

INSURANCE DIVISION, AFA, 1750 PENNSYLVANIA AVE., N.W., WASHINGTON, D. C. 20006

Please indicate below the form of payment you elect:

Monthly government allotment (I enclose \$20 to cover the period necessary for my allotment to be processed.)

Quarterly (I enclose \$30)

Semi-annually (I enclose \$60)

Annually (I enclose \$120)

Category of eligibility (please check appropriate box)

Active Duty, Air Force

Ready Reserve, Air Force

Air National Guard

5-70

EDITOR'S NOTE: This month Bob Stevens forgoes his normal format to bring you—

# POOR ROBERT'S 'ALMANAK'

**FEB 1905** CAPT. THOS. BALDWIN IN HIS AIRSHIP 'CALIFORNIA ARROW' RACES AN AUTOMOBILE 10 MILES (L.A. TO PASADENA, CALIF.) -- AND WINS BY 3 MIN.!

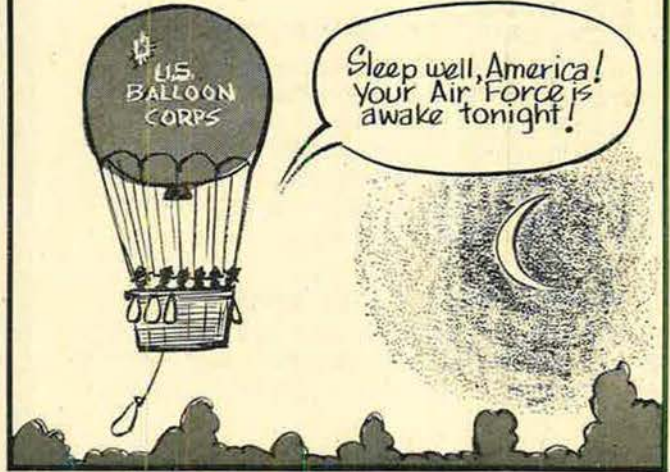
Yeh! but I hit 4 stop lights in Los Angeles!



**JUNE 1908** AIR STRENGTH OF THE U.S. ARMY IS 3 OFFICERS AND 10 MEN - ALL IN ONE BASKET!

U.S. BALLOON CORPS

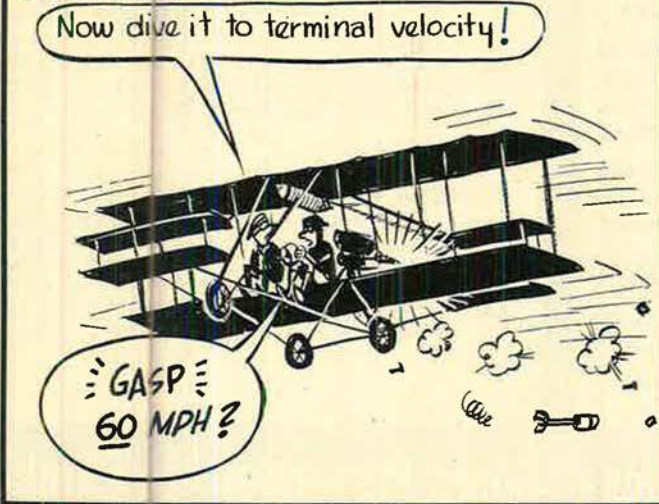
Sleep well, America! Your Air Force is awake tonight!



**JULY 1909** FINAL TEST FLIGHT OF THE FIRST GOVT. AIRCRAFT.

Now dive it to terminal velocity!

GASP!  
60 MPH?



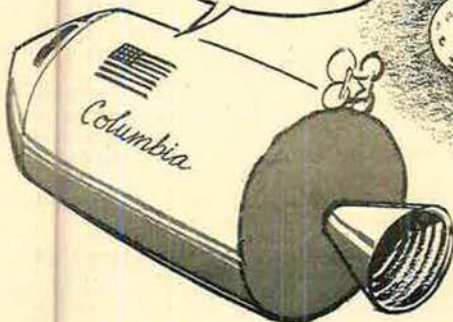
**OCT 1918** AIR PASSENGER SERVICE BETWEEN KEY WEST, FLA., AND CUBA INAUGURATED.

An' it's still operating! (off and on)



**JUNE 1927** CHAMBERLAIN AND LEVINE FLY NONSTOP FROM N.Y. TO GERMANY - 3905 MI. - IN 42 HRS; THEIR SHIP - 'COLUMBIA'!

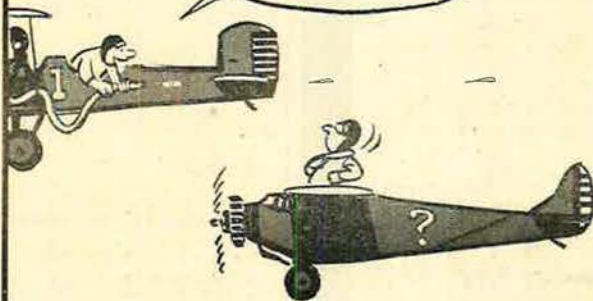
Can you beat that?



P.S. This one made it from the moon to earth in 60 hrs!

**JAN 1929** MAJ. SPAATZ AND CAPT. EAKER, PLUS CREW OF 3, SET REFUELING ENDURANCE RECORD OF 150 HRS 40 MIN. OVER L.A.

Regular or ethyl? \*



\* And that's where that old saw came from!

Bob Stevens

# Our most important space project is the voyage to Serendip.

In the eighteenth century, Horace Walpole wrote about three princes of Serendip who traveled in search of treasure.

The princes never found treasure. But they continually came across other discoveries that proved to be even more valuable.

To describe this phenomenon – that of making unexpected discoveries while in search of something else – Walpole coined the word “serendipity.”

A useful word.

Today, serendipity is perhaps the most persuasive reason why our nation must continue with

a strong, balanced program of space exploration.

Our investment in space has already paid us many direct benefits. Instant world-wide communication. Improved weather forecasting. New and vital means of national defense.

But even more important are the serendipitous applications now emerging from the technological and scientific advances made by our space program.

The techniques, products, and processes we've developed are helping us solve problems in air and water pollution. They're helping us increase the world food supply, control traffic, renew our cities, care for our sick. And the list is constantly growing.

At UTC, where we specialize in rocket propellants and advanced propulsion systems, we are proud of the part we've played in America's space program. And all of us are looking forward to the expected and the serendipitous discoveries to be made in tomorrow's journeys.

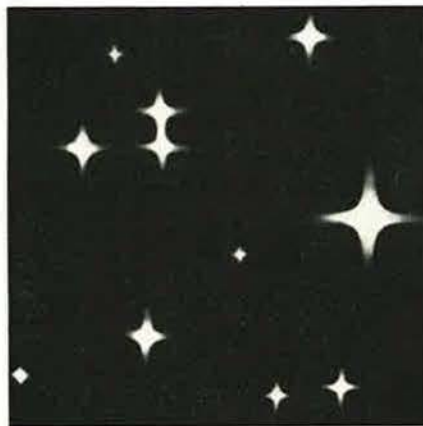
To us, in the twentieth century, every voyage into space is a voyage to Serendip.



**United Technology Center**

**U**  
DIVISION OF UNITED AIRCRAFT CORPORATION

**A**  
SUNNYVALE, CALIFORNIA 94088





Second Class Postage  
Paid at Dayton and  
Other Post Offices

AIR FORCE  
WASHINGTON, DC 20006  
1750 PENNSYLVANIA AVE. N.W.

## The complete air force: Phantom.

It's an air superiority fighter, an interceptor, a fighter-bomber or a reconnaissance aircraft. □ It carries a complete scale of weaponry and avionics for mastering any tactical situation or weather condition. □ The F-4E, with its 20mm, 6000 rounds-per-minute Gatling nose-gun, adds even greater capability, without sacrificing performance. □ It's the Phantom. The complete air force.

**MCDONNELL DOUGLAS** 